

A BiodiverCity:

Calgary's 10-year strategic plan for
biodiversity conservation

DRAFT 1

[Side bar data]

*The following is from Parks' 2013 Singapore Cities' Biodiversity Index

Habitat communities found in Calgary

Forest

- Aspen
- Balsam poplar
- White spruce

Shrub

- Upland tall
- Riverine tall
- Upland low

Grassland

- Native
- Non-native

Disturbed lands

Wetlands

Urban areas

Calgary wildlife

- 52 mammals
- 365 birds
- 6 amphibians
- 4 reptiles
- 22 fish

19% of Calgary is identified as natural area.

7% of Calgary is legally protected or secured natural area.

78% of Calgary is considered permeable.

In 2012 33,406 students under 16 formally visited a natural park.

33% of Calgarians are able to define biodiversity as a diversity of plants and animals.

[Introductory graphics]

Geographic location of Calgary, within its environmental context, edges, watershed/habitat

Natural areas and water bodies in Calgary

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IN BRIEF

What’s the most we can say about a biodiversity strategic plan in the least amount of words? Here’s what you’re about to read in one statement, three questions, four principles and one objective.

A. Biodiversity can flourish in the city of Calgary.

B. This document answers,

1. What is biodiversity?
2. Why should we conserve it in Calgary?
3. And how are we going to conserve it?

C. Our four principles for biodiversity are,

1. Conservation
2. Education
3. Collaboration
4. Integration

D. Our key objective is,

20 by 2025
There will be a 20 percent increase of naturalized areas in the city of Calgary by 2025.

WELCOME

There’s a story to be told about Calgary’s wildlife, plants and habitats; a story about the amount of these; a story about the diversity of these very things. This is a story about biodiversity in Calgary: what it is, why it’s important and what we’re doing to protect it, to ensure it remains a part of Calgary; it remains a part of us.

This story about biodiversity begins in your garden, a planter on your balcony, at the scale of holding soil in your hand. In your palm is biodiversity. It might be rich; it might be poor. But in those few grams of matter are a number of species, a variety of life – genetic variety to species to ecosystem variety. At this fine scale, this personal, understandable scale we can picture a definition of biodiversity: an amount of life forms and their diversity. Then we return this pile of soil, brush our hands off and go for a walk.

We walk out into our neighbourhood. There are trees, grass and gardens. Maybe potted plants hang from light standards, birds chirp, a squirrel runs across the street. These are part of what gives the place you live character. The vegetation in your yard, the trees planted adjacent to the street, a near-by wetland or river, here we go up another scale. We can understand biodiversity at this scale. We could count the number of trees, nesting birds, the number of frogs croaking on the shore. If we count the number of flowers, we could become aware of their diversity, the different species of flowers but also the different varieties of one species.

Perhaps the flowers are not in bloom. Perhaps it's fall or winter. In these seasons we have a different composition of biodiversity. We see the dynamics of biodiversity, from season to season, from year to year; it responds to climate, to our interventions. We pull a weed and the weed returns the next year. Or we plant different vegetation and the weeds are less present. Or it's a dry year and nothing much grows at all. Biodiversity isn't something static, it's in continuous flux.

[map]

We continue walking. Is there a large natural park nearby, perhaps Nose Hill, or Weaselhead, or Laycock, maybe the shore of the Elbow River? Here's another scale in the matrix of our urban ecology. These large, intact natural areas are some of the most biodiversity rich areas in Calgary. But these natural systems are dynamic too. If we negatively impact one of these places, if we don't manage it wisely, it can degrade. When these large, intact areas begin to lose biodiversity, the entire system tends to be at risk of failure. If we desire biodiversity though, if we recognize how important it is to our well-being, to the image of Calgary, we can restore the area, encourage it to return to a healthier state. We know that ecosystems with greater biodiversity are more stable; they better resist change. Restoration and conservation seek stability.

The next scale might require a bit more of our imagination. We can take a break from walking. From the edge of The Bow River or the middle of Ralph Klein Park, we scale up to Calgary as a city, the region in which Calgary is situated, or wider and wider until all of Canada or wider until the entire globe. At all of these scales we can measure biodiversity, at least in theory. From our home to the entire planet we can draw relationships between biodiversity and our wellbeing, and the wellbeing of the planet.

We can look at biodiversity in terms of output, by what it provides us. Biodiversity ensures we have the resources to make our homes, produce the medicine we need. It ensures our air is rich in oxygen, our soil is rich in nutrients, our water is pure, our climate is regulated. Biodiversity gives us places to recreate, places of respite, places of spiritual connections. Biodiversity offers us a sense of a larger beauty, a sense of who we are as a species; it connects us and ensures we can be mesmerized by its splendour every time an eagle soars over our city or a moose shows up in the streets of downtown Calgary.

And to Calgary we return. Appreciating the scales of biodiversity helps us become aware of how our actions can affect it. What we do in our gardens, our activities in our neighbourhood parks, to the way

we move about in Calgary, what we consume – and how much we consume, or how little – we can see our actions through the lens of biodiversity.

Biodiversity is placemaking. Road, buildings, parks, communities, recognizing how biodiversity connects these can provide an overall narrative about working together. But if we fail to recognize our actions, if we fail to recognize the innate value of biodiversity – in our garden, in our parks, in Calgary, around the globe, we lose the lungs of the city, we lose part of what defines our city, what connects us spiritually, socially, we lose characters in our story.

And this is where our story about biodiversity begins. A story about biodiversity in Calgary. A story about where we're going. This is a story that narrates our ten year vision for biodiversity in Calgary, how we got to our vision and what principles will guide us for biodiversity conservation in Calgary. Ultimately, this is a story about Calgarians and their continuing admiration for their natural environment and what plans we need to have in place to conserve it. How do we develop Calgary, how do we manage this city, how do we connect with citizens to ensure we conserve biodiversity? This plan helps tell that story.

A STORY OF CHANGE, BIODIVERSITY IN CALGARY

In our 2014 Biodiversity Report, we reviewed the landscape region where Calgary lies in southern Alberta, Canada, just next door to the Canadian Rockies. This report documented the current state of biodiversity and its management in Calgary. We provided insight into our wildlife and habitat types, as well as how The City is structured to conserve these. We looked at Calgary's ecology, governance and how we work with citizens and stakeholders. This provided the first step in our chronology of biodiversity change in Calgary.

Writing on Calgary's natural parks, Jim Foley describes Calgary as a city of edges.ⁱ Calgary is located on the edge of two ecosystems roughly bisecting the city north to south: the Fescue Grasslands and the Aspen Parklands. The Fescue Grasslands are associated with a mild climate and dominated by wetlands and dry grassland. The Aspen Parkland is marked by cold winters and short, warm winters and characterized by trembling aspen, woody shrubs and fescue grasses. In Calgary, these two ecoregions are habitat to the likes of coyote and white-tailed deer.

Calgary is also the place where two glaciers met 20,000 years ago. Although Calgary appears to be a city on the flat plains, the receding glaciers produced areas of abrupt elevation change. These areas offer differing sunlight penetration causing microclimates and associated alterations in biodiversity. Calgary is also at the confluence of two major rivers. It has four distinct creeks and numerous streams. These bodies of water and associated uplands are sources of great biodiversity.

Professor Peter Del Tredici writes, "Changes in urban vegetation over time clearly reflect constantly shifting human value judgments, socioeconomic cycles and evolving technological advances in transportation, communication and construction."ⁱⁱ The city of Calgary has had a story about changes in

biodiversity since its inception, reflecting what Professor De Tredici narrates. There is human evidence in this area dating back 8000 years. European contact occurred in 1787 with settlement in 1875. Calgary was officially incorporated as a town in 1884 with a population of 428 souls. Each of these periods are associated with types of activities on the land. At first following animals or in the case of bison, herding them over a cliff. Settlers came to Calgary with their agricultural technology and conception of landscape beauty. Farming and grazing became associated with the area creating new habitat edges. The open spaces in the city were designed to mirror the architectural norms of their homeland of geometrically designed parks. More edges were created.

This area moved through various stages in having its landscape transformed, from having nature tamed, to having it beautified – to adding trees in a mostly otherwise treeless area. Then there was a movement to protect nature, mostly along Calgary’s rivers.

In the 1960s the Province of Alberta gave municipalities power to protect steep hills, areas subject to flooding and natural drainage course. Originally this was for liability purposes, to protect private landowners, but these lands are often associated with habitat and distinct vegetation and soon by protecting these areas, The City was able to advance biodiversity goals also.

A major step for The City towards recognizing the importance of urban biodiversity came in 2009 when Council formally committed to protecting biodiversity in its Municipal Development Plan. The Plan requires the conservation, protection and restoration of the natural environment of Calgary. The stories of changes in Calgary are often reflected in Council documents. Geological edges, vegetative, topographical and watercourse edges. Human-made edges too. Calgary is in part defined by its history of making edges. This story of biodiversity change, of recognizing what we have, of where we want to go, and how we are going to get there, continues in this document.

OUR VISION FOR BIODIVERSITY

We value our city’s diversity and richness in wildlife, vegetation and landscapes; our ecological network is healthy, integrated, connected and we work to co-exist with its valuable services.

WHY BIODIVERSITY CONSERVATION?

[At least 40 per cent of the world’s economy and 80 per cent of the needs of the poor are derived from biological resources. In addition, the richer the diversity of life, the greater the opportunity for medical discoveries, economic development, and adaptive responses to such new challenges as climate change. – The Convention on Biological Diversity]

Calgary has in part been defined by its natural open spaces, its signature parks, its rivers and creeks. Calgarians consistently rank parks as an important part of the city's heritage, natural history and identity. These motivations alone might be enough to conserve the natural environment.

Biodiversity is something specific though. The genetic, species and ecosystem interactions and their variety is a definition of biodiversity. How intact these processes are can be seen in what they provide us. Intact natural systems provide us with rich soil, clean air and water. They absorb rain water and act as filters before waters enter streams and rivers. Natural systems act as water purifiers for irrigation and drinking water and also sustain ecological processes for aquatic habitat. It is accepted that greater biological diversity leads to greater productivity in plant communities, greater nutrient retention in ecosystems and greater ecosystem stability. Ecosystem processes are less stable at lower diversity.ⁱⁱⁱ Balanced species interactions produce goods and services we depend on. These are life-supporting. Without them our lives would be lesser. They're also free. Our only costs are managing them. But we heavily pay when they're lost. Providing safe drinking water for example becomes far more costly when the source for where the water originates has been degraded.

Drinking water is a perfect example for appreciating the scales of biodiversity, or how distant ecosystems benefit us locally. Municipal water supply goes far beyond municipal borders. Our water quality can in part be understood as a product of the quality of our watershed. Intact ecosystems in our watershed act as natural purifiers to the water we consume here. Air quality and climatic stability is another appreciation of distant ecosystems supporting us locally. We benefit from the distant biodiversity of the boreal forest in northern Alberta by removing CO₂ from the atmosphere and this relationship with climatic stability.

80% of Canadians live in cities. Our day-to-day life is a city life. The nature in our cities thus tends to be the nature we most often experience. This is the biodiversity of our daily routines. This immediacy provides the opportunity to conserve and manage our natural systems to ensure they are experienced, that they continue on in the future providing the services we depend on.

Being a city species means we live closer together. Closeness can encourage collective actions for change. A community garden, a resident's association naturalizing and diversifying their green space and gardens, industry implementing various "green" programs to attract and retain employees, coming together creates great energy for change.

Recognizing the value of biodiversity can create a city that responds to nature, both locally in terms of what we protect and nurture and how our processes in the city affect biodiversity beyond us; how we manage our parks to what species we grow in our gardens to how our consumption practices affect other parts of the world. Biodiversity connects our built and natural environment, how they can better integrate, how our built environment can respond to our natural one by enabling ecological processes in and on what we build: living building walls, animal overpasses, etc. Biodiversity can move us away from managing discrete assets to seeing the city as an ecosystem and business units and stakeholders working together for a common objective based on common principles.

Encouraging natural ecological systems in the city by planting native species and having corridors of vegetation linked throughout the systems helps pollinator species spread enhancing food systems and nutritional security. Nature is in our large, signature parks but also in our planters, gardens, cemeteries, landfills and right of ways. Seeing conservation as a system can help us protect a representative range of biodiversity to continue the natural history of Calgary. The City alone won't improve the environment. We must work with citizens, businesses, institutions, other levels of government and local and internal organizations. And this is where we turn to next.

WHERE WE ARE NOW

[graph the steps]

This document is part three of the five steps that we formalized in our biodiversity story. In 2011 Council committed to signing the Durban Commitment and formally joined Local Action for Biodiversity (LAB), a global urban biodiversity program coordinated by ICLEI – Local Governments for Sustainability (previously, International Council for Local Environmental Initiatives). ICLEI was founded in 1990 when more than 200 local governments from 43 countries convened at the UN World Congress of Local Governments for a Sustainable Future. By agreeing to sign The Durban Commitment, The City signified its promise to value and protect its environment, to acknowledge accountability and responsibility for the health and well-being of our communities through protecting, sustainably utilizing and managing biodiversity and recognizing its role as the foundation of our existence. That led us to step one.

In step one we worked with LAB to help describe the current state and management of wildlife and plants in Calgary. We looked back at historical factors that led us to our current realities. We also looked at our partnerships in biodiversity conservation and what is being done to conserve what we have and, where possible, restore what has been degraded. We reviewed the programs we're running, the tools we have in place to protect our natural environment and how we work with citizens like you to help us conserve our biodiversity. This 2014 City of Calgary Biodiversity Report connected steps one and two.

The LAB program provides us the opportunity to work with leading experts in the fields of conservation biology and urban biodiversity management to learn from and share experiences with the other cities that are also demonstrating leadership in biodiversity conservation. Before we discuss the rest of our steps, here are the five steps in the LAB process in summary:

1. Develop a biodiversity report documenting the current state of biodiversity and its management in Calgary;
2. Ensure long-term commitment by Council to sustainable biodiversity management through LAB cities formally signing a local government biodiversity declaration;
3. Develop a 10-year biodiversity action plan and framework that includes commitments to biodiversity implementation plans and integration within broader city plans;
4. Formally accept the 10-year biodiversity strategic action plan and framework by Council; and
5. Implement three new on-the-ground biodiversity interventions by the end of the program.

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This document is the basis for steps three, four and five. It declares our commitment to protect and enhance biodiversity at the local level and regularly monitor, report and act on the state of biodiversity within Calgary. This plan lays out the actions required to consider biodiversity in all aspects of local planning from land-use, mobility to social and economic development. We remain committed to awareness-raising of the value of biodiversity and ongoing engagement with our stakeholders to ensure participation and involvement, including biodiversity conservation in city partnerships locally, regionally and globally.

This plan provides the framework to update and strengthen existing municipal policies supporting biodiversity while providing direction on how to align with external stakeholders and other levels of government. This plan helps us to continue building a corporate picture of biodiversity conservation.

POSITION WITH OTHERS

[Graph this alignment]

We are aligned internally and externally to advance biodiversity conservation. Council-approved document gave us the direction for this plan, while high levels of government and international organizations provided us numerous strategies in which to work with. How we are nested with these is depicted below.

International

Convention on Biological Diversity: Strategic Plan for Biodiversity 2011-2020

Provides the overarching framework on biodiversity for the entire United Nations system.

Federal

Canadian Biodiversity Strategy

The Government of Canada's strategic plan to meet the obligations of the United Nations Convention on Biological Diversity.

Provincial

South Saskatchewan Regional Plan (draft)

A regional plan based on a watershed to give direction on balancing environmental, economic and cultural well-being.

Municipal

imagineCALGARY

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A long range sustainability plan for Calgary.

Natural Environment

Plants and animals

Target 1

By 2036, native biological diversity increases to healthy levels, as measured through Habitat Suitability Index indices and local key indicator species.

Municipal Development Plan

Addresses future land uses, services and transportation systems within the city.

2.6 Greening the city

Goal: Conserve, protect and restore the natural environment.

a(v). All land use and transportation planning development should seek to conserve and protect ecosystems by, establishing, protecting and restoring native habitat and areas of biodiversity locally and regionally.

Calgary Transportation Plan

Provides policy direction on multiple aspects of the city's transportation system.

3.12 Environment and Transportation

Goal: Advance environmental sustainability

c. Preserve and enhance *biodiversity* to support the natural environment in and around mobility corridors.

With imagineCALGARY we learned that Calgarians recognize the value of the natural environment. We have a goal to be responsible stewards of land, maintaining the life-supporting processes integral to healthy, intact ecosystems. We use and share our land wisely and equitably. We protect and restore our natural heritage, valuing native biodiversity as the foundation of life. Our built environment is integrated into and respects the natural environment we inhabit. We recognize how ecosystems benefit our lives and the connection between social and ecological systems. There is a connection between urban and natural systems. These systems are not discrete entities but are rather mutually dependent.

The inspiration of imagineCALGARY was given policy direction in our Municipal Development Plan. This policy adopted by Council can be considered a very “green” document. Of the six city-wide policy areas, one is solely focused on greening the city. The MDP recognizes our “environmental challenges as a result of how [the city] has grown and developed.” Calgarians “want to manage and protect the air, water, land and biodiversity to benefit themselves and future generations. ... The City of Calgary is committed

to leading and inspiring actions to reduce Calgary’s ecological footprint and to conserve, protect and enhance the environment locally and regionally.”

The 2020 Sustainability Direction is a strategic guide for transformation that identifies what must happen at The City by 2020 to contribute towards the imagineCALGARY 100-year vision. This strategic document links imagineCALGARY’s long-term vision and plan to The City’s four-year business plans and budgets. Business plans and budgets act as reference points in moving to the ten-year horizon of 2020. They provide a logical place in time to meet community needs and expectations, and establish the capacity to deliver on these results.

As our biodiversity strategic action plan is based on a ten year horizon that will extend beyond 2020, we have ensured alignment with the trajectory of 2020 continuing past it towards imagineCALGARY’s 100-year vision.

We’ve discussed our legal alignment and commitments within the City of Calgary, but we must also work with institutions, businesses and active citizens that are taking initiative to advance the goals of biodiversity conservation from new communities, innovations in habitat management to citizens working in their yards and gardens. This breadth of biodiversity is captured in our principles:

1. Conservation
2. Education
3. Collaboration
4. Integration

We’ll discuss these at greater length below.

OUR PRESSURES ON BIODIVERSITY

[Sidebar: Common environmental challenges found in cities are pollution and disruption of the natural environment from growth, consumption and over-use]

Biodiversity is an important component of cities. It helps shape the heritage of Calgary, helps shape our well-being, individually and collectively. It provides us with awe, with excitement for life. Appreciating biodiversity is appreciating the complexity of life and its processes.

But if we develop unwisely, if we disrupt the ecological processes necessary to support biodiversity, we degrade and isolate habitats that provide the opportunity for interaction between species. This results in a lack of genetic material transported through the ecological system. The lack of genetic diversity destabilizes the system. Invasive species with no natural predators tend to invade. Without appropriate management techniques, the system can collapse.

Pressures on biodiversity are a very complex process. We can, however, categorize them in four broad, although imperfect, themes:

Awareness pressures

Lack of knowledge or perception threatens biodiversity, as we are unaware of how our actions affect ecological processes. A lack of awareness can lead to a lack of engagement and action to better the situation we find ourselves in. This can often lead to the other three pressures we experience.

Legislative pressures

When there is a lack of rules, it becomes challenging to protect biodiversity, as a system-wide approach is often required for conservation practices. Legislation can also conflict. Conflict can lead to an inability to implement conservation measures. There can also be competing land use priorities, which is common in an urban environment. Public recreation and dog off-leash areas can negatively impact intact natural systems. Striking a balance between human access, development and protection, is an ongoing process in Calgary.

Budgetary pressures

[Forthcoming]

Physical pressures

Physical pressures on biodiversity can be seen as the direct impact we have on land. This can be understood through three distinct yet mutually inclusive categories: habitat loss, land degradation and the fragmentation of land. These are the by-product of land development or mismanagement. Degradation and fragmentation leads to a loss of habitat and isolated wildlife and plant communities. As discussed previously, this leads to a change in species composition at the edge of natural lands. As more generalist species move in there is an imbalance in predator-prey competition. Over-grazing and invasive species can also occur. Degradation is also a result of physical change to the park stemming from heavy use, often leading to soil compaction, erosion, damage to sensitive vegetation and, again, invasive species.

Other direct pressure can come from pollution which also degrades the land. Nutrient loading from chemicals and toxins released into the environment disrupt natural processes. These come from lawn and garden products, pharmaceuticals, contaminated runoff from parking lots and roadways and agricultural effluent.

Indirect pressures tend to be associated with climate change and pollution. Climate change and the urban heat island effect. The relationship between climate change and the elevated temperature levels in cities can be associated with drought and more severe rain events and resultant impact to water bodies. Plants and animals are also affected by abrupt temperature fluctuations.

But with recognition comes empowerment. Below are the opportunities we see.

THE OPPORTUNITIES WE SEE

[sidebar: Progress towards conservation comes from: Government policy; Public education; Grassroots initiatives; Business strategies; Design solutions]

A few years ago there were about a dozen community gardens in Calgary. Now there's close to 140. These have largely been citizen-led initiatives. Turf grass has been replaced by gardens. Undervalued areas became lush with plantings and community.

City of Calgary Fire Department sites are landscaped to provide a richer diversity of planting and drought tolerant species. They also provide on-site education about their practices to support sustainability objectives.

A new cemetery is being planned in southeast Calgary. It's proposing to increase tree and plant diversity, integrate site design with an adjacent wetland, increase top soil to minimize irrigation requirements, as well as provide education programs to advance awareness about these initiatives.

A waste management facility in Calgary has established a wetland monitoring program to assess impacts on adjacent wetlands. The program is to establish baseline conditions at the wetlands prior to the expansion of the waste facility to ensure the site is not negatively impacting the wetlands.

384 ha are planned for industrial development in east Calgary. Existing natural corridors are to be conserved through stream and wetland reclamation. The percentage of permeable landscape is to be improved in comparison to standard industrial land development practices. A diversity of native and drought tolerant vegetation is also planned.

A park stewardship program for youth in Calgary is providing numerous conservation awareness opportunities from litter pickups in parks to being a park interpreter. Instilling these values in youth will help model career choices or further volunteer choices to become life-long stewards of the environment.

The City has taken a strong position on water quality and water resource management, and recognizes the relation to protecting riparian areas and upland habitat. Water management initiatives have evolved and grown in scope from site-specific practices and consumer education to larger scale actions such as changing by-laws to make water efficiency a requirement and working with industrial and commercial consumers to realize the value of water conservation.

In Calgary land management of natural areas has transitioned from a period of protection for aesthetic purposes to one of conservation, recognizing the tacit link between natural areas and the ecological services they provide. Land management recognizes balancing public access and appreciation with conservation of sensitive areas.

This list of brief illustrations provide insight into how expanding the objectives of a project or initiatives can advance urban biodiversity and ecosystem function without directly being a biodiversity

conservation-based project. The insight here is that conservation is not simply about protecting and fencing off large areas of natural habitat and hoping biodiversity will flourish but rather rightfully managing these areas and broadening the objectives of projects in Calgary.

Biodiversity requires interdisciplinary actions. It requires recognition of how we can ameliorate our behaviours that negatively impact ecological processes and advance new ways of how we can better integrate, be more responsive to our environment. Fortunately there is wide support citizens and City Council for this.

Citizen support was demonstrated in a 2014 survey showing 89 percent of Calgarians believe life in life in Calgary is better because of public parks and 72 percent of respondents believe one person can do something to help the environment. 91 percent of Calgarians agree that a world class city is a city with a sustainable urban forest comprised of lots of healthy trees. 86 percent of Calgarians agree that Calgary's parks are an important part of our city's heritage, natural history and identity. 73 percent of Calgarians state that an important feature in a city park is biodiversity.

Council demonstrated its recognition of environmental conservation in 2009 by adopting a "green" municipal development plan. This is the document that addresses future land uses, services and transportation systems within Calgary. One section of the document is called, "Greening the city," which has a goal to conserve, protect and restore the natural environment. One policy requires that, "All land use and transportation planning development should seek to conserve and protect ecosystems by, establishing, protecting and restoring native habitat and areas of biodiversity locally and regionally."

People want to be involved in shaping and enhancing their environment and be given strong support to do so. This is completely supported by Council policy. Effectiveness, however, has been hampered by a lack of a system-wide approach to ecosystem conservation and directly tying decision making to biodiversity objectives. Strong principles endorsed by Council and acted on by Administration, businesses and citizens will help guide the trajectory of healthy biodiversity in Calgary. Any project that includes in its scope restoration, habitat protection and education could aid biodiversity. This strategic plan will establish the principles, commitments and recommendations to create the system-wide approach necessary for biodiversity conservation, to create an opportunity for broader project scopes in Calgary.

OUR STRATEGIC PLAN

We know that biodiversity happens in cities, that cities can be habitat for wildlife and contribute to the services that biodiversity provides: such as purifying water, maintain healthy soils, nurturing civic identity. Our vision is to proceed with this recognition. To ensure Calgary values a rich and diverse landscape of wildlife and vegetation. We will have an ecological network that is healthy, integrated and connected; and we will co-exist with its valuable services.

We don't aim to have higher amounts of biodiversity. It's not simply more biodiversity is better. But rather ensure natural function and heritage are maintained. We recognize a healthy environment is not simply conserving intact natural systems but also aiming to be responsive to ecosystem processes, to integrate our built systems and natural systems where possible.

Our plan is one of collaboration. We will work across business units and departments; we will connect with specialists, researchers, educators and practitioners. Collaboration will happen across sectors and across scales. We will continue our work with international organizations and keep up to date on research and novel practices. We will value citizens and their work to enhance or conserve biodiversity in their gardens, neighbourhood parks, or work with park stewardship groups.

We will remove boundaries. As we said above, biodiversity conservation isn't simply protecting large swatches of protected areas but ensuring a matrix of land is intact. Biodiversity is about scales. It's about recognizing the dynamics of city planning and operating, as well as the fluctuating nature of biodiversity.

Our key objective and indicator

We've chosen on broad-scale, non-project based objective and indicator to represent our strategic plan. Together these represent the physical form of biodiversity and offer the land supply necessary to ensure natural ecological processes as kept intact while the city develops.

There will be a 20 percent increase of naturalized areas in Calgary open space by 2025 based on the City of Calgary Parks' 2014 managed land supply.

The City of Calgary Parks currently manages 7821 hectares. 4149 hectares are natural area. 20 percent of its current natural area would be 829.8 hectares. By 2025 there will be an increase of 829.8 hectares of natural area in Calgary not including land brought into its inventory through subdivision.

These numbers are based on benchmarking data produced by Parks every year at the beginning of January. Parks will continue to support monitoring the naturalization objective in part by the benchmarking data produced.

Our principles

We established four key principles to guide our decision making. They act as a foundation for our behaviours and actions towards biodiversity conservation.

Conservation: plan, manage and restore open space in Calgary for productive, diverse, resilient ecosystems with the capacity to recover from disturbance and adapt to change.

Education: support sustainable use, production and consumption of local ecological resources by cultivating knowledge about ecological processes and Calgary's natural history.

Collaboration: work jointly with individuals and groups to advance innovations and practices associated with biodiversity conservation and environmental resiliency in planning and developing the city of Calgary.

Integration: neighbourhoods are designed to allow for interaction with nature to support healthy people and ecological processes in Calgary.

Our commitments

In order to enact the principles we require commitments from The City, industry and community members. Outlining commitments will provide a finer resolution for actions to be undertaken to ensure we achieve our vision.

We commit to:

Conserve

- Increase the aggregate hectares of natural areas in Calgary.
- Recognize the cost of protecting or removing ecological processes in growing and developing Calgary.
- Reduce direct pressures on biodiversity through managing appropriate access and use in areas rich in biodiversity and natural history.
- Ensure the conservation of genetic resources and dispersal pathways are established and protected in Calgary.
- Reduce the threat of invasive alien species through identification of threats and ensuring measures are in place to manage introduction pathways to prevent their establishment.
- Manage watersheds to protect and enhance aquatic habitat-forming processes such as hydrology, sediment transport and plant growth.

Educate

- Develop volunteer initiatives and education curriculum to support environmental stewardship and biodiversity conservation.
- Raise awareness of and encourage positive environmental actions from conservation to consumer behaviour.
- Ensure appropriate City staff, Council, businesses and communities have access to training and information on the newest products and techniques to advance the goals of biodiversity conservation, including procurement practices, building and site designs and managing open spaces.

Collaborate

- Recognize biodiversity as an aspect of economic development in Calgary.
- Partner with researchers, government and institutions to advance research and technological innovation in biodiversity conservation.
- Support and nurture community actions that advance ecosystem services and protect nature for nature's sake.
- Work with educators and school boards to advance biodiversity awareness in youth to support the development of a conservation ethic locally and globally.

Integrate

- Increase the functional habitat diversity of open space to increase access for nature appreciation in Calgary.
- Conserve habitat function and heritage by supporting non-invasive locally adapted species to minimize loss of biodiversity and monitor and manage invasive species populations.
- Develop a geographic information system that integrates land use and biodiversity data to support strategic management of Calgary’s ecosystems.
- Decrease wildlife strikes on roads in Calgary by ensuring wildlife movement pathways are connected and managed.

Our recommendations

Our commitments will require actions, a response to the pressures we previously identified on biodiversity. The following recommendations categorize possible actions. Each action requires initiating a project assigning performance measures, and managing the process to ensure objectives are being met.

Recommendation 1: Conserve wildlife, plants and natural heritage in Calgary

Conservation will require identifying and protecting lands and water to maintain essential local ecosystem function, quality and resiliency. Conservation acts as the basis for habitat protection and species conservation. A spectrum of conservation measures that will be required.

Possible actions

- a) Implement a framework to perform a Environmental Integrity Index of Calgary parks.
- b) Implement policies and guidelines to conserve and connect ecological patches and corridors; these may include green roofs and living wall design requirements, ecological corridors protection, animal crossing for urban barriers designs, park design, top-soil conservation regulation, land use zoning bylaws, development design guidelines, etc.
- c) Implement a framework to allocate municipal budget to purchase lands of high ecological and social value that can’t be otherwise protected through the subdivision process.
- d) Establish data sharing agreements with government, industry, research organizations and the public.
- e) Implement a regulatory mechanism to protect and connect environmentally significant areas.
- f) Implement an incentive program to advance the use of ecological easements.

Recommendation 2: Improve the function of the Calgary’s natural environment

Restore degraded habitats and manage the natural environment for biodiversity conservation. Increasing the overall health of open space will require numerous management tactics and on the ground applications. Protecting species habitat, reducing the population of invasive plants, naturalizing lands, and bringing excess nutrients entering waterways to levels that are not detrimental to ecosystem function and biodiversity will help achieve conservation and integration commitments. Collaboration between government, property owners, industry and researchers will help us achieve success.

Possible actions

- a) Implement a framework for habitat restoration.
- b) Implement management plans for all known species at risk in Calgary parks.
- c) Perform naturalization projects on public lands.
- d) Encourage the naturalization of private, community, business and institutional lands.
- e) Implement landscaping design guidelines to establish appropriate soil fertility, volume and management that support the goals of the open space.
- f) Implement a preferred planting list of native plant species for developers and the corporation and work with the horticulture industry to promote the sale of native plants.
- g) Implement a strategy to reduce invasive species in Calgary.

Recommendation 3: Collaborate on environmental education and volunteer programs

Raising awareness about biodiversity and ecological processes to encourage positive actions towards environmental protection and wise consumer choices. Establishing community and corporate programs through partnerships will help create stewards of Calgary's environment. Increasing public awareness and environmental literacy can be achieved by offering innovative, curriculum-based educational programs for citizens. Responding to the changing needs of citizens will be accomplished by providing diverse and equitable programs and events.

Possible actions

- a) Deliver a citywide environmental literacy and messaging campaign for all Calgarians.
- b) Work with key partners to promote grassroots community engagement with broader environmental stewardship initiatives such as pollinator friendly and biologically-diverse community gardens, school greening programs, etc.
- c) Implement a framework to integrate traditional knowledge of Calgary's historical landscape for protection and education opportunities.
- d) Implement a strategy to link all environmental education with local stewardship and programming.
- e) Provide a wide range of programs that emphasize the role of people in creating a more liveable city through biodiversity conservation.

Recommendation 4: Reduce managerial silos to advance biodiversity conservation

Develop a variety of approaches and mechanisms to integrate biodiversity concerns into City development goals. Connect with preservation groups and community members to establish champions in City Administration, Council, the private sector and community associations to promote and advance the objectives of The City's goal of biodiversity conservation. Establishing a breadth of biodiversity advocates can illuminate the numerous scales of urban biodiversity conservation.

Possible actions

- a) Identify City Council and Administration advocates for biodiversity conservation.
- b) Implement a biodiversity communications strategy.
- c) Initiate a biodiversity steering committee with representatives from The City, Council, local businesses and citizens at large.

- d) Continue the biodiversity oral history project to give biodiversity a personal connection and a human dimension.
- e) Implement a biodiversity project recognition program for community, private business and City projects.

OUR THREE BIODIVERSITY PROJECTS

[draft]

Through our commitment with the Local Action for Biodiversity program we have identified three biodiversity projects to illustrate our Commitments.

These projects are being carried out by experts where the City of Calgary is or will provide support for the projects.

1. Seasonal functional connectivity for urban coyotes in cityscapes
2. Mental Models Analysis of citizen engagement and education in biodiversity
3. Biodiversity committee

1. Seasonal functional connectivity for urban coyotes in cityscapes

Project scope

The project aims to determine seasonal functional connectivity in relation to behavioural ecology and changing climatic conditions that affect structural connectivity and landscape permeability.

We expect that either

H1) Coyote movement connectivity will be constrained more by biological seasons than by climatic conditions in urban environments during pup-rearing and denning.

Or that

H2) Coyote movement connectivity is constrained more by climatic conditions than biological seasons during dispersal

The project will inform city planners on connectivity for large mammals within the city limits to maintain or increase sustainable biodiversity in city settings.

The deliverables of the projects will be three:

1. Review paper on urban functional connectivity
2. Methodological paper on modelling suitability and permeability using expert opinion.

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3. Final paper on the development of an expert based connectivity model to identify overall connectivity and specific key corridors for coyote movements within the city limits.

Target biodiversity pressure

As it relates to the City of Calgary biodiversity strategic plan, our project is targeting

Strategy 1

Establish a linked network of representative reserves in the city and throughout the bioregion, as well as enhance diversity in gardens and in support of ecosystems in the bioregion.

Strategy 2

Protect and restore wildlife corridors.

Recommendations from the seasonal functional connectivity networks will identify potential significant priority habitats for coyotes and potential significant movement corridors. In cities coyotes are apex predators and exert top down affects through trophic cascades on other species in the ecosystem. In this way they have often been identified as ecosystem health indicators and through bottom up effects as sentinels for disease. Recommendations from the validation model will also include areas to manage the matrix (e.g. enhance diversity in gardens or potential areas to fence or remove attractants).

The results of the research can help support:

2020 Sustainability Direction

1. By 2020, no net loss of unique and environmentally significant habitats.
3. By 2020, significant landscapes and habitats in Calgary will be restored and/or reconnected.

Municipal Development Plan (MDP)

1.6.4 Ecological networks

Objective: Maintain biodiversity and landscape diversity, integrating and connecting ecological networks throughout the city.

Biodiversity

- n. Ensure the systematic conservation of land and water to reduce habitat fragmentation and ensure wildlife and fisheries connectivity.
- o. Re-establish open space connections, where feasible, to link important habitat areas within the city and region.

There are two connectivity networks resulting from this project

- 1) a structural connectivity network based purely on physical connections of open spaces (city managed and derelict).
- 2) and a functional connectivity network based on coyote seasonal ecology and behavior.

The first can help identify areas that are completely structurally isolated. Our practical recommendation section will discuss degrees of connectivity, functionally and structurally, per park with the objective of supporting the city in these goals.

Goal

The goal of this project is to understand how coyote movement networks change seasonally and whether it is due more to behavioural ecology or to climatic conditions. Our project specifically targets identifying and understanding changes in networks (priority habitats and corridors) through seasons and through different habitats. This will allow simulating changes in suitability and connectivity under different planning scenarios (e.g. ring road). The logic here is that habitats in the city that are able to sustain coyotes are also capable of supporting various other species. Therefore, these habitats may also sustain a higher range of biodiversity than those that cannot support coyotes.

Timeframe

This specific project started in May 2011 and is expected to be completed before the end of 2014. The overall research project is expected to last until 2020 with research projects on:

1. coyote spatial ecology (Spatial Ecology of Urban Coyotes),
2. coyote reproductive behavior (Citizen Coyote),
3. health at the interface between wildlife, domestic animals and people (Epidemiology and distribution of *Echinococcus multilocularis* in Calgary city parks; Biodiversity of rodent communities in city parks; Giardia and Cryptosporidium in domestic dogs and in wild hosts in urban Calgary).

Determining success

The project will be successful if the validation with actual GPS-GSM collar data from the two collared coyotes will be satisfactory so to confirm the expert based connectivity model.

The final confirmation of the quality of the project will be confirmed and definitely assessed if its results will be published in peer-reviewed journals.

Monitoring

We are totally committed to the project, we work in collaboration with the City partners and finally we aim for publication of each component of the project in high rank scientific journals.

Challenges

The project is not facing any problem. The overall research program is facing challenges with the development of animal care protocols from the University of Calgary that will not be perceived as impacting animal health.

Change management

The project was initially supposed to project connectivity models solely from GPS-GSM collar data from 10 coyotes. However, only two coyotes were caught in 2013. One coyote's collar was dropped off from one coyote within 4 months. Expert opinion surveys were put in place as a backup data source should the collars not be deployed or should they drop off prematurely.

Communications

The Urban Coyote Project is online on the City of Calgary website at

<http://www.calgary.ca/CSPS/Parks/Pages/Urban-Coyote-Study.aspx>

It is also available at the University of Calgary domain at

<http://vet.ucalgary.ca/coyote/>

There is also a twitter account (@UrbanCoyotesYYC; #coyotesYYC) and a facebook page (Calgary Urban Coyotes).

The working group also does various educational talks and academic presentations for

- Friends of Fish Creek Park
- Glenbow Park
- Rotary Club
- University of Calgary Faculty of Environmental design
- University of Calgary Faculty of Veterinary Medicine, department of Ecosystems and Public Health
- School for Public Health, University of Edmonton
- Alberta Veterinary Medical Association

The PI has had also several interviews with journalists and members of the media that have been printed and broadcasted.

The coyote connectivity project will be presented at the 2014 US-International Association of Landscape Ecologists conference in Anchorage, Alaska on May 19th.

2. A Mental Models Analysis of citizen engagement and education in biodiversity

Scope

This research project will rely on interviews with Alberta-based experts on urban biodiversity, as well as interviews with citizens of Calgary in order to develop a model of how people think about and understand urban biodiversity. While the specific geographic location is the city of Calgary, the results of this research project will have implications for urban centres across North America, Europe, and beyond.

Target biodiversity pressure

A central part of the City of Calgary's Local Action for Biodiversity initiative is the development of effective public engagement, education, and communication strategies around urban biodiversity. Citizen education and engagement have long been recognized as an important part of biodiversity conservation, and the support and meaningful involvement of citizens and stakeholder groups has been

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shown to be instrumental to the success of urban biodiversity initiatives.

Goal

Past research has shown, however, that engagement, education, and outreach efforts are often hampered because managers and agencies do not have a clear understanding of what people know, don't know, or need to know about a particular topic (in this case, urban biodiversity). Unfortunately, very few studies have focused on systematically exploring the specific information needs of citizens regarding urban biodiversity initiatives, as well as how they conceptualize urban biodiversity; this research project aims to close this gap.

Timeframe

This project will commence in July 2014, with an expected completion date of February 2015.

Determining success

One of the key goals of this research project is to identify misconceptions and gaps in citizen's knowledge about urban biodiversity, and in particular highlight what people see as the risks and benefits associated with improving the city's natural biodiversity. Thus, success will be determined, in part, through the identification of these knowledge gaps for the purpose of future communication, education, and engagement activities around urban biodiversity in Calgary.

In addition, the results of this research project will be presented at an academic conference and will be published in a peer-reviewed journal. Thus, positive reviews and constructive feedback by scientific peers will be another indicator of success.

Monitoring

We have developed a reasonable and appropriate timeline for this project, and are keeping the project on track through regular consultation with these benchmarks.

Challenges

The main challenges of this project are (i) identifying and scheduling interviews with a sufficient number of subject matter experts (i.e., 10-15), and (ii) the timely recruitment and scheduling of an appropriate number of citizens (i.e., 20-30) for the mental models interviews.

Change management

While we have planned to interview 20-30 citizens (the standard sample size for mental models analysis), we may need to modify this number if responses are more heterogeneous than expected. We have sufficient funds in our budget, and the necessary time, to accommodate this possible change.

Communications

We will advertise for study participants through local community organizations, community gardens, and other citizen groups; this—in and of itself—will help to raise awareness about the project as the research progresses. We can also request coverage in 'UToday', the University of Calgary's regular newsletter, and through the Urban Alliance (a city-university research, outreach, and engagement partnership). Finally, the results will be disseminated in academic journals, at conferences and meetings, and in publications geared to a non-scientific audience.

3. The biodiversity committee

[Forthcoming]

Develop a Terms of Reference for the committee: Stature, Purpose, Scope of Work, General Member Responsibilities, Group Composition, Roles

The committee will be responsible for monitoring relevant biodiversity projects to help ensure projects are on track. They will also be responsible for initiating new biodiversity projects, seeking partnerships, communicating projects and seeking funding sources.

The expert committee will also help determine project priorities to best determine funding. Develop a matrix to help inform decision making.

MONITORING OUR STRATEGY

[Forthcoming]

Each City of Calgary department and business units requires a Council-approved 4-year business plan and budget. These provide the direction for how the city will provide the services and programs that Calgarians have asked for. These plans will act as intervals towards our overall 10-year biodiversity strategy.

Yardsticks

ISO reporting

Each LAB project will be monitored on an ongoing basis, as established plan for each project.

CITY DEPARTMENT SNAP SHOTS

Department
City Manager
Business Units
City Auditor's Office
City Clerk's Office
Law
City Manager's Office
Overall mandate
The City Manager's Office ensures The City is a well-run organization that provides value to all of its citizens. This is provided through support and strategic advice to Council, the City Manager and all departments at The City. The department specializes in looking at the big picture of service delivery, promoting principles of transparency, accountability and good governance.
Role in biodiversity conservation
Sustainability at The City of Calgary is broadly based on the foundation of Council's Triple Bottom Line Policy which requires that all City decision and operations consider the social, economic, environmental and smart growth impacts. This applies broadly to programs, planning, policies, strategies, services, operations and approvals.
Through corporate guidance, the Office of Sustainability within the City Manager's Office establishes targets for sustainability helping ensure sustainable development principles are incorporated into decisions and actions across the corporation. The Office has developed 32 objectives that represent a midterm strategic marker to The City's contribution towards its 100-year, long-term community sustainability plan. One specific biodiversity objective of the document developed by the Office of Sustainability states that: <i>Calgary's ecosystems are healthy, connected and diverse and represent the breadth of our natural heritage.</i>

Department
Planning, Development and Assessment
Business Units
Development and Building Approvals
Land Use Planning and Policy
Assessment
Overall mandate
The department provides service devoted to collaboratively developing, recommending, promoting and implementing land use and transportation plans and policies to sustain and enhance the quality of life in Calgary.
Role in biodiversity conservation
The business units within Planning, Development and Assessment provide services in the areas of managing future growth and change for the city. These include analysing regional issues such as identifying lands for conservation. Programs also include planning for redevelopment along with lines of "complete communities."
The business units are tasked with managing the development of the city, calling upon other departments such as Parks and Water Resources to provide technical expertise in land development decision making. Through the circulation of area plans and development proposals to other business units in The City, the adherence to corporate policies for ecologically sound development is enacted.

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Area plans provide a framework for development in Calgary. They propose general land uses for a given area and provide The City direction for the protection and acquisition of open space for the conversation of our natural environment. General planning tools speak to techniques to develop communities that are responsive to our natural environment, and outline the legislative tools for land acquisition for these areas.

Department
Transportation
Business Units
Calgary Transit
Roads
Transportation Infrastructure
Transportation Planning
Overall mandate
We work to provide a safe, reliable, efficient, customer focused transportation system that supports all modes of travel and promotes sustainability and smart growth. The system contributes significantly to making Calgary a healthy, vibrant and dynamic community supporting the needs of residents, businesses and tourists. We continually enhance our services and expand and diversify the transportation system to meet the needs of a growing city, while aligning with environmental guidelines and legislation.
Role in biodiversity conservation
Transportation business units have a role in the conservation of biodiversity during planning, development and operation of the transportation system. Planning studies are scoped to identify and address biophysical features and processes such as wildlife movement corridors and environmentally significant areas with the aim of avoiding or minimizing the loss of biodiversity through careful route alignment and appropriate mitigation measures applied to design and construction.
Environmental construction operations plans guide the work done on transportation development sites, which are typically long and linear, and these plans include guidance on tree protection, aquatic habitat and water quality protection through erosion control, as well as weed control. Throughout construction, and later the operation of the system over the longer term, noxious weeds are monitored and controlled by means of mowing and herbicide application. This means that the second largest threat to biodiversity globally, after habitat loss and fragmentation, is being addressed locally along major roadways and other transportation facilities.

Department
Utilities and Environmental Protection
Business Units
Waste and Recycling Services
Water Resources
Water Services
Environmental and Safety Management
Overall mandate
The department of Utilities and Environmental Protection is tasked with environmental management through air and soil quality monitoring, and policy development. Public health is protected by ensuring the integrity of Calgary’s water supply and the overall management of the city’s watershed.
Role in biodiversity conservation

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Utilities and Environmental Protection business units are dedicated to protecting and managing the city's lands, air- and watersheds. The role in biodiversity conservation is largely through the development and delivery of corporate environmental, policies, programs and services that mitigate the environmental impact of development and the city's operations. This includes waste diversion, contaminated sites management, brownfield redevelopment, increasing fleet fuel efficiency, mitigation of environmental impacts from construction activities and supporting the community to reduce greenhouse gas emissions.

Watershed planning initiatives reduce Calgary's impacts on its rivers and ensures the protection of healthy soils and vegetation. This helps promote ecosystem function which is linked to increased biodiversity. Policies requiring [connectivity throughout the watershed from the uplands to riparian areas via retaining natural drainage courses and green spaces](#), help contribute to hydrologic function. This preserves habitat connectivity, as these areas provide multiple ecosystem services.

Initiatives designed to divert vegetative organics from landfills

helps ensure biodegrading organics including the following

Biodegrading organics, like vegetative food (peelings, coffee grounds, etc.) and yard trimmings (grass clippings, leaves, etc.) generate greenhouse gases when they're buried in a landfill where there is no oxygen.

Too much organic material in the landfill means more greenhouse gas in the air. Vegetative organics currently make up a staggering 50 per cent of the residential garbage now going into our landfills. This means our landfills are the largest single point source of greenhouse gases in the area.

Example biodiversity-related projects/targets

Existing Indicators

1. The City's regulatory approval to operate (including Total Loading Management Plan) measures Calgary's impact on the rivers (issued from Alberta Environment and Sustainable Resource Development);
2. The Stormwater Management Strategy target to keep total suspended solids that flow to the river at 2005 levels;
3. Sustainability Direction: by 2020, total loading targets continue to be met in The City's Licence to Operate, by 2020, drinking water and treated wastewater effluent will continue to meet provincial regulations for quality 100% of the time; by 2020, diversify Calgary's future water supply to align with water demand;
4. Water efficiency goal (also in 2020 Sustainability Direction) to maintain river water withdrawals at 2003 levels (and on a supplementary basis includes indicators for per capita demand for all water use, single family demand peak day demand and metering).
5. MDP target: 60 year goal to reduce imperviousness to 10-20 percent.

Department
Community Services and Protective Services
Business Units
Community and Neighbourhood Services
Recreation
Parks
Fire
Animal and Bylaw Services
Overall mandate
The business units in the department of Community Services and Protective Services deliver a broad array of social, recreation, leisure and public art programs and services that encourage active lifestyles, inclusive communities and vibrant neighbourhoods for all citizens. They protect, preserve and restore public safety through the programs and services of the Calgary Fire Department, 9-1-1, bylaw education and enforcement, and emergency and disaster response systems.
Role in biodiversity conservation
<p>Parks is the lead business unit for conservation and management of public open space. These areas include natural environments, wetlands, riparian areas and manicured parks. Parks works with a number of business units to achieve similar goals of providing healthy, intact natural areas and open spaces.</p> <p>The City strives to maintain the diversity of species and ecosystems in this region, working together to maintain and enhance landscape connectivity across the region to ensure the health and integrity of the ecological system. The City commits to understanding, respecting and enhancing the integrity of the region's ecological infrastructure by implementing land use and environmental conservation stewardship strategies.</p>

Department
Corporate Services
Business Units
Office of Land Servicing and Housing
Human Resources
Information Technology
Infrastructure and Information Services
Corporate Properties and Buildings
Fleet Services
Customer Services and Communications
Overall mandate
The City of Calgary's Corporate Services department includes seven business units providing enabling services to the Corporation as well as the citizens of Calgary.
Role in biodiversity conservation
<p>Corporate Services business units have a broad role in environmental sustainability and biodiversity conservation. The business units tasked with managing real property at The City identify, protect and restore environmentally sensitive habitats through specific land and site development projects. The eco-friendly vehicles program targets green house gas reduction and improving air quality in the city, which has a directive causative relationship with biodiversity.</p> <p>This area of The City also manages spatial data on key biodiversity indicators and monitors impacts on</p>

biodiversity related to the piloting of green technology projects such as wind turbines, green roofs, etc. The latter program is encouraged on City-owned land and buildings. Green roofs, naturalization projects and low-impact development practices on City-owned land and buildings are piloted, managed and monitored to evaluate success,.

Department
Chief Financial Officer
Business Units
Finance and Supply
Overall mandate
The Chief Financial Officer’s Department (CFOD) of The City of Calgary oversees the Finance & Supply business unit while focusing on overall financial strategy and policy, multi-year business planning and budgeting, performance monitoring, and productivity and efficiency improvement.
Role in biodiversity conservation
Supply is a business enabler for The City. . By this the business units are assisting other City departments in their procurement needs. The need and specification of any specific procurements that are conducted, are owned and managed by the business units that they service.

EXPLANATION OF SPECIFIC TERMS

Conservation/conserve:

Environmentally Significant Area: A natural area site that has been inventoried prior to potential development and which, because of its features or characteristics, is significant to Calgary from an environmental perspective and has the potential to remain viable in an urban environment.

Habitat restoration: The active process of assisting, through land management activities, the recovery of a degraded habitat to initiate or accelerate its succession towards a reference habitat.

Natural area/naturalized area: City-owned land comprised predominantly of native species and natural ecosystems except where action has been taken to naturalise the land.

Naturalization/naturalize: A type of habitat restoration; the deliberate reintroduction of species that are native to a given area or are well adapted to the climate circumstance; activities that are intended to improve and enhance the natural environment.

Natural Region/Subregion: Natural Regions are the largest ecological classification unit in Alberta and allow for the geographic classification of the province based on ecological criteria. Each Natural Region is further categorized into Natural Subregions.

Open space: In its broadest sense, open space in its broadest sense includes all land and water areas, either publicly owned or offering public access, that are not covered by structures. For the purposes of this document, open space includes current and potential future parks, pathways, roadway greens, land for parks and recreation facilities, golf courses, cemeteries and other types of alternative use open space.

Park: A specific-use open space area that is managed to provide opportunities for recreation, education, cultural or aesthetic use.

Protection/protect:

Resiliency:

Reference habitat: The target ecosystem for restoration of a degraded habitat; the reference habitat may be described from historic or contemporary data sources, or may be physically represented by undisturbed, similar native habitat appropriate for the site conditions of the degraded habitat, and which may be adjacent to the project site or elsewhere in the Natural Region/Subregion.

Urban ecology:

HOW WE CONNECTED WITH STAKEHOLDERS AND EXPERTS

[Forthcoming]

We first connected with project stakeholders in the spring and summer of 2013. The summer stakeholder sessions were put on hold due to Calgary's flood.

Stakeholders were composed of park stewardship groups, biologists, experts in environmental education, academic researchers. Groups were also composed of staff in business units.

Sessions were of six to eight people. An open conversation guided by a few questions.

A backgrounder was sent out prior to the sessions.

A summary of what we heard during our sessions was sent out

Engagement summary sent out.

Stakeholders had an opportunity to respond to this document.

An outline was developed based on the stakeholder input and literature review and review of global best practices.

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Outline went to our stakeholders and feedback was requested.

Draft circulated and feedback requested.

Final version

AFTERWORD

This is our story for biodiversity conservation so far. We're excited by it, for where we're headed. Knowing where we came from encourages us as we move forward. To arrive at this juncture in our story we described a little about Calgary's fertile connection to its lands at the confluence of two major rivers. We described Calgary as a city of edges. Our vision continues this connection. From once taming the wilderness, to beautifying the city, to conservation. Now we seek integration, to recognize that Calgary as a city of over 1.1 million people is not distinct from its natural environment but rather dependent on the services provided by an intact ecosystem. A city responsive to its natural surroundings can be mutually beneficial to both its people and its wildlife. This is why we aim to conserve biodiversity. It's our heritage, it's part of our identity, its beauty gives us a sense of who we are.

We recognize our current pressures on biodiversity, that land use change poses the "largest threat to global biodiversity loss." We know that a fragmented natural environment makes a city more expensive to operate. With this recognition comes opportunity. Biodiversity conservation in cities is about protecting large areas in their natural condition, while ensuring corridors to enable wildlife movement. These corridors can be linear open spaces – from water courses to utility right-of-ways that have beneficial vegetation intact – to appropriately designed streets and yards and rooftops. Narrower tree-lined streets, or streets where storm water is held on the surface by rich vegetation, can help aid animal movement and make streets more beautiful for us. Naturalizing yards and appropriate areas in parks, moving away from monoculture grass, also helps aid biodiversity. People coming together, working together, can help achieve this vision.

We will be monitoring three specific biodiversity projects. With each of these we've established a strategic planning model that outlines the objectives for these projects along with the check-in points to ensure we're on track. These projects align with our principles, commitments and recommendations for biodiversity conservation in Calgary. These are designed to aspire a synthesis in how Calgary grows, how it is managed and how City staff engage and are engaged by communities working to advance biodiversity in their city.

At the city scale we can begin to appreciate our connection to biodiversity, our physical and emotional connection to it, but also the necessary connection between natural systems, at the species level to the ecosystem level. If we lose these physical connections, we lose biodiversity. As we build our city through a lens of biodiversity, we make decisions about biodiversity, about our quality of life, the quality of the world. We look forward to continuing to tell that story, this story about biodiversity in Calgary.

[Contacts?]

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