



TOWN OF QUALICUM BEACH
Incorporated 1942

Urban Forest Master Plan

A Framework for Action to Maintain Healthy and
Resilient Landscapes in a Changing Climate

for

**Town of Qualicum Beach
Director of Planning
Mr. Luke Sales**

by

**Gye and Associates, Urban Forestry Consultants Ltd.
5965 Wallace Drive, Victoria, B.C. V9E 2G7**

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EXECUTIVE SUMMARY

The work of the Environment and Sustainability Committee and the results of the Quality-of-Life survey reveal a wide variety of views and issues regarding trees, their settings and their management and regulation within the Town. The need to articulate, explore and address these views and issues has given rise to this strategic *Urban Forest Master Plan* (formerly the *Tree and Vegetation Management Plan*).

The plan provides a vision to guide the document that is drawn in part from the Town's Sustainability Plan. Three goals are proposed that embody this vision and capture all eleven of the priorities identified in the survey:

1. Conserve natural values and systems
2. Accommodate other private and public values
3. Manage risk in treed landscapes

The plan makes clear that a balanced and comprehensive approach to tree policy and regulation is needed. While the range of issues does not lend itself to a "one size fits all" policy or regulation, conserving and enhancing tree cover in a manner that optimizes benefits while minimizing nuisance and risk is an overriding concern. To this end, a draft policy is provided for the conservation of trees, soils and greenspace on private property to complement the Town's existing policy for the management of trees on public lands. The term *conservation* in this context includes support for the gradual transition in the more built or urban sectors of the Town away from large remnant native trees in favour of a range of tree types and sizes more suitable to urban environments, while sustaining overall levels of tree canopy and biodiversity.

The *Tree and Soil Conservation Policy* is informed by a study to measure changes to impervious cover (buildings, roads etc.), tree cover and non-treed pervious cover (fields etc.) over the last 10 years (see Appendix-2). The study also provides estimates of the quantity of ecosystem services provided by the Town's trees and the amount of money saved by not having to engineer these services.

A critical tool to enable the implementation of this policy is a *Tree Preservation Bylaw*.¹ A tree bylaw is the most effective means to promote, preserve, enhance and transition urban forest on private lands. It does this by regulating tree cutting (particularly on lands undergoing development), ensuring optimal levels and appropriate types of tree replacement, and assisting residents and contractors to work more gently around trees.

The Plan recommends that the *Tree and Soil Conservation Policy* and the *Tree Preservation Bylaw* for private properties be complemented by a suite of other tools, such as the following:

- Adding to or modifying existing environmental development permit areas to map and assist in the management of wildfire risk.

¹ A draft Tree Preservation Bylaw is not included within the scope of this Plan, but is being developed for consideration by the public, key stakeholders, staff and Council as a separate piece of work.



- implementing new urban planning and design guidelines to assist in the transition of urban forest into new land-use contexts (see Appendix-3, *Enhancing Functional Benefits within Urban Areas*).
- increasing the resourcing, scope and standards for municipal tree care and planting,
- working with residents, local and regional Environmental Non-Governmental Organizations (such as the Qualicum Beach Streamkeepers) and qualified professionals to enhance the Town's diverse palette of treed landscapes and sustain the biodiversity they provide habitat for.

Finally, the Plan's goals and objectives provide the basis for a series of action plans to specifically address community priorities (see Appendix-1). It is intended that these action plans will be reviewed and further developed by affected stakeholders, council, staff, qualified professionals, and academics. This Plan provides consultant recommendations to the Town for long-term urban forest management. Implementation of the recommendations is subject to the availability of Town resources, as well as future Council direction. Adoption of this plan does not commit the Town to its recommendations.

Two additional appendices provide supporting analysis and guidance for successful urban forest planning.



INTRODUCTION

BACKGROUND

On October 5, 2016, the Environment and Sustainability Committee discussed the development of a tree and vegetation management plan. On October 24, 2016, Council directed staff to continue to prepare a *Tree and Vegetation Management Plan*, with input from volunteer Committee members for Council to consider.

Three members of the Environment and Sustainability Committee met with Town of Qualicum Beach (hence forth referred to as “the Town”) staff to discuss what should be included in a tree and vegetation management plan. At that meeting, the committee recognized a wide variety of issues and perspectives related to the Town’s treed environments and the importance of understanding the community’s priorities before drafting any bylaws or policies.

In the 2017 Quality-of-Life Survey, a question was included to help identify priorities that should be considered in the development of a tree and vegetation management bylaw. Survey responses identified the following priorities, which are ranked as follows:²

1. Invasive plant management
2. Watershed protection
3. Tree hazards
4. Wildfire risk
5. Achieving a balance between tree cover and sunlight to houses and garden areas
6. Slope stability
7. Tree conservation
8. Wildlife habitat protection/ management
9. Maintaining views
10. Climate change management
11. Protect unique or rare native woodland tree species (e.g. Garry Oak or Arbutus)

The priorities identified above span several of the Town’s authorities and not all can be addressed by a single policy or regulation; notwithstanding, a tree preservation bylaw to regulate the cutting of protected trees was considered by the Town as a first step and stop-gap measure while a more comprehensive plan with a broader suite of policies and tools is developed.

A draft tree protection bylaw was developed and presented to Committee of the Whole in June of 2018. After a fulsome discussion, the Committee of the Whole deferred consideration of a tree bylaw until a more comprehensive study and management plan is completed. Shortly thereafter, staff instructed G&A to begin the research component of the study.

In early 2019, as part of an effort to understand the landscape changes occurring within the Town’s boundaries, staff requested that G&A begin work to map and evaluate changes to the Town’s land and tree canopy cover over the past decade. The results of this mapping and analysis were provided to staff in May of 2019. The analysis concluded that while the Town had

² The survey polled 2000 residents, which represent approximately 24% of the Town’s population.



experienced a modest loss of trees during this period (largely associated with land conversion on both urban and rural lands) **the total amount of tree canopy has increased by 11% over the previous decade.** This positive trend reflects the steady increase in canopy extent and biomass experienced by existing trees over the study period, despite the modest decline in the number of trees resulting from land development. (While the mechanisms of tree loss are different, it is worth noting that this is a trend also found in nature, where the number of stems per unit area of in a young forest gradually declines as the stand ages and the size of residual trees increase.)

The study also established a baseline for pervious versus impervious cover across the Town—an important metric to monitor over time when assessing changes in watershed health. Impervious cover was measured at 19% overall, ranging from a high of 29% in urban areas to a low of 5% in rural areas. To better interpret the meaning of these measures, it is important to note that, while approximately 60% of the Town's land base is urban, much of the upstream catchment areas within the Town's watersheds are rural with a high percentage of pervious cover.

Following the completion of this study at the end of May 2019, G&A began drafting the present document. The title of the plan was changed at the request of the Town's standing Environment Committee to the Urban Forest Master Plan, reflecting the plan's strategic scope and policy guidance to support healthy and resilient landscapes in a changing climate.

STATEMENT OF PURPOSE AND SCOPE

Trees and their associated vegetation are key elements in many different landscapes. As the list of priorities from the Quality-of-Life survey makes clear, the range of management issues, settings and interests is broad, requiring a comprehensive and balanced approach to planning. As noted above, no single policy or regulation can address such a diverse array of issues.

This plan is intended to provide a **framework for action** to address the priorities set forth in the Town's Sustainability Plan and identified by residents in the 2017 Quality-of-Life survey. This Plan provides consultant recommendations to the Town for long-term urban forest management. Implementation of the recommendations is subject to the availability of Town resources, as well as future Council direction. Adoption of this plan does not commit the Town to its recommendations.

PLAN OVERVIEW

The plan consists of six sections.

1. The *Introduction* provides the background and rationale for the Plan.
2. The second section of the plan sets out a series of principles to guide the Plan and its implementation.
3. This is followed by a section that attempts to articulate a desired future condition for the landscapes of the Town, which is further refined in a series of performance outcomes.



4. A brief SWOT analysis is then provided of some of the strengths, weaknesses, opportunities, and threats to be considered in the Plan.
5. The above sections provide the context for the goals and objectives for the Plan. The eleven priorities identified in the Town's Sustainability Plan and Quality-of-Life Survey are reframed as objectives and grouped into three overarching goals:
 - a) Conserve Natural Values and Systems
 - b) Accommodate Other Private and Public Values
 - c) Manage the Risk Associated with Treed Landscapes

An assessment of the benefits associated with each objective (along with the risks of inaction) and summary recommendations are provided. Preliminary action plans are also provided for each objective in Appendix-1. It is intended that these action plans should be further developed and operationalized through a process of engagement and review by the Environment and Sustainability Committee, residents, staff, Council, as well as qualified professionals with specific expertise within relevant subject areas.

The thematic way the plan is structured required a reordering of the original priorities within the survey. These priorities are restored, however, with the action plans, which are presented in the original order indicated by the survey (see Appendix-1).


The final section of the Plan is devoted to a draft Tree and Soil Conservation Policy which is intended to provide the enabling framework for a Tree Preservation Bylaw and other tools to help the sustain, enhance and transition its urban forest as The Town continues to develop.

Appendix-2 presents the results of a Tree Canopy and Land Cover Analysis that was conducted in 2018/2019 in support of the Plan. This section also includes a discussion of the importance of "benchmarking" the current functional condition of the sensitive ecosystems and landscapes at risk identified in the Plan.

Appendix-3 provides a discussion of how to optimize the functional benefits of trees and vegetation within urban areas by thinking more carefully about the constraints and opportunities imposed by land-use on urban forest structure and function.



GUIDING PRINCIPLES



OCP Vision Goal 1.0: Preserve and protect our natural environment, including the ecosystems that support both people and wildlife.

PRINCIPLES

1. The program increases the resistance and resilience of the Town's landscapes to both episodic shocks (e.g., storms or flooding) and more chronic stressors (e.g., invasive species, reduced annual precipitation, increased summer heat, land conversion) so that the natural capital embodied in these landscapes may continue to provide the benefits and services desired by the community and needed to sustain the Town's diverse ecosystems and biology.
2. The program has a clear biocentric perspective and approach to land management. Land management decisions consider and seek to sustain other biological values and ecological processes, not simply human ones.
3. Notwithstanding the above, towns are human habitats too, which need to provide bright, safe, and relatively nuisance-free environments for people to live and thrive. Trees and vegetation should be carefully selected and sited to support these qualities in a community. This is what is meant by the *right tree, right place* principle.
4. The program adopts a "lift together" approach to the program by evenly distributing the cost and responsibility for the program across the entire community. This principle is intended to avoid unfairly point-loading the cost and burden of a public program onto the shoulders of a limited number of property owners or other stakeholders with mature trees on their property.
5. The program recognizes that most tree loss is associated with urban development and land-use conversion. Efforts to minimize and mitigate for mature tree loss should focus on these activities and the green infrastructure they impact.
6. Conversely, the program recognizes that most landowners are generally good stewards of their trees and soils and should be accorded the latitude to manage their properties and trees for risk and nuisance without undue interference from the Town.
7. Care is taken to regulate private property use only when critical to achieve a program outcome in a timely and effective manner and for which no alternate and less intrusive strategy is available that would achieve the same. Clear and compelling justification is provided.
8. The program is based on the best science and evidence available.
9. The program adopts clear standards, reporting formats and criteria of performance for professional assessments and documentation, as well as for their review and evaluation.



10. Municipal government leads by example and avoids a “do as I say, not as I do” approach.
11. The Town works closely with local and regional environmental groups (such as Streamkeepers) and fosters a culture of active participation, partnership and stewardship within the community and its residents, businesses, and landowners.
12. Education and public outreach are favoured policy tools for promoting a stewardship ethic amongst residents and business.
13. The program is well-integrated with other values and policy priorities of the OCP, such that public policies from different departments or with different goals mutually reinforce one another (and do not contradict or subvert one another).
14. Regulations are tied to clear and measurable performance outcomes and are subject to review from time to time.
15. Policy Tools make effective and efficient use of resources in achieving measurable outcomes.



DESIRED FUTURE LANDSCAPE CONDITION

The Town's Sustainability Plan includes a section entitled *Healthy Landscapes*, which begins with the following vision of the Town's future landscape condition. The vision statement is supported by several additional performance outcomes that are noted below.

*The community is surrounded by a wealth of natural beauty and a high-quality public realm. The community cares for natural ecosystems to ensure that they are healthy and thriving. Parks, landscaping and other shared spaces are carefully designed to serve many purposes, with an emphasis on enhancing community life and sustainable practices.*³

1. Performance outcomes:

- 1.1. Trees “punch above their weight” in their contribution to the natural beauty and character of the Town's private and public realms. The Town's generous and thoughtfully designed public treescape supports the broader system of urban programming and infrastructure, land-use and community interests that characterize this compact community. Within the more urban or built portions of the Town, it is above all a safe and open landscape, with plenty of sunlight and populated with tree species that are well-suited to the urban environment.⁴
- 1.2. On private lands within the more suburban and urban sections of the Town, remnant native conifers that established under more rural conditions are gradually being replaced with higher-functioning tree species better suited to urban-residential and commercial contexts.¹ Desirable tree attributes for urban contexts include moderate size, attractive form, drought and disease resistance, high habitat values for pollinating species and songbirds and low risk and nuisance ratings.
- 1.3. Areas of native forest with high biodiversity value are conserved and restored where needed.
- 1.4. Many properties exhibit a strong continuity of soil and vegetation with their neighbours, enhancing habitat and movement for many types of urban wildlife, plants and soil biology.
- 1.5. Sensitive ecosystems have been mapped and assessed to support effective management decisions; the Town works with senior governments to ground-truth, update and maintain the Sensitive Ecosystems Inventory (SEI).
- 1.6. Abundant, well-networked and high-functioning greenspace—with the many benefits they confer—are considered a strategic priority in all long-term community development planning (see Figure-1 below). Parks, protected areas, greenways and resource lands are expanded and connected through a long-term strategy for land acquisition.

³ Source: Town of Qualicum Beach *Sustainability Plan, Healthy Landscapes Vision In 2050*

⁴ This bullet has been adapted from the *City of Victoria's Urban Forest Master Plan*, p7. All other vision-bullets derive from the Town's *Sustainability Plan, Healthy Landscapes Vision 2050*.



Fig-1 Urban Forest benefits

- 1.7. The health and stability of watersheds, aquifers, steep slopes, environmentally sensitive areas and habitats, the intertidal and marine zones, riparian areas, agricultural lands, and key ecological areas are sufficiently protected and cared for.
- 1.8. Natural areas that have been damaged are rehabilitated over time to meet measurable structural and functional standards.
- 1.9. The community and municipal government work effectively together to help residents, businesses, farms and the Town's landscapes and natural systems adapt to a rapidly changing climate.
- 1.10. Ecological objectives are integrated into all development and design (both public and private), including conserving undisturbed, biodynamic soil wherever possible, increasing the amount of pervious surface, promoting and connecting habitat-rich landscape plantings and tree preservation and the provision of adequate volumes of new soil for tree plantings within hardscapes, such as above and below-ground parkades, sidewalks, road meridians, civic plazas, etc..
- 1.11. Sustainable materials and technology are often used in urban and landscape planning and design, including permeable materials to infiltrate water, soil cells to provide adequate soil volume in hard landscapes, and geogrid products to bridge driveways, laneways and sidewalks over tree roots.



S.W.O.T. ANALYSIS

STRENGTHS

- The Town has recently updated its OCP, which together with its Sustainability Plan, Community Climate Adaptation Plan and the Regional Growth Strategy provide a progressive and comprehensive strategic framework of sustainable land-use planning policies, bylaws and development guidelines, high amongst which is the Town's Rural Containment Boundary.
- The Town is not alone in confronting the broad range of tree and vegetation-related issues within its community. Many resources are available from other communities, organizations and institutions.
- Residents and stakeholders engage effectively with their local government.
- This initiative enjoys strong community support.
- The Town is currently well-treed and vegetated.
- Good basic thematic mapping is available for spatial reference (OCP Schedule 2.2).
- There is archival Terrestrial Ecosystem Mapping available, which is helpful in planning strategies for restoration within watersheds, natural areas and sensitive ecosystems.
- Recent tree canopy and land cover mapping has been completed to provide evidence-based data to inform the development of policy, bylaws and programs
- The Town has LIDAR imaging that can be used for three-dimensional modelling of many of the environments addressed in this plan.

WEAKNESSES

- There are relatively few ENGOs in Qualicum to assist in the non-governmental dimensions of the plan.
- The Town currently lacks specialized environmental staff (e.g. Municipal Ecologist, Urban Forester).
- There is uncertainty amongst residents regarding the medium-to-long-term effects of climate change impacts for the Town.
- Studies are required to evaluate and benchmark the health and functional condition of the natural systems the Town is seeking to preserve and enhance.

OPPORTUNITIES

- A progressive OCP provides a mandate and guidance for many of the Plan's priorities
- Rezoning applications provide opportunities to update treed landscapes to support new land use and enhance functional benefits
- Community demographic of active, retired, well-educated, accomplished and engaged seniors whose values align well with those underpinning the Plan—a tremendous potential resource!
- Well-planned and sustainable economic development is providing a growing tax base to help fund important policy initiatives, such as this one



- Increasing evidence of the deleterious effects of human-influenced climate change and a corresponding increase in public support for climate change policy and changes that move the local community, wider economy, and society onto a more sustainable footing.
- There are a growing number of successful community-based stewardship initiatives *and* for-profit land development projects in this field from which much may be learned. There are also case studies that provide lessons of what has *not* worked and proved problematic or divisive for the communities affected.

THREATS

- Poor practice during new land use development can result in unnecessary loss of trees and growing soils.
- Without active management and control, invasive species will accelerate their colonization of both disturbed and native landscapes, increasing costs of management and control.
- Annual precipitation rates have been declining throughout the Coastal Douglas Fir biogeoclimatic zone for several decades. As the climate moves toward a drier and warmer state, moisture-dependent native trees, such as Western Red cedar and Grand fir are declining in ever larger numbers on sites where they once thrived.
- The changes in weather patterns and decline of moisture-dependent coniferous tree species increases wildfire risk in more heavily wooded areas of the Town. (These areas are largely located outside the urban containment boundary but include some urban forest parks.)
- More active management of the Town's trees and vegetation on both public and private lands will require greater resources for qualified staff and policy-based programs. Failure to secure adequate funding is a therefore a potential risk.
- Lack of clear metrics for monitoring and evaluating program efficacy is a potential risk.
- Even as they allow greater access to and sharing of information, on-line posting through the internet and social media can polarize communities around key issues of concern, particularly if such issues become political. This can create challenges to local governance and developing social and political consensus around issues of concern.
- Climate change skepticism is a potential risk if it prevents early action in formulating and implanting climate mitigation and adaptation strategies.



PROGRAM GOALS & OBJECTIVES⁵

GOAL 1: CONSERVE NATURAL VALUES AND SYSTEMS

Priority Objective 1: Protect and enhance watershed quality and associated ecosystem services

Benefits:

- Clean and abundant water (via ground water recharge)
- Storm water management (interception, storage, infiltration, absorbs hydraulic energy and slows the movement of water down through the watershed)
- Biodiversity conservation: healthy creeks and wetlands provide habitat for fish and other aquatic flora and fauna and the terrestrial species that depend upon them.

Risks of Inaction:

- Increasing impervious cover
- Loss of vegetative cover
- Impacts associated with climate change (changes in annual precipitation and patterns, flash flooding, extended dry seasons, warming waters, reduced wetted season for sensitive amphibian species etc.)
- Pollution from agricultural run-off
- Soil erosion and siltation and associated increase in woody debris congestion in creeks
- Increased encroachment and disturbance within riparian buffers (land conversion)
- Loss of older second-growth forest (logging)
- Loss of biodiversity (particularly amphibians and fresh-water species)

⁵ Goals and objectives are grouped for clarity and do not necessarily follow the format and order of priorities listed in the *Quality-of-Life* survey.

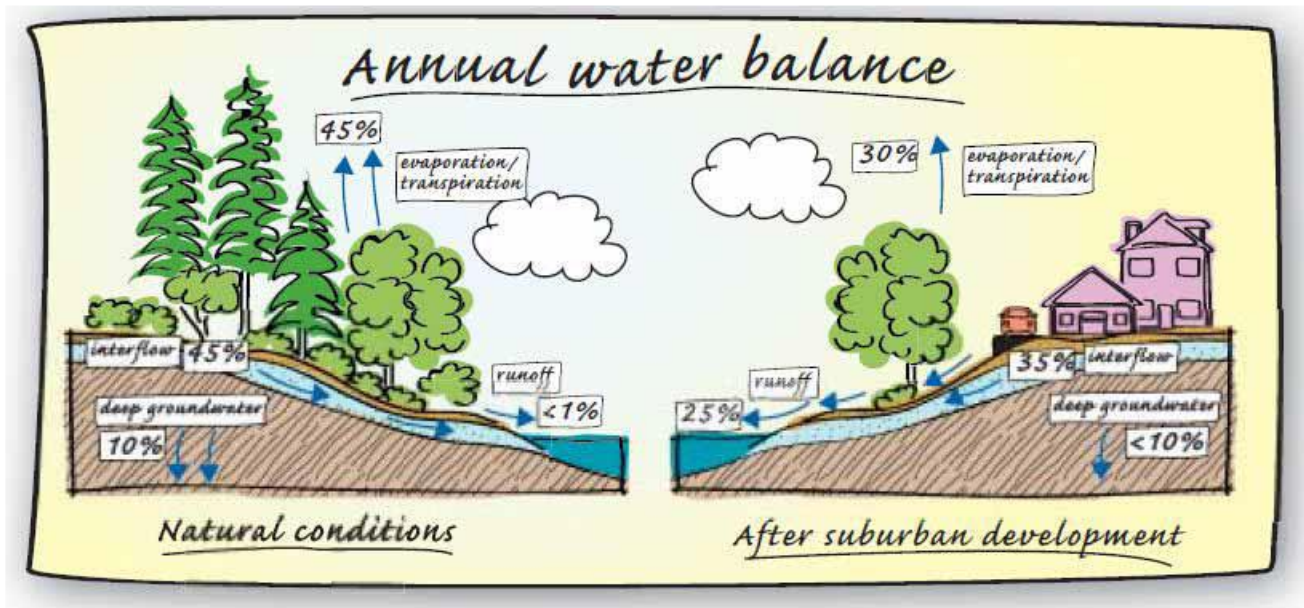


Fig-2 Watershed Hydrologic Cycle (CRD Roundtable on the Environment)

Summary Recommendations:

1. Strengthen tree-cutting restrictions and tree planting requirements and incentives
2. Assess and evaluate the current biophysical condition of each watershed
3. Develop science-based targets for minimum pervious cover and tree canopy for each watershed and strategies by which to achieve and sustain them.
4. Assess and evaluate the *Proper Functioning Condition* (PFC) of significant creeks, streams and wetlands within each watershed
5. Develop options and strategies for watershed rehabilitation and enhancement, based on *Integrated Stormwater Management* (ISM) and PFC principles
6. Engage with stakeholders
7. Develop a pool of potential resources to assist with funding and implementing the action plan, including governmental, community, ENGO, academic, professional, and economic resources for action
8. Support the work of the Qualicum Beach Streamkeepers and other watershed stewards
9. Develop a workplan to list and prioritize tasks, responsible agents, costs (including a preliminary 5-year budget forecast), timelines etc.)



Priority Objective 2: Conserve, Enhance and Connect Trees, Woodlands, and Forest

Benefits:

- Private and public realm enhancement (aesthetics, contact with nature, supports active living)
- Enhanced biodiversity and wildlife habitat
- Improved selection of trees to support different land-uses and landscape functions
- Significant mental and physical health benefits⁶
- Enhanced real estate values
- Cooling of urban heat island effect and increases in ambient summer heat due to climate warming
- Significant mitigation of storm water risk during sudden, heavy and sustained rainfall events (anticipated to be more frequent with climate change)
- Reduced energy costs
- Removes pollutants from the air, water and soil
- Carbon capture and storage
- Conservation of heirloom fruit trees enhances food security
- Conserve's soil and enhances soil biology, structure, and function; reduces risk of soil erosion and mass wasting on steep slopes

Risks of Inaction:

- Ongoing loss of soils, tree cover and connected habitat to land conversion and development
- Human health impacts associated with global warming and air pollution
- Increased stress to tree health from extended dry seasons and reduced annual precipitation
- Changes in patterns of pathogenic fungi and bacteria; increased risk of catastrophic outbreaks of tree pests and disease
- Insufficient reforestation and urban tree planting
- Increasing rates of tree loss anticipated from more intense and frequent windstorms
- Increased risk of wildfire as residential development encroaches on forested areas and fuel loads increase from unmanaged forest stands and natural areas.

Summary Recommendations:

1. Develop and enact a Tree and Soil Conservation Policy to articulate the goals and objectives of the Town with respect to trees and the soils required to support them on private property.⁷

⁶ François Reeves, interventional cardiologist and author of the new book *Planet Heart: How an Unhealthy Environment Leads to Heart Disease*.

⁷ Organic mineral soils that are capable of supporting trees and associated vegetation are grown, not made, and take many years to develop. Productive growing soils are highly structured and are formed over time through a combination of biological and abiotic processes. As such, these “living soils” represent a significant asset to the community, are not readily replaced, and should be conserved wherever possible.



These include the minimization and mitigation of tree, soil and greenspace loss associated with new development sites and support for residents in the management of their trees and gardens (completed—see Appendix-1).

2. Enact a tree conservation bylaw that prohibits the cutting of “protected trees” in areas with a low or moderate risk of wildfire without a permit.
3. Provide support for the gradual transition within urban residential and commercial settings away from large remnant forest-trees that pose a moderate-to-high risk or nuisance factor and toward trees that provide greater landscape, ecosystem and habitat benefits.
4. Provide a clear, target-based strategy to achieve and sustain tree canopy cover on all land use types (zones) within the town, including lots with few or any existing trees.
5. Ensure that green infrastructure, such as greenspace, soils and trees, are adequately monetized when assessing mitigation or replacement value.⁸
6. Implement mitigation recommendations for areas assessed at high or extreme risk of wildfire (*2007 Community Wildfire Protection Plan*).⁹
7. Address management challenges and opportunities for the Town’s public trees and treed parks.
8. Resource the Tree Conservation Action Plan.
9. Update the Town’s *Noxious Weed Bylaw* to provide authority for the Town to implement effective monitoring and mitigation measures to control emergent outbreaks of plant pests or diseases of concern on private and public property.ⁱⁱ
10. Engage and support the community in urban forest stewardship and biodiversity conservation.
11. Promote the use of site-adapted native plants wherever possible to enhance biodiversity conservation.
12. Encourage residents to look for opportunities with their neighbours to “stitch” together discrete patches of trees, soil and vegetation to form connected ribbons of habitat.
13. Develop strategies to encourage proactive stewardship of remnant forest and woodland (identify and map candidate sites for conservation, restoration, and afforestation; assess the health and biodiversity value of candidate sites; work with local ENGOs and qualified professionals to plan and carry out stewardship activities).
14. Pursue funding opportunities through mitigation cost-charges for developments that will result in tree and habitat loss.

⁸ The issue of green infrastructure monetization will be a pivotal issue as communities begin reimagining how greenspace will need to be reconfigured—including the land assembly needed to achieve it--in areas of the town being targeted for densification and mixed-use development.

⁹ Strathcona Forestry Consulting. (2007). *Community Wildfire Protection Plan for the Town of Qualicum Beach*.



15. Establish an Urban Forest Reserve Fund with clearly articulated expenditure guidelines that focus on urban forest stewardship and enhancement.
16. Further recommendations for public and private lands, as well as lands under development, are provided in the appended Action Plan for this objective.

**Priority Objective 3: Conserve Wildlife Habitat and Sensitive Ecosystems
(including rare or endangered species and plant communities)**

Benefits:

- Biodiversity is conserved (including the diversity of landscapes and landforms, distinct plant communities, habitat for wildlife, pollinating insects, invertebrates, species at risk and other flora and fauna within the Town, including soil fungi, bacteria and the associated biology that depend upon them [like trees!])
- Important ecological processes are sustained, such as nutrient cycling, water cycling and other hydrologic functions, soil formation and conservation, carbon uptake etc.
- Natural areas can be managed to create unique recreational and educational opportunities while minimizing impacts to protected environments.

Risks of Inaction:

- Habitat Fragmentation
- Ecological degradation and simplification
- Loss of greenspace
- Increased cultivation and loss of biodiversity within sensitive ecosystems
- Loss of pollinators due to habitat loss and changes in phenological culling due to climate change
- Increased presence of invasive species
- Poorly managed recreational usage
- Wildfire

Summary recommendations:

1. Support local stewardship initiatives that work to conserve natural systems, such as the Qualicum Beach Streamkeepers.
2. Update the Town's Sensitive Ecosystem Inventory.
3. Engage local residents and businesses to adopt "Naturescape principles" for the landscapes they inhabit.¹⁰

¹⁰ <https://www.bcsla.org/sites/default/files/resources/files/climate-change/downloads/Naturescape-Provincial-Guide.pdf>.



4. Commission a biodiversity conservation strategy to be developed, along with the underlying ecological and biological surveys and current, high-quality, mapping to support it.¹¹
5. Work with local ENGOs and retired life-science professionals to map and assess the current biophysical condition of the Town's natural areas and sensitive ecosystems.
6. Adopt landscape ecology principles for land use and green space planning within both rural and urban environments. Plan for large, connected green and blue spaces with a diversity of vegetation, coarse organic debris, age classes and structural attributes.
7. Identify patches of land with high ecosystem and biodiversity values and look for land-use planning opportunities to preserve, connect and enhance them (via land acquisition, amenity zoning, density transfers, conservation covenants, well-funded stewardship programs etc.).

GOAL 2: ACCOMMODATE OTHER PRIVATE AND PUBLIC VALUES

Priority Objective 4: Balance residents' desire to maintain viewsapes with the Town's policy to conserve trees wherever possible.

Benefits:

- Viewsheds are managed to accommodate both trees and vistas beyond.
- Residents with affected viewsheds are provided with clear policy, best practices and a path for resolving conflicts between view sheds and vegetation.
- The incentive for illicit tree removal is reduced.
- Future conflict is reduced between residents where the trees of one resident interfere with the views of another.

Risks of Inaction:

¹¹ A good resource to consider in developing a Biodiversity Conservation Strategy is the Conservation Measures Partnership—initially founded by The Nature Conservancy (TNC), WWF, Wildlife Conservation Society (WCS), Conservation International and Foundations of Success (<https://www.conservationmeasures.org/>). The Conservation Measures Partnership program is supported by a set of conservation standards, described here: (<https://www.conservationmeasures.org/>). The actual standards can be found here: (<https://conservationstandards.org/wp-content/uploads/sites/3/2020/12/CMP-Open-Standards-for-the-Practice-of-Conservation-v4.0-English.pdf>).



- Viewsheds continue to be eroded by emergent trees and vegetation. Property values may be adversely affected.
- Without clear policy and a process for resolving conflicts, some residents may feel compelled to remove or top trees without engaging the Town, increasing geotechnical risk on steep slopes and the incidence of trespass with neighbouring properties.

Summary recommendations:

1. Identify private lands that are prone to viewshed conflicts and make them subject to a development permit area.
2. Provide a permit application process for residents who desire to relieve a conflict between a tree (or trees) and an existing or potential viewshed.
3. Develop management options that can be attached as conditions to tree permits that support tree retention where reasonable, and tree removal and mitigation with planting of more appropriate tree species, where not.
4. Ensure within steep slope areas that any geotechnical risk is evaluated and considered as part of the permit application requirements and approval process.

Priority Objective 5: Work to resolve tree-related nuisances. Conserve mature, native trees where suitable and transition to more suitable tree-types where not. Maintain overall tree cover in the medium-long term.

Trees are sited and managed to avoid harmful nuisances, such as the following:¹²

- Over-shading of vegetable gardens, patios and solar panels
- sap falling on cars, pathways or decks
- rodents accessing roofs
- branches contacting or shading house fascia and rooves
- tree roots heaving driveways
- street trees unreasonably mask or block access to street-front retail businesses
- poorly located or selection type of street trees result in conflict with overhead power lines, causing unnecessary maintenance expense and poor tree form resulting from line clearance pruning.

Benefits:

- Physical and emotional health
- Efficient solar harvest
- Food security
- Recreational gardening
- Extended life for roofs, building fascia and other infrastructure

¹² This policy objective is not intended to promote unnecessary tree removal or alteration for minor nuisances, such as falling twigs or leaves or minor view impediments.



- Happy residents!

Risks of Inaction:

- Important benefits are diminished or become unavailable
- Resident support for the preservation of trees and vegetation within built environments is eroded
- Aggravating—and potentially costly—nuisances continue unabated
- Support for the preservation of trees and vegetation within built environments is eroded

Summary recommendations:

1. Promote the principle of the “Right tree in the right place” principle to promote beneficial outcomes and avoid tree-related conflicts;
2. Encourage residents to preserve large, mature trees and vegetation where suitable, while supporting the transition to a broader palette of more moderately-sized trees with attributes more suited to suburban and urban settings.¹³
3. Develop a catalogue of suitable tree types for different land-use conditions that optimize desired values and benefits.
4. Prevent the unnecessary or excessive removal of trees, vegetation and soils with particular focus on lands undergoing land development.
5. Maintain a conservative posture toward municipal oversight and regulation of landscape management on private properties that are not subject to re-development while tree conservation policy objectives are being met.
6. Seek out opportunities to inform and educate residents on tree management best practices, including tree selection, planting, early tree care, tree pruning and measures to relieve typical tree-related nuisances.
7. Develop policy and procedures to guide the review of tree cutting applications for the relief of nuisance.

GOAL 3: MANAGE RISK IN TREED LANDSCAPES

Priority Objective 6: Minimize wildland/urban interface fire risk¹⁴

¹³ “Suitable” trees in this context means large trees in suburban and urban settings that are open-grown, do not pose a moderate or high risk or a harmful nuisance to residents and are considered a tolerable or desirable feature by the home-owner.

¹⁴ Wildfires and their associated impacts (such as smoke and air quality degradation) are addressed as a key risk and action item associated with climate change in the Town’s Community Climate Adaptation Plan (CCCAP), pp. 5, 23 & 25.



Benefits of management:

- Safer homes and rural communities
- Values associated with standing forest are maintained, including timber values, watershed function, carbon uptake and biodiversity
- Increased fire-fighting expense

Risks of Inaction:

- Loss of human and wildlife
- Property damage
- Loss of treed ecosystems and associated values
- Air pollution
- Aesthetic impacts to the landscape

Summary Recommendations:

1. Map higher-risk areas for wildfire.
2. Maintain buffer area and continue work expanding fire protection area. Consider inclusion of vulnerable infrastructure within this area (Action 1.1 from the CCCAP).
3. Develop a strong municipal outreach program of education and incentivization for homeowners in high-risk areas, including wildfire evacuation protocol and procedures, such as evacuation route signage (Action 1.3 from the CCCAP).
4. Avoid extending urban development into areas of high wildfire risk.
5. Consider designating areas of high wildfire risk as development permit areas.
6. Work with landowners and jurisdictions with lands abutting the Town to improve wildfire risk management.
7. Manage vegetation, landscaping, and general maintenance around buildings following FireSmart principles and guidelines for both private and public property (Action 1.2 from the CCCAP).
8. Identify opportunities to lower fire ignition risk.
9. Incorporate wildfire risk abatement measures into forest management plans.
10. Request the Fire Chief to report annually on wildfire activity and risk management planning and implementation progress.
11. Complete an operational work plan for wildfire risk management within the Town's borders.

Priority Objective 7: Reduce the risk of whole or partial tree failure

Benefits of management:

- Safer communities



- Longer tree life (if tree pruned) or opportunity for urban forest renewal (if tree removed)
- Municipal arborists hone their tree risk assessment skills with practice
- The Municipality models best practices for residents to emulate

Risks of Inaction:

- Accumulating risk to life and property
- Increased legal liability
- Accumulating abatement costs
- Psychological toll for residents living with large trees whose risk status is uncertain

Summary recommendations:

1. Adopt tree care and risk management policies and practices that meet or beat the current standard of care within the industry
2. Authorize the removal of trees assessed to be at moderate or high risk by a certified arborist qualified in tree risk assessment, and for which no other risk-abatement option is suitable
3. Draft a Municipal Tree Risk Management Plan for public trees
4. Manage public tree risk on all public lands in conformance with municipal policy and best practices
5. Maintain public trees in good health and condition
6. Maintain a data base of tree failures within the Town
7. Respond to reports of danger trees on private property that may pose a risk to persons, vehicles or infrastructure on public property
8. Promote planting of tree species that are resistant to emergent climate risks, such as increased frequency and intensity of wind events, drought, pests and disease.

Priority Objective 8: Conserve and enhance tree and vegetation cover on steep slopes while minimizing the erosion of existing view sheds.

Benefits of management:

- Reduced hazard to downslope properties and residents
- Preservation of real estate and vegetation
- Safer new development near steep slopes

Risks of Inaction:

- Increased risk to downslope properties and residents
- Loss of real estate and vegetation
- Increased risk to new development near steep slopes
- Colonization of disturbed slopes by invasive species



- Potential reduction in value for properties with steep slopes

Summary recommendations: (See also Recommendations 2, 3 and 4 from Priority Objective 4 above.)

1. Identify lands with steep slopes and their associated risk
2. Implement policies and tools to improve land management on or adjacent to steep slopes
3. Delegate authority to issue Development Permits for steep slopes to staff
4. Tree removal and replacements on a steep slope will only be considered in conjunction with a site-specific tree and vegetation assessment and remediation plan
5. Amongst other factors, the site-specific tree and vegetation plan should consider the potential *unsuitability* or *elevated risk of failure* presented by certain trees on steep banks. Tree failure resulting from erosive processes is a major cause of mass wasting and slope failure.
6. Educate and support affected land owners

Priority Objective 9: Prevent, reduce and control the effects of invasive species on natural ecosystems, human health and the local economy

Benefits of management:

- Conservation of native flora and associated biodiversity
- Reduced long-term management costs (the cost of controlling invasive species rises exponentially with proliferation)
- Safer communities (some invasive species, such as Giant hogweed and Spurge laurel, can be harmful to human health)
- Provides opportunities to build critical skills and capacities and educate the public

Risks of Inaction:

- Loss of native habitat
- Increased long-term remediation costs and liability
- Lost opportunity to develop management capacity and community stewardship

Summary recommendations:

1. Implement a comprehensive program modelled after the Saanich Invasive Species Management Strategy
2. Prevent the introduction of and eradicate new invasive species
3. Contain and/or control the spread of established invasive species
4. Ensure program sustainability



5. Adopt a rigorous evidence-based adaptive management approach to the administration of the program

Priority Objective 10: Provide Adaptation Strategies to Emerging Climate Change Impacts

Benefits of climate change adaptation management:

- More resistant and resilient landscapes, including creeks, riparian areas and urban forest
- Better long-term human health outcomes
- Building capacity and critical skills through the lessons accrued from adaptive management practice
- Social and psychological benefits of being able to respond effectively at a local level to the climate crisis
- Innovations in public policy, land use planning, building technology and green infrastructure

Risks of Inaction:

- Flooding and increased soil and creek bank erosion
- Mass wasting of soils, particularly on steep slopes
- Reduced ground water and aquifer levels
- Increased rates of tree failure due to microbursts of wind with associated
- Increased rates of tree death associated with vulnerable tree species and synergistic effects of drought stress on disease progression in trees.
- consequences to nearby targets (people, cars and property)
- Impacts to human health due to warmer temperatures, aggravated by the *urban heat island effect*.
- Reduced life cycle for asphalt surfaces due to warmer temperatures

Summary Recommendations:

1. Conserve soil and water.
2. Establish minimum targets for pervious cover for all watersheds and land-use types.
3. Conserve mature tree cover by introducing a Tree Preservation Policy and bylaw for trees on private property.
4. Include soil conservation plans as a requirement of all rezoning, subdivision and development and building permit applications. Provide DPA guidelines to support this requirement.
5. Increase afforestation and tree care standards on public lands.



6. Accelerate the replacement of tree cover lost to new development by requiring higher standards of tree replacement.
7. Promote tree species that are more drought and wind resistant on both public and private lands
8. Promote the principle of *right tree, right place* for new plantings
9. Conserve existing tree cover and take active measures to increase tree cover where it is lacking.
10. Promote good tree selection, planting, and early tree care practices
11. Promote design and urban planning practices that reduce the overall percentage of *effective* impervious cover within the town
12. Increase the amount of tree canopy cover over urban roads
13. Promote the use of garden mulches around trees and shrubs to reduce irrigation requirements
14. Promote the use of micro-irrigation systems to conserve water.
15. Consider technology or engineered ecosystems to sequester storm water and/or treat grey water for use as landscape irrigation.



TOWN OF QUALICUM BEACH DRAFT TREE AND SOIL CONSERVATION POLICY

Purpose

This policy recognizes the importance of tree canopy and healthy soils for the many environmental, economic, health, social and aesthetic benefits of urban and rural forests to the community. The policy supports Goal 1 of the current Official Community Plan Vision--*Preserve and protect our natural environment, including the ecosystems that support both people and wildlife*—and is guided by the principles of the Town’s draft Urban Forest Master Plan.

This policy enables the establishment of both regulatory and stewardship tools and procedures to preserve, diversify and enhance the urban forest tree canopy on private lands in the following ways:

1. Minimize any unnecessary removal or damage to trees, greenspace and soils.
2. Provide clear exemptions under which the necessary removal of trees may be considered and for which no lesser remedy is appropriate. (See *Exemptions* below.)
3. Trees and their associated habitat have measurable value. Ensure that green infrastructure, such as greenspace, soils and trees, are adequately monetized when assessing mitigation or replacement value.
4. Provide a clear, target-based strategy to achieve and sustain green-space and tree canopy cover on all land use types (zones) within the town, including lots with few or any existing trees.¹⁵
5. Where appropriate, promote a gradual transition on urban lots and public spaces away from large remnant forest trees and toward urban forest cover that is more suitable to urban land use and conditions.
6. Prevent unnecessary damage to the growing environment of trees--and the soils and ecological processes that sustain them—during land development.
7. Preserve organic soils *in situ* on new development sites as future habitat for trees and vegetation, ongoing watershed health and for stormwater management.
8. Provide relevant guidelines for landscape design associated with commercial, multi-family residential and mixed-use permit applications.¹⁶

¹⁵ In areas of the Town identified for increased levels of urbanization and densification, this strategy may need to be addressed at both a neighbourhood and site-level, scale. Flexible use of different strategies to achieve green, liveable communities is needed within the Town’s longer-term community development planning.

¹⁶ Useful guidelines will address soil volume requirements for trees planted on hard surfaces, preference for climate-adapted and a minimum percentage of native tree species in planting plans, use of technologies for establishing viable planting sites within built environments, such as soil cells to provide both structure and soil volume, geo-grid to bridge pathways and drive aisles over root zones and helical piles to support structures that encroach within tree root zones.



9. Establish mandatory standards for the replacement of trees (including ratio, size and type).
10. Implement effective measures to monitor and control for outbreaks of invasive tree pests or diseases of concern.¹⁷

Scope

This policy applies to landscapes within the Town on private lands. Town Policy 4002-4 addresses trees on Town-controlled lands.

Policy statement

The Town of Qualicum Beach (Town) is committed to conserving and enhancing trees and their associated canopy, soils and vegetation on both private and public lands and in a manner that optimizes benefits while minimizing risk and nuisance. The Town will regulate the protection and replacement of trees on private lands pursuant to applicable by-laws and procedures and facilitate and incentivize environmental stewardship by local residents, businesses and ENGOS.

Exemptions

Protected trees and soils on private and public property that meet one of the following conditions, *and that cannot be remediated by means other than removing the tree or soil*, may be removed with confirmation from the Director of Planning or designate:

1. Tree is dead, dying or dangerous;
2. Tree is damaging or impairing infrastructure;
3. Tree poses a significant nuisance or, by virtue of its size and/or species, is inappropriate for its location such that it interferes with the reasonable use and enjoyment of a property or public byway or facility;¹⁸
4. The tree (or trees) is located within the Interface Fire Development Permit Area and removal is part of a FireSmart strategy to reduce wildfire risk within one of the Wildfire Interface Priority Zones for fuel removal or reduction;
5. Ornamental conifers abutting urban or rural dwellings that pose a fire risk;
6. Tree is located within the Agricultural Land Reserve or on land zoned for agricultural use where the tree interferes with the intended land use;
7. Protected trees growing on rural lands are permitted to be removed at the rate of two trees per acre per year, excepting where the tree is a Garry oak, Arbutus, Pacific yew or

¹⁷ Consider modification to the Town's current *Noxious Weed Bylaw* as a policy tool to address this concern.

¹⁸ An example of a *significant tree nuisance* would be one or more trees that overstand a house, deck or vegetable garden, blocking sunlight and depositing unwanted sap or debris onto these structures. Tree species such as Cottonwoods, Leyland cypress, Tree of Heaven, Golden willow and Red alder are poor candidates for growing in urban environments and can constitute a nuisance or hazard in many cases.



Pacific dogwood in good condition and where no tree removal has already been permitted for removal under a different exemption. Consideration should be given for exceptions to this requirement where circumstances warrant and guided by the principles of Tree and Soil Conservation Policy.

8. Consideration should be given to exempting commercial woodlots from the annual cut allowance in lieu of a *Sustainable Woodlot Management Plan* prepared by a Registered Forester.
9. Tree and associated soils are located within a proposed building, driveway, off-street parking area or underground service corridor for which no reasonable alternate siting of these elements is possible;
10. Tree and soil removal are required for installation of roads or services as shown on an engineering drawing, reviewed by a certified arborist and that has been approved by the Director of Engineering;
11. Tree and removal is required for servicing of a bare land strata subdivision for which no other remedy is available, has been reviewed by a certified arborist and that has been approved by the Director of Engineering;
12. The tree and/or soil removal is required to implement a development permit and or zoning amendment that has been approved by Council;
13. Where the Protected Tree is located within a designated view corridor identified in existing Town Policy 4002-4 and authorized in writing by the Director of Planning.

Tree and Soil Replacement

The following Replacement Tree policy is recommended and supported by the Environment Committee:

1. Replace tree removals associated with non-development related tree cutting applications (i.e. homeowners maintaining their yards) at a ratio of 1:1. This requirement shall be waived for properties that exceed the Town's *Tree Canopy Cover* target for their property's zoning, post-cutting.
2. Replace all trees removed for the purposes of land development at a ratio of 3:1, including rezoning, subdivision, comprehensive development and building permit applications;
3. For development-related applications only, where the total number of replacement trees required exceeds the number of available plantable sites, cash-in-lieu in the amount of \$700 per replacement tree shall be paid to the Town. This requirement shall be applied in addition to the requirement to achieve the tree canopy cover target for the subject property's zoning, post-cutting.
4. All replacement tree payments to the Town shall be deposited for use in the Urban Forest Reserve Fund.



Replacement trees shall be a minimum of 4cm caliper for deciduous trees and 3m in height for coniferous trees. Where native soil volumes are constrained (for example, within highly-built environments, such as parkades, civic plazas, roadway medians etc.), planting sites shall be designed, engineered and provisioned to meet BCSLA soil volume standards for urban trees, required to support the development of replacement trees to maturity.

A security deposit of \$700 per replacement tree shall be paid before a tree cutting permit is issued. Release of the deposit may be applied for after the completion of two full growing seasons (April 1 – October 31), provided the replacement tree is in good condition at the end of this period.

Biodiversity Conservation:

The town shall promote the conservation of beneficial plant and animal species and species-of-concern with the following strategies:

- Require wildlife surveys where beneficial for new development permits (particularly for birds, fish and species-at-risk);
- Provide guidelines for minimizing disturbance (e.g. construction, tree pruning or removal) during the vulnerable breeding season;
- Encourage urban “naturescaping” and re-wilding of unused greenfield sites;
- Support local ENGOs and stewardship activity in restoring local natural areas and habitat;¹⁹

Best Practices and Professional Reliance:

The town shall promote the use of best practices for all aspects of tree care, urban and landscape design and plant husbandry, including but not limited to the following:

- Tree pruning
- Plant selection
- Site selection (including off-sets from municipal or residential/commercial infrastructure)
- Planting and planting site preparation
- Genetic provenance of native plants
- Restricting the sale and planting of invasive plant species
- Promoting use of fire-resistant tree species within Wildfire DPAs
- Use of qualified professionals for ecological assessments, landscape design, tree risk assessments, tree protection planning, geotechnical assessments.

Related documents:

The town shall observe the established plans, by-laws, and legislation:

Town Official Community Plan (reference relevant sections here)

Town Sustainability Plan

¹⁹ The Town can also develop greater capacity itself for restoring and maintaining public natural area parks.



Draft Town Tree and Vegetation Management Plan
Draft Town Tree Protection By-law
Town Policy 4002-4 *Building and Grounds: Pruning, Trimming and Removal of Trees on Town-Controlled Lands*

Definitions:

Tree canopy: refers to the layer of tree leaves, branches, and stems that provide tree coverage of the ground when viewed from above.

Policy details:

Policy Number: xxxx-x

Section: Environment

Sub-Section: Trees

Author: Director of Planning

Authority: Council



CONCLUSION

This plan provides a way forward for the community of Qualicum Beach to manage its trees and vegetation amidst a broad range of interests, issues and landscapes. The plan has focused on three main goals:

- Conserve natural values and systems
- Accommodate other private and public values
- Manage the risk associated with treed environments

Clear objectives and strategies have been provided for each of these goals in the ten action plans appended to this report. It is intended that these action plans will be presented to, reviewed by and further developed by affected stakeholders, council, staff, qualified professionals and academics.

End report.



END NOTES

¹ The gradual replacement of large remnant forest trees in urban areas (such as Douglas fir, Grand fir, Red cedar and Big-leaf maple) with more appropriate tree species is a key concern of the Town's Environment Committee. In response, the expressed desire for an attractive, low risk and high-functioning urban forest has been added to the "Desired Future Landscape Condition" section of the plan and several key policies, objectives and recommendations have been revised to address this aspiration and how to achieve it in a sustainable fashion. A member of the Committee requested a 30-year transition strategy also be included; while such a strategy has not been formally codified in this plan, the changes made throughout the document effectively provide the policy direction and measures needed to achieve this goal.

¹ The Canadian Food Inspection Agency (CFIA) has the lead role in protecting Canada from the introduction of new plant pests and preventing the spread of certain pests within and between provinces. The CFIA conducts Pest Risk Assessments of new pests and regulates many pests. The Agency conducts annual surveillance programs within Canada to document the absence of selected pests as well as to detect the presence of new invasive species arriving in Canada.

The Government of British Columbia administers the Plant Protection Act and the Weed Control Act to help prevent the spread of plant pests and invasive plants within the province.

The British Columbia Plant Protection Advisory Council provides a forum to address plant health and plant quarantine issues of concern to British Columbia.

<https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/animals-and-crops/plant-health/invasive-pests-and-biosecurity>



GLOSSARY

Biodiversity: The variability among living organisms—animals, plants, their habitats and their genes—from all sources including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part. This includes diversity within species, between species, and of ecosystems.

Biophilic city: A city “with abundant nature and natural systems that are visible and accessible to urbanites... A biophilic city is at its heart a biodiverse city, a city full of nature, a place where in the normal course of work and play and life residents feel, see and experience rich nature – plants, trees, animals. The nature is both large and small – from treetop lichens, invertebrates, and even microorganisms to larger natural features and ecosystems that define a city and give it its character and feel.”²⁰

Biophilic design: “...an innovative approach [to urban planning and design] that emphasizes the necessity of maintaining, enhancing and restoring the beneficial experience of nature in the built environment”.²¹

Canopy cover: The fraction of a measureable land area that is covered by tree canopy (normally expressed as percent canopy cover).

Ecological Function: The ecological and evolutionary processes, such as energy flow, genetic transmission, migration and mutation, disturbance, and nutrient cycling, which sustain or modify ecosystems over time.

Ecosystem: A community of plants, animals, insects and micro-organisms that are linked by energy and nutrient flows and live, feed, reproduce and interact with each other and with the physical environment. Ecosystems have no fixed boundaries; a single lake, a watershed, or an entire region could be considered an ecosystem.

Ecological goods and services: Benefits arising from the ecological functions of healthy ecosystems. These benefits accrue to all living organisms, including animals and plants, rather than to humans alone. However, there is a growing recognition of the importance to society that ecological goods and services provide for health, social, cultural, and economic needs. Examples of services that benefit urban communities include rainwater treatment, carbon sequestration, air purification, soil development, climate buffering, biodiversity and watershed function.

Forest: The term *forest* is used here to refer to contiguous stands of predominantly native coniferous tree species of varying age classes. (Compare to the term *woodland* below).

Green infrastructure: An adaptable term used to describe an array of products, technologies, and practices that use natural systems – or engineered systems that mimic natural processes – to enhance overall environmental quality and provide utility services. As a general principal, green infrastructure techniques use soils and vegetation to infiltrate, evapo-transpirate and/or recycle stormwater runoff.

²⁰ Beatly, 2010

²¹ Kellert & Heerwagen 2008



Green space: Any vegetated land including bodies of water, whether public or private, within or adjoining an urban area.

Greenways: A city-wide network of pathways and bikeways situated on streets, along shoreline areas, and in natural corridors that link parks, employment districts, urban villages and other destinations along routes that give priority to walking and cycling and feature an attractive, well landscaped ambience including street trees and boulevard plantings, viewpoints, heritage resources, and natural habitat areas.

Habitat: The place or type of site where an organism or population naturally occurs.

Infrastructure: The physical capital and associated services considered basic and necessary to the functioning of an urban area. These include such things as: sanitary sewers, treatment plants, and water pipelines and distribution/collection systems; roads, signals, sidewalks and other components of the transportation system including transit vehicles, ferries and airports; solid waste management facilities including transfer stations and landfills; and, energy supply and distribution systems including hydroelectric and natural gas transmission and distribution systems. More generally, infrastructure can refer to other tangible public and private assets necessary to support the development of a modern urban settlement, such as hospitals, schools and recreation facilities.

Municipal forestry: The sustainable care, planning and long-term development of treed environments located on public lands.

Official Community Plan: Under the Local Government Act, a general statement of the broad objectives and policies of the local government respecting the form and character of existing and proposed land use and servicing requirements in the area covered by the plan.

Open space: Land that provides outdoor space for unstructured or structured leisure activities, recreation, ecological habitat, cultural events or aesthetic enjoyment that is publicly accessible.

Park: Open land held by the Town of Qualicum Beach that provides outdoor space for unstructured or structured leisure activities, recreation, ecological habitat, cultural events, or aesthetic enjoyment, not including planted areas within street rights of way.

Place character: The combination of street and lot patterns, landscape features, building forms, and activities that collectively determine the experiential and visual character of a place.

Proper functioning condition (PFC) assessment method: A qualitative method for evaluating the functional condition of a riparian area through an assessment of the hydrologic, vegetative and geomorphic attributes and processes within this environment at a point in time.

Rainwater management: A management approach that concentrates on conserving rainwater as a resource at the point of infiltration using best management practices collectively referred to as Green Infrastructure.

Stormwater: The water that originates during precipitation events. Stormwater that does not soak into the ground becomes surface runoff, which either flows directly into surface waterways or is channeled into storm sewers, which eventually discharge to surface waters.



Sustainability: The ability of all species to live within the means of one planet and share resources equitably.

Treed ecosystem: A functional biological environment and its abiotic constituents (such as soil, air, water and sunlight) that in which one or more trees feature as a dominant structural and functional component.

Urban forest: Sum total of all trees and their associated ecosystems, including understorey biota and soils, within the City of Victoria. Urban forest occurs on both public and private lands, including parks, boulevards, remnant ecosystems, residential yards, commercial and industrial lands and open spaces.

Urban forestry: The sustainable care, planning and long-term development of the urban forest and its associated ecosystems at multiple scales, including the site, neighbourhood, watershed and city.

Woodland: The term *woodland* is used here to refer to stands of predominantly native *deciduous* (broad-leaf) tree species (compare to the term *forest* above).



TOWN OF QUALICUM BEACH
Incorporated 1942

APPENDIX-1

Tree and Vegetation Action Plans



ACTION PLAN 1 – INVASIVE PLANT SPECIES RISK

(ASSOCIATED GOAL 3: MANAGE RISK IN TREED LANDSCAPES)

Objective: Prevent, reduce and control the effects of invasive species on natural ecosystems, human health and the local economy.

Overview

Introduced plant species are plants that have been imported to areas outside of their historical ecological range. They are often referred to as aliens, exotics, foreign, or non-native; however, not all introduced species are necessarily invasive or harmful. Many of our favourite ornamental trees and bedding plants “come from away”. Introduced species are regarded as harmful and “invasive” when their introduction or spread threatens the environment, economy or society, including human, plant or animal health. **It is estimated that the spread of invasive species is second only to habitat loss as a major cause of biodiversity loss.**

Discussion

Invasive plants may be transported to local areas by means of retail nursery sales, mail-order seed suppliers or plant material may have contaminated imported goods or shipping containers. Invasive plants are able to gain a foothold in local landscapes because they are successful at overcoming constraints that otherwise limit the spread of less aggressive plant species. Scotch broom and English hawthorn, for instance, are two examples of introduced species that are able to fix atmospheric nitrogen while producing chemical changes in the soils they colonize that suppress other plants.

The impact to local ecosystems of some invasive plants is a matter of ongoing investigation and discussion. Many infestations occur on disturbed sites where native vegetation has been removed. Some of the less pernicious “Invasives” can provide useful ecological functions that would otherwise be missing on brownfield sites, such as soil stabilization, rainfall interception and infiltration, shading, flowers for pollination and the enhancement of soil structure and biology where it has been degraded. Himalayan blackberry and gorse are local examples that are appreciated for their fruit or flowers by some, while cursed by others. Other invasive plants, however, such as Japanese knotweed, are considered wholly pernicious, spreading aggressively, and have proved difficult to remove without the use of strong herbicides.

The number and diversity of invasive plants in both rural and urban communities continues to grow. **Early intervention is rewarded by reduced management costs in the longer term, as it is significantly more expensive to remove infested landscapes once plants have become well-established.**



Recommendations

1. Implement a comprehensive program modelled after the Saanich Invasive Species Management Strategy.²²

Key components of this program modelled on the Saanich plan include the following:

- a) Regulate invasive species with the Town's Noxious Weeds and Grasses Bylaw 722 (2018). This Bylaw restricts BC weed species in the weed control act as well as other invasive species specifically identified by the Town. Currently, only one species is identified for control in the bylaw: Scotch broom.
- b) Consider funding a staff position for a Municipal Ecologist. Effective development and implementation of the Invasive Species Action Plan (ISAP) will require having the necessary scientific, technical and planning expertise on staff or available on a contract basis.
- c) Develop community support for the rationale, goal and implementation of the ISAP. Engage with key stakeholders to explore ways of modifying current practice to help achieve the Plan's primary objective and strategies.
- d) Adopt the *Capital Region Invasive Species Partnership* (CRISP) protocol for cataloguing and prioritizing regional invasive plant species. (Source link provided in the section *Useful Resources* below.)
 - i) **Prevent** species not known to occur in the region, but likely to establish once introduced.
 - ii) **Eradicate** species known to occur in limited distribution and low density. Eradicate if found.
 - iii) **Contain** infestations found in portions of the region. Contain existing infestations and prevent spread to un-infested areas.
 - iv) **Control** infestations common and widespread throughout the CIPC region. Focus control in high value conservation areas. Use biological control, if available, on a landscape scale.
 - v) **Classify** unknown invasive species as status is determined.
 - vi) **Excluded** species are removed from the list if not an environmental threat and to CN or CL otherwise.
- e) Review and amend the Town's Noxious Weeds and Grasses bylaw to include consideration of the current CRISP regional plant list and management classifications.

²² The Saanich Invasive Species Management Strategy (2013) was coordinated and lead by the Manager of Environmental Services, Adrienne Pollard with research and public engagement assistance from Dr. Val Shaefer (retired), formerly Director of the University of Victoria's Restoration of Natural Systems program.



2. Prevent the introduction of and eradicate new invasive species

The most efficient and economical management approach to invasive species is prevention and early detection using the Early Detection/Rapid Response (EDRR) approach. By focusing efforts on new and upcoming species, rather than managing after they have spread will keep resource requirements to a minimum. The Town will take the lead on invasive species categories and management classifications of Prevent and Eradicate, including species of special concern, with support from community and other partners based on established roles and responsibilities.

- a) Design and implement an *Early Detection and Rapid Response (EDRR)* protocol.
- b) Research, survey and identify EDRR species.
- c) Add EDRR species to the Town's Noxious Weeds and Grasses bylaw and prioritize their control over established species.

3. Contain and/or control the spread of established invasive species

Invasive plants, such as Himalayan Blackberry and English Ivy, have established in many areas and it is not expected that complete eradication of these species will occur. These particular species have come to form novel ecosystems and need to be managed as new communities, an approach to vegetation management called intervention ecology rather than ecological restoration. The emphasis is on containing their spread and controlling new populations from establishing within natural areas.

4. Ensure program sustainability

Securing and diversifying resources to continue focusing on priority actions is critical to being effective and efficient in the long-term.

Actions

- a) Focus resource allocation on the EDRR program, special concern species, as well as providing the required resources.
- b) Engage with stakeholders such as local ENGOs (e.g. Qualicum Beach Streamkeepers), local/regional plant nurseries, colleges, landscape contractors, land owners and resident associations on a yearly basis to facilitate support and participation for the ISAP and report out on progress in its implementation.
- c) Collaborate to develop regional invasive species biomass transportation, disposal and processing alternatives that are cost-effective, accessible, effective and ecologically sound.
- d) Promote restoration for all sites cleared of invasive plant species.
- e) Research and seek new sources of funding and approaches to combat invasive species.
- f) Provide opportunities for volunteers to collaborate, expand knowledge, and celebrate successes, large and small.
- g) Explore landowner incentives to control and properly dispose of invasive species.



5. Adopt a rigorous evidence-based adaptive management approach to the administration of the program

- a) Monitor
- b) Identify
- c) Assess, measure and evaluate
- d) Act
- e) Monitor and re-assess
- f) Adapt management procedures

Helpful resources

Saanich Invasive Species Management Strategy:

<https://www.saanich.ca/assets/Parks~Recreation~and~Community~Services/Documents/InvasiveSpeciesManagementStrategy.pdf>

Invasive Species Council of B.C. (ISCBC): <https://bcinvasives.ca/>

Status List for Priority Invasive Plants in the Capital Region (CRISP):

https://www.crd.bc.ca/docs/default-source/default-document-library/2019-03--regional-priority-invasive-species-list.pdf?sfvrsn=836aceca_0



ACTION PLAN 2 - WATERSHED PROTECTION

(ASSOCIATED GOAL 1: CONSERVE NATURAL VALUES AND SYSTEMS)

Objective: Protect and enhance watershed quality and ecosystem services

Overview and Discussion

Watersheds are rain catchment areas that lie between the highest elevations of land. Rainwater migrates downhill between soil layers or along bedrock. Some rainwater penetrates down to recharge groundwater aquifers, other flows remain surficial and coalesce into streams and creeks before terminating into a receiving water body such as a lake, wetland or the sea. Three water courses—Grandon Creek, Beach Creek and French Creek—traverse through the town and into the Salish Sea. These creeks function as drainages for the watersheds within which the Town sits.

Watersheds are important for many reasons and provide key benefits to the Town and the ecosystems and diverse biology that depend upon them. Rainwater is intercepted in the canopies and vegetation that cover much of the upland and lowland portions of the watersheds, slowing the passage of water (or snow-melt) to rehydrate thirsty soils while minimizing erosion. Once in the soils, rainwater can make its way through fractured rock or gravel to recharge groundwater, some of which feeds the Town's fresh drinking aquifers or provides fresh water for agriculture. In more impermeable soils or bedrock, the water migrates downslope, gradually coalescing into small streams and tributaries. Along the way, the water picks up, transports and disperses nutrients to plants and other biology growing within the soils. Rainwater recharges freshwater streams, lakes, ponds and wetlands, sustaining the fish, amphibians and other life that reside within these water bodies or the riparian areas associated with them.

The functional health of a watershed depends to a very great extent on the soils and vegetation cover within it and the soil biology that vegetation supports. Soil structure is what allows soil to efficiently infiltrate and disperse rain water. This structure is developed over time by the biology within the soil, including the seasonal extension and retrenchment of plant roots and the burrowing of worms, invertebrates and even fungi. Most soil biology lives within the upper half-metre of soil.

Impervious land cover (roads, buildings and parking lots) degrades the functional condition of watersheds. Conventional storm water management systems concentrate water from impervious surfaces into conveyance systems that typically direct it to the nearest stream or creek. Pollution, soil and stream channel erosion and depositions of silt and gravels within streams occur, degrading fish habitat and stream condition. Streams become more vulnerable to sudden flashes of storm water as there is less vegetation and pervious soils to infiltrate, slow and clean the rainfall within watershed catchment areas. The energy of hydrologic flows is increased significantly. As the functional condition of the watershed and its water courses decline, the benefits and ecosystem services associated with healthy watersheds decline also. If urbanization is left unchecked, the functional condition of the watershed can deteriorate to a point whereby it cannot be recovered.



Conversely, if the proper functioning condition of watersheds and their tributaries are maintained, they are better able to resist and recover from periodic shocks and sustain the benefits and ecosystem services that we and many other life forms rely upon. As noted above, a critical factor in maintaining watershed health is abundant tree and vegetative cover, including and especially along riparian areas adjacent to waterways.

Integrated storm water best practices, such as green roofs, on-site storm-water infiltration (such as bioswales, rain gardens or other detention devices, interrupted street curbs and daylighted culverts can help to mitigate the impact of urbanization of watersheds.

Recommendations:

1. Strengthen tree-cutting restrictions

- Restrict all tree-cutting without a permit in sensitive areas around watercourses and greenways, as identified by the Ecological Development Permit Areas (DPAs) in the Official Community Plan (OCP) Map Schedule 2.4.
- Applications for tree removals in Ecological DPAs should be reviewed by staff, and approval should only be permitted when the DPA guidelines are met and the proposed cutting is supported by a report from a Qualified Environmental Professional (QEP).
- Cutting should follow best practices, including removal of flammable debris. Consult QEP regarding salvage of tree stems for use as coarse woody debris within EDPA.
- Tree removals are currently prohibited in some areas by way of Development Permit Area guidelines ***but a tree protection bylaw will provide more effective for enforcement.*** Reconsideration the current draft tree bylaw.

2. Assess and evaluate the current biophysical condition of each watershed

- Review and refine mapping of watershed extent
- Document the location and percentage of impervious cover, tree cover and non-treed pervious cover within each watershed.

3. Assess and evaluate the *Proper Functioning Condition (PFC)* of significant creeks, streams and wetlands within each watershed

- Significant work has been done in assessing the health and condition of the Town's creeks by the Qualicum Beach Streamkeepers (QBS). PFC assessment should actively engage with the QBS and build on their foundational work.

4. Develop options and strategies for watershed rehabilitation and enhancement, based on *Integrated Stormwater Management (ISM)* and PFC principles

5. Engage with stakeholders

- Engage with stakeholders within each watershed on their properties to listen to their interests and concerns. (See the Qualicum Beach Streamkeepers and Creeks and Communities Strategy links in the *Helpful Resources* section below.)



- Identify the watershed values and benefits of most relevance to stakeholders;
 - Conduct field trips led by a Qualified Environmental Professional (aquatic biologist) to observe the condition of local streams, creeks and wetlands and learn about ISM and PFC best practices.
- 6. Develop a pool of potential resources to assist with funding and implementing the action plan, including governmental, community, ENGO, academic, professional and economic resources for action**
- Current municipal policies and tools
 - Current ENGOs or interested residents, relevant associations, professionals, volunteers etc.
 - Current and potential sources of funding
- 7. Support the work of the Qualicum Beach Streamkeepers and other watershed stewards**
- Monitoring
 - Stream restoration
 - Training
 - Funding
- 8. Develop a work plan to list and prioritize tasks, responsible agents, costs (including a preliminary 5-year budget forecast), timelines etc.).**

Helpful resources

- Qualicum Beach Streamkeepers website:
https://www.qbstreamkeepers.ca/about_us.html
- Water Balance Model for British Columbia: <https://waterbalance.ca/>
- Riparian Area Management: Proper Functioning Condition Assessment for Lotic Areas. U.S. Department of the Interior. Bureau of Land Management, National Operations Center, Denver, CO. 2015.
- Keeping Water on the Land Handout:
https://www.blm.gov/or/programs/nrst/files/KWOLposter_flyer.pdf
- Creeks and Communities – an initiative of the U.S. Riparian Coordination Network – *Achieving healthy streams through bringing people together:*
 - Creeks and Communities Strategic Plan (2002)
<https://www.blm.gov/or/programs/nrst/files/121902Final.pdf>
 - Creeks and Communities – introductory slide shows
<https://www.blm.gov/or/programs/nrst/power.php>
 - Creeks and Communities Handout:
https://www.blm.gov/or/programs/nrst/files/09_CCposter_handout.pdf



ACTION PLAN 3 – DANGER TREE RISK

(ASSOCIATED GOAL 3: MANAGE RISK IN TREED LANDSCAPES)

Objective: Reduce the risk of whole or partial tree failure

Overview

Periodic tree failures, either in whole or in part occur periodically in all communities. Tree failures that occur within striking distance of a target—such as persons, vehicles, buildings or vulnerable infrastructure—can cause loss of life or significant property damage. Residents, businesses, utility authorities and municipal corporations have a duty of care to manage tree risk to an acceptable standard of care or as proscribed in a tree risk management policy.

Recommendations

1. **Adopt tree care and risk management policies and practices that meet or beat the current standard of care within the industry**
2. The removal of trees assessed to be at moderate or high risk by a certified arborist qualified in tree risk assessment, and for which no other risk-abatement option is suitable, shall be authorized through a tree cutting permit application. Staff may commission an independent review of a tree cutting application if considered necessary. (This measure assumes that the Town has a tree cutting permit application procedure in place, which is generally empowered by a Tree Protection Bylaw.)
3. Emergency removals without a permit application shall be permitted under the following conditions:
 - 3.1. The tree is unstable, and the probability of failure is judged to be imminent (minutes or hours, not days or weeks); and
 - 3.2. The owner receives on-site approval for an immediate tree removal from a municipal parks arborist qualified in tree risk assessment; or
 - 3.3. If a municipal parks arborist is unavailable to attend the site, the owner provides a post-removal tree risk evaluation that confirms the tree's condition as unstable and in imminent danger of failing. All tree risk evaluations shall be prepared by an *ISA Certified Arborist* with an ISA Tree Risk Assessment Qualification and include photographic documentation of the tree and the target context.
4. **Draft a Municipal Tree Risk Management Plan for public trees.** Key elements of a plan include the following:
 - 4.1. Policy statement
 - 4.2. Goals of the program
 - 4.3. Standard of care statement
 - 4.4. Determination of acceptable risk
 - 4.5. Training and qualifications of risk assessors (ISA TRAQ)



- 4.6. Risk assessment protocol (ISA TRAQ)
 - 4.7. Frequency of assessments
 - 4.8. Management options to mitigate risks
 - 4.9. Record-keeping protocols
 - 4.10. Program funding strategy
 - 4.11. Program assessment, reporting and adaptive management
 - 4.12. Public communication and outreach policy and procedures
5. **Manage public tree risk on all public lands in conformance with municipal policy and best practices.**
6. Many tree failures occur due to poor tree structure, which is often the result of poor early care practices during the development of the tree. Implementing a program of tree care best practices for public trees when they are young can avoid expensive remedial work once they mature and reduce the rate of unnecessary stem or branch failures.
- 6.1. Carry out an audit and needs assessment of current municipal tree care practices.
 - 6.2. Develop an urban forestry action plan to address any critical gaps in the policies and care of the Town's public trees.
 - 6.3. Promote early tree care best practices for both public and private trees.
 - 6.4. Maintain an information web page(s) providing links to resources for the public on tree care best practices, such as the following site maintained by the International Society of Arboriculture:
<http://www.treesaregood.org/treeowner>.
7. Best management practices shall be implemented to keep public trees structurally sound and in good health, subject to public policy and resource limits.
8. **Maintain a data base of tree failures within the Town.** Should the Town implement a Tree Preservation Bylaw, it will be well-positioned through its tree cutting permit system to track tree failures. A registry of tree failures is useful for identifying risk factors specific to the Qualicum area that can be used to better manage future risk potential. Typical risk factors include the following:
- Tree species
 - Age class
 - Site conditions and disturbance history
 - Past tree alterations
 - Common root or stem rots
 - Other presenting defects in tree structure
9. In cases where a tree on private property is reported to be of concern for risk of failure to the Town by staff, council or a member of the public, the Town shall undertake a Level I (visual) tree risk assessment from public property by a qualified agent or member of staff. If the tree is rated to be at moderate or high risk, the homeowner shall be contacted by the Town and steps taken to confirm the risk assessment and abate the risk, if necessary, and at the owner's expense.



10. In cases where notification and engagement with a homeowner prove ineffective in relieving a documented tree hazard, provide authority for the Town to intervene and require or undertake the effective abatement of the tree hazard by pruning or removal and charge back the cost of the abatement work to the homeowner on their property tax bill.
11. As the intensity and frequency of localized windstorms or “microbursts” is anticipated to increase with a warming climate, the municipality and local retail nurseries are encouraged to maintain and communicate a list of trees appropriate for emerging climate conditions.²³ The list should be populated with a diversity of genera, species and cultivars that exhibit the following attributes:
 - high wood strength,
 - slower rates of growth,
 - strong mechanical structure and
 - resistance and resilience to drought, pests and disease.

Helpful Resources

Municipal Specialist Certification Study Guide, Nelda P. Matheny and James R. Clark (International Society of Arboriculture, Champaign, Illinois, USA. 2008) Chapter 6: Managing Risk in the Urban Forest

Tree Risk Assessment Manual, Julian Dunster (International Society of Arboriculture, Champaign, Illinois, USA. 2013)

ISA Best Management Practices - Tree Risk Assessment (International Society of Arboriculture, Champaign, Illinois, USA. 2011)

²³ Remnant forest-grown trees are typically not appropriate to retain where new residential or commercial development is approved.



ACTION PLAN 4 – FIRE RISK

(ASSOCIATED GOAL 3: MANAGE RISK IN TREED LANDSCAPES)

Objective: Minimize risk of fire associated with urban and rural vegetation

Overview

Wildfire interface risk is on the rise in rural towns and communities around the province. Contributing factors include the following:

- Annual precipitation rates are declining.
- Dry seasons are getting longer.
- Summer temperatures are getting hotter.
- Fuel loads within wooded areas continue to build; and
- Residential development is pushing out into forested areas.

A 2019 Hazard, Risk and Vulnerability Analysis conducted on behalf of the Regional District of Nanaimo, the Town of Qualicum Beach and the City of Parksville, concluded that of 53 hazards, Fires (Wildfire and Urban Interface) presented the greatest risk.²⁴

Table 12 – Top hazard for the region

Hazard	Likelihood (1-5)	Overall Consequence (11-55)	Risk
Fires (Wildfire and Urban Interface)	5	37	185
Overland Flooding	5	29	145
Wind Event	4	35	140
Drought	5	28	140
Motor Vehicle Incident	4	31	124
Electrical Power Outage	5	24	120
Structure Fire	5	24	120
Rivers, Lakes, and Stream Flooding	5	23	115
Coastal Flooding	5	22	110
Human Disease	3	33	99
Intentional Acts of CBRNE	2	35	70
Active Threat	2	33	66
Megathrust Earthquake	1	55	55

A 2007 *Community Wildfire Protection Plan* provides a detailed and place-specific assessment and management plan for the Town.²⁵

The emergency programs for the City of Parksville and Town of Qualicum Beach work in unison to provide large scale emergency support and disaster service—including Wildfire and Urban Interface fire emergency response--to residents of the Parksville-Qualicum Beach area.

²⁴ CCEM Strategies. (2019). Hazard, Risk and Vulnerability Analysis. Prepared for Regional District of Nanaimo, Town of Qualicum Beach, and City of Parksville.

²⁵ Strathcona Forestry Consulting. (2007). Community Wildfire Protection Plan for the Town of Qualicum Beach.



Flammable vegetation close to urban buildings is also a known fire risk. This risk is managed by the Town's Fire Department.

Recommendations

1. Implement an Environmental Development Permit Area that identifies areas of the Town assessed at *high* to *extreme* risk of wildfire. Add this EDPA to Schedule 2 of the current OCP.
2. **Refer to the Town's 2007 Community Wildfire Protection Plan** (Stratchona Forestry Consulting) for detailed recommendations.
3. Climatic and local conditions on the ground continue to change. It is recommended that the Town **update its 2007 Wildfire Protection Plan**. The Plan made a number of implementation recommendations for areas at *high* to *extreme* wildfire risk that the Town may wish to report out on.
1. Working with the recommendations provided in the above plan, **prepare an operational workplan for wildfire risk management within the Town's borders**, including prioritizing tasks, identifying responsible agents, costs, and timelines. Include the development of a preliminary 5-year annual budget forecast.
2. **Work with rural landowners and jurisdictions with lands abutting the Town to implement provincial FireSmart guidelines and improve wildfire risk management.**
3. **Consider designating areas of high wildfire risk as development permit areas.** Develop DPA guidelines and permit conditions as appropriate.
4. **Avoid extending urban development into areas of high wildfire risk.** Evaluate current and long-term municipal land-use and community development planning within high-risk wildfire areas.
5. **Prescribe treatment measures to slow or interrupt potential fire spread, including the identification of strategic points for intervention.**
6. **Develop a strong municipal outreach program of education and incentives for homeowners in high-risk areas** to promote the development of home-based wildfire risk management plans and the adoption of best practices for wildfire risk abatement. Typical best practices include the following:
 - Clear flammable vegetation away from buildings to recommended setbacks and reduce fuel loads of dead trees and branch litter in forested settings near settlements.
 - Avoid planting flammable evergreen trees, such as pines, firs and cedar varieties within 30m of buildings within high-risk areas.
 - Use flame-retardant roofing and building materials.
 - Encourage rural landowners to place fire-fighting hand tools in strategic areas for rapid response to ignition events.



7. **Incorporate fire risk management as an exemption to be added to any future Tree Preservation Bylaw.**
8. **Minimize fire ignition risk.** Sign and manage rural road edges to lower the risk of fire ignition from cigarettes or hot vehicle exhausts.
9. Should second or third-growth forested lands come under municipal management, **incorporate wildfire risk abatement measures into forest management plans.** Encourage private forest land managers to do the same.
10. **Request the Fire Chief or local emergency management authority to report annually on wildfire activity and response,** including the following:
 - establishment of pre-emptive fire breaks,
 - improvements to firefighting access and
 - water supply and access for wildfire fighting.

Helpful Resources

<https://www2.gov.bc.ca/gov/content/safety/emergency-preparedness-response-recovery/fire-safety/wildland-urban-interface-fire-information>

<https://www.emergencycoastside.ca/>

<https://www2.gov.bc.ca/gov/content/safety/wildfire-status/wildfire-situation>



ACTION PLAN 5 – REDUCE TREE-RELATED NUISANCES & DAYLIGHT HOMES AND GARDENS

(ASSOCIATED GOAL 2: ACCOMMODATE OTHER PRIVATE AND PUBLIC VALUES)

Objective: Work to resolve tree-related nuisances while conserving trees whenever possible.

Overview

Poorly placed or overgrown trees can pose a nuisance to other values on private property by over-shading homes (resulting in dark interiors and premature deterioration of house roofing and fascia), patios, vegetable gardens and/or solar panels. Other nuisances can include sap or insect excrement dripping onto vehicles or decks, tree roots heaving paved drive or walkways, unwanted encroachment of vegetation into living or garden spaces etc.

Discussion

In the draft 2018 Tree Preservation Bylaw, best pruning practices are exempted from the requirement for a permit application. Crown or root pruning is often enough to relieve a nuisance concern.

If pruning is not enough, Town Council may wish to consider the amount of latitude it wishes to provide staff to manage nuisance-based tree cutting applications on private property, including for unwanted shading. If the rates of loss and replacement of tree cover within the Town trend within an acceptable range relative to the Town's tree canopy cover goals, Council may wish to grant staff the discretion to review and approve these types of tree cutting permit applications. Alternately, if Council feels that less latitude is called for, it may wish to adjudicate nuisance-based tree cutting applications themselves.

An underpinning principle of governance that Council may wish to consider with respect to this issue is whether, under what circumstances, and to what degree local government should intervene to regulate the reasonable use, enjoyment and management by residents of their own property. Other relevant considerations include the following:

- Most tree loss is associated with new development and changes in land use, whereas only relatively small amounts of tree cutting are associated with periodic maintenance of vegetation on residential properties.
- Trees and vegetation tend to grow vigorously in our climate and soils (roughly at a compound rate of 1.5% per annum), so residents must periodically intervene to constrain vegetation from encroaching unduly upon their homes and gardens.
- Some of the native forest-trees—such as Douglas-fir, Grand fir, and Western Red cedar—can grow very large and may not be suitable for smaller urban yards. While these are desirable species within larger open spaces, such as parks, rural acreages or larger urban lots, flexibility is needed on small residential lots to allow residents to transition to more suitably sized tree species.

Recommendations



1. **Encourage residents to preserve trees and vegetation wherever possible.**
2. **Maintain a conservative posture toward municipal oversight and regulation** of properties not subject to redevelopment while tree conservation policy objectives are being met. Intervene only when there is a compelling need to do so. If a permit application approach is adopted (see Item 6 below), ensure that it is as simple, inexpensive and easy to navigate as possible.
3. **Promote the principle of the “Right tree in the right place”** principle for new plantings to avoid future conflicts with trees and vegetation. This principle may also be applied to situations where an existing mature tree has outgrown its space and presents an increasing and demonstrable nuisance to one or more residents.
4. **Seek out opportunities to inform and educate residents on tree management best practices**, including tree selection, planting, early tree care, tree pruning and measures to relieve typical tree-related nuisances.
5. **Prevent the unnecessary or excessive removal of trees and vegetation.**
6. **Develop policy and procedures to guide the review of tree cutting applications for the relief of nuisance.**
 - a. Require clear documentation with the tree cutting application:
 - i. a clear description of the nuisance and any measures that have already been investigated or attempted to relieve it;
 - ii. a sketch indicating approximate location of subject tree(s) on property in relation to house or target of concern;
 - iii. photographic images that illustrate the nuisance, if possible.
 - b. Assess the application, being mindful of Objective 2 above.
 - c. If necessary, request an arborist’s assessment and report.
 - d. Permit or deny the application. If the permit is denied, provide an alternate (preferred) remedy(s).

Helpful Resources

- ISA Best Management Practice booklets: (<https://www.isa-arbor.com/store/category/117/>)
- Tree-Pruning Guidelines
 - Tree Planting
 - Integrated Pest Management



ACTION PLAN 6 – SLOPE FAILURE RISK

(ASSOCIATED GOAL 3: MANAGE RISK IN TREED LANDSCAPES)

Objective: Conserve and enhance tree and vegetation cover on steep slopes while minimizing the erosion of existing view sheds.

Overview

Steep slopes can fail. Examples of typical slope failures include localized areas of rapid soil erosion (usually associated with concentrated channels of storm water run-off), mass wasting or displacement, partial erosion or wasting that undermines soils at higher elevations. Urban land use and management can reduce or exacerbate the risk of slope failure. Adequate tree and vegetation cover on steep slopes and upslope environments significantly reduces the risk of slope failure or degradation.

Some factors that can increase the risk of failure include the following:

- steepness of bank,
- the competency of the soils and underlying geological condition of the slope,
- cutting or removal of vegetation (trees and vegetation help to bind and anchor soils and control storm-water run-off),
- extreme weather or seismic events,
- changes to the hydrology of the site, and
- mechanical disturbance.

The trees growing on steep slopes can grow up into the established viewsheds of residences located further upslope and back from the top of bank. Managing conflicts between steep slope vegetation and viewsheds can be challenging. (Cross-reference Action Plan 9 – Viewshed Conflicts.)

Recommendations

1. Assess, stratify and map properties within proposed Steep Slope Development Permit Area according to their slope and associated risk of failure (e.g., slopes 15 – 30% vs. slopes greater than 30%)
2. Implement policies and tools to improve land management on or adjacent to steep slopes to reduce the risk of slope failure.
3. Educate and support affected landowners
4. Recommendation: Inform affected residents of land management best practices, typical risks for be aware of and municipal policy governing activity on or adjacent to steep slopes.
5. Delegate authority to issue Development Permits for steep slopes to staff.
6. Tree removal and replacements on a steep slope will only be considered in conjunction with a site-specific tree and vegetation plan that includes the following.
 - a. A landscape plan shall be provided that is designed to maximize slope stability, minimize visual impacts into the site resulting from tree removal and minimize future viewshed conflicts associated with replanting.
 - b. A geotechnical report and long-term monitoring plan shall be provided.



- c. If tree removal and replanting is proposed, a report prepared by an ISA Certified Arborist shall also be required, in coordination with the geotechnical professional.
- d. Each tree removed is replaced by suitable species at a ratio of 10 replacement trees for every one removal. The landscape planting plan shall ensure that tree types are selected that will avoid potential future viewshed conflicts.
- e. Phasing for tree removals should be encouraged so that vegetation is not removed on more than one-third of a slope each year. There are cases where such phasing is not feasible due to access constraints or other limitations.
- f. Secure a commitment from applicants to develop and implement a management plan to prevent, reduce, control invasive plant species on the slope.
- g. All cut material will be removed from the bank; Procedures for the safe implementation of this measure shall be specified in the applicant's Tree and Vegetation Management Plan. (If improperly carried out, this measure has potential to impact worker safety and cause collateral damage to understorey vegetation on the slope.)
- h. A S. 219 Covenant must be registered on the title of the affected property addressing the geotechnical requirements of the site.
- i. If the proposed work is in a highly visible area, the Director of Planning may require the landscape plan (Item-a. above) be extended to address the entire site, include a planting plan identifying the location, number and type of plants (existing and proposed) and a 10-year maintenance plan and a performance bond to ensure the successful establishment of plantings during that time.

Helpful Resources

Steep Slopes Development Review – City of Coquitlam

<https://www.coquitlam.ca/docs/default-source/council-agenda-documents/citydocs--2931498-v1-regularcouncil - 2018 04 16 - item 10.pdf?sfvrsn=2>

Best Management Practices Handbook: Hillslope Restoration in British Columbia

<http://www.llbc.leg.bc.ca/public/PubDocs/bcdocs/352461/bmp-handbk-final-mar-2002.pdf>



ACTION PLAN 7 - TREE CONSERVATION

(ASSOCIATED GOAL 1: CONSERVE NATURAL VALUES AND SYSTEMS)

Objective: Conserve trees, woodlands and forest.

Overview and Discussion

Although not without their challenges, trees provide many important values and benefits to the community and diverse landscapes of the Town.

URBAN FOREST BENEFITS



The benefits of trees noted in the figure above are evident in the priorities and associated landscapes highlighted in the *Quality-of-Life Survey*. Trees, forests, and woodlands are working hard to stabilize steep slopes, maintain proper functioning condition within the Towns streams, wetlands and watersheds, buffer the effects of climate change, soften the look of the Town’s built environment, enhance the public realm, mitigate storm water, remove pollutants from the air and provide habitat for many floras and fauna.

In this respect, not all trees—or treed environments—are equal. Larger canopy trees provide significantly greater ecosystem and health benefits than do small ornamental trees. Larger connected groupings of trees provide greater ecosystem and biodiversity benefits than isolated specimen trees.

There are some settings, however, when the amount or location or kind of tree cover can be “too much of a good thing”. This concern is at the heart of several of the *Survey’s* priorities, such as obstructed view sheds or the blocking of sunlight from some resident’s gardens or solar panels. This is not simply a matter of “dosage” (i.e. too many v. too few trees), but rather having **the right tree in the right place** so that trees can play well in the metaphorical sandbox of community, where many interests and values must coexist.



Trees in poor condition can also pose a risk to people and property in the event of failure. Poorly placed trees can create a significant nuisance for some homeowners and the Town's public works crews: large surficial tree roots can heave sidewalks and driveways, infiltrate perimeter drains, rain sap seasonally onto decks, cars and driveways or provide access points for unwanted guests onto house roofs and attics. In more rural areas, or where forested areas interface with new urban development, there is the risk of wildfire to consider.

The soils and climate of the Town are ideal conditions for tree growth, provided that the Town is able to sustain adequate amounts of good soil and green space for trees to mature in. When it comes to sustaining urban forest, well-structured and biologically productive soils are a greater limiting factor than are trees themselves. A well-structured, productive growing soil takes many decades to develop (largely through soil biology). Land development can destroy this valuable resource through soil compaction, unnecessary removal of native soils, inversion of the soil column and burying soils with fill. Without healthy growing soils and adequate space to mature in, trees cannot flourish. When thinking about how to protect trees during land development, consider how to minimize disturbance to intact soil areas, even if not currently treed.

As urban areas densify, the competition over green space intensifies; as a consequence, there is a need to think strategically about how to ensure that the Town continues to enjoy an abundance of high-functioning treed environments within its more developed areas. Restricting conservation to site-level strategies is, at best, a rear-guard action: there is a limit to what can be conserved when building lots are subdivided into ever smaller areas and house sizes, accessory buildings and servicing requirements increase. As land-use patterns change, there is a need to move away from site-centric thinking and begin to plan and design for high-functioning public greenspaces that are embedded into higher density communities. This involves strategies that include land assembly, new zoning options, landscape ecology, engineered ecology, integrated storm water planning and innovative street, block and neighbourhood-level planning and design.

One final note on trees and development. Returning to the theme of "dosage", development can be a long-term positive influence on urban forest health and character or a bane, depending on three factors: quantity, velocity and quality. When development occurs at a sustainable pace and scale **and is administered effectively**, it can function as a positive influence on the urban forest at the landscape scale by provoking greater diversity in tree species, age classes. In this way, land development functions analogously to *natural disturbance events* in wild forestland—such as wildfire, pests and disease, windstorms, drought etc. When these events occur at a local scale on a periodic basis, they have the effect of diversifying the structure of our forest land, creating what is called a *landscape mosaic* and conferring greater health, resistance and resilience to the ecosystem. Urban redevelopment can be an opportunity to plant new trees that will be better adapted to the new land use and emerging climatic conditions. Similarly, residents who periodically remove one or more trees (whether to manage risk, daylight their gardens or eliminate a nuisance) also contribute to the long-term health and utility of the urban forest when the casualty tree is replaced following ***the right tree in the right place principle***.



From this point of view, the challenge is not to *prohibit* tree cutting or urban development, but to *regulate* the scale, pace and quality of how these disturbances occur to ensure that valuable soils are conserved where possible, greenspace is maintained (if in new locations and configurations) and new trees, appropriate to their setting and desired function, are planted in sufficient numbers to ensure that the urban tree canopy is sustained. The tool that provides municipal government with the ability to regulate tree cutting and replacement on private lands is the *Tree Protection Bylaw*. Like any tool, bylaws can be clumsy or deft and much depends on how they are crafted and administered.

Recommendations:

1. **Develop and enact a Tree and Soil Conservation Policy** (draft completed—see Appendix-1).
2. **Enact a tree conservation bylaw that prohibits the cutting of “protected trees” without a permit.**
 - a. **In addition to Trees growing within Environmental Development Permit Areas, the following trees are proposed as “Protected”.**
 - i. The following sensitive native species 50 centimetres (20 inches) or more in height, or 5 centimetres (2 inches) or more in diameter when measured 15 cm (6 inches) above natural grade:
 1. Arbutus (*Arbutus menziesii*);
 2. Garry Oak (*Quercus garryana*);
 3. Pacific Dogwood (*Cornus nuttallii*);
 4. Pacific Yew (*Taxus brevifolia*);
 5. Cascara (*Rhamnus purshiana*);
 6. Seaside Juniper (*Juniperus maritima*);
 7. Trembling Aspen (*Populus tremuloides*);
 8. Douglas maple (*Acer glabrum*)
 9. Pacific crabapple (*Malus fusca*)
 10. Black hawthorn (*Crataegus douglasii*)
 - ii. Any tree with a stem diameter greater than 30cm DBH.
 - b. **Tree Cutting Permit applications would be reviewed by staff and removals would be considered in the following circumstances:**
 - i. Any tree or protected tree that interferes with or is in such close proximity to utility wires as to be a danger, subject to a report submitted by an Arborist.
 - ii. Any tree or protected tree that has roots that interfere with, block or damage a drainage or sewage system or other underground improvements, subject to a report submitted by an Arborist.
 - iii. Any tree or protected tree that is on or is impeding in use of any park or highway, as determined by the Director of Engineering and Operations.
 - iv. Any tree or protected tree that is within a proposed building footprint as approved by a Town of Qualicum Beach Building Permit.



- v. Where an arborist report documents that the protected tree, by virtue of its size and species, is inappropriate for its location and includes the reasons that it is deemed to be inappropriate for its location, all to the satisfaction of staff. Avenues of appeal are recommended to the Director of Planning and to Council, if required.
- vi. Where the applicant submits a landscape plan and surety bond to the satisfaction of staff that provides for a new landscape of greater ecological value to the urban forest than what is currently provided by the tree (or trees) proposed for removal.

3. Address municipal tree management challenges and opportunities

- a. Promote cross-disciplinary collaboration amongst relevant departments.
- b. Monitor, evaluate and adapt
- c. Invest in good stock selection, generous soil volumes and young tree care, which will save money and provide greater benefits over the live cycle of the tree.
- d. Implement a program to work with the Province of BC, local land managers and nursery trades to monitor for and control outbreaks of plant pests or diseases of concern on both public and private lands.
- e. On forested sites, undertake root rot surveys more frequently to identify and control emergent centers of diseases being transmitted to healthy adjacent trees via root grafts.
- f. Reduce tree conflicts with sidewalks, underground services and road right of ways by encouraging residents to host a street tree on their private frontage.
- g. Reduce the negative impact to concerned community members over significant tree removals on public lands through robust stakeholder engagement and public notification undertaken well in advance. Plant replacement trees immediately following tree removal.
- h. Set a good example (“Do as we do, not just as we say”)

4. Resource this Tree Conservation Action Plan (TCAP)

- a. Lobby senior levels of government to recognize the urban forest as a tangible asset of public infrastructure and to assist in funding it accordingly. (Developing a *Natural Assets Registry* will assist in this process.)
- b. Operationalize this action plan. Establish capacity-building objectives and resourcing requirements as a basis for planning a realistic 5-year implantation plan.
- c. Make the most of available resources.
- d. Seek new opportunities for resourcing the work of urban forestry.
- e. Work with the development community to help fund new urban forest.

5. Engage and Support the Community in Urban Forest Stewardship

- a. Education and Outreach
- b. Community Engagement
- c. Support ENGOs promoting tree or natural area conservation
- d. Provide excellent on-line resource material
- e. Implement a significant tree program to support residents who host a significant tree



- f. Provide free trees and training to residents who contract to host and water new street trees on their frontage
- g. Celebrate trees and the many benefits they provide!

Town-wide Recommendations

1. **Create a position for a Municipal Ecologist** within the Planning Department, who is empowered to work with staff across the organization and community to steer work on the goals of this plan and report annually to Council.
2. **Operationalize this Tree Conservation Action Plan**, including annual schedules with prioritized tasks, the staff or outside resources responsible for implanting those tasks, measures of success, realistic timelines and the provision of estimates and options to resource the plan.
3. **Incorporate the goals, policy objectives and strategies of the TCAP within other relevant Town plans, policies, bylaws and development guidelines.**
4. **Increase urban forest cover** to more optimal levels in neighbourhoods currently exhibiting low canopy cover.
5. **Conserve or replace sufficient greenspace to sustain the urban forest**, with particular attention to the needs of large canopy trees.
6. **Develop a biodiversity strategy**, including measurable objectives for the protection, recovery or enhancement of sensitive ecosystems, species at risk and other important flora and fauna.
7. **Update the Town's Sensitive Ecosystem Inventory, including associated imagery and data sets and re-evaluate the current condition of these assets.** Include natural areas on both public and private lands, including forested areas greater than 0.4 ha.
8. **Develop and implement a Sensitive Ecosystems Management Plan for both public and private lands.**
 1. Areas identified as potential Sensitive Ecosystems with a condition rating of *Good* or *Excellent* should be prioritized for active management, including ongoing restoration, and community stewardship.
 2. Evaluate Sensitive Ecosystems with a condition rating of *Fair* for restoration potential. Restoration efforts should be considered in those cases where the system has the capability or potential to be restored to a higher functional condition.²⁶
9. **Encourage connectivity between areas of natural habitat** through strategic greenway and neighbourhood urban forest enhancement initiatives.

²⁶ Remnant SEI classes in poor condition typically no longer have sufficient ecological integrity to be restored to a proper functioning condition, particularly in urban settings where stresses and factors that undermine ecological integrity are pervasive. While these settings fail to meet the definition of an SEI due to their condition, they can continue to offer other ecosystem and amenity benefits.



10. **Add a GIS inventory layer of all areas of contiguous forest 0.4 ha and larger on both private and public land** (may be incorporated into the SEI GIS layers).
11. **Measure and report on the scope and value of ecosystem** services provided by the urban forest on both public and private lands.
12. **Communicate this information** as part of a broader effort to engage and educate the community on urban forest values and benefits.

Recommendations for Public Lands

1. **Develop and fund an enhanced Street Tree Management Program for the Town.**
Ensure that operational resourcing levels keep up with increases in the street tree inventory over the entire life cycle of the asset.
2. **Systematically map, classify and assess the condition of urban forest on public lands**, including street trees, natural areas, recreational parks and other public landscapes.
3. **Where appropriate, conserve, connect, restore and enhance forested ecosystems on public lands.** Tools to conserve forested landscapes include the following:
 - strategic land assembly,
 - acquiring additional park land or greenways through land use negotiations (i.e. rezoning and densification)
 - promote and support greater levels of community stewardship
 - Develop a Natural Areas management capacity within the municipal organization.
4. **Consider establishing a Natural Assets Registry for the Town.²⁷**

The Town is currently investigating the viability of establishing a GIS-based asset management system for its “hard” assets, such as streetlights, benches, etc. Should this initiative prove efficacious, street trees would be an early green infrastructure asset-type to consider adding as resources permit. Larger treed parcels, such as forest-land around the airport, could follow in time.

5. **Develop a Tree Risk Management Policy and Program for street trees, natural areas and other tree environments on public land.**
6. **Manage existing mature street trees to extend their *safe useful life expectancy*** (buying time for newer trees to develop and contribute meaningfully to the urban forest canopy).

²⁷ The following links provide two examples how the concept of municipal natural asset management has been applied in other jurisdictions:
https://www.refbc.com/sites/default/files/The%20Municipal%20Natural%20Assets%20Initiative%20overview%20guidance%20document%20for%20stormwater%20management_May_31-v2.pdf

<https://fcm.ca/en/resources/mcip/measuring-the-value-natural-assets>



7. **Continue a vigorous street tree replacement program, selecting species and locations to achieve the following outcomes:**
 - maximize species and age diversity,
 - be ready for future climates,
 - minimize nuisance and risk,
 - minimize maintenance costs, and
 - maximize green infrastructure and other benefits.
8. **Make young tree care a high priority** within the municipal forestry program.
9. **When designing new landscapes within public spaces, choose planting schemes that will optimize the potential benefits and ecosystem functions of the landscape** (e.g., transforming greenways into productive ecosystem corridors as well as attractive transportation corridors for pedestrians, cyclists and electric wheelchairs).

Recommendations for Privately Owned Lands

1. **Implement the draft Tree Protection Bylaw**
2. **Develop a program to identify and conserve heritage and other significant trees and landscapes throughout the Town.**
3. **Consider a pilot project to encourage homeowners to ‘host’ public trees in their front yards,** in areas where there is a high level of conflict between street trees and underground services and infrastructure.
4. **Increase community support for the urban forest.**
5. **Empower homeowners to make good urban forest decisions on their property.**

Recommendations for Private Lands under Re-development

1. **Develop urban forest policy objectives and design guidelines for new developments** that are appropriate to each major land-use type.
2. **Ensure that guidelines for landscaping of new developments include measures to enhance the urban forest.**
3. **Improve oversight of landscape design, planting and construction on redevelopment sites** to ensure that the City’s design guidelines are met. Implement landscape plan checking or quality assurance for a representative sampling of new development applications.
4. **Ensure that new tree plantings are sustainable** by inspecting trees both after planting and at the end of the establishment period (two summers) before returning planting deposits.

Helpful resources

Gye and Associates, Consultants in Urban Forestry and Arboriculture, [City of Victoria Urban Forest Master Plan](#) (Victoria, BC. 2013)



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Nelda Methany and James R. Clark, Trees and Development, A Technical Guide to the Preservation of Trees During Land Development (International Society of Arboriculture, Champaign, IL, USA. 1998)

Nelda Methany and James R. Clark, Municipal Specialist Certification Study Guide (International Society of Arboriculture, Champaign, IL, USA. 2008)

James Urban, Up By Roots, Healthy Soils and Trees in the Built Environment ((International Society of Arboriculture, Champaign, IL, USA. 2008)

Sustainable Sites Initiative, Sites V2, Reference Guide for Sustainable Design and Development, (University of Texas, Austin, Texas. 2014)



ACTION PLAN 8 - WILDLIFE HABITAT AND SENSITIVE ECOSYSTEM CONSERVATION

(ASSOCIATED GOAL 1: CONSERVE NATURAL VALUES AND SYSTEMS)

Objective: Conserve Wildlife Habitat and Sensitive Ecosystems (including rare or endangered species and plant communities)

Overview

The eastern coastal lowland of Vancouver Island and the adjacent Gulf Islands comprise a unique ecological region in Canada, with exceptionally high biodiversity values and many rare and endangered plant and animal species and plant communities. Intense development pressure in this area has resulted in the fragmentation and loss of many of these rare ecosystems...With so few of these rare and fragile ecosystems left in the region, the study area, the need to treat seriously every one of the sites identified, and to fully evaluate all possible land use options before initiating any changes is critical.²⁸ Between 1993 and 1997, the Canadian Wildlife Service undertook an aerial inventory of the remaining terrestrial sensitive ecosystems in this region. The study was updated in 2011. The study developed a catalogue of the different sensitive ecosystem types. 39.3 ha. of sensitive ecosystems were mapped for the Qualicum Beach area—about 2.2% of the Town’s land base--each one with different structural characteristics and habitat potential:

Older forest	16.4
Riparian	21.5
Wetland	1.4
Sub-total:	39.3 ha

In addition these *sensitive terrestrial* ecosystems, the Town contains reaches of three creeks containing aquatic flora and fauna as well as significant areas of other ecosystems, including agricultural lands, younger forest, older second growth forest, deciduous woodland and novel or modified ecosystems within the Town’s more urban landscapes.

While virtually any landscape can provide some habitat potential, many rare and endangered native species are adapted to habitats with specific structural characteristics. Within these habitats, native and adapted flora and fauna have developed relatively persistent ecological relationships with their environment (or “niches”), which must be conserved in order to sustain these species as viable populations. A recent study determined that native oaks in the eastern USA can host up to nearly 600 species of caterpillars, whereas introduced species of oak typically support only a handful of species.

²⁸ Sensitive Ecosystems Inventory: East Vancouver Island and Gulf Islands 1993 – 1997, Volume 1, Peggy Ward, Gillian Radcliffe, Jan Kirkby, Jeanne Illingworth and Carmen Cadrin (Technical Report Series Number 320, Pacific and Yukon Region, Canadian Wildlife Service. (1998)



This has significant consequences for bird species that depend upon caterpillars as a major food source.²⁹

Many forces are at work to degrade these habitats and the complex web of ecological relationships that they sustain. These forces include habitat fragmentation, simplification, predation, land conversion, industrial forestry and agriculture, flooding and drought. As these habitats become stressed, opportunistic fungal and bacterial species can begin to swell in number and overcome the resistance of host flora and fauna.

Biodiversity conservation is the work of preserving, repairing and reconnecting habitats for the purposes of conserving the resident biology. It is a complex and skillful endeavour that requires considerable expertise. It can be assisted, however, by efforts that preserve the trees and vegetation that provide much of the structure and function underpinning these ecosystems. It is an uncomfortable reality today that there are no longer any pristine natural areas left on the earth—virtually all natural environments have been altered to some degree by human activity, many of them to a significant degree. With this alteration comes a responsibility to manage the ecosystems we have disturbed and the biological life forms and systems they support. It is also in our self-interest.

Biodiversity and high-functioning ecosystems support a healthy, livable and sustainable community. Preserving nature (including plants, wildlife, and ecological values and functions) provides many benefits, such as clean air and water, moderated temperatures, reduced infrastructure, and aesthetic and recreational value.

Recommendations:

- 1. Update the Town’s Sensitive Ecosystem Inventory**
- 2. Support local stewardship initiatives that work to conserve natural systems, such as the Qualicum Beach Streamkeepers.**
- 3. Engage with local residents and businesses to “naturescape” the landscapes they inhabit.**
- 4. Commission a biodiversity conservation strategy to be developed, along with the underlying ecological and biological surveys and mapping to support it.**
- 5. Work with local ENGOs and retired life-science professionals to map and assess the current biophysical condition of the Town’s natural areas and sensitive ecosystems**
 - Relevant locations
 - spatial extent
 - important landscape linkages (where relevant)
 - structural attributes
 - resident species of flora and fauna
 - vulnerability rating (functional condition)
 - damaged, missing or threatened components

²⁹ <https://www.audubon.org/news/new-research-further-proves-native-plants-offer-more-bugs-birds>



- 6. Adopt landscape ecology principles for land use and green space planning. Plan for large, connected green and blue spaces with a diversity of vegetation, coarse organic debris, age classes and structural attributes.**

Helpful resources

Strategic Directions for Biodiversity Conservation in the Metro Vancouver Region, The Biodiversity Conservation Strategy Partnership, Vancouver, BC (2008):

<http://www.metrovancouver.org/services/regional-planning/PlanningPublications/StrategicDirectionsBiodiversityConservation.pdf>

Bird Friendly Design Guidelines Explanatory Note, City of Vancouver, Vancouver BC (2014): <https://vancouver.ca/files/cov/bird-friendly-strategy-design-guidelines-draft-2014-09-01.pdf>

Habitat Acquisition Trust, Victoria, BC: <http://hat.bc.ca/>



ACTION PLAN 9 – MAINTAIN VIEWS

(ASSOCIATED GOAL 2: ACCOMMODATE OTHER PRIVATE AND PUBLIC VALUES)

Objective: Balance residents’ desire to maintain viewsapes with the Town’s policy to conserve trees wherever possible.

Overview

View shed conflicts arise when trees obstruct or threaten to obstruct a view to which one is attached or a potential view that one hopes may enhance the liveability and value of a home. Unlike other forms of nuisance, relief from this type of conflict often falls into the category of a “nice to have”, rather than a “must have”.

Sometimes the conflict is simple to fix. The trees in question belong to the homeowner and the conflict can be remedied through pruning without resorting to wholesale tree removal. More often, however, the trees belong to a neighbour and nothing short of radical topping or removal of the offending trees will provide satisfaction. In these more prevalent types of cases, the conflict is not just between trees and views, but often becomes a conflict between neighbours. Properties located on elevated heights near or just back from the crown of a slope with trees growing on properties downslope or beside the conflicted lot are most prone to view shed conflicts.

Two types of challenges can beset the conflicted homeowner. The first is to persuade the owner of the offending trees to take action to enhance the view. If successful in obtaining a sympathetic hearing from the tree owner, a second challenge is to remediate the view conflict without running afoul of one or more municipal regulations (such as a steep slope development permit area or a tree protection bylaw).

From a municipal governance perspective, the challenge with these types of conflicts is in how best to balance private interests with public policy while staying clear of potential civil disputes.

Recommendations:

- 1. Provide a permit application process for residents who desire to relieve a conflict between a tree (or trees) and an existing or potential viewshed.**
 - a) A tree removal permit application to enhance a viewshed may be considered by staff under Exemption 3 of the draft Town Private Tree Conservation Policy. (This strategy assumes that the Town Private Tree Policy is adopted and that a permit-enabling tree bylaw is passed by Council.)
 - b) Where the subject trees are growing on steep slopes, it is recommended that the applicant be required to provide expert reports from relevant qualified professionals, such as a registered professional geotechnical engineer (where the trees in question are growing on a steep slope) and/or certified arborist. Tree removal should be considered only after other options are considered, such as crown reductions or spiral pruning.
 - c) It is recommended that permit applications that are denied by staff be permitted to be appealed to Council.
- 2. Identify private lands that are prone to view shed conflicts and make them subject to a development permit area.**



- a) Provide guidelines for new tree planting on slopes at risk of obstructing views to limit species to trees maturing at moderate height. Crown reduction or spiral pruning guidelines may also be appropriate.

Helpful Resources

City of Vancouver webpage “Protecting Vancouver’s Views”: <https://vancouver.ca/home-property-development/protecting-vancouvers-views.aspx>

“Alternate Dispute Resolution for Neighbour Tree Conflicts and the Role of Local Government”, Australian Centre of Excellence for Local Government (2018): https://www.uts.edu.au/sites/default/files/2019-03/Andrew%20Simpson-ADR%20Neighbour%20Tree%20Conflicts%20and%20Local%20Government_0.pdf



ACTION PLAN 10 – CLIMATE CHANGE RISK

(ASSOCIATED GOAL 3: MANAGE RISK IN TREED LANDSCAPES)

Objective: Provide Adaptation Strategies to Emerging Climate Change Impacts

Overview

As global temperatures rise, weather patterns and events are anticipated to grow more extreme and unpredictable. Some of the local effects may include some or all of the following:

- Less annual precipitation;
- Rainfall and snowmelt events during the winter months may be more intense, depositing more stormwater on the landscape during any one event than has historically been the case and raising the risk of flooding and soil erosion or mass wasting.
- More intense wind events, including *microbursts* of localized, high-energy winds capable of toppling trees and damaging structures.
- Longer, hotter, and droughty summers with an increased risk of wildfire.

These effects will impact both residents and landscapes. The Town's trees and vegetation will play a major role in buffering those impacts and contributing in a small way to the global effort to mitigating climate change. The Town's significant tree canopy cover, both rural and urban, sequesters meaningful amounts of carbon. The same canopy helps to cool our streams, streets and homes during the heat of summer. As noted earlier, trees play a major role in absorbing, slowing and cleaning storm water and stabilizing soil.

The Town's trees and vegetation, however, are not themselves immune to the effects of climate change. Some species are already showing signs of stress in the emergent climate conditions, as moisture-dependent species such as Western Red Cedar and Grand Fir are dying off on drier sites. In addition to drought-stress, additional impacts that should be anticipated to the urban forest include more aggressive disease progression and higher rates of windfall. Where historically we have prized large mature trees in our communities for the significant ecological services and benefits they provide, these are the class of trees that are going to be most vulnerable to microbursts, should these events increase in frequency and intensity. ***When thinking of climate adaptation, we must think simultaneously about how to enhance the ability of the urban forest to buffer its effects on our communities, while also asking what management changes we should be making to help the urban forest cope with climate change. In both cases, the project will be to make both communities and the urban forest more resistant and resilient to the effects of a changing climate.***

Recommendations

1. Conserve water
2. Conserve mature tree cover by introducing a Tree Preservation Policy and bylaw for trees on private property.
3. Increase afforestation and tree care standards on public lands.



4. Accelerate the replacement of tree cover lost to new development by requiring higher standards of tree replacement.
5. Promote tree species that are more drought and wind resistant on both public and private lands
6. Promote the principle of *right tree, right place* for new plantings
7. Conserve existing tree cover and take active measures to increase tree cover where it is lacking.
8. Promote good tree selection, planting and early tree care practices.
9. Promote design and urban planning practices that reduce the overall percentage of *effective* impervious cover within the town, such as integrated storm water management, the use of pervious sidewalk, driveway and parking materials and the application of *engineered ecology* principles when designing infrastructure (such as raingardens, daylighting culverted streams, constructing wetlands into urban environments etc.)
10. Increase the amount of tree canopy cover over the roads of the village centre to cool the heat island effect and promote more walkable and livable communities.
11. Restore degraded natural areas using native trees and vegetation typical of sites that are drier and less nutrient rich than has historically prevailed in the area.
12. On forested sites, undertake root rot surveys more frequently to identify and control emergent centres of diseases being transmitted to healthy adjacent trees via root grafts.
13. Promote the use of garden mulches around trees and shrubs to reduce irrigation requirements.
14. Promote the use of micro-irrigation systems to conserve water.
15. Consider technology or engineered ecosystems to sequester storm water and/or treat grey water for use as landscape irrigation.

Helpful resources

Urban Forests – A Climate Adaptation Guide, prepared on behalf of the British Columbia Ministry of Community, Sport and Cultural Development by Judith Cullington and Gye and Associates, Consultants in Urban Forestry and Arboriculture, Victoria, BC. (2010): http://www.gyeandassociates.ca/wp-content/uploads/2014/05/Urbanforests_Adaptation_Guide_2012_0.pdf

Urban Forest Climate Adaptation Framework for Metro Vancouver - Tree Species Selection, Planting and Management, Diamond Head Consulting, Vancouver BC. (2016, updated 2017): <http://www.metrovancouver.org/services/regional-planning/PlanningPublications/UrbanForestClimateAdaptationFrameworkTreeSpeciesSelection.pdf>



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APPENDIX-2

Landscape Mapping and Assessment



LANDSCAPE MAPPING & ASSESSMENT³⁰

LAND COVER AND TREE CANOPY ANALYSIS

Land Area:

Excluding the foreshore area, the land base of the Town measures 1779 ha., of which for the purposes of this study 57% (1006 ha.) is classified as urban, 38% rural (676 ha.) and 5% (97 ha.) is private industrial forest land. As the primary focus of this study is the urban and rural portion of the town (henceforth referred to in this report as the *study area*), it is useful to express these areas as a percentage of this combined area. The urban portion of the town accounts for 60% of the study area and the rural portion 40%.

Land Cover Analysis:

For the purposes of this study, three land cover classes were derived:

- Impervious cover
- Pervious treed cover
- Pervious non-treed (open) cover

19% of the study area is *impervious* (roads, buildings, parking areas etc.). This figure rises to 29% within urban areas diminishes to 5% in rural areas.

41% of the study area is covered in *tree canopy*. This figure drops to 33% in urban areas and increases to 54% in rural areas.

40% of the study area is *open cover*. This figure drops to 38% in urban areas and increases to 41% in rural areas. Table-1 below provides a comparison of these values with two other island communities.

	Qualicum		
	Beach	Oak Bay	Campbell River
Impervious hardscape	19%	34%	9%
Pervious softscape (non-treed)	40%	34%	33%
Pervious tree cover	41%	33%	58% ³¹

Table-1 Land-cover comparison in three communities

Analysis of Ecosystem Services associated with tree cover:

The I-Tree Canopy software provides tree benefit estimates that are largely focused on pollution abatement and carbon sequestration. Other ecosystem benefits like stormwater management, urban heat island cooling, wildlife habitat provision and soil ecology enhancement are not

³⁰ Gye and Associates, Urban Forestry Consultants Ltd. (2019) *Tree Canopy and Land Cover Analysis Report*.

³¹ Campbell River's undeveloped land base is significantly larger than the Town. Tree cover within their Urban Containment Boundary is nearly identical with the Town's urban area (33% v. 32.7%).



addressed by this particular software, but are important benefits to consider. In addition to providing volumetric estimates of pollutant interception and removal by trees, the software monetizes these values, providing estimates of what it would cost were these services to be provided by a current engineered solution.

The total amount of carbon-dioxide stored in trees within the Town lands (including private forest land) is estimated to be approximately 215 kilo-tons, with an equivalent monetary value of \$14,726,500 CAN. 8.56 kilo-tons of carbon-dioxide are estimated to be sequestered each year at a value of \$586,450 CAN.

64 metric tons of pollutants are removed each year by trees within the rural and urban portions of the Town only, for an estimated value of thirty-eight thousand, two hundred and sixty dollars (\$38,260 CAN).³²

10-Year Change in Tree canopy Cover

The study area is calculated to have *increased in net canopy cover* by 11% (60.3 ha.) during the 10-year study period between 2009 to 2018. This figure rises to a 29% gain (58.5 ha.) in urban areas and a gain of only 0.5% (1.8 ha.) in rural areas. Much of this change is accounted for by the steady accumulation of new growth from existing open-grown tree stock.³³ Open-grown trees (prevalent in urban areas) translate much of their new growth into broader canopies, while trees in closed forest stands translate their growth into increased vertical mass. This accounts for the marked difference in the 10-year rates of change in canopy cover (a two-dimensional metric) between urban and rural parts of the Town.³⁴

The potential increase in these areas was muted somewhat by tree removal during the study period. Urban areas experienced a loss of 7.2% (14.4 ha.) of their 2009 canopy cover, while rural areas experienced a loss of 4.1% (14.7 ha.) during this period. This translates into an annual rate of tree loss of less than 1% (1.4 ha.) in urban areas and less than half a percent (1.5 ha) per year in rural areas. Our analysis suggests that most tree removals were associated with changes in

³² Pollutants measured include carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide and particulate matter less than 2.5 microns in size. Detailed results are appended for each land area.

³³ A dramatic example of the concept of annual growth rate and accumulation comes from a local woodlot in Cedar—Merv Wilkinson’s ‘Wildwood Tree Farm’. Merv based his annual cut rate of 160 m³ on his property’s annual growth rate, minus a small safety margin. Merv usually harvested his timber in 5-year cutting cycles, removing up to 800 m³ at a time. Shortly before his death, Merv completed his 10th cut, estimating that his forest will have roughly the same volume of timber remaining after the cut is finished as was originally cruised back in 1945.

³⁴ It is important not read too much into the low rates of canopy cover increase in rural areas where closed forest and deciduous woodland conditions prevail. Overall biomass increase is much closer to those occurring in urban conditions; it is just not being expressed in the two-dimensional expansion of canopy over other types of land-cover. The closed stand-conditions in which the preponderance of rural trees are growing constrains new biomass growth to occur *within* the stand in a more three-dimensional or vertical orientation. For this reason, it is worth noting that *tree canopy cover* is just one metric by which the health and character of urban and rural forests can be evaluated.



land-use, specifically in land development for new construction (urban areas), farming (rural areas) or recreation (golf course).

A portion of the urban area of the Town is comprised of several large, treed parks and natural areas that are not subject to land-use change. **It is recommended that these areas be broken out into a separate sub-class**, should the Town elect to continue measuring incremental change in its urban tree canopy.

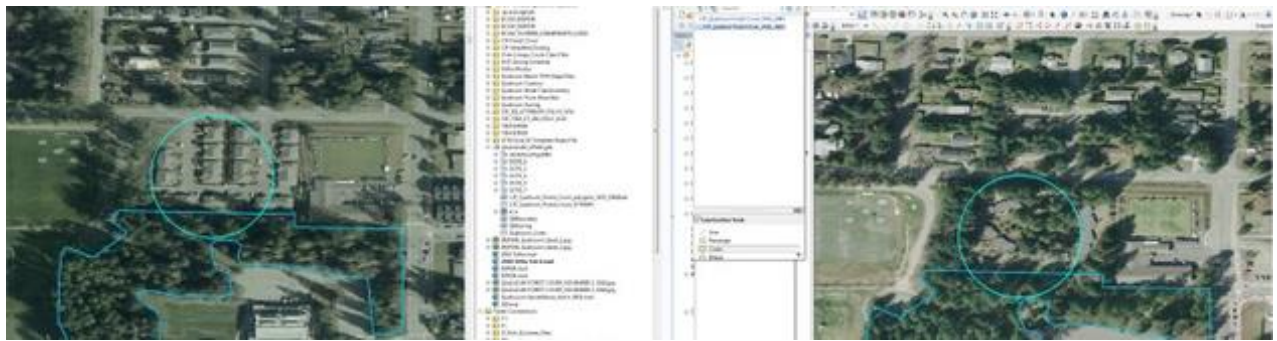


Fig-3 Typical tree-loss polygons 2018 v.2009

At the same time, however, small gains in canopy cover were also accruing as a result of new tree planting. New tree planting accounted for a gain of 0.7% (3.8 ha.) within the study area (varying between 1% in urban areas and 0.5% in rural areas) over the ten-year study period.³⁵

Notwithstanding the effects to tree canopy cover from tree removals and new plantings over the last decade, by far the greatest influence of the Town's urban and rural tree canopy has been the positive accumulation of new growth experienced by its existing tree stock as many of these trees continue to mature in age and size. Despite the absolute amount of tree loss experienced over the past decade, the remaining urban and rural tree biomass within the Town is significantly greater than it was a decade ago.

It is worth noting that *tree canopy cover* is just one metric by which the health and character of urban and rural forests can and should be evaluated. Other important metrics include the following:

- The diversity of tree genus, species and cultivated varieties within the Town,
- The relative prevalence and diversity of native treed ecosystems, with the additional biodiversity benefits they confer,
- The diversity in age classes and growth rates,
- The resistance and resilience of treed landscapes to environmental shocks, such as drought, windstorms, flooding and outbreaks of pests or disease,
- Landscape ecology attributes, such as patch size, configuration and connectivity,
- increase in foliage and live-branch biomass,
- the prevalence and quantity of non-living woody biomass

³⁵ The figures provided for the 10-year change in *net canopy cover* reflect the contributions of all three of these influences (i.e. tree removal, new tree plantings and annual growth increment from existing tree stock).



- the diversity and abundance (or absence) of micro-flora and fauna on the forest floor and within the soils of treed landscapes

These attributes influence the functional benefits that can accrue from these environments and are important to consider when devising policy and management strategies for treed landscapes within the Town.

LIDAR MAPPING

LIDAR, which stands for “Light Detection and Ranging”, is a surveying method that measures distance to a target by illuminating the target with laser light and measuring the reflected light with a sensor. Differences in laser return times and wavelengths can then be used to make digital 3-D representations of the target.

Lidar has found many applications including forestry and biodiversity conservation. Canopy heights, biomass measurements, and leaf area can all be studied using airborne LIDAR systems. Measurements are used to inventory forested areas as well as calculate individual tree heights, crown width, diameter and volume.

For example, *the Save the Redwoods League* has undertaken a project to map the tall redwoods on the Northern California coast. Lidar allows research scientists to not only measure the height of previously unmapped trees, but to determine the biodiversity of the redwood forest. Lidar technology will be useful in directing future efforts to preserve and protect ancient redwood trees.³⁶

The Town has two complete orthophotos and Lidar datasets for the entire Town (2009 and 2019). The most recent imagery (2019) also includes an aerial tree survey, which provides an estimate of tree height and the extent of the overall canopy.

MAPPING AND EVALUATING LANDSCAPES AT RISK

The Plan addresses several landscapes at risk, including steep slopes, wildfire interface zones, watersheds, water courses and natural areas important for their habitat and recreational value). In order to effectively manage these areas and protect the values they provide, it is critically important that stakeholders, including the Town, have a clear idea of the location and extent of these landscapes, as well as a basic understanding of their physiographic character and ecology. Many of the landscapes of risk noted above are included in the Town’s mapped EDPAs.

Of particular importance is an understanding of the ecological character and history of the landscape and the various ecological drivers that continue to shape and influence the trajectory of the landscape over time. These drivers operate at multiple scales (some of which are far greater than the landscape under consideration) and include climate, geology, natural disturbance regimes and human land-use and impacts, amongst others.

³⁶ Source: <https://en.wikipedia.org/wiki/Lidar>



TOWN OF QUALICUM BEACH
Incorporated 1942

APPENDIX-3

Enhancing the Functional Benefits of Trees in Urban Areas

ENHANCING THE FUNCTIONAL BENEFITS OF TREES WITHIN URBAN AREAS

The potential of the urban forest to provide benefits to the community is strongly influenced by land use. This is due to the constraints and opportunities imposed by land use on the physical character of local treed environments—i.e., their abundance, composition, size, spatial configuration and vertical structure. This relationship, illustrated in the figures below, has important planning implications for the Town, as it informs how best to achieve urban forest goals and benefits within the opportunities and constraints presented by different urban environments.

The following two sections illustrate how land use influences both the abundance and the structural character of treed environments, making it a key driver of variation within the urban forest.

The Influence of Place on Urban Forest Abundance

Land use can have a significant influence on the amount of urban forest in each area, as measured by tree canopy cover.

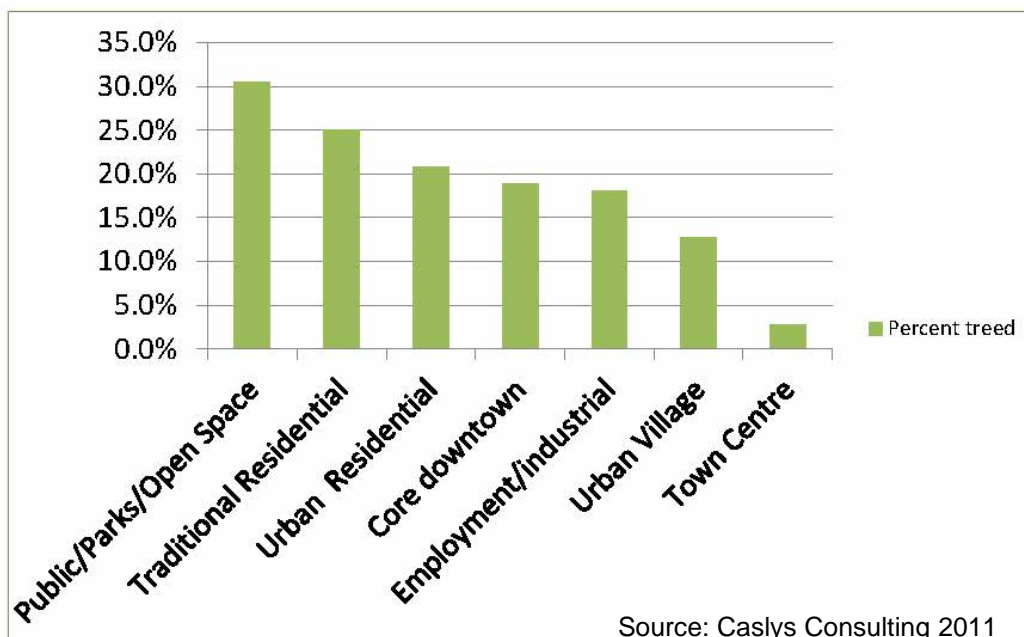


Fig-4 Tree density variation across different land use types

This pattern is consistent with that found in other cities. Figure 5 looks at several similar land-use designations with the City of Seattle in relation to their Victoria counterparts. While the actual canopy cover differs somewhat, they are similar enough to reinforce the general influence of land-use on tree cover.

Victoria Urban Place designations	Victoria % canopy cover	Seattle % canopy cover
Traditional residential	25.1	18.0
Urban residential	14.7	13.0
Industrial/ Employment	2.3	8.0
Town Centres	4.0	8.0
Public facilities, institutions, parks and open space	30.5	41.0
Downtown/Core	4.4	9.0
CITYWIDE	17.6	18

Fig-5: Comparing Victoria and Seattle Tree Canopy Cover by Land Use

The Influence of Place on Urban Forest Character:

Just as place influences the quantity of the urban forest, it also influences the quality or character of those treed environments. For example, treed boulevards beautify our roads and contribute important aesthetic and green infrastructure benefits, but their simplified understorey of turf and concrete (designed for a safe operating environment for automotive and pedestrian movement) limit their biodiversity potential. Conversely, natural areas (historically a park use) with their larger patch sizes, native plant communities and more complex understoreys, support higher levels of biodiversity—in fact, it is one of their most valued functions. When treed environments are well placed, designed and managed, they can make a significant contribution to both the feel and the functionality of the urban settings in which they grow.



Fig-6: Interplay of factors affecting urban forest potential

The Relationship Between Place and Character:

This discussion has attempted to illustrate how the character of the urban forest is influenced by different land uses. It has also argued how the urban forest, in its turn, can contribute to providing or enhancing a sense of place. These principles highlight the need for the Town to:

- Be mindful of the constraints and opportunities presented by each place setting in developing its urban forest objectives and design guidelines.
- Be strategic about what urban forest benefits to pursue within different place settings.

For instance, smaller urban residential properties lend themselves to tree species that grow to a more modest size than many native forest or woodland species; nevertheless, the value of urban forest in these spaces can be significant. Connectivity between adjacent gardens can be encouraged and the targeted selection of plant species (shrubs and herbaceous perennials) to support pollinators, butterflies, invertebrates, and a succession of songbirds can increase the biodiversity value of these lots significantly.

As another example, large parking areas provide a very different set of opportunities and constraints: these spaces can be engineered to accommodate large soil-volumes below ground to support moderately sized shade-trees to cool the pavement and cars beneath the tree canopies, intercept and infiltrate rainwater, remediate air pollution and provide a welcome connection to nature in a highly built environment.

- Encourage a place-based and multi-functional approach to the planning and design of treed environments within different urban settings. DPA design guidelines are one tool that can be used to communicate a desired condition within different settings.

Just as the character of the urban forest varies by land use type, so do the challenges and opportunities for urban forest management.



ⁱ The gradual replacement of large remnant forest trees in urban areas (such as Douglas fir, Grand fir, Red cedar and Big-leaf maple) with more appropriate tree species is a key concern of the Town's Environment Committee. In response, the expressed desire for an attractive, low risk and high-functioning urban forest has been added to the "Desired Future Landscape Condition" section of the plan and several key policies, objectives and recommendations have been revised to address this aspiration and how to achieve it in a sustainable fashion. A member of the Committee requested a 30-year transition strategy also be included; while such a strategy has not been formally codified in this plan, the changes made throughout the document effectively provide the policy direction and measures needed to achieve this goal.

ⁱⁱ The Canadian Food Inspection Agency (CFIA) has the lead role in protecting Canada from the introduction of new plant pests and preventing the spread of certain pests within and between provinces. The CFIA conducts Pest Risk Assessments of new pests and regulates many pests. The Agency conducts annual surveillance programs within Canada to document the absence of selected pests as well as to detect the presence of new invasive species arriving in Canada. The Government of British Columbia administers the Plant Protection Act and the Weed Control Act to help prevent the spread of plant pests and invasive plants within the province. The British Columbia Plant Protection Advisory Council provides a forum to address plant health and plant quarantine issues of concern to British Columbia.
(<https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/animals-and-crops/plant-health/invasive-pests-and-biosecurity>)