WHAT'S INCLUDED IN THE NATURE CHAPTER?

This chapter explores how to bolster natural areas of ecological importance, expand wildlife habitat and better connect residents with nature.

CHAPTER 5: NATURE

Autumn in Stanley Park, 1890s | CoV Archives

Coal Harbour, now Lost Lagoon, 1897 I CoV Archives

Children playing in intertidal marshes, False Creek, 1902 I CoV Archives

Bison in Stanley Park, 1939 | CoV Archives

Stanley Park Windstorm, 2007 I Park Board

NATURE TIMELINE

9000BC

>11,000 years ago:
Glacial till collects after last ice age to create a forested highland between the Fraser River and the Burrard Inlet.

2000BC

>4,000 years ago:
The Musqueam people establish their winter village at the mouth of the Fraser River and begin active stewardship of the area.

1790

1792:
Lord Vancouver explores the Strait of Georgia and is the first European to set foot on present-day Vancouver. Site is home to a dense coniferous forest with trees 1,000 years old.

1880

1888:
The City opens the 405 hectare Stanley Park, homeland of First Nations people. Today, the Park accounts for 75% of Vancouver's native forests.

1980

1988:
Stanley Park Ecology Society is established. SPES leads environmental education, stewartdship and interpretation programs in Stanley Park.

2000

2006:
A wind storm causes dramatic damage to many ancient trees in Stanley Park.

BACKGROUND

HISTORY + SYSTEM CONTEXT

Vancouver is a coastal city at the foot of the North Shore Mountains, situated between the Salish Sea and the Fraser River.

The City of Vancouver sits on the Burrard Peninsula or Ulksen in the Squamish language, a shallow glacial deposit from the retreat of the last ice sheets 11,000 years ago. Within the unceded and traditional territories of the Musqueam, Squamish and Tsleil-Waututh First Nations, Vancouver's boundaries once included 11,490 hectares of relatively undeveloped habitat. Since incorporation and because much of Vancouver was planned before environmental regulation, extensive areas of historic ecologies are gone, including most coastal wetlands and inland streams. The Park Board manages over 1,275 hectares of parkland in the City of Vancouver, of which 847 hectares are considered natural areas.

Along with managing the majority of remaining natural areas in the city and its greatest ecological assets, the Park Board also plans for and responds to pressures including increasing development, rising sea levels, ocean acidification and changes in precipitation. Scientists predict increased severity of rain storms as well as prolonged summer droughts. Invasive and urban-adapted species, such as English ivy, Japanese knotweed and the American bullfrog, are outcompeting native fauna and flora. In addition, suppression of natural ecological processes is negatively impacting biodiversity and natural succession. Environmental contaminants in air, water and soil impact wildlife, including oil spills, pest control and stormwater runoff. These disturbances pose profound threats to natural areas and could require millions of dollars of preventative and restorative measures (e.g., replacement of urban forest due to summer droughts).

From large natural areas like Stanley Park to small neighbourhood parks, nature takes many forms in the city and its benefits touch all parts of the system. Parklands connect neighbourhoods, frame views to mountains and waterfront, provide vital habitat and allow city dwellers to disengage from a busy world.

KEY TERMS

ecological network

The inter-connected system of natural spaces across the city. It is composed of both terrestrial and marine (shoreline and intertidal) areas

natural areas

Large and small patches of the urban landscape that support nature, such as forests, wetlands and shorelines, but also green roofs and rain gardens

habitat

The area or type of environment in which a species of plant or animal lives, such as a woodpecker in a forested habitat or tide pool sculpin in an intertidal marine habitat

climate change

Disturbance to the typical climate (or average weather) of a region or city and overall change of the Earth's climate

New Brighton Salt Marsh, is a recent major iniatiative and a collaboration with Port Metro Vancouver (2017) to create salt marsh on the east side of New Brighton Park. The project is a unique opportunity to restore coastal wetland habitat on the south shore of Burrard Inlet. Photo: Vancouver Fraser River Port Authority

BACKGROUND

SYSTEM CONTEXT CONT.

According to the 2016 Vital Signs report by the Vancouver Foundation, "natural beauty" is the number one reason people give for choosing to live in BC.

While this chapter focuses on natural areas managed by the Park Board, ecosystems like wildlife corridors do not follow jurisdictions (e.g. Stanley Park is owned by Parks Canada, water is managed by DFO in the intertidal zones). To truly provide an innovative ecological framework, the Playbook must build on existing efforts while also advocating for system-wide thinking and integrating how the city's natural areas tie into a larger context of protected lands.

As a city, Vancouver has made strategic plans for biodiversity, climate change resiliency and stormwater management. VanPlay offers an opportunity to advance key objectives of these plans through a variety of avenues such as system-wide strategies for environmental education, green operations, connections to nature and rewilding.

MAJOR INITIATIVES

In addition to the efforts indicated at right, the Park Board is pursuing the following larger efforts:

- Restore or enhance natural areas across Vancouver, such as forest restoration in Everett Crowley Park.
- Use park acquisition and development planning to expand and connect parks.
- Seek partnerships with other agencies and First Nations to improve estuary habitats and shorelines, such as the New Brighton Salt Marsh.
- Incorporate small-scale habitat areas, such as pollinator meadows, into parks and streets.

RELATED INITIATIVES

- Vancouver Biodiversity Strategy—2016
- Vancouver Bird Strategy—2015
- Healthy City Strategy—2015
- Environmental Education + Stewardship Action Plan—2014
- Urban Forest Strategy—2014 and 2018
- Park Board Adoption of the Truth and Reconciliation Commission's Calls to Action (11 Recommendation Strategies)—2016
- City of Reconciliation—2014
- Green Operations Plan—2013
- Climate Change Adaptation Strategy—2012
- Greenest City 2020 Action Plan—2011
- Stanley Park Ecological Action Plan—2011
- Metro Vancouver Ecological Health Action Plan—2011
- Still Creek Enhancement Plan—2002
- Vancouver Greenways Plan—1995
- Vancouver Parks Management Plan—1992
- Vancouver Parks + Recreation Master Plan—1982
- Fraser River and Burrard Inlet Waterfront Policies and Guidelines—1974

ENGAGEMENT HIGHLIGHTS

PRIORITIES FOR ACTION

Throughout all the community engagement to date, the most commonly cited opportunities and big ideas were on the topics of:

- Access to nature
- Wild spaces
- Biodiversity
- Wildlife

The public identified natural areas as the third highest priority (38% put it in their top three) for action over the next 25 years. Beaches ranked in the top two of frequently used amenities, with 86% of respondents to the survey visiting a beach in the last year.

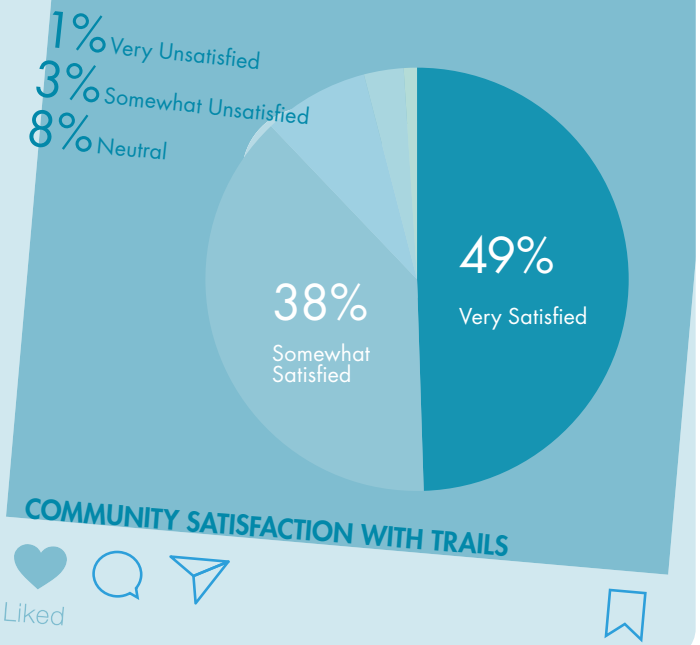
OPPORTUNITIES

- There is a strong public appetite for more wild, less curated spaces. This proposes a change in the way we view and manage public landscapes. Increasing the diversity of landscapes in parks— including pollinator meadows and wetlands— will better serve local ecologies but will also offer more and different opportunities to access nature.
- Many of the conversations during the VanPlay Tour were about the possibility of expanding outdoor recreation and education programs to support Vancouverites heading out into nature in a confident and responsible way.
- Previous Park Board engagement, such as for New Brighton Shoreline Restoration and Water Conservation initiatives, suggests that the community supports habitat restoration and green corridors, such as daylighting creeks and pedestrian paths that support nature.
- The External Advisory Group suggested that a classification system for natural areas would help define ecological management priorities as well as access to nature opportunities.
- Spatial equity and access to nature was a topic that the External Advisory Group felt we could explore more. It is important to ensure all Vancouverites have access to nature.
- Speakers Haley Roser and Eleanor Arkin from frida&frank at the VanPlay Smart City Talks received lots of audience support for their initiative to encourage us to play in the rain and to connect with nature (weather) and others in public spaces.

CHALLENGES

- Throughout VanPlay engagement and previous conversations with the public (People, Parks and Dogs and numerous other projects), the amount, location and management of off-leash dog areas were cited as a common challenge.
- Many residents would like to see improved waste management and reduced use of single-use plastics and would like to see replacement with compostable materials to reduce the impact of rubbish on natural areas (in addition to the environmental impact globally).
- During the consultation for New Brighton Habitat restoration, some residents communicated a concern about loss of outdoor recreation amenities (tennis courts, dog off leash areas) as a result of naturalising the space.
- Steven Apfelbaum, in his VanPlay Smart City Talk, challenged the Park Board to manage the ecology of the city by considering the wider landscape context.

COMMUNITY SURVEY TAKEAWAY



PREVIOUS ENGAGEMENT REVIEW

Studies show residents are generally supportive of habitat restoration projects in Vancouver's natural areas.

Priorities for habitat restoration and park designs include preserving existing habitats, enhancing land and marine ecosystems and adding in parkland, environmental educational features and dog areas.

EMERGING QUESTIONS

MORE WILD SPACES: Where can we create more wild spaces in the city? How can we balance need for wild, less curated spaces with needs for other outdoor recreation amenities?

ECOLOGICAL HEALTH: In a growing city how can we support ecological health? Can green infrastructure improve water quality and ecological health while managing the city's stormwater?

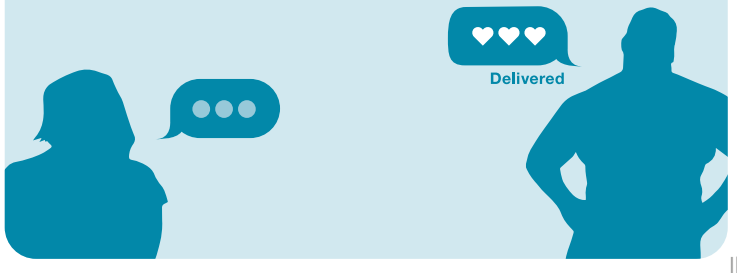
CONNECTION TO NATURE: How can we best support Vancouverites to be stewards of our natural spaces? How do we diversify the types of landscapes in our parks to bring more nature into Vancouver's neighbourhoods?

VANPLAY TOUR TAKEAWAY

"Natural areas are patches of the urban landscape that support nature. From large natural areas like Stanley Park to small parks, nature takes many forms in the City: connecting neighbourhoods and providing habitat, canopy cover and space for community gardens and horticulture, while allowing residents to disconnect from a busy world."

STAKEHOLDER ENGAGEMENT

"Natural areas play an important role in the city's environmental, social and economic systems. Systems thinking can help to improve the quality of planning and decision-making for natural areas."



VanPlay

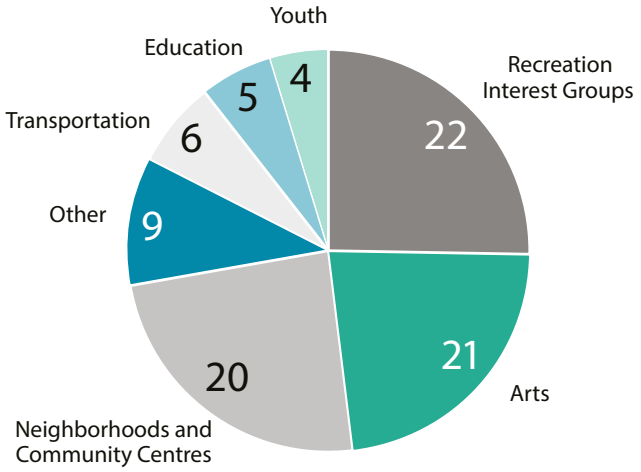
ENGAGEMENT HIGHLIGHTS

VANPLAY DEEP DIVE

Between February and April 2018, key stakeholder groups were invited to engage in the VanPlay process through "VanPlay Deep Dives." 345 members of key stakeholder groups completed 64 "VanPlay Deep Dive" workbooks. The goals of the VanPlay Deep Dive are:

- To better understand Vancouver's parks and recreation system by mapping out and celebrating the diverse networks of amenities, programs, services and experiences to which stakeholders contribute in Vancouver.
- To identify who is involved in leading, sharing and supporting these diverse services
- To shape the future by setting principles and goals which reflect what a successful future looks like
- To identify the actions and resources needed to achieve goals

Groups Who Participated in Deep Dive Engagement



STAKEHOLDER PERSPECTIVES ON CURRENT STATE OF NATURE

Through VanPlay Deep Dive, 774 comments were gathered on the current state of parks and recreation. From a list of potential focus topics (see list below), Deep Dive stakeholders identified environmental health as a priority.

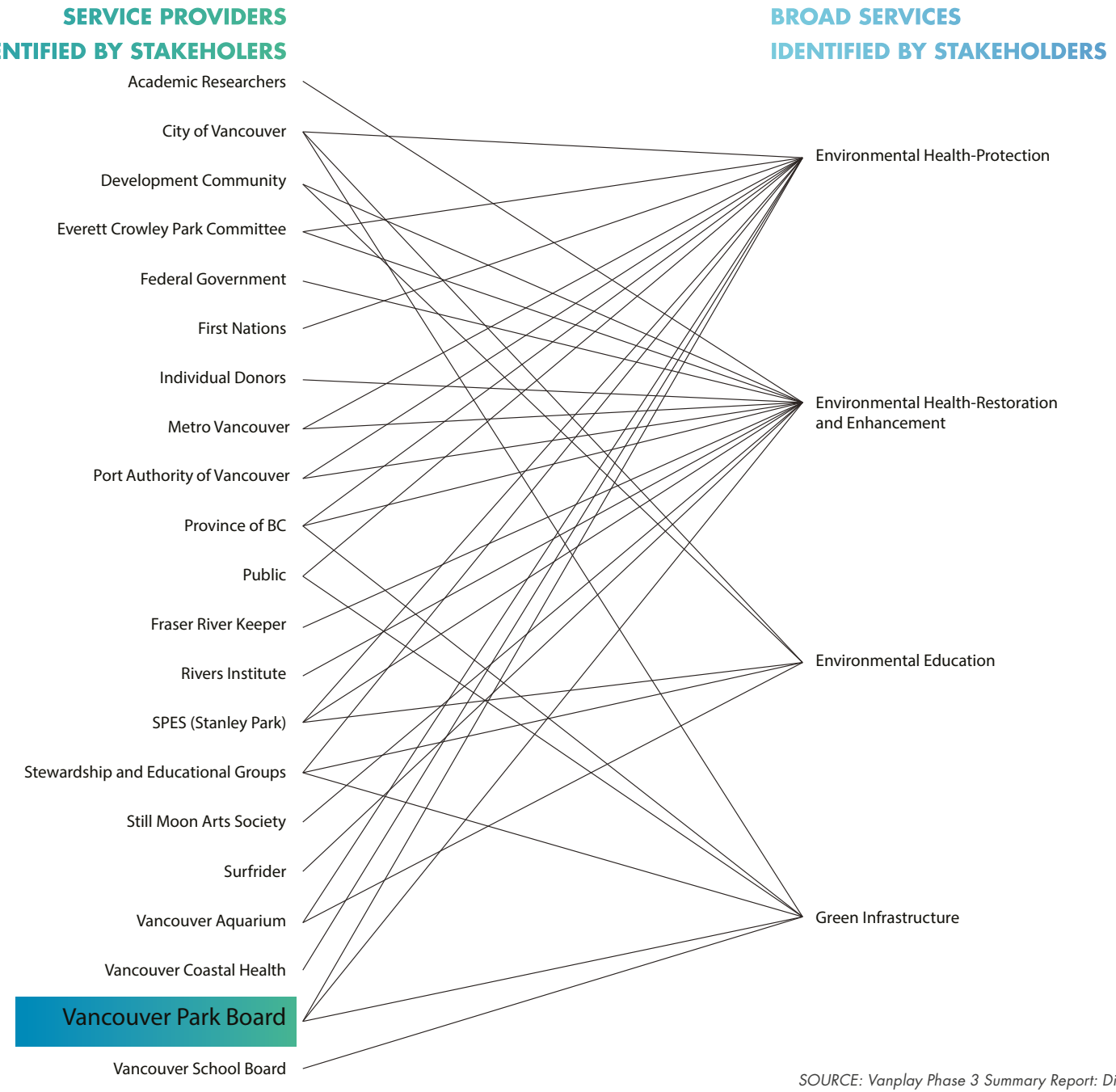
- Access to natural areas (bike trails, walking, transit, etc.)
- Environmental health
- Indigenous reconciliation
- Maintenance and renewal
- New natural areas
- Environmental education (Programs, interpretative signage, etc.)
- Green Infrastructure (stormwater, green streets, etc.)
- Streams and waterway management
- Urban forest (street trees, park trees, privately owned trees)
- Wildlife habitat (pollinator gardens, wetlands, etc.)
- Wildlife management (feral rabbits, song birds)

For the full Deep Dive report, please see Appendix 7.

WHAT THIS DIAGRAM (OPPOSITE) TELLS US →

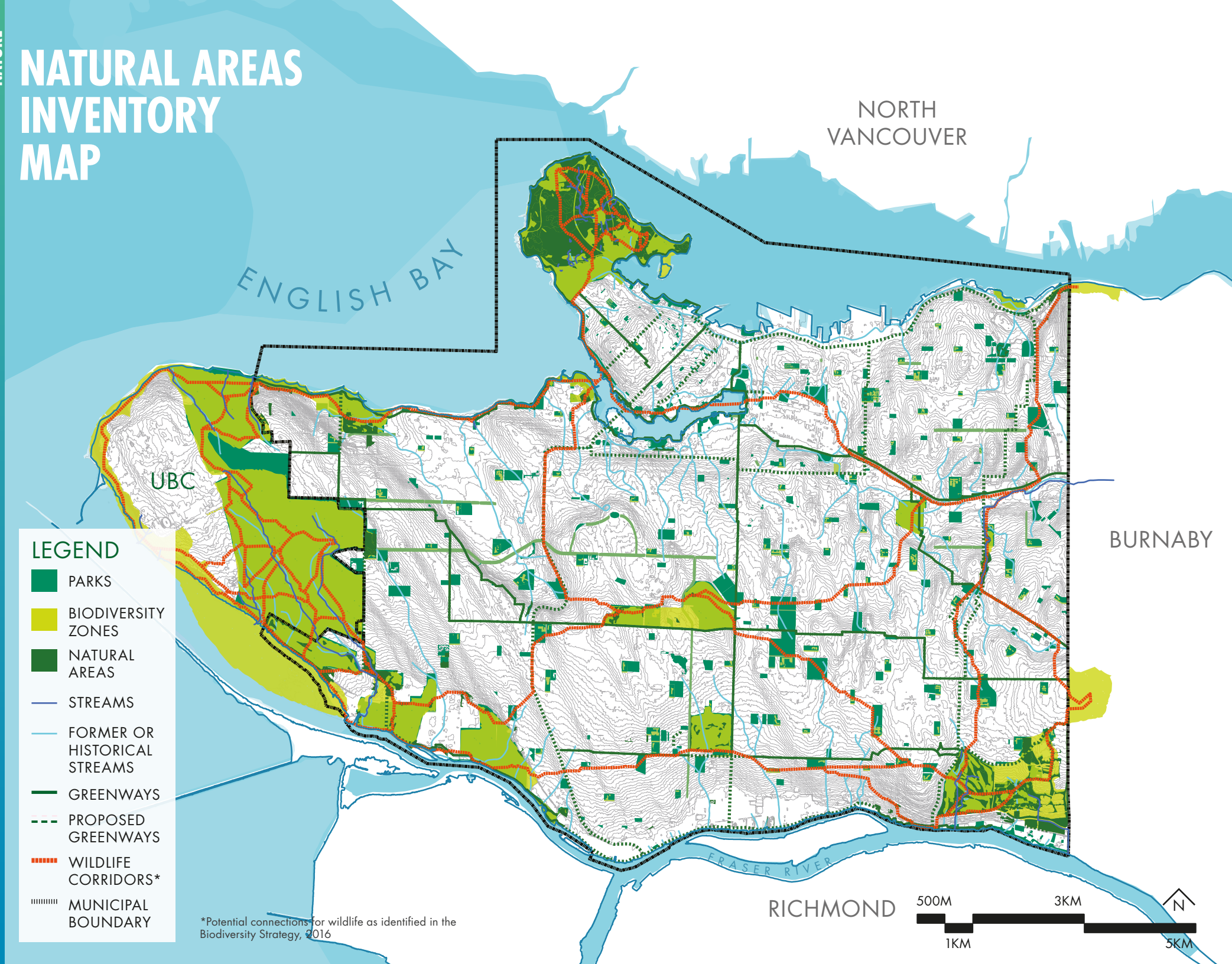
The diagram on the facing page reflects findings from stakeholders on the current state of the nature network and what broad topics are top of mind to these stakeholders.

DEEP DIVE FINDINGS SUMMARY: NATURE SERVICES AND PROVIDERS



SOURCE: Vanplay Phase 3 Summary Report: Direction – Citywide

NATURAL AREAS INVENTORY MAP



INVENTORY + ANALYSIS: ACCESS

NATURAL AREAS INVENTORY

Vancouver's parks host 482 hectares of natural areas that range from tidal flats to mature forests.[1] The map at left provides an inventory of natural areas, former streams and potential ways to connect the network (wildlife corridors). The table at right summarizes information found in the Turf and Horticulture Booklet.

WHAT THIS ANALYSIS TELLS US

1. Through programs like Audubon certification of golf courses, **the Park Board has taken steps towards creating ecologically rich public lands** but there are opportunities to expand these efforts.
2. **Biodiverse areas are relatively isolated.** While Stanley Park and Pacific Spirit Regional Park offer large tracts of habitat, corridors between habitat areas are sparse.

OPPORTUNITIES TO EXPLORE

3. **Habitat creation can occur at many scales, ranging from pollinator meadows to street trees to coastal habitat.** Understanding the opportunities for increased biodiversity across scales will allow us to protect what we have but also see potential in urban areas.
4. **Managing turf more naturally can result in more habitat areas** however, is contingent on community support and additionally funding to support invasive species management and ensure service standards and safety are maintained.
5. **The map and table do not show the impact of private open space**, such as backyards and private facilities, that provide additional connectivity.

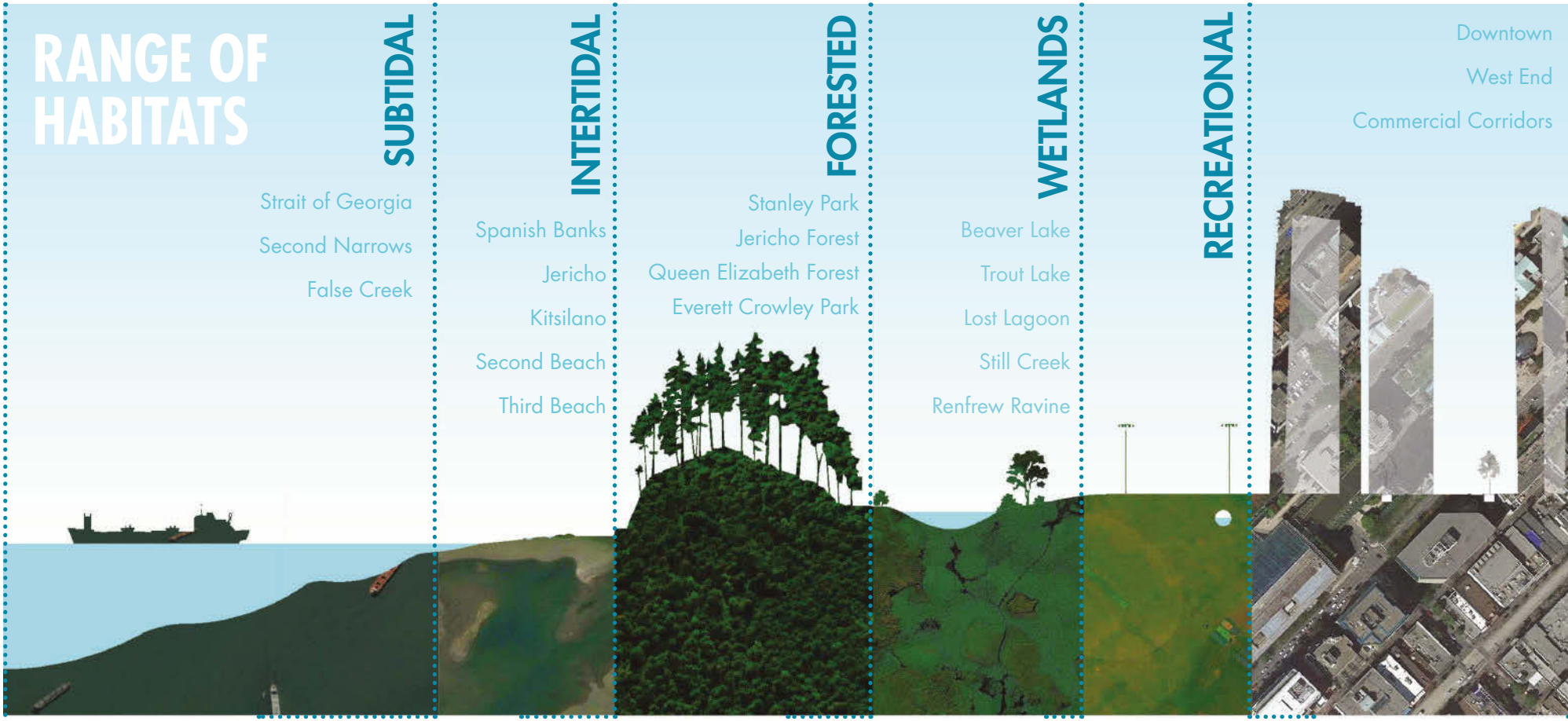
1 Vancouver Board of Parks and Recreation. Biodiversity Strategy. Vancouver, BC, 2016

HORTICULTURE BEDS, TURF IN PARKS + GOLF COURSES
Analysis of Opportunities to Provide Natural Areas

TOTAL AREA OF MANAGED TURF AND HORTICULTURE BEDS		715.2 ha
CURRENT TURF AND HORTICULTURE AREAS MANAGED NATURALLY BY THE PARK BOARD		
Native Areas in Golf Courses	Unmaintained grass and woodland remnant areas (including riparian zones). Not irrigated.	6.9 ha
Meadows in Parks	Unmaintained grass areas. Cut at four to six inches in height. Non-irrigated.	0.94 ha
Naturalised Beds in Parks + Golf Courses	Remnant woodland and native plantings (including riparian zones).	29.1 ha
Pond + Water Features in Parks	Living body of water. Non-chlorinated. Non-recreational.	36.8 ha
CURRENT TOTAL MANAGED NATURALLY THROUGH EXISTING MANAGMENT PRACTICES		73.7 ha or 10%
POTENTIAL TURF AND HORTICULTURE AREAS TO MANAGE NATURALLY BY THE PARK BOARD		
Grade C Turf in Parks	Soil based grass areas. Infrequent maintenance. Non-irrigated. Could transition to meadow or naturalized.	298.3 ha
Rough Areas on Golf Courses	Sand-based golf playing areas surrounding greens and fairways. Well maintained. Cut at one and half to two inches. Mowed twice weekly. Irrigated. With transition to Audubon certified courses, this would transition into meadow.	107.1 ha
Shrub + Ground Cover in Beds	Shrub species mix primarily for landscaping, requiring less care.	16.3 ha
POTENTIAL TOTAL TO MANAGE NATURALLY THROUGH CHANGED MANAGEMENT PRACTICES		421.7 ha or +59%

SOURCE: Turf + Horticulture Booklet, Vancouver Board of Parks and Recreation, 2016

RANGE OF HABITATS



SUBTIDAL

SIZE: 1,639 ha

ASSETS: Large Marine Animals + Fish Habitat | Migratory Routes | Trade Routes | Views

THREATS: Acidification | Contamination | Rising Water Temperatures | Overfishing

JURISDICTION: Federal + Provincial Government

HABITAT STATUS: Stable but poorly Surveyed

INTERTIDAL

SIZE: 246 ha

ASSETS: Resident + Migratory Birds | Forage Fish | Wave Mitigation | Tidal Pools | Beaches | Recreation Space| Views

THREATS: Acidification | Contamination | Rising Water Temperatures | Sea Level Rise

JURISDICTION: Park Board, Port Authority

HABITAT STATUS: Declining

FORESTED

SIZE: 2,069 ha (urban forest); 713 ha (habitat)

ASSETS: Coastal Temperate Rainforest | Record Trees | Native Species | Connection to Nature

THREATS: Hotter, Longer Summers | High-intensity Storms | Invasive Plants + Insects

JURISDICTION: Park Board, CoV, Private

HABITAT STATUS: Stable

WETLANDS

SIZE: 49 ha

ASSETS: Freshwater Wetlands + Water Bodies | Nursery Areas | Amphibian Habitat | Connection to Nature

THREATS: Invasive Species | Buried Streams | Contamination | Eutrophication

JURISDICTION: Park Board

HABITAT STATUS: Rare but Stable

RECREATIONAL

SIZE: 1,525 ha

ASSETS: Recreation Space | Meadow / Pollinator Habitat | Detention Areas | Green Infrastructure

THREATS: Low Biodiversity | Overuse | Development | Contamination | Rising Temperatures | Chafer Beetle | Dog Waste

JURISDICTION: Park Board

HABITAT STATUS: Stable

URBAN

SIZE: 2,286 ha

ASSETS: Green Roofs, Strata Parks + POPS | Green Infrastructure | Unconventional Open Space | Views

THREATS: Heat Island Effect | Contamination | Severe Storms | Human Impacts

JURISDICTION: CoV

HABITAT STATUS: Growing

NOTE: Areas can be included in multiple categories. For instance, a park could be included in both the Forested and Recreational categories.

URBAN CORRIDORS

SIZE: unknown

ASSETS: Fringe Habitat | Wildlife Corridors | Informal Recreation | Biodiversity | Urban Forest

THREATS: Invasive Species | Development | Overuse / Human Impacts

JURISDICTION: CoV, community partners

HABITAT STATUS: Declining

ORNAMENTAL

SIZE: 102 ha

ASSETS: Biodiversity | Bird + Pollinator Habitat | Connection to Nature | Urban Forest

THREATS: Invasive Species | Hotter, Dryer Summers | Overuse | Maintenance Costs

JURISDICTION: Park Board

HABITAT STATUS: Stable

LOW DENSITY

SIZE: 6,180 ha

ASSETS: Stormwater Infrastructure | Wildlife Corridors + Habitat | Pervious Paving |Urban Forest

THREATS: Development | Human Impacts | Invasive Species | Contamination

JURISDICTION: CoV

HABITAT STATUS: Declining

INDUSTRIAL

SIZE: 642 ha

ASSETS: Fringe Habitat | Wildlife Corridors | Bird and Small Mammal Habitat

THREATS: Development | Sea Level Rise | Contamination | Urban Heat Island Effect

JURISDICTION: CoV, Metro Vancouver

HABITAT STATUS: Declining

RIVERINE

SIZE: Outside City

ASSETS: Freshwater Habitat | Migratory Routes | Trade Routes

THREATS: Eutrophication Contamination | Rising Water Temperatures | Sea Level Rise

JURISDICTION: Port Authority, Federal + Provincial Government

HABITAT STATUS: Stable

ESTUARINE

SIZE: Outside City

ASSETS: Nursery Areas | Brackish Habitat | Bird Habitat

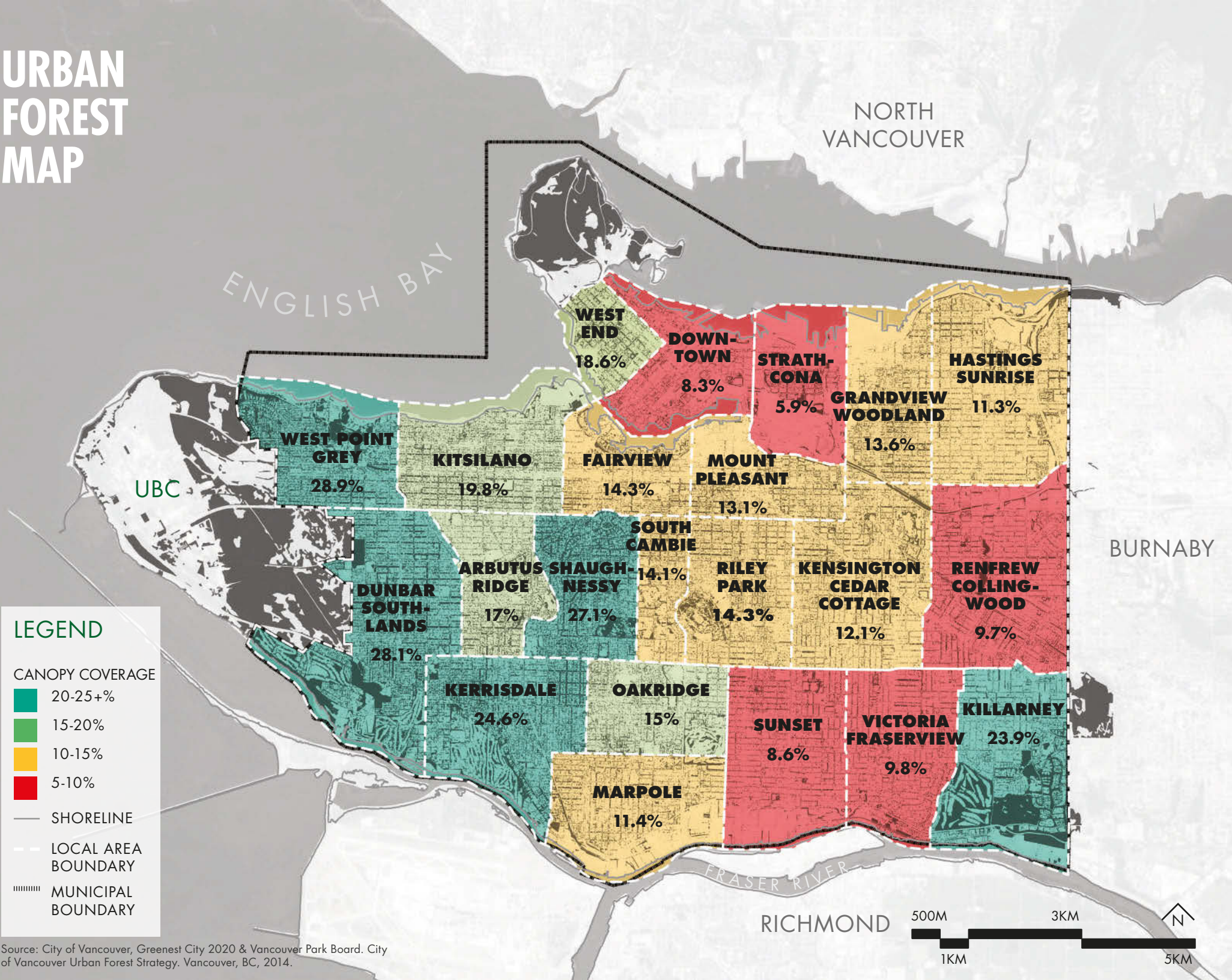
THREATS: Contamination | Rising Water Temperatures | Sea Level Rise

JURISDICTION: CoV, Musqueam First Nations, Provincial Government

HABITAT STATUS: Declining

SOURCES: Regional Context Statement, Biodiversity Strategy, Urban Forest Strategy, Metro Vancouver Industrial Lands Inventory, Turf + Horticulture Inventory, Open Data Catalogue, Vancouver Park Board. Vancouver Park Board. Park Provision Standard Study. Vancouver, BC, 2016 / 2018.

URBAN FOREST MAP



LEGEND

CANOPY COVERAGE
- 20-25+%
- 15-20%
- 10-15%
- 5-10%

SHORELINE

LOCAL AREA BOUNDARY

MUNICIPAL BOUNDARY

Source: City of Vancouver, Greenest City 2020 & Vancouver Park Board. City of Vancouver Urban Forest Strategy. Vancouver, BC, 2014.

INVENTORY + ANALYSIS: QUALITY

URBAN FORESTS

Vancouver's magnificent rainforest setting is a mix of everything from native towering cedar, fir and hemlock trees to annually blossoming cherries. Its urban forest comprises approximately 140,000 street trees, 300,000 park trees and many trees on private property.

WHAT THIS TELLS US

1. **Canopy cover is uneven across neighbourhoods.** The West side of Vancouver, including Shaughnessy and West Point Grey, has substantially more canopy than the East.
2. **Industrial areas and major traffic arterials have particularly low canopy coverage.** The industrial zones along the Burrard Inlet, False Creek Flats and Fraser River and major thoroughfares, like Cambie, are largely devoid of trees.

OPPORTUNITIES TO EXPLORE

1. **We have extensive data on forest abundance but not on forest health and forest quality.** While the city has undergone extensive mapping of canopy cover, citizen scientists can help determine forest health and quality.
2. **Vancouver should encourage the planting of trees that are hardy and resilient to climate change.** Planting tree species that are resilient to a changing climate will protect the urban forest. The Park Board is updating tree selection guidelines to plant trees that are suitable for Vancouver's future climate.
3. **Continued investment in the urban forest will aim to address these green deficits.** However, some creative problem solving is required to add trees in areas with limited space, permeability or insufficient soil depth to maintain a large tree. Innovation, such as use of green infrastructure for drainage, has potential to enhance the urban forest.

Vancouver's urban forest ranges from street trees to dense forests in Stanley Park| Vancouver Park Board

Stanley Park | Katherine Howard

INVENTORY + ANALYSIS: QUALITY

SPECIES AND HABITAT HEALTH

As Vancouver developed, much of the natural vegetation was cleared. The impacts of urbanization—from invasive species to heat island effect—imperil the city's ecological health, meaning that ongoing work is required to repair years of disturbance. The following summarizes the Biodiversity Strategy:

WHAT THE BIODIVERSITY STRATEGY TELLS US

1. **While some species are thriving, more are in decline.** Due to the restoration of native streams and wetlands, salmon have returned to Vancouver after many years of absence. Urban adapted mammals are also increasing.

2. **Native species of both flora and fauna are struggling.** The pressures of invasive species, competition and changing climactic conditions are unevenly affecting native insects, mammals, amphibians and plants.

OPPORTUNITIES TO EXPLORE

1. **Re-introduction of wildlife.** Logging and land clearing, draining of wetlands and streams and hunting of large mammals and other wildlife all led to a decline of biodiversity in Vancouver. Re-introduction of important species may be an essential way to enhance biodiversity in Vancouver's highly urbanized landscape.

2. **Improved ecological function requires further focus and collaboration.** Green infrastructure, maintenance and management all influence ecological processes that can improve water quality and mitigate impacts, such as the urban heat island effect.

SOURCE: Vancouver Board of Parks and Recreation. Biodiversity Strategy. Vancouver, BC, 2016

SOURCES: Regional Context Statement, Biodiversity Strategy, Urban Forest Strategy, Metro Vancouver Industrial Lands Inventory, Turf + Horticulture Inventory, Open Data Catalogue, Vancouver Park Board. Park Provision Standard Study. Vancouver, BC, 2016 / 2018.

NATURE KEY FINDINGS

83
GREAT BLUE HERON NESTS IN STANLEY PARK IN 2016

SEEING TREES
REDUCES MUSCLE TENSION & BLOOD PRESSURE SIGNIFICANTLY WITHIN 3 MINUTES

URBAN FOREST CANOPY

37% PRIVATE **35% STREETS** **28% PARKS**

STANLEY PARK

SEA LEVEL RISE

+1M 2100

+ 50CM 2050

91%
OF VANCOUVER'S ORIGINAL STREAMS ARE BURIED!

BUT SALMON HAVE RETURNED TO STILL CREEK SINCE 2012

VANCOUVER BOARD OF PARKS AND RECREATION

VanPlay

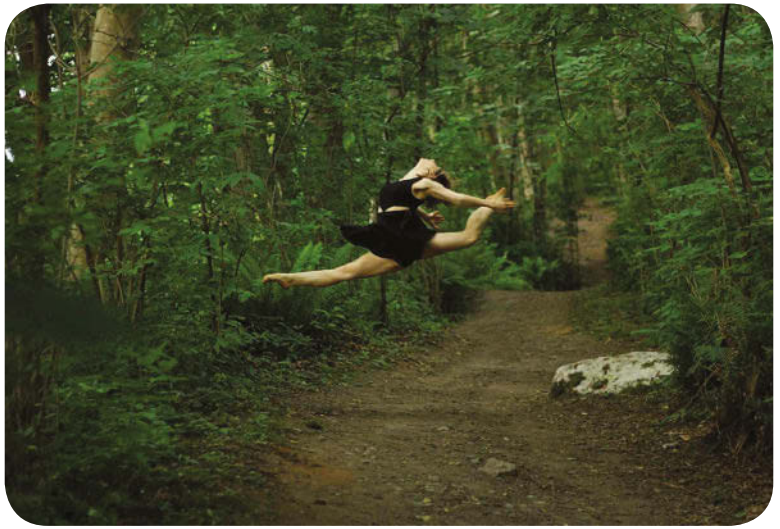
INVENTORY + ANALYSIS: QUALITY

ARTS AND CULTURE IN NATURE

Nature often serves as a muse for artists and Vancouver's stunning natural beauty is no exception.

Theatre and dance performances in parks, forests and on beaches move the arts out of the theatre and gallery and into the natural landscape. For example, as part of Vancouver's Canada 150+ celebrations, Aeriosa aerial dancers, Spakwus Slolem Squamish dancers and drummers created Thunderbird Sharing, a stunning performance high in the trees and on the forest floor of Stanley Park – a creative work of gratitude to the ancient forest.

Environmental art projects also happen in parks around the city. Working collaboratively with Park Board operations and gardeners, EartHand Gleaners has transformed Trillium Park into a site where artists grow materials for weaving, dying, papermaking and more and where they maintain the park plantings as part of their arts practice. Park-based environmental art and site specific natural materials generate creative activities that are both ancient and innovative and in harmony with eco-systems. For example, the EartHand Gleaners' Weaving Wagon is a pop-up studio where green waste is repurposed as material for weaving practices from around the world. Another eco art garden grows behind West Point Grey Community Centre/ Aberthau House. At this site, textile plants and local food grow together, encouraging permaculture, urban agriculture and textile arts.



Top to Bottom:

Dancer in Aberthau Woods | Desiree Dunbar

Weaving Wagon | Park Board - Arts, Culture & Engagement Team

INTERPRETING NATURE

Environmental learning feeds our curiosity about the natural world. Whether it is a guided walk or a path with fascinating interpretative signs, parks offer spaces to explore and learn about our surroundings.

The Stanley Park Ecological Society (SPES) connects thousands of individuals with nature through public education programs and habitat restoration. Beyond programming (such as discovery walks, nocturnal animal tours, indigenous medicine workshops and wetland explorations), SPES also offers cultural events. Their Celebrating Solstice event highlights natural elements in the solstice holiday traditions by hosting a walk in the park and the event culminates with an indigenous solstice dinner at the end of the night. Other parks and community centres offer similar programming, like family-friendly nature walks and wildlife watching. For example, the Moberly Arts and Cultural Centre garden is used for growing herbs and medicinal plants under the guidance of a renowned indigenous eco artist. The VanDusen Botanical Garden provides guided tours of its 55-acre oasis, as well as summer camps focused on topics such as foraging or birdwatching and adult education classes, like bumblebee identification workshops or indigenous medicinal plant walks.

Top to Bottom:

Children at VanDusen listening to guided tour | Park Board

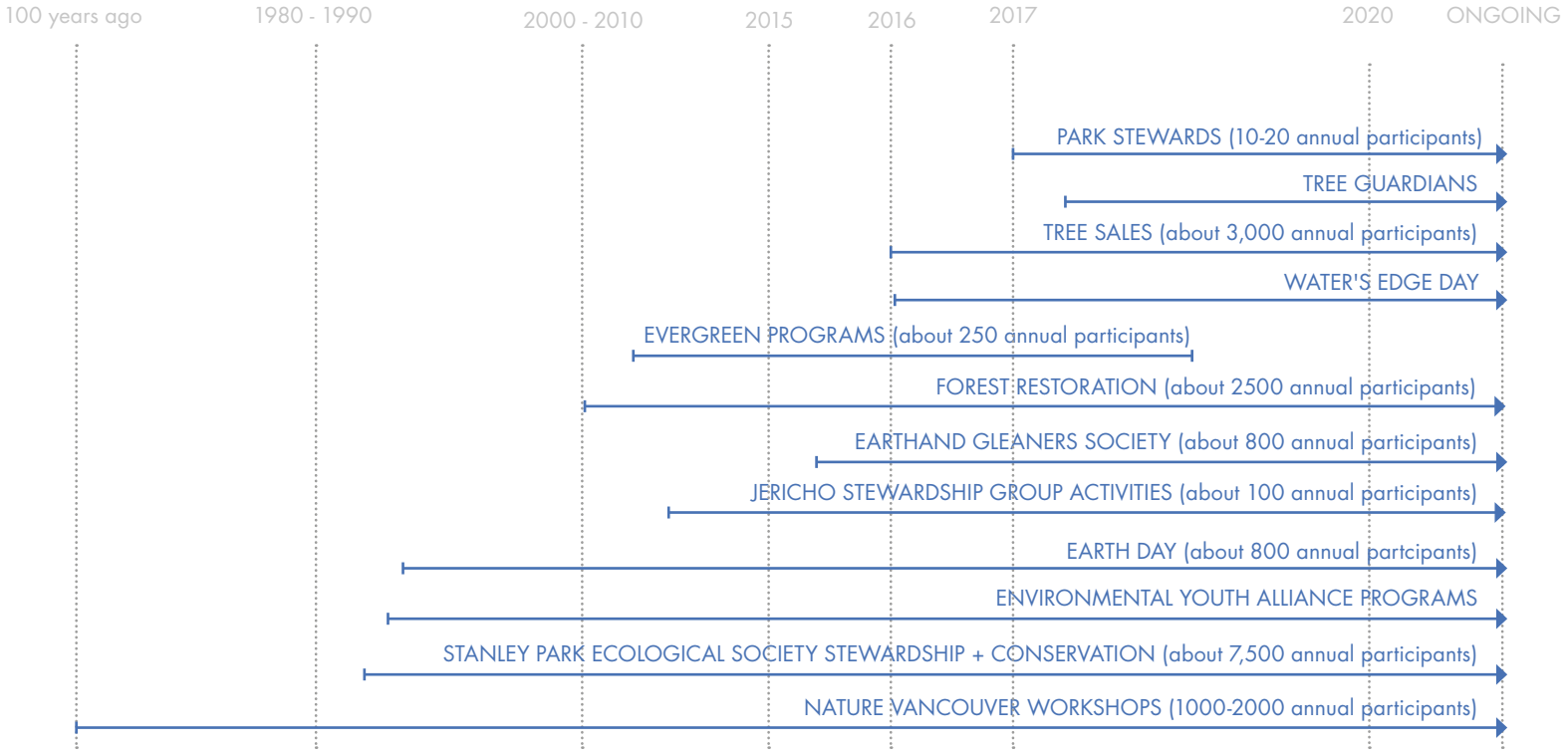
Fire Dancer at Solstice in 2014 | Tatiana Balashova

STEWARDSHIP PROGRAMS

Park Stewards I Vancouver Park Board

5th and Pine Pollinator Garden, planting day I Vancouver Park

Board



SOURCE:
City of Vancouver, Greenest City 2020 & Vancouver Park Board. City of Vancouver Urban Forest Strategy. Vancouver, BC, 2014.

Vancouver Board of Parks and Recreation. Biodiversity Strategy. Vancouver, BC, 2016.

City of Vancouver & Greenest City 2020. Vancouver Bird Strategy. Vancouver, BC, January 2015.

INVENTORY + ANALYSIS: INCLUSIVITY

EDUCATION + STEWARDSHIP

Thriving stewardship programs, a popular bi-annual tree sale and buzzing planting days show that Vancouverites are keen to get their hands dirty.

The Park Board's Environmental Education and Stewardship Action Plan aims to increase and enhance nature experiences for all Vancouverites and to improve understanding and awareness of nature in the city.

In addition to make big strides in the ecological health of the city, environmental stewardship offers opportunities for recreation through volunteerism and care of natural areas in leisure time and builds social capital.

Park Board stewardship activities have been happening for over a hundred years (see diagram at left) and the community has participated by:

- Removing invasive plants
- Sharing nature sighting stories with neighbors
- Picking up litter
- Planting trees
- Installing and maintaining bird houses
- Replacing invasive plants with native ones
- Ongoing efforts to create habitat in parks
- Caring for the urban forest and other significant ecological spaces

KEY TERM

steward

A steward is a person who cares for something that benefits everyone.

environmental stewardship

A principle that recognises the need to conserve and restore natural ecosystems for the benefit of current and future generations of all species. More than simply respecting their surroundings, environmental stewards respond and actively take responsibility for human and ecosystem health.

environmental education

Lifelong, interdisciplinary learning focused on the relationship between humans and their natural environment.

Jericho Pond | Nick Page

INVENTORY + ANALYSIS: INCLUSIVITY

CONNECTION TO NATURE

Studies show that interacting with nature improves our mental and physical health, increases empathy and lowers stress.

In addition to their ecological benefits, natural areas act as vibrant community spaces that connect us to our neighbours and to our environment. Many residents choose to call Vancouver home due to its incredible natural setting and easy access to wild spaces. The Park Board and its community partners offer dozens of ways to both engage with nature and support the city's wildlife— from educational programs to tree planting to fun runs.

As the city continues to urbanize, natural areas should be maintained to protect the human health benefits they provide. According to the 2014 report— *Connecting Canadians with Nature by the Canadian Parks Council*, Canadians on average spend 90% of their time indoors. This, in part, has led to a vitamin D deficiency among 1.1 million Canadians as well as a decline in outdoor activity by children. Only 7% of Canadian children and youth meet the daily activity requirements and 28% of children walk to school, compared to 58% of their parents.

However, appreciation of nature is a near universal value shared among Canadians. We have much to learn from Musqueam, Squamish and Tsleil-Waututh nations who have managed and stewarded the landscape since time immemorial. Their knowledge of horticultural cultivation, sustainability and maintaining ecological health has the potential to transform our relationship with nature.

Increasing the diversity of landscapes in parks will better serve local ecologies but also offer more and different access to nature. Protecting and expanding natural areas pays dividends for future generations through the following benefits:

- IMPROVED HEALTH OUTCOMES: Walking in the woods can improve sleep quality. Exposure to nature lowers our blood pressure and stress levels.
- SPIRITUAL CONNECTION: Studies have shown that participants immersed in natural environments are more likely to place value on experiential aspirations than material ones.
- CHILDHOOD DEVELOPMENT: A multitude of studies have shown that playing in natural environments is essential to our children's development of core skills, including observation, problem-solving and reasoning, categorization, creativity, imagination and risk-identification.

INVENTORY + ANALYSIS: INCLUSIVITY

RESILIENCE

The 21st century has been marked by rapid urbanization and an increasingly volatile climate across the globe.

Climate Change Adaptation

As part of the Greenest City 2020 Action Plan, the City of Vancouver adopted the Climate Change Adaptation Strategy in 2012 to proactively prepare for climate change. This cross-departmental initiative provided an action list of projects, programs and investments to safeguard the city in the future. The climate change action items that will impact Vancouver's natural areas are the following:

- SEA LEVEL RISE: prepare coastal parks for sea level rise and erosion, adjust beach / park plantings to be salt tolerant and educate the public on storm surge impacts.
- HOTTER, DRIER SUMMERS: Use vulnerability mapping to locate spaces for new parks and green spaces and to identify zero irrigation zones .
- IMPACTS TO NATURAL AREAS: Incorporate climate change best practices in Urban Forest Management Plan, map tree deficit areas, adapt species criteria for planting strategies and tree selection to be climate resilient, apply wind management along shorelines and explore rainwater storage options.

Green Infrastructure

When it rains or snows in urban areas, streets are inundated with large volumes of stormwater. Traditional approaches to handling this stormwater include piping, storing and channelising waterways to deal with the increased volumes. Green infrastructure provides 'soft' alternatives to the typical 'hard' infrastructure structures that disrupt natural hydrologic function and improve water quality. Green infrastructure returns ecological function by using soil, plants and root structure to address critical urban hydrological challenges, such as flooding, drought, urban heat island and coastal erosion. They also provide additional community benefits, such as beautification, reduced flooding and storm resilience.

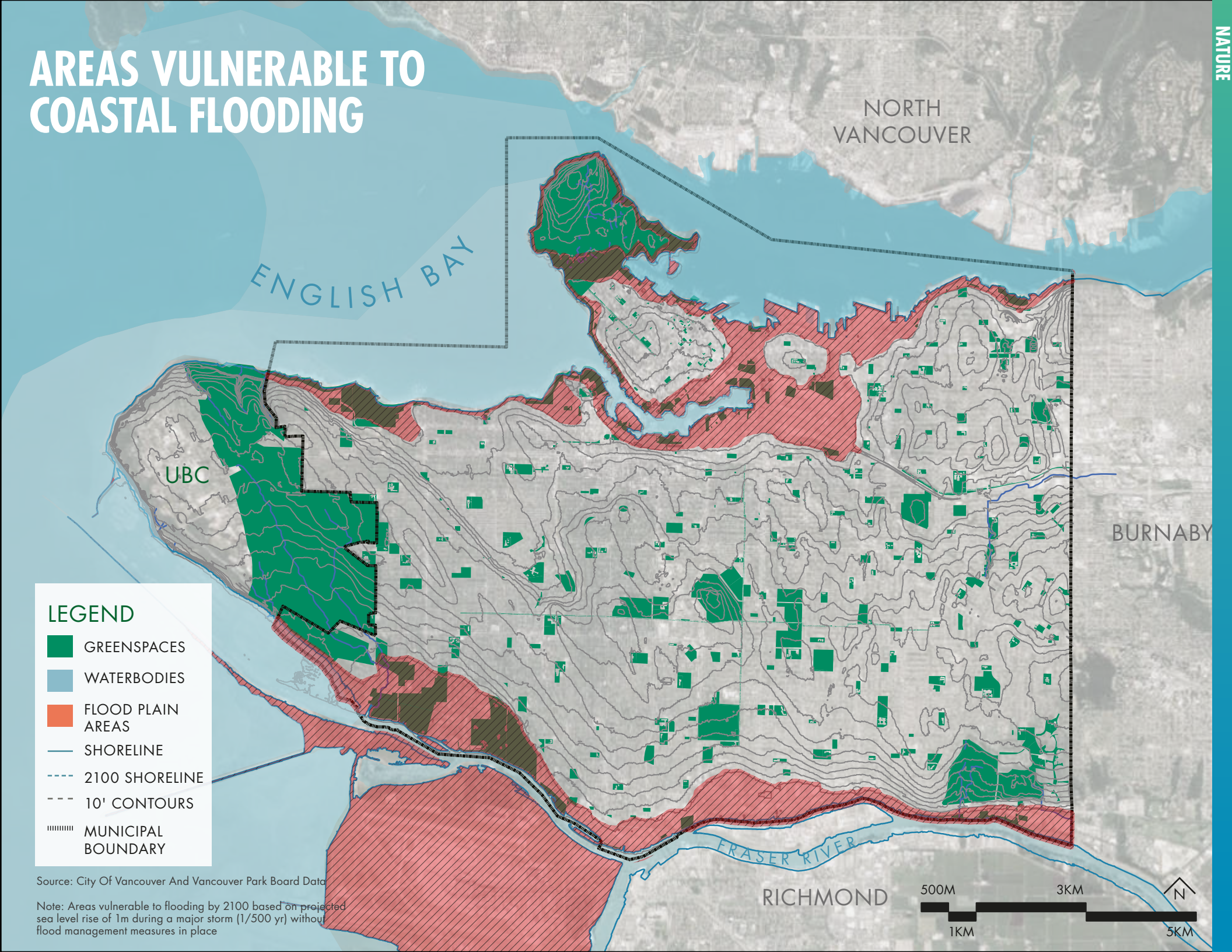
There are a number of plans influencing green infrastructure planning in Vancouver. Provincial, regional and local level plans are summarised below:

- BRITISH COLUMBIA: In 2008, BC adopted the Climate Action Plan, which includes green infrastructure initiatives, such as green land and sea transportation and solar highways. One such initiative at Peace Arch Border crossing is a new signal that has been installed to move waiting traffic in a series of pulses, allowing motorists to reduce unnecessary vehicle idling by turning off their engines while waiting for traffic ahead to clear.
- METRO VANCOUVER: "Green Infrastructure in Metro Vancouver" provides a legal and regulatory framework, identifies a range of opportunities for various contexts, and frames the ecological and economic value of green infrastructure.
- CITY OF VANCOUVER: The Climate Adaptation Strategy and Rain City Strategy include a number of green infrastructure initiatives, including green streets, turf conversion, capturing and cleaning rainwater and retaining and reusing stormwater in parks.

green infrastructure

An approach to water management that protects, restores, or mimics the natural water cycle. Green infrastructure is effective, economical and enhances community safety and quality of life (source: American Rivers).

AREAS VULNERABLE TO COASTAL FLOODING



Source: City Of Vancouver And Vancouver Park Board Data

Note: Areas vulnerable to flooding by 2100 based on projected sea level rise of 1m during a major storm (1/500 yr) without flood management measures in place

OPPORTUNITIES + CHALLENGES

The following list of opportunities and challenges is a summary of key findings gleaned from consultation with staff, stakeholders and the community, including the Fall 2017 Community Dialogue and Community Centre Association Meetings.

opportunities

interests or topics that have the potential to positively impact parks and reaction

challenges

constraints or obstacles that have the potential to negatively impact parks and recreation

OPPORTUNITIES

1. **COMMUNITY ENGAGEMENT AND STEWARDSHIP**—Engaging the public in critical conversations, stewardship projects and educational programs increases stakeholdership and engagement with natural areas. In initial feedback on opportunities for the park system, nature programs and expanded natural areas were top priorities.

2. **CONNECTION TO NATURE**—Natural beauty polled as the top reason residents call Vancouver home. A strong connection to nature is core to the identity of Vancouver and many of the opportunities identified by the public for the future of parks centre on improving natural areas. These include biodiversity, green corridors and creating more wild areas in the city.

3. **RENEWED ECOLOGICAL FUNCTION**—Urbanism has disrupted the hydrology of Vancouver and buried 91% of the city's native streams. Daylighting some of these streams and re-creating them through green streets and infrastructure would positively impact Vancouver's resiliency to flooding and storms. Forest restoration and street tree planting can enhance the urban forest.

4. **AQUATIC RESERVES AND PROTECTED HABITAT**—With water bordering three sides of the city, there are opportunities for protection and designation of marine protected areas while providing space for sensitive recreational uses in these areas.

5. **GREEN OPERATIONS**—Greening operations allows the Park Board to demonstrate best practices at their parks and community centres. Recycling, compost, cargo bikes for operations and water use reduction are all potential opportunities.

6. **SUPPORTING URBAN NATURE**—There is a strong public desire for more nature play and wild spaces in and around Vancouver. This offers opporunity to change landscape types in parks, provide Park Board leadership and incorporate nature in everyday life.

7. **FIRST NATIONS STEWARDSHIP**—We have much to learn from Musqueam, Squamish and Tsleil-Waututh nations who have managed and stewarded the landscape since time immemorial. Their knowledge of horticultural cultivation, sustainability and maintaining ecological health has the potential to transform our relationship with nature.

8. **INCLUSIVITY + WELCOME**— Through programming, activities, subsidies, permitting, events, art and education, we can make spaces more welcoming, interesting and safe for everyone. There is also an opportunity for community centres to act as entryways to natural areas.

9. **RE-INTRODUCTION TO WILDLIFE**— Vancouver's declining biodiversity reflects over a century of development ranging from logging and land clearing, draining of wetlands and streams, to hunting of large mammals and other wildlife. Many wildlife species were lost during the early part of this development process. Re-introduction of important species may be an essential way to enhance biodiversity in Vancouver's highly urbanized landscape. This won't mean releasing black bears and elk, but but could involve re-introducing tree frogs, Douglas squirrels, American marten, cutthroat trout and other species that are essential components of food-webs and ecosystem functioning.

10. **ENVIRONMENTAL LEARNING**— Natural areas are of interest to teachers looking for an engaging way to capture students imagination and provide a connection with nature. Outdoor classrooms, lessons and camps in partnership with the environmental stewardship programs are in demand. The Park Board is working with Vancouver School Board to make outdoor learning easier and more accessible.

CHALLENGES

1. **TOUGH TRADEOFFS**—With the limited land mass for parks, there are many competing interests that affect the size and quality of natural areas. Balancing recreational areas with land for natural areas is a key challenge.

2. **DECLINE OF ECOLOGICAL HEALTH**—Degraded environments can negative impact the community's experience and their potential to experience nature in the city. Insufficient maintenance makes increasing the sustainability and resilience of urban natural areas a challenge.

3. **SEA LEVEL RISE**—Rising tides threaten all of Vancouver's shorelines and up to 11% of the city's landmass. Engaging in resilient, living shoreline practices is preferred wherever possible, rather than hard armouring or dyking; recognize that the parks may provide a buffering effect for adjacent properties to the impacts of sea level rise and erosion.

4. **CLIMATE CHANGE**—First and secondary impacts of climate change will stretch the Park Board's operations and maintenance resources, from irrigation to storm cleanup and tree removal. With hotter, drier summers and increased volatility in storms, ecosystems will be increasingly vulnerable to environmental stresses.

5. **INVASIVE SPECIES**—There is potential for serious impacts to ecosystems due to Chafer and Japanese Beetle, fire ants, Japanese knotweed, Himalayan blackberry and other invasive species. Assessing the stressors and location of invasives is a first step in developing a management plan and educating the staff on early detection signs that can limit their spread.

6. **BALANCING PARK LAND USES**—Changes to park vegetation such as converting mowed turf to wildflower meadows is not always supported by park users.

7. **NATURE DEFICIT DISORDER**—Connection to nature is core to the identity of Vancouverites but with technology increasingly integrated into our lives, getting people outdoors remains a challenge. Lack of time outdoors can curtail people's appreciation of and advocacy for the natural world.

FOUNDATION FOR INNOVATION

PEER CITY CASE STUDIES

Natural areas are a critical aspect of park systems around the world. Here are three pioneering approaches from near and far.

Singapore National Parks (NParks): The Garden City

Combining high-tech innovations with native plant species, Singapore has become a model for providing abundant green space in one of the densest cities in the world. NParks has done this by greening Singapore with more than 300 parks and four nature reserves, while actively engaging the community. With limited land area and a growing population, the city has taken innovative approaches to providing natural areas wherever it can. Greenery is not just at ground level, but also layered vertically throughout the city. The CEO of the Housing + Development Board and a former architect and urban planner, Cheong Koon Hean, describes Singapore's model of livable density: "Innovative design can reduce that feeling of density by creating the illusion of space using 'green' and 'blue' elements. We intersperse parks, rivers and ponds amid our high-rises. These bodies of water also double as flood-control mechanisms. And we plant lushly – some three million trees cover Singapore, including a stand of virgin rainforest, rich in biodiversity, right in the heart of the island." The addition of 16 Nature Ways (Nature Ways are routes lined with specific plants to replicate the natural forest and facilitate the movement of birds and insects between two green spaces) throughout the city are an innovative approach to facilitating the movement of animals between green spaces and connecting high biodiversity to urban communities. Currently, the network stretches a total of 68km and the goal is to increase this to 180km by 2020. The nature ways are designed to mimic the natural structure of forests and include four layers: shrub, understory, canopy and emergent.


NEW YORK CITY


SEATTLE

PEER CITY CASE STUDIES

New York: Hyde Park + Citizen Science

On the other side of the world in New York, technology is used as a tool to engage citizens in scientific exploration and discovery of new knowledge – a crowdsourcing of science. Citizen scientists volunteer their time, resources and efforts to collaborate with professional scientists via projects posted to the SciStarter.com website. This work promotes the notion that "anyone, anywhere can participate in meaningful scientific research". A variety of citizen science projects have been completed in Hyde Park. Over 3,500 citizen scientists from around the United States, involved with the Mastodon Matrix Project, helped sift through 22 tons of dirt/matrix that was excavated after scientists discovered a mastodon fossil in a Hyde Park backyard. This work has provided a deeper understanding of Pleistocene ecology. Subsequent projects have involved citizen scientists studying amphibian migrations, measuring mercury in dragonflies and completing water assessments. Citizen science can help bridge gaps, provide large samples of data that in the past were hard to gather and perhaps most importantly, cultivate a deep connection to the natural world through science.

Seattle: Street Edge Alternatives + Green Streets Program

Seattle's Department of Public Works has been a pioneer in green streets and green infrastructure since the early 2000's. The Street Edge Alternatives Project reimagined street rights-of-way to mimic natural hydrology in the roadway design and reduce impacts to waterways. The project narrowed the street, detained stormwater onsite in bioswales and provided natural infiltration through extensive native planting. Since this pilot project, the program has expanded green street projects to neighbourhoods across the city with natural drainage systems (or roadside rain gardens) recently completed in Ballard and Delridge, as well as over 30 other green infrastructure projects underway.