

The SFU logo consists of the letters "SFU" in white, bold, sans-serif font, centered within a solid red rectangular background.

ACT Adaptation to
Climate Change Team

APRIL 5, 2019

The background image shows a modern, multi-story residential building with numerous balconies and large windows. The building is situated on a hillside, with lush green trees in the foreground. The sky is clear and blue. The image is partially obscured by a large teal diagonal shape that serves as a design element for the text overlay.

Metro Vancouver 2050: **A Mecca of Biodiversity-Led Green Infrastructure**

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ACKNOWLEDGMENTS

ACT would like to thank the following students who acted as note takers at the workshop:

Chris Raftis, Johann Zerbe, Ronja Sorensen, Robert Straker, Maddie Hague, Henry Finn, Gord Frenke

We are also grateful for the participation of the following organizations at the workshop:

- **Bird Studies Canada**
- **City of Burnaby**
- **City of Coquitlam**
- **City of Delta**
- **City of New Westminister**
- **City of North Vancouver**
- **City of Pitt Meadows**
- **City of Port Moody**
- **City of Richmond**
- **City of Surrey**
- **City of Vancouver**
- **Diamond Head Consulting Ltd.**
- **Ducks Unlimited Canada**
- **Kerr Wood Leidal**
- **Metro Vancouver**
- **Ministry of Forests, Lands, Natural Resource Operations and Rural Development**
- **Planning Institute of British Columbia**
- **SFU School of Resource & Environmental Management**
- **Society Promoting Environmental Conservation**
- **South Coast Conservation Land Management Program**
- **South Coast Conservation Program**
- **Surrey Environmental Partners**
- **Township of Langley**
- **Tsleil-Waututh Nation**
- **UBC Botanical Garden**

Especial thanks goes to **Pamela Zevit** formerly of South Coast Conservation Program and copy editor **Lynn Slobogian** for their helpful edits, and ACT Executive Director **Deborah Harford** for guidance and supervision..

ACT gratefully acknowledges the support of the **Bullitt Foundation** and the **Real Estate Foundation of BC** for this project.



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SUMMARY OF WORKSHOP RESULTS

On November 23, 2018, SFU ACT hosted a workshop with Metro Vancouver-based professionals who shared a common interest in advancing the connection between green infrastructure, biodiversity health, and climate action.

The three-hour workshop consisted of presentations and a discussion on how green infrastructure could be planned with the intent of reducing impacts on, or even enhancing, biodiversity health as climate change and land use alters the landscape of Metro Vancouver. Participants crafted a vision of Metro Vancouver as a biodiversity-focused green infrastructure mecca, and milestone achievements that could aid in reaching this vision.

Presenters and their topics included:

- [Dr. Laura Cristine, University of Calgary: Landscape Connectivity and Biodiversity Health in a Changing Climate](#)
- [Pamela Zevit, South Coast Conservation Program: Holistic Habitat Restoration for Species and Ecosystems at Risk](#)
- [Mike Coulthard, Diamondhead Consulting: The City of Surrey's Biodiversity Strategy and Adapting Municipalities for Biodiversity Health](#)

Following the presentations, participants engaged in table-based discussions focused on answering the following questions:

1. If Metro Vancouver were a mecca of biodiversity-focused green infrastructure, what would it look and feel like?
2. What would be the major milestones on the path to achieving that vision?
3. How would governance, institutions, policies, politics, culture, education, your organization, and citizens have to adapt or transform to make that vision possible?





The following sections summarize the outcomes of these discussions.

Envisioning a Biodiverse Metro Vancouver in 2050: The Vision

Participants crafted a multi-faceted vision of Metro Vancouver's biodiverse future, captured in narrative format in the following paragraphs.

The urban environment becomes multi-functional and natural. Nature isn't something you 'get out' into on the weekends; it is something you experience every day because you are already in it as you move through the city. Natural refuge from heat and sound for people and wildlife alike is spread all over the city.

Investments in transit make roads and pavement less common, and roads that are left are permeable and reflect heat instead of absorbing it. Underneath roads are natural wildlife passageways that allow species to travel throughout the city. Rather than upgrading to larger culverts, creeks and streams are routinely daylighted. Bike and walk commuting are a nature experience in themselves. Neighbourhoods employ fused grid systems decommissioning and greening inner streets to use as multi-functional natural areas, providing traffic calming and safer neighbourhoods.

Living dikes¹ become common as coastal-edge habitats provide enhanced ecosystems and connections between marine and terrestrial life while protecting against sea level rise. Neighbourhood spaces and yards are nature-scaped.² Parks are reconfigured to maximize biodiversity health in concert with human use. The urban forest is home to a diversity of mostly native tree species adapted to local conditions, and canopy cover reaches 45%. Boulevards, gardens, public lands, and rights of way are intentionally designed to provide pollinator- and wildlife-friendly spaces. Riparian areas connect across landscapes irrespective of city boundaries.

Communal grey water in multi-family dwellings is treated on site and recycled for use in drier summer months to irrigate vegetation and provide water sources for wildlife. Green infrastructure manages on average 90% of the water, making the capacity to treat stormwater even better than present-day levels.

Buildings are designed to provide shade for people and wildlife, and commonly employ living walls and green roofs, storing and treating runoff as well as providing habitat for birds and pollinators. The vertical landscape provided by the built environment supports a diversity of features that provide refuge for wildlife to thrive in.

Metro Vancouver’s adaptive governance and regional planning approach attracts designers and practitioners from around the world to employ novel and innovative green infrastructure solutions. Cutting-edge technological advances (e.g., 3D design and printing) allow for the sharing and modifying of green infrastructure design, and eco-mimicry and bioengineering is cheaper and easier to employ. Accessible green infrastructure designs for private property (bioswales, green roofs, planting prescriptions, etc.) are readily available and ubiquitously offered by trained installation technicians—a burgeoning employment opportunity within Metro Vancouver that becomes a unique specialty and economic driver for ideas and services that are exported worldwide.

Achieving the Vision

Building on the vision for what Metro Vancouver might look like if it were a world leader in biodiversity-led green infrastructure, participants identified major milestone achievements that would be required to achieve the necessary shifts in governance, politics, culture, education, policy, and institutions. Participants also considered what transformations might be needed in their organizations and their own personal and professional practices.³ The following themes emerged:

- More adaptive and integrated governance
- A regional green infrastructure master plan
- Collaboration across the Salish Sea
- Integration within and between institutions, teams, and organizations
- A shift in the legal landscape
- Paying for a greener future
- Connecting development and biodiversity health
- Society, education, and culture

“

Nature isn’t something you ‘get out’ into on weekends, it’s something you experience everyday.





More Adaptive and Integrated Governance

The most commonly proposed solution was a move toward more adaptive governance at all levels that was more integrated, interdisciplinary, and interjurisdictional, and led by a more robust regional government mandate to connect green infrastructure. This would require Metro Vancouver to play a larger role in bringing municipalities together and facilitating development of an integrated green infrastructure planning process. This could be achieved through broadening the mandate of the regional growth strategy.

This planning process should also complement and support First Nations' efforts in land-use planning. This presents an opportunity to recognize the authority, knowledge, and understanding that First Nations bring in this context, in order to further inform a green infrastructure approach focused on biodiversity and social-ecological systems planning.

A Regional Green Infrastructure Master Plan

With an enhanced mandate and clearer jurisdictional authority, Metro Vancouver—in coordination with, and support from, other levels of government—could lead development of a regional green infrastructure master plan and planning process that would empower communities, build capacity, and facilitate a more cost-effective approach. This planning process would recognize the importance of prioritizing critical migratory corridors, refugia, and future habitats as part of climate change adaptation and mitigation, while supporting existing species and habitats. Regional, cross-jurisdictional landscape-level green infrastructure pilot projects would increase cost effectiveness through shared investment, demonstrating additional benefits of a holistic approach to caring for natural assets. Components of the plan might include:

- Targeted no net loss of greenspace or natural areas
- Development of a green infrastructure code, modeled after the BC Energy Step Code, geared toward promoting and incentivizing biodiversity-focused approaches
- Watershed-level planning and strengthening of the Water Sustainability Act and regional Integrated Stormwater and Watershed Management Plans

Collaboration across the Salish Sea

To be truly effective, this planning process would connect to transboundary interests on both sides of the Salish Sea. This could be modelled after the transboundary working group, Shared Waters Alliance (Boundary Bay–Puget Sound),⁴ or larger landscape partnerships like the Yellowstone to Yukon Conservation Initiative⁵ and the North Pacific Landscape Conservation Cooperative.⁶ The Shared Waters approach focuses more on urban watershed issues, while the latter two focus more on connectivity and protection of wilderness. A transboundary coastal planning process would recognize the additional challenges and potential synergies that come with working to protect the ecologically-important biodiversity hotspots represented by the estuaries and upland ecosystems of the Salish Sea. This is especially important as these areas are currently facing historic levels of urbanization and habitat loss.

Integration within and between Institutions, Teams, and Organizations

This adaptive, collaborative, and integrated governance approach would be supported through embedding a transformative whole-systems approach in departments and

organizations responsible for land-use decision-making. Sustainability would be positioned as a central, common goal in an organizational environment where it would be typical for diverse interests to work together and collaborate toward innovative solutions to complex problems. Departmental silos would be broken down through innovative information sharing and planning frameworks that incorporate an interdisciplinary, interjurisdictional approach. This approach would expand to relationship building with post-secondary institutions that work to apply this transformative model in education and internal organizational training.

A Shift in the Legal Landscape

In this future vision, the rights of nature, and of people to have access to healthy ecosystems, are recognized and protected. This would be manifested through a restructuring of rights and constitutional reform, acknowledging the right to a healthy environment both equitably for all and temporally (for future generations). This would be accomplished through giving ecosystems better protection from harm (e.g., the Fraser River could be given personhood status, similar to the Whanganui River in New Zealand). The understanding that nature is inextricably intertwined with humanity's health and well-being would be normalized. Perceptions of public safety would shift from being short-term, reactive, and incident-driven to a long-term, proactive approach. The model of the Agricultural Land Reserve, which protects prime farmland across BC, could be used as an example of how to protect high-priority urban natural areas, as well as providing for a multi-functional landscape that supports people and wildlife alike. Policy would be evidence-based and founded on the precautionary principle, reducing the likelihood of support for unsustainable practices.

These models and approaches are also integral to reconciliation with First Nations, shifting from colonial ways of thinking about land ownership toward a more balanced stewardship approach that reflects Indigenous knowledge and ways of being on the land and with each other.



Departmental silos would be broken down through innovative information sharing and planning frameworks that incorporate an interdisciplinary, interjurisdictional approach.





Paying for a Greener Future

Money does grow on trees, in the form of the valuable ecosystem services they provide. Development of a robust natural asset management framework and valuation methodology for local governments would help to position green infrastructure as a critical priority. To be effective, this approach would need to be fully incorporated into asset management systems, beginning with alterations to Public Sector Accounting Board⁷ regulations to allow for inclusion of natural assets in annual reporting.

A broader understanding of the risks of inaction would shed light on the harm of discounting the existing and future value of natural assets.

A regional green fund would be established to ease the burden on municipalities to fundraise independently and bolster their capacity to find further funding for green infrastructure projects. Administered at the regional government level, the fund would incentivize collaboration between and across municipalities. Regional governments would carry the weight of acquiring funding from other levels of government (provincial, federal, international) so that municipal staff could spend less time in lengthy and complex fundraising processes.

Municipalities would also generate revenue from reimaged or redeployed mechanisms including:

- Stormwater utility fees (e.g., the City of Surrey model)
- Development cost charges and/or community amenity contributions
- A green fund or green utility that would incentivize protection of natural areas and disincentivize damages to biodiversity in the same way as a carbon tax or pollution fine

Connecting Development and Biodiversity Health

Property development processes also would acknowledge and mitigate damage to biodiversity. This could be realized through a green fund/utility. Salmon Safe certification⁸ is an example of a proactive process underway in urban and rural areas of BC and the Pacific Northwest that incentivizes green infrastructure practices through recognition and certification. This could be taken one step further by evolving such an approach into a green code incentive program for developers that employ best practices as simple as keeping trees or planting native species, to more robust features that manage stormwater like green roofs, living walls, and maintenance or enhancement of creek systems. Development that demonstrates best practices in this regard could also be prioritized by development permitting staff.

More detailed development and zoning bylaw requirements might include:

- Tax or ban on turf lawns
- Requirement that 50% of undeveloped land meets topsoil specifications
- Brownfield development prioritized over greenfield
- Increased setbacks from ocean, stream sides, and wetlands
- Reduced footprint of construction, and more emphasis on higher-density, multi-family homes
- Industrial land that includes green infrastructure on site

A regional government empowered with a stronger green infrastructure mandate could also pursue a more strategic, harmonized, regional development permitting process and/or zoning that focuses on maximizing ecosystem benefits. Scaling up urban agriculture could work to diminish some of the need for high-intensity farming methods on traditional agricultural land. Incentives to encourage biodiversity-friendly farming approaches (e.g., the Environmental Farm Plan program⁹) can contribute to increasing economically-viable products while creating productive wildlife habitat.

Society, Education, and Culture

The natural setting of Metro Vancouver attracts many nature lovers, ideally positioning our region to encourage awareness of the value of the natural world. Health researchers have already acknowledged the inherent connection between nature, mental health, and well-being. A change in priorities would allow green infrastructure to provide solutions rather than barriers to pressing social issues like inequality by providing access to natural assets more broadly. In this vision, shared natural spaces facilitate unstructured play and neighbourliness, and a new cultural paradigm aligns people around shared socio-ecological interests and nature-based solutions. Education for all ages centres on a common goal of sustainability, with a core tenet of integrating the value of nature. Art-based green infrastructure projects are led by youth empowered by their communities. Innovative citizen engagement and festivals draw people together to participate in creative solutions thinking.

“ Shared natural spaces facilitate unstructured play and neighbourliness, and a new cultural paradigm aligns people around shared socio-ecological interests and nature-based solutions. ”





Conclusions

These discussions proved useful for unearthing new ideas and demonstrated the will and understanding of the people most closely connected to implementing these changes in the future. This report is not typical research; rather, it is an attempt to practice local, place-based, relational learning. The ideas expressed can be used as a palette of possibilities to inspire our imaginations. By bringing connected but disparate people from across the region to share and learn from one another, we hope this process and vision works to surface new ideas and new relationships that can help transform the way we talk about climate action, biodiversity, and green infrastructure.

We saw a clear and overarching desire for development of a more integrated framework for planning and decision-making around green infrastructure and biodiversity health across disciplines, jurisdictions, and political boundaries. A mix of financial mechanisms—both incentive-based and punitive—regulations, and shifts in culture, education, and within ourselves and our teams will be required—and the change begins with each of us. ACT will continue to provide opportunities to professionals to share their learnings in this context across disciplines and boundaries.

ENDNOTES

- 1** West Coast Environmental Law – Design Basis for a Living Dike Concept <https://tinyurl.com/y37kyz7p>
- 2** Naturescaping is an approach (most often employed in urban areas) in which landscape design and landscaping integrate natural features and aspects to support native species and biodiversity.
- 3** Creative license was applied in distilling responses to this question. In instances where participants' ideas were formulated as barriers or challenges, they were reframed as a means of transition to achieving the 2050 vision.
- 4** The Shared Waters Alliance: Proactively Addressing Water Quality in an International and Multi-Jurisdictional Watershed <https://tinyurl.com/yaw8gtdl>
- 5** Yellowstone to Yukon Conservation Initiative <https://y2y.net/>
- 6** North Pacific Landscape Conservation Cooperative <http://www.northpacificlcc.org/>
- 7** The Public Sector Accounting Board (PSAB) was created to serve the public interest by establishing accounting standards for the public sector <https://www.frascanada.ca/en/psab>
- 8** Salmon-Safe certification for urban areas https://www.fraserbasin.bc.ca/water_salmon-safe.html
- 9** BC's Environmental Farm Plan program <http://ardcorp.ca/programs/environmental-farm-plan/>