



**Environmental
Law Centre**
UNIVERSITY OF VICTORIA



The Northwest Burke Vision: Principles and Recommendations

An ELC Clinic report prepared for:
Coquitlam River Watershed Roundtable

Student: Kelly Twa
Supervisor: Deborah Curran

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**Coquitlam
River Watershed
Roundtable**
coquitlamriverwatershed.ca

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Report on the Northwest Burke Vision:
Principles and Recommendations

The content of this report is legal information and should not be relied on as legal advice.

Photos provided by the Coquitlam River Watershed Roundtable

Prepared by Kelly Twa, Uvic Environmental Law Clinic Student
Supervised by Deborah Curran
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Part 1: Introduction

1.1 Executive Summary

The purpose of this report is to support the Coquitlam River Watershed Roundtable’s (the Roundtable) direction to ensure that proposed residential development in Coquitlam, British Columbia—described in the *Northwest Burke Vision* (the NBV)—will proceed in a manner that is ecologically sustainable and supports the strategies for a healthy watershed identified by the Roundtable in the Lower Coquitlam River Watershed Plan. This report contains recommendations for best practices in municipal policy and bylaws regarding wildlife and riparian areas protection, improved stormwater management, the use of environmental assessments, and the incorporation of traditional ecological knowledge into decision-making. Our recommendations for the implementation of Coquitlam’s North Burke Vision include:

- Partnering with the Roundtable to develop a Natural Space Strategy;
- Planning for cluster development;
- Using amenity density bonuses that encourage the preservation of natural space;
- Completing integrated watershed management plans prior to neighbourhood plans;
- Introducing a stormwater utility and rebate program;
- Introducing a rainwater bylaw;
- Exceeding the requirements of the *Riparian Areas Regulation*;
- Extending watercourse development permit areas to the entire NBV;
- Managing trees effectively;
- Using environmental development permit areas to protect all environmentally sensitive areas and corridors; and
- Using traditional ecological knowledge by engaging the Kwikwetlem First Nation.

1.2 The Coquitlam River Watershed Roundtable

The Coquitlam River Watershed Roundtable (the Roundtable) is a diverse community group dedicated to promoting the long-term sustainability of the Coquitlam River watershed. Launched in 2011, the Roundtable is led by a Core Committee of 18 government and non-government members who meet every two months in order to advance the Roundtable’s projects, including its watershed plan.¹

In 2015, the Roundtable developed the Lower Coquitlam River Watershed Plan (the LCR Watershed Plan) that sets out a vision for how integrated planning and watershed management can promote a healthy watershed and community. In developing the LCR Watershed Plan, the Roundtable used the Open Standards for the Practices of Conservation methodology, which takes into account ecological as well as human well-being components to create action plans for healthy watersheds and communities.²

¹ Coquitlam River Watershed, “Roundtable” (2018), online: <coquitlamriverwatershed.ca/roundtable>.

² The Open Standards for the Practice of Conservation, “About Open Standards”, online: <cmp-openstandards.org/about-os/>.

The Roundtable members identified the following 10 key components:³

- Ecological Components:
 - Coquitlam River System
 - Riparian Areas
 - Salmon
 - Natural Areas

- Human Well-Being Components:
 - Liveable Communities
 - Human Health and Safety
 - Resource Industries
 - Recreation
 - Cultural and Spiritual Values
 - Stewardship

In a 2016 report, the Roundtable identified pressures that currently affect or threaten these key components. Land development, stormwater, and invasive species are among the highest ranking of various pressures that the Roundtable is currently focusing on while developing implementation action plans for the LCR Watershed Plan.⁴

1.3 Northwest Burke Vision (NBV)

On July 17, 2017, Coquitlam City Council adopted the NBV residential planning document.⁵ The planning document is a 30-year “game-plan” that will guide the planning and development of approximately 400 hectares of land in Coquitlam.⁶

This land located on the southwestern slopes of Burke Mountain (abutting Pinecone Burke Provincial Park) and adjacent to the Coquitlam River in the Northeast and Northwest of Coquitlam⁷ is one of Coquitlam’s “last significant greenfield areas.”⁸ As such, it is also one of the last remaining opportunities for Coquitlam to showcase and ensure sustainable development consistent with the Roundtable’s vision, which was engaged by the City early in the visioning process.

³ Coquitlam River Watershed Roundtable, “Watershed Plan”, online: <coquitlamriverwatershed.ca/content/watershed-plan>.

⁴ Coquitlam River Watershed Roundtable, “Lower Coquitlam River Watershed Plan Implementation 2016 Going Forward” (2016), online: <www.coquitlamriverwatershed.ca/sites/default/files/Progress%20Report%202016%20-%20web.pdf> [Roundtable, “Plan Implementation”].

⁵ City of Coquitlam, “Planning & Development Resources: Northwest Burke Vision” (2017), online: <www.coquitlam.ca/planning-and-development/resources/special-plans-projects/northwest-burke-vision.aspx>.

⁶ *Ibid.*

⁷ City of Coquitlam, “Northwest Burke Vision” (17 July 2017) at 5, online: <www.coquitlam.ca/docs/default-source/community-planning-documents/northwest-burke-vision---final-report.pdf> [Coquitlam, “NBV”].

⁸ *Ibid* at 46.

The City convened a public advisory group of representatives from various community sectors, including the Roundtable, to guide the preparation of the NBV. Three phases of consultation with the public and community stakeholders resulted in the final edition of the NBV, which provides a policy framework and phasing implementation strategy to coordinate development. The intent is to create certainty for residents, landowners and industry, as well as provide direction on future land use and the preservation of natural areas.⁹

The NBV describes the context for natural features and the area, identifies future neighbourhood planning areas, and discusses key development priorities such as road and trail networks, utility servicing, and place-making. The NBV identifies different opportunities and constraints in each of the proposed neighbourhoods, taking into account the local geography and setting of each sub region.

A Vision Statement and five Guiding Principles direct the NBV. The Guiding Principles are as follows:

1. Encourage family-friendly neighbourhoods;
2. Provide a range of housing;
3. Respect natural areas;
4. Ensure a comprehensive network of streets, trails and pathways; and
5. Enhance the unique recreation and tourism opportunities.¹⁰

1.4 Purpose of Report

This report reviews the NBV to evaluate how well it aligns with the goals and strategies in the Roundtable’s LCR Watershed Plan. We examine how the City of Coquitlam currently uses legal and non-legal regulatory tools to promote sustainable development, and detail how the City of Coquitlam can enact bylaws and policies to further promote the sustainable development of the NBV lands to meet the goals of the LCR Watershed Plan.

1.5 Key Areas of Concern

The NBV lands are located in a geographic region of increasingly rare ecological value. The Coquitlam River Escarpment bisects the NBV area from north to south creating two relatively distinct areas: the Burke Mountain lands to the east and the Coquitlam River lands to the west.¹¹ The NBV area is “rich with wetlands, watercourses, riparian corridors and forests, as well as steep slopes, flood plains, [and] utility corridors, which combine to provide access to Pinecone Burke Provincial Park and the Coquitlam River.”¹² The Coquitlam River Escarpment itself presents a number of physical constraints to development, including steep and unstable slopes, debris runout areas, floodplains, and ditches.¹³

⁹ *Ibid* at 1.

¹⁰ *Ibid* at 12.

¹¹ *Ibid* at 5.

¹² *Ibid* at 16.

¹³ *Ibid* at 5.

Development in the lands next to Burke Mountain, as well as lands next to the Coquitlam River, may pose a threat to wildlife habitat, species at risk, and riparian function. In seeking a review of the NBV, the Roundtable has asked that this report focus on recommendations that would have positive impacts on wildlife, stormwater management, environmental assessment, riparian areas, and incorporating traditional ecological knowledge into decision making.

Wildlife

The Coquitlam River Watershed contains many wildlife species, including various species at risk.¹⁴ Although pinpointing species at risk in the NBV lands is difficult without a detailed assessment, City of Coquitlam staff have confirmed the occurrence of the following species at risk in the Lower Coquitlam Watershed: Great Blue Heron, Pacific Water Shrew, Western Painted Turtle, and Red-legged Frog.¹⁵ Beavers and a range of bird species are also present in the region.¹⁶

In addition to protecting wildlife and species at risk, the Roundtable has also long emphasized the need for protect fish. Salmon are identified as one of the key ecological components in the LCR Watershed Plan, and the RT maintains that development in the NBV must take into account not only the significance of the watershed as a habitat for salmon and other significant fish and aquatic species, but also the value of fish to human well-being. This report examines best practices in areas like stormwater management and riparian areas protection that will have positive effects on both fish and wildlife.

Stormwater Management

The NBV generally sets out stormwater management strategies, including the need to implement stormwater management plans. This report provides recommendations on the best practices that Coquitlam can adopt to protect watercourses and habitats in the NBV region, particularly during the course of development, which is expected to take place over 30 years.

Environmental Assessment

Robust environmental assessments are crucial to implementing bylaws that safeguard ecological health. This report examines ways in which these assessments can be incorporated into various regulatory tools.

¹⁴ BC Hydro's Fish and Wildlife Compensation Program – Coastal, "Species at Risk Conservation and Stewardship in the Coquitlam Watershed, Final Report 2013-2014" by Aimee M Mitchell (April 2014), online: www.sccp.ca/sites/default/files/species-habitat/documents/FWCP_FinalReport_CoquitlamSAR_2013-14_DRAFT%20for%20web.pdf.

¹⁵ Personal communication with M Birch, Environmental Services Coordinator, City of Coquitlam (November 2017).

¹⁶ *Ibid.*

Riparian Areas

Riparian areas are the areas bordering streams, lakes, and wetlands that link water to land, and they are the most productive ecological zone.¹⁷ Since the NBV lands are bisected by the Coquitlam River and rich with many other streams and wetlands, the health and function of riparian areas are an important consideration when pursuing development. When development takes place near riparian areas, special attention must be devoted to managing rainwater, protecting water quality, and preventing floods and pollution. The discussion below on riparian areas offers recommendations for best practices that will help lead to ecological protection for fish, wildlife, and plant habitat.

Incorporating Traditional Ecological Knowledge

Currently, municipalities do not have a legal duty to consult with First Nations pursuant to section 35 of the *Constitution Act, 1982*.¹⁸ However, incorporating First Nations' views, interests, and traditional ecological knowledge into the development process is a recommended step as part of a reconciliation process for a watershed community, for gathering knowledge on the local area, and for making well-informed decisions.

¹⁷ British Columbia Ministry of Forests, Lands and Natural Resource Operations, "Quick Guide for Waterfront Land Owners & Developers" (2016), online: <www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/fish-fish-habitat/riparian-areas-regulations/rar-brochure-2016_final_web.pdf> [FLNRO, "Quick Guide"].

¹⁸ *Neskonlith Indian Band v Salmon Arm (City of)*, 2012 BCSC 499 [Neskonlith].

Part 2: Overarching Principles & Methodology

Various overarching principles guide the recommendations set forth in this report. These principles include the importance of municipalities preserving green infrastructure, promoting connectivity between natural areas, and accepting that all levels of government have a role to play in environmental sustainability. This section also sets out the methodology used to prepare this report.

2.1 The Importance of Preserving Green Infrastructure

Green infrastructure refers to ecological systems that provide services to human populations, whether they are natural or engineered.¹⁹ It includes undeveloped areas (natural and altered), parks and greenways, agricultural lands, engineered wetlands, and rooftop gardens.²⁰

Green infrastructure and sensitive ecosystems provide economic, social, health, and environmental benefits to local governments and their populations. For example, 3,400 hectares of wetlands provide annual flood control worth \$2.7 million as a natural storage area.²¹ In the NBV, economic values of preserving green infrastructure include attracting tourism, assisting with stormwater management, and increasing property values.

Social benefits to preserving green infrastructure include providing recreation and health opportunities for residents. In the NBV, creating trail systems and preserving nature maintains clean air and water, creates active living networks for human physical health, and may increase overall human well-being through greenspace exposure.

Preserving green infrastructure also has obvious environmental benefits that include securing important habitats for wildlife and species at risk, avoiding watercourse pollution, maintaining intact sensitive ecosystems, and reducing carbon emissions.

2.2 The Importance of Connectivity

Green landscape connectivity refers to the extent to which natural areas are connected by natural corridors and other connective elements.²² It can be measured for a given organism by looking at the probability of movement between all points or resource patches in a landscape.²³ When land development introduces human activity into natural areas, connectivity is substantially reduced. As organisms move through landscapes, they tend to respond to natural factors while moving in

¹⁹ Deborah Curran et al, *Green Bylaws Toolkit for Conserving Sensitive Ecosystems and Green Infrastructure* (Victoria: University of Victoria Environmental Law Centre, April 2016) at 23, online: <www.greenbylaws.ca>.

²⁰ *Ibid.*

²¹ Ducks Unlimited Canada, "Natural Values" (April 2006), online: <www.ducks.ca/assets/2012/06/nv6_wet.pdf>; Patrick Dugan, ed, *Wetlands in Danger* (London: International Union for the Conservation of Nature, 1993) at 23, cited in *ibid* at 24.

²² Curran et al, *supra* note 19 at 37.

²³ Philip D Taylor et al, "Connectivity is a Vital Element of Landscape Structure" (1993) 68:3 *Oikos* 571 at 572.

ways that maximize access to resources, while minimizing fitness costs.²⁴ The structure of the landscape is therefore critical for maintaining regional populations and for allowing species to shift their geographic range in response to climate change and other human pressures.

In the NBV, there are various distinct ecosystems, including riparian areas and upland habitats. Ensuring connectivity between these unique habitats requires detailed planning prior to development. Establishing greenway corridors should be a prerequisite to identifying areas for development in neighbourhood plans. As an example, under the Regional District of Central Okanagan's Ellison Official Community Plan (OCP), zoning applications for land proposed for development require consideration of environmental impact and overall ecosystem connectivity on and offsite.²⁵ The Ellison OCP also proposes that development should conserve, enhance, and promote the protection of wildlife corridors and ecosystem connectivity with interfacing Crown lands.²⁶ This report's section on 'Preserving Natural Areas' discusses how connectivity can be identified and incorporated into neighbourhood plans. However, as an overarching principle and a tool fundamental to ecological health,²⁷ connectivity should be a primary consideration that is accounted for before development is identified for the NBV.

2.3 Sustainability as a Shared Responsibility

Promoting environmental sustainability through green infrastructure and regulatory tools is a shared responsibility of multiple jurisdictions. Provincial and federal laws promote environmental sustainability in a number of ways, for example by safeguarding riparian areas at the provincial level and protecting fish and species at risk at the federal level. Municipalities, however, have unique jurisdiction (which is often underutilized) to regulate for the protection of green infrastructure. As we show, there are many ways municipalities can introduce bylaws, environmental development permit areas, and general municipal policies that can dramatically increase protection of water and watercourses, park lands, and local wildlife and their habitats.

2.4 Methodology

The starting point for preparing this report was a detailed review of the NBV and the preliminary documents that led to the final draft. After reviewing the regulatory tools and policies already in place for the City of Coquitlam, we drafted recommendations, drawing from case studies of other municipalities that exemplify best practices. Most of the recommendations are identified in the *Green Bylaws Toolkit for Conserving Sensitive Ecosystems and Green Infrastructure* (2016).²⁸ Sample bylaw provisions and further resources are included where possible. Since a number of regulatory tools will have positive impacts on more than one of the key areas of concern, a table

²⁴ Samuel A Cushman, Jesse S Lewis & Erin L Landguth, "Why did the Bear Cross the Road? Comparing the Performance of Multiple Resistance Surfaces and Connectivity Modeling Methods" (2014) 6:4 *Diversity* 844 at 845.

²⁵ Regional District of Central Okanagan, by-law No 1124, *Ellison Official Community Plan* (27 February 2006), s 2.2.1, online: <www.regionaldistrict.com/media/17248/ConsolidatedEllisonOCPBylawNo1124.pdf>.

²⁶ *Ibid*, s 2.2.4.

²⁷ Taylor et al, *supra* note 23 at 572.

²⁸ Curran et al, *supra* note 19 at 25.

(below) is used in each section to help identify the positive effects of each recommendation, including whether those potential effects are strong, medium, or weak.

Wildlife	Stormwater Management	Riparian Areas	Environmental Assessment	Traditional Ecological Knowledge
Strong	Medium	Strong	Weak	Medium

Part 3: Recommendations

3.1 Respecting Natural Areas

Respecting Natural Areas is one of the five Guiding Principles in the NBV. With significant ecological diversity in the region, in order to protect wildlife and ensure long-term sustainability, sensitive and strategic development is required. This section offers general recommendations to guide the process of development so that it respects natural areas.

Recommendation: Partner with the Roundtable to develop a Natural Space Watershed Strategy

The NBV recognizes that natural areas including the Coquitlam River, watercourses, riparian areas, ravines, and steep sloped landscapes will become some of the defining features of the NBV Area.²⁹ A partnership with the Roundtable can help the City to properly incorporate these features and their values into the NBV plan prior to identifying areas for development.

The Roundtable's LCR Watershed Plan proposes a Natural Space Watershed Strategy to assess the current open space system and to identify further areas of open space that can provide multiple benefits via a watershed planning approach.³⁰ As submitted by the Roundtable during the consultation process,³¹ the City of Coquitlam can partner with the Roundtable on this Strategy to accurately and comprehensively identify and assess natural spaces in the NBV, and make decisions on how to preserve these natural spaces through parks and protection. The NBV uses a Land Use Overlay that defines future land use patterns in generalized, conceptual terms,³² and the Strategy could underpin the Overlay with a focus on the health of the watershed and components affected by development, such as riparian areas, liveable communities, and recreation.³³

Furthermore, by partnering with the Roundtable, the City would also have the opportunity to engage with Kwikwetlem First Nation members on the Roundtable who may wish to discuss incorporating First Nation values and traditional ecological knowledge into the Strategy.

Recommendation: Develop a connectivity strategy

The conceptual Land Use Overlay developed in the NBV guides future planning, which includes implementing parks and natural areas.³⁴ The NBV does not identify neighbourhood parks due to as-yet undetermined densities and populations. However, the NBV recognizes that the natural features of the region present many open space and recreational opportunities, and a "creative challenge" for determining how to integrate active and passive parks into the landscape.

²⁹ Coquitlam, "NBV", *supra* note 7 at 17.

³⁰ Roundtable, "Plan Implementation", *supra* note 4.

³¹ City of Coquitlam, General Manager Planning and Development to City Manager, "Proposed Northwest Burke Vision & Phase 3 Public Consultation Summary" (12 July 2017) at 66, online: <www.coquitlam.ca/docs/default-source/council-agenda-documents/regularcouncil_2017_07_17_-_item_9.pdf> [Coquitlam, "Consultation Summary"].

³² Coquitlam, "NBV", *supra* note 7 at ii.

³³ *Ibid* at 72.

³⁴ Curran et al, *supra* note 19 at 4.

In developing park spaces, best practices require connectivity as a strategy that is fundamental to ecological health.³⁵ Where development occurs, connectivity must be promoted to ensure that wildlife is protected and that plant and animal species can move between natural areas.³⁶ In the NBV, connectivity planning must take place in advance of development to ensure that trails and parks are instituted in thoughtful ways that promote connectivity and reduce the amount of encroachment on sensitive habitats, especially where species at risk may reside. As a best practice, it is recommended that the City of Coquitlam adopt an official strategy that promotes connectivity. A leading example can be drawn from the Okanagan, where local governments developed a watershed-wide connectivity strategy.³⁷

The *Green Bylaws Toolkit* identifies mapping as an essential prerequisite to implementing green infrastructure and green bylaws.³⁸ The City of Coquitlam already has an extensive mapping system that delineates all of its Environmentally Sensitive Areas.³⁹ These data provide a foundation for strategic conservation-based land use planning. Parks, protected areas, hazards such as steep slopes, and connectivity must be identified before the City delineates neighbourhoods, types of development, and densities in the NBV. If green infrastructure is laid out first, development can then be fitted into a connected natural landscape.

Best Practice: Designing and Implementing Ecosystem Connectivity in the Okanagan

The Okanagan Collaborative Conservation Program and South Okanagan Similkameen Conservation Program came together to develop a *Biodiversity Conservation Strategy for the Okanagan Region*.⁴⁰ In their comprehensive report, they review the evidence on the importance of connectivity and why it is required, as well as providing criteria for various stages of connectivity strategy implementation. For example, they provide criteria for connective elements selection that encourage a mix of both riparian and upland corridors, as well as ensuring high quality vegetation within these corridors.⁴¹ They also include a discussion of the local government regulatory tools and bylaws that can be used to help implement connectivity planning.⁴²

Conclusion: Respecting Natural Areas

Partnering with the Roundtable to develop a Natural Space Watershed Strategy and developing a connectivity strategy are just two ways that the NBV's goal of respecting natural areas can be achieved. In fact, connectivity and natural space strategies might best be achieved through a single

³⁵ Taylor et al, *supra* note 23 at 572.

³⁶ Curran et al., *supra* note 19 at 37.

³⁷ Susan Latimer & Allison Peat, *Keeping Nature in Our Future: Designing and Implementing Ecosystem Connectivity in the Okanagan* (Okanagan Collaborative Conservation Program, 2014), online: a100.gov.bc.ca/appsdata/acat/documents/r42389/Part3DesigningandImplementingEcosystemConnectivity_1405351562655_5351338661.pdf.

³⁸ Curran et al, *supra* note 19 at 30.

³⁹ City of Coquitlam, "City Maps", online: www.coquitlam.ca/city-services/city-maps.aspx.

⁴⁰ Latimer & Peat, *supra* note 36 at iii.

⁴¹ *Ibid* at 14.

⁴² *Ibid* at 21.

document. In preparing an official Strategy, the City of Coquitlam will be able to outline a strong vision for protecting wildlife and riparian areas while also having room to support additional components important to the Roundtable such as recreation and stewardship.⁴³ This is also a place where the City can strengthen the NBV and associated planning by considering First Nations' values and traditional ecological knowledge. While this approach might not directly incorporate stormwater management or environmental assessment policies, the strategy could still incorporate commitments that touch on these two priorities. Other recommendations contained in the rest of this report will demonstrate how the City of Coquitlam can also use regulatory tools to implement measures that will contribute to respecting natural areas.

Respecting Natural Areas: possible benefits				
Wildlife	Stormwater Management	Riparian Areas	Environmental Assessment	Traditional Ecological Knowledge
Strong	Medium	Strong	Weak	Medium

3.2 Density & Clustering

The NBV's Land Use Overlay includes land use designations that exist in the City's OCP, as well as some pre-existing neighbourhood plans. It shows areas where general densities have been mapped; for example, "single family and town housing mix" areas, as well as "single family, town housing, and apartment mix" areas.⁴⁴ It also shows some "special site conditions" where preferred land uses are contemplated in advance of neighbourhood planning and development. This includes encouraging site development that is suitable to the environment, such as higher densities on steeper slopes, to reduce the need for retaining walls and site grading.⁴⁵ After defining parks, natural area, and connectivity corridors, it is recommended that the NBV focus on medium to high density housing through clustering to achieve the preservation of natural areas, increase the size of natural corridors, and decrease the human footprint on the environment.

Recommendation: Plan for cluster development

Cluster development is the process of grouping housing units and other development close together so that they are able to share the same servicing structures, and so that significant natural landscape patches can be preserved.⁴⁶ Cluster development is considered a "landscape approach" to residential development that seeks to sustain landscape structure and ecosystem processes while recognizing that humans will impose on those systems.⁴⁷ Clustering can also be

⁴³ Roundtable, "Plan Implementation, *supra* note 4.
⁴⁴ *Ibid* at 15.
⁴⁵ *Ibid* at 41.
⁴⁶ Anne Kearney, "Residential development patterns and neighborhood satisfaction" (2006) 38:1 Environment & Behavior 112 at 113.
⁴⁷ *Ibid*; Jill Grant, Patricia Manuel & Darrell Joudrey, "A framework for planning sustainable residential landscapes" (1996) 62:3 J American Planning Assoc 331.

combined with amenity density bonuses (discussed below), which can make clustering attractive to developers.⁴⁸

Clustering in the NBV can be delineated within neighbourhood plans so that the extent of development is thoughtfully managed before developing subdivisions. Under the *Local Government Act*, municipalities do not have to compensate a landowner for any reduction in the value of their land due to any loss or damage that results from adopting an OCP or a zoning bylaw.⁴⁹ Clustering is a useful tool that ensures development takes place on a smaller footprint of the total developable area. This can promote large greenway corridors and natural areas while keeping development away from ecologically sensitive lands such as riparian areas.

Where development is to be restricted within the boundaries of private land, the City and landowner can register a covenant on that natural area to ensure that it remains free of development.

Recommendation: Use amenity density bonuses that encourage preservation of natural space

Local governments have the authority to implement amenity density bonuses under the *Local Government Act*.⁵⁰ An amenity density bonus allows landowners to add additional floor space or units to their development in exchange for providing a public amenity from which the community will benefit.

Although the City of Coquitlam has an existing Community Amenity Contribution Program,⁵¹ it only allows developers to make a financial contribution in exchange for increased density. In order to promote sustainable development, the City of Coquitlam should consider amending their Community Amenity Contribution Program to allow developers to dedicate parkland or waterfront access as part of an exchange for density. To qualify, these dedications would need to exceed what is already required by law or what the City can achieve through development permitting (e.g. requiring watercourses to be dedicated if designated in an environmental development permit area). To create a transparent amenity density bonus policy, it is important that the City include the maximum increase in density that is permissible for any location, a list of amenities that the community needs, and a transparent amenity density formula that will help all parties understand the extent of the benefit that accrues to the developer and the benefit that returns to the community.⁵² In revitalizing the amenity density policy, the City of Coquitlam can consult community members – including the Roundtable – to identify new amenities that will provide benefits to the community as well as the environment.

⁴⁸ Curran et al, *supra* note 19 at 75.

⁴⁹ *Local Government Act*, RSBC 2015, c 1, s 458.

⁵⁰ *Ibid*, s 482.

⁵¹ City of Coquitlam, “Planning & Development Resources: Community Amenity Contributions” (2017), online: <www.coquitlam.ca/planning-and-development/resources/fees/community-amenity-contributions-program>.

⁵² Curran et al, *supra* note 19 at 80.

Best Practice: Burnaby's Community Benefit Bonus Policy

The City of Burnaby uses its zoning bylaw to implement an amenity density bonus program, defined through its 1997 Community Benefits Bonus Policy.⁵³ Under the Policy, both community amenities and affordable and special needs housing⁵⁴ can be offered in exchange for the bonus. The following community amenities are eligible for consideration in an application for a density bonus:

- major public open space or plaza;
- public facilities, including a library, community or recreation centre, arts facility, youth centre;
- space for community or non-profit groups that serve the community;
- public art;
- extraordinary public realm improvements including landscaping treatment and special street furniture;
- improvements to park land or other public facilities;
- extraordinary environmental enhancements; or
- child care facilities.⁵⁵

When implementing the bonus, the bylaw requires that lots be rezoned to Comprehensive Development District. The bylaw also requires that the development plan for the lot include the conservation or provision of amenities or the provision of affordable or special needs housing equivalent in value to the increase in the value of the lot attributable to the increase in floor area ratio.⁵⁶

Conclusion: Density & Clustering

Although the NBV provides general direction for land use planning through the Land Use Overlay, connectivity and then clustering through zoning and subdivision policies must be in place before more detailed development planning occurs and expectations about densities and types of housing are entrenched. By focusing on regulatory tools that increase density in areas to be developed, protection of natural areas will be easier to achieve. This will help to preserve wildlife habitat and riparian areas, and decrease the total amount of impermeable surfaces that make stormwater management difficult. To promote the sustainability of the entire NBV, we recommend clustering developments and providing incentives to developers to provide public “green” amenities through an amenity density program.

⁵³ City of Burnaby, “Community Benefit Bonus Policy” (2017), online: <www.burnaby.ca/city-services/policies--projects---initiatives/community-development/policies/community-benefit-bonus-policy.html>.

⁵⁴ *Local Government Act*, *supra* note 49, s 483.

⁵⁵ City of Burnaby, by-law No 4742, *Zoning Bylaw* (November 2017), s 6.22(2), online: <www.burnaby.ca/Assets/Zoning+Bylaw/Section+6+Supplementary+Regulations.pdf>.

⁵⁶ *Ibid*, s 6.22(1).

Density and Clustering: possible benefits				
Wildlife	Stormwater Management	Riparian Areas	Environmental Assessment	Traditional Ecological Knowledge
Strong	Strong	Strong	Weak	Weak

3.3 Rain and Stormwater Management

Urban development changes the natural environment in ways that affect the natural hydrological regime. Runoff from properties and development leads to erosion, sedimentation, and pollution of downslope ecosystems. Natural features, wildlife and fish habitat, and sensitive wetlands are all at risk if rain and stormwater are not properly managed. Residential development also blocks natural infiltration, resulting in less recharge of aquifers and soil saturation, which can lead to water shortages and negative impacts on stream health, especially in the summers.⁵⁷

The LCR Watershed Plan identifies stormwater as having a high impact on the watershed, and sets objectives for improved stormwater practices for single-family developments.⁵⁸ In regard to the NBV development, the Roundtable identifies watershed planning as a prerequisite to neighbourhood planning and development.⁵⁹

The City of Coquitlam treats rainwater as a resource, and employs the principal strategy of mimicking the natural hydrology of the watershed by controlling and infiltrating urban runoff. The City has a target of capturing 75-90% of the average annual rainfall volume,⁶⁰ and makes use of various policy and regulatory tools to manage their rainwater, as described below.

Integrated Watershed Management Plans

The NBV development area covers three distinct watersheds: the Hyde Creek Watershed, the Partington Creek Watershed, and the Coquitlam River Watershed. Integrated watershed management plans (IWMPs) are in place for Hyde Creek and Partington Creek. The NBV states that there are plans to develop sub-area integrated watershed management plans for the Coquitlam River Watershed prior to neighborhood planning.⁶¹ The existing IWMPs in both Partington Creek and Hyde Creek identify the following key issues:⁶²

- Flood protection of low lying lands, mainly in Port Coquitlam;
- Stream flow protection;

⁵⁷ Curran et al, *supra* note 19 at 49.

⁵⁸ Roundtable, “Plan Implementation”, *supra* note 4.

⁵⁹ Coquitlam, “Consultation Summary”, *supra* note 31 at 64.

⁶⁰ City of Coquitlam, “Sewer & Drainage: Rainwater Management”, online: <www.coquitlam.ca/city-services/drainage-sewer/stormwater-management/rainwater.aspx> [Coquitlam, “Rainwater Management”].

⁶¹ Coquitlam, “NBV”, *supra* note 7 at 20.

⁶² Roundtable, “Plan Implementation”, *supra* note 4.

- Stream water quality protection;
- Riparian area protection;
- Fish habitat restoration and enhancement;
- Mitigation of stream erosion in steep grades;
- On-site rainwater management to mimic the natural hydrology; and
- Integration of land development with stormwater management.

Both plans identify goals for stormwater management. The City developed the Partington Creek IWMP in 2011, and it is more comprehensive in its objectives and scope than the Hyde Creek IWMP.⁶³ The Partington Creek IWMP uses stormwater and drainage criteria derived from a variety of sources,⁶⁴ and identifies two goals for watershed management:

- 1) No-net loss of ecological health for the watershed as a whole measured using the Watershed Health Tracking System;
- 2) Provide a net environmental benefit for fish and fish habitat in the watershed.

The City developed the Hyde Creek IWMP in 2004. This IWMP establishes a goal of no net loss of fish habitat in the watershed. It also sets out various watershed objectives, including maintaining the ecological function of watercourses and wetlands through restoration and enhancement of fish and wildlife habitat, and encouraging progressive stormwater management practices within development through guidelines.⁶⁵

Stormwater Management Policy and Design Manual⁶⁶

This policy and design manual (adopted in 2003 and updated in 2016) establishes objectives for stormwater management and sets guidelines for the development of drainage systems and stormwater management plans. It includes extensive hydraulic criteria and technical information to assist proponents in preparing submissions and building both major and minor systems. Criteria for acceptable levels of flooding, peak flow, and runoff volumes are included. Requirements for the use of detailed engineering plans are also included.

In reviewing objectives identified in the City's IWMPs and supporting policies, as well as the LCR Watershed Plan, the following recommendations identify ways to ensure the City is following best practices to achieve watershed health in its development of Northwest Burke.

⁶³ City of Coquitlam, "Partington Creek Integrated Watershed Management Plan" (July 2011), online: <www.coquitlam.ca/docs/default-source/city-services-documents/Partington_IWMP_March_2011.pdf?sfvrsn=0> [Coquitlam, "Partington Creek IWMP"].

⁶⁴ These criteria are derived from the City's *Source Controls Design Requirements and Guidelines 2009*, the City's *Riparian Area Regulation Amendment, 2006 Bylaw No. 3746*, the City's *Stormwater Management Policy and Design Manual 2003*, the City's *Stream and Drainage System Protection Bylaw 2001*, Metro Vancouver's *Template for Integrated Stormwater Management Planning 2005*, and the DFO's *Urban Stormwater Guidelines and BMPs for the Protection of Fish and Fish Habitat*, 2001. See *ibid* at 1.3.

⁶⁵ City of Coquitlam & City of Port Coquitlam, "Hyde Creek Integrated Watershed Management Plan" (April 2004) at 1-4, online: <www.coquitlam.ca/docs/default-source/city-services-documents/Hyde_Creek_IWMP_Final_Report_Feb_2004.pdf?sfvrsn=0> [Coquitlam, "Hyde Creek IWMP"].

⁶⁶City of Coquitlam, "Stormwater Management Policy and Design Manual" (March 2016), online: <www.coquitlam.ca/docs/default-source/city-hall-files/Stormwater_Management_Policy_and_Design_Manual.pdf?sfvrsn=4>.

Recommendation: Complete the IWMP in the Coquitlam River Watershed prior to preparing neighbourhood plans and commencing development

The NBV identifies the requirement for sub-area IWMPs or stormwater management prior to neighborhood planning in the Coquitlam River Watershed region of the NBV development.⁶⁷ This is a best practice that will allow the City to gather sufficient data on the watershed, establish goals, and put policies in place that support connectivity and ecological health. In order for the NBV to move forward with a leading approach to stormwater management, the IWMP must establish a goal of no net loss of the amount of any sensitive ecosystem from pre- to post-development levels. Further, the IWMP should also state a commitment to exceeding the *Riparian Areas Regulation's* requirements, with significant riparian setbacks that provide additional corridors and protection for waterways (see further details below).

Recommendation: Help single-family homeowners improve stormwater practices in the watershed through the use of a stormwater utility and rebate program

Currently, the City's rainwater source control measures include a requirement of 300 mm of topsoil in landscaped areas for all single-family lots, with encouraged use of rain barrels.⁶⁸ To support the Roundtable's strategy of helping single-family homeowners improve stormwater practices in the watershed, the City should consider implementing a rainwater utility along with an incentive program for property owners.

Best Practice: Victoria's Rainwater Rewards Program⁶⁹

Municipalities have the jurisdiction to implement a fee in respect of all or part of a service of the municipality, as well as establish terms and conditions for payment of a fee, including discounts.⁷⁰ Stormwater utilities are identified as a best practice by the Federation of Canadian Municipalities,⁷¹ and have had success in various municipalities across the United States.⁷² In 2015, the City of Victoria introduced an annual stormwater utility through Bylaw No 14-071.⁷³ Stormwater charges are directly tied to the impact a property has on the local watershed, and create a transparent and fair way for Victoria to fund its rainwater management programs. Under Victoria's Rainwater Rewards program, property owners can implement rainwater source controls such as green roofs, rain barrels and cisterns, infiltration chambers, permeable paving, and rain gardens to save 10-50% of their annual stormwater bill.

⁶⁷ Coquitlam, "NBV", *supra* note 7 at 20.

⁶⁸ Coquitlam, "Rainwater Management", *supra* note 60.

⁶⁹ City of Victoria, "Rainwater Rewards Program", online: <www.victoria.ca/EN/main/residents/water-sewer-stormwater/stormwater/rainwater_rewards_program.html>.

⁷⁰ *Community Charter*, SBC 2003, c 26, ss 8 and 194.

⁷¹ City of Victoria, "Stormwater Utility FAQ", online: <www.victoria.ca/EN/main/residents/water-sewer-stormwater/stormwater-utility/stormwater-utility-faq.html>.

⁷² United States Environmental Protection Agency, "Paying for Stormwater – The Benefits of a Utility", online: <www.epa.gov/green-infrastructure/paying-stormwater-benefits-utility>.

⁷³ City of Victoria, by-law No 14-071, *Sanitary Sewer and Stormwater Utilities Bylaw* (13 March 2015), online: <www.victoria.ca/assets/City~Hall/Bylaws/Sanitary%20Sewer%20Stormwater%20Utilities%20Bylaw_14-071.pdf>.

For low density homes with 1-4 units, the City has adopted a “do-it-yourself” system that guides homeowners through the steps of planning, installing, and maintaining their own rainwater management methods. For higher density properties, the use of a professional may be required, and the City also has a stormwater specialist that can assist in development and inspections.⁷⁴ Implementing a rainwater utility in Coquitlam would help the City to incentivize its residents to meet runoff targets implemented within IWMPs, as well as protect the ecology of the NBV lands in the post-development phase through homeowner participation.

Recommendation: Ensure current City goals are met through rainwater bylaws

The City of Coquitlam currently has environmentally robust goals within its IWMPs and rainwater policies. These goals include no net loss of ecological health for the watershed as a whole – as measured using the Watershed Health Tracking System – and no net loss (Hyde Creek) or a net benefit (Partington Creek) for fish and fish habitat in the watershed.⁷⁵ Best practices also require setting a target for no net increase in post-development runoff from pre-development levels.⁷⁶

To make these goals enforceable, rainwater and watercourse protection bylaws are strongly recommended. The authority to implement these bylaws comes from both the *Local Government Act* and the *Community Charter*.⁷⁷ The *Green Bylaws Toolkit* suggests this model rainwater bylaw provision:

The quantity of rainwater leaving the site after development shall be equal to or less than the quantity of rainwater leaving the site before development to achieve the following performance targets:

- a) *Impervious surfaces shall be designed to drain at least [e.g., 90%] of the rainwater runoff volumes entering the lot for any storm event to the natural hydrologic pathways at the site within the same lot (i.e., through infiltration and other source controls), such that not more than [e.g., 10%] of the total rainwater runoff volume crosses any lot line at post-development;*
- b) *The rate of pre-development rainwater runoff from the lot shall be maintained at all times to ensure that stream flow rates do not exceed those rates corresponding with the natural mean annual flood, and that this maximum rate will occur not more than once per year; and*
- c) *The use of channels, swales, drainage ways, or other drainage facilities for conveying, transporting, storing, or infiltrating rainwater overland across lot boundaries is not permitted.*⁷⁸

⁷⁴ City of Victoria, “Rainwater Rewards For Your Home”, online: www.victoria.ca/assets/Departments/Engineering~Public~Works/Images/Stormwater/Rainwater%20Rewards%20for%20Your%20Home.pdf.

⁷⁵ Coquitlam, “Partington Creek IWMP”, *supra* note 63 at 1-1; Coquitlam, “Hyde Creek IWMP”, *supra* note 65 at iii.

⁷⁶ Curran et al, *supra* note 19 at 47, 216.

⁷⁷ *Local Government Act*, *supra* note 49, s 523 (impermeable surfaces) & ss 306-307, 312 (drainage); *Community Charter*, *supra* note 70, s 63.

⁷⁸ Curran et al, *supra* note 19 at 219.

*Best Practice: The District of Metchosin's Rainwater Bylaw*⁷⁹

The District of Metchosin has implemented a comprehensive bylaw to ensure the District's rainwater goals are met. *Bylaw No 467 for the Protection and Management of Rain Water* incorporates prohibitions as well as enforces rainwater standards that regulate all use and development of land. Under the bylaw, rainwater must be managed "as close as is practicable to development sites on the lot where development is occurring so that there is no net loss of the Proper Functioning Condition of any Riparian-wetland Areas, watercourse or waterbody."⁸⁰ Proper Functioning Condition is defined within the bylaw as a condition that is determined by a Qualified Professional.⁸¹ The District will only approve development if the application includes conditions requiring the installation of permanent rainwater quality and quantity control facilities that must meet standards established by the District.⁸² The District will not issue approvals if runoff rates exceed target levels set within the bylaw.⁸³ The District also uses the bylaw to manage rainwater during the construction phase of development. Landowners or developers must construct erosion and sediment control measures before clearing or excavation commences, and these must remain in place until all landscaping and construction is complete.⁸⁴ The bylaw is made enforceable through an offence provision that holds a person convening the bylaw liable to a fine of not more than \$2500 and not less than \$100. Each day that an offence continues may be considered as a separate offence.⁸⁵

Conclusion: Rainwater

With intense development proposed over the next 30 years, the City of Coquitlam can better enforce its leading rainwater policies and watershed quality goals by updating and completing IWMPs for the NBV area, and through a rainwater management bylaw. A bylaw can help the City mitigate the potentially detrimental impacts of rain and stormwater on ecological health and habitats. The use of a stormwater utility is another way that the City can acquire funding for studies and mitigation measures, while encouraging new homeowners in NBV to do their part in developing important source control measures. This process also aligns with the Roundtable's goal of supporting stewardship initiatives across the watershed.⁸⁶ By comprehensively managing rain and stormwater through IWMPs and bylaws, the City can achieve its connectivity goals and prevent pollution of riparian areas and local ecosystems, including wildlife habitats.

⁷⁹ District of Metchosin, by-law No 467, *A Bylaw for the Protection and Management of Rain Water*, online: <metchosin.civicweb.net/document/276>.

⁸⁰ *Ibid*, s 3.1.1.

⁸¹ *Ibid*, s 1.3.

⁸² *Ibid*, s 2.2.1.

⁸³ *Ibid*, s 2.3.1(1)-(2).

⁸⁴ *Ibid*, s 3.4.6.

⁸⁵ *Ibid*, s 5.1.6.

⁸⁶ Roundtable, "Plan Implementation", *supra* note 4.

Rain & stormwater management: possible benefits				
Wildlife	Stormwater Management	Riparian Areas	Environmental Assessment	Traditional Ecological Knowledge
Strong	Strong	Strong	Medium	Weak

3.4 Riparian Areas Management

Riparian areas are the areas bordering streams, lakes, and wetlands that link water to land.⁸⁷ Protecting riparian areas –including the vegetation within these zones – is essential for conserving fish, wildlife, and plant habitat, as well as preventing pollution. Once protected, these areas can have a positive impact on property values through higher aesthetic values and the value of greenspace to human well-being, and bring benefits such as better air quality, increased shoreline stability, and decreased flood hazard.⁸⁸ Managing these riparian areas has become a priority for the provincial government, which regulates them under the *Riparian Areas Protection Act* (the *Act*) and the *Riparian Areas Regulation (RAR)*.⁸⁹ The *Act* requires that a local government ensure that their bylaws meet or exceed the protection set out in the *RAR*.⁹⁰

Under the *RAR*, “Riparian Area” means a streamside protection and enhancement area.⁹¹ A streamside protection and enhancement area (SPEA) is defined as an area “adjacent to a stream that links aquatic to terrestrial ecosystems and includes both existing and potential riparian vegetation and existing and potential adjacent upland vegetation that exerts an influence on the stream.” The size of an SPEA is determined according to the *RAR* “on the basis of an assessment report provided by a Qualified Environmental Professional” (QEP).⁹²

Before development can take place in a riparian area, a QEP must prepare a report that provides the following:

- That they are certified as a QEP;
- That they have followed the assessment methods under the *RAR*; and
- A professional opinion that confirms:
 - that if the development is implemented as proposed there will be no harmful alteration, disruption or destruction of natural features, functions, conditions that support fish life processes in the riparian assessment area; or
 - if the streamside protection and enhancement areas identified in the report are protected from the development, and the measures identified in the report as

⁸⁷ FLNRO, “Quick Guide”, *supra* note 17.

⁸⁸ *Ibid*; Margaret M Hansen, Reo Jones & Kristen Tocchini (2017) “Shinrin-Yoku (Forest Bathing) and Nature Therapy: A State-of-the-Art Review” 14:8 Intl J Environmental Research & Public Health 851.

⁸⁹ *Riparian Areas Protection Act*, SBC 1997, c 21; *Riparian Areas Regulation*, BC Reg 376/2004.

⁹⁰ *Riparian Areas Protection Act*, *supra* note 89, s 12(4)(b).

⁹¹ *Riparian Areas Regulation*, *supra* note 89, s 1.

⁹² *Ibid*.

necessary to protect the integrity of those areas from the effects of the development are implemented by the developer, there will be no harmful alteration, disruption or destruction of natural features, functions and conditions that support fish life processes in the riparian assessment area.⁹³

The local government may also approve developments where the Minister of Fisheries and Oceans has authorized the harmful alteration, disruption, or destruction of natural features, functions and condition that support fish life processes in the riparian assessment area that would result from implementation of the development proposal.⁹⁴

Under the *Act*, Riparian Assessment Areas are prescribed.⁹⁵ Once the QEP performs the assessment, they determine the proper SPEA, inside which development cannot occur. Developers have the option to use a simple or detailed approach to determining this SPEA, which is explained in further detail in the Assessment Methods Schedule to the *RAR*.⁹⁶

In 2006, the City of Coquitlam adopted the *RAR* requirements into section 523 of their Zoning Bylaw.⁹⁷ Under this bylaw, applicants have the choice of applying a simple or detailed assessment method for determining their SPEA. The simple assessment allows them to use the City's online mapping tool to determine the assessment area. In the detailed assessment methodology, the applicant will retain a QEP to prepare an environmental assessment report prior to land development.⁹⁸

The City of Coquitlam is also protecting its riparian areas through its *Stream and Drainage System Protection Bylaw*.⁹⁹ This bylaw has prohibitions that help prevent the obstruction or impediment of the flow of a drainage system or the introduction of deleterious substances into a drainage system.¹⁰⁰ Drainage system means "any natural, designed, constructed or installed system or network of streams, creeks, waterways, watercourses, waterworks, ditches, drains or sewers located in the City on private or public property that conveys, or is capable of conveying, drainage or runoff."¹⁰¹ Anyone carrying out development must, at minimum, install erosion and sediment

⁹³ *Ibid*, s 4(1)-4(2).

⁹⁴ *Ibid*, s 4(3).

⁹⁵ The Riparian Assessment Area for a stream is the 30-metre strip on both sides, measured from the high water mark. For a ravine less than 60 metres wide, it is the strip from the high water mark to a point that is 30 metres beyond the top of the ravine bank. For a ravine 60 metres wide or greater, it is a strip on both sides of the stream measured from the high water mark to a point that is 10 metres beyond the top of the ravine bank. *Ibid*, s 1(1).

⁹⁶ *Ibid*, Schedule: Assessment Methods, <www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/fish-fish-habitat/riparian-areas-regulations/rar_assessment_methods.pdf>.

⁹⁷ City of Coquitlam, "Planning & Development Resources: Environmental Watercourse Mapping", online: <www.coquitlam.ca/planning-and-development/resources/Property-Developer-and-Builder-Resources/environmental-watercourse-mapping.aspx>; City of Coquitlam, by-law 3000, *Zoning Bylaw* (31 July 2017), pt 5 <www.coquitlam.ca/docs/default-source/zoning-bylaw/Part_05_-_General_Regulations.pdf?sfvrsn=16>.

⁹⁸ City of Coquitlam, "Overview Of The City's Riparian Areas Policy For Protecting Fish Habitat" (2010), online: <www.coquitlam.ca/docs/default-source/development-permits/Riparian_Areas_Regulation_Policy_Overview.pdf?sfvrsn=0>.

⁹⁹ City of Coquitlam, by-law No 4403, *Stream and Drainage System Protection Bylaw* (2013), online: <publicdocs.coquitlam.ca/cyberdocs/getdoc.asp?doc=1567099>.

¹⁰⁰ *Ibid*, s 3.

¹⁰¹ *Ibid*, s 2.1.

controls such as clean water management, storm inlet protection, and paved surfaces sweeping and maintenance.¹⁰² The City is also protecting riparian areas through the implementation of watercourse development permit areas, discussed within this section's recommendations.

Recommendation: Exceed the RAR Requirements

The RAR regime is primarily in place to protect fish habitat, and requires QEPs to provide an opinion that development will not result in a harmful alteration of riparian fish habitat.¹⁰³ Although meeting the requirements of the RAR is a requirement under provincial legislation, local governments also have the power under the *Riparian Areas Protection Act*¹⁰⁴ to exceed the protection measures that are prescribed by the RAR. There are many benefits to exceeding the requirements of the RAR that go beyond fish protection. These include flood attenuation, urban forest resilience, improved connectivity, buffering between residential and natural uses, and enhanced corridor protection for extreme weather events such as high temperatures in the summer, and significant high wind and wet weather events.

Local governments can use zoning, development permit areas, and regulatory bylaws as vehicles for exceeding the requirements of the RAR.¹⁰⁵ Currently, some cities are purchasing land to extend their riparian areas. The Mission Creek Restoration Initiative in the Okanagan is an example of a city undertaking this approach to riparian restoration.

Best Practice: Mission Creek Restoration Initiative, Kelowna

Since the 1950s, sections of Mission Creek in Kelowna, BC have been channelized and diked, along with other significant changes that have led to loss of more than 60% of the Creek's length, 80% of its spawning and rearing habitat, and 75% of its wetland and riparian areas.¹⁰⁶ As a response, in 2008 the City of Kelowna established the Mission Creek Restoration Initiative (MCRI)—a multi-phase, multi-stakeholder partnership—to restore natural functions to the lower sections of Mission Creek. The MCRI involves all levels of government, including First Nations, collectively working towards restoring fish and wildlife stocks and habitat. The MCRI's complimentary objectives are to conserve and expand biodiversity and species at risk, to improve flood protection, and to inspire and support community stewardship.¹⁰⁷ The restoration methodology focuses on the following:

- Setting back the dikes to widen the Creek;
- Re-establishing the floodplain;
- Reconnecting remnant oxbows;
- Restoring Creek banks and planting riparian vegetation;
- Creating wetlands and habitats for species at risk;
- Maintaining the Mission Creek Greenway and public access to the greenway; and

¹⁰² *Ibid*, s 4 & Schedule A.

¹⁰³ *Riparian Areas Regulation*, *supra* note 89, Schedule, s 1.

¹⁰⁴ *Riparian Areas Protection Act*, *supra* note 89, s 12(4)(b).

¹⁰⁵ Curran et al, *supra* note 19 at 136.

¹⁰⁶ Mission Creek Restoration Initiative, "The Restoration Project", online: <www.missioncreek.ca/restoration-project/>.

¹⁰⁷ *Ibid*.

- Improving drainage for agricultural land.

One of the MCRI's strategies for restoration includes acquiring properties in historic areas that are now flood-prone due to an inadequate riparian buffer and intense storm events. Providing long term flood attenuation and property protection is one of the additional benefits that come from extending riparian areas. The expanded floodplain, which covers almost two hectares of what was once pasture, will provide new habitat for fish, wildlife, and indigenous vegetation.¹⁰⁸

The City of Coquitlam can avoid the need for retrofitting riparian areas in the future by exceeding the *RAR* when planning for connectivity and development in the NBV.

Recommendation: Extend Watercourse Development Permit Areas to the entire NBV

Coquitlam's use of Watercourse Protection Development Permit Areas (WPDPAs) is one example of how the municipality is already protecting watercourses. These Development Permit Areas only cover development in the Northeast Coquitlam Area Plan and three Neighbourhood Plan areas, but any development within 30-50m of a watercourse in those areas must obtain a permit and undergo an *RAR* review.¹⁰⁹ As previously noted, the NBV areas contain various streams, rivers and watercourses that would benefit from having WPDPAs extended across the entire development region.

Once WPDPAs are required for all watercourses, the City can also designate them as development permit information areas and incorporate requirements for environmental impact assessments and other ecological studies through a broadened use of QEPs.¹¹⁰ If the City commits to exceeding the *RAR*, they can utilize QEP assessments as part of environmental impact recommendations that go beyond simply determining the SPEAs.¹¹¹

Recommendation: Manage trees effectively

Retention of important vegetation near riparian areas is considered a best management practice by the provincial government.¹¹² When development occurs near riparian areas, municipalities must manage both the retention of this valuable vegetation and the safety of human life and property. The *Community Charter* gives municipalities the jurisdiction to implement tree protection bylaws.¹¹³ In July of 2017, the Director of Development Services addressed Coquitlam

¹⁰⁸ Mission Creek Restoration Initiative, "Phase One Construction Fact Sheet" (8 May 2016), online:

<www.missioncreek.ca/restoration-project/phase-one-construction-fact-sheet/>.

¹⁰⁹ City of Coquitlam, by-law 4776, *Citywide Official Community Plan, part 4: Urban Design + Development Permit Areas* (31 July 2017) at 1.2.3 & 5.1.1, online: <www.coquitlam.ca/docs/default-source/citywide-ocp/Part_4_-_Urban_Design_and_Development_Permit_Areas.pdf?sfvrsn=2> [Coquitlam, by-law 4776].

¹¹⁰ *Local Government Act*, *supra* note 49, ss 484-487.

¹¹¹ Curran et al, *supra* note 19 at 134.

¹¹² British Columbia Ministry of Environment, "Best Management Practices for Tree Topping, Limbing, and Removal in Riparian Areas" (2009), online: <www.env.gov.bc.ca/okanagan/documents/HazardTree_26May_09.pdf>.

¹¹³ *Community Charter*, *supra* note 70, ss 8(3)(c), 50.

City Council to present an update on tree management within SPEAs.¹¹⁴ Key findings included that the Ministry of Environment Danger Tree Assessment process that has been used in connection with the RAR assessment process is not rigorous enough to properly assess the probability of wind throw and other associated risks of danger trees.¹¹⁵ The report recommended that there be a higher standard of protection for public and private properties. The report also noted:

*Areas that are more urban with frequent human interaction, like Burke Mountain, should be reviewed using Tree Risk Assessment Qualification (TRAQ). This assessment cannot be done by a QEP, only an International Society of Arboriculture certified person, such as a Registered Professional Forester may complete this review.*¹¹⁶

Following the presentation of this report, the City committed to further consultation with the development industry and to bring forward the issue later in 2017.¹¹⁷

We recommended that, once watercourse development permit areas are extended to the entire NBV region, the recommendations of the Director of Development Services be incorporated into environmental development permit area (EDPA) requirements and tree bylaws.¹¹⁸ Rather than having to cut down more trees, the best practice for protecting riparian areas is to ensure that riparian buffers are wide enough to accommodate high risk trees while protecting private properties.

Conclusion: Riparian Areas

With multiple significant watercourses in the NBV, ensuring riparian areas are protected is a top priority. By implementing broader EDPA requirements for non-riparian areas that are environmental sensitive across the development, and ensuring that trees are properly managed, the City can not only provide fish protection (a central focus of the Roundtable) but also extend environmental protection to water quality, wildlife habitat, and species at risk, as well as securing important connectivity across the landscape. Exceeding the RAR will increase environmental assessment opportunities for the City and open the door to inviting traditional ecological knowledge into the assessment process.

Riparian areas management: possible benefits				
Wildlife	Stormwater Management	Riparian Areas	Environmental Assessment	Traditional Ecological Knowledge
Strong	Strong	Strong	Strong	Medium

¹¹⁴ City of Coquitlam, Director of Development Services to City Manager, “Tree Management within Streamside Protection and Enhancement Areas (SPEAs)” Doc # 2659555.v2 (25 July 2017), online: <www.coquitlam.ca/docs/default-source/council-agenda-documents/councilincommittee_2017_07_31_-_item_5.pdf?sfvrsn=2>.

¹¹⁵ *Ibid* at 3.

¹¹⁶ *Ibid* [emphasis added].

¹¹⁷ *Ibid* at 5.

¹¹⁸ *Local Government Act*, *supra* note 49, s 488.

3.5 Environmental Development Permit Areas

Local governments have the authority under the *Local Government Act* to establish environmental Development Permit Areas (EDPAs) to protect the natural environment, its ecosystems, and biological diversity; to establish objectives to promote energy conservation or water conservation; and to regulate the form and character of development.¹¹⁹ Environmental services staff from across the province agree that EDPAs are the best site-specific way to protect environmentally sensitive areas.¹²⁰ Prior to establishing EDPAs, a local government must designate the extent of those EDPAs in its OCP, along with the special conditions or objectives that justify the designation.¹²¹

Watercourse Protection Development Permit Areas (discussed above) are an example of an EDPA that the City of Coquitlam is currently using to protect watercourses. That said, these EDPAs only apply to watercourses on properties located in the Northeast Area plan and three Neighbourhood Plans.¹²² The following recommendations explore how the City can use EDPAs in the entire NBV development to promote protection of green infrastructure and sensitive ecosystems.

Recommendation: Use EDPAs to protect all environmentally sensitive areas and corridors

The NBV area is full of environmentally sensitive areas that include wetlands, watercourses, and steep slopes. Development in this area will be challenging, and carries risks of environmental and ecological disruption. Blanketing an EDPA across the entire Northwest Burke neighbourhood can provide comprehensive site-specific regulation that allows the City to more directly control any risks to the local environment and its ecosystems. In addition, at a site-specific scale, EDPAs will permit the City to realize corridor connectivity for the network established in the IWMP and neighbourhood plan.

Watercourse Protection DPAs can continue to be used, along with the development of new hazard development permit areas and EDPAs that address regions where steep slopes may make development dangerous and difficult, or woodland areas where wildlife habitats are at risk.

Both the Resort Municipality of Whistler and City of Kelowna have enacted blanket EDPAs, using protected area mapping as the basis for EDPA designation, establishing EDPAs across the entire land base except for highly urbanized areas such as the commercial core.¹²³

The City of Coquitlam has a number of staff members working in the environmental services section, and has experience reviewing Watercourse Protection Development Permit Applications. Once EDPAs are extended across the entire proposed NBV development, the City will be able to use a variety of tools to address all of the concerns raised in this report. For example, using EDPAs will allow the City to require environmental assessments through QEPs, protect watercourses,

¹¹⁹ *Ibid.*

¹²⁰ Curran et al, *supra* note 19 at 86.

¹²¹ *Ibid* at 87.

¹²² Coquitlam, by-law 4776, *supra* note 109 at 1.2.3.

¹²³ Curran et al, *supra* note 19 at 99-100.

secure connectivity, promote rainwater management practices, encourage greater setbacks for riparian areas and dangerous trees, and ensure minimal impact on sensitive ecosystems takes place. The use of Traditional Ecological Knowledge can be incorporated both into the process of assessing areas for different EDPAs, and in the final result of requirements that will bind development permits.

Environmental Development Permit Areas: possible benefits				
Wildlife	Stormwater Management	Riparian Areas	Environmental Assessment	Traditional Ecological Knowledge
Strong	Medium	Strong	Strong	Strong

3.6 Traditional Ecological Knowledge

The natural environment has cultural, subsistence, economic, and spiritual values for many individuals, including First Nations people. Due to the complexities of Indigenous relations and the interplay between Indigenous rights and local development, this report does not address the underlying Aboriginal rights and title of the Kwikwetlem and other First Nations. However, in any greenfield land development, it is clear that the City has a moral and neighbourly obligation to meaningfully engage the Kwikwetlem First Nation.

The City of Coquitlam’s name itself comes from the name of the local Kwikwetlem First Nation. “Kwikwetlem” means a “red fish up the river,” which refers to the red sockeye that historically swam up the Coquitlam River.¹²⁴ While urbanization and over-fishing have resulted in the decimation of this species of sockeye, in 2014 the Coquitlam River was removed from the Endangered Rivers list due to the formation of the Roundtable and the commitment of the Cities in the watershed to progress towards developing the LCR Watershed Plan.¹²⁵ The importance of the unique salmon run to Kwikwetlem is reflected in a Coast Salish creation story about the origin of sockeye salmon that identifies Coquitlam as one of few locations along the lower Fraser River where salmon were born and found in abundance.¹²⁶

In their comments to City Council on the NBV, the Roundtable has expressed concern that there is no evidence of engagement or consultation with the Kwikwetlem First Nation, who are important partners of the Roundtable. Although municipalities have no independent legal duty to consult

¹²⁴ Coquitlam River Watershed, “Kwikwetlem First Nation”, online: <www.coquitlamriverwatershed.ca/kwikwetlem-first-nation>.

¹²⁵ Marni Turek & Craig Orr, “Strength through Partnerships: Coquitlam River stakeholders partner to develop a new kind of watershed plan” (November 2015) Municipal World 11, online: <www.coquitlamriverwatershed.ca/sites/default/files/MW-Nov15%20Orr-Turek.pdf>.

¹²⁶ Kwikwetlem First Nation, “Respect and Care for Our Lands, Water, and Heritage: Report on Kwikwetlem Interests as Related to Kinder Morgan Canada’s proposed Trans Mountain Pipeline Expansion Project”, National Energy Board (August 2014), Part A at 3, online: <docs2.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2449925/2450432/2813281/C199-1-2_-_Kwikwetlem_First_Nation_Interest_-_A4S9A7.pdf?nodeid=2813366&vernum=-2>.

First Nations under s 35 of the *Constitution Act, 1982*,¹²⁷ there is immense value in engaging the local First Nation when development is proposed, especially when the land in question is unceded territory.

The Kwikwetlem First Nation is currently involved in a number of environmental stewardship and restoration projects. They are one of six Lower Fraser First Nations collaborating on a \$2 million fund for projects that support the enhancement of fish habitat, including mitigating the impacts of highway developments on fisheries in the region.¹²⁸

The Kwikwetlem First Nation recently established the Kwikwetlem Lands Stewardship Committee. The Roundtable has been invited by this Committee and Kwikwetlem First Nation Council to partner together and become better engaged around watershed management planning and land use initiatives within the Coquitlam River watershed. A first workshop and Committee meeting between these groups, including members of the development community, will be the start of a new dialogue around sustainable development and watershed health for the community and for fish.

By incorporating Indigenous perspectives and traditional ecological knowledge, the City of Coquitlam can benefit from strengthening their relationship with the Kwikwetlem First Nation, as well as exploring different ideas on how to incorporate that knowledge into environmental assessments and watershed planning.

Incorporating Traditional Ecological Knowledge: possible benefits				
Wildlife	Stormwater Management	Riparian Areas	Environmental Assessment	Traditional Ecological Knowledge
Strong	Medium	Strong	Strong	Strong

¹²⁷ *Neskonlith*, *supra* note 18 at para 54.

¹²⁸ Kwikwetlem First Nation, "Environment and Fisheries", online: <www.kwikwetlem.com/environment.htm>.

Part 4: Conclusion

The Northwest Burke Vision will guide the development of one of the last large green space neighbourhoods in the City of Coquitlam. With development taking place at the base of Pinecone Burke Provincial Park, and the Coquitlam River running right through the proposed region, the disruption of the natural environment is inevitable. In order to secure the long term health of a watershed that is deeply important to the Kwikwetlem First Nation and the people of Coquitlam, the Roundtable commissioned this report to evaluate best practices for Northwest Burke in light of their Watershed Plan and the vision for the watershed.

The Roundtable identified wildlife, stormwater management, riparian areas, environmental assessment, and the incorporation of traditional ecological knowledge as high priority concerns requiring consideration in formulating recommendations. Although this list does not include all the potential areas of concern – nor is this report intended to provide a comprehensive review of all aspects of the NBV – the City can start with these recommendations as a foundation for future planning and development.

The City of Coquitlam has ample authority under the *Local Government Act* and *Community Charter* to use regulatory tools that are legally enforceable to ensure environmental protection. While the City currently implements certain bylaws and policies that would be considered best practices, there is room for improvement in a variety of areas. This report sets out a baseline for the NBV as an opportunity for the City to refine and implement a leading strategy in sustainable municipal development.