



District of Saanich  
Urban Forest Strategy Update

# State of the Urban Forest Report

FEBRUARY 2023





# Land Acknowledgement

The District of Saanich lies within the territories of the ləkʷəŋən peoples represented by the Songhees and Esquimalt Nations and the W̱SÁNEĆ peoples represented by the Tsartlip, Pauquachin, Tsawout, Tseycum and Malahat Nations. The First Peoples have been here since time immemorial and their history in this area is long and rich.

The District of Saanich is proud that our name is derived from the W̱SÁNEĆ peoples. Saanich Council is committed to taking a leadership role in the process of healing wounds of the past and becoming a more just, fair and caring society.



## Acknowledgments

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# Table of Contents

<b>Land Acknowledgement .....</b>	<b>ii</b>
<b>Executive Summary .....</b>	<b>vi</b>
<b>Glossary .....</b>	<b>viii</b>
<b>1 Introduction.....</b>	<b>1</b>
1.1 What is the urban forest and who manages it? .....	3
1.2 The urban forest and Reconciliation .....	4
1.3 Why is the urban forest important?.....	5
<b>2 Saanich’s Urban Forest Policies .....</b>	<b>9</b>
2.1 Guiding Policies.....	11
2.2 Implementing Tools.....	13
2.3 Supporting Bylaws, Policies and Plans.....	15
<b>3 Saanich’s Urban Forest Program.....</b>	<b>16</b>
3.1 Tree Planting.....	17
3.2 Tree Care.....	20
3.3 Tree Protection .....	24
3.4 Service Requests for Public Trees.....	25
3.5 Maintaining Natural Areas and Trails .....	27
3.6 Partnering with the Community.....	27
3.7 Current Budget and Resources .....	28
3.8 Peer City Comparison.....	29
<b>4 State of Saanich’s Urban Forest .....</b>	<b>33</b>
4.1 District-wide canopy cover.....	36
4.2 The urban forest in each local area .....	38
4.3 Public trees .....	41
4.4 Private trees.....	44
4.5 Natural forests .....	47
4.6 Tree equity factors .....	51
4.7 Significant trees .....	53
<b>5 Saanich’s Progress: Implementing the Urban Forest Strategy.....</b>	<b>54</b>
<b>6 The 2023 Urban Forest Report Card .....</b>	<b>59</b>
<b>References .....</b>	<b>63</b>
<b>Appendix 1: Criteria and Indicators Table.....</b>	<b>66</b>



# Table of Figures

Figure 1. Saanich's urban forest includes all trees throughout the municipality .....	3
Figure 2. The proportion of public and private trees in Saanich's urban forest .....	4
Figure 3. Urban forest benefits from ecosystem services .....	5
Figure 4. Saanich's urban forest policy framework.....	10
Figure 5. Progress on tree planting targets from Saanich's Climate Plan .....	18
Figure 6. Urban forest management asset life cycle .....	21
Figure 7. Climate drivers and expected impacts on Saanich's Urban Forest.....	23
Figure 8. Applications for tree cutting permits increased between 2016 and 2021 .....	24
Figure 9. The large tree argument supports tree retention where feasible.....	24
Figure 10. Call volumes have increased since 2016 for urban forest services .....	25
Figure 11. 2021 combined operating and capital budget for urban forestry. ....	28
Figure 12. Canopy cover is the visible extent of tree foliage and branches against the ground when viewed from above.....	35
Figure 13. Saanich's District-wide tree canopy cover.....	36
Figure 14. Canopy cover by Local Area .....	38
Figure 15. Management units in Saanich's urban forest .....	41
Figure 16. Zoning Classifications are generalized land uses in Saanich .....	44
Figure 17. Age class of natural forests in Saanich .....	47
Figure 18. Location of Saanich's tallest trees.....	48
Figure 19. Trees showing remote sensing signatures consistent with death or decline .....	49
Figure 20. Comparison of height class distribution of all trees with trees in decline ...	50
Figure 21. Tree equity priority factors.....	51
Figure 22. Comparison of canopy cover by census dissemination area and combined priority factor index.....	52
Figure 23. Listed groups of Significant Trees by Local Area .....	53



# Executive Summary



The State of the Urban Forest Report collects information about Saanich's urban forest resource and the District's management program to set a performance baseline for the upcoming Urban Forest Strategy update. The State of the Urban Forest Report also acts as a progress update on the 2010 Urban Forest Strategy.

The report is laid out in five main sections:

- » **A review of the District's urban forest policies, including associated bylaws and plans.**
- » **A review of the of the District's urban forest management program, including tree planting, care, protection, partnerships, budget and resources and compairson to B.C. peer cities.**
- » **An analysis of the state of the District's urban forest, including canopy cover, analysis by local area, by public and private land, and other geospatial and demographic factors.**
- » **An analysis of the District's progress on implementing the 2010 Urban Forest Strategy.**
- » **An urban forest report card based on best management practices related to urban forestry.**

## Assessing urban forest progress

A criteria and indicators approach is used to assess urban forest management in Saanich. **Saanich scores fair on the urban forest report card for its overall urban forest management.**

Using an accurate, high resolution LiDAR methodology, Saanich's canopy cover was

estimated at 43% in 2019. This method applied machine learning to detect trees from other objects in LiDAR, and was manually reviewed to correct errors. Past canopy estimates have been highly variable. Due to different methodologies, past estimates are not directly comparable with the current result.

Mapping tree canopy shows that it is not evenly distributed throughout the municipality, with Rural Saanich accounting for over half of the total trees and tree canopy. Rural Saanich's canopy cover is 56%, the highest of any Local Area, and contains the most natural forests. Policies limiting urban development help preserve tree canopy in Rural Saanich, although Agricultural Land Reserve designations and agricultural uses reduce the District's ability to regulate trees in the area.

Five Local Areas, Saanich Core, Tillicum, Carey, Shelbourne, and North Quadra, have canopy cover below 30%, the target recently endorsed by Council's motion Adopting the 3:30:300 Rule. Only Cadboro Bay and Rural Saanich have higher canopy cover than the 2019 District-wide average of 43%.

Neighbourhoods with low tree canopy cover experience relatively high rates of removal, pointing to pressures from development. Tree canopy within the Urban Containment Boundary is expected to decline as growth and densification continue.

## Structure and distribution of trees

Individual tree canopies derived from LiDAR puts the number of trees in Saanich at approximately 742,000.

Over 537,000 trees in the urban forest are on private property (not District-owned property). Industrial and commercial properties have the fewest trees, while higher intensity residential



uses also have canopy cover below Council's target of 30% in each neighbourhood.

An estimated 205,000 trees are on lands owned by the District. Canopy cover is 57% over Saanich Parks and 28% over roadways. Suitable planting sites in parks are being exhausted, while there are opportunities to increase canopy cover over roads. This would have the co-benefit of providing healthier, more attractive infrastructure for active transportation, but requires considering higher tree maintenance requirements and tree survival limitations on higher traffic roadways.

### **Tree protection and replacement**

About half of the trees planted in the District are replacement trees from development. This means that only one out of every two trees planted are "new" trees that add to Saanich's urban forest canopy. This limits the District's ability to expand its urban forest and underscores the importance of retaining and protecting trees during development and public infrastructure-building.

Typically trees that grow slowly, live long lives, and are large at maturity provide the greatest benefits to ecosystem services and canopy cover. Newly planted trees often take several decades to provide similar benefits. This highlights the need to protect Saanich's existing trees, while also providing investment in and care for the next generation of young trees.

### **Climate risk**

Climate change projections for the 2050s in Saanich are likely to have significant impacts on the health and vitality of trees and forests in the community today. Several native tree species are experiencing declines in health and vitality connected to climate, including Western Redcedar, Grand Fir, and Arbutus. While the urban forest is a vital part of the District's climate adaptation and mitigation

planning, it will also need support to adapt to climate impacts such as hotter temperatures, extended droughts, new invasive species and tree diseases, and more variable weather events that elevate rates of tree damage. Climate-related impacts are already being observed to increase the need for the District's urban forest management services in the form of increasing service calls and more frequent storm response.

### **Looking forward: Renewing the 2010 Urban Forest Strategy**

The 2010 Urban Forest Strategy included 7 strategies and 14 actions. Three actions have been completed, ten are still in progress, and one was not started.

While the 2010 Urban Forest Strategy provided guidance for forest management over the past 13 years, the 2023 rating of *Fair* for the District's urban forest management shows improvement is needed for the long-term health and sustainability of the urban forest. The District needs to adapt its urban forest management to address equity, reconciliation, climate impacts, urban densification, and improvements in roadways and the public realm.

The next phase of the Urban Forest Strategy Update project will use the findings of the State of the Urban Forest Report to develop strategic actions to maintain and enhance the District's urban forest, while recognizing other important District of Saanich priorities such as increasing housing opportunities and providing active transportation options.



# Glossary

<b><i>Biodiversity</i></b>	Biodiversity encompasses all living species on Earth and their relationships to each other. This includes the differences in genes, species and ecosystems.
<b><i>Canopy cover</i></b>	A measure of the extent of the urban forest based on the amount of ground covered by the foliage of trees when viewed from above.
<b><i>Ecosystem services</i></b>	The many and varied benefits to humans provided by the natural environment and from healthy ecosystems. Carbon sequestration, recreation potential, shade, water filtration, and pollination are all examples of ecosystem services associated with the urban forest.
<b><i>Green infrastructure</i></b>	A broad category that includes natural assets and designed and engineered elements that have been created to mimic natural functions and processes in the service of human interests <sup>[1]</sup> .
<b><i>Local Area</i></b>	Neighbourhoods identified by the Official Community Plan and used by the District to develop Local Area Plans. Saanich has 12 Local Areas: Blenkinsop, Cadboro Bay, Carey, Cordova Bay, Gordon Head, North Quadra, Quadra, Royal Oak, Rural Saanich, Saanich Core, Shelbourne, and Tillicum.
<b><i>Management units</i></b>	Areas of land ownership or departmental jurisdiction, e.g. roadways, private land, District-owned property, and parks, that define responsibilities for urban forest management and influence urban forest management practices.
<b><i>Natural area</i></b>	Any physical area that contains sufficient native species, ecological communities, or habitat features to support native biodiversity.
<b><i>Natural asset</i></b>	Natural assets are the stock of natural resources or ecosystems that are relied upon, managed, or could be managed by a local government for the provision of one or more services to a community <sup>[2]</sup> .
<b><i>Private tree</i></b>	A tree not owned by the District of Saanich.
<b><i>Protected tree</i></b>	A class of tree defined by the Tree Protection Bylaw and subject to its rules.
<b><i>Public tree</i></b>	A tree owned by the District of Saanich, typically on District of Saanich-owned property.
<b><i>Significant Tree</i></b>	A tree or group of trees listed in Schedule B of the District's Tree Protection Bylaw.

<b><i>Tree</i></b>	For the purposes of this report, a tree is any woody plant with a height of at least 2 m, including all native and non-native species.
<b><i>Tree equity</i></b>	When all people experience the benefit of trees and the urban forest in proportion to their needs.
<b><i>Urban forest</i></b>	All trees within the District of Saanich, including those in private yards, public parks, conservation areas, boulevards, natural areas, and other locations in urban areas and Rural Saanich.
<b><i>Urban forest program</i></b>	A set of activities performed by the District and community partners to plan, grow, manage, protect, and steward the urban forest, as well as all related policies, equipment, resources and knowledge used to work towards the District's urban forest vision.

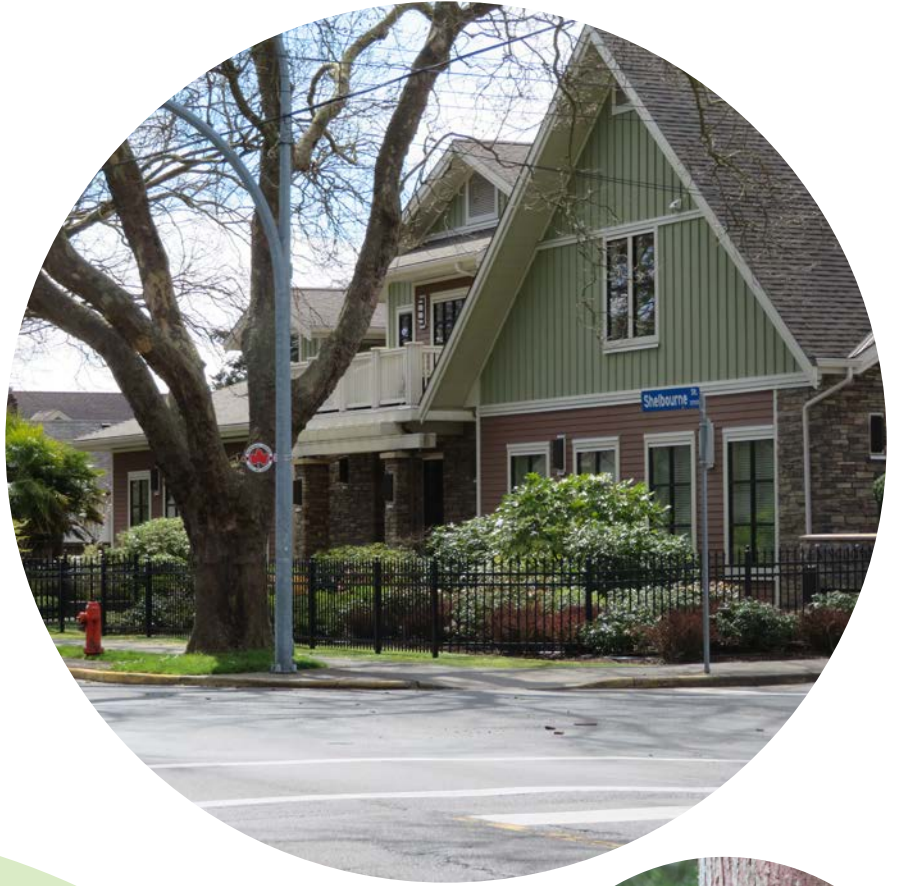




# 1 Introduction

The State of the Urban Forest Report presents information about trees and forests in the District of Saanich to support the renewal of the Urban Forest Strategy. First prepared in 2010, the Urban Forest Strategy is the document that guides the District's urban forest management over time. Since the adoption of the Strategy, the District has implemented many of its recommendations and continues to advance others. A decade of change is making it important to review the Urban Forest Strategy to ensure it continues to support the community's goals and values.

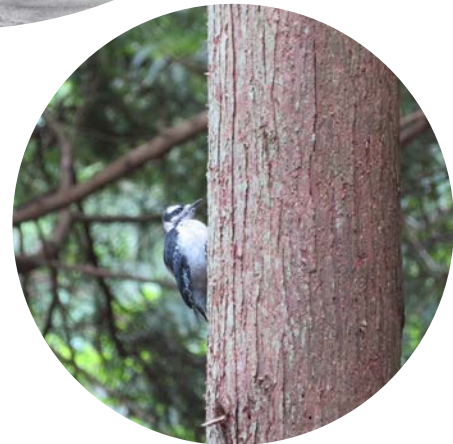




## Purpose of the Report

The purpose of the State of the Urban Forest Report is to provide:

- » A review of the District's urban forest management program, including associated bylaws and plans
- » An assessment of the District's urban forest management program, including tree planting, care, protection, partnerships, budget and resources and comparison to B.C. peer cities
- » An analysis of the state of the District's urban forest, including canopy cover, analysis by Local Area, by public and private land, nad other geospatial and demographic factors.
- » An evaluation of the District's progress on implementing the 2010 Urban Forest Strategy
- » A report card based on best management practices related to urban forestry.





# 1.1 What is the urban forest and who manages it?

Saanich's urban forest includes all treed landscapes within the District's municipal boundary, including private yards, public parks, conservation areas, boulevards, natural areas, and other locations in urban areas and Rural Saanich. Urban forests are dynamic, living systems that change with shifting interactions between trees and soils, water, fungi, wildlife, other plants, disturbance and humans who shape the places where trees can grow. The urban forest is a major component of Saanich's green infrastructure and natural areas, supporting biodiversity, cleaning air and water, and improving the quality and livability of urban neighbourhoods.

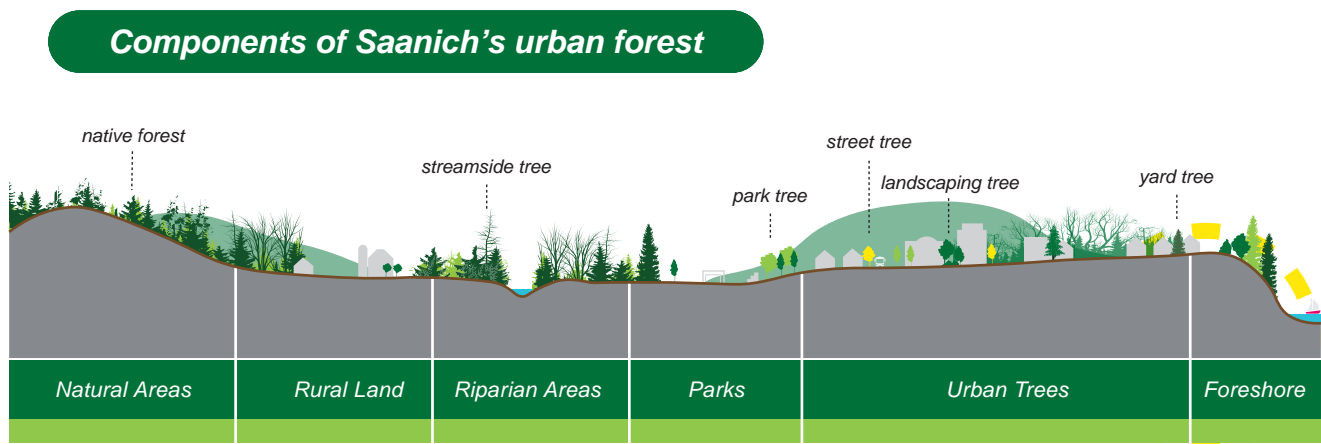


Figure 1. Saanich's urban forest includes all trees throughout the municipality.

Many different actors and organizations manage the urban forest. The District of Saanich plays a critical role in the management of both public and private trees. Under BC's Community Charter, local governments can regulate trees by bylaw, including those on private land. The District manages an estimated **205,000 trees in Saanich parks, public roadways, and on other municipal property** – approximately one-quarter of the trees estimated to exist in the municipality. **Another 537,000 trees are estimated to grow on private property** or other lands not owned or managed by the District. Residents, businesses, organizations, and other groups owning land in Saanich take day-to-day care of these trees.

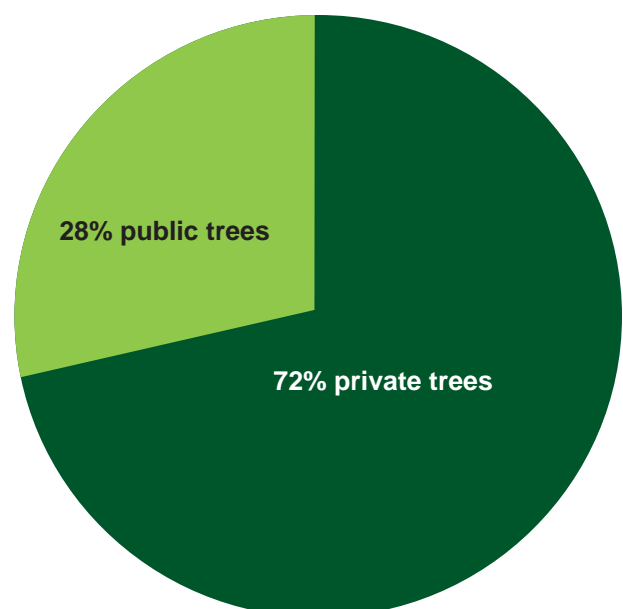


Figure 2. The proportion of public and private trees in Saanich's urban forest.

## 1.2 The urban forest and Reconciliation

The process of colonization in Canada has resulted in settlers replacing Indigenous laws, displacing Indigenous systems of governance, unlawfully taking Indigenous land, and eroding Indigenous cultures. Today, the ideologies of colonialism still shape society and government systems of governance and societies, perpetuating harm and inequities.

### **The urban forest reflects this history:**

Saanich's urban forest includes tree species from around the world, brought and planted by settlers. Immigrants build wooden houses, grow fruit, and decorate a growing city with trees: London planes, Japanese cherries, and American elm are all reminders of these new connections to other parts of the world. At the same time, much of Saanich's native forest biodiversity depended on Indigenous land stewardship that was displaced or actively prohibited.

The District recognizes the traditional territories of the ƳSÁNEĆ and Lək̓ʷəŋən peoples and recently entered ÁTOL,NEUEL (Respecting One Another) Memorandum of Understanding (MOU) with the ƳSÁNEĆ Leadership Council, which provides a framework for government-to-government relationship with the three nations of ƳJOŁEŁP (Tsartlip), STÁUTW (Tsawout), and ƳSIKEM (Tseycum)\*. The MOU formalizes a shared commitment to develop a strong and fair government-to-government relationship to address shared interests and priorities within themes such as governance, environmental concerns, and parks management.

Part of the ongoing process of reconciliation is acknowledging the deep and continuing relationships between Indigenous Peoples and the land, including traditional forest

resources and archaeological sites now contained within the urban forest. The oral history of ƳSÁNEĆ reminds us that Saanich is near the heart of colonization in British Columbia and that written history and laws are often contrary to the memory and experiences of Indigenous people. Urban forest management could contribute to reconciliation by including decolonizing and Indigenous practices in the District's programs and policies.



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\* <https://www.saanich.ca/assets/News~and~Events/Documents/%C3%81TOL,NEUEL%20MOU.pdf>



## 1.3 Why is the urban forest important?

The urban forest provides benefits that support the health of Saanich residents and enhance the community's livability. These benefits, sometimes called ecosystem services, include providing habitat for wildlife, stabilizing steep slopes, storing and sequestering carbon, and cooling streets and homes. There are four main types of ecosystem services:

**Cultural** – how people value the urban forest, including beautification, sense of place, mental and physical health, spirituality, recreation, and tourism.

**Regulating** – natural processes providing a direct benefit, such as pollination allowing plants to fruit and set seed, and trees consuming and storing carbon from the air or providing shade.

**Supporting** – natural processes providing indirect benefits by creating the conditions for other services to occur. Photosynthesis is an example of a supporting ecosystem service in the urban forest, which is how trees convert light into energy to feed themselves.

**Provisioning** – the direct products of trees and forests, such as medicines, fruits, mushrooms, clean water, timber, and plant fibres.



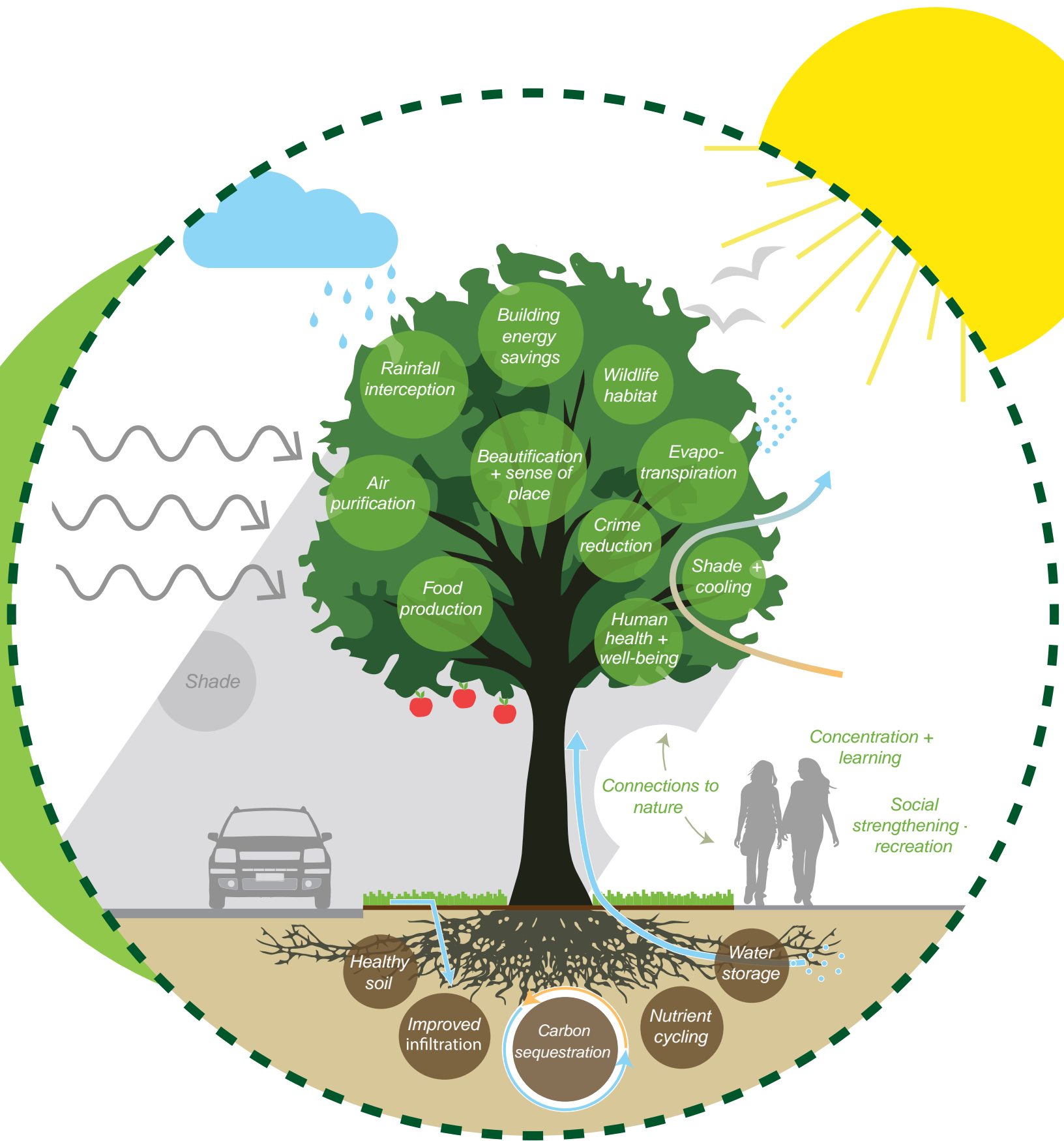


Figure 3. Urban forest benefits from ecosystem services.



# Connections to Saanich's Priorities

## Healthy community

The urban forest benefits the physical and mental health of Saanich's residents, supporting **community well-being**. Exposure to nature has been found to lower stress levels, improve work performance, and even shorten hospital recovery times<sup>[3][4][5]</sup>. People who live near green spaces are more likely to achieve recommended levels of physical activity<sup>[6]</sup> and live longer lives<sup>[7][8]</sup>. Trees over walking and biking routes can promote active transport<sup>[9][10][11]</sup>, which District of Saanich policies like the **Active Transportation Plan** are working to encourage. Forest bathing and other forms of "nature therapy" can be prescribed by doctors in Canada as treatment for medical conditions like stress and depression<sup>[12][13]</sup> and are showing promise to a much wider range of physical and mental illnesses<sup>[14][15]</sup>.

## Biodiversity and Natural Environment (Resilient Saanich)

At the same time as it advances the Urban Forest Strategy, the District is preparing a plan for Saanich's natural biodiversity under the **Resilient Saanich Environmental Policy Framework**. High biodiversity protects the ecosystem services that make human life in urban areas possible – services like the capture of stormwater, cycling of nutrients in

waste and soil, and pollination of gardens<sup>[16]</sup>. Work to support biodiversity in the District complements the urban forest and vice versa: the urban forest is a reserve of biodiversity in cities<sup>[17]</sup>, because trees provide the habitat used by many other plants, animals, fungi, and microbes.

## Reconciliation

Native forest ecosystems within the urban forest have special meaning for Indigenous people, and continue to offer medicines, protection to fisheries, economic opportunities, and space for cultural practices. Stewardship of native forest ecosystems was part of pre-colonial Indigenous societies and interrupted by colonization. Practices like underburning brush and debris helped to maintain highly biodiverse Garry oak woodlands, one of the rarest forest environments in Canada<sup>[18]</sup>. The urban forest can continue to support the land-based practices of Coast Salish people and urban Indigenous people residing in Saanich. Saanich is committed to healing relationships with lək'wəŋən and W̱SÁNEĆ peoples as well as its urban Indigenous population, in line with the **Truth and Reconciliation Commission's Calls to Action**.

## Climate resilience

Climate change in Saanich is already impacting the conditions trees and people experience. Impacts include longer, hotter, and drier summers, more intense rainfall and storms, and sea level rise<sup>[19]</sup>. The urban forest takes in carbon dioxide and sequesters carbon in wood, plant tissues, and soils, helping to mitigate global heating<sup>[20][21]</sup>. The **Climate Plan** suggests additional carbon

sequestration by trees will be needed to meet the goal of Net Zero emissions by 2050. Locally, a healthy urban forest helps Saanich adapt to climate change impacts. Trees stabilize slopes and reduce erosion associated with unpredictable rainfall<sup>[22]</sup>. Trees cool the air by stopping the sun from heating up pavements and by transpiring water from leaves into vapor – natural air conditioning<sup>[23]</sup>. Trees are already part of the District's climate action, with a goal to double tree planting each year between 2020 and 2025 to plant 10,000 trees as part of the Climate Emergency Accelerated Actions.

### **Ecosystem services: clean air and water, and healthy soil**

Trees and forests capture rain and stormwater runoff, which is intercepted and filtered by leaves and roots<sup>[24][25]</sup>. A large portion of the rain hitting a mature tree never reaches the ground, simply evaporating back into the atmosphere (and avoiding drainage pipes entirely)<sup>[26]</sup>. The District is currently working on **integrated stormwater management plans** to address long-term drainage needs in every neighbourhood. The urban forest cleans the air by taking in pollutants like carbon monoxide, road particulates, and nitrogen dioxide and releasing oxygen<sup>[27]</sup>, supporting the healthy environment desired by the **Climate Plan** and other policies. Trees play service delivery roles that are the focus of the **Asset Management Strategy** now in development. Trees also build up healthy soils by adding organic matter through leaf litter, nutrients through root secretions and nitrogen-fixing nodules, and physical aeration<sup>[28]</sup>, critical for biodiversity and proper ecosystem functioning.

### **Strong economy**

The District is creating an **Economic Development Strategy** for Saanich. Attractive commercial streets with high tree canopy cover generate more sales and business activity than less green areas by encouraging people to stay longer and spend more<sup>[29]</sup>. Trees in urban settings have been found to have positive impacts on real estate values<sup>[30][31][32]</sup>. Saanich's urban forest includes popular places for tourism and recreation like PKOLS (Mount Douglas Park), attracting visitors who spend money at local businesses.

### **A shared sense of community**

The urban forest, by reflecting Saanich's unique landscape and people, contributes to ways people find identity and community. Research in Vancouver has found that exposure to natural spaces increased people's sense of community belonging or social capital<sup>[33]</sup>. The renewal of the **Official Community Plan** is underway which will include a vision for the community and its values.

## Quick Facts

- » *2010 Urban Forest Strategy established a target for no net loss of urban tree canopy*
- » *Council's Strategic Plan 2019-2023 included an action to review and implement the Urban Forest Strategy and the project is now underway*
- » *The Climate Action Plan sets a target to plant 10,000 trees by 2025*
- » *Tree Protection Bylaw regulates trees on public and private land, and development regulations influence the space to grow trees*

## 2 Saanich's Urban Forest Policies

Plans, bylaws, and policies form the District's approach to trees. This section provides a summary of key policies reviewed, organized into three categories:

**Guiding policies** provide a framework for the District's management, including high-level recognition of the urban forest and associated values.

**Implementing tools** regulate and enforce tree protection, maintenance, and replacement, as well as planting site design.

**Supporting plans and policies** relate to the urban forest but are not the primary tools used to manage it. They include areas of alignment like transportation and wildlife conservation.



The District of Saanich's authority to regulate trees is established by provincial legislation. The **Community Charter** establishes the powers of a municipality, including the ability to regulate trees. The **Local Government Act** also plays a role in urban forest management by establishing how the District plans community development. The Local Government Act requires the District to maintain an **Official Community Plan (OCP)**, which identifies where land uses can occur and the vision and values of the community. All bylaws adopted by the District must be consistent with the policy statements in the OCP. The Agricultural Land Commission Act

protects farming in British Columbia. Trees on lands under this act are not protected by the District's Tree Protection Bylaw.

Other federal and provincial legislation creates legal requirements for habitat, wildlife, water, and other values influencing urban forest management. These acts include the federal Species at Risk Act and Migratory Birds Convention Act, and the provincial Water Sustainability Act, Heritage Conservation Act, and Wildlife Act.

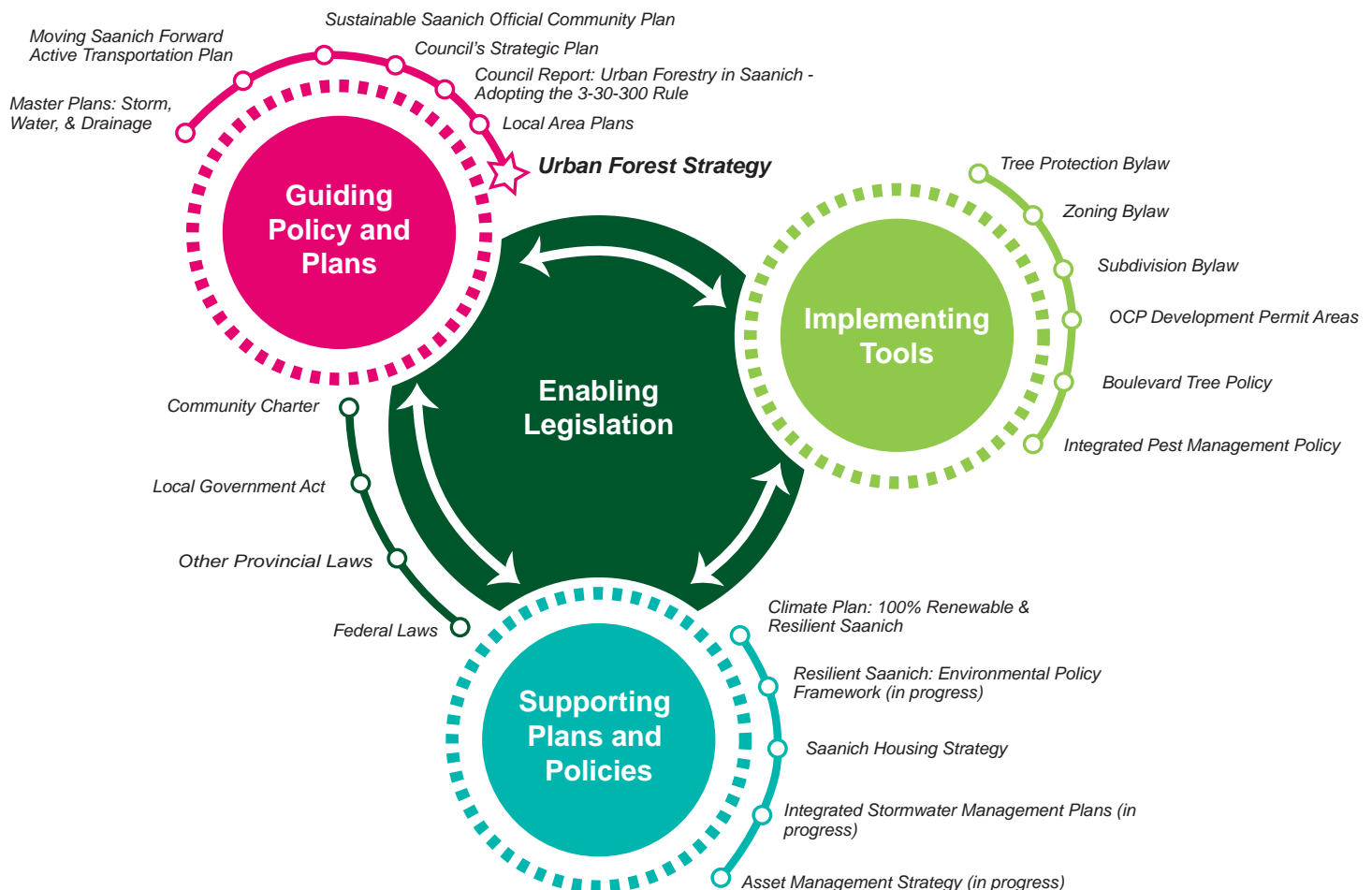


Figure 4. Saanich's urban forest policy framework

## 2.1 Guiding Policies

The **Sustainable Saanich Official Community Plan** (OCP) sets out a vision that includes the urban forest as part of Saanich's environmental integrity. Prepared in 2008, the OCP is now being updated. Policy statements from the OCP led to the development of the first Urban Forest Strategy and supported tree protection and planting as a tool for climate change resilience.

Council's **Strategic Plan 2019-2023** included an action to review and implement the Urban Forest Strategy and the project is now underway.

The **Urban Forest Strategy** was first prepared in 2010 and established an overarching goal to protect and enhance the urban forest in Saanich, including a canopy cover target for the municipality of 36% and a policy of no net loss of trees. The Strategy included seven strategies to achieve the goal, including tree planting, protection, inventory, investing in the District's urban forest program, and public outreach. The Strategy's recommendations are completed or in progress. Most recently, Council funded Saanich's first tree inventory (now in progress) and the development of better reporting for trees through the District's Tempest software. For a progress update on Urban Forest Strategy implementation, see Section 6. The Urban Forest Strategy is now being updated to respond to new and developing challenges and opportunities.

In 2021, Council endorsed the **3:30:300 Rule** as a guiding principle for urban forest management. The 3:30:300 Rule proposes that everyone should be able to see 3 trees from their home, all neighbourhoods where people live should have at least 30% canopy cover, and all homes should be within 300m of a park or greenspace to ensure urban forest benefits are sufficient and accessible to all<sup>[34]</sup>.

The 3:30:300 rule will be incorporated into the Urban Forest Strategy update.

**Local Area Plans** take direction from the OCP and explore the form, use and character of neighbourhoods at a finer scale. They often contain policies that influence the planting or overall distribution of urban forest canopy.

The District is in the process of renewing area plans, with the most recent plans being for Cordova Bay (2021), Cadboro Bay (2021, in draft), and Uptown-Douglas (2022). The Urban Forest Strategy will incorporate information from the local area plan processes.

The **Cordova Bay Plan** reported 2011 canopy cover of 36% and set policies to maintain canopy cover, promote tree retention, plant street trees, and support development variances to accommodate mature trees.

The **Uptown-Douglas Plan** reports 2016 canopy cover of just 5% and sets a target for 20% tree canopy cover. To support this goal the plan also includes policies for improving soil volumes on street boulevards, promoting tree protection, and incorporating climate change considerations into urban forest management.

The **Shelbourne Valley Action Plan** (2017) urban forest policy seeks to achieve adequate soil volumes in boulevard tree planting through a minimum 2-metre-wide planting area and through the use of engineered soil cells to ensure long term viability. However the current build out of Shelbourne Street (Shelbourne Street Improvements Project) reduced the recommended planting boulevard width to 1.5m. Older local area plans typically have fewer references to trees or the urban forest.



The **Active Transportation Plan** sets a vision to make walking, cycling and public transit a convenient and safe part of everyday life for all residents and visitors. The vision requires the build out of significant new infrastructure for walking and biking, as well as road improvements to enhance safety. Capital works are opportunities to retrofit streetscapes with boulevard trees and tree-supportive designs like soil cells, although this is not required under current policies.

Plans for utility services influence the urban forest on municipal rights-of-way. The **Water Master Plan**, **Sewer Master Plan**, and **Drainage Master Plan** direct capital spending on infrastructure improvements, involving construction in street boulevards where public trees are also located.



## 2.2 Implementing Tools

### 2.2.1 Tree protection and replacement

The **Tree Protection Bylaw** is the primary tool used to regulate trees in Saanich. The bylaw defines “protected trees” which are the subject of regulations. Trees are protected because of their size and species, status as a replacement tree or Significant Tree, or their location. All trees growing on Saanich-owned property are protected. Significant trees are special trees nominated by the community for protection.

The bylaw establishes a permitting process to protect trees from unauthorized activities. When trees are removed, the bylaw defines replacement requirements to meet the No Net Loss policy. If trees cannot be replaced on site, the District accepts cash-in-lieu for the **Urban Forest Reserve Fund** to plant trees elsewhere in the municipality. The number of trees that must be replaced ranges from one to three per tree removed depending on the reason for removal.

In 2019, Saanich Council directed staff to

amend the Tree Protection Bylaw with the intent of strengthening it. These amendments went into effect in January of 2020. Council also endorsed the recommendation to “direct staff to establish a practice of 3:1 replacement for trees removed from municipal projects...” and to “to establish a reserve fund specific to supporting the goals and objectives of the Urban Forestry Strategy”

The Tree Protection Bylaw does not give the District unlimited authority to protect trees or stop tree removal. While the Community Charter gives local governments to authority to regulate trees on private property and enforcement powers, it also sets out limitations to those authorities.

**Development Permit Areas (DPA)** are where special policies or guidelines for the development or alteration of the land are in effect. They can be used to guide species selection, support native biodiversity, and preserve on-site permeable surface area suitable for tree planting. Many of the District’s development permit areas include the same guidance for trees: that development should retain significant wooded areas and native vegetation. The **Streamside Development Permit Area** protects trees around riparian areas. The **Rural Saanich Interface Fire Hazard Development Permit Area** supports removal of trees to meet FireSmart guidelines – these removals are specifically exempted from tree replacement provisions in the Tree Protection Bylaw.

The District uses the **Boulevard Tree Policy** (along with the Tree Protection Bylaw) to guide its management of protected trees in Saanich-owned road rights-of-way. The policy is designed to discourage the removal of healthy boulevard trees from the **Desirable Tree Planting List** and disallows several types of pruning and removal requests,





such as for views or sunlight access. The policy sets standards for when work near a boulevard tree requires the District's approval and establishes that protection of trees and vegetation is a high priority during the development process. The District reserves the right and responsibility for hazard tree management on Saanich-owned boulevards under the policy.

The **Integrated Pest Management Policy** establishes the District's approach to forest health monitoring and control of invasive species and other threats to trees and natural assets.

### 2.2.2 Creating growing space for trees

The **Zoning Bylaw** impacts trees in Saanich by controlling lot coverage, the shape of setbacks and available soil volumes, and requiring trees in landscaping within certain land uses. In off-street parking for commercial and industrial areas, the bylaw requires that one tree be provided per 115 m<sup>2</sup> of total lot area. Where they are allowed, underground structures can be located anywhere within a lot, including up to the parcel boundary. This "lot-line" construction – often for parking structures – causes significant challenges for the retention of trees on-site and on neighbouring property, and can also neutralize potential growing space in adjacent public boulevards.

The **Subdivision Bylaw** regulates the creation of new lots in Saanich and also contains details used by developers to deliver new streetscapes and infrastructure, including new street trees. Schedule I of the Bylaw contains the standards for the installation of boulevard street trees which must be followed. Schedule H contains the District's Engineering Specifications that dictate how infrastructure and services for development must be designed and installed.



## 2.3 Supporting Bylaws, Policies and Plans

Saanich's **Climate Plan** shows a pathway to achieve net zero carbon emissions by 2050. The plan includes a target to plant 10,000 trees by 2025 to support future carbon sequestration and climate adaptation. Several other strategies concern the urban forest, including increasing stewardship tools for private landowners, revisiting tree retention and replacement policies during development, connecting natural areas with restored ecosystems, improving ecosystem monitoring, and evaluating the services provided by natural assets.

The District is currently developing an Environmental Policy Framework at the same time as the update of the Urban Forest Strategy. This initiative, **Resilient Saanich**, will integrate sustainability and the natural environment into the District's future policies, plans and programs. Part of the Resilient Saanich process is an assessment of biodiversity value in Saanich, resulting in a **Biodiversity Conservation Strategy**. This report on the State of the Urban Forest has incorporated relevant findings from ongoing work for a parallel State of Biodiversity Report being prepared to support the Resilient Saanich process.

The **Housing Strategy** identifies a path to increase housing affordability in Saanich. Supporting development within the urban containment boundary through infill and densification is one of the main ways the District can advance its interrelated goals for a healthy environment and resilient future; however, redevelopment can result in a loss of trees from neighbourhoods.

The District is preparing **integrated stormwater management plans** for its watersheds to guide stormwater control and related infrastructure service delivery. Urban forest management can provide co-benefits for integrated stormwater management because trees intercept rainwater and support infiltration, reducing demand for drainage, while green infrastructure approaches can help provide irrigation to trees in streets and other development scenarios.

An **Asset Management Strategy** for District-owned infrastructure is underway and will identify alignments between the District's service delivery for conventional and green infrastructure.





## 2021 Year in Review

- » *Over 6,160 trees planted towards the 10,000 tree planting goal by 2025*
- » *1,360 tree permit applications handled*
- » *Over 1,900 requests for service relating to a public tree*
- » *\$12.45 spent per resident on operational urban forestry*

## 3 Saanich's Urban Forest Program

The Parks, Recreation and Community Services Department delivers core services for urban forest management. The Urban Forest Strategy update will help identify the service levels needed to support the District's renewed vision in the Urban Forest Strategy update. The State of the Urban Forest Report describes core services currently provided by the Parks, Recreation and Community Services Department and information about the urban forest program's budget.



## 3.1 Tree Planting

The District plants trees on municipal land to grow the urban forest canopy. Some trees are “new” in that they represent an effort to increase Saanich’s urban forest. Other trees are “replacement trees”, which are trees that must be planted to offset tree removals under the Tree Protection Bylaw. In 2019, the District committed to doubling its rate of tree planting until 2025 from 1,000 to 2,000 trees per year. Funding provided in 2021 and 2022 placed the District on track to meet its target, but progress towards the goal has been challenging, as each year there are fewer places to plant trees on public land.

**There are currently four programs to plant trees:**

### Partnership Tree Planting Program

This program allows Saanich homeowners to request a new street tree on the public boulevard in front of their property. Participants can select their preferred tree from several available species, which the District plants and cares for during establishment. Partners have the opportunity to contribute to young tree care by watering and weeding as necessary. Since 2016, this program has added between 60 and 75 trees per year to Saanich’s streets.

### Boulevard Tree Planting

The Boulevard Tree Planting program is the District’s general program for installing new and replacement trees in street boulevards. As with the Partnership Tree Planting Program, this program focuses on the publicly owned land in front of people’s homes and businesses. In recent years, this program has planted more replacement trees than new trees. Since 2016, this program has added 900 trees to Saanich’s streets, of which one-in-ten have been new trees while the remainder are replacements.





Park Tree Planting

The District plants trees primarily in landscaped parks using this program. Landscaped parks are park properties where the landscape is actively maintained, often to support a specific goal or set of goals for active use and recreation. The trees in these parks may include native species but often are non-native species used as ornamental trees or to provide shade. In general, the ground is mowed grass, bark-mulch, or pavement. Tree planting in these areas is managed separately from planting in natural areas to acknowledge the different roles each type of park plays in Saanich’s urban forest. This program has planted over 600 trees since 2016, with planting numbers fluctuating from year to year. More than half of the trees planted since 2016 were planted in the 2018/19 and 2021/22 planting seasons, when 184 trees and 180 trees were planted respectively.

Natural Areas Restoration

The District plants trees in natural areas for ecological restoration. Only native species are used in this program. Following the Climate Emergency declaration, this program was expanded in 2021 to contribute over 2,000 trees from just under 1,000 trees one year earlier. This program uses a mix of seedlings, smaller potted trees and caliper trees, while other programs focus on caliper trees only.

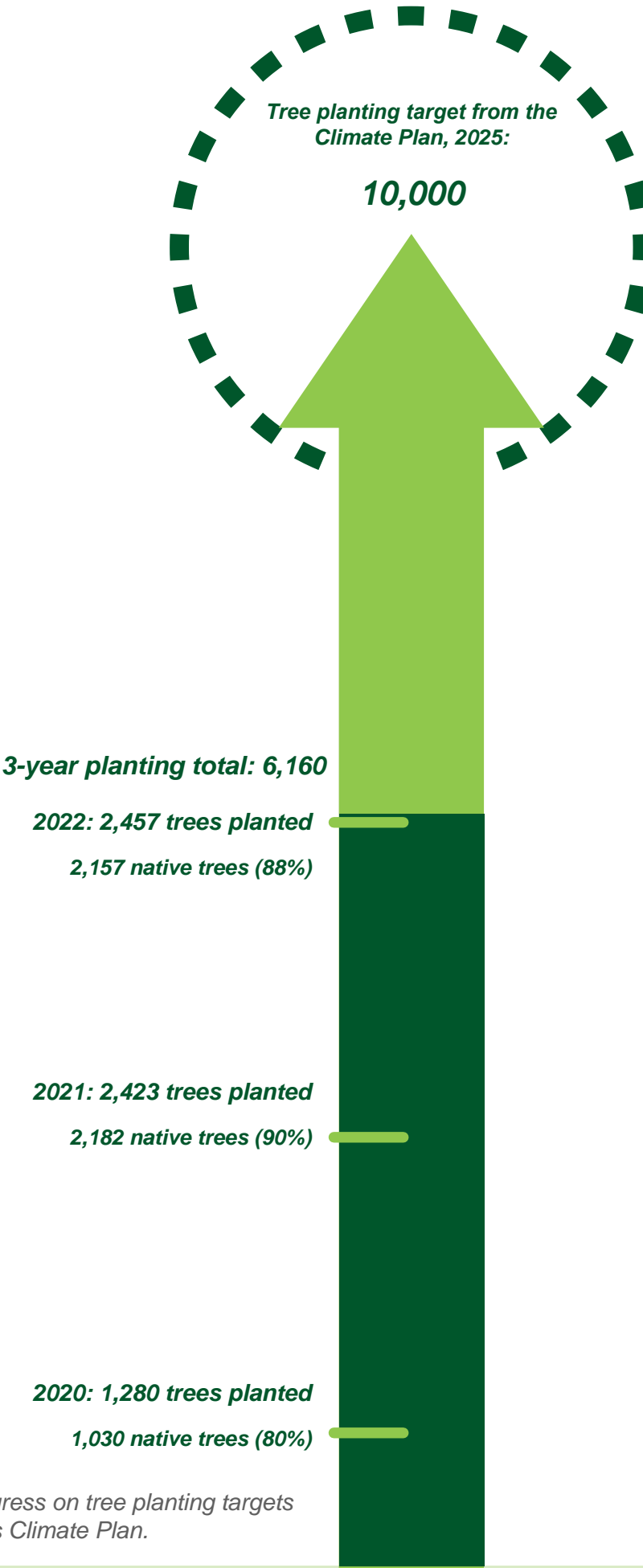
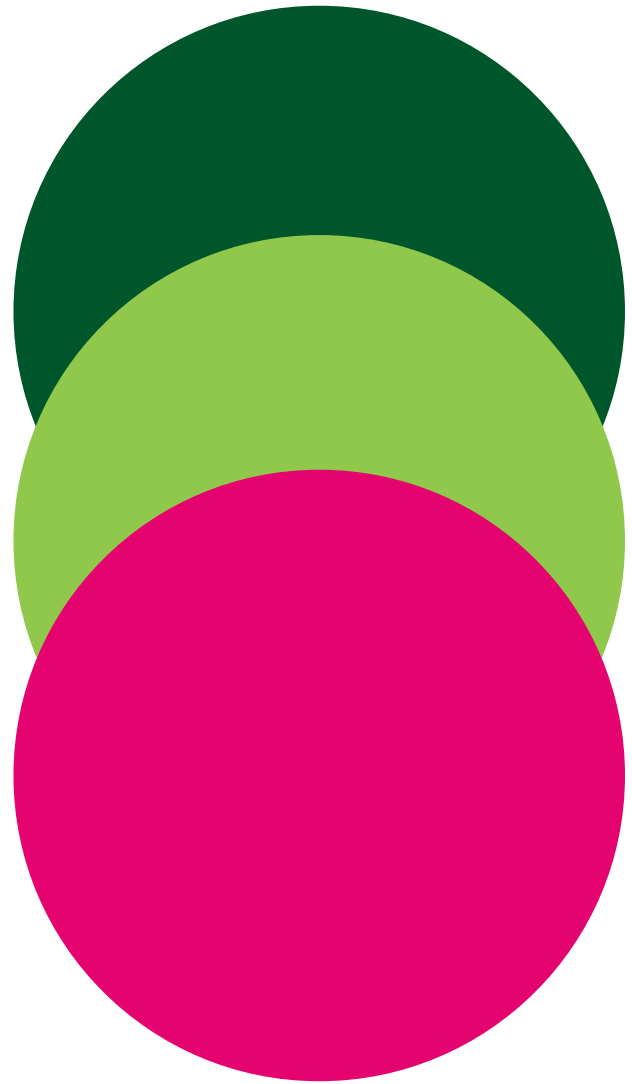


Figure 5. Progress on tree planting targets from Saanich’s Climate Plan.

# Barriers to planting trees

The District faces challenges in planting trees on public land:

- » **Planting site availability is limited.**  
Trees need enough, soil, water and air below ground, and space above ground to reach their mature canopy potential. Suitable urban tree planting locations are limited by the presence of above- and below-ground infrastructure, soil volumes that are too small, and paved areas like sidewalks and driveways. Every District tree removed requires three replacements, which has quickly filled locations that were easy to plant.
- » **Increased planting in parks is not always appropriate.** While unplanted, open areas exist in District-owned parks, tree planting must balance other recreational uses and demands on park land. Many parks already have high tree canopy cover, or have recently had new trees planted.
- » **Native tree species face challenges.**  
The District values the unique natural ecosystems of Saanich and has recently increased native tree planting in parks and natural areas to help meet Climate Plan goals. In more urbanized areas, native tree species are often unsuitable because they fail to thrive in small soil volumes around lots of buildings and pavement. Climate change is also reducing the suitability of local seed sources for Saanich's increasingly warm, dry summers.



## 3.2 Tree Care

Intensively managed trees in streets and parks require care throughout their life cycles. Each tree is individually planted, watered, pruned and then removed at the end of its life. Newly planted trees receive scheduled early life care while older trees receive care on an as needs basis. Trees growing in natural areas typically receive less individualized care, though the District does act to address threats to forest health and public safety in these areas when reported. The best way to maximize benefits from the urban forest is to ensure that forest ecosystems remain healthy, and that intensively managed street and park trees live long, healthy lives.

### Young Tree Care

Once planted, intensively managed trees are watered or irrigated for three to five years. Sometimes soil amendments like mulch, biochar, inoculants or fertilizer are added to support healthy root growth and soils. Some young trees also receive “structural pruning” to correct for early defects in their form and development. The District also protects young trees from animals or wind damage by using wire cages and stakes if needed. Taking these steps early in a tree’s life increases the likelihood that the tree will establish roots, have good structure and branch strength, and avoid larger pruning cuts later in life.

### Watering and Irrigation

The District irrigates 68 high-visibility boulevards and 72 landscaped parks throughout the community. Climate change is resulting in increased need for watering. Where feasible and appropriate, the District negotiates with developers through the rezoning process to install irrigation for street trees in improved street boulevards. Street trees also receive supplemental watering when young. Water bags are placed on the trunks of new Partnership Trees to drip irrigate

the area immediately around the tree’s base, while trees planted by other programs are watered by soil injection seasonally.

### Mature Tree Care

Mature trees are inspected in response to service requests or staff observations in the field, and may then be pruned or undergo risk assessment as needed. For high value public trees, the District may take additional steps to manage tree health and risk, including fertilization, and soil amendments. These treatments maximize tree service life and support maintaining large and significant trees in the community for as long as possible.

### Tree Care on Roads

Trees planted on higher traffic roads have higher maintenance requirements and tree survival limitations. Trees along roads make up the highest number of trees requiring hand watering. These trees typically require a more frequent maintenance interval because of the surrounding high-value targets. The maintenance often includes traffic control, driving up costs.

### Urban Forest Health Management

The District employs an Integrated Pest Management Policy to guide forest health response. Pesticides are a least preferred option for pest and disease control. Through invasive species removal and extensive ecological restoration, the District aims to support healthy, resilient urban forest ecosystems that are resistant to pest invasion. Pest and disease outbreaks in the urban forest are becoming more common, likely due to climate change and related stress on trees.



For the greatest benefit, a tree should spend most of its life in healthy maturity

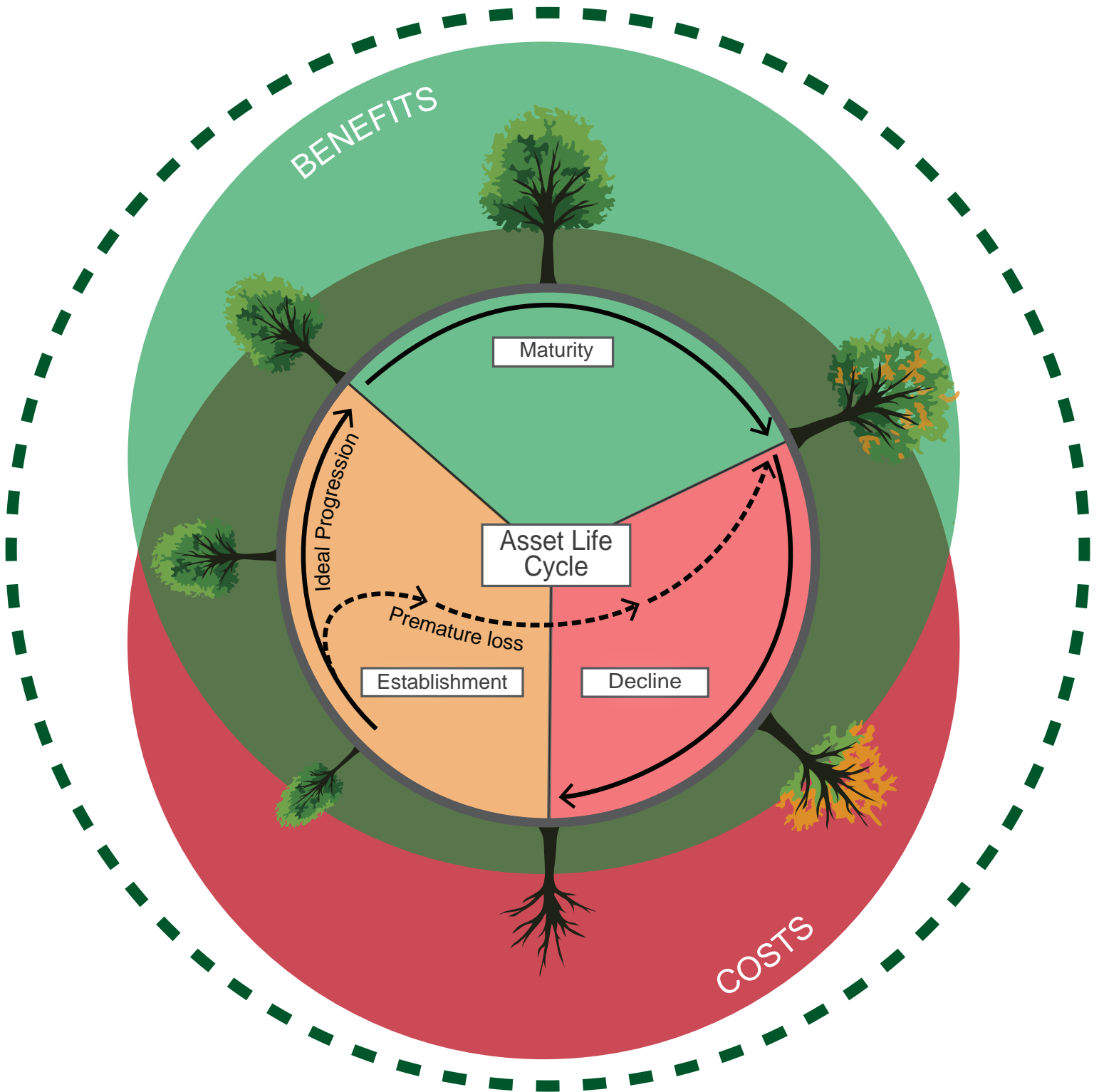


Figure 6. Urban forest management asset life cycle.

# Climate change: impacts on the urban forest

- 1. Changes in temperature and precipitation patterns:** Climate change is likely to bring changes in temperature and precipitation patterns, impacting the growth and survival of trees in urban forests. Warmer temperatures will increase water demand and heat stress. Changes in precipitation patterns may lead to flooding or drought, which can negatively affect urban forests.
- 2. Increased stress on trees:** Higher temperatures and drier conditions can increase stress on trees, making them more susceptible to pests and diseases or premature death.
- 3. Increased risk of pests and diseases:** Climate change can create conditions favouring the growth and spread of pests and diseases that kill trees. For example, warmer temperatures can lead to increased populations of pests such as bark beetles. Changes in precipitation patterns can also create conditions that favour the growth of tree diseases like certain fungi or bacteria.
- 4. Changes in species composition:** As climate conditions change, the suitability of different tree species for urban forests will shift. Some tree species that are currently well adapted to the local climate may become less suitable, while others that are currently rare or absent may become more viable. This could result in changes in the composition and structure of urban forests on Vancouver Island.
- 5. Changes in species distribution:** As temperatures warm, some tree species may migrate north or to higher elevations in search of cooler temperatures. High-elevation species could die off without suitable habitats to migrate to.
- 6. Impact on carbon sequestration:** Urban forests are an important carbon cycle component, sequestering carbon dioxide from the atmosphere and storing it in trees and soils. Climate change may impact the ability of urban forests to sequester carbon.
- 7. Increased wildfire risk:** Climate change is expected to increase the frequency and severity of wildfires in many areas, including Vancouver Island.
- 8. Increased flooding and erosion:** Extreme weather events like heavy rainfall and storms can lead to increased flooding and erosion in urban forests. This can damage trees and other vegetation, as well as impact infrastructure, water quality and habitat for wildlife.
- 9. Changes in seasonal timing:** Climate change can alter the timing of biological events, such as flowering and leafing out, which can affect the functioning of urban forests. For example, if trees leaf out too early, they may be more susceptible to damage from late frosts.
- 10. Impacts on ecosystem services:** Urban forests provide various ecosystem services, such as air and water filtration, carbon sequestration, and wildlife habitat. Climate change can affect the ability of urban forests to provide these services.

**Stressed trees, higher tree mortality and demand for ecosystem services will increase urban forest management workloads**

## Climate Driver

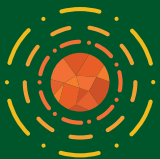
## Climate Impact

BY THE 2050s, PROJECTED CHANGES\* TO:



### TEMPERATURES

Warmer temperatures year round, with three times as many days over 25 °C. One-third as many days with lows below 0 °C.



### EVAPOTRANSPIRATION

Increased rates of evaporation and transpiration from waterbodies, soil and plants.



### PRECIPITATION

More rain throughout year, except in summer. Longer summer dry spells.



### GROWING SEASONS

Longer and warmer growing season, lasting over 350 days per year.

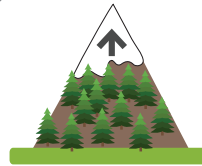


### VARIABILITY

More frequent and unseasonal extreme weather

\*Projected changes are adapted from the Climate Plan and source document: Climate Projections for the Capital Regional District

WILL LIKELY CAUSE



### SPECIES DISTRIBUTION SHIFTS

Forest species may shift northward and upslope as heat and moisture conditions exceed their tolerance.



### LESS MOISTURE AVAILABILITY

Evapotranspiration rates will increase relative to precipitation, resulting in drier soils and vegetation.



### LONGER FIRES SEASONS AND LARGER FIRES

Fires may occur more often and burn larger areas. Fire risk is expected to increase based on warmer, drier summers.



### MORE PESTS AND INVASIVE SPECIES

Pests may reproduce more rapidly and more often. Trees and ecosystems may be more vulnerable to attack and invasion.

CO<sub>2</sub>



### LONGER, WARMER GROWING SEASONS

Longer growing seasons may support more growth, species diversity and potentially more carbon sequestration.



### MORE EXTREME WEATHER EVENTS

Heat, extreme precipitation, freezing rain, heavy wet snow, flooding, landslides, windstorms and other events may happen more often leading to more tree damage.

Figure 7. Climate drivers and expected impacts on Saanich's Urban Forest.



### 3.3 Tree Protection

Requests to remove or conduct certain works around a protected tree in Saanich require an application to the District for a tree cutting permit. The reasons the District will issue a permit to remove a tree are limited. They include where protected trees are clearly dead or dying, impacting utilities, impacting a building foundation, are proposed to be removed for agriculture, must be removed to accommodate an approved development, are shown to be inappropriate for their location, or are an identified fire hazard within the Interface Fire Development Permit Area. A permit will also be issued for the removal of one protected tree for each acre in a lot per calendar year within Rural lands.

An issued permit contains conditions that must be met, including measures to protect and work around retained trees and the number of replacement trees and any required security deposits. Development and servicing-related applications are referred to the Parks, Recreation and Community Services Department by other departments as necessary.

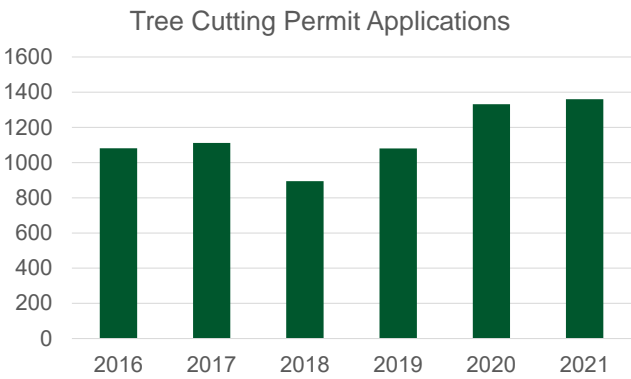


Figure 8. Applications for tree cutting permits increased between 2016 and 2021.

The District’s Tree Protection Bylaw defines any tree within the municipality having a diameter at breast height (or 1.4 m above ground) of 60 cm or more as a protected tree. Several native species are protected when much smaller than this. 60 cm diameter is a large tree that is highly likely to have been growing for multiple decades. The bylaw thus provides some flexibility for landowners when managing their young ornamental trees. This recognizes the “Large Tree Argument”, an urban forestry principle that recognizes large-stature trees tend to outperform smaller trees for urban forest benefits<sup>[35]</sup>.

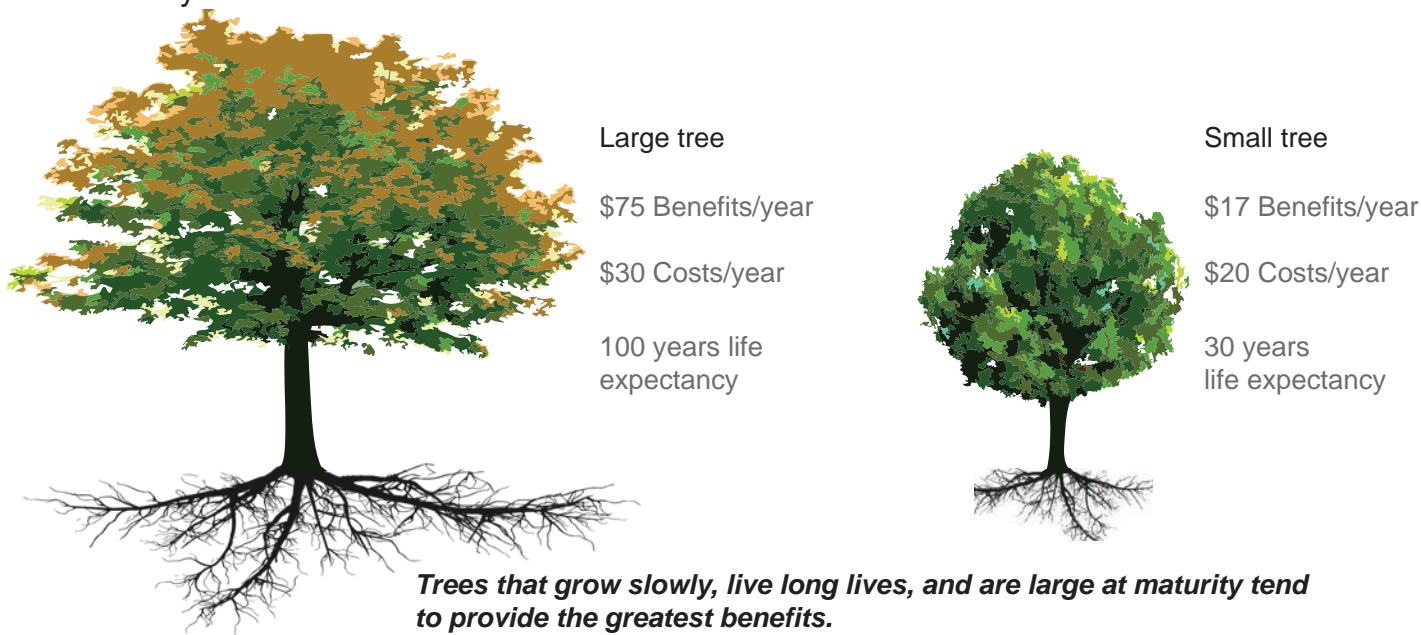


Figure 9. The large tree argument supports tree retention where feasible.

The Tree Protection Bylaw also defines Significant Trees, a class of protected tree that is listed in Schedule B of the bylaw. Significant Trees require a vote by Council to include in the Tree Protection Bylaw and represent trees of significant size, stature, uniqueness, heritage, or other value to the District. They are afforded additional protections under the Tree Protection Bylaw.

Administering the Tree Protection Bylaw is a significant responsibility within the Parks, Recreation and Community Services Department. Between 2016 and 2021, the

department processed over 6,800 tree cutting permit applications, increasing from 1,082 in 2016 to 1,360 in 2021. Staff arborists conduct field visit to verify plans and tree impacts, and to release security deposits on retained and replacement trees. Some site visits are triggered when the public reports tree cutting concerns to investigate and enforce the Tree Protection Bylaw. Enforcement actions taken by the District include education, remediating tree impacts, levying financial penalties, and may include requiring replacement trees be planted.

### 3.4 Service Requests for Public Trees

The Parks, Recreation and Community Services Department receives calls from the public, utilities, external agencies, and other District of Saanich departments requesting different urban forestry services. Requests for tree pruning are the most common subject of calls from the public in every year since 2016,

with 55-67% of calls being related to pruning of a public tree. Other common call subjects include potential Tree Protection Bylaw infractions on public and private land and requests to remove public trees. Calls often concern complicated decisions regarding infrastructure and protection of public trees

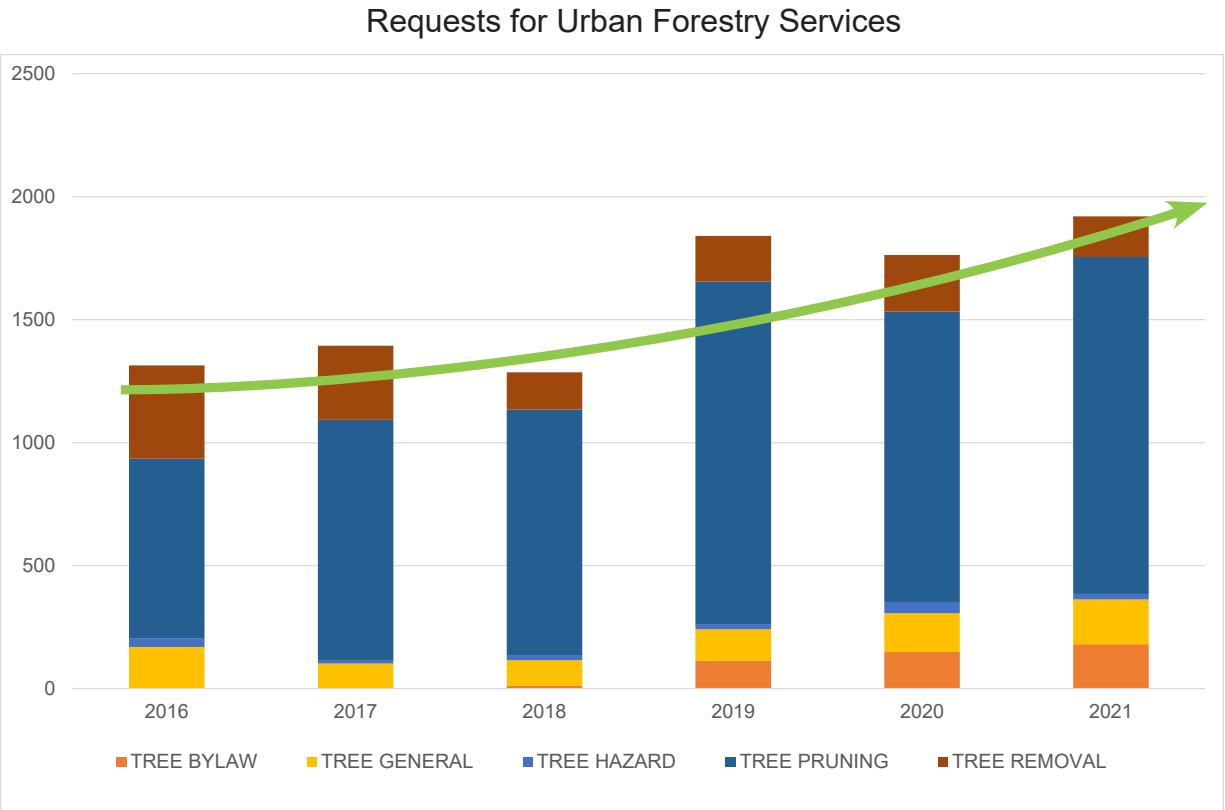


Figure 10. Call volumes have increased since 2016 for urban forest services.



from construction impacts. Call volumes have increased between 2016 (1,300 calls in total) and 2021 (1,900 calls). The number of calls about tree removal has decreased while call volumes about pruning and bylaw infractions have increased.

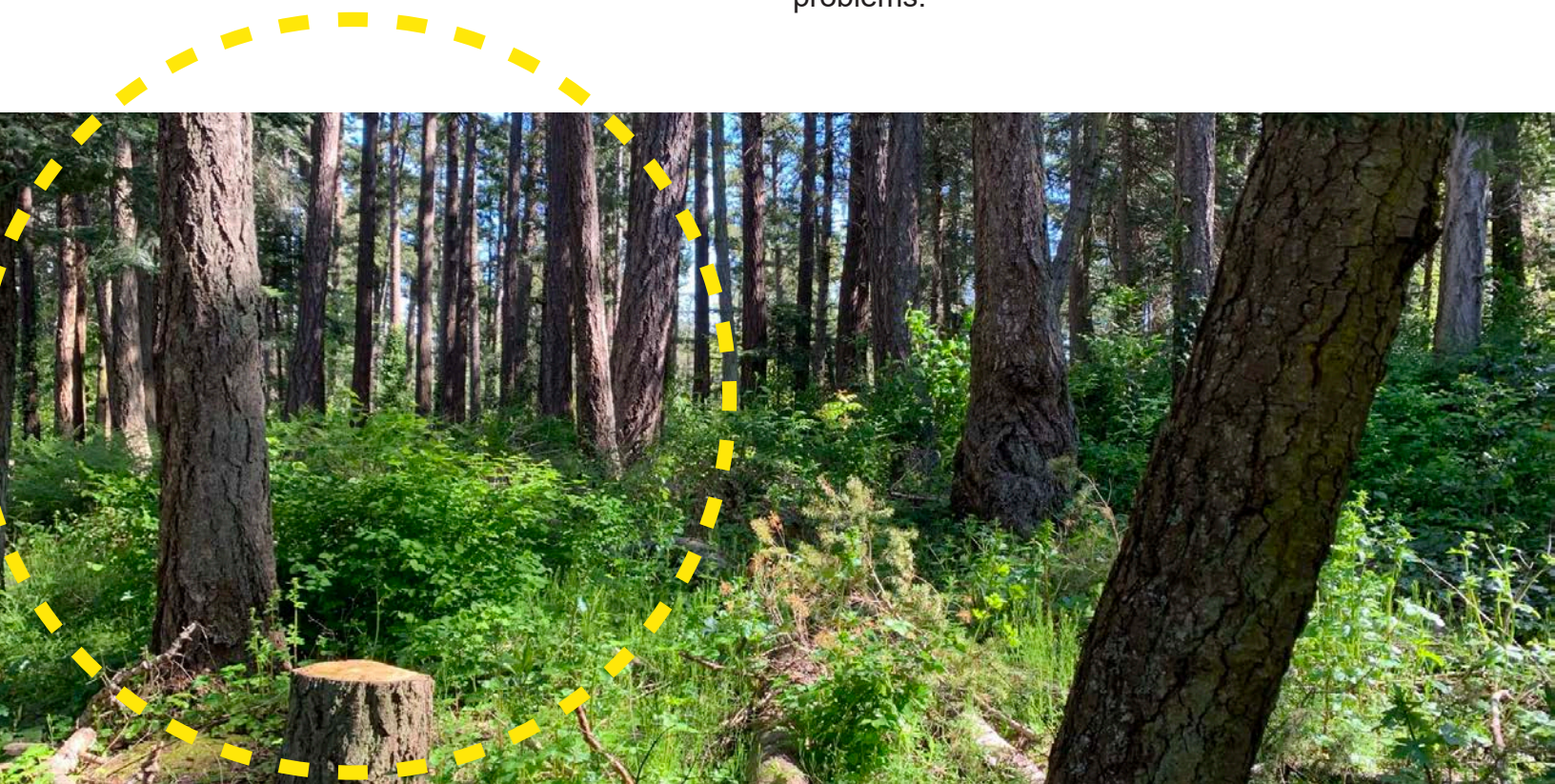
### 3.4.1 Community risk management and storm clean-up

Community risk management includes risk inspections performed on street and park trees, and storm damage clean up. Tree risk management programs are primarily focused on assessing and mitigating tree risk, which is assessed based on the likelihood of tree failure, potential to impact a target and the consequence of that impact. Risks mitigation typically involves pruning or removing the tree.

The Parks, Recreation and Community Services Department conducts tree risk assessments when contacted by residents, external agencies, and other District of Saanich departments concerned about public trees. Since 2016, the Urban Forestry

team has received hundreds of service calls annually about potentially hazardous trees. These are assessed by a qualified municipal arborist. Between 15 and 45 calls each year result in the classification of a hazardous tree (only these calls are reflected in Figure 10).

During storms and other natural disasters, on-staff expertise in tree risk, care, and removal is important for prioritizing damage to public trees and ensuring roadways and infrastructure remain in service. Unlike other communities of similar size, the District conducts almost all of its urban forest operations internally without contractor support, including pruning and hazard tree removal. Only work requiring a Certified Utility Arborist is contracted out, as this role does not exist within the municipality. The Parks, Recreation and Community Services Department coordinates with the Fire and Engineering Departments to restore important services to residents when trees fall on roads and trails or block stormwater drainage. After storm clean-up is complete, the District relies on the service call system to identify new problems.





## 3.5 Maintaining Natural Areas and Trails

The urban forest program also provides services for invasives species control and trails maintenance in District-owned parks and natural areas. Saanich uses a priority action approach for invasive species management, seeking to prevent establishment of species at high-risk of being introduced, eradicate newly established invasive species, contain established pests with a low likelihood of eradication, and control widespread species that have little potential for containment. Invasives species management requirements are increasing each year. Trails maintenance includes brushing and clearing debris to maintain public access and promote safe use.

## 3.6 Partnering with the Community

The District recognizes the importance of connections between people and nature and promotes several opportunities to engage residents in stewardship of natural areas and the urban forest. The Pulling Together program gathers volunteers to assist invasive species management in parks and natural areas. Complementing Pulling Together is the Invasive Species Reporting program, which encourages residents to notify the appropriate authorities when an invasive species is sighted. The Native Plant Salvage and Naturescape programs promote the use and retention of native plants for biodiversity. The Partnership Tree program invites residents to call-in to the urban forestry team to identify tree planting opportunities in front of their home, while residents with a Significant Tree on their property can access grants from the District to support tree health care. Several other opportunities to participate

in stewardship are offered by the District's partners, including the Garry Oak Ecosystems Recovery Team, Bowker Creek Initiative, Gorge Waterway Initiative, and Colquitz Coalition.

### How big a risk are trees?

In general, the risk of injury from trees is low. It is challenging to find local statistics on injuries related to falling trees and tree branches. However, research from Australia found that only 0.15% of hospital admissions could be attributed to accidental tree failures<sup>[36]</sup>, and that the annual mortality rate from accidental tree failures was approximately one in five million<sup>[37]</sup>. In the UK, the annual mortality rate from tree-related causes was estimated to be one in ten million<sup>[38]</sup>. In both countries, deaths from tree failures were a much lower annual risk than accidents at home, road traffic accidents and work accidents.



### 3.7 Current Budget and Resources

Saanich’s urban forest program relies on both capital and operational budgets to maintain its service levels. Overall, the Urban Forestry and Natural Areas team’s activities have a regular operational cost approaching \$1.5 million plus an additional capital cost of almost \$500,000 in 2021. Administering and enforcing the Tree Protection Bylaw cost another \$1,000,000. Excluding capital costs, the budget for tree care, planting, and administering the Tree Protection Bylaw equalled about \$21 per resident in 2021.

Expenses within the program are categorized into different activities. Administering the Tree Protection Bylaw accounts for one-third of the total cost of the urban forest program, with slightly less going to tree care. Supporting the Tree Protection Bylaw has continued with two new positions created in 2021 to begin the Urban Forest Mapping and Tracking project. Tree planting and ecosystem restoration are the next most significant activities, making up 10% and 7% of the 2021 program cost.

The District’s investment in staff in urban forestry are the critical element underpinning the program. In most activity categories, staff expertise accounts for over two-thirds of the amount spent on the urban forest program. Other costs include nursery tree and plant stock, equipment parts and replacements, operating costs like fuel, insurance, protective gear, and professional fees and professional development courses. As the program grows in complexity, the importance of staff qualifications and training increases to meet the increased demand for services and more complicated program administration.

2021 Combined Operating and Capital Budget for Urban Forestry

**\$2,955,000**      **Operating: \$2,466,000**  
**Capital: \$489,000**

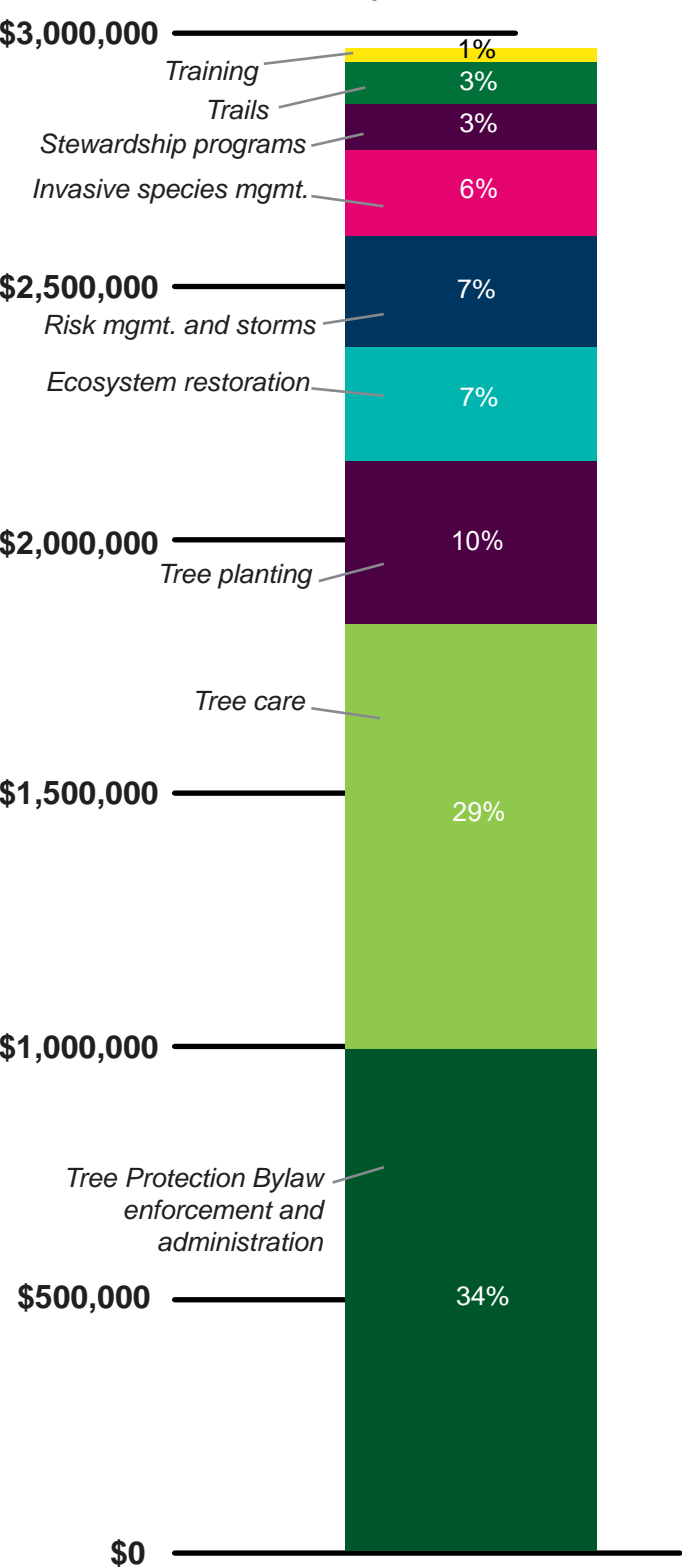


Figure 11. 2021 combined operating and capital budget for Urban Forestry.

## 3.8 Peer City Comparison

To understand the performance of the District's Urban Forest Program, five additional municipalities have been selected from nearby towns and cities. Cities considered include municipalities within Metro Vancouver and the Capital Regional District with similar populations, urban forest ecosystems, or development contexts. The selected Peer Cities are:

- Victoria** *Saanich's neighbour faces similar issues related to infill development and shares climate and cultural similarities with Saanich. Victoria uses a "minimum tree" number of 50 trees/ha to expand urban canopy cover in underserved areas through tree replacement regulations. The City has a regularly updated inventory of almost all street trees and most park trees which it uses to schedule proactive maintenance, a key difference from Saanich's primarily reactive maintenance program.*
- Oak Bay** *Saanich's neighbour exists within a similar ecological context and has focused on increasing the protection of legacy mature Garry oaks and other large trees around the municipality. Oak Bay's tree bylaw sets canopy cover targets by zoned land use, ranging from 20% for multifamily development to 45% in single-family areas. These numbers guide tree replacement requirements and planting efforts by the municipality. Oak Bay, like Saanich, lacks a tree inventory and previously struggled to prevent the loss of large, mature trees.*
- Coquitlam** *This city in northeastern Metro Vancouver has more people than Saanich but a similar canopy cover and population density. The pace of development is a major influence on canopy cover, with both greenfield and infill development occurring. The interface with the City's surrounding coastal coniferous forest is a focus of development review. The City is set to develop an urban forest management strategy while it explores risk assessment methods for wildfire and windthrow at the forest edge.*
- Langley (Township)** *This Metro Vancouver municipality is one of Canada's most rapidly growing cities. The impact of greenfield development on trees has been a concern in rural residential areas similar in land use to Rural Saanich. The Township recently adopted a "Community Forest Management Strategy" and updated its tree bylaw to enhance inspection and enforcement provisions and expand the permitting process.*
- Surrey** *The second-largest city in British Columbia, Surrey is a recognized leader in environmental management, capable of achieving economies of scale in its urban forest program. Despite the difference in scale between Saanich and Surrey, the two communities share a similar context in their regions as historically suburban municipalities that now contain a mix of land uses, including agriculture and rapidly intensifying urban centres.*



The Peer Cities Table provides information on each city's urban forest program. The municipalities differ in the levels of service offered within their urban forest programs and how programs are represented in the budget. Budget numbers reported in the Peer Cities Table are compiled from each city's recent Financial Plans and Statements of Financial Information. Budget numbers generally reflect the level of effort each city is placing on operational urban forestry and don't reflect the costs of tree bylaw administration. For this reason, the cost of Saanich's Tree Protection Bylaw implementation is omitted below.

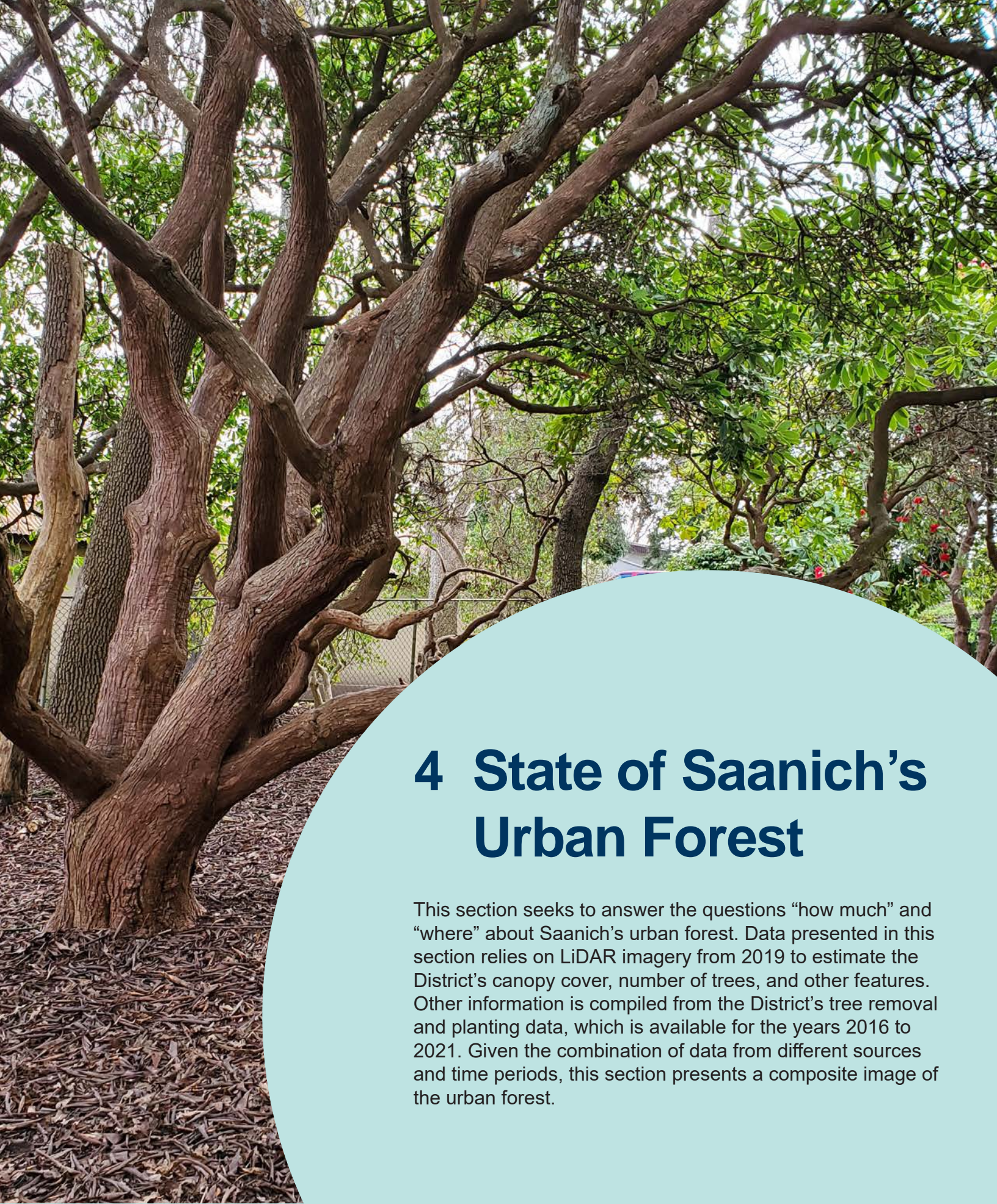
	Saanich	Victoria	Oak Bay	Coquitlam	Langley Township	Surrey
<b>CONTEXT</b>						
Population (2021)	117,735	91,867	17,990	148,625	132,603	568,322
Pop density (/km <sup>2</sup> )	1,137	4,722	1,710	1,217	432	1,798
Land area (km <sup>2</sup> )	103.6	19.5	10.5	122.2	307.2	316
<b>PLAN</b>						
Canopy Cover (Year)	43% (2019)	28% (2019)	33% (2016)	40% (2014)	30% (2018)	32% (2014)
# Inventoried Public Trees	None	33,812	None	13,500	26,900	103,985
ISA Arb On Staff?	Yes	Yes	Yes	Yes	Yes	Yes
Operational UF Budget (excludes tree bylaw)	\$1,470,000	\$2,800,000	\$640,000	\$2,600,000	\$1,300,000	\$4,800,000
	\$280,000					
Capital Budget for Tree Planting	+ \$200,000 natural restoration	\$65,000	Not reported	Not reported	\$290,000	Not reported
Approximate \$/resident in operational budget	\$12.45	\$30.48	\$35.58	\$17.49	\$9.80	\$8.45
<b>PLANTING</b>						
Annual new public trees (excludes natural areas)	400-500	350-400	50-100	500-600	600-650	4,475

	Saanich	Victoria	Oak Bay	Coquitlam	Langley Township	Surrey
MANAGE						
Tree inventory	None	Street trees & landscaped parks	None	Streets & landscaped parks	Streets & landscaped parks	Street trees & landscaped parks
Pruning	Reactive	Proactive	Reactive	Reactive	Reactive	Proactive
Risk management program	Reactive	Proactive	Reactive	Reactive	Reactive	Proactive
UFS/Plan	Yes	Yes	Yes	No	Yes	Yes
PROTECT						
Public or Private Trees	Both, corporate exemption	Both, corporate exemption	Both, corporate exemption	Both, corporate exemption	Both, corporate exemption Parallel process for dev.	Both, corporate exemption
Private Protected Tree Size	60cm DBH (some species smaller)	30cm DBH (some species smaller)	30cm DBH (some species smaller)	20cm DBH	20cm DBH	20cm DBH
Tree density or canopy cover requirement	None	50 trees/ha during dev.	Requires canopy cover by land use during dev.	None	None	None
Significant/Heritage Tree clause	Yes	Yes	Yes	No	Yes	Yes
PARTNER						
Budgeted urban tree stewardship program	Yes	Yes	No	Yes	No	Yes
Reconciliation approach in parks and land management	Formal	Formal	Informal	Informal	Informal	Informal

## Key Findings from the Peer City Comparison

- » **Canopy cover:** Saanich has the highest canopy cover of its peers, a number lifted by large areas of forest in Rural Saanich. Tree protection is limited in large areas of Rural Saanich, where rules protecting agriculture supersede the Tree Protection Bylaw. Within the Urban Containment Boundary, the District's canopy cover is 31%, comparable to its peers.
- » **Monitoring and tree inventory:** Of peer cities, only Oak Bay currently lacks a tree inventory. Saanich has started work to improve its monitoring and tracking of the urban forest through a GIS-based inventory with funding to support the inventory of bylaw replacement trees.
- » **Budget:** Saanich's operational spend of \$12.45 per capita on urban forestry (not including bylaw administration) is similar to larger peer cities but significantly less than smaller cities that offer some higher service levels.
- » **Tree care:** Only Victoria and Surrey have proactive maintenance of their intensively managed street and park trees.
- » **Tree protection:** Saanich's Tree Protection Bylaw stands out among peer cities as having the largest general size requirement for designation as a protected tree – twice as large as the nearest peer. Saanich does protect native trees at smaller sizes, including even small saplings of some native species.
- » **Trees or canopy cover:** Saanich is similar to Metro Vancouver municipalities in regulating trees (stem count), rather than canopy cover, within its tree policies. Victoria and Oak Bay's regulation of canopy cover are the result of recent policy changes and complement existing replacement tree regimes.
- » **Reconciliation and partnerships:** Saanich and Victoria lead in their approach to reconciliation. No other peer cities have pursued formal working agreements with host Indigenous nations encompassing park or land management. Saanich joins four of its peers in having dedicated funding for stewardship and volunteer programming in the urban forest.





## 4 State of Saanich's Urban Forest

This section seeks to answer the questions “how much” and “where” about Saanich’s urban forest. Data presented in this section relies on LiDAR imagery from 2019 to estimate the District’s canopy cover, number of trees, and other features. Other information is compiled from the District’s tree removal and planting data, which is available for the years 2016 to 2021. Given the combination of data from different sources and time periods, this section presents a composite image of the urban forest.



## Quick Facts about Saanich's Urban Forest

- » *43% canopy cover District-wide, 31% canopy cover inside the Urban Containment Boundary*
- » *Over 742,000 trees within the municipality, of which approximately 205,000 are on Saanich-owned property*
- » *Of Saanich's 12 Local Areas, 5 have less than 30% canopy cover, and 8 have less than 36% canopy cover.*
- » *Urban areas are dependent on small trees for urban forest benefits. Only Rural Saanich has more trees over 30 m tall than trees less than 10 m tall*
- » *Industrial and commercial lands have 11% tree canopy cover, the lowest in Saanich*
- » *Natural forests contribute three-quarters of Saanich's urban forest*
- » *Only 1% of Saanich contains old forest (>140 years in age)*
- » *Saanich's tallest trees are over 55 m in height. Within the UCB, PKOLS (Mount Douglas Park) and Mystic Vale are the best places to see tall trees*
- » *About 13,000 trees in Saanich show signs of decline. Natural forests see higher rates of decline than urban areas*
- » *Over 150 trees are listed as Significant Trees by the Tree Protection Bylaw*

## How were the estimates in this section made?

This section reports on canopy cover and structural information about trees in different parts of Saanich. Tree canopy cover is a measurement used by many municipalities to assess the extent of their urban forest over time. Canopy cover refers to the percentage of an area covered by tree crowns when looking down from above. It is cost-effective to measure, easily understood, and comparable across jurisdictions. Canopy cover can be compared across smaller geographic units such as neighbourhoods and land uses or summed within the city's entire boundary.

Canopy cover for this report was derived using a combination of aerial orthoimagery and remotely sensed Light Detection and Ranging (LiDAR) data collected in 2019. LiDAR is a remote sensing method of data collection that uses a plane or drone to send non-visible beams of light vertically towards the ground as the vehicle travels overhead. A sensor on the aerial vehicle then records

the time taken by light to reflect back from different surfaces. These records can be processed to create a map of heights for buildings, trees, and open spaces. Computers are used to combine this data with aerial orthophotography to allow it to be classified into tree and non-tree surfaces.

Higher resolution data can be used to identify individual trees and characteristics like height and whether a tree is deciduous, coniferous or declining. Individual tree detection was completed for Saanich. For the purposes of this analysis, a height cutoff of 2 m was used to count vegetation as tree canopy.

Tree inventories are another common tool for obtaining detailed information on urban trees (e.g., diameter, condition, species etc.). The District does not yet have a tree inventory but is in the process of collecting one, which will provide more information about District trees for future analysis.

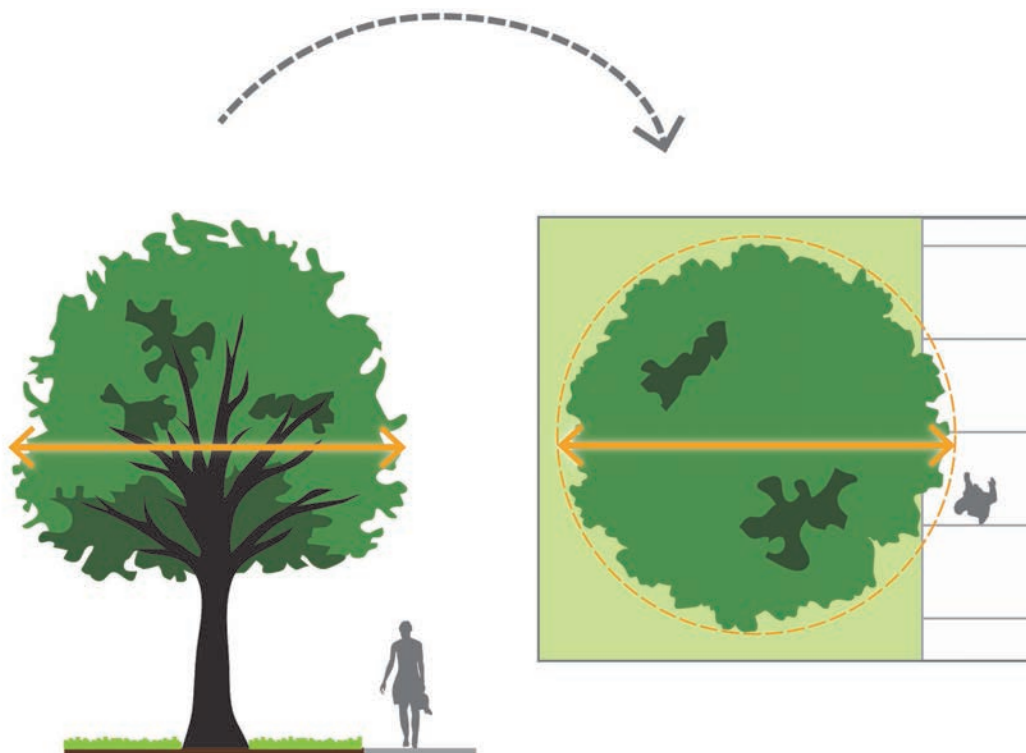


Figure 12. Canopy cover is the visible extent of tree foliage and branches against the ground when viewed from above.



## 4.1 District-wide canopy cover

Saanich's Land Area: 10,652 ha

*Saanich's Canopy Area: 4,548 ha*

- » *Saanich's 2019 canopy cover was 43% across the entire municipality*
- » *Canopy cover inside the Urban Containment Boundary, where most people live and work, is 31%*

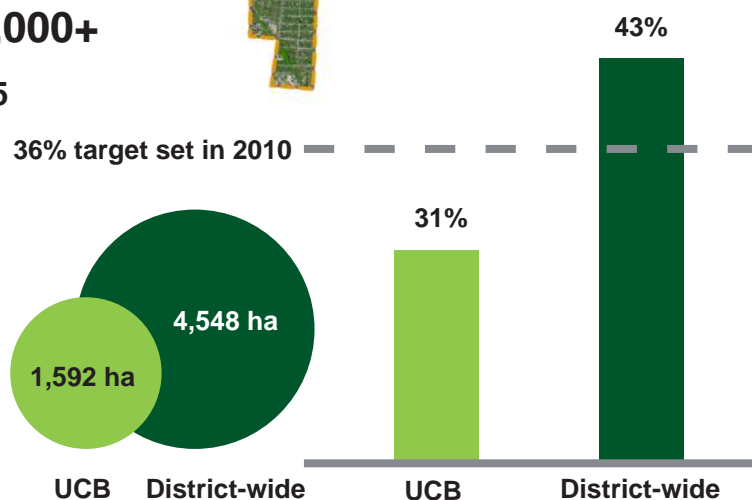
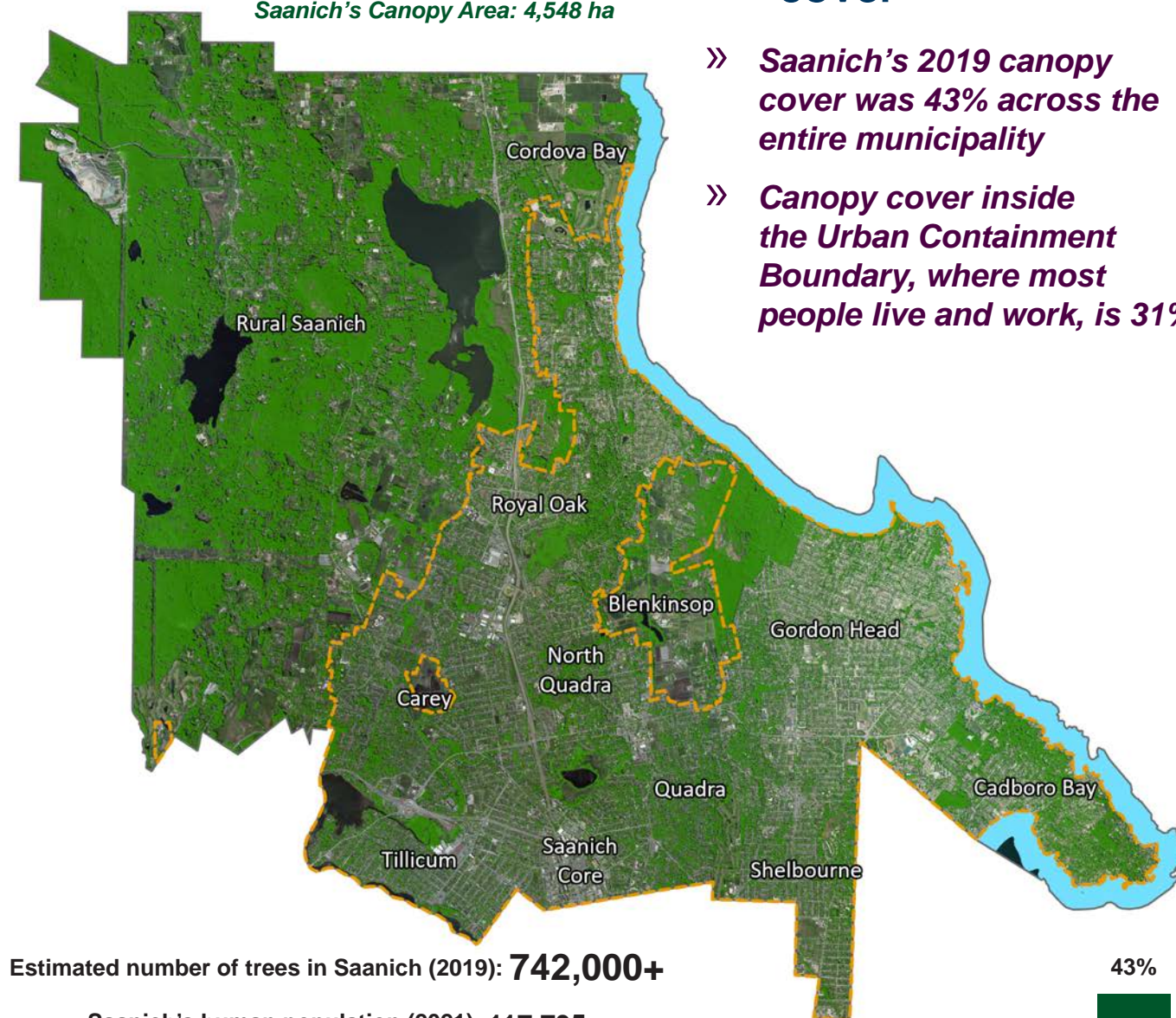


Figure 13. Saanich's District-wide tree canopy cover.

# Why are there conflicting estimates of canopy cover?

Over the years, a range of different canopy cover estimates have been reported for the District. Shifting canopy baselines have created challenges for setting targets and measuring progress in urban forest management.

## State of the Urban Forest Report - 43%

**The 43% canopy cover stated in this report is an accurate estimate of canopy cover for 2019.** Repeating the method used to generate this assessment will enable change detection in future years as long as the data is collected in the same season and processed in the same way. The data has been manually cleaned to remove errors, and validated using i-Tree Canopy.

The following is a summary of historic analyses and some considerations for why these methods are not comparable to the current estimate.

## 2008 UFSI Mapping Project and 2010 Saanich Urban Forest Strategy - 36%

Canopy cover for the District was reported as 36% based on 2005 imagery, and this value was used in the 2010 Urban Forest Strategy.

The data relied on imagery only, and classified pixels as having tree cover density based on colour. The actual value reported is that 36% of the municipality's land area had tree cover density > 50%. The method did not outline individual trees and is not an estimate of canopy extent. The study reported a declining trend in tree canopy.

## 2011 Capital Regional District Land Cover Mapping - 39%

This report repeated the methodology from the UFSI study. It revised the previously reported canopy cover finding for 2005 from 36% to 42%. The difference between

the values reported for 2005 appear to be due to differences in both the canopy area and land area reported. Saanich's canopy cover reported for 2011 was 39%. The study reported a declining trend in tree canopy.

## 2021 Capital Regional District Land Cover Mapping - 47% or 45%

This report repeated the methodology from the previous two studies and also added a new LiDAR based methodology to estimate canopy cover for 2019.

Using the previous methodology, the report estimated canopy cover at 47%. This indicated a declining then increasing trend. Differences in the season of the imagery may explain some of that trend. The differences between the canopy area reported in each report and for each year are shown below, and demonstrate that the baseline canopy cover reported in the 2010 Urban Forest Strategy was not reliable:

Imagery based method	2008 report	2011 report	2021 report
Land area	11,136	10,708	10,699
2005 canopy area >50% canopy density	4,037	4,602	5,055
2011 canopy area		4,190	4,677
2019 canopy area			4,979

The 2021 report also included a LiDAR methodology that did capture canopy extents, and results in a canopy cover estimate of 45%. The District reviewed the canopy dataset and found it was an over-estimate due to errors (e.g., roofs or non-trees) that would need to be cleaned. Rather than cleaning that dataset, the analysis was redone for the State of the Urban Forest Report.

## 4.2 The urban forest in each local area

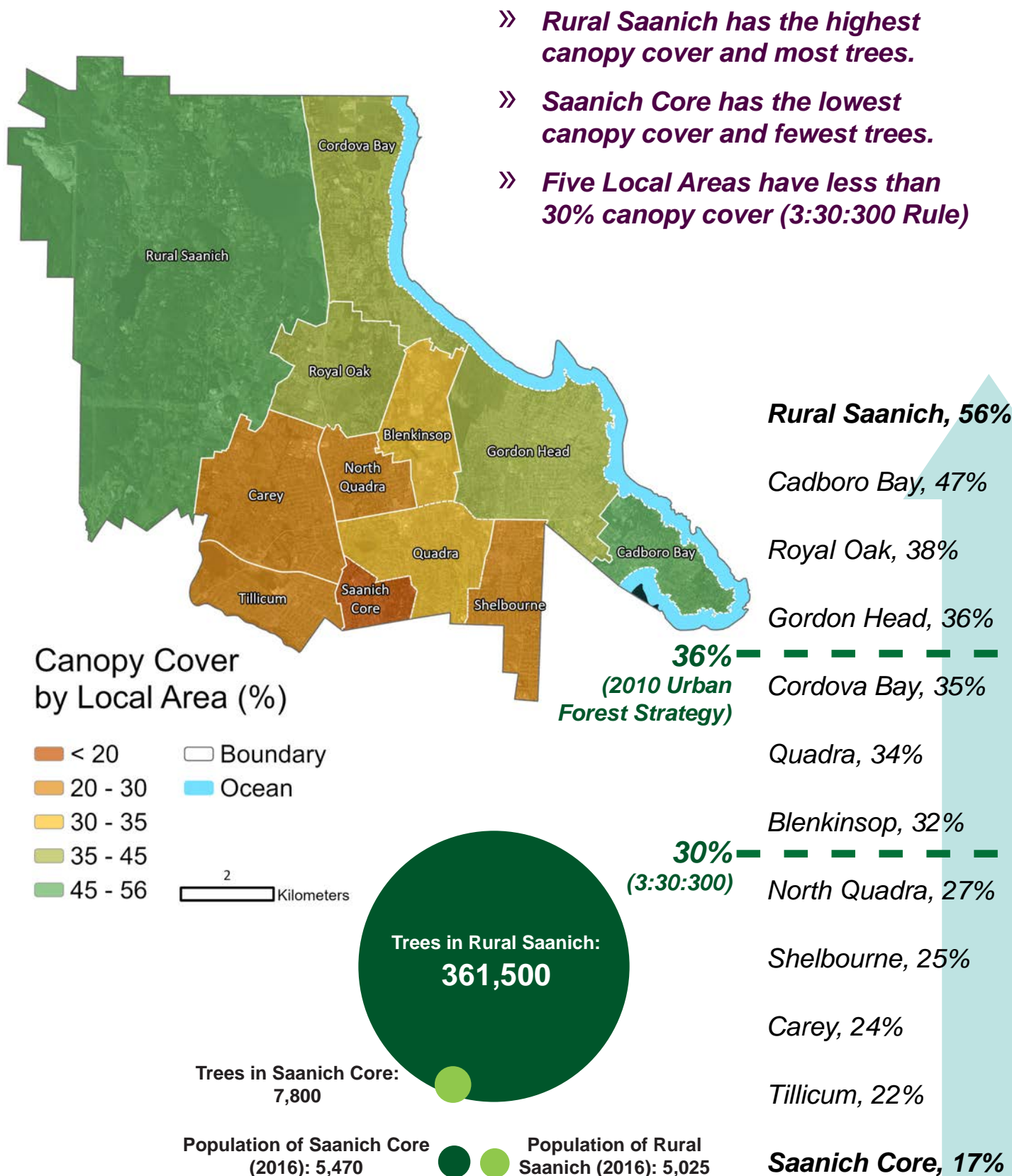


Figure 14. Canopy cover by Local Area.



## How is the urban forest different in each Local Area?

The graphs to the right and on the following page can help answer this question. They show the total number of trees in each Local Area, the total canopy area, and the distribution of canopy and stems by 10-metre height classes.

The green bars indicate the number of trees in each 10-metre height class, read on the left axis. All Local Areas, except Rural Saanich, have more trees in smaller height classes.

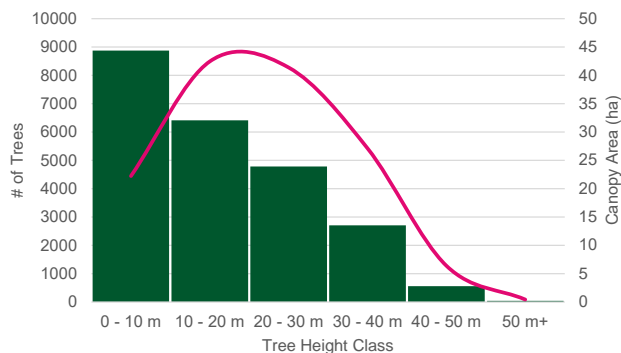
The pink lines show which size class of trees contribute the most canopy area. Most canopy area is contributed by larger trees, even though there are typically more small trees in each Local Area.

For example, in Blenkinsop, an even-stepped distribution of tree sizes means there are relatively more small trees and very few large trees. Most of the canopy in Blenkinsop is contributed by trees between 10 and 30 m in height. On the other hand in Rural Saanich there are a large number of tall trees, which contribute most of the area's canopy cover. Over 100,000 trees in Rural Saanich are estimated to be at least 30 m in height, while several Local Areas have hardly any trees of 30 m or more in height.

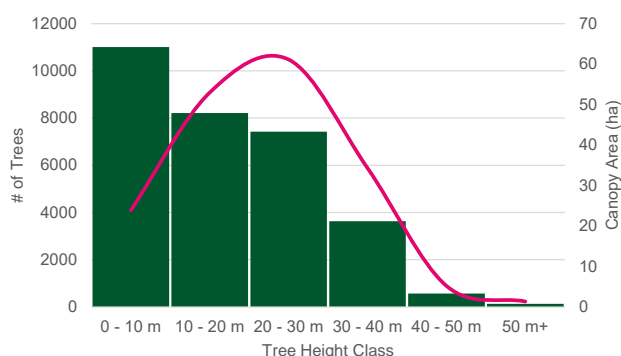
Overall, Saanich's more urban local areas are dominated by small trees. More established, or more suburban areas tend to have more of a mix of tree sizes.

Rural Saanich is unique among Local Areas — its canopy distribution by size class reflects that it is home to extensive natural forests with towering, long-lived native trees.

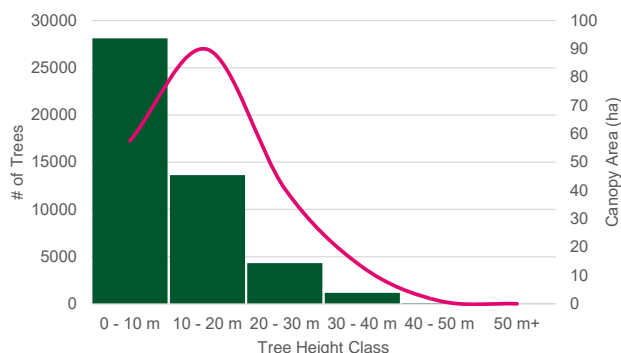
*Blenkinsop, 23,400 trees*



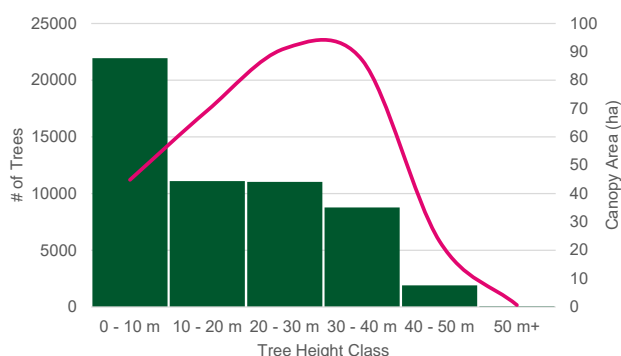
*Cadboro Bay, 31,000 trees*



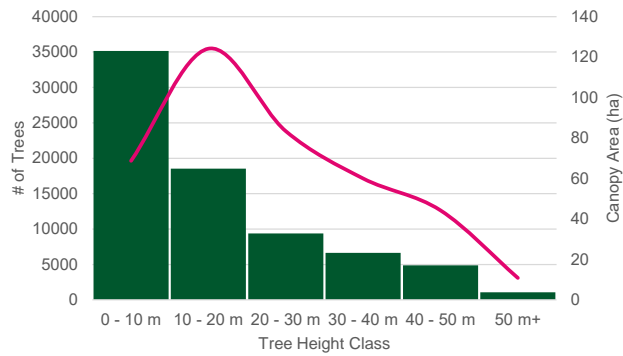
*Carey, 47,300 trees*



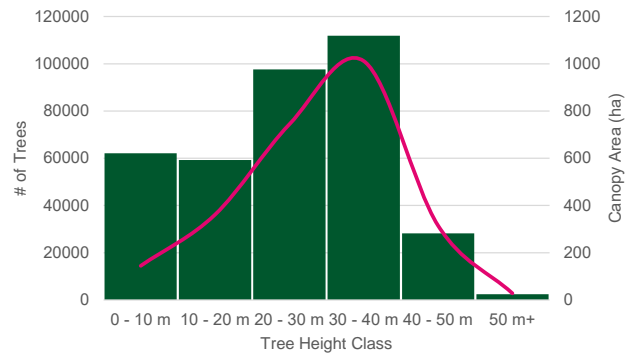
*Cordova Bay, 54,800 trees*



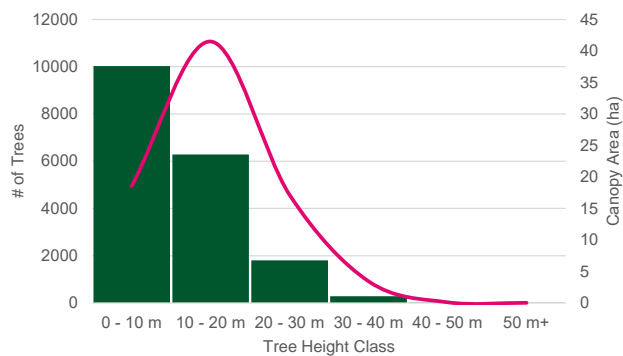
### Gordon Head, 75,700 trees



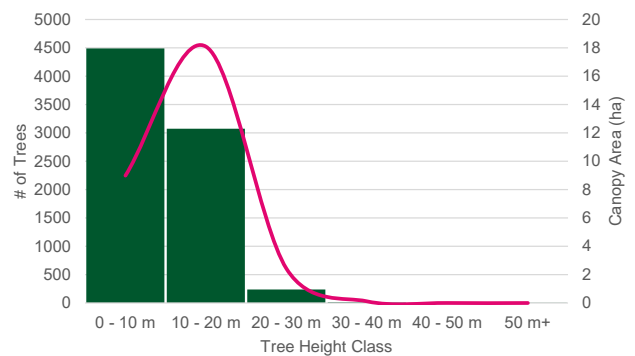
### Rural Saanich, 361,500 trees



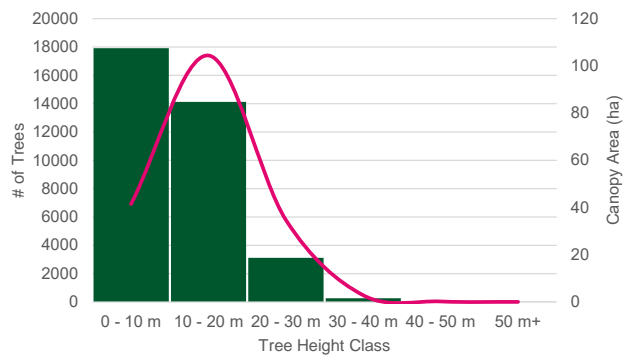
### North Quadra, 18,400 trees



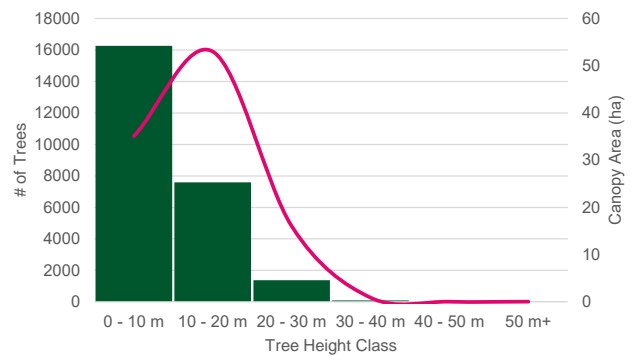
### Saanich Core, 7,800 trees



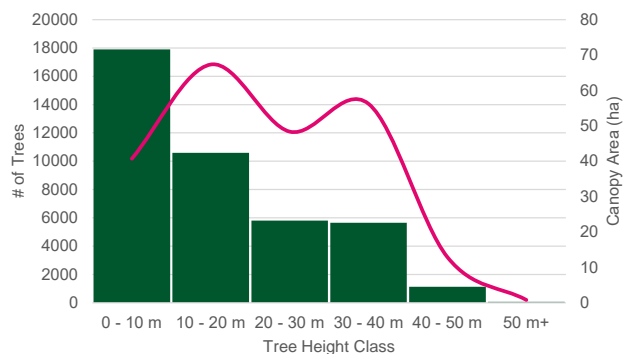
### Quadra, 35,500 trees



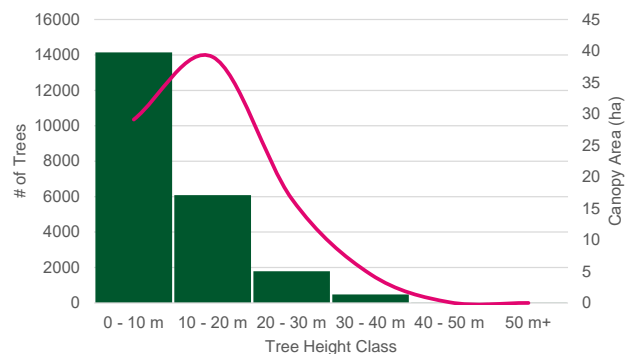
### Shelbourne, 25,300 trees



### Royal Oak, 41,200 trees



### Tillicum, 22,500 trees



# 4.3 Public trees

For the purposes of this report, public trees are those on District-owned property or managed by Saanich in rights-of-way (street boulevards), parks, and other properties. These “management units” can inform the District’s levels of service for urban forestry. Trees in regional parks managed by the Capital Regional District are not included among Saanich’s public trees, though they are a significant resource within the municipality.

There are approximately 205,000 public trees.

- » Over 116,800 trees grow along roadways in Saanich.
- » 79,800 trees grow in District of Saanich parks
- » 8,400 trees grow elsewhere on District-owned property.
- » Canopy cover across all District-owned property is 39%. In Saanich Parks it is 57%. It is 28% over roads.

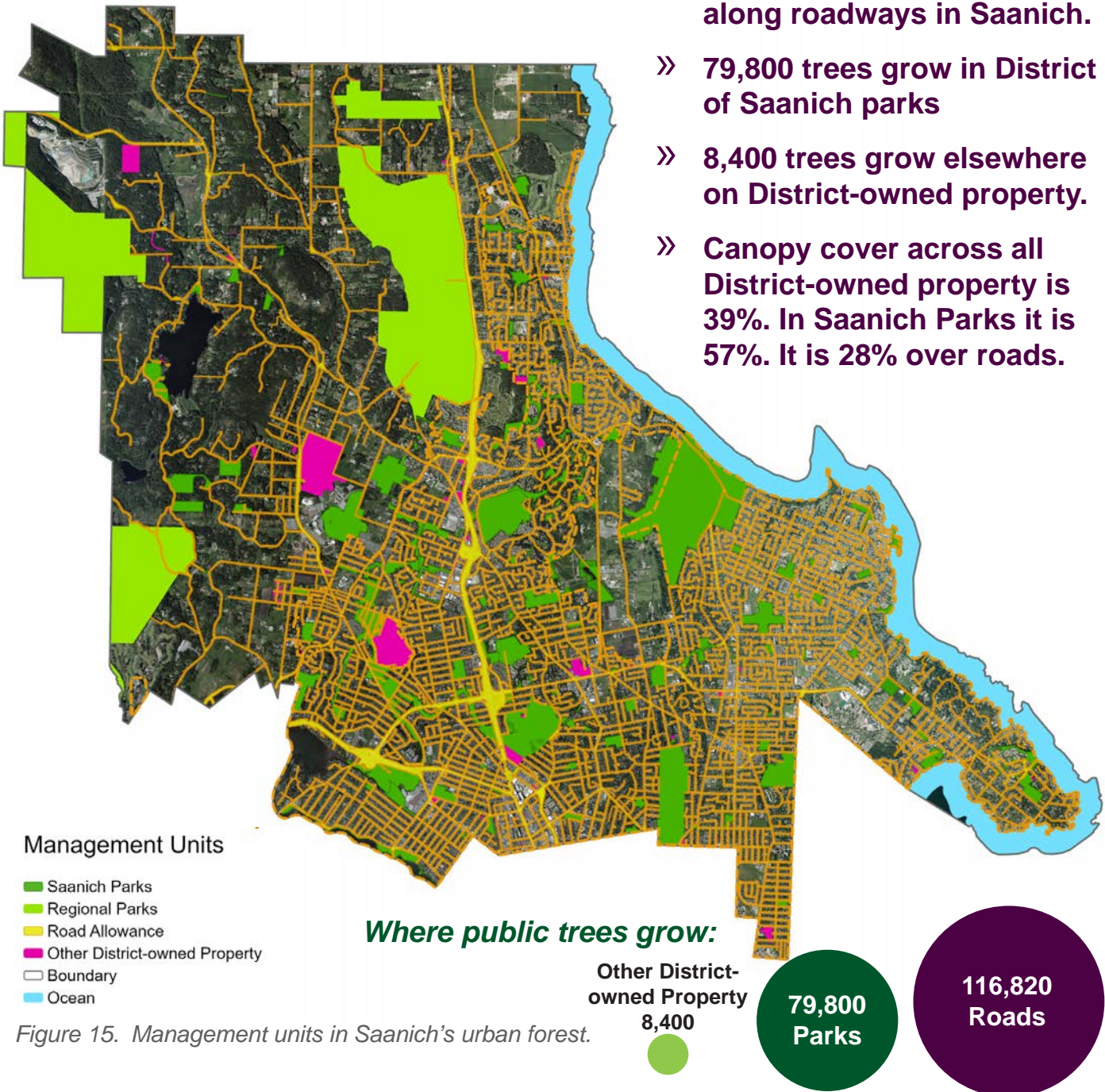


Figure 15. Management units in Saanich’s urban forest.



## Tree removal from public land

Trees are removed from District-owned property for many purposes, including to accommodate capital works and infrastructure, address public safety hazards, and occasionally to accommodate permitted development on adjacent private property. The District tracks these removals, allowing them to be reported for the years 2016 to 2022. During that timeframe, 2,004 trees were removed from public land, a number that has declined over time from 392 trees in 2016 to 180 in 2022. Within the timeframe, tree removals from public land peaked in 2019 at 441.

During this time, changes in the Tree Protection Bylaw increased the protection of trees on public land.

In the table below, the colours indicate the distance and direction from the median number of removals between 2016 and 2022. Red indicates that a year saw a higher than the median number of removals in that Local Area, while green indicates a lower than median number of removals was seen.

The data, while the best available, underreports the number of trees removed in each year because it is known to exclude removals not recorded in service call data.

Estimated Tree Removals from Public Land, 2016-2022							
Local Area	2016	2017	2018	2019	2020	2021	2022
Blenkinsop	8	10	6	23	8	9	3
Cadboro Bay	39	30	29	25	20	6	11
Carey	33	33	39	67	22	18	22
Cordova Bay	36	31	32	45	20	4	15
Gordon Head	55	55	64	92	37	53	26
North Quadra	14	9	10	20	4	2	5
Quadra	19	19	20	17	13	10	4
Royal Oak	33	32	23	41	18	11	13
Rural Saanich	39	33	46	66	28	14	55
Saanich Core	35	16	19	8	4	0	8
Shelbourne	20	16	29	21	17	12	12
Tillicum	61	32	8	16	10	10	6

*\*Numbers in red are higher than the median rate of loss. Numbers in green are below the median rate of loss. The deeper the shade, the further from the median for that Local Area.*



## Saanich's tree species

Species diversity in the urban forest is often held as an important part of sustainable urban forest management. The District of Saanich lacks a tree inventory, which is a record of public or private trees that includes information like size, condition, and species. However, the District's tree planting data does record species. Species data from recent plantings can only hint at what the urban forest contains. However, it does present a picture of the future of the urban forest.

These are the ten most commonly planted public trees since 2016:

**8% Garry Oak**

**5% Persian Ironwood**

**5% Red Maple**

**5% Eddie's White Wonder  
Dogwood**

**3% Ginkgo**

**3% Serbian Spruce**

**3% Amur Maple**

**3% Douglas-fir**

**2% Sweetgum**

**2% Honey Locust**

**None of the trees species in the District's planting records account for more than 10% of the total number of plantings since 2016.** The District has planted over 100 different species since 2016.

The significance of natural forests in contributing Saanich's urban forest makes it highly likely that the most common species in the municipality are native forest trees. Saanich is part of the Coastal Douglas-fir biome, a unique zone of warm and mild climate where unique plants and ecosystems prosper. Common native tree species include:

**Douglas-fir**

**Grand Fir**

**Garry Oak**

**Arbutus**

**Bigleaf Maple**

**Western Redcedar**

**Shore Pine**

**Red Alder**

**Black Cottonwood**

**Pacific Dogwood**



## 4.4 Private trees

Private trees occur on land not owned or managed by the District. Examining how many trees are on each land use can provide insight into patterns associated with these land uses in the location of trees on private land.

**There are over 537,000 private trees in Saanich.**

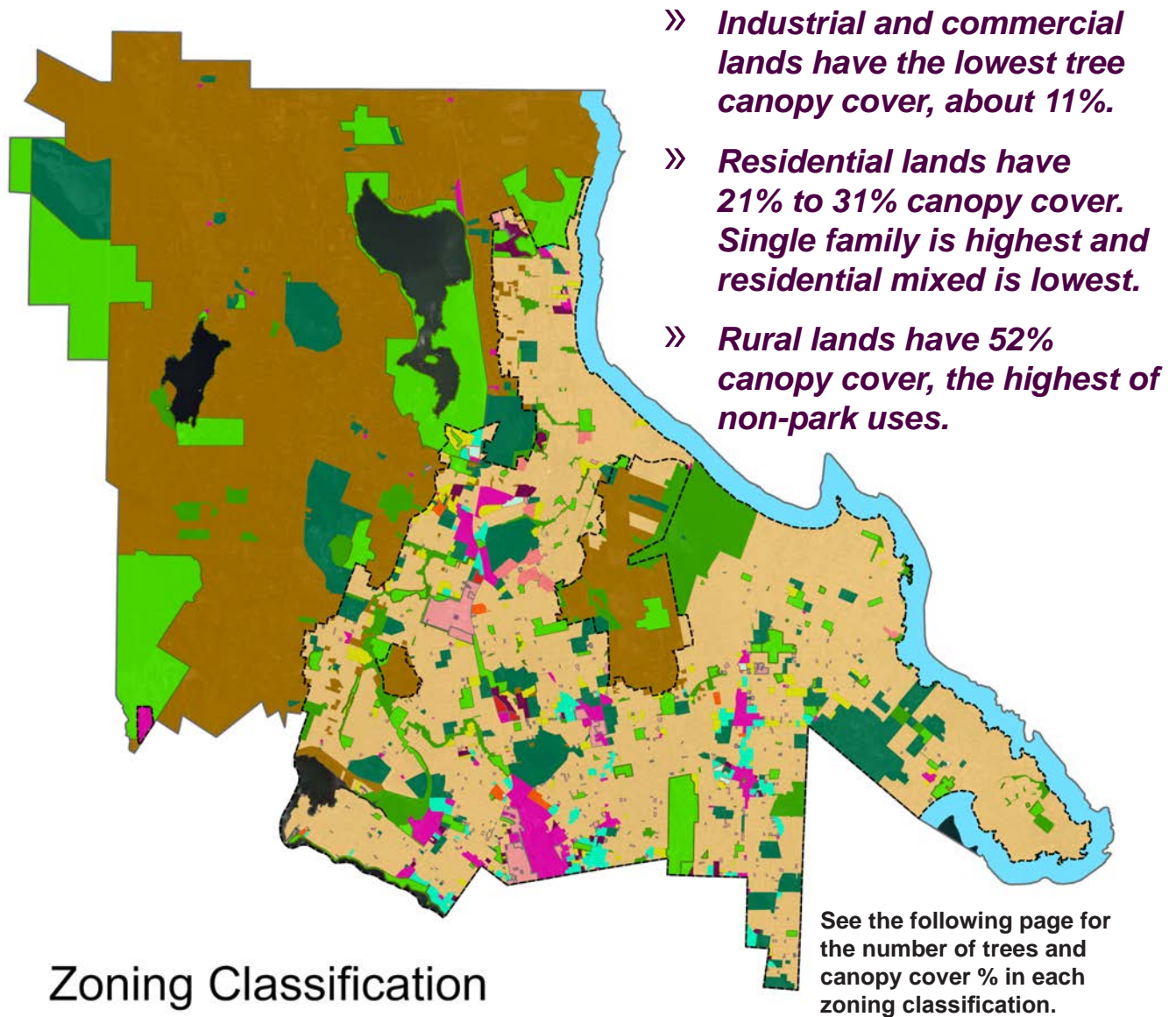


Figure 16. Zoning Classifications are generalized land uses in Saanich.



	<b>Zoning Classification</b>	<b>Canopy Cover</b>	<b>Tree Count</b>
	<i>Apartment</i>	23%	7,200
	<i>Attached Housing</i>	26%	10,200
	<i>Commercial</i>	11%	8,100
	<i>Comprehensive Development</i>	13%	700
	<i>Industrial</i>	11%	2,600
	<i>Multi-Family Commercial</i>	12%	300
	<i>Natural Park Zone</i>	71%	48,800
	<i>Public (Institutional)</i>	36%	54,200
	<i>Recreation and Open Space</i>	61%	102,100
	<i>Residential Comprehensive</i>	30%	2,200
	<i>Residential Mixed</i>	21%	3,400
	<i>Residential Personal Care</i>	26%	700
	<i>Rural</i>	52%	303,200
	<i>Single Family</i>	31%	240,800
	<i>Two Family</i>	25%	5,300



## Tree removal from private land

The rate of tree removal from private land appears to have decreased in most Local Areas between 2016 and 2021. In the following table, the approximate number of tree removals related to an issued tree cutting permit are listed by Local Area for each year between 2016 and 2021. Numbers shaded in red indicate a year where the total tree loss exceeded the median, while numbers shaded in green indicate less tree loss than the median. The results suggest that only Saanich Core, Shelbourne, and Tillicum have seen increased rates of tree removal over time, while other neighbourhoods have seen fewer trees lost. This would mean that the neighbourhood with the lowest existing canopy cover (Saanich Core) and two of the next four lowest-canopy neighbourhoods are seeing higher relative tree loss.

Estimated Losses of Protected Trees from Private Land, 2016-2021						
Local Area	2016	2017	2018	2019	2020	2021
Blenkinsop	96	42	71	58	25	34
Cadboro Bay	235	268	103	265	167	130
Carey	154	86	69	73	53	46
Cordova Bay	375	231	202	235	139	118
Gordon Head	158	232	108	290	88	103
North Quadra	52	59	58	28	38	17
Quadra	118	87	65	59	65	65
Royal Oak	153	397	355	157	43	61
Rural Saanich	5332*	358	251	652	244	412
Saanich Core	14	15	70	17	5	25
Shelbourne	38	39	80	46	33	49
Tillicum	22	24	128	37	59	125

\*Numbers in red are higher than the median rate of loss. Numbers in green are below the median rate of loss. The deeper the shade, the further from the median.

\*Most of the tree loss in Rural Saanich in 2016 was associated with a single application to clear a forested lot for agricultural use.

## 4.5 Natural forests

Saanich contains large and small areas of natural forests on public and private land. These are forests composed mainly of native species forming natural or semi-natural ecosystems with related plants and animals. Natural forests include large, intact forests in parks and on rural lands and small fragments within urban areas. Because of their size and distribution throughout the municipality, natural forests provide much of Saanich's tree canopy cover.

Natural forests contribute over 50% of the urban forest cover in Rural Saanich, Cadboro Bay, Blenkinsop, Cordova Bay, Royal Oak, Quadra, and Gordon Head. They form about 15% of the canopy cover in Saanich Core. Natural forests may provide as much as three-quarters of the municipality's total canopy cover.

- » ***There are over 3700 ha of natural forests, covering more than one-third of Saanich's land area.***
- » ***Only 1% of Saanich's land area contains old forests.***
- » ***Young forests cover 18% of Saanich, while mature forests cover 14%. Pole sapling forests, or recently established and rapidly growing young forests, occupy 2%.***

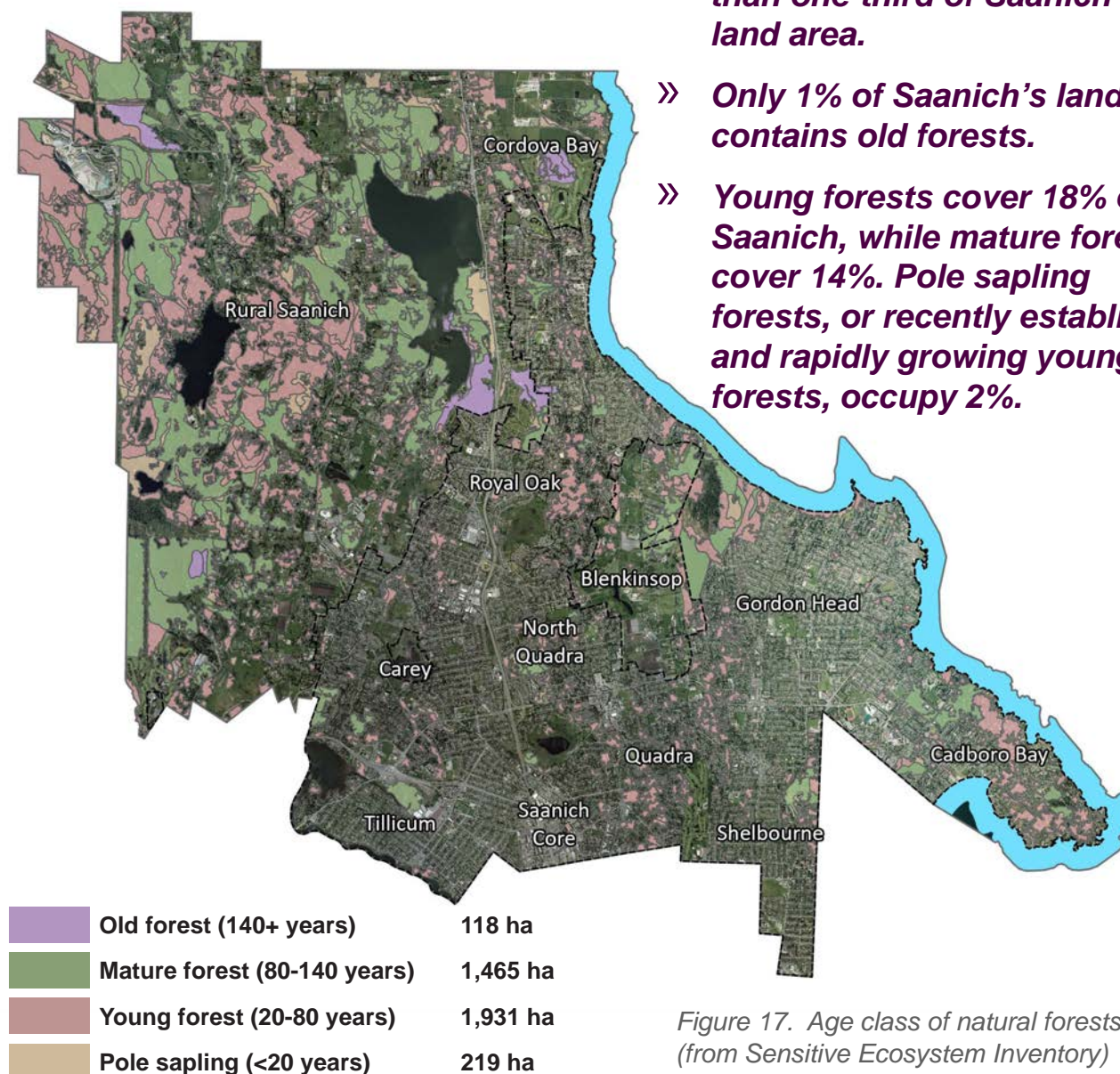


Figure 17. Age class of natural forests in Saanich (from Sensitive Ecosystem Inventory)



## Saanich's tallest trees

LiDAR processing of the tree canopy enables the creation of a map of tree heights across the District. Saanich's tallest trees reach heights of over 55 m, taller than an 18-storey apartment building. Almost all of Saanich's tallest trees occur in natural forests, whether in parks, protected areas, or private property. Although we don't know the precise identity of Saanich's tallest tree, it is highly likely to be a Douglas-fir in mature or old forest.

- » **Saanich's tallest trees are over 55 m in height, or as tall as an 18-storey apartment building.**
- » **Most tall trees are found in Rural Saanich, though a handful are found within urban areas.**
- » **Within the UCB, PKOLS (Mount Douglas Park) and Mystic Vale are the best places to see tall trees.**

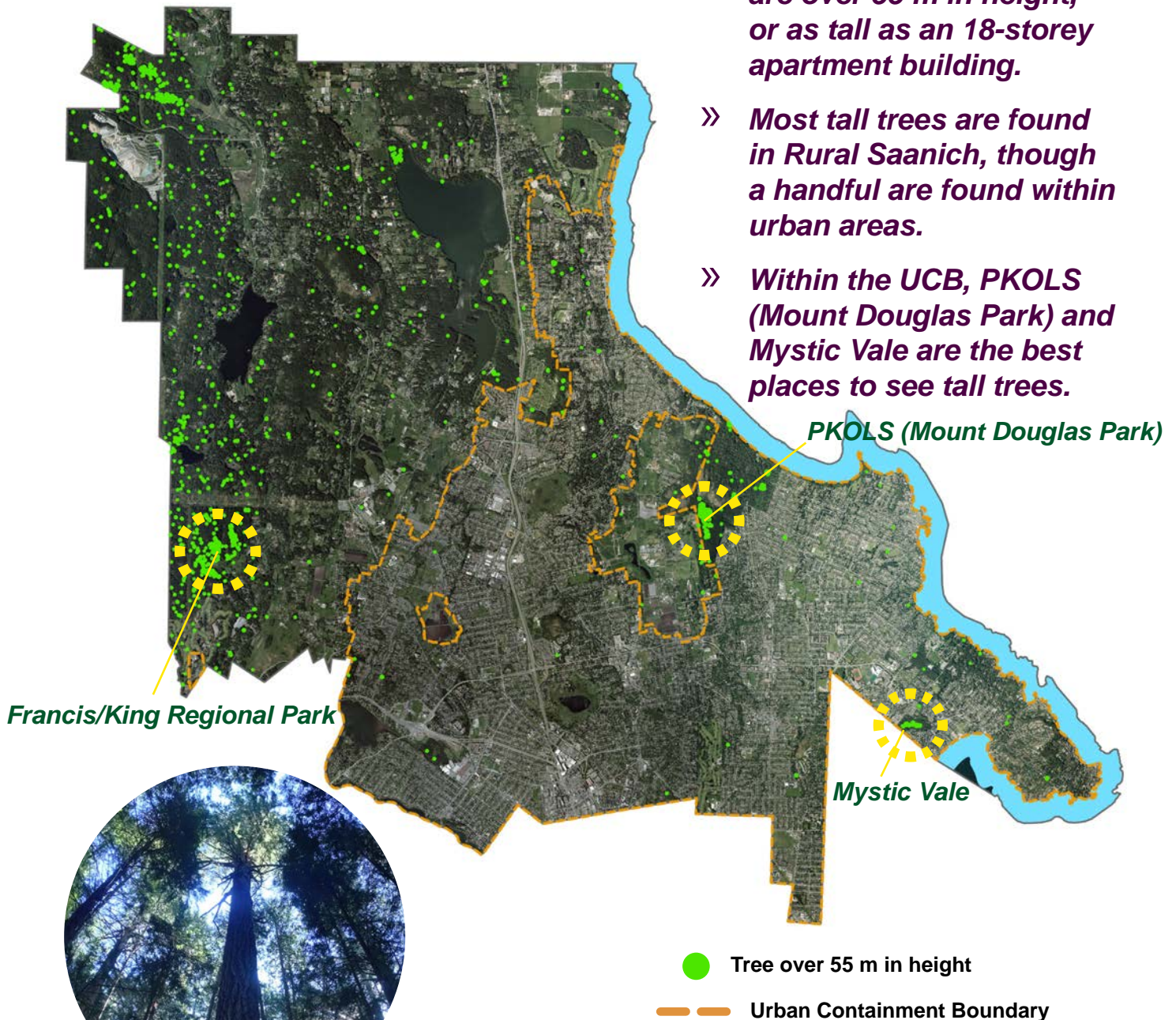


Figure 18. Location of Saanich's tallest trees.



## Trees in decline

In addition to tree height, LiDAR processing paired with computer-assisted classification of aerial orthoimagery can tell us information about the health of Saanich's trees. Dead or declining trees have lost some or all of their foliage and reflect light differently from live and healthy vegetation. These differences can be used to train a computer to highlight areas where trees are potentially unhealthy. This analysis was completed for the State of the Urban Forest Report. It is important to consider that tree decline and even death are important natural processes that support habitat, biodiversity, and forest ecosystems at background levels. The results below have not been verified in the field, and little information is available to compare them with normal rates of loss, which is why they cannot be used conclusively.

- » **About 13,000 trees in Saanich have signatures of decline.**
- » **Less than 1% of public trees show decline and 2% of private trees show decline.**
- » **Most trees identified in decline are in Rural Saanich.**

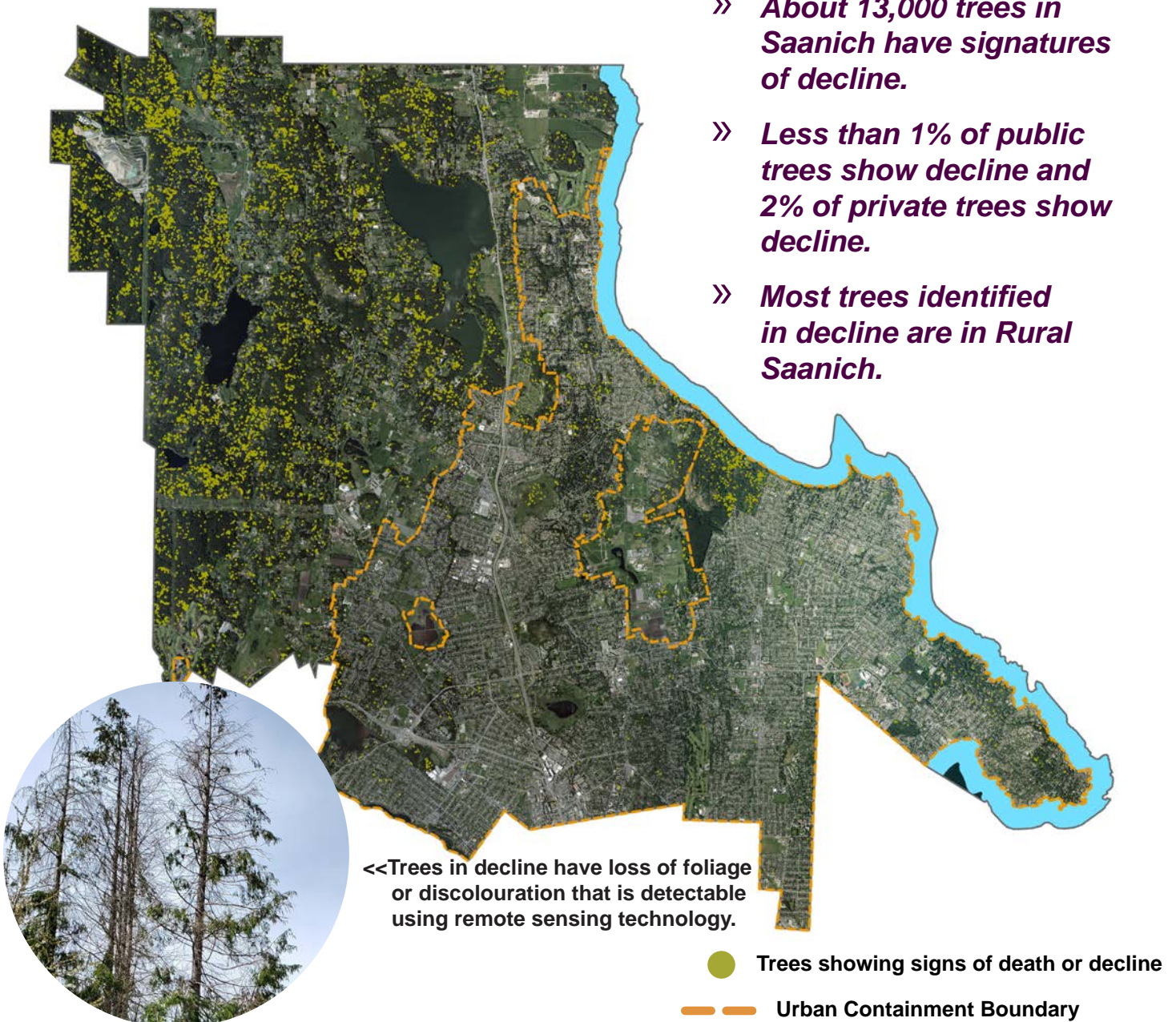


Figure 19. Trees showing remote sensing signatures consistent with death or decline.

The charts on this page compare the distribution of canopy by height class for all trees in Saanich (top) and trees showing signs of decline (bottom). The bars are read on the left and show the number of trees in each height class. The lines are read on the right and show the canopy area in each height class. The charts show that markers of tree decline do not follow the same pattern as all trees. Relatively few trees detected in decline occur in the smaller height classes, while there are many trees 20-30 m in height. Since most trees flagged are in Rural Saanich, this could reflect losses of forest trees which

are slightly shorter than the tallest trees in the forest. This canopy position is common for Western Redcedar and Grand Fir, both moisture-loving species that have been observed in poor health following abnormally dry summers. Many tree may have suffered the death of their tops and will continue to have lower live foliage. This is also a pattern seen in Western Redcedar responding to drought impacts. There are few baselines with which to compare these results; however the Urban Forest Strategy will consider their potential causes and impacts for urban forest management.

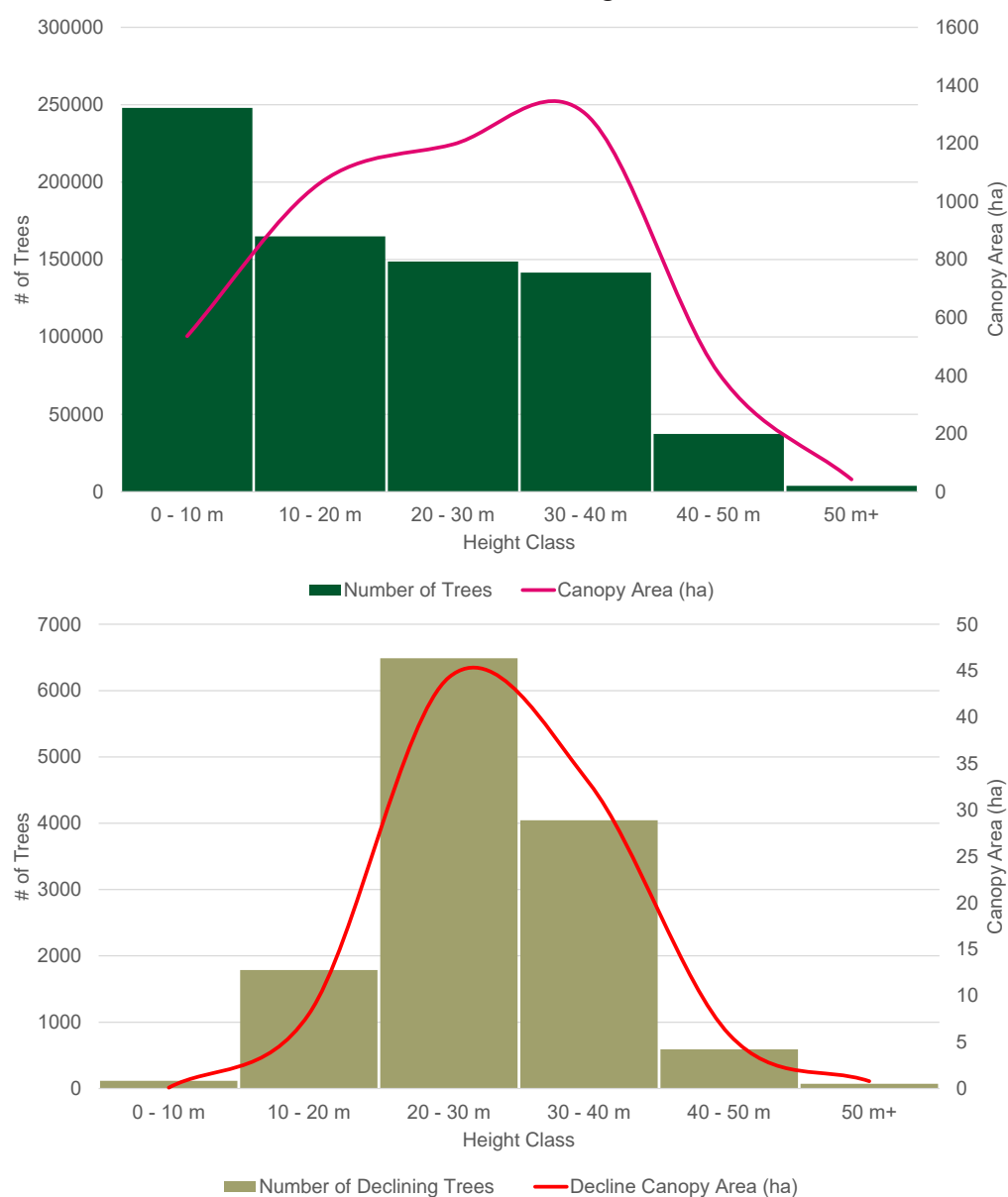


Figure 20. Comparison of height class distribution of all trees with trees in decline.



# 4.6 Tree equity factors

To ensure all Saanich residents have the same opportunities to enjoy urban forest benefits, urban forest management and planning should reflect tree equity. Tree equity is the idea that the urban forest should be available to people who most need its benefits. The Urban Forest Strategy will report on Saanich’s Tree Equity Score, which depends on revised target setting for canopy cover that has not yet occurred. Some of the factors that are included in the Tree Equity Score ranking are already known, and include:

Factor	Description of Measurement
Climate	Average surface temperature, as measured from remote sensing data.
Income	Percentage of people living on incomes below 200% of the federally-designed poverty line (< CAD \$40,000)
Age	Senior (age 65+) and children (0-14) as a proportion of working age adults (15-64)
Ethnicity	Percentage of people who belong to visible minority groups, as defined by the Employment Equity Act and, if so, the visible minority group to which the person belongs.
Unemployment	Percentage of the labour force that do not have a job, but are available and willing.

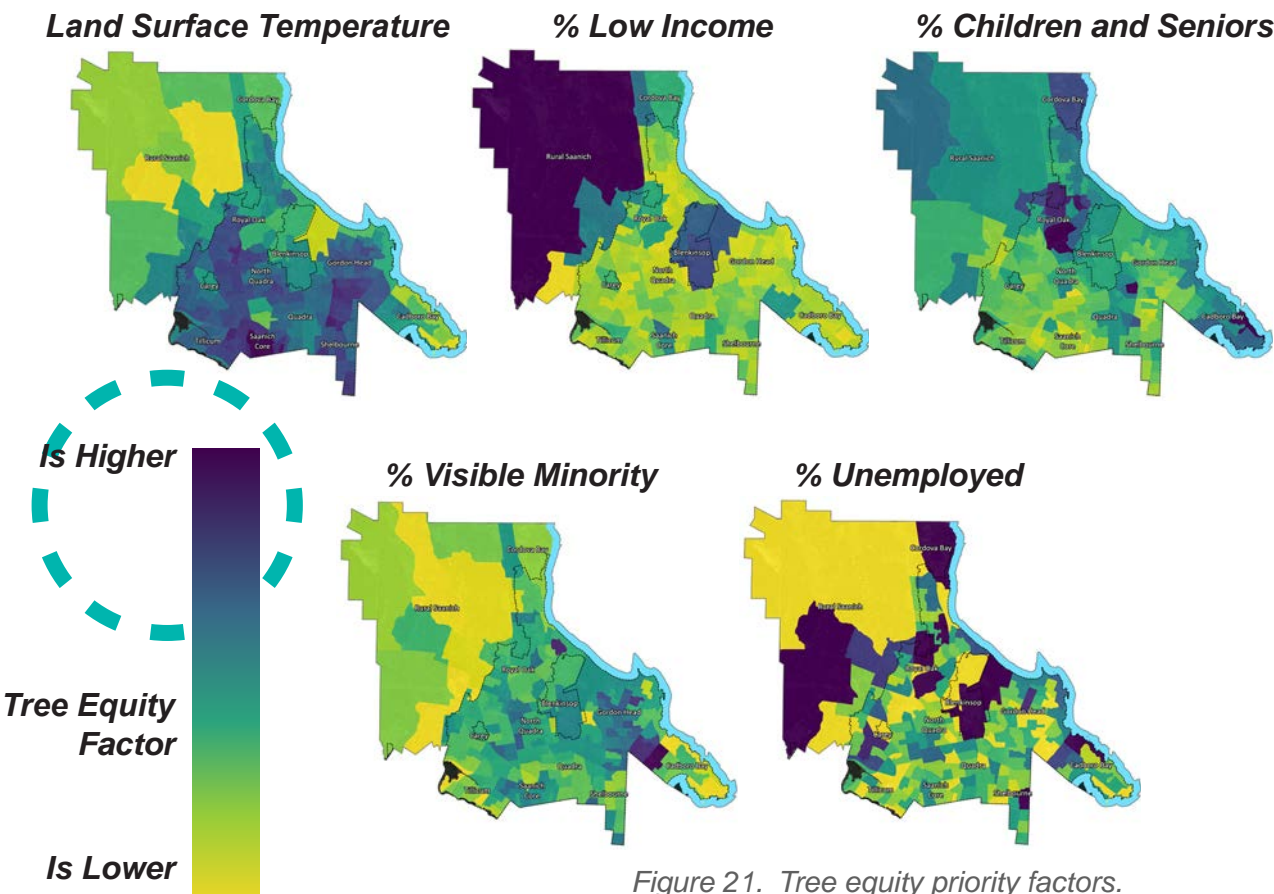
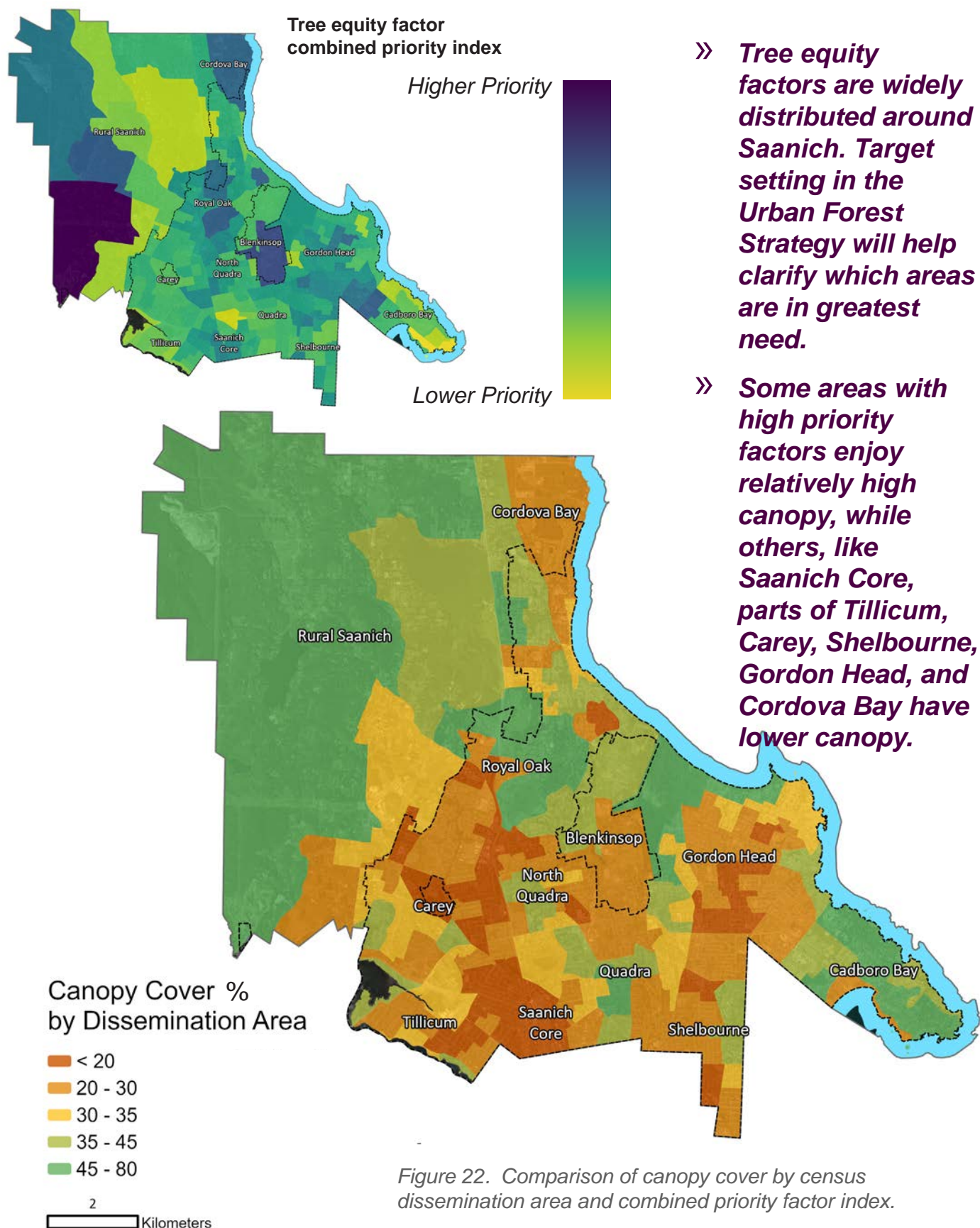


Figure 21. Tree equity priority factors.

## Comparing Saanich's canopy to tree equity factors



» **Tree equity factors are widely distributed around Saanich. Target setting in the Urban Forest Strategy will help clarify which areas are in greatest need.**

» **Some areas with high priority factors enjoy relatively high canopy, while others, like Saanich Core, parts of Tillicum, Carey, Shelbourne, Gordon Head, and Cordova Bay have lower canopy.**

# 4.7 Significant trees

Significant trees are a special class of tree listed in the Tree Protection Bylaw. There are almost 150 trees or groups of trees listed. The actual number of individual trees protected by this designation is much higher, because many groups of trees are included in the Significant Tree list. Notable groups of trees include London Plane trees along Shelbourne Street Memorial Avenue, and several groups of Garry oak on private and public land. Other groups are included because of their ecological uniqueness, such as the shore pines growing within Rithet's Bog.

**Shore pine trees in Rithet's Bog are included >> on Saanich's Significant Trees List**

Of Local Areas, Gordon Head has the highest number of groups of trees on the Significant Tree list, while Blenkinsop has the fewest. Significant trees are often nominated by residents themselves. Recommendations are reviewed by staff before being submitted to Council for ultimate approval and inclusion.



Groups of Trees in Significant Tree List

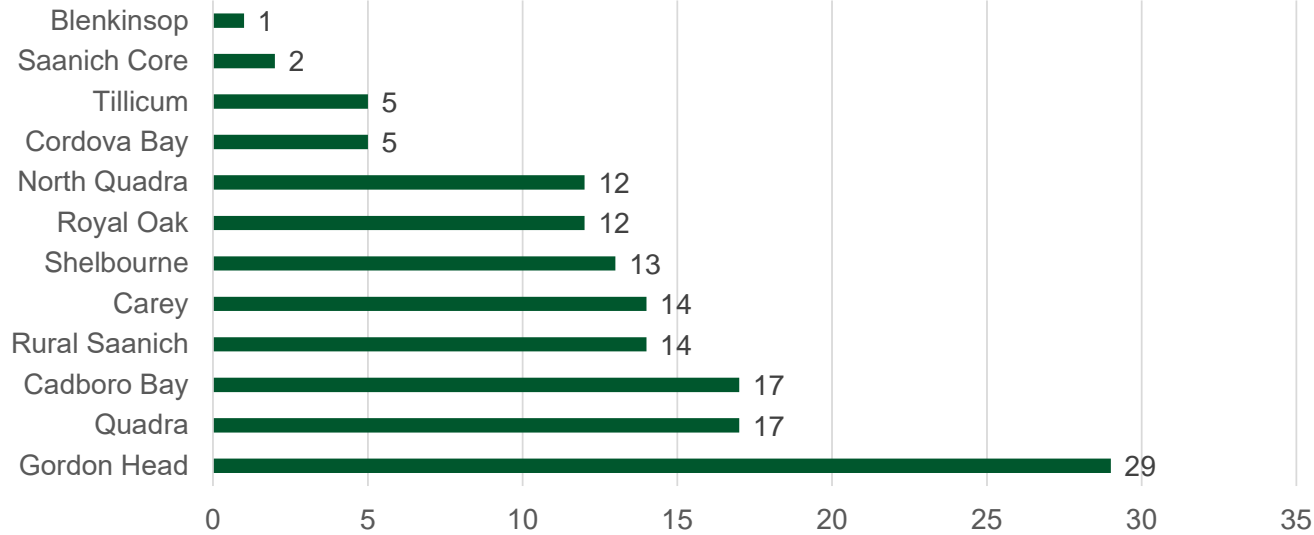


Figure 23. Listed groups of Significant Trees by Local Area.





## **5 Saanich's Progress: Implementing the Urban Forest Strategy**



# Progress on the 2010 Urban Forest Strategy

The 2010 Urban Forest Strategy resulted in positive changes to regulations and practices that increased tree protection in the municipality and grew public awareness. With the renewal of the Urban Forest Strategy, now is an appropriate time to review the actions and assess progress on implementation.

The 2010 Urban Forest Strategy organized its actions within seven *Strategies*. The seven strategies are to:

- » ***Grow the Urban Forest Canopy***
- » ***Amend the Tree Preservation Bylaw***
- » ***Develop Urban Forest Guidelines***
- » ***Integrate the UFS with other District and Regional Initiatives***
- » ***Inventory the Urban Forest***
- » ***Develop an Urban Forest Operations Program***
- » ***Engage the Community***

14 actions are listed within the strategies. In the table on the following pages, actions are listed as complete, in progress, or not started.

In total, three actions are complete, ten actions are in progress, and one action is not started.



Action from 2010 Strategy	Assessment
<b>Strategy 1: Grow the Urban Forest Canopy</b>	
Develop a No-Net-Loss Canopy Policy	<b>In progress</b> – although a formal policy has not been created, the District's working practice is to replace at least one tree for every tree removed through its replacement tree strategy. Improving replacement tree tracking is a goal of recently authorized work under Strategy 5.
Develop a Green Infrastructure Contribution Fund	<b>Complete</b> – this recommendation was achieved with the creation of the Urban Forest Reserve Fund in 2020.
Develop a Comprehensive Urban Forest Planting Program	<b>In progress</b> – most of the sub-items for this action have been achieved, but critical elements like a planting site database and connection to urban forest inventory are still in development.
<b>Strategy 2: Amend the Tree Preservation Bylaw</b>	
Engage the community in a public process to amend the Tree Preservation Bylaw	<b>Complete</b> – this resulted in the 2014 adoption of the current Tree Protection Bylaw.
<b>Strategy 3: Develop Urban Forest Guidelines</b>	
Formulate and implement Design Guidelines	<b>In progress</b> – Related standards for tree planting and species selection have been developed, but not comprehensive design guidelines for incorporating trees early in the design process.
Collaborate with BC Hydro and Ministry of Transportation in the formulation of Design Guidelines	<b>In progress</b> – Relationship building with BC Hydro has improved species selection and contractor practices around electrical lines, but no comprehensive guidelines have been developed.
<b>Strategy 4: Integrate the UFS with other District and Regional Initiatives</b>	
Form an inter-departmental working group to synchronize tree-related initiatives	<b>In progress</b> – Relationship building between departments continues, though frequently on a project-by-project basis. Several sub-items from this action have not been started.
Establish a Memorandum of Understanding between the urban forest-related departments within the District.	<b>Not started</b> – a formal memorandum of understanding between departments with respect to trees has not been pursued. Staff have developed procedures for communicating about tree-related work between departments without a formal memorandum.
<b>Strategy 5: Inventory the Urban Forest</b>	
Following measurement of the extent of canopy cover in Saanich, establish canopy cover targets.	<b>In progress</b> – Council recently endorsed the 3:30:300 Rule, which states residents should enjoy 30% canopy cover in their neighbourhood. While canopy cover targets have not been adopted in the OCP, they have been adopted in recent Local Area Plans.



Invest in a comprehensive urban forest inventory	<b>In progress</b> – Council authorized funding for developing a GIS-based tracking system for District-owned trees in 2021, but authorization does not include a full tree inventory, focusing instead on improved tracking of replacement trees.
<b>Strategy 6: Develop an Urban Forest Operations Program</b>	
Develop urban forest “Best Practices” Maintenance Manual	<b>In progress</b> – Standards have been developed to guide the District’s urban forest operations but updates are irregular.
Train/educate District staff and the public	<b>In progress</b> – Credentials for staff and municipal contractors have been regularized with a small but dedicated budget for staff training. There is limited outreach with consulting arborists.
<b>Strategy 7: Engage the Community</b>	
Maximize public awareness about the urban forest	<b>In progress</b> – The District has invested in multi-platform communications on urban trees and the urban forest but communications remain ad hoc. It advertises tree care best practices through the Partnership Tree Planting Program.
Foster community partners’ involvement in the urban forest	<b>Complete</b> – The District is invested in stewardship programs for urban forestry and natural areas, but lacks room to grow without further resources.



# Challenges for implementation

Several actions from the 2010 Urban Forest Strategy remain incomplete. Implementation has faced several challenges, including:

- » **Limited resources:** While Council has recently allocated funding for developing a GIS-based tracking system for trees, an inventory of public tree assets has not yet been funded (Strategy 5). Insufficient resourcing also factors into a lack of progress building relationships with external agencies (Strategy 3) and across departments (Strategy 4), and in updating and maintaining a manual of best practices for urban forest operations (Strategy 6).
- » **Planting site availability:** An expansion of tree planting programs has resulted from Council's directions on climate and increasing the tree replacement ratio for any public tree removal to 3:1 (Strategy 2). The District's tree planting programs are exhausting existing planting sites on public land. Continuing to grow the urban forest on public land will increasingly rely on conversions of existing park space, the acquisition of new property for planting, and the rehabilitation of planting sites in currently unsuitable locations such as boulevards with utility conflicts. The District has not invested in an inventory of planting sites, which can be an important component of an overall urban forest inventory.
- » **Conflicting priorities:** Trees occupy valuable space in the urban environment which is also desired for other purposes, including affordable housing, routing utilities, and transportation improvements like bike lanes. Although a healthy urban forest can have supportive connections to several of the District's priorities, limited space, resources, and timelines sometimes mean the

optimal design solution for trees is not pursued. This reality can affect the District's capital projects (Strategy 3) and interdepartmental relations (Strategy 4) as well as development on private land.

- » **Climate risk:** The changing climate is already having significant impacts on the District's urban forest, with several native tree species experiencing declines related to warmer, drier summer conditions. Although urban trees are often non-native species, climate change impacts may be magnified by the difficult conditions of urban planting sites which include hotter temperatures, reduced soil volumes and compacted soils. Changing conditions also impact the distribution and success of tree and forest diseases, adding uncertainty to management decisions and implying integrated pest management will become more important over time. Tree health and survival is expected to decline, placing additional pressure on the District's tree care, planting, and protection activities (Strategy 6).

Challenges for implementation will be explored in more detail as part of the updated Urban Forest Strategy, which will be renewed with a revised set of Actions to address the current context of Saanich's urban forest.





## 6 The 2023 Urban Forest Report Card

The urban forest report card uses a “criteria and indicators” approach to evaluate the District’s urban forest program for 2023. The approach used is based on the framework for sustainable urban forest management prepared by Leff<sup>39</sup> and adapted to suit Saanich’s context. Criteria are areas of performance (just like math, science, or language arts on a school report card). The indicators are performance assessments that describe urban forest program components as “poor”, “fair”, “good”, or “optimal”. The review the detailed criteria and indicator statements, see Appendix 1.



**The District scores well, with an overall rating for 2023 of fair.** The District rates good on 16 criteria, fair on 16 criteria, and poor on five criteria. An area of strength for the District is its efforts to integrate urban forestry into corporate decision-making, policies, and plans.

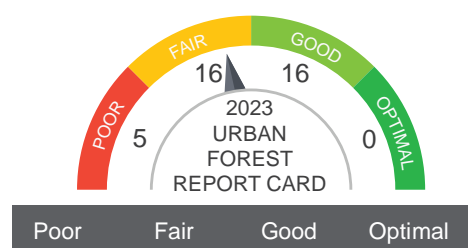
Performance is fair or good on criteria related to **community engagement** and **protecting the urban forest**. These are areas where the District has made improvements but some actions from the 2010 Urban Forest Strategy remain in progress and require further investments to fulfill.

**Planting and tree health management** are fair or good overall, but include some areas of potential improvement such as tree equity and adopting proactive risk and condition assessments for public trees.

**Climate mitigation & adaptation** is an area where the District could improve. No actions from the 2010 Urban Forest Strategy addressed this theme.

## Urban Forest Report Card

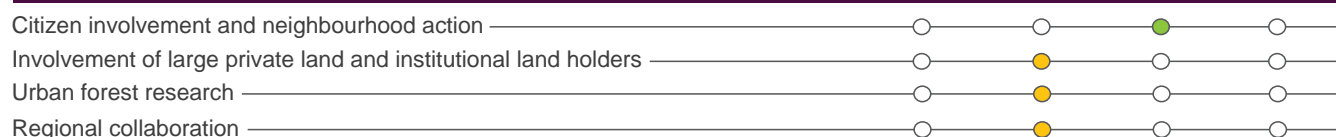
- 2022 program grade (in colour)
- Work already in progress is expected to improve rating
- ⋯ Assessment based on partial or interim data



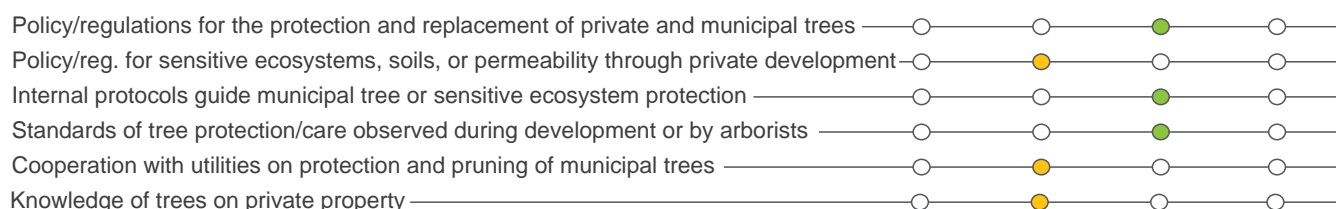
### THEME: PLANNING & INTEGRATION



### THEME: COMMUNITY ENGAGEMENT & STEWARDSHIP



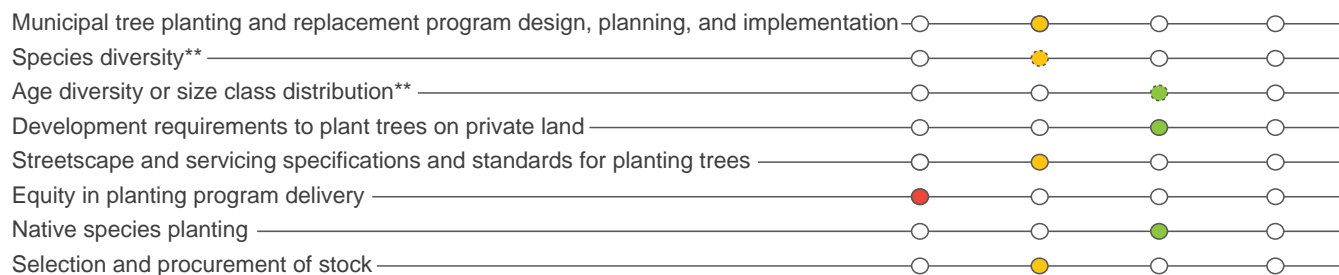
### THEME: PROTECTING TREES



\* Work in progress is expected to improve this indicator

\*\* Pending inventory data.

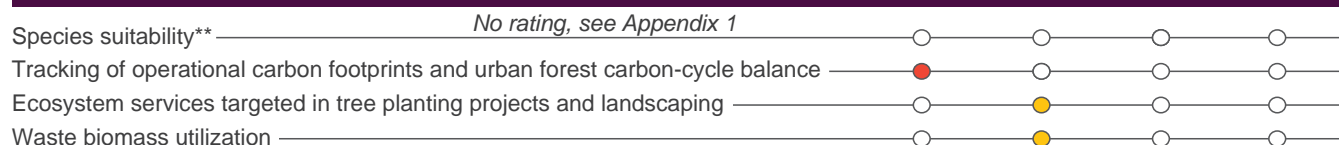
## THEME: PLANTING TREES AND CREATING SPACE



## THEME: TREE HEALTH & RISK MANAGEMENT



## THEME: CLIMATE CHANGE ADAPTATION & MITIGATION



\* Work in progress is expected to improve this indicator

\*\* Pending inventory data.

Page 2







## Next Steps

The Urban Forest Report Card is a performance baseline that can be re-assessed each time the Urban Forest Strategy is updated. Recommendations considered for the renewed Urban Forest Strategy will aim to shift the District's urban forest management program towards good and optimal.

The public will have opportunities to provide feedback on the State of the Urban Forest Report and ask questions. Visit <https://www.saanich.ca/EN/main/community/natural-environment/trees/urban-forest-strategy.html> for the latest information on the Urban Forest Strategy update.



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# Appendix 1 — Criteria and Indicators Table

The criteria and indicators table is based on the following sources:

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The Sustainable Forestry Initiative has released a draft of its upcoming certification standard for urban forests. Once adopted, this standard is expected to become widely adopted in North America and may be useful for future comparison or progress reporting:

- » Sustainable Forestry Initiative: SFI Urban and Community Forest Sustainability Standard (2021). Available online at: <https://www.forests.org/wp-content/uploads/SFI-Urban-and-Community-Forest-Sustainability-Standard-%E2%80%93-November-1-2021.pdf>

Assessment Criteria	Objective	Indicator for Community Forestry Performance			
		Saanich's 2023 Rating: <div><div></div></div>			
		Poor	Fair	Good	Optimal
PLANNING AND INTEGRATION					
Awareness of the urban forest as a community resource	The urban forest is recognized as vital to the community's environmental, social, and economic well-being.	General ambivalence or negative attitudes about trees, which are perceived as neutral at best or as the source of problems. Actions harmful to trees may be taken deliberately.	Trees are widely acknowledged as providing environmental, social, and economic services but are not widely integrated in corporate strategies and policies.	<div><div></div></div> Trees are widely acknowledged as providing environmental, social, and economic services and urban forest objectives are integrated into other corporate strategies and policies.	Urban forest recognized as vital to the community's environmental, social, and economic well-being. Widespread public and political support and advocacy for trees, resulting in strong policies and plans that advance the viability and sustainability of the entire urban forest
Relative tree canopy cover	Achieve desired degree of tree cover, based on potential or according to goals set for entire municipality and for each neighbourhood or land use.	The existing canopy cover for entire municipality is <50% of the desired canopy	The existing canopy is 50%-75% of desired	<div><div></div></div> The existing canopy is >75%-100% of desired	The existing canopy is >75%-100% of desired - at the individual neighborhood level as well as overall municipality



Assessment Criteria	Objective	Indicator for Community Forestry Performance			
		Saanich's 2023 Rating: ●			
		Poor	Fair	Good	Optimal
Clear and defensible community forest canopy assessment and goal	Urban forest policy and practice is driven by comprehensive goals municipality-wide and at the neighbourhood or land use scale informed by accurate, high-resolution assessments of existing and potential canopy cover.	No assessment or goals	Low-resolution and/or point-based sampling of canopy cover using aerial photographs or satellite imagery – and limited or no goal setting	● Complete, detailed, and spatially explicit, high-resolution Urban Tree Canopy (UTC) assessment based on enhanced data (such as LiDAR) – accompanied by comprehensive set of goals by land use and other parameters	The Municipality has a complete, detailed, and spatially explicit high-resolution Urban Tree Canopy (UTC) assessment accompanied by a comprehensive set of goals, all utilized effectively to drive urban forest policy and practice municipality-wide and at neighbourhood or smaller management level
Inter-departmental and inter-agency cooperation on Community forest Canopy Assessment	Ensure all relevant municipal departments and agencies cooperate to advance goals related to urban forest issues and opportunities.	Little cooperation and conflicting among departments and/or agencies often leading to poor outcomes for trees	Common goals but limited cooperation among departments and/or agencies and mixed outcomes for trees	● Municipal departments, affected agencies and urban forest managers recognize potential conflicts and reach out to each other on an informal but regular basis	Formal inter-departmental working agreements or protocols for all projects that could impact municipal trees




Assessment Criteria	Objective	Indicator for Community Forestry Performance			
		Saanich's 2023 Rating: ●			
		Poor	Fair	Good	Optimal
Municipality-wide urban forest management plan	Develop and implement a comprehensive urban forest management plan for public and private property.	No plan	Existing plan limited in scope and implementation	● Recent comprehensive plan developed and implemented for publicly owned forest resources, including trees managed intensively (or individually) and those managed extensively, as a population (e.g., trees in natural areas)	Strategic, multi-tiered plan with built-in adaptive management mechanisms developed and implemented for public and private resources
Municipal green infrastructure management	Integrate green infrastructure assets into the municipal asset management system to support accounting for them in the Municipality's financial planning to build climate resilient infrastructure.	No recognition of value of natural or human-made elements that provide ecological and hydrological functions (green infrastructure)	● Local government recognizes the value of green infrastructure but does not yet have information to include them in an asset management system	Green infrastructure assets have been partially or fully inventoried and some assets are included in an asset management system, with the intent to ultimately capture all assets in the consolidated financial statements of the municipality	Green infrastructure assets are inventoried and included in an asset management system and on the consolidated financial statements of the municipality

Assessment Criteria	Objective	Indicator for Community Forestry Performance			
		Saanich's 2023 Rating: ●			
		Poor	Fair	Good	Optimal
Municipal-wide biodiversity or green infrastructure strategy	Acquire and restore publicly-owned natural areas in pursuit of meeting municipal-wide biodiversity and connectivity goals.	No or very limited planning and stewardship of natural areas	● Area specific management plans focused on management, restoration, and protection of natural areas	Natural areas management strategy guiding management, restoration, and protection of the existing natural areas network	Biodiversity strategy or equivalent in effect to manage, restore and existing and acquire future natural areas network throughout the municipality
Municipal community forestry program capacity	Maintain sufficient well-trained personnel and equipment – whether in-house or through contracted or volunteer services – to implement municipality-wide urban forest management plan	Team severely limited by lack of personnel and/or access to adequate equipment. Unable to perform adequate maintenance, let alone implement new goals	Team limited by lack of staff and/or access to adequate equipment to implement new goals	● Team able to implement many of the goals and objectives of the urban forest management plan.	Team able to implement all of the goals and objectives of the urban forest management plan.
Urban forest funding to implement a strategy	Maintain adequate funding to implement the urban forest strategy.	Little or no dedicated funding	● Dedicated funding but insufficient to implement the urban forest strategy or maintain new assets as they are added to the inventory	Dedicated funding sufficient to significantly implement the urban forest strategy and maintain new assets as they are added to the inventory	Sustained funding to fully implement the urban forest strategy and maintain new assets as they are added to the inventory



Assessment Criteria	Objective	Indicator for Community Forestry Performance			
		Saanich's 2023 Rating: <div><div></div></div>			
		Poor	Fair	Good	Optimal
COMMUNITY ENGAGEMENT AND STEWARDSHIP					
Citizen involvement and neighbourhood action	Citizens and groups participate and collaborate at the neighbourhood level with the municipality and/or its partnering NGOs in urban forest management activities to advance municipality-wide plans.	Little or no citizen involvement or neighborhood action	Community groups are active and willing to partner in urban forest management, but involvement and opportunities are ad hoc	<div><div></div></div> Several active neighborhood groups engaged across the community, with actions coordinated or led by municipality and/or its partnering NGOs	Proactive outreach and coordination efforts by the Municipality and NGO partners result in widespread citizen involvement and collaboration among active neighbourhood groups engaged in urban forest management
Involvement of large private land and institutional land holders (e.g., schools)	Large private landholders to embrace and advance municipality-wide urban forest goals and objectives by implementing specific resource management plans.	Large private landholders are generally uninformed about urban forest issues and opportunities	<div><div></div></div> Landholders manage their tree resource but are not engaged in meeting municipality-wide urban forest goals	Landholders develop comprehensive tree management plans (including funding strategies) that advance municipality-wide urban forest goals	As described in “Good” rating, plus active community engagement and access to the property’s forest resource

Assessment Criteria	Objective	Indicator for Community Forestry Performance			
		Saanich's 2023 Rating: ●			
		Poor	Fair	Good	Optimal
Urban forest research	Research is active and ongoing towards improving our understanding of the urban forest resource, the benefits it produces, and the impacts of planning, policy, design and management initiatives.	No urban forest research	● Isolated academic research occurs in the municipality's urban forest	The municipality supports and has input on academic research occurring in its urban forest and knowledge transfer occurs	The urban forest is a living laboratory - in collaboration with public, private, NGO and academic institutions - integrating research and innovation into managing urban forest health, distribution, and abundance
Regional collaboration	There is cooperation and interaction on urban forest plans among neighbouring municipalities within the region, and/or within regional agencies.	Municipalities have no interaction with each other or the broader region for planning or coordination on urban forestry	● Some neighboring municipalities and regional agencies share similar policies and plans related to trees and urban forest	Some urban forest planning and cooperation across municipalities and regional agencies	Widespread regional cooperation resulting in development and implementation of regional urban forest strategy
PROTECTING TREES					
Policy or regulations regulating the protection and replacement of private and municipal trees	Secure the benefits derived from trees on public and private land by enforcement of municipality-wide policies and practices including tree protection.	No or very limited tree protection policy	Policies in place to protect public trees and employ industry best management practice	● Policies in place to protect public and private trees with enforcement but lack integration with other municipal policy to enable effective tree retention	Urban forest strategy and integrated municipal-wide policies that guide the protection of trees on public and private land, and ensure they are consistently applied and enforced

Assessment Criteria	Objective	Indicator for Community Forestry Performance			
		Saanich's 2023 Rating: 			
		Poor	Fair	Good	Optimal
Policy or regulations for conservation of sensitive ecosystems, soils, or permeability on private property through development	Secure the benefits derived from environmentally sensitive areas by enforcement of municipality-wide policies in pursuit of meeting biodiversity and connectivity goals.	No or very limited natural areas protection policy	 Permit requirements or policy in place to protect at least one of sensitive ecosystems, soils or permeability on private property with enforcement but lack integration with other municipal policy to enable effective tree retention	Permit requirements or policy in place to protect sensitive ecosystems, soils and permeability on private property with enforcement but lack integration with other municipal policy to enable effective tree retention	Permit requirements or policy in place to protect sensitive ecosystems, soils and permeability on private property with enforcement and integration with other municipal policy that is effectively enabling tree retention
Internal protocols guide public tree or sensitive ecosystem protection	Ensure all relevant municipal departments follow consistent tree or ecosystem protection protocols for capital design and construction activities.	No protocols guiding public tree or ecosystem protection for capital design and construction activities	Informal and inconsistent processes followed for public tree or ecosystem protection for capital design and construction activities	 Established protocols for public tree or ecosystem protection for capital design and construction activities but outcomes are inconsistent or sometimes unachievable	Established protocols for public tree or ecosystem protection for capital design and construction activities are consistently followed and outcomes are successful



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Standards of tree protection and tree care observed during development by local arborists and tree care companies	Consulting arborists and tree care companies understand municipality-wide urban forest goals and objectives and adhere to high professional standards.	Limited understanding or support for tree protection requirements	General understanding or support for tree protection requirements but large variation in the quality of information and services provided	● General understanding or support for tree protection requirements and generally consistent quality of information and services provided	Advocacy for tree protection requirements, engagement with municipal staff on improving processes and standards, and generally consistent quality of information and services provided to high professional standards
Cooperation with utilities on protection (and pruning) of public trees	All 3rd party utilities employ best management practices and cooperate with the municipality to advance goals and objectives related to urban forest issues and opportunities.	Utilities take actions impacting urban forest with no municipal coordination or consideration of the urban forest resource	● Utilities inconsistently employ best management practices, sometimes recognizing potential municipal conflicts or reaching out to urban forest managers and vice versa.	Utilities employ best management practices, recognize potential municipal conflicts, and reach out to urban forest managers on an ad hoc basis – and vice versa	Utilities employ best management practices, recognize potential municipal conflicts, and consistently reach out to urban forest managers and vice versa

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Knowledge of trees on private property	Understand the extent, location, and general condition of privately-owned trees.	No information about privately owned trees.	● Aerial, point-based or low-resolution assessment of tree canopy on private property, capturing broad extent	Detailed Urban Tree Canopy analysis of the urban forest on private land, including extent and location, integrated into a municipality-wide GIS system	The municipality has an i-Tree Eco analysis of private trees as well as detailed Urban Tree Canopy analysis of the entire urban forest integrated into a municipality-wide GIS system
PLANTING TREES AND CREATING SPACE					
Municipal tree planting and replacement program design, planning and implementation	Comprehensive and effective tree selection, planting and establishment program that is driven by canopy cover goals and other considerations according to the UFS.	Tree replacement and establishment is ad hoc	● Some tree planting and replacement occurs, but with limited overall municipality-wide planning and insufficient to meet replacement requirements	Tree replacement and establishment is directed by needs derived from an opportunities assessment and species selection is guided by site conditions, tree health and climate adaptation considerations	Tree planting and replacement is guided by strategic priorities and is planned out to make progress towards targets set for canopy cover, diversity, tree health and climate adaptation within the timeframe of the strategy

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Species diversity*	Establish a genetically diverse population of intensively managed trees across the municipality as well as at the neighbourhood scale	Five or fewer species dominate the entire tree population across municipality	● No single species represents more than 10% of the total tree population; no genus more than 20%, and no family more than 30%	No single species represents more than 5% of total tree population; no genus more than 10%; and no family more than 15%	At least as diverse as "Good" rating (5/10/15) municipality-wide - and at least as diverse as "fair" (10/20/30) at the neighborhood level
Age diversity (size class distribution)**	Provide for ideal uneven age distribution of all "intensively" (or individually) managed trees – municipality-wide as well as at neighbourhood level	Even-age distribution, or highly skewed toward a single age class (maturity stage) across entire population	Some uneven distribution, but most of the tree population falls into a single age class	● Total tree population across municipality approaches an ideal age distribution of 40% juvenile, 30% semi-mature, 20% mature, and 10% senescent	Total population approaches that ideal distribution municipality-wide as well as at the neighborhood level
*Indicator assessed based on species data from recent District of Saanich plantings only. Tree inventory work will confirm this indicator.					
**Indicator assessed based on derived height class distributions from LiDAR analysis of canopy cover.					



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Development requirements to plant trees on private land	Ensure that new trees are required in landscaping for new development or, where space is lacking, there is an equivalent contribution to tree planting in the public realm.	Landscaping requirements do not address trees on private land	Developments are generally required to provide replacement but the outcomes are often in conflict with public trees and other infrastructure due to space limitations and not connected to meeting canopy cover targets	● Developments are required to provide replacement trees or, where space is not adequate according to soil volume available, provide cash-in-lieu for equivalent tree planting on public land. The requirement is not connected to meeting canopy cover targets	Developments are required to provide a minimum density of trees per unit measure or, where space is not adequate according to soil volume available, provide adequate cash-in-lieu for equivalent tree planting on public land. Planting density is determined based on meeting a municipal-wide canopy cover target.
Streetscape and servicing specifications and standards for planting trees	Ensure all publicly owned trees are planted into conditions that meet requirements for survival and maximize current and future tree benefits.	No or very few specifications and standards for growing sites	● Specifications and standards for growing sites exist but are inadequate to meet urban forest goals	Specifications and standards exist and are adequate to meet urban forest goals but are not always achieved	All trees planted are in sites with adequate soil quality and quantity, and with sufficient growing space to achieve their genetic potential and life expectancy, and thus provide maximum ecosystem services

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Equity in planting program delivery	Ensure that the benefits of urban forests are made available to all, especially to those in greatest need of tree benefits.	● Tree planting and outreach are not determined equitably by canopy cover or need for benefits. No policy or direction exists to support focusing on equity in planting programs.	Planting and outreach includes attention to low canopy neighborhoods or areas	Planting and outreach targets neighborhoods with low canopy and a high need for tree benefits	Equitable planting and outreach at the neighbourhood level are guided by strong citizen engagement in identified low-canopy/high-need areas
Native species planting	Encourage the appreciation of climate suitable native vegetation by the community and ensure native species are planted where appropriate to enhance native biodiversity and connectivity	Voluntary use of climate suitable native species on publicly and privately-owned lands	The use of climate suitable native species is encouraged on a site-appropriate basis in public and private land development projects	● Policies require the use of climate suitable native species and management of invasive species on a site-appropriate basis in public and private land development projects but are not integrated across all policy or guided by a connectivity analysis	Policies require the use of climate suitable native species and management of invasive species on a site-appropriate basis in public and private land development projects and through tree bylaw

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Selection and procurement of stock	Diversity targets and climate adaptation/mitigation objectives guide tree species selection and nurseries proactively grow stock based on municipal requirements.	Species selection is not guided by diversity targets or climate adaptation/mitigation objectives	● Species selection is guided by diversity and climate adaptation/mitigation but required stock is rarely available from nurseries and acceptable substitutes reduce diversity	Species selection is guided by targets for diversity and climate adaptation/mitigation and required stock or acceptable substitutes are usually available from nurseries	Species selection is guided by targets for diversity and climate adaptation/mitigation and required stock is secured ahead of the planned planting year from contract or in-house nurseries
TREE HEALTH AND RISK MANAGEMENT					
Tree inventory	A current and comprehensive inventory of intensively managed trees to guide management, including data such as age distribution, species mix, tree condition and risk assessment.	● No inventory	Partial inventory of publicly-owned trees in GIS	Complete inventory of street trees and intensively managed park trees in GIS but inconsistently updated	The municipal tree inventory is complete, is GIS-based, supported by mapping, and is continuously updated to record growth, work history and tree condition



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Natural areas inventory	A current and comprehensive inventory of sensitive and modified natural ecosystems and their quality mapped to Provincial standards to provide standardized ecological information to support decision-making.	No inventory of natural areas	Natural areas inventoried in GIS but not recently updated and attribute information not to a standard that can support decision-making	● Natural areas inventoried in GIS and with standard and complete attribute information to support decision-making but not updated in the last 5 years	Natural areas inventoried in GIS and with standard and complete attribute information to support decision-making and updated in the last 5 years
Maintenance of intensively managed trees	Maintain all publicly owned intensively managed trees for optimal health and condition in order to extend longevity and maximize current and future benefits	Intensively managed trees are maintained on a request/ reactive basis.	● Intensively managed trees are maintained on a request/ reactive basis or on a grid cycle but targets are not being met. Program includes immature tree structural pruning	All intensively managed trees are systematically maintained on a cycle determined by workload and resource limitations. All immature trees are structurally pruned	All mature intensively managed trees are maintained on an optimal pruning cycle. All immature trees are structurally pruned
Publicly owned tree species condition assessment	Current and detailed understanding of condition and risk potential of all publicly owned trees that are managed intensively (or individually)	● Condition of urban forest is unknown	Sample-based tree inventory indicating tree condition and risk level	Complete tree inventory that includes detailed tree condition ratings	Complete tree inventory that is GIS-based and includes detailed tree condition as well as risk ratings

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Tree risk management	Comprehensive tree risk management program fully implemented, according to ANSI A300 (Part 9) "Tree Risk Assessment" standards, and supporting industry best management practices.	● No coordinated tree risk assessment. Response is on a reactive basis only	Some areas within the municipality are prioritized for risk assessment and management. Little annual budget is available to develop a more proactive inspection program	Priority areas of the municipality are inspected on a regular schedule and operational standards and budgets are in place for responding to and managing tree risks within an appropriate timeframe	A comprehensive risk management program is in place, with all public lands inspected on defined schedules and operational standards and budgets in place for responding to and managing tree risks within an appropriate timeframe
Emergency response planning	A response plan guides call-out procedures, resources available and the clean-up response for extreme weather and earthquake.	Response plan not documented or not current	Response plan is documented and includes call-out procedures, roles and responsibilities but lacks details to prioritize hazards and clean-up	● Response plan includes call-out procedure, roles and responsibilities, and criteria for prioritizing tree hazards and removing debris is in place	A comprehensive response plan is in place and a response drill occurs annually
Pest and Disease Management	An Integrated Pest Management (IPM) plan guides treatment responses to existing and potential pest, disease and invasive species threats to the urban forest.	No integrated pest management plan and no pest management	No integrated pest management plan and reactive pest management	● An integrated pest management plan is in place and implemented	A comprehensive pest management program is in place, with detection, communication, rapid response and IPM practiced

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CLIMATE CHANGE ADAPTATION AND MITIGATION					
Species suitability	Establish a tree population suited to the urban environment and adapted to the overall region	Fewer than 50% of all trees are from species considered suitable for the area	>50%-75% of trees are from species suitable for the area	More than 75% of trees are suitable for the area	Virtually all trees are suitable for the area
		No rating - insufficient data. Suitability assessments depend on tree species data from inventory and a locally calibrated assessment of climate risk by species.			
Tracking of operational carbon footprints and urban forest carbon-cycle balance	Organization will actively track their operational carbon footprints and their community-wide urban forest carbon-cycle balance and work with community partners to minimize greenhouse gas emissions (GHG) emissions while maximizing carbon sequestration and avoided GHG emissions.	<div></div> Carbon footprint not considered for operations	Basic CO2/GHG accounting and carbon cycle assessment and climate action plan undertaken for urban forestry operations and for the entire community with specific goals and objectives for urban forestry	Basic CO2/GHG accounting and carbon cycle assessment and climate action plan undertaken for urban forestry operations and for the entire community with specific goals and objectives for urban forestry and formal policies in place to encourage use of trees and green infrastructure for carbon sequestration and energy conservation in buildings	Basic CO2/ GHG accounting and carbon cycle assessment and climate action plan undertaken for urban forestry operations and for the entire community with specific goals and objectives for urban forestry and formal policies in place to encourage use of trees and green infrastructure for carbon sequestration and energy conservation in buildings, and to maximize urban wood and woody biomass utilization.



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Ecosystem services targeted in tree planting projects and landscaping	Incorporate ecosystem services objectives into public and private tree planting projects to improve urban tree health and resilience, carbon sequestration, stormwater management and cooling.	Ecosystem services not considered in planting projects or intentionally designed into vegetated landscapes	● Ecosystem services, such as stormwater interception, occasionally incorporated into public or private land planting projects and landscape designs	Guidelines in place for planting projects and landscape designs on public and private land to deliver specific ecosystem services	Ecosystem services targets are defined for the urban forest and policy requires planting project and landscape designs on public and private land to contribute to meeting targets
Waste biomass utilization	A closed system diverts all urban wood and green waste through reuse and recycling.	Wood waste from the urban forest is not utilized	● Wood waste from the urban forest is utilized as mulch, coarse woody debris in restoration areas or biofuel	Wood waste from the urban forest is utilized as mulch, woody debris in restoration areas or biofuel and sometimes high value pieces are milled and stored for later use or sold on to local value-added industries	Low value wood waste from the urban forest is utilized as mulch or biofuel and all high value pieces are milled and stored for later use or sold on to local value-added industries