

# Attachments

## Attachment A: Summary of initiatives, projects or work completed or ongoing in the last year.

### Expert advice

The BiodiverCity Advisory Committee (Committee) continues to provide review and advice to Calgary City Administration to advance Council-approved Our BiodiverCity, Calgary's 10-year Biodiversity Strategic Plan (referred to below as BiodiverCity Strategic Plan). The working document, BiodiverCity Action Plan, provides a structure for Calgary to meet the biodiversity commitments in the BiodiverCity Strategic Plan. The Committee supports The City with moving forward each of the four biodiversity principles outlined in the BiodiverCity Strategic Plan: Ecological Literacy, Ecological Resilience, Collaboration, and Integration. The Committee has also encouraged inclusion of targets, performance measures, indicators and key actions in the BiodiverCity Action Plan that can contribute to sustaining Calgary's biodiversity.

A key area of work that the Committee remains keenly engaged in is The City's restoration target of 20 percent of Calgary's open space by 2025, as outlined in the BiodiverCity Strategic Plan. Habitat restoration is a type of land management activity intending to recover a degraded habitat to initiate or accelerate its succession towards a habitat with increased biodiversity such as replacing turf grass with native grasses and wildflowers. The Committee is concerned that City Administration will be unable to meet Calgary's BiodiverCity Strategic Plan 2025 target for habitat restoration.

The Committee has also raised concern about on-going losses of Environmentally Sensitive Areas (ESAs) leading to a decline in biodiversity. ESAs are key natural components of the regional landscape, providing essential ecosystem functions and services. These include flood mitigation, drinking water supply, maintenance of regional biodiversity, preservation and connectivity of unique habitats and landscapes, and provision of culturally and economically valued resources and opportunities (CMRB Environmentally Sensitive Areas Background Report, 2019).

### City Administration Updates on City Biodiversity Initiatives

The Committee received several updates and presentations from City staff working on biodiversity related projects and programs and provided feedback on these initiatives. Included in City staff updates were:

- Calgary Environment Strategy (Jen Silverthorn, Environment and Safety Management).
- Citywide Growth Strategy: New Communities (Lesley Kalmakoff, Desmond Bleik, Growth Strategy)
- Loss of the inner-city forest (John McFaul, Nature Calgary)
- Calgary's Roadside Naturalization Pilot (Ethan Askey, Manager, Sustainability Strategy)
- Calgary Captured (Tracy Lee, Miistakis Institute)
- Valuing our Natural Assets and Ecosystem Services (Heather Galbraith, Resilience Program Lead, Jillian Curley, Adaptation Specialist, Climate Change and the Environment)
- Connecting the Dots: The Clearwater Greenway (Doug Leighton, former VP of Sustainability for Brookfield Residential)
- The City of Calgary Riparian Monitoring Program Phases 1 and 2 (2017-2022) (Norma Posada, Water Resources)
- ESA Loss (Heather Rudd and Dave Hayman, Urban Conservation)

### Calgary Youth Science Fair

Since 2017, the Committee has attended and supported the Calgary Youth Science Fair event through judging and presentation of awards for projects in three age classes that align with Calgary's BiodiverCity Strategic Plan principles of ecological literacy, ecological resilience, and collaboration.

The BAC invited the three successful proposals to come and present their findings.

#### Junior or Elementary Award

- Amy Cheng and Clara Baskerville – How can we save the bees?

#### Intermediate or Junior Award

- Isabelle Klaassen – Phytoremediation of Calgary stormwater

#### Senior Award

- High environmental concentrations of atrazine cause Apoptosis in *Daphnia magna*

### **Work related to the Biodiversity Advisory Committee**

There are many on-going initiatives with the potential to impact biodiversity within the City of Calgary. This includes the ensuring the protection of biodiversity when developing new communities and developing or restoring habitat to protect our ecological network. We recognize that as a vibrant and growing city, Calgary must balance growth with protecting the environment. The ability to assign value to natural assets and the services they provide should help inform this decision-making process. Promoting ecological literacy is also important for protecting biodiversity. We wish to highlight some project such as Calgary Captured and the Call of the Wetland that have helped Calgarians become more engaged with wildlife and biodiversity. Calgary has also demonstrated its commitment to biodiversity and has been designated as a Bee City and Bird Friendly City.

#### New Community Growth

Administration is currently reviewing 19 new communities' business cases for the 2022 round of evaluations. Together these business cases represent approximately 1820 hectares of undeveloped lands (farmland and natural assets such as grasslands and wetlands). Recommendations of which business cases to approve are anticipated to be made to Infrastructure and Planning Committee (IPC) in June. Evaluation criteria are based on Municipal Development Plan (MDP) and Calgary Transportation Plan (CTP) alignment, market demand, and financial impact. Per direction of the Council approved Growth and Development Climate Framework, this round of business case reviews will for the first-time incorporate consideration of climate mitigation, climate adaptation, and the retention and utilization of natural assets that support biodiversity.

To evaluate policy alignment, proponents are asked "How does the business case provide opportunities to protect or utilize the natural assets of the area?" which is intended in part to support outcomes related to biodiversity. Proponents were also required to submit a supplementary 'Natural Assets Valuation Form' that documents the pre-development area of natural assets and the anticipated amounts to remain post-development. No business cases have proposed to protect any developable lands beyond the minimum requirements for Municipal Reserve and Environmental Reserve. Some business cases have proposed measures that may be considered to support preservation and utilization of natural assets at subsequent stages of the planning approvals continuum, such as enhanced stormwater infrastructure.

#### City of Calgary's Ecological Network

Previously only seen across broad landscapes of national or continental scale, a shift has been made in recent years towards the design and management of city natural environments as biodiversity elements within a connected system of habitat cores and corridors. These urban networks provide food, shelter and movement for species, hydrological and ecological processes. Calgary's revised Municipal Development Plan (2021) directs The City to "maintain biodiversity and landscape diversity, integrate and connect ecological networks throughout the city" and describes the network as "one of the defining features that establish Calgary's character, sense of place and quality of life."

In 2019, Calgary Parks used a series of spatial and analytical tools to map linkages between key ecological components within our urban landscape. GIS-based least-cost path analysis, circuit-theory based landscape analysis, spatial multiple criteria decision analysis and expert knowledge were all used to delineate the ecological network in the City of Calgary. The result is a spatial dataset that represents high value habitats within the city and the best opportunity for interconnections between them. The following ecological network elements were identified for Calgary:

- habitat cores (natural area parks 30 hectares or larger)
- stepping stones (natural and semi-natural areas between 5 and 30 hectares)
- corridors (green space at least 50 metres wide between cores and/or stepping stones)
- other green spaces (natural and semi-natural areas under 5 hectares in size)

Each of these network elements was assigned a score based on its size and utility as a network element. Habitat cores, for example, are of sufficient size to support entire populations of animals and plants, along with their associated ecological functions and, therefore, ranked higher in value than stepping stones or smaller urban green spaces. Once each of the ecological network elements has a score describing its importance with regards to the function of the overall network and a measure of health or integrity, these scores may be used to make operational and budget decisions to best support biodiversity both on a local (i.e., neighbourhood) scale and citywide. Similarly, ecological network scoring will help City staff identify parks and corridors in greatest need for intervention through restoration or naturalization action. Figure 2.8 from the Municipal Development Plan (2021) depicts Calgary's ecological network and its key elements.

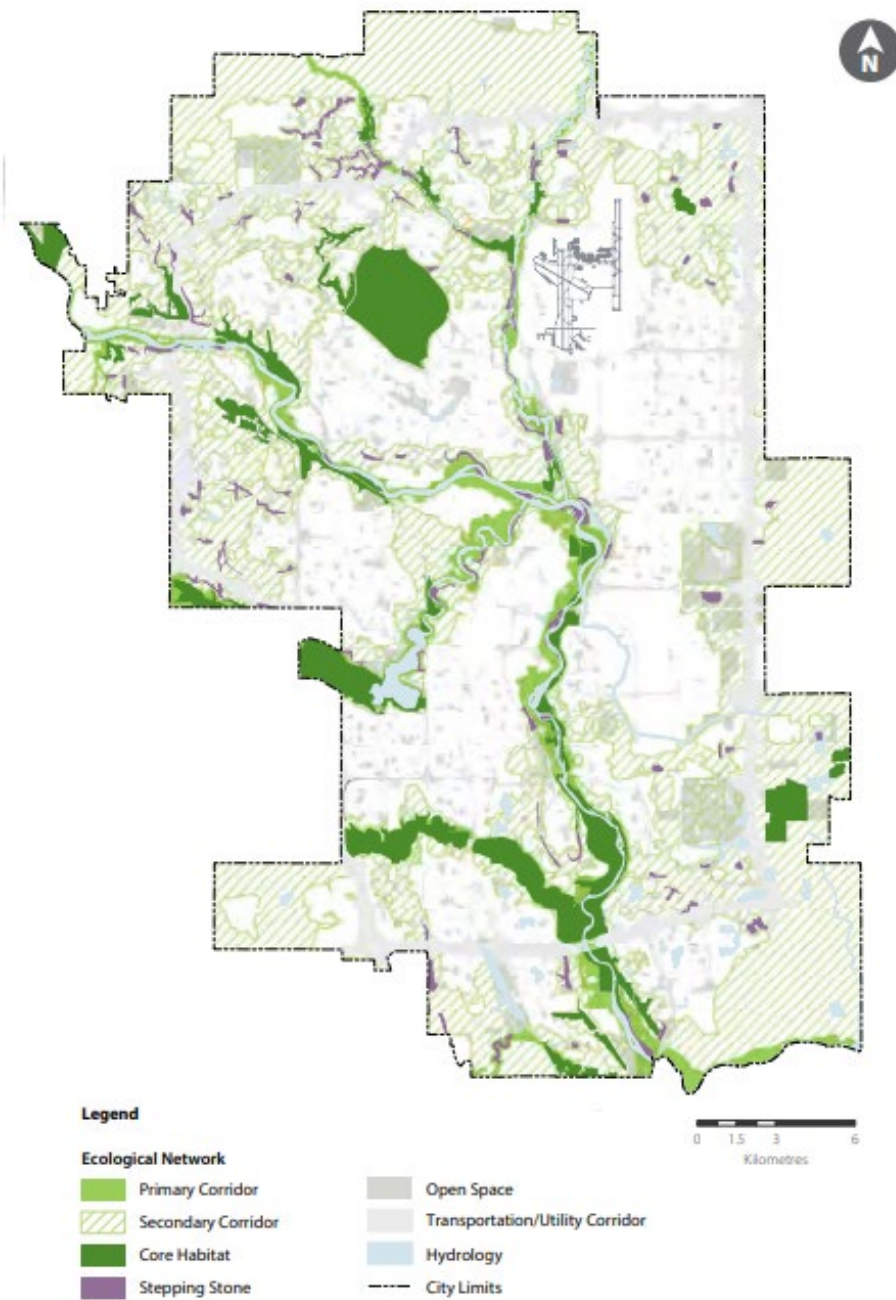


Figure 2-8: Ecological Network Map

## Reference

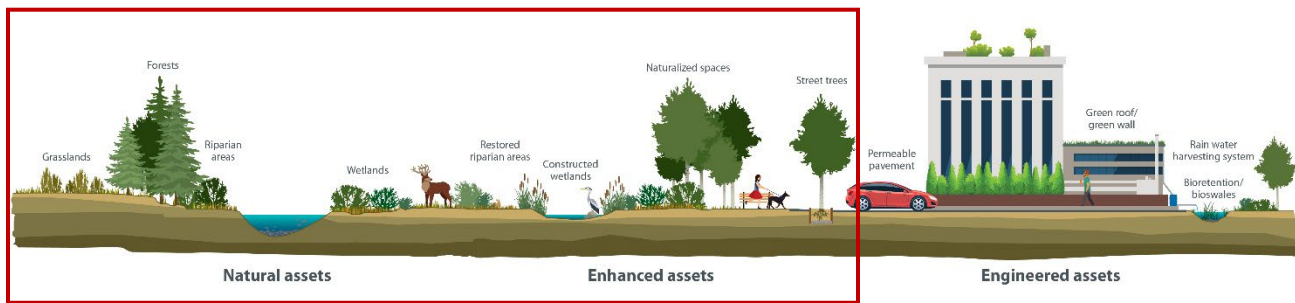
The City of Calgary. 2021. Municipal Development Plan (MDP) – 2020.

<https://publicaccess.calgary.ca/lldm01/livelink.exe?func=ccpa.general&msgID=OTTKcgyTerX&msgAction=Download>

Valuation of Natural Assets

Natural infrastructure provides numerous societal, economic and environmental benefits, many of which can be assessed and quantified to describe a service economic value. However, traditionally these benefits are often undervalued or go unrecognized in financial processes, leading to an increased risk of mismanagement and loss of natural infrastructure. The City of Calgary has been developing a more holistic view of natural infrastructure as a key method in building a city that is resilient, particularly to the effects of climate change. This project was completed to better communicate the value of Calgary’s natural assets and the services they provide to inform decision-making and planning around land use, asset management and operations.

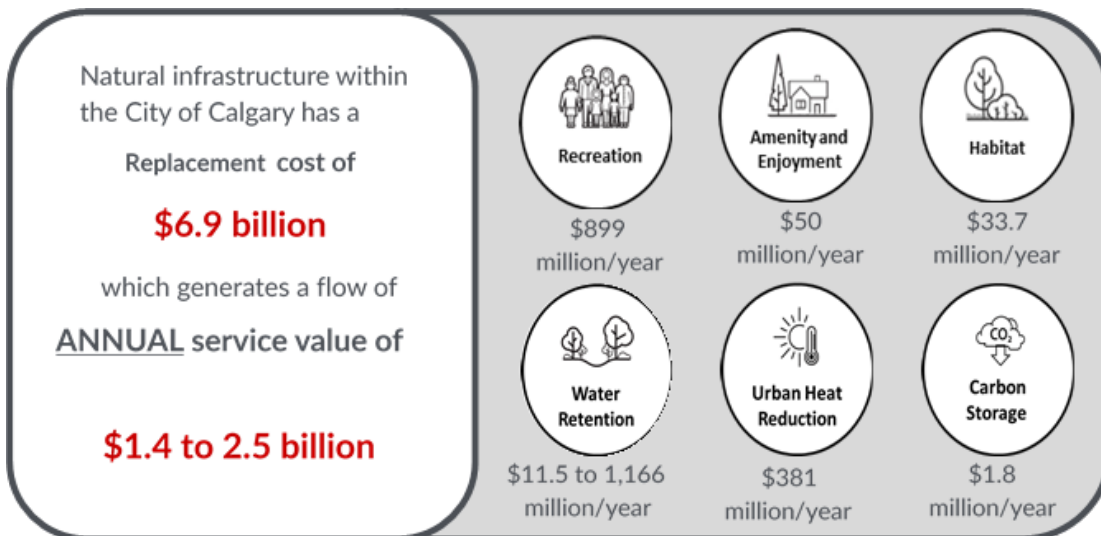
The City of Calgary considers natural infrastructure to include a range of assets which rely on ecological and hydrological processes to provide municipal, ecosystem and societal services (Figure 1). Natural assets within this spectrum include the grasslands, forests, riparian areas, watercourses, and wetlands in Calgary. For this project we will consider natural assets, in addition to public street trees.



**Figure 1: The spectrum of natural infrastructure in the City of Calgary, with the range of currently analyzed natural assets noted within the red box.**

Natural assets provide multiple services and a range of benefits. The services selected for valuation in this study include the following: recreation, amenity and enjoyment, habitat, water retention, urban heat reduction, and carbon storage. Natural assets are a climate resilient approach to managing climate change; reducing some impacts of climate change as well as storing carbon to reduce greenhouse gases in the atmosphere.

The assets included in this project are grasslands, forests and shrublands, watercourses, wetlands and street trees within The City of Calgary’s municipal boundary. Agricultural land within Calgary’s municipal boundary was also assessed for some services.



The values described above attempt to quantify a fraction of the benefits from natural assets. This analysis has demonstrated the significant value that natural assets provide to the City of Calgary.

As we better understand natural assets to be a critically important piece of municipal infrastructure, the need to effectively resource their protection, restoration and construction, through land use planning, municipal budgeting and decision making becomes clearer. Natural assets provide ecosystem services that improve municipal service provision, city livability, and residents' health and enjoyment of their communities. They are a fundamental component in meeting Council's goal of a healthy and green city.

For a copy of the report and more details please contact [Jillian.curley@calgary.ca](mailto:Jillian.curley@calgary.ca)

### Calgary Captured

Since 2017, the Calgary Captured program has monitored medium to large mammals using motion activated cameras in parks and riparian corridors within Calgary. The objectives of the program are to build a dataset of species presence in Calgary, engage Calgarians in urban wildlife awareness, and to improve our understanding of how wildlife responds to the urban environment. Calgary Captured is a collaborative partnership with the Miistakis Institute, City of Calgary, Alberta Parks, Friends of Fish Creek Provincial Park, and Weaselhead/ Glenmore Park Preservation Society, and has been supported by the Calgary Foundation, TD Friends of the Environment, and Alberta Ecotrust.

Calgary Captured highlights:

- 5,404 volunteer Calgarians helped classified camera images to species.
- Wildlife was documented in all parks monitored, and included coyotes, bobcats, lynx, cougars, moose, white tailed deer and mule deer.
- Results show that parks located within our riparian corridors (Calgary's ecological network) such as the Bow River, Fish Creek and Elbow River, had higher diversity of mammals documented, highlighting the importance of these areas.
- Results indicate that wildlife adjust their behaviour and park use in response to the presence of people and pets:
- Wildlife tends to be more active at night in parks with high daily numbers of people and pets.
- Cameras recorded approximately 20,000 images of off-leash dogs – 89% of these images were in on-leash dog areas.

Program results have contributed to park management plans and will continue to inform the understanding of and ability to maintain urban biodiversity and ecological connectivity.

### Call of the Wetland

Call of the Wetland was initiated to assess amphibian biodiversity of Calgary's remaining wetlands and engage citizens in the process. The project team selected 52 publicly accessible wetland sites from across the city. Amphibians were chosen as an indicator of wetland health and function. Prior to this project, there was little information available on the presence and status of Calgary's frogs, toads and salamanders. Two hundred Calgarians contributed to the monitoring program and reported 3 of the historic 6 species observed in Calgary, boreal chorus frog, wood frog and tiger salamander.

Miistakis engaged with the City of Calgary, Wilder Institute / Calgary Zoo, Mount Royal University and University of Toronto to form an urban wetland network where additional wetland biodiversity projects are currently on-going. For example, data from Call of the Wetland was used to identify wetlands with high habitat value and wetland corridors important to amphibian movement. This information is valuable for planning of new residential development where natural wetlands still occur or to inform where restoration of wetlands and wetland corridors could benefit urban biodiversity.

## Bee City

If you have driven along 16 Ave near the communities of Rundle and Marlborough, you probably have noticed the colourful wildflowers carpeting the roadsides this late summer and fall. The site is hard to miss with tall annual sunflowers rising above the thick cover of shorter wildflowers, in various fall hues such as yellow, red and orange with highlights of pink and white.

The 16 Avenue NE project area encompasses five (5) hectares, including both sides of the east and westward lanes, and the middle median, from 68 Street to 52 Street NE. The roadsides from 52 Street to 36 Street serve as an experimental control area that is undergoing a reduced mowing maintenance regime.

Prior to this project, transforming roadsides and medians into pollinator habitat had only been done on a small scale. In addition to the naturalization work, bumblebee boxes and solitary bee hotels have been added to the site to provide additional nesting habitat.

It is our hope that this proof of concept will be more widely accepted City-wide and allow us to do even more for pollinators, further supporting The City of Calgary's Bee City Canada designation as a Bee City.

Learn more about bees at [Calgary.ca/Bee a polli-neighbour](https://calgary.ca/Bee-a-polli-neighbour).

## Bird Friendly Calgary and Calgary's Bird

Bird Friendly Calgary is a volunteer run organization who, with the support of the City were successful in getting Calgary designated as one of the first Bird Friendly Cities across Canada in May 2021. Efforts by the City and independent organizations including roaming cat bylaws, habitat protection and light pollution and window strike reduction made this possible. Since receiving the certification, Bird Friendly Calgary has been working with Nature Canada to support the efforts of other municipalities to become Bird Friendly. In addition, the team has begun to look at opportunities to make the city more biodiversity and bird friendly. This has included continued efforts to reduce window strikes, collaborating with other groups to work on light pollution and understanding roaming cat populations in the City. Currently, with support of the City, Bird Friendly Calgary is working on designating an official city bird. This vote has encouraged engagement with schools and citizens at large to learn more about birds and other wildlife in the City and how we can all make small changes in our own habits that support biodiversity.

## Committee Recruitment

The Committee recruited three new public members to replace those leaving the Committee.

**Attachment B: 2022 Work Plan**

Project / Initiative / Activity	Biodiversity Program Area	Biodiversity Program	Start	End
Support the Calgary Youth Science Fair; biodiversity awards	Ecological Literacy	Stewardship	Q1	Q2
Calgary Biodiversity Day proclamation	Ecological Literacy	Public Awareness	Q1	Q2
Present to council for approval the Biodiversity Advisory Committee's updated Terms of Reference (May 26, 2022)	(all)	(all)	Q1	Q2
Annual report to Community and Development Committee (June 21, 2022)	Ecological Literacy	Staff Awareness	Q1	Q2
Review on an ad hoc basis applicable City of Calgary policies and strategies	(all)	(all)	Q1	Q4
Support and participate in Bird Friendly City and the selection of Calgary's Bird	Ecological Literacy	Public Awareness, Stewardship	Q1	Q4
Review the updated BiodiverCity Action Plan	(all)	(all)	Q2	Q4
New Council orientation package / how to communicate with council more effectively	Ecological Literacy	Staff Awareness	Q1	Q4
2 Billion Trees Program – support with participation in Tree Equity Coalition Meeting	(all)	(all)	Q1	Q4
Clarify opportunities for strategic input on City of Calgary projects e.g., Calgary's River Valley Plan, Drought Plan	(all)	(all)	Q1	Q4
Bio Engineering Restoration Site Visit – July 2022 – invite councillor participation	Ecological Resilience	Staff Awareness	Q3	Q3
Provide comment to Council on Environmentally Significant Area Loss	Ecological Resilience	Public Awareness	Q1	Q2
Provide comment to Council on Habitat Restoration Program	Ecological Resilience	Public Awareness	Q1	Q2
Provide comment to Council on the Habitat Condition Rating analysis of Calgary Parks	Ecological Resilience	Public Awareness	Q1	Q2
City Subject Matter Expert presentations to BAC (e.g., wetland habitat restoration, ESA loss)	Ecological Literacy	Public Awareness	Q1	Q4
Onboard new BAC members	NA	NA	Q1	Q4



## Attachment C: Additional information you would like to share with Council

The Committee provides this additional information based on a recent review of the City Parks 2020 Habitat Restoration Program Update and a March 2021 presentation on Environmentally Significant Areas Loss, and is informed by the BiodiverCity Strategic Plan – Concordance with BiodiverCity Action Plan - Five Year Review that was conducted by the Committee from Q4 2020 – Q1 2021.

### Restoration

- Restoration often occurs opportunistically on lands managed by Parks, Transportation, and Water Services
- Calgary Parks has begun assessing Habitat Condition Rating within City Parks which will identify and prioritize parks in need of restoration in the future
- Habitat being restored may not be in the context of priority habitats for biodiversity
- Currently the city is not on track to meet the 20% target of restoration of open spaces by 2025 (832 ha)
- The city is on track to meet only about 36% of this target but would need significant additional capital funds as well as additional staffing to complete the work based upon the amount of area that still needs to be restored or is in progress (source: Urban Conservation)

### Considerations:

- Greater investment in Parks to meet 2025 restoration target
- Build a cross-corporate restoration program
- Set either an achievable restoration target and/or extend target deadline

### Environmentally Sensitive Area (ESA) Loss

In 2019, the City of Calgary lost about 58% of ESA that has been identified in Biophysical Impact Assessments. This is a net loss when the loss is compared to the gains made with restoration. Ideally, all ESA should be protected but this is not always possible due to land use needs for development.

There are many policies and guidelines intended to preserve biodiversity within the City of Calgary but few mechanisms to achieve these goals:

- Municipal Reserve
- Environmental Reserve Easement to prevent pollution or ensure public access (mostly undevelopable land)
- Conservation reserve (buy ESA at market rate)
- Naturalized Municipal Reserve (restoration)

### Considerations:

- Use or develop additional mechanisms or utilize current mechanisms to a greater extent to preserve ESA (e.g., conservation reserve, environmental reserve easements, land trusts, ecological gifts, Claim by the Crown)
- Prioritize preserving ESA that represents particularly biodiverse or rare ecosystems and habitats within the City of Calgary and prioritize areas that have been identified as important in the Ecological Network such as important connectivity corridors, shelterbelts, and steppingstones between core areas.
- Develop a comprehensive spatial map of known and potential ESAs and existing rare habitats
- Track the categories of ESA and habitats that are being lost
- Set targets for protecting ESA and priority habitats (not per development but a city-wide target)

## Underway

- On-going monitoring of ESA loss
- Updating ESA criteria to make ESA designation more robust

## **Loss of Urban Forest**

While the BAC supports densification within the city rather than developing undeveloped lands, the city is losing significant areas of the urban forest annually through redevelopment. This leads to a loss of biodiversity and climate resiliency. There are also issues with tree equity in the City, with poorer neighborhoods having fewer trees.

- Recommend that Council establish a biodiversity/climate resiliency fund that is funded through a fee on all redevelopment applications that can be used for targeted conservation and restoration
- Recommend that the City improve tree equity

## **Additional Recommendations to Council in support of Eco literacy**

- Establish City of Calgary Biodiversity Day annually on May 22<sup>nd</sup> in alignment with International Day for Biological Diversity (<https://www.cbd.int/idb/>)
- Support the City Nature Challenge Calgary a competition between cities around the world which encourages citizens to document the biodiversity within their city (<https://citynatureyyc.ca/>)
- Update City of Calgary website to communicate biodiversity messaging to citizens and to highlight the work and recommendations of the BAC