SFU ACT Adaptation to Climate Change Team

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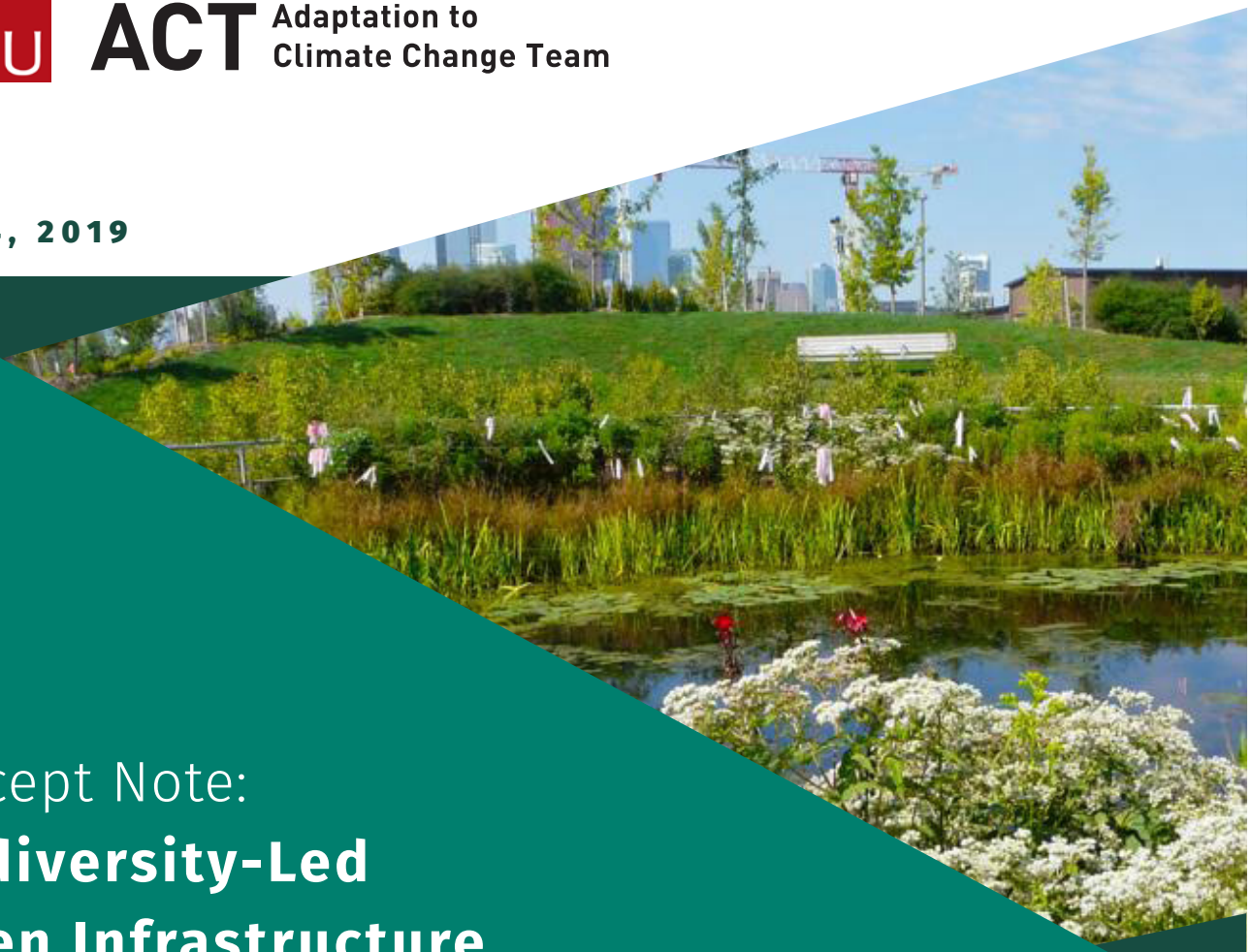

Concept Note:

Biodiversity-Led Green Infrastructure

ACKNOWLEDGMENTS

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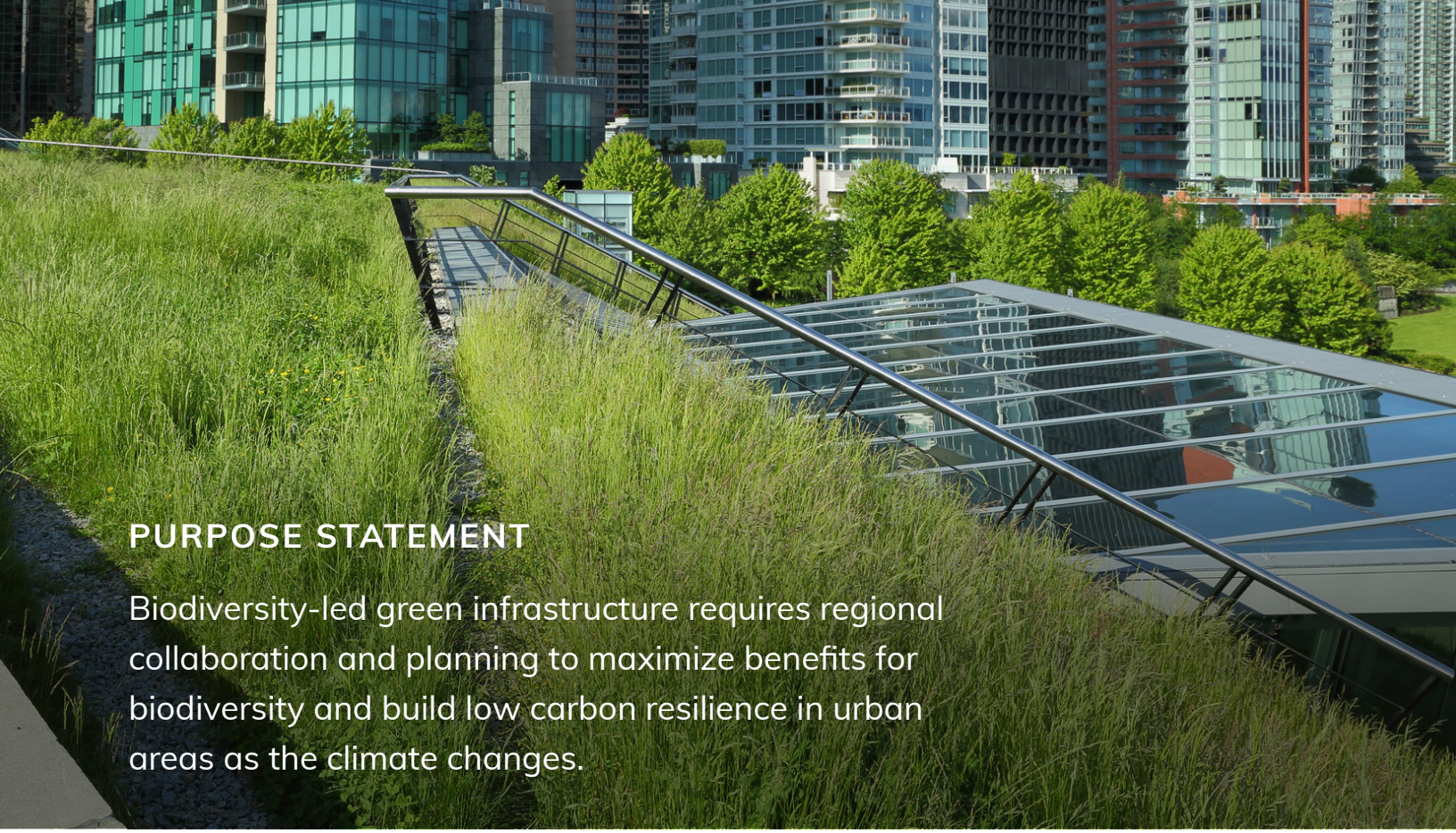

PURPOSE STATEMENT

Biodiversity-led green infrastructure requires regional collaboration and planning to maximize benefits for biodiversity and build low carbon resilience in urban areas as the climate changes.

CONTEXT

Human activities are resulting in a rate of species extinction and ecosystem degradation that is being called the sixth mass extinction. Globally, we are witnessing biodiversity loss at such a rate and scale that it will potentially have a greater impact than the effects of climate change.[1] Land use changes and urbanization are intensifying the rapid loss of biodiversity by altering and fragmenting habitats and harming ecosystem health through pollution and degradation.[2] In addition, climate change is forcing species to migrate and shrinking and shifting habitats.[3] Meanwhile, climate change impacts to urban environments—such as the increase of extreme weather events and rising temperatures—are making life more difficult for all species, and requiring widespread urban and rural adaptation responses as we reduce emissions.

Nature-based climate change solutions are being advanced rapidly worldwide as ways to reduce urban vulnerability to climate change impacts.[4] Understanding is growing that protection and restoration of natural areas have a wide variety of co-benefits, such as limiting the urban heat island effect and improving air quality, contributing positively to human health and quality of life, enhancing opportunities for local food production, reducing GHG emissions and sequestering carbon, improving stormwater management and mitigating flood risks,[5] and reducing pressure on aging grey infrastructure that is increasingly overburdened by growing populations and densification.

However, the use of nature-based solutions for climate change adaptation is largely being approached separately from planning for protection of species and ecosystems, resulting in missed opportunities to benefit biodiversity while building low carbon resilience. To achieve these co-benefits, green infrastructure approaches need to be regionally connected in order to optimize conditions that can assist biodiversity health and survival in a changing climate.[6]

Biodiversity-led green infrastructure

Successful implementation of biodiversity-led green infrastructure requires strategic ecosystem-scale approaches to protecting, restoring, and connecting green spaces in urban areas through corridors and networks of green infrastructure.[7] This approach requires consideration of planning on the scale of watersheds, river basins, and other ecosystem-level perspectives, rather than containment within jurisdictional boundaries. Regional green infrastructure planning of this kind can draw on existing and emerging research and practices focused on ecosystem connectivity, nature-based solutions to climate change, low-impact development, urban greening, natural asset management, and low carbon resilience.[8]

STEPS REQUIRED TO ADVANCE BIODIVERSITY-LED GREEN INFRASTRUCTURE

ACT's engagement of diverse stakeholders and practitioners, supported by literature reviews on green infrastructure and nature-based solutions to climate change, has led to the identification of three key steps that can help advance biodiversity-led green infrastructure on a regional scale:

1. **Convene an interdisciplinary community of practice.**
   Adapting urban areas to climate change while enhancing biodiversity health requires collaboration across the public and private realm with a wide variety of knowledge holders and practitioners, such as biologists, landscape architects, engineers, planners, accountants, community members, neighbourhood associations, health practitioners, schools, and teachers. An interdisciplinary community of practice is required to advance cross-sectoral understanding of green infrastructure and its potential as well as regional approaches to biodiversity-led green infrastructure. Participants should include First Nations, non-Indigenous governments, the private sector, professional practitioners across sectors, non-governmental organizations, and academics.

2. **Consider how a regional approach aligns with other existing strategies.**
   Concepts relevant to a regional approach, such as green space protection, emissions reduction, active transportation, storm- and wastewater management, and climate change adaptation, may already have been considered in existing strategies. Advancing a biodiversity-led green infrastructure approach requires three actions: the examination of existing mechanisms, such as official community plans, regional growth strategies, and climate action strategies; the identification of opportunities to integrate or update these; and the design and introduction of new mechanisms and tools.

3. **Consider linkages to peri-urban and rural areas.**
   Ecosystems and habitat boundaries rarely align with jurisdictional boundaries. For instance, an ecosystem-scale approach will help identify potential migration corridors that species are likely to use as the climate changes. Planning and decision-making at this scale requires collaboration with surrounding regions, including work with the parks, agriculture, and forestry sectors, to advance collaboration on biodiversity-led green infrastructure and ecosystem connectivity enhancement.

CONCLUSION

Urgent action is required to prioritize habitat protection, reduce the loss of biodiversity, and adapt to climate change while reducing emissions, all of which can be achieved through strategic use of nature-based green infrastructure solutions. Degradation of ecosystems and loss of biodiversity due to urbanization and climate change negatively impacts the physical, emotional, and economic well-being of communities.[9] Green infrastructure approaches have been shown to have numerous co-benefits, including alleviation of pressure on grey infrastructure. These approaches can be implemented using a biodiversity lens in order to build low carbon resilience while protecting and restoring conditions that support biodiversity health and survival in urban areas.

Local governments and other key sectors can collaborate on a regional scale to adopt an ecosystem-based planning approach that transcends jurisdictional boundaries to maximize the potential benefits and co-benefits of green infrastructure for biodiversity.

ENDNOTES

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ACT Adaptation to Climate Change Team

ACT (the Adaptation to Climate Change Team) in the Faculty of Environment at SFU brings leading experts from around the world together with industry, community, and government decision-makers to explore the risks posed by top-of-mind climate change issues and to identify opportunities for sustainable adaptation.

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