



Toward natural asset management in the

# District of Saanich

British Columbia



Summary of enhanced inventory results and recommendations

July 2024



## Invest in Nature

The Natural Assets Initiative (NAI) is a Canadian not-for-profit that is changing the way local governments deliver everyday services — increasing the quality and resilience of infrastructure at lower costs and reduced risk. The NAI team provides scientific, economic and government expertise to support and guide local governments in identifying, valuing and accounting for natural assets in their financial planning and asset management programs, and developing leading-edge, sustainable and climate-resilient infrastructure.

### Land Acknowledgement

The District of Saanich lies within the territories of the lək'wəŋən peoples represented by the Songhees and Esquimalt Nations and the WSÁNEĆ peoples represented by the WJOLELP (Tsartlip), BOKEĆEN (Pauquachin), STÁUTW (Tsawout), WSIKEM (Tseycum) and MÁLEXEŁ (Malahat) Nations. The First Peoples have been here since time immemorial and their history in this area is long and rich.

### Acknowledgements

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### Disclaimer

While reasonable efforts have been made to ensure the accuracy of the report's content, any statements made are made only as of the date of the report and such information and data are subject to uncertainties, inaccuracies, limitations and to changes based on future events.

*Editor's note:* This report was updated in July 2024, after its first presentation to Council in June 2024. Valuations for mental and physical health services were changed to accurately reflect population and service measures in the District of Saanich.

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# Glossary

<b>Asset group</b>	A classification of assets that are similar in nature and useful life; a subset of asset type. (edited version of AMBC definition)
<b>Asset type</b>	A major classification of assets made up of various related asset groups. (edited version of AMBC definition)
<b>Co-benefits</b>	Ecosystem services that enhance the livability and resilience of the community but are not managed as a direct municipal service
<b>Indicator</b>	A specific property of a service that can be objectively evaluated. An indicator may be evaluated by one or more performance measures.
<b>Municipal service</b>	Work done by the municipality to deliver a community need to the public or to the natural environment.
<b>Service characteristic</b>	A general characteristic or attribute used to describe a service, such as: <ul style="list-style-type: none"><li>■ <b>Regulatory</b> - Does the service comply with applicable laws?</li><li>■ <b>Capacity/availability</b> – Does the service meet the needs of users?</li><li>■ <b>Quality</b> - Does the service meet quality standards? How good is it?</li><li>■ <b>Reliability</b> – Is the service reliable? How often is it interrupted?</li><li>■ <b>Safety</b> – Is the service safe for workers and the public?</li><li>■ <b>Sustainability</b> – How does the service provide for environmental, social, and financial sustainability?</li></ul>
<b>Service delivery objectives</b>	Community goals or strategic objectives for delivery of the service.
<b>Levels of service (LOS)</b>	Specific parameters that describe the extent and quality of services that the municipality provides to users. LOS support service delivery objectives and are described using indicators and performance measures. LOS are broken down into the following categories: <ul style="list-style-type: none"><li>■ <b>Legal Requirements</b> - Statutory, regulatory, and contractual requirements are the minimum levels of service that must be provided.</li><li>■ <b>Community LOS</b> – The level at which the customer is receiving the service, from an experiential, non-technical perspective.</li><li>■ <b>Technical LOS</b> – The adequacy of assets to provide services to the community, from a physical characteristics' perspective. This is also known as the operational/asset level of service.</li></ul>
<b>Performance measure</b>	The means used by the municipality to assess a level of service. Example performance measures include operations and maintenance data, complaints, expert assessment, service contract, occupational health and safety records, program data. Performance measures may be a single measures or comparative metrics.

# Acronyms

<b>ALR</b>	Agriculture Land Reserve
<b>AM</b>	Asset Management
<b>CDF</b>	Coastal Douglas Fir
<b>CRD</b>	Capital Region District
<b>EMA</b>	Emergency Management Act
<b>FRAS</b>	Financial Reporting and Assurance Standards
<b>FRPA</b>	Forest and Range Practices Act
<b>GIS</b>	Geographic Information System
<b>GRI</b>	Global Reporting Standards
<b>ha</b>	hectare
<b>IPSASB</b>	International Public Sector Accounting Standards Board
<b>LOS</b>	Levels of Service
<b>MBCA</b>	Migratory Birds Convention Act
<b>MNRF</b>	Ministry of Natural Resources and Forestry
<b>n/a</b>	not applicable
<b>NAI</b>	Natural Assets Initiative
<b>NRN</b>	National Road Network
<b>OSM</b>	Open Street Map
<b>RAPA</b>	Riparian Areas Protection Act
<b>SARA</b>	Species at Risk Act
<b>SEI</b>	Sensitive Ecosystem Inventory
<b>UCB</b>	Urban Containment Boundary
<b>VRI</b>	Vegetation Resource Inventory
<b>WSA</b>	Water Sustainability Act

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## 1.0 Purpose

This report summarizes the results of a project to develop an enhanced natural asset inventory and related activities (hereafter, “the Inventory Project”) in the District of Saanich (hereafter, “the District”), and documents steps it can take to continue making progress with its natural asset management efforts; the inventory described in Section 3.0 was also provided to the District in tabular and dashboard formats as part of this project. In July 2023, the District’s Asset Management Strategy was approved; it provides a roadmap for a structured approach to asset management that embraces continuous improvement.

The District’s Asset Management (AM) Program, in turn, establishes the formal framework and system for implementing Saanich’s Asset Management Policy. The District of Saanich has completed asset inventories for most of its assets, except for its natural assets. This document is the final report for the Asset Management Strategy, Strategy 3, Project 3.1 - Develop a natural assets inventory.

The Inventory Project reflects the integration of numerous initiatives related to natural asset management (see Figure 1 below and *Annex A: Saanich documents related to natural assets*).



**Figure 1: Current Saanich Natural Asset Management Initiatives**  
(Source: NAI)

In 2023, the District of Saanich developed an asset management strategy with an implementation plan for 2023-2027 which includes the development of a natural asset *inventory* which will inform the creation of a natural asset management *plan*.

The scope of this Council-approved Inventory Project is to develop an enhanced natural assets inventory, which focuses on building an understanding of the natural assets the District relies on, the extent of that reliance, and provides a foundation for the development of the natural asset management plan. The natural asset inventory was developed in accordance with CSA standard W218:23<sup>1</sup>, and is available as an online dashboard at [go.greenanalytics.ca/Saanich](https://go.greenanalytics.ca/Saanich).

<sup>1</sup> It is important to note that the CSA W218 standard does not require a risk assessment or condition assessment but does include information on how an organization should pursue them if desired.

Each section of this report describes in detail the Inventory Project activities and results to support progress in natural asset management by the District of Saanich, as follows:

- **Section 2** provides context for both natural asset management and the physical and governance landscape related to the Project scope.
- **Section 3** identifies the data sources and categorization methods used to develop the natural asset inventory, including maps of the various natural asset types.
- **Section 4** documents the preliminary condition assessment for natural assets. Overall condition results are included in Section 4.1 (p. 23), and details on each individual condition assessment are provided in *Annex B*.
- **Section 5** provides descriptions and risk rankings of the identified hazards to natural assets (e.g., rural development pressure). Section 5.4 (p. 33) outlines priority risks for the District of Saanich.
- **Section 6** provides the preliminary identification of municipal services and co-benefits supported by natural assets, and identifies potential levels of service (i.e., performance measures) for consideration by the District of Saanich.
- **Section 7** describes the process for determining the value of a pre-determined range of services and co-benefits provided by natural assets, which includes both annual service values (\$/year) and replacement values. The results, which must be understood as minimum valuations, are summarized in Sections 7.4 and 7.5 (pp. 60-62).
- **Section 8** documents engagement efforts with First Nations rightsholders and government stakeholders to inform collaboration on future natural asset management efforts by the District of Saanich.
- **Section 9** summarizes the recommendations for the District of Saanich to further develop the natural asset inventory, as well as steps the District can consider when developing a Natural Asset Management Plan.





## 2.0 Introduction

### What are natural assets?

'*Natural assets*' are the stock of natural resources or ecosystems that contribute to the provision of one or more services required for the health, well-being and long-term sustainability of a community and its residents.<sup>2</sup> Natural assets support the delivery of core municipal infrastructure services, such as water storage, flood mitigation, waste management, drought mitigation, and recreation. They also provide non-infrastructure benefits (or co-benefits), such as climate regulation, clean air, habitat, and biodiversity, which contribute to the health and well-being of a community. The District of Saanich has adopted the Brundtland Reports' definition of sustainability – "meeting the needs of the present without compromising the ability of future generations to meet their own needs," (*Brundtland, 1987*).

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<sup>2</sup> As defined in the District of Saanich's Asset Management Policy (2019) and Asset Management Strategy (2023)

## Why manage natural assets

Understanding, accounting for, and ultimately protecting and managing natural assets for the full suite of infrastructure and non-infrastructure services they provide is increasingly proving to be an important way for local governments, but also other watershed agencies, to achieve a wide range of service delivery, biodiversity, climate change resilience and other outcomes. Outcomes of *effective natural asset management* include cost-effective and reliable delivery of municipal services, support for climate change adaptation and mitigation, and enhanced biodiversity.

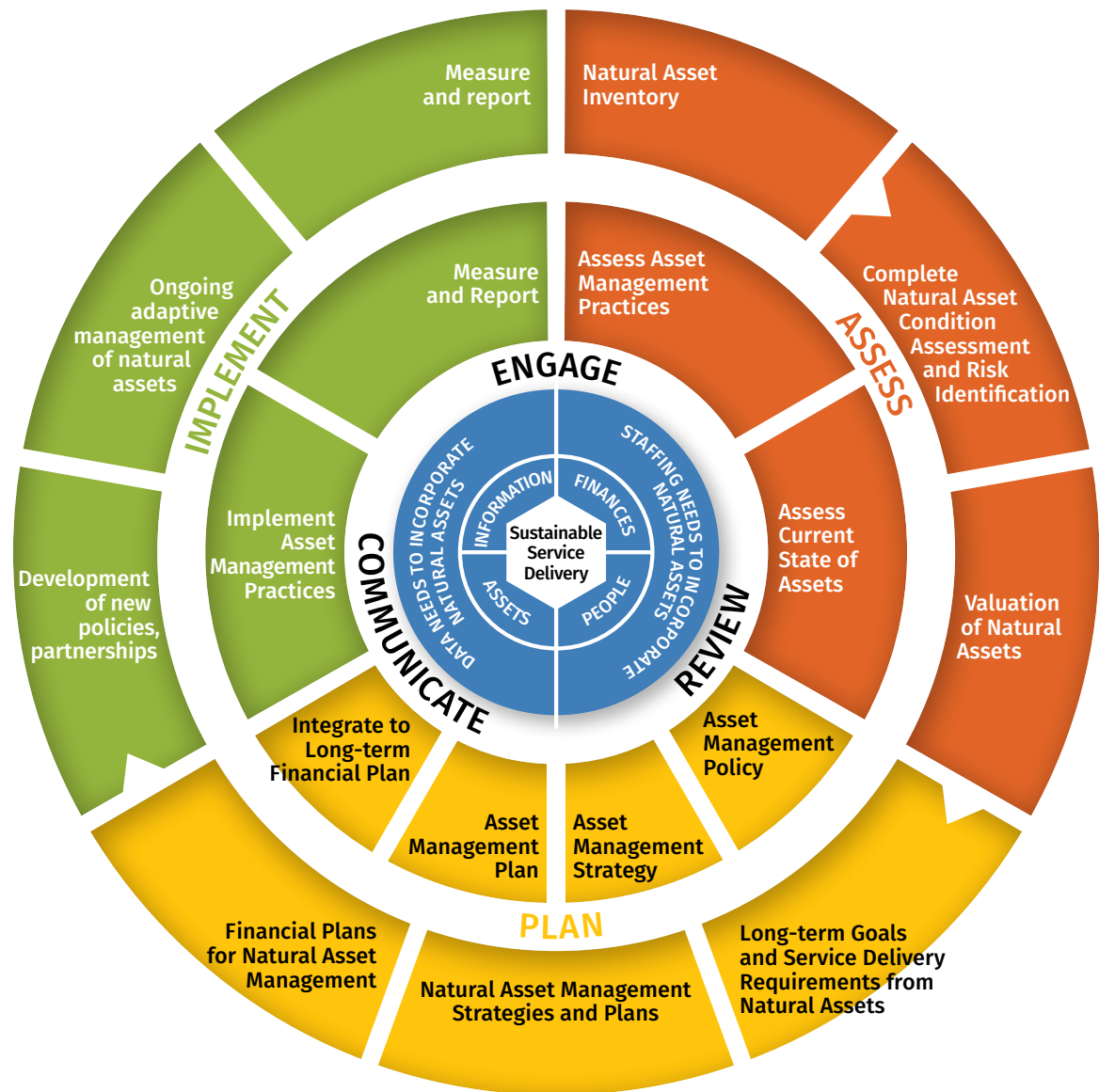
Drawing on the learnings of integrated water resource management and the interconnections and interdependencies among ecological processes, the integration of natural assets into asset management ensures nature is embedded within decision-making and budgetary planning. Through this new viewpoint, ecological integrity becomes prioritized, evidence increasingly guides decision making, program efficiency is improved through the consolidation of programs within the appropriate ecological boundaries.

Aspects of natural asset management (NAM) are now becoming the subject of national standards. In 2023 the Canada Standards Association Group (CSA) released 'Specifications for the Development of Natural Asset Inventories, which provide information about the location, types, and extent of natural assets and the condition they are in. This will be followed by additional standards for other aspects of the natural asset management process.

## Asset Management Process

Asset management is an on-going, iterative process. The natural asset management approach used for this project is based on standard asset management practices that local governments are increasingly required to adopt in Canada, and which are articulated by organizations such as Asset Management BC, based on global norms. To achieve sustainable service delivery, asset management should assess the current state of assets, including their condition, value and risks they face (i.e., the 'Assess' phase), develop asset management policies, strategies, and financial plans, (i.e., the 'Plan' phase) and implement practices, systems, and monitoring to measure progress (i.e., the 'Implement' phase). Figure 2 below describes this process and has been adapted from Asset Management BC's asset management wheel. The figure has been amended to reflect natural asset management considerations. As shown, inventories are an essential first step to long-term natural asset management efforts. They are part of the continuous improvement process, and as such, are updated and adapted as new information becomes available.





*Figure 2: The Natural Asset Management Process  
(Source: NAI 2017, adapted from Asset Management BC)*

## What is a natural asset management plan?

A natural asset management plan is a plan for managing a local government's assets to deliver agreed standards of service that recognize natural assets alongside engineered assets. The purpose of such a plan is to make explicit the costs and benefits associated with service delivery and to manage those costs appropriately, while also adequately managing associated risks. A natural asset management plan is distinct from, yet interconnected with, the District of Saanich's Biodiversity Conservation Strategy and Urban Forest Strategy, which address some of the same natural areas and a portion of the services provided by natural assets.

## What is a natural asset inventory?

Natural asset inventories provide information on the types of natural assets a local government relies upon<sup>3</sup>, their condition, and the risks they face. As depicted in Figure 3, a natural asset inventory is the task of asset management. Although by itself, an inventory will not give a sense of asset capacity or comprehensive/detailed service values, it is an essential first step towards a full natural asset management project.

The District of Saanich's AM Program scope includes engineered and natural assets. Natural assets are one of nine asset types.<sup>4</sup> They are a component of the broader category of green infrastructure, which includes designed and engineered elements that have been created to mimic natural functions (see Figure 3).

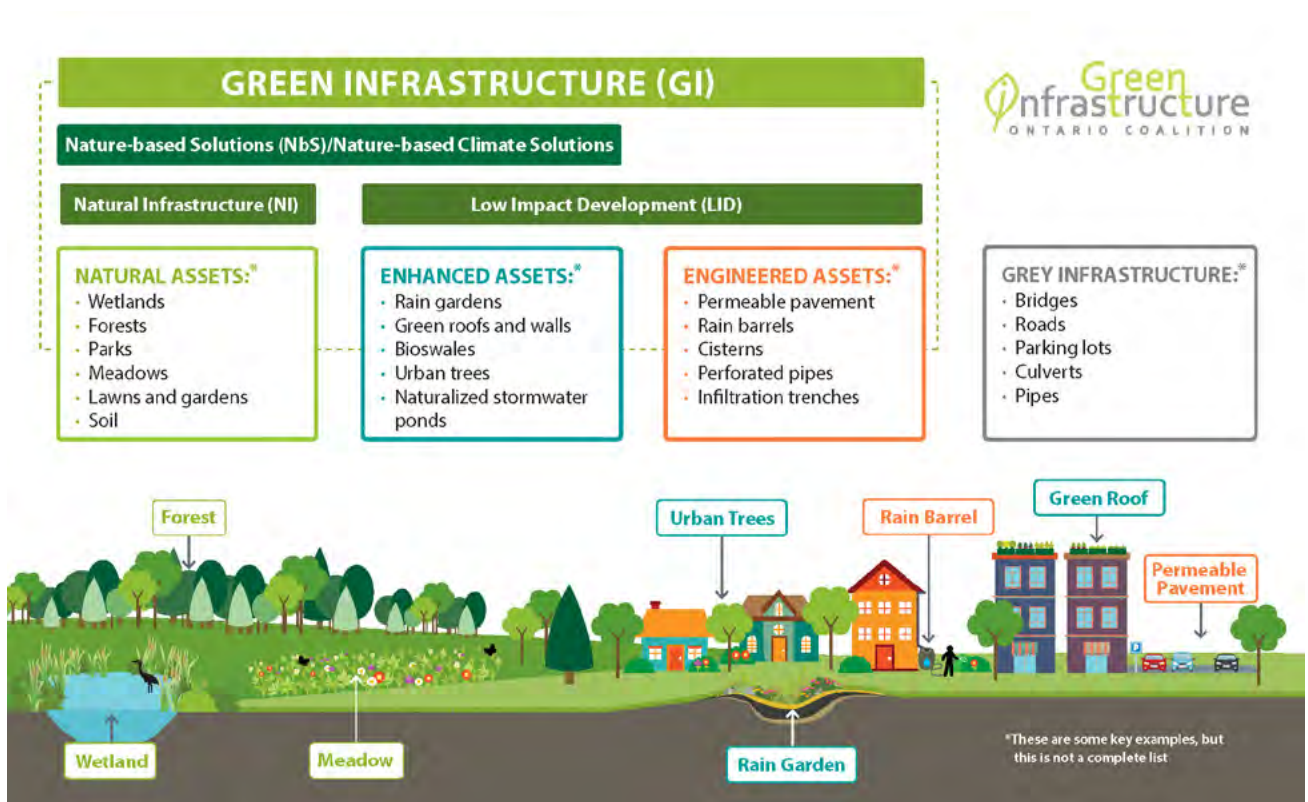


Figure 3: Green Infrastructure Diagram  
(Source: Green Infrastructure Ontario Coalition)

- 3 Note that many local governments rely on services from natural assets they do not own.
- 4 Nine asset groups include drainage, facilities, information technology, park and trail services, transportation, vehicles and equipment, wastewater (collection), water (distribution), and natural assets.





## 2.1 Local Government Context

### GENERAL

The District of Saanich is a member municipality of the Capital Region District (CRD), British Columbia. It is the largest of the thirteen member municipalities and three electoral areas in the CRD. The District of Saanich has a population of 117,735 (Statistics Canada, 2021) and an area of 11,178 hectares (Saanich GIS data). About half of the District is within the urban containment boundary; the remainder is rural/ agricultural (see Figure 4). It is centrally located within the capital region and shares its boundaries with the City of Victoria, the District of Highlands, the Town of View Royal, the Township of Esquimalt, the District of Oak Bay, and District of Central Saanich, and the Juan de Fuca Electoral Area.

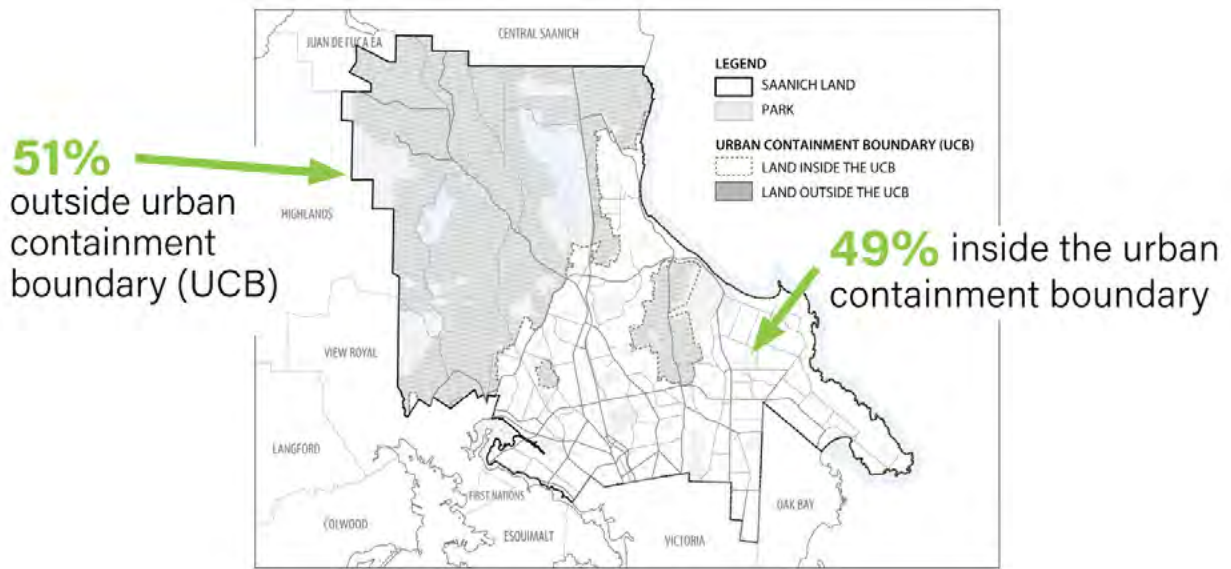


Figure 4: Regional Context (Source: Saanich OCP, 2024)

### GOVERNANCE

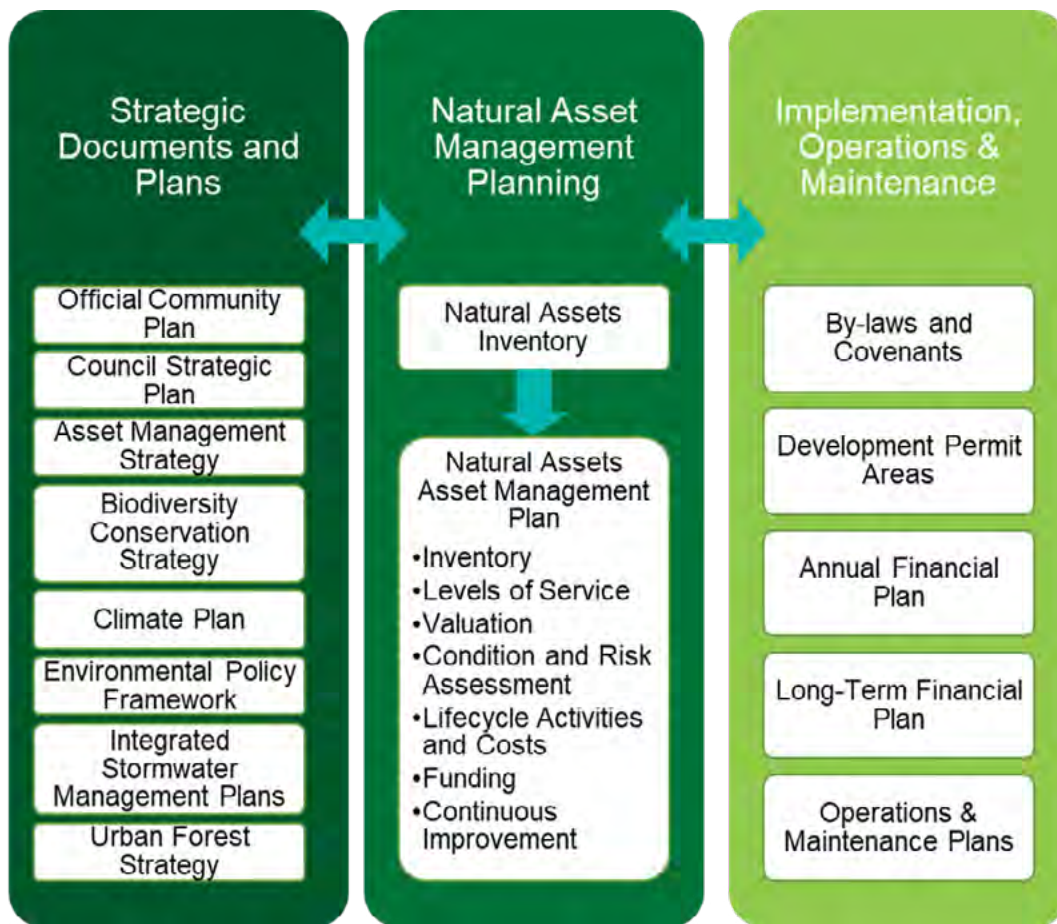


Figure 5: Diagram of Alignment Between the District of Saanich's Natural Asset Management Efforts and other Saanich Initiatives (Source: Saanich Council Report, 2023)

The District of Saanich's Official Community Plan (2024) recognizes the importance of ecosystem functions, and that climate change puts more pressure on natural assets such as forests, wetlands, coastal areas, and waterways. Natural assets support the provision of municipal services to the community as well as additional services known as co-benefits. Success in natural asset management would also support the District's Official Community Plan vision of 'a sustainable community where a healthy natural

environment is recognized as paramount for ensuring social well-being and economic vibrancy, for current and future.' The District's natural asset management initiatives also align well with other strategic policies and plans as shown in Figure 5.





## 3.0 Basic Natural Assets Inventory

### 3.1 Inventory Overview

Natural asset inventories have two main components: an asset registry (which is a tabular representation of the data) and an online dashboard. The registry was provided to the District of Saanich in an Excel file and the dashboard as a website address. Information on the condition of the assets is a subset of the inventory and is depicted in both the registry and dashboard. The scope of the inventory is all natural assets within the District's boundary, whether they are managed by Saanich or not. This includes natural assets on public and private lands.

## Inventory Data

To establish the inventory, data was obtained from the District of Saanich, the Province of British Columbia, Open Street Map, and the federal government. These spatial data layers were combined to establish a comprehensive depiction of natural assets. Most the data informed geospatial boundaries of natural asset polygons. However, a canopy cover assessment dataset informed the assessment of individual tree counts, which was based on a LiDAR processing. Table 1 describes the data sources used to develop the inventory and complete the condition assessment.

Dataset	File Name	Source	Purpose
<b>Building</b>	Buildings	Saanich	Saanich Municipal Building footprints, used to distinguish buildings from natural land cover.
<b>National Road Network (NRN) BC Roads</b>	NRN_BC_14_0_ROADSEG.shp	Government of Canada	Used to account for locations and extents of roads through study area.
<b>BC Parcel Fabric</b>	parcelmapbc	ParcelMap BC	Delineating parcels for land ownership.
<b>Open Street Map (OSM) Traffic Dataset</b>	gis_osm_traffic_a_free_1.shp	©Open Street Map, Available with Open Database license	Open Street Map parking data, from which parking lot features were pulled and used to distinguish these structures from other land cover.
<b>Sensitive Ecosystem Inventory (SEI)</b>	Sensitive Ecosystem Inventory	Saanich	Mapped areas of sensitive ecosystems, used to identify natural areas for asset delineation.
<b>Diamondhead Biodiversity</b>	Diamondhead Biodiversity Polygons	Saanich	Supplementary data for forest assets as well as delineation of marine shoreline areas
<b>Waterbody</b>	Waterbody	Saanich	Area of ponds and lakes at higher level of detail than Coastal Douglas Fir dataset. Used to delineate water areas of the inventory.
<b>Ocean Boundary</b>	OceanCache <sup>5</sup>	Saanich	A high-resolution file accounting for ocean location and boundary. Used to account for ocean assets and polish the boundaries of areas along the ocean front.
<b>Coastal Douglas Fir (CDF)</b>	CoastalDouglas Fir Areas	Saanich	Areas of natural ecosystems, focused on Coastal Douglas Fir biogeoclimatic areas used to identify natural areas for asset delineation.

<sup>5</sup> This is composed of (i) coastal bluff (25ha), which was from SEI's Coastal Bluffs, (ii) coastal sands (37ha), which was sourced from Diamondhead Biodiversity Polygons where RSTC Targets = Coastal Sand Ecosystems (where data for Coastal Bluffs was available) (iii) Ocean (638ha), sourced from provided data "SaanichNAIP.gdb", both the "MunicipalBoundary" and "OceanCache" layer were utilized to establish Ocean area [NOTE: The Municipal Boundary layer extends into the ocean, and was used as the cut-off point]; (iv) Bedrock (0.6ha), sourced from VRA and merged with Coastal Bluff as requested.



Dataset	File Name	Source	Purpose
<b>OSM POIS Dataset</b>	gis_osm_pois_a_free_1.shp	©Open Street Map, Available with Open Database license	Open Street Map data of various points of interest in the study. For this study, Golf Courses, Schools (for school fields not captured by parks), pitches, and graveyards were pulled from this data to be distinguished from other types of land cover. These features are considered to be “built-up pervious” and are not included as natural assets in the inventory.
<b>Parks</b>	Park	Saanich	Dataset detailing park boundaries. They are considered built up pervious areas. This classification was used to delineate them from natural assets.
<b>Agriculture Land Reserve (ALR) Boundary</b>	ALRBoundary	Saanich	Agricultural land reserve boundary within the study area. Used to reclassify areas as agricultural that are not classified according to other criteria.
<b>Urban Containment Boundary</b>	Urban Containment Boundary	Saanich	Area detailing urban boundaries, used to reclassify sections of VRI.
<b>Vegetation Resource Inventory (VRI) 2022</b>	VEG_COMP_POLY_AND_LAYER_2022.gdb	Province of BC	Used to provide a starting point for land cover in the study area. As a final cleaning process, the Urban containment boundary file was buffered by 15 m and all VRI herb areas within are reclassified to Mixed Urban, to prevent private lawns counting towards natural assets.
<b>Watercourse</b>	Watercourse	Saanich	Used to estimate watercourse proximity condition.
<b>Zoning</b>	Zoning	Saanich	Used to sub-divide areas by zoning.
<b>First Nation Reserve Boundaries</b>	FirstNation Reserve	Saanich	Used to subdivide areas by First Nation Reserve boundaries.
<b>Drainage Basin Boundaries</b>	DrainageBasin Boundary	Saanich	Used to subdivide areas by drainage boundaries.

Table 1: Summary of Data Sources



### 3.2 Asset Hierarchy

Through consultation between the project team and District of Saanich staff, the asset hierarchy was developed and refined based on considerations of how assets are managed and the available spatial data. Figure 6 shows how the natural asset types included in the asset hierarchy and how they integrate with other green and grey infrastructure. The focus of this report is on natural assets. Other green infrastructure such as bioswales, ditches, green roofs, rain gardens, permeable pavement, soil cells, and stormwater ponds are or will be incorporated into the District’s engineered asset management plans. This distinction for green infrastructure is tied to the nature of the specific green infrastructure types. The “other” green infrastructure are features that are typically constructed and actively managed and maintained by the District. As a result, they are easily integrated into traditional asset management plans. Natural assets on the other hand have several unique features (e.g. they are typically not constructed, can exist indefinitely if not degraded by external pressures) that require alternative consideration.

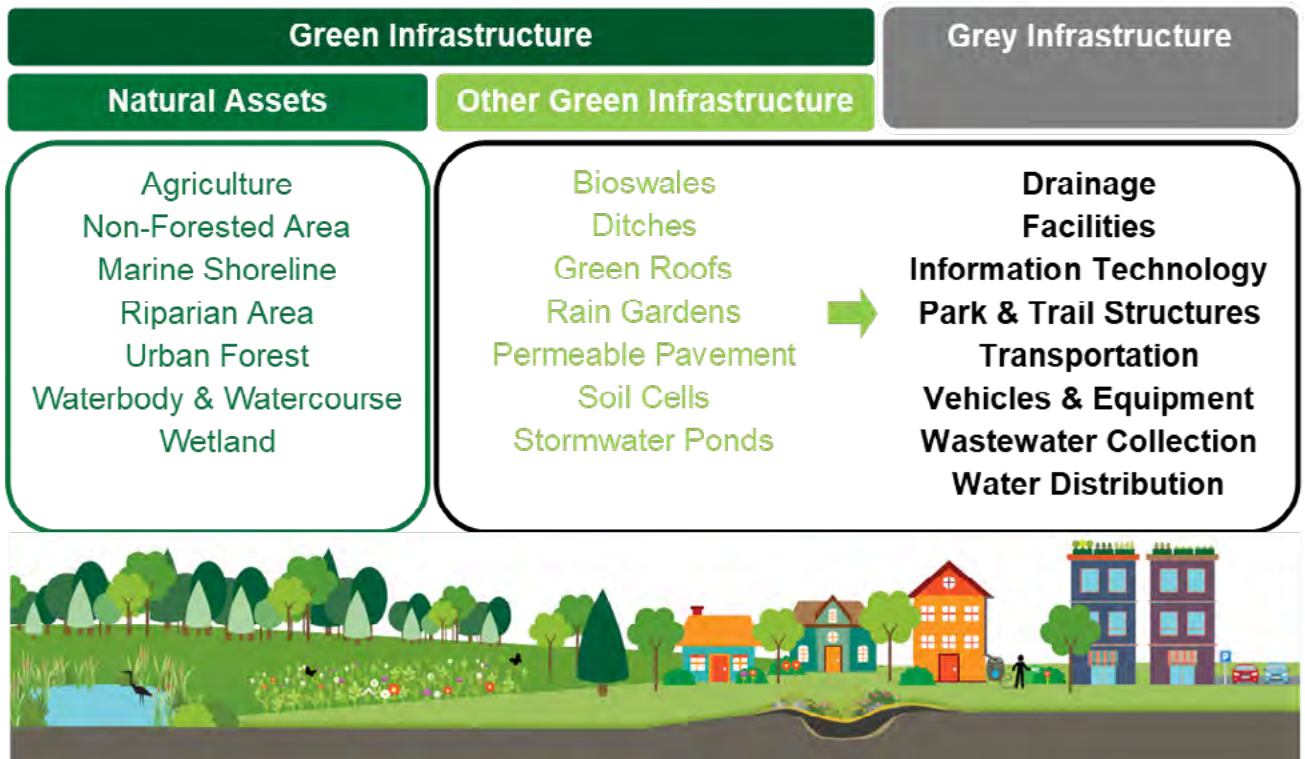


Figure 6: Natural Asset Integration with Other Green Infrastructure and Grey Infrastructure

Agricultural land is often not considered a “natural asset” given that they are highly managed areas. In addition, the District has limited management influence over those areas. However, some communities find it helpful to include these areas alongside natural assets to help them understand and monitor the broader landscape context. Furthermore, agricultural areas also contribute to other co-benefits (e.g. stormwater regulation) can be useful to consider. For these reasons agriculture was included in the natural asset

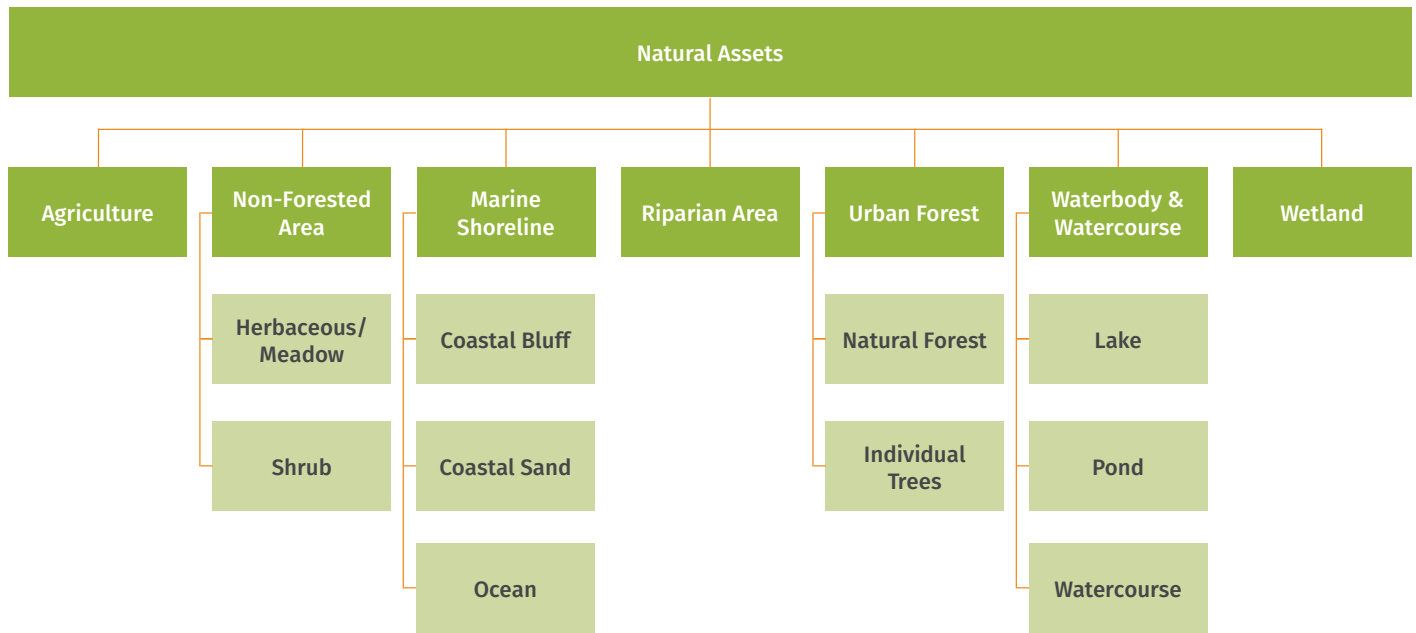
inventory. The inventory is also structured such that agricultural areas can be easily filtered out if the District ever wishes to focus more specifically on the more strictly natural assets. Soils are sometimes noted as a type of natural asset. These are not included as they are largely captured as a component of the existing asset types. To the extent that the District wishes to actively monitor and manage soils, soil data could be linked to the natural assets as an attribute in the inventory.<sup>6</sup> Although individual trees could also be considered other green infrastructure (enhanced), they have been included in Saanich’s natural assets inventory because they are part of the District of Saanich’s Urban Forest Strategy and will be managed as part of the urban forest.

Table 2 demonstrates how the District’s natural assets are organized into a hierarchy in the inventory. At the highest level, the hierarchy defines ownership of the asset. The second level defines their location, which is currently based on what subwatershed natural assets are located in. Then natural assets are organized into seven asset groups, some of which are further divided into subgroups of assets. The natural asset group and subgroups are also depicted in Figure 7.

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	
<b>Owner</b>	Asset Type	Asset Location	Asset Group	Asset Subgroup 1	Asset Subgroup 2	
<b>Municipal</b> (District of Saanich)  <b>Private/Other</b>	Natural Asset	Currently defined based on subwatershed	Agriculture			
			Marine Shoreline	Coastal Bluff		
				Coastal Sands		
				Ocean		
			Non-Forested Area	Herbaceous / Meadow		
				Shrub		
			Riparian Area			
			Urban Forest	Natural Forest	Mature Forest	
					Old Forest	
					Young Forest	
Individual Tree	Boulevard Trees					
	Park/Facility Trees					
	Private Trees					
Waterbody and Watercourse	Lake					
	Pond					
			Wetland			

**Table 2: Levels of the Natural Asset Hierarchy**

<sup>6</sup> Air, airsheds, and the atmosphere are sometimes thought of as a natural asset. Certainly, the atmosphere is an essential natural feature humans rely on. However, to date they have not been considered as part of natural asset management plans since local governments do not own or manage the atmosphere.



*Figure 7: Natural Asset Hierarchy*

Most of the assets are represented as polygons, or areas measured in hectares in the inventory. Exceptions to this are the tree inventory (which is represented as point data – one point for each tree) and the watercourse assets (which are represented as line data that is measured in length). Tree data contained tree points for all trees across the District. Trees in this data were classified into two categories: (i) natural forest trees, and (ii) individual urban trees (e.g. street and park trees). Individual trees associated with natural forest area are summarized as an attribute within the appropriate polygon. For individual urban trees, the point data represents the inventory trees located across that urban portions of Saanich that are not associated with an existing natural asset area.

The area-based inventory defined a total of 10,846 individual assets, covering 6,375 hectares (ha), as noted in Table 3, and the number of individual trees and kilometres of watercourses as noted in Table 4. An asset is defined as a continuous area of the same land cover type. For example, an intact forested area would be defined as one asset, but a forested area that is bisected by a road would constitute two assets.

The total area of the District of Saanich is 11,178 ha, which implies natural assets cover more than 57% of the District’s land cover, exceeding the Kunming-Montreal Global Biodiversity Framework Target 2 Goal to conserve and manage 30% of natural areas (Convention on Biological Diversity, 2024). While these areas are not ‘conserved’, the District’s efforts towards natural asset management could increasingly contribute towards protection of the natural environment and its associated functions and processes. While the focus of this report (i.e., the condition and risk assessments) is on the area-based natural assets, Table 4 summarizes the linear and point assets by type.

Asset Group	Number of Assets	Total Area (ha)
Agriculture	422	910
Non-forested Area	924	478
Marine Shoreline	769	700
Riparian Area	1,780	207
Urban Forest	5,895	3,481
Waterbody and Watercourse	587	360
Wetland	469	239
<b>Total</b>	<b>10,846</b>	<b>6,375</b>

Table 3: Summary of Polygon Natural Assets by Asset Group

Asset Group	Asset Subgroup	Quantity
Urban Forest	Individual Trees (outside Natural Forest areas)	377,712
Waterbody and Watercourse	Watercourse	142 km

Table 4: Summary of Point and Linear Natural Assets by Asset Group

## State of the Urban Forest Report and the Natural Asset Inventory

It is important to note that the natural asset inventory is distinct from the dataset developed for the District of Saanich’s State of the Urban Forest Report. One of the primary objectives of the State of the Urban Forest data set was to inform the District’s urban forest and canopy cover. The focus on canopy cover meant that other natural asset types (e.g. wetlands) were less clearly delineated. Such added distinction can be important from an asset management perspective when considering possible management interventions. As a result, a separate geospatial analysis was completed for the natural asset inventory, drawing on the best available data (as noted in Table 1). Doing so allowed for a more accurate distinction between the different natural asset types. However, this means that estimated area of urban forest differs from what is reported in the State of the Urban Forest. While there were several specific reasons why the numbers differ, the difference is largely attributed to what was captured as wetland.

Figure 8 shows the spatial distribution of the natural assets (area or polygon-based assets).

# Saanich Natural Asset Inventory

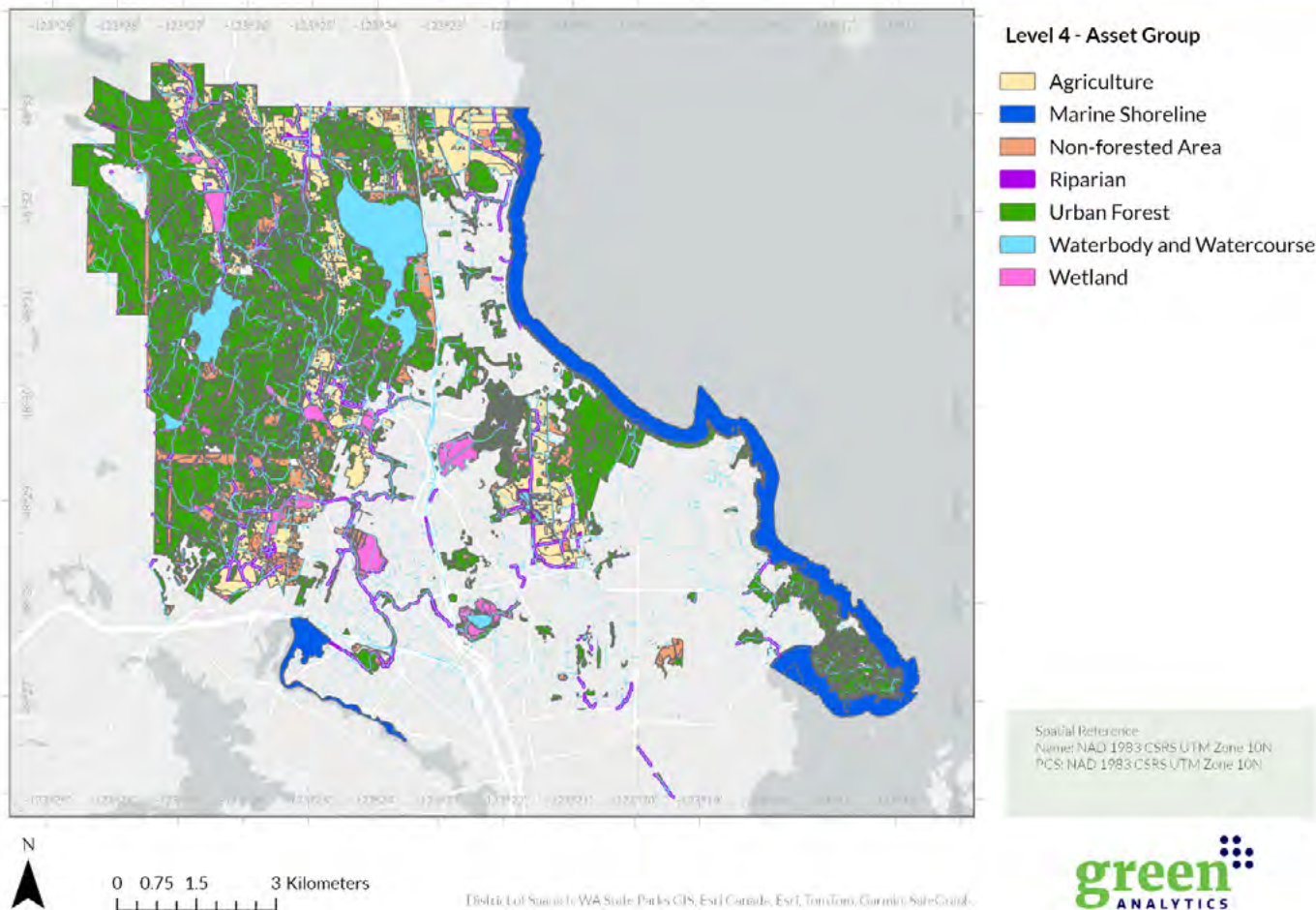


Figure 8: Saanich Natural Asset Inventory as Shown in Online Dashboard

Parks, and their boundaries, were used as criteria to subdivide areas of the inventory. Figure 9 shows the spatial distribution of the natural assets (area or polygon-based assets) within District of Saanich parks. Within these parks, the area-based inventory defined a total of 1,850 individual assets, covering 1,164 hectares (ha), as noted in Table 5.



# Saanich Natural Asset Inventory

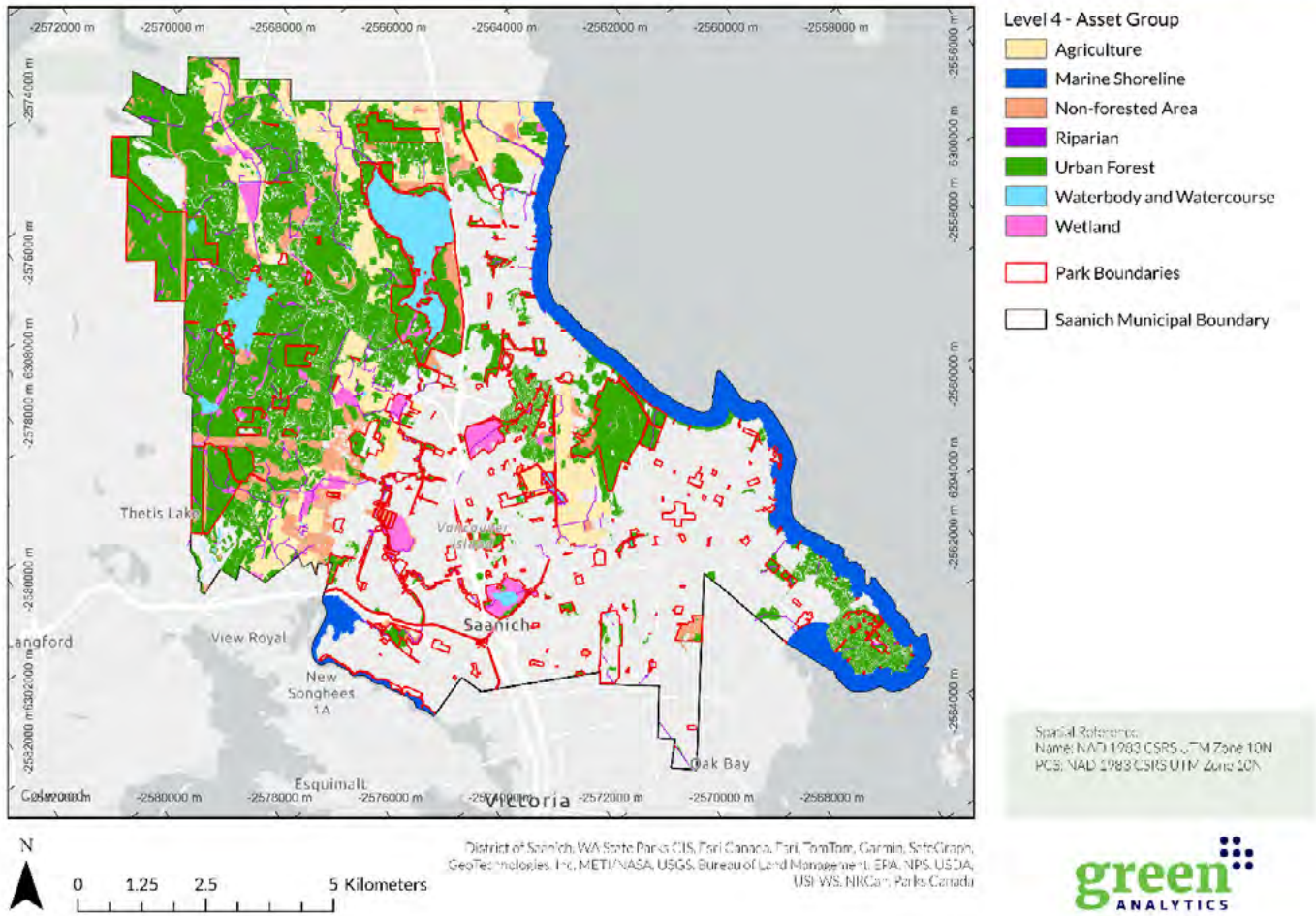


Figure 9: District of Saanich Natural Asset Inventory in comparison to District of Saanich park boundaries

Asset Group	Number of Assets	Total Area (ha)
Agriculture	4	7
Non-forested Area	106	95
Marine Shoreline	67	3
Riparian Area	378	50
Urban Forest (excludes individual trees)	1,028	882
Waterbody and Watercourse	63	21
Wetland	204	105
<b>Total</b>	<b>1,850</b>	<b>1,164</b>

Table 5: Summary of Polygon Natural Assets within District of Saanich Parks by Asset Group

### 3.3 Asset Registry

Each natural asset within the inventory has a unique identification number that allows users to select and analyze individual assets and manipulate the corresponding data as required. For example, changes in condition can be noted for individual assets. Information on each asset is housed in a spatially explicit asset registry. This registry exists as a GIS compatible geodatabase, as well as a tabular CSV format. Figure 10 is an excerpt from the District of Saanich’s online registry showing natural asset characteristics and details. Additional detail is provided in the online dashboard (e.g., a series of attributes for each asset contained within the inventory).

### 3.4 Online Dashboard

Inventories may provide more insights when characterized visually in a dashboard, which enables users to explore different aspects of the data. For instance, natural asset information can be quickly summarized by watershed area, or, if users want to explore the specifics of forest assets, they can quickly filter the data to focus on that particular asset. Figure 11 is a screenshot from the dashboard. The full version can be accessed at [go.greenanalytics.ca/Saanich](http://go.greenanalytics.ca/Saanich).

Within the dashboard, various filters are accessible throughout the different sections of the dashboard. Filtering allows a user to create custom subsets of data based on a selection of attributes within the natural asset inventory dataset.

In the Summary, Tabular Asset Registry, Condition Assessment, and Risk Identification tabs, the following filters are available:

- Owner
- Asset Group
- Asset Subgroup 1
- Asset Subgroup 2
- Zoning Class
- Watershed Catchment Name
- Park Name

In the Tree Registry tab, the following filters are available for the Individual Tree registry:

- Owner
- Tree Class
- Crown Area
- Height Class



In the Watercourse Registry tab, the following filters are available:

- Class
- Common Name
- Facility ID

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District of Saanich, BC

Summary of enhanced inventory results and recommendations

The screenshot shows the 'Natural Asset Registry' tab selected. A text box explains that the inventory was constructed based on the natural asset classes of each polygon. Below this, there are filter dropdowns for Owner (All), Asset Group (All), Asset Subgroup 1 (All), and Asset Subgroup 2 (All). A navigation bar includes 'Natural Asset Areas', 'Urban Tree Registry', and 'Watercourse Registry'. The main table, titled 'Natural Asset Registry', has the following columns: Asset ID, Sub-Asset ID, Area (ha), Level 1 - Owner, Level 2 - Asset Type, Level 3 - Asset Location, Level 4 - Asset Group, Level 5 - Asset Subgroup 1, Level 6 - Asset Subgroup 2, Majority Terrestrial Habitat Type, and Majority TEM Leading Structure. The table contains 20 rows of data.

Asset ID	Sub-Asset ID	Area (ha)	Level 1 - Owner	Level 2 - Asset Type	Level 3 - Asset Location	Level 4 - Asset Group	Level 5 - Asset Subgroup 1	Level 6 - Asset Subgroup 2	Majority Terrestrial Habitat Type	Majority TEM Leading Structure
OCN7	OCN7-2	551	Private/Other	Natural Assets		Marine Shoreline	Ocean			
WAI486	WAI486-1	236	Private/Other	Natural Assets		Waterbody and Watercourse	Lake			MF
WAI318	WAI318-2	71	Private/Other	Natural Assets		Waterbody and Watercourse	Lake			YF
FOR730	FOR730-26	49	Municipal	Natural Assets		Urban Forest	Forest			YF
OCN6	OCN6-1	44	Private/Other	Natural Assets		Marine Shoreline	Ocean			
AGR124	AGR124-2	35	Private/Other	Natural Assets		Agriculture				
FOR485	FOR485-129	25	Municipal	Natural Assets		Urban Forest	Forest	Mature Forest	Mature Forest	YF
FOR651	FOR651-108	25	Private/Other	Natural Assets		Urban Forest	Forest	Mature Forest	Mature Forest	YF
FOR685	FOR685-105	34	Municipal	Natural Assets		Urban Forest	Forest	Mature Forest	Mature Forest	YF
WE113	WE113-15	23	Municipal	Natural Assets		Wetland				
FOR729	FOR729-12	21	Private/Other	Natural Assets		Urban Forest	Forest			YF
AGR132	AGR132-10	20	Private/Other	Natural Assets		Agriculture				
FOR730	FOR730-12	19	Municipal	Natural Assets		Urban Forest	Forest	Young Forest	Young Forest Tall	YF
FOR617	FOR617-43	19	Private/Other	Natural Assets		Urban Forest	Forest	Mature Forest	Mature Forest	MF
WE1121	WE1121-1	19	Private/Other	Natural Assets		Wetland				
AGR125	AGR125-3	19	Private/Other	Natural Assets		Agriculture				
FOR597	FOR597-15	10	Municipal	Natural Assets		Urban Forest	Forest	Mature Forest	Mature Forest	OF
AGR139	AGR139-5	18	Private/Other	Natural Assets		Agriculture				
AGR52	AGR52-16	18	Private/Other	Natural Assets		Agriculture				
AGR19	AGR19-4	17	Private/Other	Natural Assets		Agriculture				
AGR137	AGR137-6	17	Private/Other	Natural Assets		Agriculture				
FOR730	FOR730-23	16	Municipal	Natural Assets		Urban Forest	Forest			YF
NBAR45	NBAR45-58	16	Private/Other	Natural Assets		Marine Shoreline	Coastal Sands			
AGR14	AGR14-6	16	Private/Other	Natural Assets		Agriculture				

Figure 10: Excerpt from the Registry, which is a Tabular Representation of Inventory Data

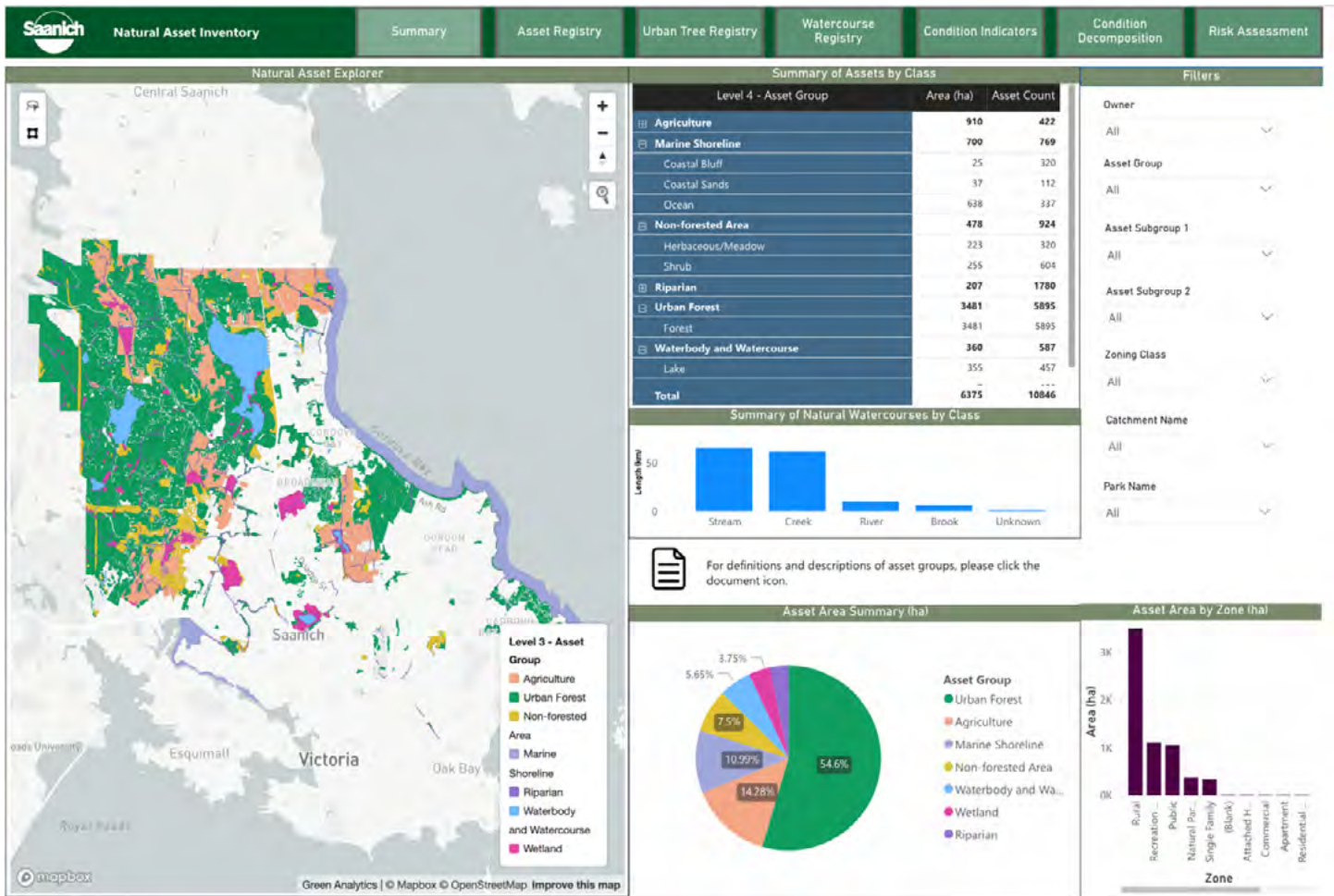


Figure 11: Screenshot of Main Inventory Summary from the Online Dashboard



## 4.0 Preliminary Condition Assessment

Documenting the condition of natural assets is a key aspect of natural asset inventories. A natural asset condition assessment provides an understanding of both the ecological health of natural assets, and the ability of natural assets to provide services. This information, in turn, can support the effective management of natural assets, be reflected in the registry and the dashboard, and updated over time.

A desktop-based condition assessment was completed for all natural assets except agriculture, individual trees, or watercourses (due to data constraints) and built into the inventory to provide an initial understanding of the status of the natural assets for the District of Saanich. Since there is currently no field based data on the condition of natural assets, a suite of condition indicators were used as a proxy. This approach is consistent with the CSA standard and is a reasonable first step in assessing condition and can be used as a foundation for future work in this area.

The condition indicators are noted below and categorized into three criteria to align with the CSA standard for natural asset inventories. These include physical context to consider the physical attributes of the asset (e.g., topology, soil type), landscape context to consider the asset as a whole and how it is influenced by surrounding areas (e.g., landscape connectivity, fragmentation), and ecological context which considers the ecological attributes of the asset (e.g., forest composition, presence of native species).

**CRITERIA FOR PHYSICAL CONTEXT**

- 1/ Natural Area Patch Size and Shape
- 2/ Natural Asset Proximity to Watercourses
- 3/ Forest Proximity to other Natural Assets
- 4/ Wetland Proximity to other Natural Assets

**CRITERIA FOR LANDSCAPE CONTEXT**

- 5/ Extent of Adjacent Complementary Land Uses

**CRITERIA FOR ECOLOGICAL CONDITION**

- 6/ Biodiversity Condition

The indicators employed in the desktop assessment are proxy metrics for broader ecological condition considerations. The underlying assumption for natural asset condition assessments is that an asset that is assessed as being in a “good” condition from an ecological perspective, is anticipated to be able to provide a “good” level of ecological services. For example, larger asset size implies more connectivity of natural areas, while higher road density implies more fragmentation and higher hydrologic impairment of water flows, and more permeability implies greater ability to store water which means more effective stormwater management. The indicators are described in [Annex B](#) along with detailed results for each indicator.

## 4.1 Condition Results

Overall condition ratings assigned to natural assets were applied to align with the CSA standard for natural asset inventories. The CSA rating scale definitions are outlined in Table 6. Detailed allocation explanations for each individual condition assessment are outlined in [Annex B](#).

Rating	Explanation
<b>Very Good</b>	Well maintained, good condition, no signs of deterioration in ecological conditions. Natural asset service provision is high.
<b>Good</b>	Ecological conditions appear to be sufficient; some minor localized (or isolated) impacts noticeable, which might be a warning sign of possible decline. Natural asset service provision is acceptable.
<b>Fair</b>	Clear signs of deterioration in ecological function and service-influencing factors. Natural asset service provision, while still functional, is at risk of failing.
<b>Poor</b>	Condition is below standard with large portion(s) of the system exhibiting significant deterioration in ecological function. Natural asset service provision is impacted, and some services might be non-functioning.
<b>Very Poor</b>	Widespread signs of advanced deterioration; unlikely that the natural asset is providing any functional service.

*Table 6: CSA Condition rating scale definitions*



Overall, about 2,863 ha (52% of the natural assets assessed for condition, or 45% of the total natural assets mapped) were assessed in very good condition and 2,169 ha (39% of the natural assets assessed for condition, or 34% of the total natural assets mapped) were assessed in good condition (Table 7).

Condition Rating	Number of Assets	Area (ha)
Very Good	2,860	2,863
Good	5,560	2,169
Fair	1,562	385
Poor	414	47
Very Poor	28	1
<b>Total</b>	<b>10,424</b>	<b>5,465</b>
Not rated	422	910

Table 7: Breakdown of Condition Ratings by Area and Number of Assets

Figure 12: shows the results of the spatial distribution of the condition ratings. Results by condition indicator are provided in [Annex B](#).

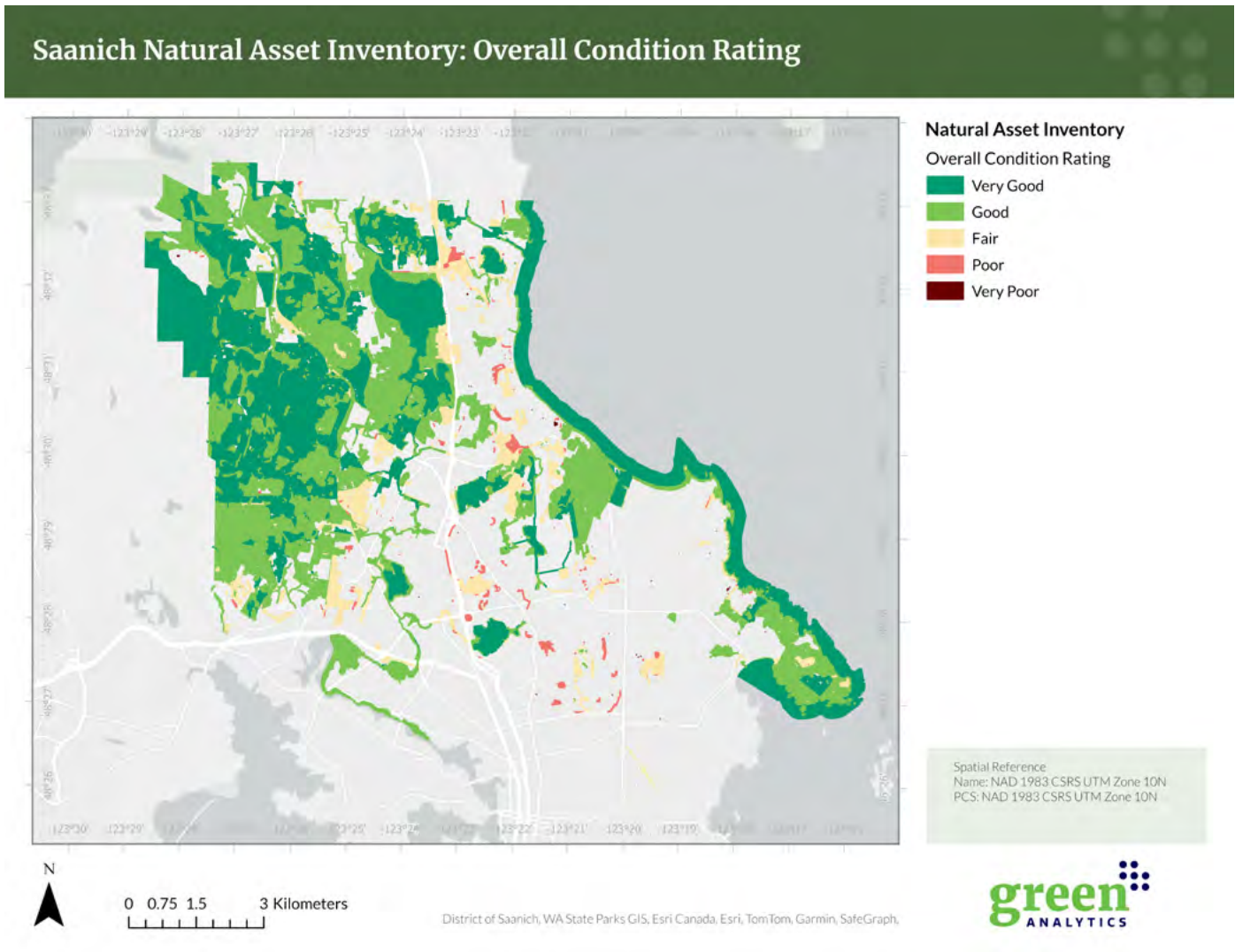


Figure 12: District of Saanich Natural Asset Inventory Mapped by Overall Condition Rating

Figure 13 presents condition results by asset type and rating.

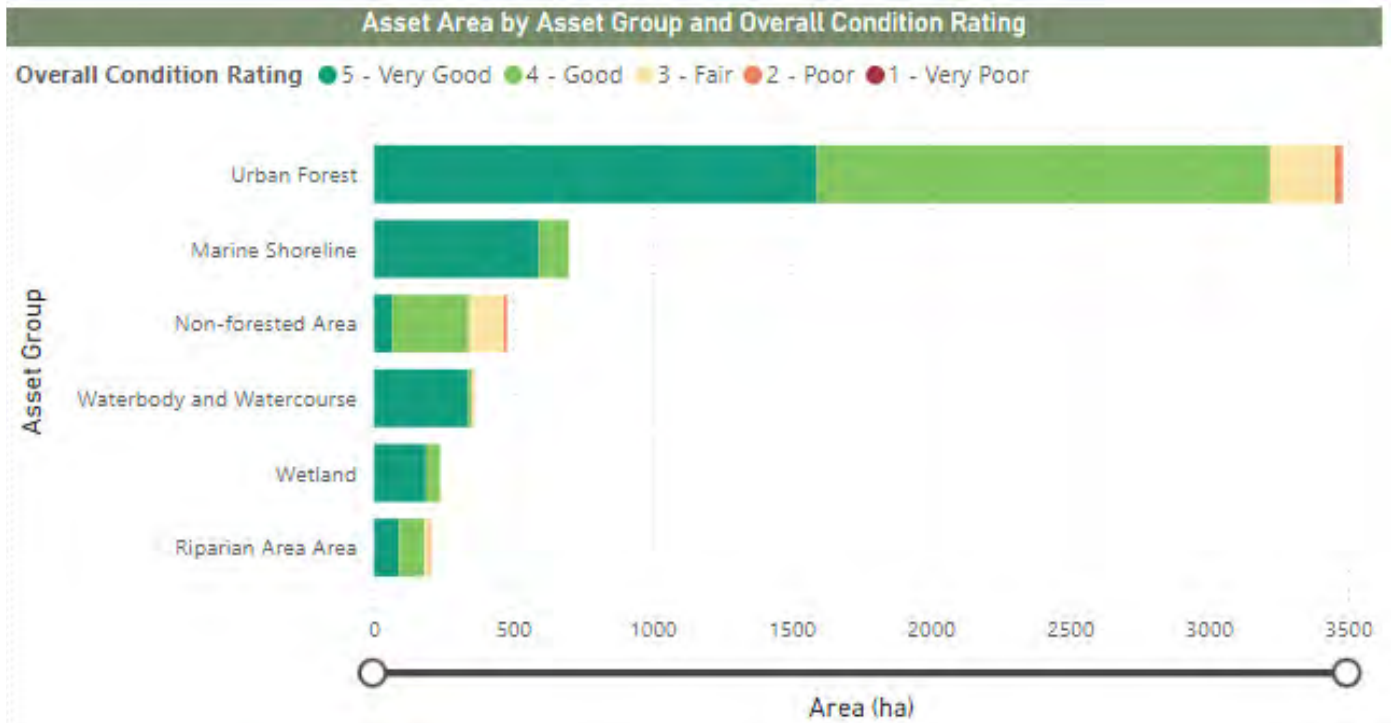


Figure 13: Summary of Condition Rating by Natural Asset Type

## 4.2 Maintaining the Inventory

Inventories are not static. Both the registry and the dashboard can be expanded and/or updated as new information becomes available. For example, asset condition might improve as a result of restoration efforts, or new studies may add insights on the condition of the assets. New data can be reflected in the asset registry and subsequently in the online dashboard as it becomes available. Furthermore, the level of desired detail may evolve as asset management readiness increases or as areas of natural asset management focus emerge. That said, inventories should grow in detail and sophistication only insofar as they remain aligned with the capacity of the communities to maintain them and the uses to which they will be put. Their evolution and development should be a function of the monitoring, reporting and lessons of the asset management cycle and be driven by the imperative of ensuring sustainable, cost-effective delivery of services to the community, which is the core of asset management.





## 5.0 Preliminary Risk Identification

### 5.1 Risk Identification Overview

Identifying risks facing natural assets is a means to help local governments prioritize management actions for natural assets. Risk management for natural assets is a four-stage process that includes hazard identification, analysis of likelihood and impact, development of risk mitigation strategies, and control and documentation. Risk identification informs the first and second stages of risk management by identifying the top risks to natural assets and their associated services, plus a high-level analysis of likelihood and impact.



$$\text{Risk score} = \text{Likelihood of occurrence} \times \text{Impact of occurrence}$$

Risk types relevant to natural asset management typically include:

- **Service risk:** the risk of an asset failure that directly affects service delivery.
- **Strategic risk:** the risk of an event occurring that impacts the ability to achieve organizational goals.
- **Operations and maintenance risk:** risks related to poor asset controls and oversight, which can lead to poor record-keeping and poor monitoring of asset.
- **Financial risk:** risks related to the financial capacity of the District of Saanich to maintain municipal services.
- **Political risk:** risks related to the nature of municipal politics.

## 5.2 Risk Rating Methodology Used for the Project

The following process was followed to arrive at preliminary risk ratings for natural hazards for the District of Saanich:

- 1/ Inventory hazards and affected natural asset groups
- 2/ Assign identified hazards to relevant natural asset groups and services
- 3/ Identify priority stressors using risk ratings
- 4/ Map risk across the District

In October 2023, District staff participated in a risk management workshop led by the Natural Assets Initiative (NAI) to identify hazards to natural assets and their associated services. Staff started by exploring common hazards to consider the likelihood and impact severity of hazards and to group hazard categories by their primary drivers. A follow-up meeting was held in December 2023 to review results and consider additional hazards identified in previous NAI projects.

A total of nineteen hazards were identified and were grouped into categories, organized by three over-arching drivers – climate change, development pressure and lack of capacity. Each of these risk drivers can result in cascading and systematic hazards, which are discussed briefly below.



## Climate Change

Extreme weather events are becoming more common, of longer duration and severity as the earth warms. Droughts and heatwaves are a coupled result of global warming. Drought stricken areas become more vulnerable to forest fire, susceptible erosion, invasive species, and pests. The relevant cascading hazards of climate change in the District of Saanich include:

- Drought
- Extreme heat
- Wildfire
- Extreme precipitation events
- Pollutant loading
- Invasive species
- Erosion
- Storm surge
- Rising sea levels

## Development Pressure

Increasing development pressure could bring about a range of cascading impacts *if* the areas identified for development fragment and degrade priority natural assets and/or the connectivity of natural assets, and ultimately degrade hydrological connections, impair climate resilience, increased heat island impact and damage biodiversity. The environment doesn't need to be pitted against development, however. Where environmental and community objectives can be articulated, solutions that minimize environmental harm and maximize community well-being can be identified. The relevant cascading hazards of development pressure in the District of Saanich include:

- Development pressure – urban
- Development pressure - rural
- Habitat Conversion and Fragmentation
- Overuse of trails
- Illegal dumping

## Lack of Capacity

The lack of capacity to address natural asset risks can lead to lost opportunities (where natural asset management can mitigate risks) and deepening risks over time. This may be due to a range of challenges including lack of knowledge or expertise within the District, the absence of over-arching policies related to natural assets, staff and council turnover and competing interests for use of time. The relevant cascading hazards in the District Saanich include:

- Lack of legislated protection
- Lack of dedicated resources / formalized maintenance programs
- Lack of education / understanding
- Lack of policy tools
- Lack of integrated planning

For each hazard, natural asset groups at risk and services that could be impacted were documented. Each hazard was then ranked from 0-25 according to the probability of an impact occurring (see Table 8 below for likelihood ratings followed) and the relative magnitude of its negative consequences (see Table 9 for impact ratings used), with 0 being the lowest and 25 being the highest risk.

Likelihood Rating	Event Type	
	Recurrent Impact	Single Event (only occurs once)
<b>Almost certain (5)</b>	Could occur several times per year	>90% chance of occurring by 2050
<b>Likely (4)</b>	May arise about once per year	51 – 90% chance of occurring by 2050
<b>Possible (3)</b>	May arise once in ~ 10 years	21-50% chance of occurring by 2050
<b>Unlikely (2)</b>	May arise once in 10 years to 25 years	1-20% chance of occurring by 2050
<b>Rare (1)</b>	Unlikely during next 25 years	< 1% chance of occurring by 2050

*Table 8: Likelihood of Impact from Hazards – Rating Scale*  
Source: District of Saanich

Impact Rating	Description of rating
<b>Catastrophic (5)</b>	Irrecoverable damage/irreversible impacts to the asset and/or major loss of functions.
<b>Major (4)</b>	Major, widespread impacts to the asset in the medium / long-term and/or severe and widespread loss of ecological functions. Damage that could be reversed with intensive efforts (e.g., introduction of tree disease)
<b>Moderate (3)</b>	Moderate impacts on the asset in the short/medium-term. Isolated but moderate instances of damage to the ecosystem functions that could be reversed with intensive efforts.
<b>Minor (2)</b>	Minor, localized impacts on the asset in the short-term. Isolated but minor instances of damage to the ecosystem functions that could be reversed.
<b>Negligible (1)</b>	Appearance of threat but no real impacts on the asset or its functions.

*Table 9: Hazard Impact Rating Scale*  
Source: NAI & Green Analytics

To assess impact and consequence, the District of Saanich considered four questions:

- 1/ What impact is likely to happen?
- 2/ What is the consequence of that impact happening?
- 3/ What can be done to mitigate the probability of impact and/or consequence?
- 4/ What cues will signal the need for mitigation?

The total risk score was then converted into a rating scale:

- **High:** hazards with a score between 16 and 25
- **Medium-high:** hazards with a score between 15 and 16
- **Moderate:** hazards with a score between 11 and 15
- **Medium-low:** hazards with a score between 10 and 11
- **Low:** hazards with a score between 6 and 10

### 5.3 Results of the Risk Identification Process

The risk identification process revealed:

- 10 high-level hazards
  - Invasive species,
  - Development pressure - urban,
  - Development pressure – rural
  - Extreme heat
  - Drought
  - Habitat conversion and fragmentation,
  - Extreme precipitation events,
  - Lack of dedicated resources / formalized maintenance programs
  - Lack of policy tools,
  - Lack of legislated protection of natural assets
- 3 medium-high level hazards
  - Erosion,
  - Storm surge,
  - Rising sea levels
- 3 medium-level hazards
  - Pollutant loading,
  - Lack of education / understanding
  - Lack of integrated planning
- 3 low-level hazards
  - Wildfire,
  - Overuse of trails,
  - Illegal dumping



Further details on the risk scores and natural assets affected are provided in Table 10.

Risk driver	Hazard	Risk score	Natural Assets Groups Affected
Climate Change	Wildfire	L	Urban Forest
Climate Change	Extreme precipitation events	H	Agriculture, Non-forested area, Urban forest, Waterbody, and Watercourse, Wetland
Climate Change	Pollutant loading	M	All
Climate Change	Invasive species	H	All
Climate Change	Erosion	M-H	All
Climate Change	Storm surge	M-H	Agriculture, Marine Shoreline, Non-forested Area, Riparian, Urban Forest, Waterbody and Watercourse
Climate Change	Rising Sea Levels	M-H	Agriculture, Marine Shoreline, Non-forested Area, Riparian, Urban Forest, Waterbody and Watercourse
Climate Change	Extreme Heat	H	All
Climate Change	Drought	H	All
Development Pressure	Development pressure (urban)	H	All
Development Pressure	Development pressure (rural)	H	All
Development Pressure	Overuse of trails	L	Non-forested areas, Urban forest
Development Pressure	Illegal dumping	L	All
Development Pressure	Habitat Conversion/ Fragmentation	H	All
Lack of capacity	Lack of legislated protection	H	All
Lack of capacity	Lack of resources / maintenance programs	H	All
Lack of capacity	Lack of education / understanding	M	All
Lack of capacity	Lack of policy tools	H	All
Lack of capacity	Lack of integrated planning	M	All

**Table 10: Simplified Risk Results**  
*Note: n/a = not applicable*

In terms of scope, the identified risks affect natural assets across the District of Saanich, with numerous risks potentially affecting all natural asset groups. The identified risks also have the potential to negatively impact engineered assets, property, and personal health and safety. See Figure 14 for a visual representation of risk impact and likelihood.

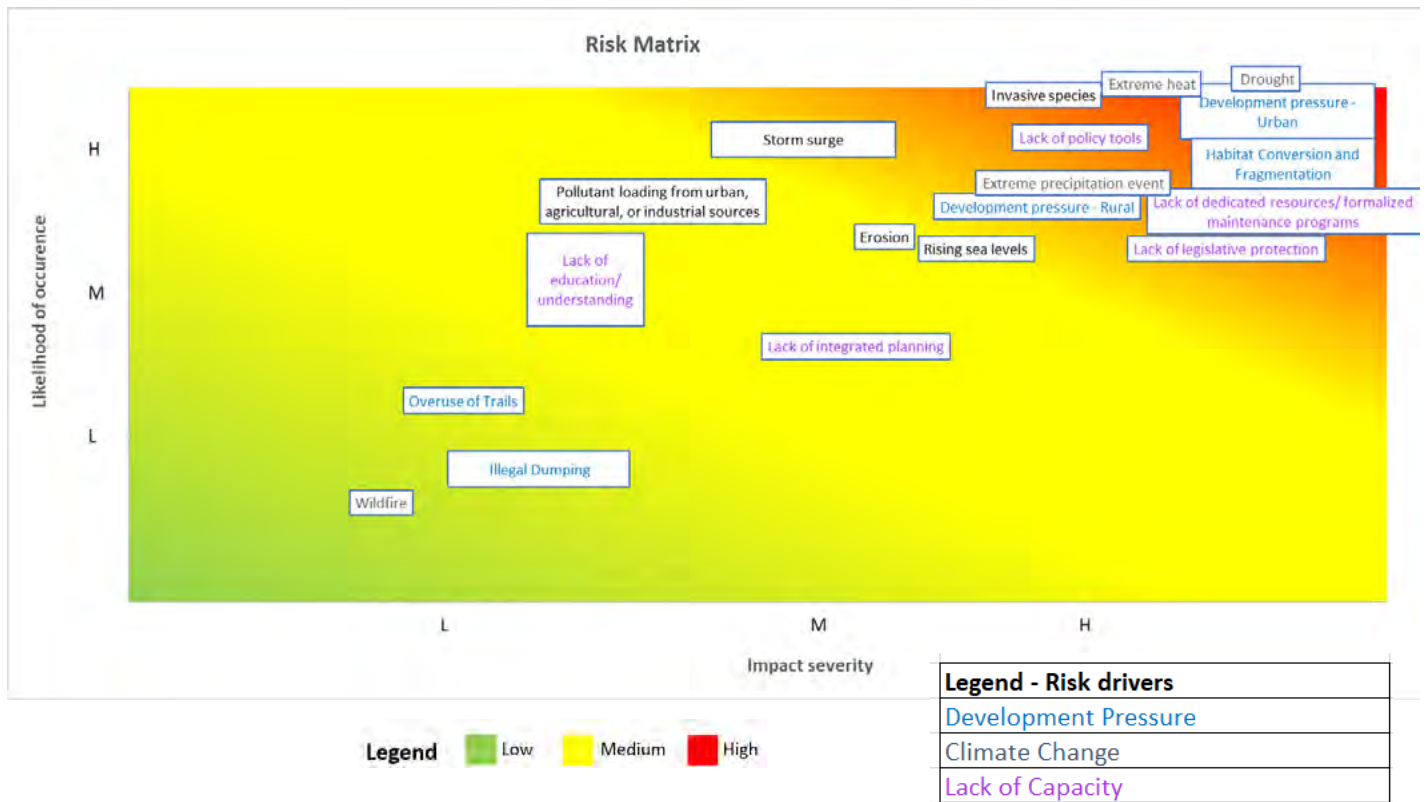


Figure 14: Results of Risk Identification Process

Table 11 lists and provides brief descriptions of typical risk mitigation strategies for consideration as part of the development of a natural asset management plan.

<b>Accept</b>	Risk may be acceptable if probability and consequences are small
<b>Minimize</b>	Risk under local government’s control that warrants exposure reduction
<b>Share</b>	Partners in a project permit the sharing of larger risks to reduce it for each
<b>Transfer</b>	Insurance, fixed price contracts, and other risk transfer tools

Table 11: Risk Mitigation Strategies

## 5.4 Priority Risks for the District of Saanich

The outcomes of the risk identification process highlight potential priorities (high risk score hazards) which the District of Saanich could focus its natural asset management efforts. Where possible, these are also informed by the condition assessment and mapped to show the distribution of risks across the District. These are:

- **Drought:** Droughts impact the native plants and animals, including Cedars and Grand Firs. Most impacted assets include watercourses and wetlands for their stormwater value. The climate projections indicate a 60% decrease in terms of snowpack, and this may impact the aquifer recharge zones. Mitigation measures include planting trees in the future that are better adaptive to changing weather.
- **Extreme heat:** Similar to drought, extreme heat impacts aquifers. The fish habitat is also impacted due to an increase in stream temperature. The management control includes ensuring adequate forest cover to manage the temperature in aquatic areas.
- **Invasive Species:** Invasive species can degrade wildlife habitat, displace native species, increase wildfire hazards, and impair terrestrial and aquatic ecological services. The District of Saanich administers an Invasive Species Management Strategy (Saanich, 2024).
- **Development Pressure:** Both urban and rural development primarily has an adverse impact on the health and current state of natural assets. Development policies play a major role in regulating and enabling the protection and conservation of predetermined areas and/or individual natural assets.
- **Habitat Fragmentation:** Habitat fragmentation may result in the destruction or degradation of ecosystems and lead to declines in municipal services, as well as co-benefits. The District's Urban Containment Boundary plays a key role in limiting habitat fragmentation and can be complemented by policies and by-laws to target areas of concern.
- **Extreme precipitation events:** Storm events can impact natural assets throughout the municipality such as compromising capacity of ecosystem services to deliver services. Climate change projections for the region (2024) identify increased frequency and intensity of winter storms, which will both impact natural assets, but also elevates the important role that natural assets play. Maintaining the land's absorptive capacity through retention of forest cover and restoration of floodplains and wetlands will help mitigate the impacts of major storm and flood events.
- **Lack of Legislated Protection:** The management actions are time constrained as bylaws may not apply to all areas (e.g., Agricultural Land Reserve), lack compliance and enforcement, or come into force too late. To advance the protection of natural assets, the District of Saanich

could explore, in addition to bylaw measures: partnerships to increase community support and access specialized skillsets and planning tools to ensure natural assets are considered at early development process stages.

- **Lack of Dedicated Resources/ Formalized Maintenance Programs:** The lack of dedicated resources can be caused by a range of factors, including internal competition for resources within a municipality, a lack of understanding or a lack of capacity.
- **Lack of policy tools:** A lack of policy tools can result from a lack of policy and legislative direction in the legislation governing local governments. As an example, many environmental protection regulations exist in European countries, whereas in the Canadian context, the development of these regulations falls under the local government within the restrictions of the Local Government Authority.







## 6.0 Preliminary Services and Performance Measures Identification

### 6.1 Overview

A unique characteristic of natural assets is that they provide a wide array of ecosystem services, including carbon sequestration, recreation, and flood control. Some of these ecosystem services contribute to a municipality's core infrastructure system and municipal service delivery, such as water and stormwater management. Other ecosystem services offer co-benefits to the community, such as pollination, carbon storage or air quality. Individual natural assets can provide this array of benefits simultaneously. For example, forests store carbon, improve air quality, support stormwater management, and provide recreation and public health co-benefits). Sometimes this is referred to as benefits stacking. Similarly, multiple natural asset types provide the same co-benefits to some degree (e.g. both wetlands and forests provide habitat, support stormwater management, and provide public health and recreation co-benefits). The value proposition of leveraging natural assets to provide community services at lower costs than built assets is in part driven by their ability to simultaneously provide a range of services.<sup>7</sup>

<sup>7</sup> See page 7 of *Nature is Infrastructure: How to Incorporate Natural Assets Into Asset Management Plans*.

Ecosystem services are defined as “the many and varied benefits to humans provided by the natural environment and from healthy ecosystems”.

This report includes a preliminary identification of the municipal services and co-benefits supported by natural assets, a preliminary identification of potential levels of service (LOS) for natural assets, including indicators and performance measures, and documentation of current levels of service where known. Performance measures will be finalized in Saanich’s Natural Asset Management Plan.

Levels of service (LOS) represent the service delivery commitments of a local government, inform asset management and financial plans, and help local governments prioritize capital and operational budgeting decisions. Defining LOS enables local governments to link strategic objectives with the technical and operational requirements for infrastructure. It enables local governments to make the best possible investments towards sustainable service delivery.

It is the responsibility of a local government’s council to approve and monitor progress on LOS. Doing so enables them to be transparent and accountable for their decisions about service delivery. When councils share information about LOS and associated costs with the public, other stakeholders, and rightsholders, they are better able to communicate the social, environmental, and financial impacts of changing service levels and engage the community on their “willingness to pay” for alterations in service levels.<sup>8</sup>

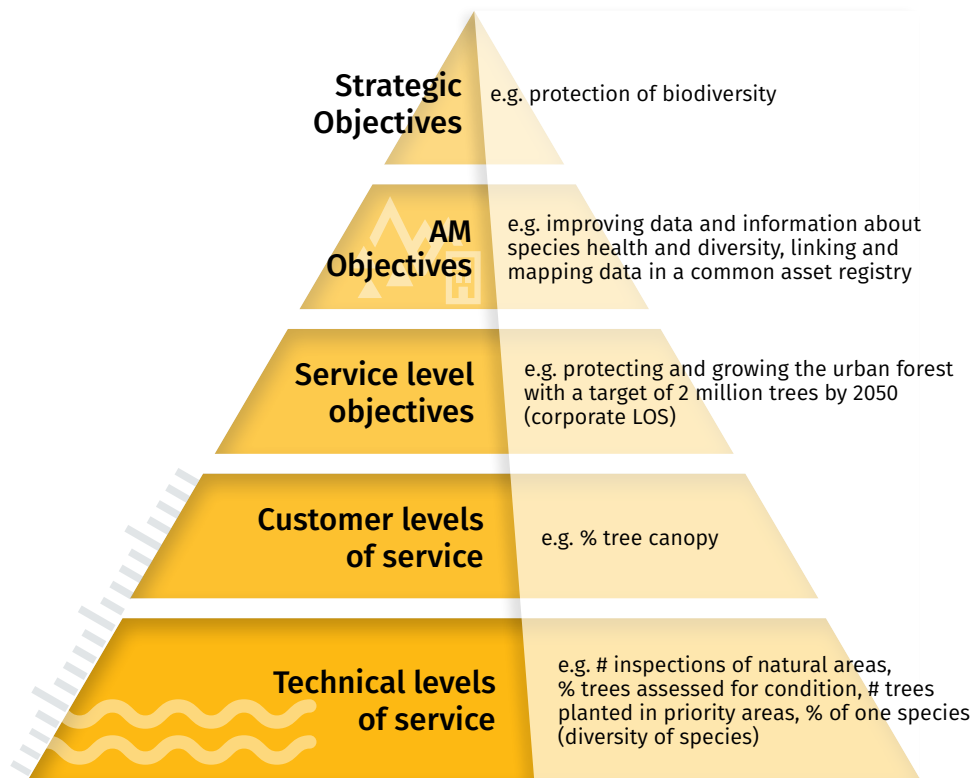
It should be noted that few local governments in Canada have developed levels of service for natural assets, and there are currently no standards for levels of service; however, there are emerging studies and strong examples in this sector to draw from.

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<sup>8</sup> From page 6 of *Developing Levels of Service for Natural Assets: A Guidebook for Local Governments*

## Levels of Service Hierarchy

The preliminary levels of service hierarchy is shown in Figure 15, and definitions are provided in the Glossary.



*Figure 15: Levels of Service Hierarchy*

(Source: NAI, *Developing Levels of Service for Natural Assets*, 2022)

## 6.2 Preliminary Identification of Services

### Strategic Objectives

As outlined in the *AM Strategy*, there is strategic alignment between Saanich's vision (see Figure 16) established in the *Official Community Plan (OCP)* and the goals of the AM Program. The OCP is the principal legislative tool for guiding future growth and change in the District of Saanich, and all other District plans and strategies must comply with the principles and policies of the OCP.



*Figure 16: Saanich Vision  
(Source: Official Community Plan 2024)*

The Official Community Plan identifies a number of focus areas, and includes objectives and policies for each. Table 12 shows the objectives that are related to natural assets. For the purposes of this report, these are the strategic objectives for natural asset management. Other District documents that relate to natural asset management are listed in [Annex A](#).

OCP Section	OCP Focus Area	OCP Objectives Related to Natural Assets
5	<b>Climate Change Response</b>	<p><b>A/</b> Transition Saanich to be a 100% renewable energy, zero carbon community by 2050 or before.</p> <p><b>B/</b> Incorporate adaptation strategies into land use, building and infrastructure planning and design, emergency response, natural areas management, and other services to create a more resilient community.</p>
6	<b>Natural Environment</b>	<p><b>A/</b> Incorporate and retain Saanich’s unique natural features, biodiversity, and ecosystem services.</p> <p><b>B/</b> Improve the health of watersheds and freshwater/marine shoreline habitat.</p> <p><b>C/</b> Enhance the urban forest and increase equitable access.</p> <p><b>D/</b> Recognize the vital importance of a healthy natural environment to supporting community health and well-being and climate resilience.</p> <p><b>E/</b> Support environmental stewardship, public education, awareness, and participation.</p> <p><b>F/</b> Enhance meaningful community connection with nature in ways that foster the well-being of both people and the natural environment.</p>



OCP Section	OCP Focus Area	OCP Objectives Related to Natural Assets
7	Land Use	<p><b>A/</b> Maintain the Urban Containment Boundary as the principal growth management tool to protect agricultural land, natural areas, and rural character while also supporting efficient service and infrastructure provision and climate resilient communities.</p> <p><b>B/</b> Plan for most new housing and employment growth to be accommodated in Primary Growth Areas.</p>
9	Transportation & Mobility	<p><b>A/</b> Integrate land use with transit and other forms of sustainable transportation.</p> <p><b>B/</b> Prioritize walking, cycling, public transit, and the movement of goods and services in transportation planning and implementation.</p>
10	Utilities & Service Infrastructure	<p><b>A/</b> Apply a coordinated sustainable service delivery approach to infrastructure.</p> <p><b>B/</b> Consider the latest climate projections in the design, upgrade, operations, and maintenance of new and existing infrastructure.</p> <p><b>C/</b> Integrate natural assets and ecosystem services into the District's broader approach to infrastructure management.</p>
11	Parks, Trails and Open Space	<p><b>A/</b> Provide residents with a range of safe parks, trails, open spaces, and recreational opportunities to support active living, health, well-being and community cohesion.</p> <p><b>B/</b> Work towards equitable and walkable access to parks and open spaces for all urban residents.</p> <p><b>C/</b> Protect, restore, and enhance natural areas, ecological function and biological diversity.</p>
12	Agriculture and Food Security	<p><b>A/</b> Protect agricultural land for farming by current and future generations.</p> <p><b>B/</b> Support access to a safe and nutritious food supply.</p> <p><b>C/</b> Create opportunities for local food production in both rural and urban areas.</p>
13	Community Well-being	<p><b>A/</b> Foster a diverse, equitable and inclusive community where all residents are engaged and feel a sense of belonging.</p> <p><b>B/</b> Provide a range of recreation, arts, and culture opportunities for people of all ages, cultural backgrounds, and abilities.</p> <p><b>C/</b> Recognize First Nations heritage and the community's colonial past as part of Saanich's path towards reconciliation.</p> <p><b>D/</b> Create a healthy, safe, and resilient community.</p> <p><b>E/</b> Incorporate heritage resources and values into planning and placemaking.</p>
14	Economic Vibrancy	<p><b>A/</b> Enhance economic vitality through sustainable, supportive community infrastructure.</p> <p><b>B/</b> Align economic development with a sustainable and equitable community.</p>

Table 12: Strategic Objectives Related to Natural Assets

## Preliminary Services and Service Delivery Objectives

The District of Saanich is responsible for the delivery of a wide range of services to the community, and delivery of these services is enabled by its physical assets, including engineered (i.e., built) and natural assets.

The Asset Management Strategy includes a summary of the municipal services that the District of Saanich provides to the community and the asset types supporting the delivery of each service (2023). Building on this work, Table 13 provides a preliminary identification of the District’s municipal services that are supported by natural assets. Note that drinking water supply is not included because this service is the responsibility of the Capital Regional District.

Municipal Services Supported by Natural Assets	Service Delivery Objectives for Natural Asset Management	Natural Asset Groups
<b>General Government Services</b>		
Provide a wide variety of general administrative, communications and legislative services, including but not limited to climate change mitigation and adaptation	Enhance agriculture and food security	Agriculture
	Leverage natural assets to support climate change mitigation and adaptation	Agriculture, Non-forested Area, Marine Shoreline, Riparian Area, Urban Forest, Waterbody and Watercourse, Wetland
<b>Parks, Recreation and Community Services</b>		
Protect, restore and enhance biodiversity, natural areas and the urban forest, as well as riparian areas, waterbodies and watercourses, and wetlands, which together provide a wide variety of stormwater management and ecosystem services	Protect, maintain, and enhance natural areas to support mental and physical health	Agriculture, Non-forested Areas, Marine Shoreline, Riparian Areas, Urban Forest, Waterbodies and Watercourses, Wetlands
	Protect, enhance, connect, and manage habitat for biodiversity conservation	
	Protect, enhance, and manage the Urban Forest	Urban Forest
<b>Stormwater Management Services</b>		
Manage stormwater to protect buildings and transportation network from flooding	Leverage natural assets to manage stormwater quantity and mitigate flood risk	Agriculture, Non-forested Areas, Marine Shoreline, Riparian Areas, Urban Forest, Waterbodies and Watercourses, Wetlands
Treat stormwater to protect the natural environment	Leverage natural assets to improve the quality of stormwater discharges	
<b>Transportation Services</b>		
Provide active transportation network	Provide boulevard trees for shading	Urban Forest

Table 13: Preliminary Services and Service Delivery Objectives

In addition to supporting municipal service provision, natural assets may also provide one or more co-benefits, such as:

- Air quality regulation
- Amenity and enjoyment
- Biological control (regulating pests/diseases)
- Food production
- Historical/heritage
- Indigenous values
- Pollination
- Provision of medicinal resources
- Provision of science and educational opportunities
- Soil retention and erosion control
- Tourism
- Urban heat island effect reduction

## 6.3 Preliminary Identification of Performance Measures

### LEGAL REQUIREMENTS

Legal requirements are the minimum levels of service that must be provided, and these are typically documented as a regulatory attribute of Technical Levels of Service. Legal requirements for natural assets in the District of Saanich include one or more of the following:

- **Federal**
  - Fisheries Act
  - Migratory Birds Convention Act (MBCA)
  - Species at Risk Act (SARA)
- **Provincial**
  - Community Charter
  - Ecological Reserves Act
    - Victoria Harbour Migratory Bird Sanctuary
    - 10 Mile Point Ecological Reserve
  - Environmental Management Act (EMA)
    - Spill Preparedness, Response and Recovery Regulation
    - Spill Contingency Planning Regulation
    - Spill Reporting Regulation
  - Fish Protection Act
    - Streamside Protection Regulation
  - Forest and Range Practices Act (FRPA)
  - Land Act
  - Local Government Act
  - Riparian Areas Protection Act (RAPA)

- Water Sustainability Act (WSA)
- Wildlife Act
- **Capital Regional District**
  - CRD Parks Regulation Bylaw No. 1
  - Core Area Liquid Waste Management Plan
- **District of Saanich**
  - Official Community Plan By-law 8940 (Dec 2023 Draft)
  - Streamside Development Permit Area (2008) (under review)
  - Floodplain Development Permit Area (2008)
  - Stormwater Development Permit
  - Watercourse and Drainage Bylaw (1996) (under review - 2024 Draft)
  - Bylaws (see [Annex A](#))
  - Council Policies (see [Annex A](#))

### PRELIMINARY COMMUNITY LEVELS OF SERVICE

Preliminary identification of Community LOS for the municipal services supported by the District of Saanich's natural assets are shown in Table 14, as examples for consideration. Further identification and documentation of Community LOS will be undertaken as part of the Natural Asset Management Plan project, including confirmation of the Community LOS to be tracked, identification of the current LOS, committed/desired LOS, LOS targets, LOS gaps, and strategies to address the gaps.

Service Delivery Objective	Service Characteristic	Indicators (Preliminary)	Performance Measures (Preliminary)	LOS (current)
<b>General Government Services</b>				
<b>Enhance agriculture and food security</b>	Capacity/availability	Food production opportunities	% of Saanich land area that is outside of the Urban Containment Boundary	51% <sup>9</sup>
<b>Leverage natural assets to support climate change mitigation and adaptation</b>	Sustainability	Climate change mitigation	% reduction of community-wide GHG emissions from 2007 baseline	2022: 16% <sup>10</sup>
	Sustainability	Climate change adaptation	% of households prepared for a seven-day emergency disaster event	2022: 42% <sup>11</sup>

<sup>9</sup> Source: District of Saanich, Official Community Plan (May 2024)

<sup>10</sup> Source: Saanich Climate Plan Annual Report Card 2023, District of Saanich (2024)

<sup>11</sup> Source: Annual Report 2022, District of Saanich (2023)



Service Delivery Objective	Service Characteristic	Indicators (Preliminary)	Performance Measures (Preliminary)	LOS (current)
<b>Parks, Recreation and Community Services</b>				
<b>Protect, maintain, and enhance natural areas to support mental and physical health</b>	Capacity/availability	Access to parks	% of residents who have access to a Saanich park within 0.5km (5-10 min walk)	2022: 97% <sup>12</sup>
			% of residents who have access to a Saanich park, regional park, or publicly accessible greenspace within 0.5km (5-10 min walk)	2022: 100% <sup>13</sup>
			# of residents who live in a location that meets the 3:30:300 principle <sup>14</sup>	TBD
<b>Protect, enhance, connect, and manage habitat for biodiversity conservation</b>	Quality	Protection of habitat	# of parks with natural areas that have stewardship programs (i.e. Pulling Together Program for removal of invasive species and ecological restoration)	2022: 45 <sup>15</sup>
			# of volunteers' hours for the Pulling Together Program per year	2022: 16,313+ <sup>16</sup>
			The total area (ha) within the District that is designated as protected for nature.	TBD
		% of the Biodiversity Habitat Network inside the urban containment boundary that is protected using a variety of tools.	TBD	
		Keystone wildlife species	Numbers of keystone wildlife species in District owned parks.	TBD
<b>Protect, enhance, and manage the Urban Forest</b>	Capacity/availability	Tree canopy cover	% of District land area with tree canopy cover (overall, by rural/urban and by neighbourhood).	43% <sup>17</sup>
	Capacity/availability	Natural forest cover	Total area (ha) of natural forest cover.	3,733 ha <sup>18</sup>
	Reliability	Citizen satisfaction	% awareness of UF service levels, and % satisfaction among those aware.	TBD

<sup>12</sup> *Ibid.*

<sup>13</sup> *Ibid.*

<sup>14</sup> *The OCP outlines the 3:30:300 Principle, which Council endorsed in 2021 as a guiding principle for urban forest management (i.e. everyone can see at least 3 trees from each home, have 30% tree canopy in the neighbourhood, and live within 300 m from a park or green space) (District of Saanich, 2024)*

<sup>15</sup> *Ibid.*

<sup>16</sup> *Ibid.*

<sup>17</sup> *Source: District of Saanich, State of Urban Forest Report (2013)*

<sup>18</sup> *District of Saanich (2023) State of the Urban Forest Report.*

Service Delivery Objective	Service Characteristic	Indicators (Preliminary)	Performance Measures (Preliminary)	LOS (current)
<b>Stormwater Management Services</b>				
Leverage natural assets to manage stormwater quantity and mitigate flood risk	Reliability	Protection from flooding	# community complaints related to stormwater flooding per year	TBD
			% permeable area (overall, by rural/urban and neighbourhood).	TBD
Leverage natural assets to improve the quality of stormwater discharges	Sustainability	Outfall discharge quality	Number of discharges per year with a high Public Health Concern Rating (i.e. exceeds contamination limits)	2022: 2 <sup>19</sup>
<b>Transportation Services</b>				
Provide boulevard trees for shading	Capacity/availability	Shading from boulevard trees	% Tree Canopy Cover along streets (overall and by street type)	TBD

Table 14: Preliminary Community Levels of Service

### PRELIMINARY TECHNICAL LEVELS OF SERVICE

Preliminary identification of Technical LOS for the municipal services supported by the District of Saanich's natural assets are shown in Table 15, as examples for consideration. Further identification of Technical LOS will be undertaken as part of the Natural Asset Management Plan project, including confirmation of the Technical LOS to be tracked, identification of the current LOS, committed/desired LOS, LOS targets, LOS gaps, and strategies to address the gaps.

The technical LOS measures below follow good practices related to emerging natural asset management work and most are being applied in a small number of communities that NAI has worked with to develop levels of service frameworks, including the City of Saskatoon, the Resort Municipality of Whistler, the Regional District of Nanaimo, the Town of Pelham, and Halifax Regional Municipality. Some Technical LOS relate to more than one Community LOS because natural assets support the delivery of more than one municipal service.

Technical LOS will be further refined over time as industry standards emerge.<sup>20</sup>

<sup>19</sup> Source: Core Area Stormwater Quality Program 2022 Report, Capital Regional District (2023)

<sup>20</sup> See NAI's guidance on developing natural asset management plans, which was developed through a participatory process with several local governments and industry leaders: [mnai.ca/nature-is-infrastructure-how-to-include-natural-assets-in-asset-management-plans/](https://mnai.ca/nature-is-infrastructure-how-to-include-natural-assets-in-asset-management-plans/)

Service Delivery Objective	Service Characteristic	Indicators (Preliminary)	Performance Measures (Preliminary)	LOS (current)
<b>General Government Services</b>				
<b>Enhance agriculture and food security</b>	Capacity/availability	Local food production	# of properties in ALR and A+ zoned lands claiming farm status	2022: 281 <sup>21</sup>
			% of citizens who have a vegetable garden or keep poultry	2022: 47% <sup>22</sup> vegetable, 0% poultry
			% of neighbourhoods (local areas) that have a community garden	25% (3 out of 12) <sup>23</sup>
<b>Leverage natural assets to support climate change mitigation and adaptation</b>	Sustainability	Climate change mitigation	# of trees planted per year (target is 10,000 trees per year)	2023: 3,035 trees planted (target is 10,000 trees per year) <sup>24</sup>
	Sustainability	Ecological Footprint	Global hectares (gha) per capita	6.1 gha per capita (2023 data) <sup>25</sup>



<sup>21</sup> Source: Annual Report 2022, District of Saanich (2023)

<sup>22</sup> Ibid.

<sup>23</sup> Ibid.

<sup>24</sup> Source: Saanich Climate Plan Annual Report Card 2023, District of Saanich (2024)

<sup>25</sup> Source: Official Community Plan, District of Saanich (2024); The ecological footprint is an estimate of how much biologically productive land and water area an individual or population needs to produce all the resources it consumes and to absorb the waste it generates. An average of 1.52 gha is available for each person on the planet (2021 data).

Service Delivery Objective	Service Characteristic	Indicators (Preliminary)	Performance Measures (Preliminary)	LOS (current)
<b>Parks, Recreation and Community Services</b>				
<b>Provide natural areas to support mental and physical health</b>	Capacity/availability	Access to parks	# ha of parkland per 1000 population	2022: 7.4 <sup>26</sup>
			% of Saanich parkland that is natural area	202: 62% <sup>27</sup>
<b>Protect, enhance, connect, and manage habitat for biodiversity conservation</b>	Capacity/availability	Pervious surfaces	Total area of pervious surfaces in the District using LiDAR and orthophoto analysis.	TBD
		Riparian area	Amount of natural riparian buffer (ha) along streams and wetlands.	TBD
	Quality	Invasive species	Total area of invasive plant infestations within protected parks.	TBD
		Physical condition	Number of Natural State Covenant areas within the District in Fair, Good or Very Good condition.	TBD
Protect, enhance, and manage the Urban Forest	Capacity/availability	Tree planting	Number of new (non-replacement) trees planted on public property	TBD
			Number of new (non-replacement) trees planted on private property	TBD
			Cover area (ha) of tree and shrubs on ALR lands and lands zoned for agriculture.	TBD
<b>Stormwater Management Services</b>				
<b>Leverage natural assets to manage stormwater quantity and mitigate flood risk</b>	Reliability	Protection from flooding	% of District of Saanich land area with pervious (and impervious) surface	Impervious surfaces = 15.8% of District's land area (inside UCB: 29.5%, outside UCB: 4.8%) <sup>28</sup>
			Volume (m <sup>3</sup> ) storage capacity of wetlands	TBD
<b>Leverage natural assets to improve the quality of stormwater discharges</b>	Regulatory	Ocean discharge quality	% compliance with regulatory requirements	100%

<sup>26</sup> Source: *The Canadian City Parks Report: Nurturing Relationships & Reciprocity 2022, ParksPeople (2022)*

<sup>27</sup> Source: *Annual Report 2022, District of Saanich (2023)*

<sup>28</sup> Source: *State of Biodiversity Report, District of Saanich (2023)*



Service Delivery Objective	Service Characteristic	Indicators (Preliminary)	Performance Measures (Preliminary)	LOS (current)
<b>Stormwater Management Services</b>				
<b>Leverage natural assets to manage stormwater quantity and mitigate flood risk</b>	Reliability	Protection from flooding	% of District of Saanich land area with pervious (and impervious) surface	Impervious surfaces = 15.8% of District's land area (inside UCB: 29.5%, outside UCB: 4.8%) <sup>29</sup>
			Volume (m <sup>3</sup> ) storage capacity of wetlands	TBD
<b>Leverage natural assets to improve the quality of stormwater discharges</b>	Regulatory	Ocean discharge quality	% compliance with regulatory requirements	100%
<b>Transportation Services</b>				
<b>Provide boulevard trees for shading</b>	Capacity/availability	Shading from boulevard trees	% of available space on boulevards occupied by boulevard trees	TBD
			# of boulevard trees planted per year	TBD

Table 15: Preliminary Technical Levels of Service



<sup>29</sup> Source: State of Biodiversity Report, District of Saanich (2023)



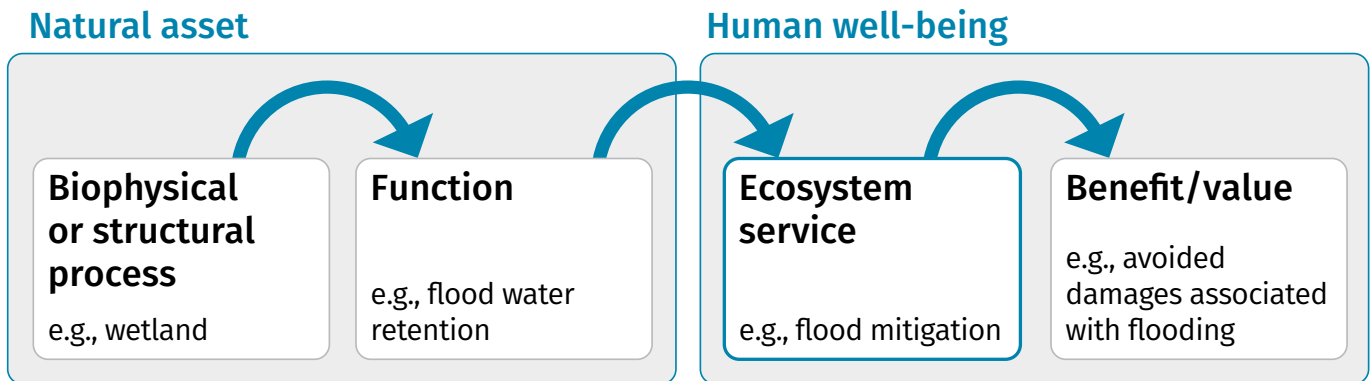
## 7.0 Preliminary Valuation

### 7.1 Valuation of Natural Assets

This project included a high-level preliminary valuation of natural asset services. Estimating a value for ecosystem services can be challenging because direct measurement tools are frequently lacking. Many natural asset service values are not reducible to a market value, which complicates their consideration in decision making. Without metrics that can be used to indicate changes in the quantity or quality of services, natural assets can be taken for granted and overused. For example, the level of service indicators many municipalities use to evaluate if engineered infrastructure is meeting the service needs of a community are typically developed with the assumption that nature will continue to provide its current levels of service in the background. When an asset is taken for granted, it is easy to manage poorly, which can lead to a decline in service provision to the detriment of communities. Understanding the value of natural assets is essential in making strategic asset management decisions.



Fortunately, over the last 40 years, economists have devised techniques to systematically link functioning ecosystems with human well-being to estimate the economic value of ecological services (see Figure 17). Although all recognize the linkages are a simplification of reality and consequently the need for further research and refinement, their studies have provided a conceptual framework for valuing nature and its related (ecosystem) goods and services. These methods are useful when trying to decide how to make the best decision about a proposed management action that could impact natural assets, or when considering whether it makes economic sense to replace or upgrade aging engineered infrastructure with natural infrastructure.



*Figure 17: Illustration of the Linkages Between a Natural Asset, the Ecosystem Services Provided and the Benefits and Values that Flow to End Users*

[Source: CSA 2023]

Economists have developed several techniques for putting dollar values on the non-market goods and services provided by ecosystems. These can be grouped into three broad categories: **1/** direct market valuation approaches; **2/** revealed preference approaches; and **3/** stated preference approaches. These are described in Table 16.

- Direct market valuation methods derive estimates of ecosystem goods and services from related market data.
- Revealed preference methods estimate economic values for ecosystem goods and services that directly affect the market prices of some related goods.
- Stated preference methods obtain economic values by asking people to make trade-offs among sets of ecosystem or environmental services or characteristics.

Valuation Method	Description
<b>DIRECT MARKET VALUATION APPROACHES</b>	
<b>Market prices</b>	Assigns value equal to the total market revenue of goods /services.
<b>Replacement cost</b>	Services can be replaced with man-made systems; for example, waste treatment provided by wetlands can be replaced with costly built treatment systems.
<b>Avoided cost</b>	Services allow society to avoid costs that would have been incurred in the absence of those services; for example, storm protection provided by barrier islands avoids property damages along the coast.
<b>Production approaches</b>	Services provide for the enhancement of incomes; for example, water quality improvements increase commercial fisheries catch and therefore fishing incomes.
<b>REVEALED PREFERENCE APPROACHES</b>	
<b>Opportunity cost</b>	Value of the next best alternative use of resources; for example, travel time is an opportunity cost of travel because this time cannot be spent on other pursuits. The travel cost method is a well-accepted application of the opportunity cost approach.
<b>Travel cost</b>	Service demand may require travel, which have costs that can reflect the implied value of the service; recreation areas can be valued at least by what visitors are willing to pay to travel to it, including the imputed value of their time.
<b>Hedonic pricing</b>	Service demand may be reflected in the prices people will pay for associated goods; for example, housing prices along the coastline tend to exceed the prices of inland homes.
<b>STATED PREFERENCE APPROACHES</b>	
<b>Contingent valuation</b>	Service demand may be elicited by posing hypothetical scenarios that involve some valuation of alternatives; for instance, people generally state that they are willing to pay for increased preservation of beaches and shoreline.
<b>Contingent choice</b>	Similar to contingent valuation, service demand is elicited by posing hypothetical alternatives. This approach does not ask people to state their values directly, but instead infers values based upon trade-offs people are willing to accept.

*Table 16: Accepted Primary Valuation Methods Used to Value Non-Market Ecosystem Services*

The purpose of undertaking valuation of natural assets is to provide information to support decision making, for example:

- **Communication** - Communicate the importance of natural assets to Council and the public.
- **Education** - Provide information to Council to inform decision-making.
- **Funding** - Support grant applications.
- **Policy Development** - Provide information to support policies to protect natural assets.
- **Land Use Decisions** - Inform decisions on land conservation and natural area protection in the land use planning.



- **Development Permits** - Inform decisions on development permits by communicating the service value per hectare gained from natural assets.
- **Design Projects** - Use service values of a natural asset to inform decision making during capital project design phase (i.e., support cost-benefit analysis of natural assets vs engineered assets).

Natural assets were valued from two perspectives:

- 1/ **Annual Service Value (\$/year)** - The annual economic value that the community gains from natural assets as measured by changes in human well-being (i.e., the benefit outcome of services supported by natural assets). Annual Service Value is typically an underestimate because it is not possible to determine the value of all services provided by a natural asset. Table 14 provides an overview of services for valuation. Services valued are in italics.
- 2/ **Replacement Value (\$)** - The economic value of natural assets that represents the cost of replacing the levels of service provided by natural assets with engineered infrastructure or the cost of rehabilitating natural assets to their optimal natural functioning. Here, we've used the latter approach, utilizing existing studies to estimate restoration costs for various land and water classes. This approach avoided the need for detailed modelling to determine the capacity needs of replacement infrastructure. Considerations include:
  - Natural assets provide a range of services. As such, there is increased value from conserving and restoring natural assets as replacement typically does not provide full value compared to the undisturbed natural state.
  - Replacing the levels of service provided by natural assets can take a long time compared to what was delivered prior to the damage or loss.
  - While built assets depreciate over time, if properly managed, natural assets can maintain their value in perpetuity.
  - It is not always possible to completely replace a natural asset's structure, processes, and functionality, and therefore the services provided by those assets. For example, in some cases constructed wetlands may not deliver the same levels of service as natural occurring wetlands.

While significant progress has been made to recognize natural assets in private accounting standards (e.g., the Natural Capital Protocol, the Taskforce on Nature-Related Disclosures) and national accounting standards (e.g., the System of Environmental-Economic Accounts), there is growing guidance at the public sphere as well. This includes for example:

- Public Sector Accounting Board, Financial Reporting & Assurance Standards (FRAS) Canada
- Global Reporting Initiative (GRI)
- International Public Sector Accounting Standards Board (IPSASB)

## 7.2 Benefit Transfer

Ideally, a valuation of services should involve detailed ecological and economic studies of each ecosystem of interest for each land cover type, utilizing one or more of the above valuation techniques. Unfortunately, undertaking such studies is expensive and time consuming. Therefore, a different approach - the benefit transfer method can be used to indicate an order-of-magnitude values for a range of services to prioritize natural asset management activities.

For the purposes of this project, the preliminary valuation uses the benefit transfer method, where the economic valuation of services from another location are transferred to the target location. This approach can provide defensible, order-of-magnitude estimates when the geography, demographics and policy context between sites are very similar. Ecosystem values were derived from nine peer-reviewed natural capital valuations<sup>30</sup> targeted to Canadian geographies and therefore, provides credible values. Table 17 summarizes primary valuation methods used for non-market ecosystems services.

To calculate total benefits, the following steps were completed: **(1)** annual per hectare values of the identified services were converted to 2023 CAD values using the Bank of Canada's Inflation Calculator<sup>31</sup>; **(2)** multiplied by the total area of the land class; and **(3)** totalled for the region. Values are provided in ranges to recognize differences resulting from the use of varying methodologies and geographies. Results are provided as both total values/year and value per hectare/year.

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<sup>30</sup> Note: The West Vancouver valuation was not included due to lack of data to for benefit transfer.

<sup>31</sup> [www.bankofcanada.ca/rates/related/inflation-calculator/](http://www.bankofcanada.ca/rates/related/inflation-calculator/)

Studies Reviewed	C Seq	M & P	Hab	SWM Qu	AQR	P&D	FP	P	SR & EC	R
Natural Capital: The Economic Value of the National Commission's Green Network (2016)	X		X	X	X	X	X	X	X	X
City of Saskatoon: Natural Capital Asset Valuation: Pilot Project (2020)	X	X	X	X	X	X	X	X		
City of Calgary: Determining the value of natural assets report (2021)	X		X	X						X
Credit Valley Conservation: Estimating the Value of Natural Capital in the Credit River Watershed (2009)	X		X	X						X
Greenbelt: Ontario's Good Fortune: Appreciating the Greenbelt's Natural Capital (2016)				X						X
Howe Sound (2014)	X		X	X	X		X			X
Lower Mainland Nat Cap (2010)	X			X	X		X	X		X
Grindstone (2022)	X		X	X	X				X	X
Ecosystem Service Values of the City of Toronto Ravine System (2017)	X	X	X		X		X			X

Table 17: Studies Referenced for Natural Asset Valuation

### 7.3 Preliminary Services Identification

A workshop was held with District staff to identify municipal services and co-benefits to consider for the valuation. These were divided between 'Municipal Services', which the District has responsibility for providing and 'Co-benefits' which do not fall within the District responsibilities, but which are deemed of importance to the community. Table 18 provides an overview of the results of the workshop. It must be emphasized that these identified services represent only a small subset of actually provided by nature.

District of Saanich Service Type	Service	Services Included in Preliminary Valuation	Services Identified for Future Valuation
<b>MUNICIPAL SERVICES</b>			
<b>Climate Change Mitigation and Adaptation</b> (General Government Services)	Carbon sequestration		
	Climate change adaptation		Identified for Future Valuation
<b>Protect, restore and enhance natural assets</b> (Parks Services)	Mental and physical health	Included in Preliminary Valuation	
	Habitat for biodiversity conservation	Included in Preliminary Valuation	
<b>Stormwater Management Services</b>	Stormwater quantity regulation	Included in Preliminary Valuation	
	Stormwater quality management		Identified for Future Valuation
<b>Transportation Services</b>	Shading		Identified for Future Valuation
<b>Water Services</b>	Water supply	Not included because service is provided by CRD	
<b>CO-BENEFITS</b>			
	Air quality regulation	Included in Preliminary Valuation	
	Amenity and enjoyment		Identified for Future Valuation
	Biological control (regulation of pests and disease)	Included in Preliminary Valuation	
	Food production	Included in Preliminary Valuation	
	Historical / heritage		Identified for Future Valuation
	Indigenous values		Identified for Future Valuation
	Pollination	Included in Preliminary Valuation	
	Soil retention and erosion control	Included in Preliminary Valuation	
	Provision of medicinal resources		Identified for Future Valuation
	Tourism		Identified for Future Valuation
	Urban heat island effect reduction		Identified for Future Valuation
	Provision of science and educational opportunities		Identified for Future Valuation

Table 18: Services Identified for Future Valuation



## MUNICIPAL SERVICES

### Carbon Sequestration

BC residents face multiple challenges related to climate change such as increased frequencies of flooding, wildfires, and drought (BC Auditor General, 2018). Forests, wetlands, non-forest assets, riparian areas, wetlands, and agricultural lands within Saanich mitigate climate change impacts by sequestering and storing greenhouse gases. The mitigation of climate change is likely to have a wide range of benefits and avoided impacts to humans and biodiversity.

Carbon storage values are not annual values. They are values at a point in time, dependent on the volume of carbon storage accumulated over time. Once ecosystems are disturbed, decades and centuries of stored carbon are released into the atmosphere. This calculation is rarely assessed since the period an ecosystem has remained undisturbed is rarely known.

Table 19 provides a summary of carbon sequestration benefits from natural assets in the project area. The high end of the value range represents studies that utilized Canada's Carbon Budget Model, whereas the low end of the range is drawn from benefit transfer analysis that utilized Canadian studies.

Natural Asset Grouping	Area (hectares)	Range of reported values (\$/ha/year) (\$ 2023 )	Range of Annual Service Value (rounded to million \$/year) (\$ 2023)
Agriculture	910	\$111 - \$723	\$0.1 - \$0.7
Non-forested area	478	\$91 - \$800	\$0.04 - \$0.4
Riparian	207	\$1,288	\$0.3
Urban Forest	3,481	\$271 - \$1,445	\$0.9 - \$5.0
Wetland	239	\$137 - \$1,432	\$0.03 - \$0.3
<b>TOTAL</b>			<b>\$1.4 - \$6.7</b>

Table 19: Carbon Sequestration Annual Service Values

### Mental & Physical Health

The natural environment provides health benefits including shade as a protective measure against extreme heat events (Aram, 2019), and opportunities for regular physical activity that lead to a reduced risk of obesity, coronary heart disease, diabetes, some cancers, mental illness (Capaldi et al, 2015), and mortality (White et al, 2016). Exposure to the natural environment can lower the pulse rates, reduce cortisol levels, and improve immune functioning (Capaldi, 2015). It also improves the air quality which decreases the chances of respiratory illnesses (Haq, 2011). This connection between people and nature is also important for everyday enjoyment and work productivity (2011). Estimated values of the mental and physical health benefits associated with time spent in nature often rely upon the avoided health care costs resulting from inactivity and mental illness and the foregone GDP due to ill health. Studies that used

this approach were chosen for the preliminary valuation. This project followed the approach to estimate the percentage of the population spending the recommended time in nature (i.e., 150 minutes per week) in Table 20. That is, 50% of the population aged 15-69 years old.

While time in any natural ecosystem is beneficial, only those ecosystems that have supporting studies are represented here. Total values for natural asset groupings were determined according to the percentage of natural assets represented within the Mental and Physical Health Municipal Service.

Natural Asset Grouping	50% of population 15 – 69 years	Range of reported values (\$/person/year) (\$ 2023 )	Total Value (\$/year) (\$ 2023)
Marine Shoreline	41,625	\$346 - \$1,239	\$1.8 - \$6.8
Non-forested area			\$1.3 - \$4.7
Urban Forest			\$9.2 - \$34.3
Waterbody & watercourse			\$1 - \$3.6
Wetland			\$0.7 - \$2.6
<b>Total rounded to nearest million (\$/year)</b>		<b>\$14 - \$52</b>	

*Table 20: Mental & Physical Health Annual Service Values*

### Habitat for Biodiversity Conservation

Natural assets within the District of Saanich provide habitat for plants, animals, birds, and reptiles. The diversity of land cover enhances the biodiversity of the project area. Narrowly speaking, biodiversity is not generally considered an ecosystem service. However, without biodiversity there are no ecosystem services at all.

Furthermore, biodiversity is also inseparable from concepts such as healthy, diverse, and connected land cover. This can be seen as an asset value to the extent that individuals place value on the preservation of species and habitat. Estimating these values requires complex surveys to measure willingness to pay for habitat preservation. Since such values have not been measured for the District, research from other areas was used as a proxy. Of relevance, the City of Calgary study utilized a meta-analysis for more than 90 studies, which have here been included in the value range for urban forests, wetlands, and non-forested areas.

Average habitat preservation values were estimated on a per hectare per year basis. Applying these average values to the area of natural assets in the District provides an indication of the value of services they generate. Table 21 summarizes these values by asset class in 2024 CAD.

Natural Asset Grouping	Area (hectares)	Range of reported values (\$/ha/year) (\$ 2023 )	Range of Annual Service Value (rounded to million \$/year) (\$ 2023)
<b>Agriculture</b>	910	\$6 - \$3,081	\$0.005 - \$2.8
<b>Non-forested area</b>	478	\$6 - \$3,081	\$0.003 - \$1.5
<b>Riparian</b>	207	\$37 - \$169	\$0.008 - \$0.03
<b>Urban Forest</b>	3,481	\$234 - \$3,313	\$0.8 - \$11.5
<b>Waterbody &amp; watercourse</b>	359.95	\$9.59 - \$1,207.76	\$0.004 - \$0.4
<b>Wetland</b>	239	\$111 - \$34,487	\$0.03 - \$8.2
<b>TOTAL</b>			<b>\$0.9 - \$24.5</b>

*Table 21: Habitat for Biodiversity Conservation Annual Service Values*

### Stormwater Quantity Regulation

Natural assets support stormwater quantity regulation. For example, forests and wetlands intercept precipitation and impact the volume and timing of runoff and storage in surface and groundwater sources (Calder et al, 2007 & Dudley, 2003). After a rainstorm occurs, several processes affect the amount and timing of water entering watercourses. Precipitation can either be intercepted by trees (and later evaporate) or reach the ground, where it will either generate fast surface runoff or infiltrate into the groundwater and later contribute to slow, shallow subsurface flow into watercourses. For pervious areas, runoff typically only occurs if the ground has poor infiltration potential (e.g., clay) or when the soil is saturated. Generally, the less precipitation intercepted by forest, and the larger the impervious area contributing to fast runoff, the higher the peak streamflow in receiving streams. Climate projections for the Capital Region indicate an increase in the number and intensity of winter storms, potentially contributing to flooding (Saanich, 2020).

Detailed hydrological and hydraulic modelling is often used to value the contribution of natural assets to water quality management. Lacking such modelling, ranges associated with studies that measured the value of natural assets for disturbance regulation – primarily flood mitigation – were identified for transferring to the District of Saanich. The results are in-line with the District’s Urban Forest Strategy that estimated the value forests for stormwater quality regulation to range between \$26,661.78 - \$1,368,000,510.46 using the i-Tree model. Table 22 provides a summary of these values by natural asset grouping.

Natural Asset Grouping	Area (hectares)	Range of reported values (\$/ha/year) (\$ 2023 )	Total Value (rounded to million \$/year) (\$ 2023)
Non-forested area	478	\$8 - \$700	\$0.004 - \$0.3
Riparian	207	\$32 - \$996	\$0.007 - \$0.2
Urban Forest	3,481	\$720 - \$6,201	\$2.5 - \$21.6
Wetland	239	\$1,268 - \$25,602	\$0.3 - \$6.1
<b>Total</b>			<b>\$2.8 - \$28.2</b>

Table 22: Stormwater Quantity Regulation Annual Service Values (\$2023)

## CO-BENEFITS

### Air Quality Regulation

The District of Saanich's natural assets play a role in regulating atmospheric gases and providing clean air. The increase in wildfire events – now the second largest source of fine particulate matter – can impact air quality and human health (BC, 2024). Specifically, trees and vegetation regulate gases and improve air quality by collecting particulate matter on the surface area of leaves and absorbing gaseous pollutants into leaves. Improved air quality benefits the surrounding population, for example through fewer visits to the hospital for respiratory and other illnesses (Nowak et al, 2018). This service value is often based on avoided healthcare costs resulting from the ability of natural assets to filter gases and particulate matter from the air. The results coincide with Saanich's Urban Forest Strategy that estimated the value of forests for clean air at \$42,916.41 - \$2,831,508.78 using the i-Tree model. Table 23 summarizes the annual service values for air quality regulation.

Natural Asset Grouping	Area (hectares)	Range of reported values (\$/ha/year) (\$ 2023 )	Total Value (\$/year) (\$ 2023)
Non-forested area	478	\$19 - \$29	\$0.009 - \$0.01
Urban Forest	3,481	\$232 - \$813	\$0.8 - \$2.8
Waterbody & watercourse	360	\$814	\$0.3
Wetland	239	\$232 - \$813	\$0.06 - \$0.2
<b>Total</b>			<b>\$1.2 - \$3.3</b>

Table 23: Air Quality Regulation Annual Service Values

### Biological Control

Forests, meadows, and shrubland can provide biological control through the prevention of plant diseases and the insect pests. The level of biodiversity influences the presence of natural enemies, who perform biological control. In addition, pest control protects agricultural crops from being destroyed from pests and promotes the sustainability of the sector. Values are here attributed to the habitats of native species that are essential for biological control



(see Table 24). Two studies reviewed provided estimates for biological control, both of which utilized a 2008 study that estimated the annual cost to replace pest control provided by birds with chemical pesticides or genetic engineering (Wilson, 2008).

Natural Asset Grouping	Area (hectares)	Range of reported values (\$/ha/year) (\$ 2023 )	Total Value (rounded to million \$/year) (\$ 2023)
<b>Non-forested area</b>	478	\$12- \$61	\$0.006 - \$0.03
<b>Urban Forest</b>	3,481	\$12 - \$52	\$0.04 - \$0.2
<b>Total</b>			<b>\$0.05 - \$0.2</b>

Table 24: Biological Control Annual Service Values

### Food production

Food production is dependent upon healthy natural assets – particularly upon healthy soils. The non-market values of food production are represented here. The studies reviewed for this assessment reported on the benefits of urban agriculture and community gardens to participants (i.e., improved access to food, better nutrition, increased physical activity, improved community cohesion), and the estimated market value of urban agriculture. Annual service value of food production is summarized in Table 25.

Natural Asset Grouping	Area (hectares)	Range of reported values (\$/ha/year) (\$ 2023 )	Total Value (rounded to million \$/year) (\$ 2023)
<b>Agriculture</b>	910	\$155- \$1,133	\$0.1 - \$1.0
<b>Marine Shoreline</b>	700	\$1	\$0.0007
<b>Non-forested area</b>	478	\$8 - \$491	\$0.004 - \$0.2
<b>Total</b>			<b>\$0.1 - \$1.3</b>

Table 25: Food Production Annual Service Values

### Pollination

Approximately one in every three bites of food you eat is supported by pollinators for ensuring crop quality and yield (University of California, 2006). Birds, bats, bees, butterflies, insects, and other small mammals provide pollination services that are essential for the growth of fruits, nuts, vegetables, seeds, and grains. Across Canada, the total value of honeybees for crop production has been estimated at over \$2 billion annually (Canadian Honey Council, 2024). In the absence of pollinators, agricultural yields are significantly lower. The protection of natural assets within and adjacent to agricultural lands is therefore a key agricultural best management practice.

Natural Asset Grouping	Area (hectares)	Range of reported values (\$/ha/year) (\$ 2023 )	Total Value (rounded to million \$/year) (\$ 2023)
<b>Agriculture</b>	910	\$98	\$0.09
<b>Non-forested area</b>	478	\$66 - \$1,669	\$0.03 - \$0.8
<b>Urban Forest</b>	3,481	\$38 - \$1,669	\$0.1 - \$5.8
<b>Total</b>			<b>\$0.3 - \$6.7</b>

Table 26: Pollination Annual Service Values

### Soil retention & erosion control

Natural assets play an important role in the formation, protection, and decontamination of soils and sediments. This includes sediment retention and erosion control, soil formation and maintenance of soil structure, decomposition, and nutrient cycling. The studies reviewed for this project estimated average erosion control values on a per hectare, per year basis. Applying these average values to the District of Saanich provides an indication of the erosion control services generated; annual service values are summarized in Table 27.

Natural Asset Grouping	Area (hectares)	Range of reported values (\$/ha/year) (\$ 2023 )	Total Value (\$/year) (\$ 2023)
<b>Agriculture</b>	910	\$95 - \$131	\$0.09 - \$0.1
<b>Non-forested area</b>	478	\$95 - \$3,082	\$0.05 - \$1.5
<b>Riparian</b>	207	\$134	\$0.03
<b>Urban Forest</b>	3,481	\$169 - \$260	\$0.6 - \$0.90
<b>Total</b>			<b>\$0.7 - \$2.5</b>

Table 27: Soil Retention and Erosion Control Annual Service Values

## 7.4 Annual Service Value Summary

The preliminary valuation demonstrates that natural assets provide approximately **\$21.4 - \$125 million** in public benefits annually from the listed services (see Table 28). Together, these service values provide a composite figure that can be considered as a minimum service value, as this is only a small subset of the many services nature provides.<sup>32</sup> This composite figure can support and inform decision-making; however, it is only part of a broader understanding of what is meant by nature's "value". Furthermore, only a portion of the many services provided by the ecosystems of Saanich are estimated here.

<sup>32</sup> It is also important to recognize these findings in terms of minimum service value because, unlike engineered assets that depreciate and decay, natural assets are often adaptable, providing services that become more valuable over time within a changing climate.

The results present a range, which is common in the benefit transfer literature. For example, the study that brought the valuation of nature-based services to prominence reported on 17 ecosystem services across 16 biomes that were valued in the range of US\$16–54 trillion per year in 1997 dollars (Costanza et al, 2018). In fact, several of the source studies used to arrive at service estimates provide value estimate ranges (e.g., the Natural Capital Commission’s *The Economic Value of the National Capital Commission’s Green Network Report*) estimates the economic value of all natural and cultivated green space ranges from a low of \$188 million to a high of \$829 million (\$2016). Notwithstanding the lack of precision, the estimates provide valuable insight into the magnitude of ecosystem values and can help guide natural asset management decisions.

Physical and mental health, stormwater quality regulation and habitat for biodiversity conservation ranked amongst the highest-valued services assessed. In terms of natural asset classes, urban forests are of heightened importance, followed by wetlands. This finding reflects the state of research (i.e., forests and wetlands are the most common asset group valued) and the need for additional primary studies. Table 29 below provides results by natural asset group.

Service	Low value (\$ 2023)	High value (\$ 2023)
<b>MUNICIPAL SERVICES</b>		
Carbon Sequestration	\$1.4	\$6.7
Physical & Mental Health	\$14	\$52
Habitat for Biodiversity Conservation	\$0.9	\$24.5
Stormwater Quantity Regulation	\$2.8	\$28.2
<b>CO-BENEFITS</b>		
Air Quality Regulation	\$1.2	\$3.3
Biological Control	\$0.05	\$0.2
Food Production	\$0.1	\$1.3
Pollination	\$0.3	\$6.7
Soil Retention and Erosion Control	\$0.7	\$2.5
<b>TOTAL</b> rounded to nearest million (\$/year)	<b>\$21</b>	<b>\$125</b>

*Table 28: Preliminary Annual Service Value Results by Service (2023 CAD \$/year in millions)*

Natural asset group	Low value (\$ 2023)	High value (\$ 2023)
<b>Agriculture</b>	\$0.4	\$4.7
<b>Non-Forested Area</b>	\$1.4	\$9.4
<b>Marine Shoreline</b>	\$1.8	\$7
<b>Riparian Area</b>	\$0.3	\$0.5
<b>Urban Forest</b>	\$15	\$82
<b>Waterbody &amp; Watercourse</b>	\$1.3	\$4.3
<b>Wetland</b>	\$1.1	\$17.4
<b>TOTAL</b> rounded to nearest million (\$/year)	<b>\$21</b>	<b>\$125</b>

*Table 29: Preliminary Annual Service Value Results by Natural Asset Group (2023 CAD \$/year in millions)  
Note: Total values little lower due to rounding*

## 7.5 Replacement Value

Replacement values were estimated for several natural asset groups where there was available data. Replacement values can provide an important component of lifecycle costing and can be based upon the cost to replicate the services of nature with engineered alternatives or the cost to restore natural asset processes and functions. The latter approach is used here, which reflects the preliminary values and should be viewed to reflect order-of-magnitude estimates. Replacement value can demonstrate, for example, what a full-scale restoration project might entail should a natural system require it. Replacement values must be used carefully, as most natural assets cannot be “replaced” in any conventional sense, and certain benefits are ultimately irreplaceable. Three studies were used to provide replacement value ranges. This included:

- Credit Valley Conservation (2009), Estimating the Value of Natural Capital in the Credit River Watershed.
- City of Calgary (2021), Determining the value of natural assets report.
- City of Edmonton (2021), Urban Forest Asset Management Plan.

The reported values in the above studies were based upon literature reviews, which were then refined for the study area through engaging municipal staff and contractors. Reviewed studies assessed identified activities to secure, create or establish natural assets, including:

- Site preparation
- Replanting
- Vegetation establishment
- Basic Maintenance (e.g., watering and mulching)

Table 30 describes the replacement values by natural asset group.



Natural Asset Group	Natural Asset Sub-group	Area (ha)	Unit Cost (\$/ha) (\$2023)	Replacement Value (rounded to million \$) (\$2023)
<b>Agriculture</b>				Future assessment
<b>Marine Shoreline</b>	Coastal Bluff			Future assessment
	Coastal Sands			Future assessment
	Ocean			Future assessment
<b>Non-forested Area</b>	Shrub	255	\$15,575 - \$87,885	\$4 - \$95
	Herbaceous / Meadow	223	\$16,005 - \$630,228	\$4 - \$141
<b>Riparian</b>				Future assessment
<b>Urban Forest</b>	Natural Forest	3,481	\$6,860 - \$330,279	\$24 - \$1,150
	Individual Trees	377,172 trees	\$2,223 - \$17,056	\$838 - \$6,433
<b>Waterbody &amp; Watercourse</b>		360	\$883,383 - \$1,929,090	\$318 - \$694
<b>Wetland</b>	Wetland	239	\$123,473 - \$983,832	\$30 - \$235
<b>Total</b>				<b>\$1,218 - \$8,748</b>

*Table 30: Replacement Value (2023 CAD \$ in millions)*

The preliminary valuation demonstrates that natural assets have a replacement value of **\$1.2 - \$8.7 billion** (see Table 30). This value represents the cost to replace natural assets through rehabilitation. The resulting value is presented as a broad range — \$1 - \$9 billion — reflecting restoration activities are site specific and vary with location, the condition of natural assets, the restoration activities included in the estimate and the desired replacement characteristics. For example, tree replacement costs provided by the City of Calgary vary with tree size or maturity and include estimates for planting, maintenance, and watering. The City of Edmonton's estimates include the removal of the old tree, in addition to planting and watering costs.

Figure 18 (below) represents the annual replacement values derived from natural assets in the District of Saanich.

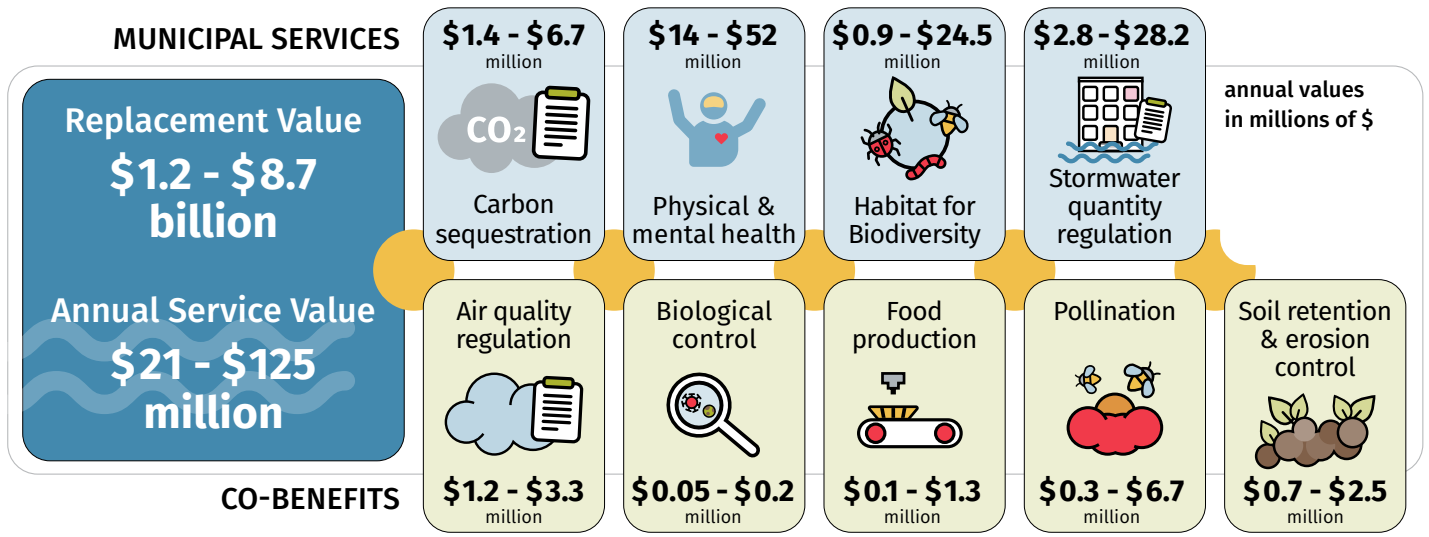


Figure 18: Graphic Summary of Municipal Annual Services Values and Replacement Value.







## 8.0 Engagement with Rightsholders and Stakeholders

Natural asset management is an inherently interdisciplinary practice, requiring coordination across departments at the organization level, as well as engagement and considerations for First Nations and other Indigenous rightsholders, private landowners, and government stakeholders.

### FIRST NATIONS

As part of this project, the District of Saanich began the process of engagement with First Nations, including the WSÁNEĆ Leadership Council Society, Songhees Nation, Esquimalt Nation, BOKÉĆEN (Pauquachin First Nation), STÁUTW (Tsawout First Nation), WJOLÉLP (Tsartlip First Nation), and WSIKEM (Tseycum First Nation), by sending a letter with information about the project and to express the District of Saanich's interest in ongoing discussions and collaboration regarding natural asset management.

The District of Saanich continues to make efforts to support a collaborative relationship with Indigenous partners, though capacity limitations presented some challenges regarding the First Nations' ability to participate directly on the Project through the engagement workshop with neighbouring local governments. However, District staff did attend a meeting of the WSÁNEĆ Leadership Council as part of this project, where they discussed shared interest in natural assets. The Council also provided materials from consultations on other projects related to natural assets and asked that these previous consultations be referred to with respect to their capacity to provide repeated feedback on multiple projects.

Expanding on this, the feedback received from the WSÁNEĆ Territories Indigenous People's Forum is a notable resource for this Project and should be referred to for further natural asset initiatives by the District of Saanich. In 2021, the municipalities of Central Saanich, North Saanich, and the Town of Sidney hosted a WSÁNEĆ members community forum to learn about Indigenous concerns and hopes for the future of WSÁNEĆ territory and the Saanich Peninsula. Key themes and responses are reflected in the forum report (WLC 2021), and include concerns over urban sprawl, recognizing cultural significance of the area, and a need for enhance protection of creeks and watersheds, all of which is relevant to the District's natural asset management efforts. Attendees also voiced the need for respectful dialogue and involvement of Indigenous voices in decision making.

To this end, the District of Saanich has been engaging with the WSÁNEĆ Leadership Council and community to gather their input on the development of the Urban Forest Strategy and Biodiversity Conservation Strategy. During this engagement, the WSÁNEĆ Leadership Council emphasized the importance of respecting everything. Respect should be the principle that the District follows in planning and caring for the environment and in developing and building a working relationship and walking together. An ÁTOL,NEUEL ("Respecting One Another") Memorandum of Understanding (MOU) between the WSÁNEĆ Leadership Council and the District of Saanich was signed to reflect the idea and practice of respecting all. The Council also highlighted the significance of passing on knowledge and traditions and prioritizing of strengthening ecosystems within Saanich.

It is fortunate that there are multiple areas of engagement between the District and regional First Nations. It is suggested that the District continue their engagement efforts on these priority strategies and support internal awareness of the traditional history of the lands and current First Nation priorities with regards to natural asset management activities.

To support consistent communication with respect to capacity limitations, the District of Saanich should consider consolidating engagement activities with regards to natural assets, including outcomes from this Project and the above-mentioned strategies. In the future, the District may benefit from the *Community to Community Program*; provided by the Province of BC and the Union of BC



Municipalities, the program funds joint forums between local governments and First Nations to discuss common issues and opportunities in the spirit of reconciliation.<sup>33</sup> The District should also consider providing honoraria or expense reimbursements for First Nations' consultation services related to natural asset management.

The District of Saanich looks forward to future conversations and collaboration with First Nations regarding natural asset management planning.

### PRIVATE LANDOWNERS

The physical scope of the inventory is all natural assets within the District's boundary, including those on private lands. Strategic involvement of private landowners will be required for a comprehensive approach to natural asset management by the District of Saanich, and important in later stages of implementation.

Educational engagement with private landowners is one of the foundational tools a local government can employ to ensure the health of critical natural assets on private property, in addition to financial incentives or tax breaks for ecosystem services, conservation easements, and regulatory measures (MNAI 2018).

While in-depth engagement with private landowners was not within the scope of the Project, the District of Saanich maintains transparent communication and updates on the Project and natural asset management activities on a public webpage.<sup>34</sup> The District has already established some environmental stewardship initiatives through which to educate private landowners and the public, such as the Saanich Naturescape Program.

The District is also actively pursuing land planning and stewardship through their 2020 Climate Action Plan and the Biodiversity Conservation Strategy — specific actions include incentives for land developers to incorporate green infrastructure, urban forest protections, and invasive species management, all of which directly contribute to maintaining healthy natural assets.

During the engagement workshop with local governments, participants noted the University of Victoria as a potential priority landowner with regards to natural assets on its property. The District of Saanich is encouraged to discuss opportunities for collaborative planning with the University so that environmental management activities are aligned with the District's natural asset-related plans and priorities. The District is making notable progress in employing regulatory tools and incentives for private landowners; as its natural asset management strategies evolve, the District may consider additional engagement with larger landowners to educate them on the benefits they receive from natural assets to encourage buy-in.

<sup>33</sup> UBCM Community to Community Program: [www.ubcm.ca/c2c](http://www.ubcm.ca/c2c)

<sup>34</sup> See [www.saanich.ca/EN/main/local-government/asset-management-program/natural-asset-management.html](http://www.saanich.ca/EN/main/local-government/asset-management-program/natural-asset-management.html)

## GOVERNMENT STAKEHOLDERS

The District of Saanich is at a preliminary stage of engagement with external stakeholders regarding natural assets and future efforts. As part of the Inventory Project, the District identified neighbouring municipalities with whom to engage and share project activities. The rationale is that these entities share borders (and as a result, natural assets, and their services) with the inventory area, and as such may have interest and motivation in pursuing collaborative action to address potential risks to service delivery through natural asset management.

The District of Saanich and NAI hosted a virtual engagement workshop for neighbouring entities in April of 2024 (meeting notes are included in [Annex C](#)). The purpose of this workshop was to open a conversation on natural asset management in the region, highlight potential shared areas of interest along the District's jurisdictional boundary, and share the project approach. Participants were also invited to speak to any relevant natural asset or nature conservation work that may align with the District of Saanich.

Staff from the following entities participated in the April workshop:

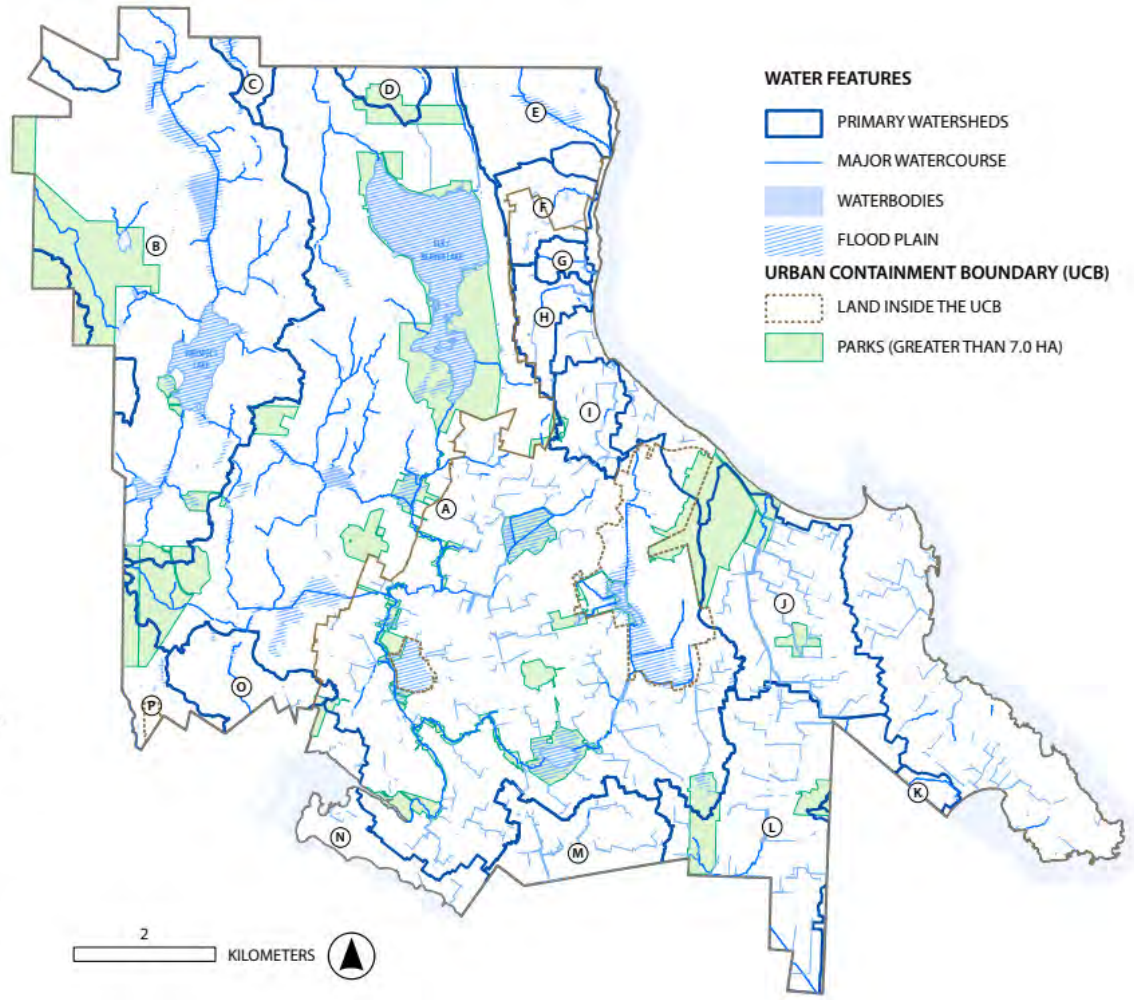
- City of Victoria
- Capital Regional District
- Township of Esquimalt
- District of Central Saanich
- Town of View Royal

Invitations were also extended to the District of Highlands, and the District of Oak Bay.

Overall, the workshop was received positively; while none of the participants have completed a formal natural asset inventory of their own, many noted their interest in pursuing related projects in the near-to-mid future. The workshop identified several natural areas of shared interest. Watersheds that overlap municipal boundaries were identified as being of particular interest (see Figure 19). For example, the Tod Creek Watershed spans four municipalities (Central Saanich, District of Highlands, District of Saanich, and View Royal). There is an opportunity for discussion of collective approach to watershed-level management and data collection through the CRD's Integrated Watershed Management (IWM) Committee.

**PRIMARY WATERSHEDS**

- (A) COLQUITZ CREEK
- (B) TOD CREEK
- (C) GRAHAM CREEK
- (D) SANDHILL CREEK
- (E) NOBLE CREEK
- (F) BURNHAM BROOK
- (G) GARDOM CREEK
- (H) REVANS CREEK
- (I) GALEY BROOK
- (J) MOUNT DOUGLAS CREEK
- (K) MYSTIC VALE / HOBBS CREEK
- (L) BOWKER CREEK
- (M) CECELIA CREEK
- (N) GORGE / PORTAGE INLET
- (O) CHARLTON CREEK
- (P) CRAIGFLOWER CREEK



*Figure 19: District of Saanich’s Municipal Boundary Organized by Watershed Area  
(Source: Saanich 2023)*





## 9.0 Recommendations

This section provides recommendations for next steps in the District of Saanich's natural asset management planning based on insights gained from considering its Natural Asset Strategy and the natural assets inventory results. It is divided into *9.1 Possible actions for the further development of the preliminary inventory*, and *9.2 Steps the District can consider in developing a Natural Asset Management Plan*.



## 9.1 Possible Actions for The Further Development of the Inventory

The District of Saanich could consider the following incremental measures for further development of the preliminary inventory:

- Consider reviewing and updating the inventory every 5 to 10 years. Key updates could include:
  - Update and refine assets areas as data improves and land use changes.
  - Refine the condition assessment to include:
    - agriculture, individual trees, and watercourses,
    - additional metrics related to condition (e.g., relative biodiversity, riparian and wetland health, soil condition, connectivity, and others).
  - Consider developing a field-based condition assessment protocol to confirm and verify and refine condition ratings based on site inspections.
- Progress from risk identification to the next stage of risk assessment – the development of risk mitigation strategies for natural assets.
- Further develop the condition assessment and risk assessment using local climate projections, land use modelling, and other data already at Saanich’s disposal.
- Integrate the natural asset registry with Saanich’s built asset management registry to ensure a single registry is being managed and maintained regularly.
- Model the levels of service that natural assets currently provide core municipal services and the levels of service under different potential management, local climate change projections, and rehabilitation or restoration scenarios.
- Document the following information related to each Level of Service that the District plans to track:
  - Current LOS (level that is currently being provided)
    - Desired Trend (increase or decrease)
    - Desired LOS (target)
    - Performance Gap (difference between current LOS and desired LOS)
    - Strategies to Address Gaps
    - Data Management Practices (where data is stored, how it is updated, frequency of updates)

- Identify natural asset valuation gaps (e.g., carbon storage estimates) and articulate valuation objectives (i.e., how values will be used) to inform methodological approach.
- Refine preliminary natural asset valuation of municipal services through the application of primary studies that can be tailored to the District (e.g., primary studies that provide formulas for detailed results) or detailed modelling to identify capacity of natural assets to provide target service(s).
- Build awareness amongst staff of the role of natural assets in service delivery, and awareness amongst Councils of the value of natural assets in Saanich and the resources required to maintain and restore them.
- Build awareness and support for natural asset management on public lands through incentives, payments, and user fees to balance the costs and benefits of maintaining the area in its natural state.
- Develop communications plan for ongoing engagement, both to inform NAM and support 'willingness to pay', support for investments into long-term actions.
- Concentrate efforts towards relationship-building with First Nations and Indigenous governments for equitable stewardship and upholding Truth and Reconciliation.

## 9.2 Steps the District of Saanich Can Consider to Advance to a Natural Asset Management Plan

As noted, natural asset management is an adaptive management process involving continuous improvement. There are many directions in which the District could progress. One reasonable step is the development of a natural asset management plan, which will help the District connect information on natural assets, risk, and levels of service, with potential investments and management actions to maintain those services. Steps in this regard could include:

- 1/ **Confirm scope, roles, and responsibilities.** Undertake a meeting or workshop to confirm (a) assumptions (b) roles, responsibilities, and capacities (c) community capacity to undertake a larger project.
- 2/ **Fill essential knowledge gaps.** If discussions on scope and certainty and related data needs for modelling indicate the need for additional data, these could be filled.
- 3/ **Modelling.** Modelling the levels of service that natural assets currently provide and the levels of service under different potential management, local climate change projections, and rehabilitation or restoration scenarios, gives communities the ability to explore how different actions will affect the health and corresponding performance of natural assets. Existing hydrologic and hydraulic models should be used to facilitate development of a new hydrologic model, that captures and delineates natural to better understand their hydrologic function from a stormwater management perspective.



- 4/ **Lifecycle Costing.** Complete a lifecycle economic assessment for the core municipal services of natural assets. For those assets under Saanich’s jurisdiction, this includes considering:
  - Maintenance and monitoring costs
  - Disposal costs
- 5/ **Planning.** This step allows local governments to explore different scenarios such as “what happens to the services provided by the wetland if there is significant building upstream?” or “what happens to the services if the forest is restored?” Using modelling, changes in service levels can be understood and quantified. Corresponding values can also be determined through continued economic assessment. Based on the foregoing, local governments can begin to consider and prioritize actions ranging from status quo to planning, regulatory, financial operations, maintenance, acquisition, and monitoring interventions.
- 6/ **Ongoing monitoring.** It is essential to continue monitoring the project to learn whether interventions are working and to share lessons and learnings from other communities undertaking natural asset management.





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# Annex A – District of Saanich Documents Related to Natural Assets

## By-laws

- Boulevard Regulation Bylaw No. 9487 (2018)
- Noxious Weed Bylaw No. 8080 (2000)
- Park Management and Control Bylaw No. 7753 (1997)
- Pesticide Bylaw No. 9054 (2010)
- Subdivision Bylaw
- Tree Protection Bylaw, 2014, NO. 9272
- Watercourse and Drainage Regulation Bylaw No. 7501 (1996)
- Zoning Bylaw No. 8200 (2003)

## Council Policies

- Asset Management Policy
- Boulevard Tree Policy
- Community Garden Policy
- Hazard Tree and Abatement Policy
- Integrated Pest Management Policy

## Corporate Plans

- Agriculture and Food Security Plan (2018)
- Asset Management Strategy (2023)
- Biodiversity Conservation Strategy (under development)
- Climate Plan (2020)
- Council Strategic Plan (2023-2027)
- Environmental Best Management Practices
- Integrated Stormwater Management Plans (under development)
- Invasive Species Management Strategy
- Natural Areas Action Plan
- Natural Areas Management Guidelines
- Official Community Plan
- Parks, Recreation and Community Services Directions and Actions Plan (under development)
- State of Biodiversity Report (2023)
- State of Urban Forest Report (2023)
- Urban Forest Strategy (under development)

# Annex B – Additional Condition Results by Indicator

## Natural Area Patch Size

**INDICATOR:** The relative size and shape of contiguous natural asset areas, with larger patches that are more round or square rather than linear being considered of higher quality than smaller patches that are more linear with little or no “interior” habitat (i.e., all edge).

**RATIONALE:** The objective of this indicator is to create a proxy for condition based on the relative size and shape of contiguous patches of natural assets. In general, larger blocks of habitat (whether they be meadow, forest, and/or wetland) tend to support a greater diversity of plants and wildlife, including habitat specialists that require or benefit from conditions only found somewhat removed from a non-natural land cover type (e.g., roads, residential, institutional, or commercial development). In an urban or urbanizing context, as the distance from the edge of a natural area to the interior of that area decreases, the penetration of noise and other human-related disturbances and encroachments that can negatively impact certain species associated with those habitats increases (Environment Canada 2013).

**APPROACH:** “Interior” habitat – at least in woodlands - is typically measured starting at 100 m inwards from the feature or “patch” edge (e.g., Environment Canada 2013). The first step was thus to establish the “patch” edge, which was defined at the edge of continuous areas of natural assets (regardless of asset type).

**SCORING:** Ratings were allocated as follows:

- **Very Good:** An asset within a habitat patch with an interior area measured 100 m from the feature edge.
- **Good:** An asset within a habitat patch with an interior area measured 75 m from the feature edge and not already captured as “very good.”
- **Fair:** An asset within a habitat patch with an interior area measured 50 m from the feature edge and not already captured as “very good” or “good.”
- **Poor:** An asset within a habitat patch with an interior area measured 25 m from the feature edge and not already captured as “very good”, “good”, or “fair.”
- **Very Poor:** Any asset with no interior area measured at 25 m from the feature edge.



## Natural Asset Proximity to Watercourses

**INDICATOR:** The distance between each asset and the nearest watercourse line was measured.

**RATIONALE:** In addition to a natural area's intrinsic size and shape, its location in relation to other natural assets and features within a given area also influences the types of ecological functions it can provide. Proximity of a terrestrial natural asset to water, or having a hydrologic feature within a terrestrial asset, is generally considered positive. Environmental Canada's habitat guidelines for southern Ontario (EC 2013) and the Province of Ontario's Natural Heritage Reference Manual (MNRF 2010) ascribe ecological significance to terrestrial habitats that contain or are close to hydrological features such as wetlands that occur within floodplains (which are associated with watercourses), woodlands with wetlands and/or watercourses within them, and grassland/meadow habitats adjacent or close to riparian and/or wetland habitats. Specific distances / thresholds cited in these documents as heightening feature functions are as follows:

- Naturalized riparian habitat within at least 30 m of a watercourse edge (i.e., top of bank) (EC 2013), and
- Woodlands within 50 m of a watercourse (MNRF 2010)

In addition, 120 m is the standard distance used for considering adjacency to an identified natural asset in terms of the lands within which negative impacts to an asset may occur.

**APPROACH:** The closest distance between watercourse lines and natural assets was measured.

**SCORING:** Ratings were allocated as follows:

- **Very Good:** Asset directly intersects watercourse.
- **Good:** Asset is within 30 m of a watercourse but does not directly intersect it.
- **Fair:** Asset is within 30 - 120 m of a watercourse.
- **Poor:** Asset is within 120 – 240 m of a watercourse.
- **Very Poor:** Asset is greater than 240 m away from a watercourse.

## Forest Proximity

**INDICATOR:** A measure of the proximity of forest assets to other forest or wetland assets.

**RATIONALE:** According to research documented by Environment Canada (2013):

- For forest birds, research has found that habitats near other natural areas support more species than isolated habitats of the same size, and that some species with large home ranges may use several patches instead of one large area.
- In landscapes with relatively low forest cover overall, species diversity and survivorship increase when the remaining habitat patches are larger and more clumped or aggregated.
- Based on the limited available science, the isolation between forest patches for forest birds generally occurs at about five kilometres, but for amphibians at between one and two kilometres. For forest plants, some level of immediate proximity is required.

**APPROACH:** Each forest asset was buffered by the condition rating thresholds noted below and the appropriate rating applied based on the closest buffer where another forest or wetland asset was found.

**SCORING:** Based on the research noted by Environment Canada (2013) and the associated proximities, condition rating are:

- **Very good:** Forest assets < 1 km from any other forest or wetland asset
- **Good:** Forest assets within 1 to 2km from any other forest or wetland asset
- **Fair:** Forest assets within 2 to 3km from any other forest or wetland asset
- **Poor:** Forest assets within 3 to 5km from any other forest or wetland asset
- **Very poor:** Forest are > 5km from any other forest or wetland asset

## Wetland Proximity

**INDICATOR:** A measure of the proximity of wetland assets to other wetland or forest assets

**RATIONALE:** According to research documented by Environment Canada (2013):

- Fragmentation of wetland habitats degrades their functions by reducing habitat for species that are less tolerant of disturbances, that require more contiguous habitat, or both.
- Some of these negative impacts of fragmentation can be offset, at least for some species, by maintaining concentrations of natural habitat fragments in close proximity.
- The importance of adjacent natural areas, as well as proximity between patches of wetland, has been recognized for several wildlife species.
- Proximity distances range depending on the species from less than 500m for turtles and spotted salamanders to as large as 3km for birds.

**APPROACH:** Each wetland asset was buffered by the condition rating thresholds noted below and the appropriate rating applied based on the closest buffer where another forest or wetland asset was found.

**SCORING:** Based on the research noted by Environment Canada (2013) and the associated proximities, condition rating are:

- **Very good:** Wetland assets < 0.5 km from any other forest or wetland asset
- **Good:** Wetland assets within 0.5 to 1 km from any other forest or wetland asset
- **Fair:** Wetland assets within 1 to 2 km from any other forest or wetland asset
- **Poor:** Wetland assets within 2 to 3 km from any other forest or wetland asset
- **Very poor:** Wetlands are > 3 km from any other forest or wetland asset

## Extent of Adjacent Complementary Land Uses

**INDICATOR:** The extent of complementary land uses within 120 m of an asset was measured.

**RATIONALE:** How and the extent to which a given natural area is influenced by drainage in the adjacent landscape varies depending on factors such as local topography and soils, where the feature “sits” in the landscape (e.g., upland versus lowland) and the size and nature of the feature itself. However, it is well-established that the condition of a terrestrial natural feature (including wetlands) in an urban context tends to be negatively impacted when more of the surrounding land uses are impervious (i.e., paved, concrete or buildings) as this tends to alter pre-existing drainage and infiltration pathways, which can cause a natural area to receive more, or less, drainage than prior to being in the urban context. Urban runoff also typically carries a host of sediments and contaminants, and when such runoff is directed to natural areas and not properly treated, it can also negatively impact the feature and its functions.

Increases in the extent of impervious surfaces within a given watershed or catchment area are generally known to have negative impacts to natural features in that watershed or catchment area, particularly for features downstream of the impervious areas, resulting in a push towards planning that limits impervious surfaces and incorporates low impact development measures that facilitate local infiltration (e.g., Government of Ontario 2006, Government of Ontario 2018). Environment Canada’s (2013) guidance for streams/watercourses in urbanized watersheds in southern Ontario states that “impairment in stream water quality and quantity is highly likely above 10% impervious land cover and can often begin before this threshold is reached. In urban systems that are already degraded, a second threshold is likely reached at the 25 to 30% level”.

However, land cover types with extensive pervious surfaces that are not “natural” per se but occur in the lands adjacent to natural areas, such as manicured parks/open spaces and agricultural lands, are recognized as potentially supporting the functions of nearby natural areas in some regards by providing one or more of the following:

- permeable surfaces (and therefore potentially supporting hydrologic regimes),
- temporary or permanent vegetation (e.g., isolated or small groupings of trees/landscaped areas, agricultural crops), and/or
- intervening lands uses between natural areas and built areas that are used less frequently and/or less intensively by people.

Therefore, having, for example, a school ground between a wooded area and a high-density residential area is generally considered preferable to having the high-density residential area directly abutting the natural area.



**APPROACH:** A 120 m buffer (exclusive of asset area) was drawn around each natural asset “patch” in the inventory. The extent of landcover associated with complementary land uses and natural assets was estimated in hectares within each buffer. Areas of complementary uses include Agriculture, Built-up Pervious, and Golf Course land cover. These areas have vegetated cover but are not natural in the true sense of the definition. The area of the 120 m buffer was estimated in hectares (excluding the area of the asset itself from counting towards this estimate), and the percentage of each buffer that consists of these natural area/complementary land uses was estimated. A ranking was then applied to each buffer and linked to the relevant natural assets.

**SCORING:** A rank was assigned to each asset based on what percentage of the asset’s adjacent lands (i.e., measured at 120 m) is composed of identified pervious and complementary land uses (e.g., passive parklands, golf courses, or agricultural lands) as per the following:

- **Very Good:** 51 to 100% complementary land uses
- **Good:** 31% to 50% complementary land uses
- **Fair:** 16% to 30% complementary land uses
- **Poor:** 1% to 15% complementary land uses
- **Very Poor:** 0% complementary land uses

## Biodiversity Condition:

**INDICATOR:** A measure of the extent an asset that is suitable for supporting biodiversity.

**RATIONALE:** The biodiversity of an area is indicative of its overall ecological health, as healthier ecosystems will be better able to support a wide variety of species.

**APPROACH:** Biodiversity data provided by Saanich was used to estimate the area (in ha) of each asset classified as Moderate, High, or Very High. The area figures were converted to percentages and a rating from Very Poor to Very Good was assigned according to the scoring provided below.

**SCORING:** A rank was assigned to each asset based on the percent of area suitable for supporting biodiversity, as per the following:

- **Very Good:** 80-100% of the area is composed of suitable biodiversity area.
- **Good:** 60-80% of the area is composed of suitable biodiversity area.
- **Fair:** 40-60% of the area is composed of suitable biodiversity area.
- **Poor:** 20-40% of the area is composed of suitable biodiversity area.
- **Very Poor:** 0-20% of the area is composed of suitable biodiversity area.

Table 31 shows condition results by condition indicator.

Condition Rating	Natural Area Patch Size Condition Area (ha)	Proximity to Watercourse Condition Area (ha)	Forest Proximity Condition Area (ha)	Wetland Proximity Condition Area (ha)	Adjacent Complementary Land Use Condition Area (ha)	Biodiversity Condition Ranking
<b>Very Good</b>	4,974.67	2,416.29	3,480.65	239.07	5,000.88	393.99
<b>Good</b>	100.11	1,909.53	-	-	332.29	1,166.35
<b>Fair</b>	122.35	558.56	-	-	81.94	1,358.73
<b>Poor</b>	164.29	310.78	-	-	49.34	637.54
<b>Very Poor</b>	103.72	269.98	-	-	0.70	848.22
<b>Total</b>	<b>5,465</b>	<b>5,465</b>	<b>3,481</b>	<b>239</b>	<b>5,465</b>	<b>4,405</b>

Table 31: Results by Condition Indicator

The series of maps below show the spatial distribution of the results of the condition assessment by condition indicator (one map for each condition indicator).

### Saanich Natural Asset Inventory: Natural Area Patch Rating

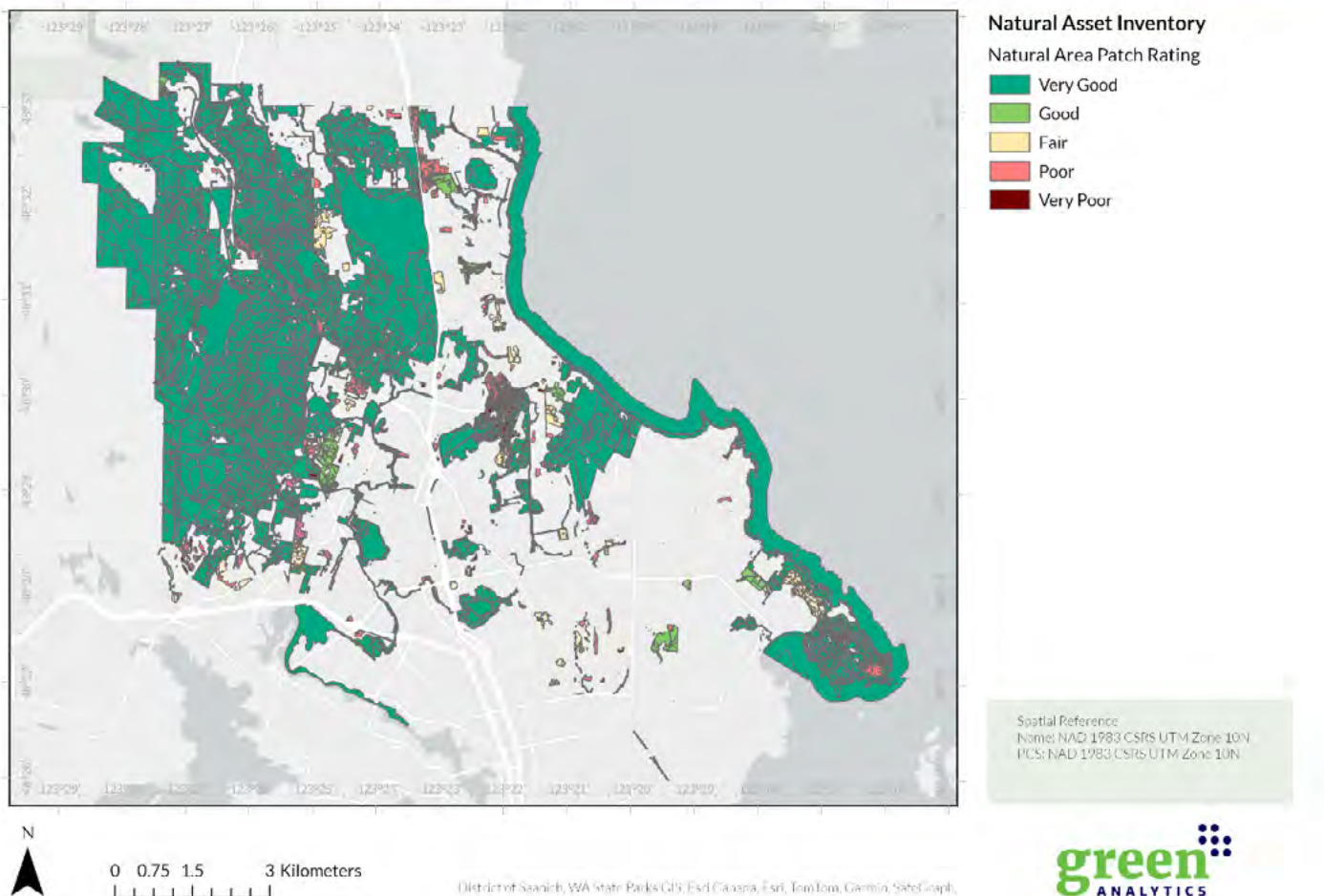


Figure 20: Saanich Natural Asset Inventory Mapped by Natural Patch Rating

# Saanich Natural Asset Inventory: Watercourse Proximity Rating

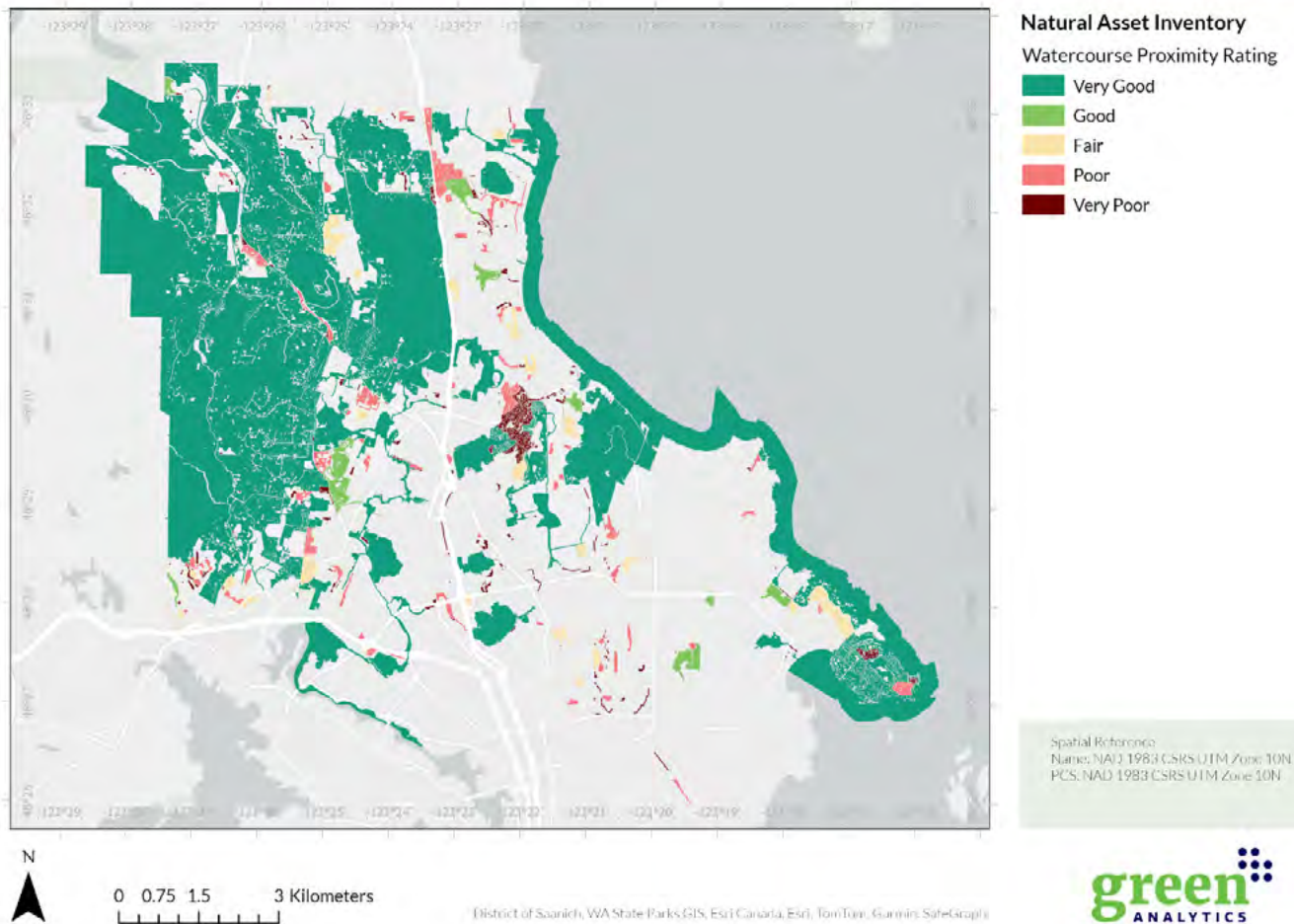


Figure 21: Saanich Natural Asset Inventory Mapped by Watercourse Proximity Rating

# Saanich Natural Asset Inventory: Forest Proximity Rating

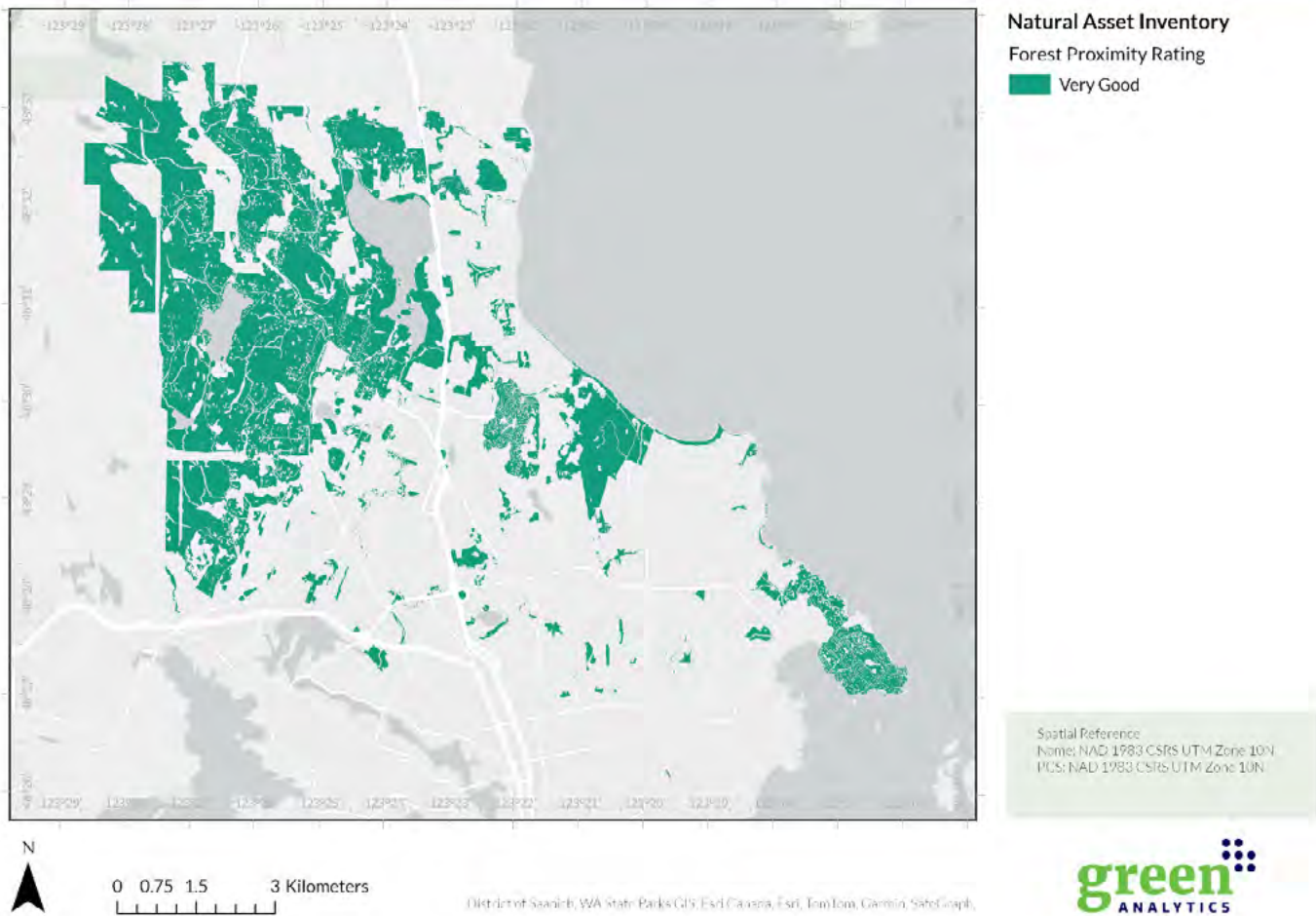


Figure 22: Saanich Natural Asset Inventory Mapped by Forest Proximity Rating



# Saanich Natural Asset Inventory: Wetland Proximity Rating

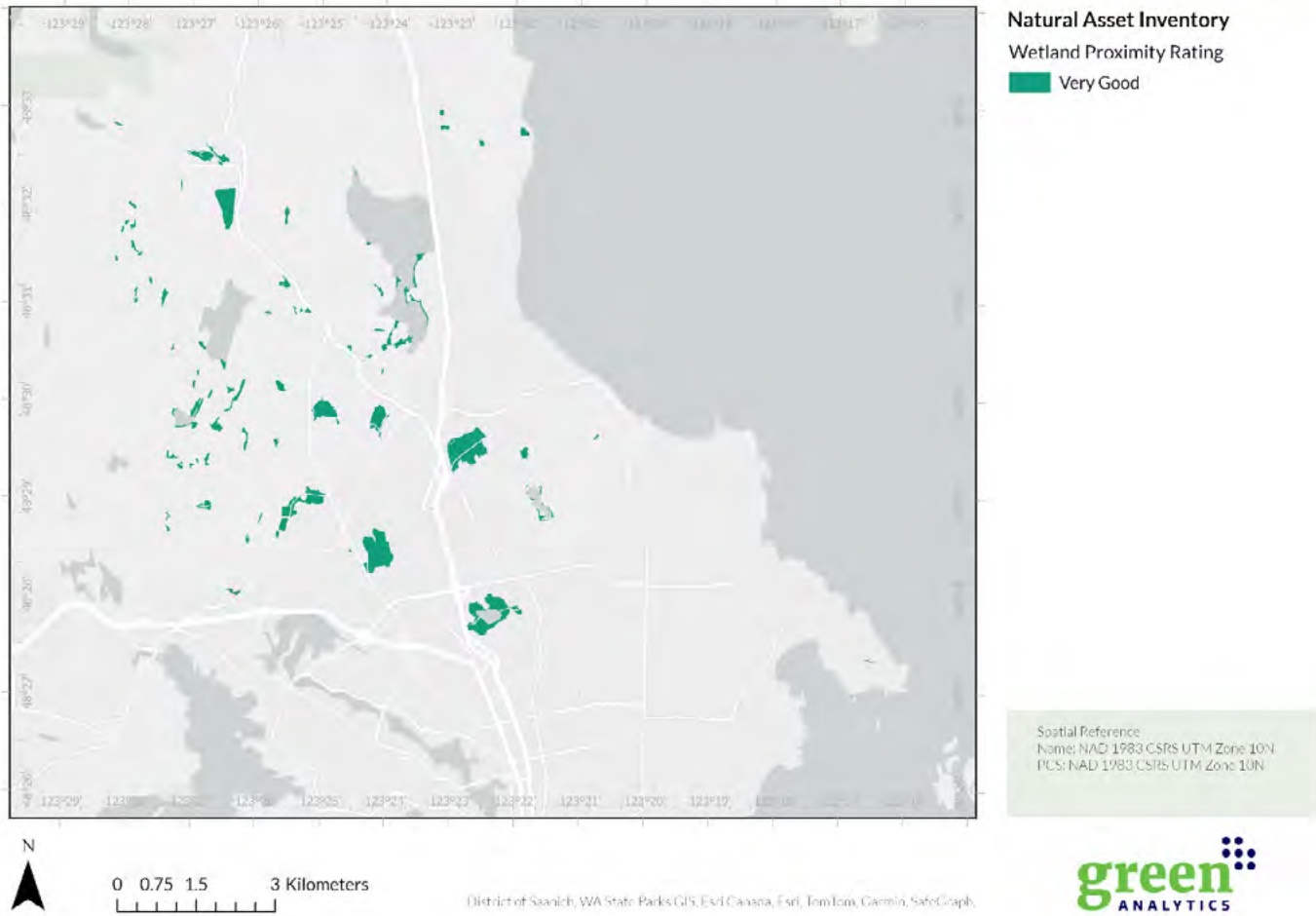


Figure 23: Saanich Natural Asset Inventory Mapped by Wetland Proximity Rating

# Saanich Natural Asset Inventory: Complementary Land Use Rating

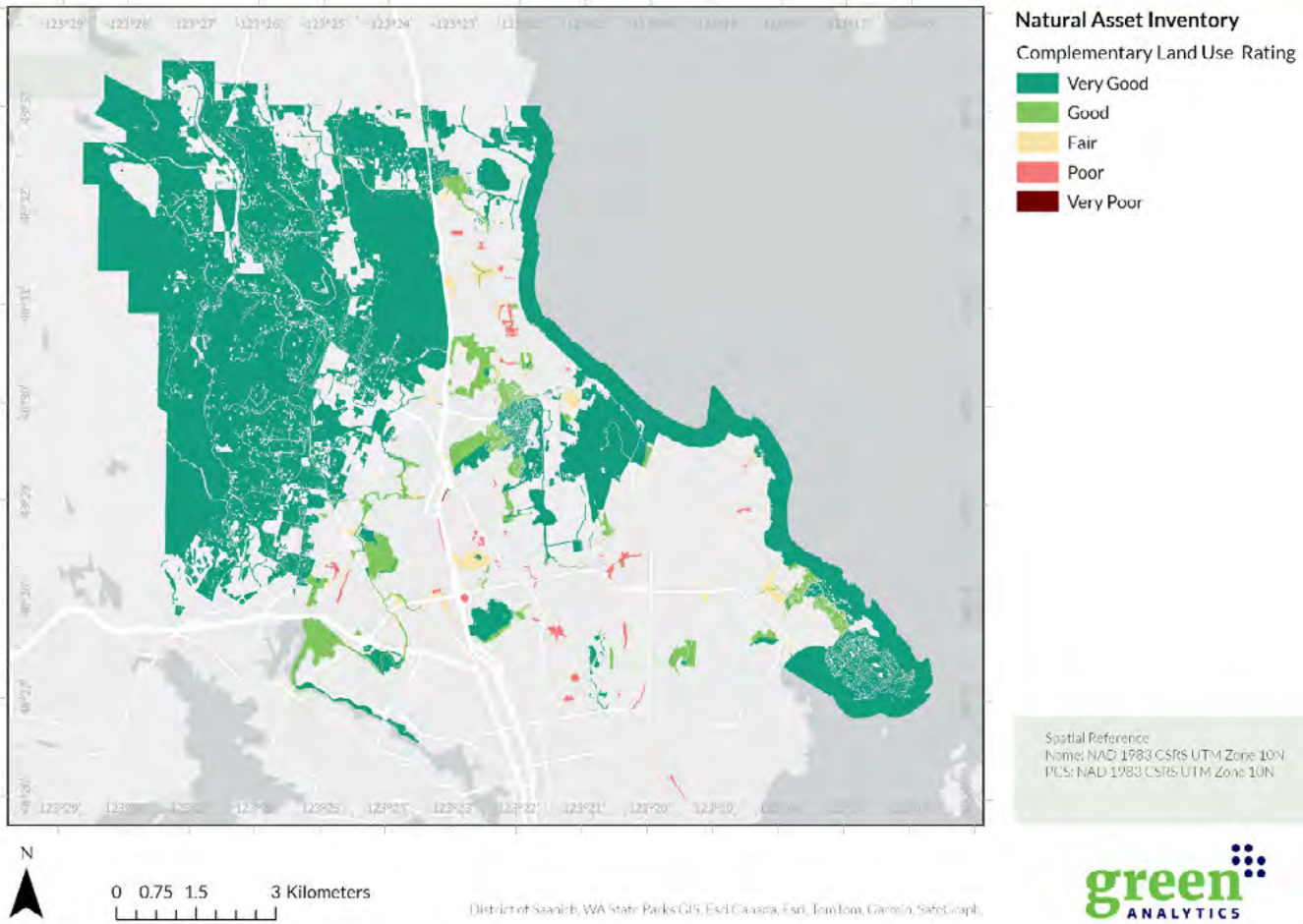


Figure 24: Saanich Natural Asset Inventory Mapped by Adjacent Complementary Land Use Rating

# Saanich Natural Asset Inventory: Biodiversity Condition Rating

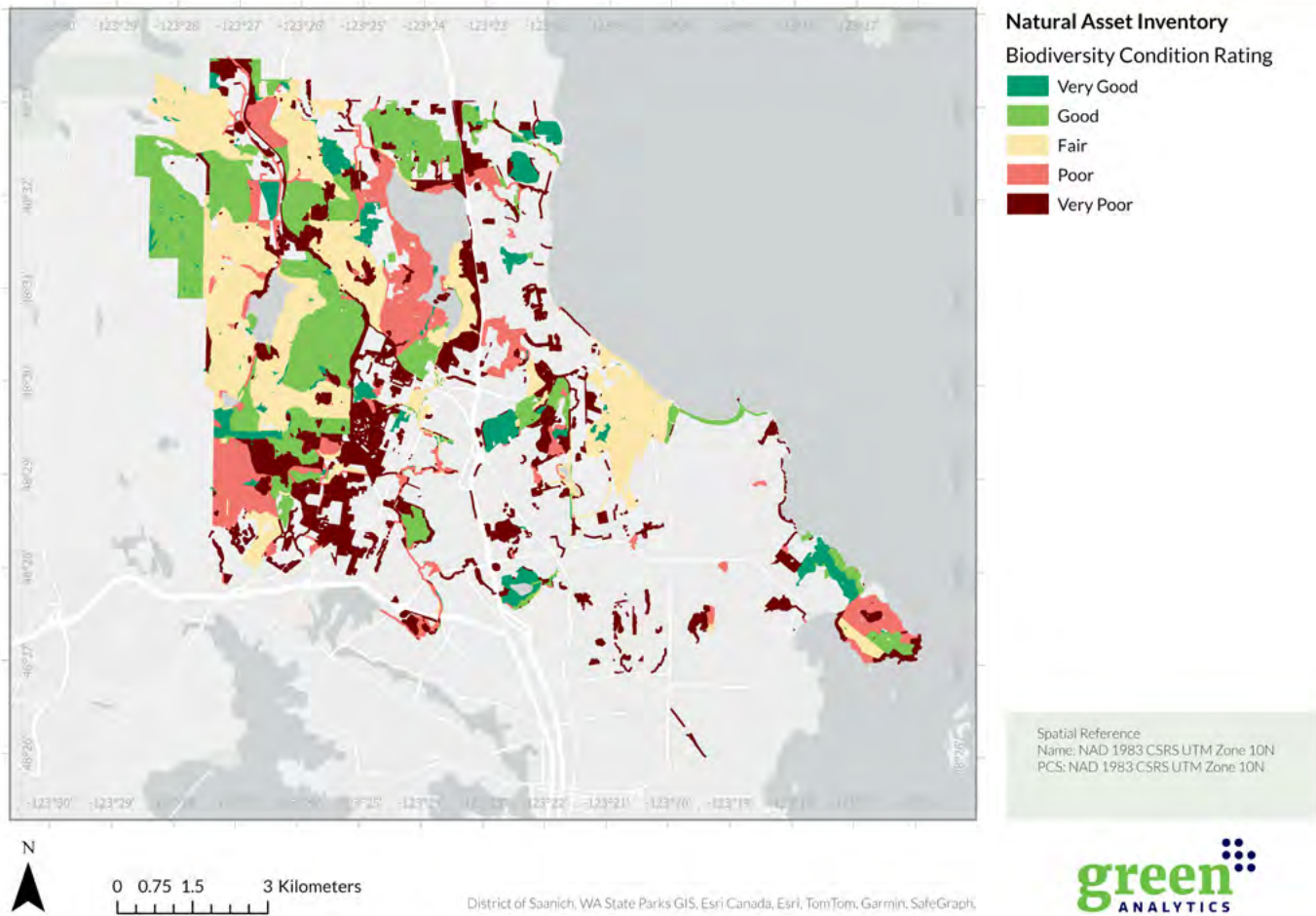


Figure 25: Saanich Natural Asset Inventory Mapped by Biodiversity Condition Rating

# Annex C – Notes from Engagement Workshop with Neighbouring Municipalities

## District of Saanich Natural Asset Management Project

### Engagement Workshop

April 9, 2024, 10am – 12pm | Online (Zoom)

Organization	
<b>District of Saanich</b>	Jacqueline Weston (host)
<b>Natural Assets Initiative</b>	Michelle Molnar (host) Emily Sharma (host)
<b>City of Victoria</b>	Trina Buhler Jeff Lynka Rory Tooke Kristie Signer Summer Formosa Mike Creighton Patrick Fingler Laura Berndt Nina Sutic-Bata
<b>CRD</b>	Kristy Wallace Laura Hardiman Jody Watson Alex Miklas
<b>District of Central Saanich</b>	Jennifer Lukianchuk Troy Ziegler
<b>Township of Esquimalt</b>	Robbie Young
<b>Town of View Royal</b>	Ben Lubberts

Table 32: List of Workshop Attendees



Invitations were also extended to representatives from the District of Highlands, District of Oak Bay, as well as rightsholders including the WSÁNEĆ Leadership Council Society, Songhees Nation, Esquimalt Nation, BOKEĆEN (Pauquachin First Nation), STÁUTW (Tsayout First Nation), WJOŁŁP (Tsartlip First Nation), and WSI\_KEM (Tseycum First Nation).

## Project Overview

For the full presentation, please refer to the slide deck and meeting recording here.

The District of Saanich maintains a public webpage on their natural asset management initiatives, accessible at: [www.saanich.ca/EN/main/local-government/asset-management-program/natural-asset-management.html](http://www.saanich.ca/EN/main/local-government/asset-management-program/natural-asset-management.html)

### DISCUSSION

#### QUESTION 1

Based on your own initiatives and/or today’s presentation, are there potential shared areas that are of key relevance to your organization? Are there any that were not included?

Jurisdiction	Suggested potential areas/ assets of interest	Areas/assets added or emphasized during discussion
<b>CRD</b>	<ul style="list-style-type: none"> <li>■ Bear Hill Regional Park</li> <li>■ Elk/Beaver Regional Park</li> <li>■ Francis/King Regional Park</li> <li>■ Mount Work Regional Park</li> <li>■ Shared watersheds</li> </ul>	<ul style="list-style-type: none"> <li>■ Tod Creek watershed – spans 4 municipalities (Central Saanich, Highlands, Saanich, View Royal)</li> <li>■ There is an existing opportunity for discussion of collective approach to watershed-level management and data collection through the CRD’s Integrated Watershed Management (IWM) Committee</li> <li>■ See shared monitoring program example from Grindstone Creek project</li> <li>■ Oak Beaver Reservoir</li> </ul>
<b>City of Victoria</b>	<ul style="list-style-type: none"> <li>■ Bowker Creek watershed</li> <li>■ Cecelia Creek watershed</li> <li>■ Marine shoreline (federal migratory bird sanctuary)</li> </ul>	<ul style="list-style-type: none"> <li>■ Cecelia Ravine Creek watershed</li> </ul>

Jurisdiction	Suggested potential areas/ assets of interest	Areas/assets added or emphasized during discussion
<b>District of Central Saanich</b>	<ul style="list-style-type: none"> <li>■ Hagan-Graham Creek watershed</li> <li>■ Tetayut Creek watershed</li> <li>■ Tod Creek watershed</li> <li>■ Marine shoreline (federal migratory bird sanctuary)</li> <li>■ Forested area along boundary (north of Elk Lake)</li> </ul>	<ul style="list-style-type: none"> <li>■ Hagan-Graham creek watershed – Maber Flats area</li> </ul>
<b>Township of Esquimalt</b>	<ul style="list-style-type: none"> <li>■ Hospital Creek watershed</li> <li>■ The Gorge waterway</li> </ul>	<ul style="list-style-type: none"> <li>■ The Gorge Park</li> </ul>
<b>Town of View Royal</b>	<ul style="list-style-type: none"> <li>■ Craigflower Creek watershed</li> <li>■ Tod Creek watershed</li> <li>■ The Gorge waterway</li> </ul>	<ul style="list-style-type: none"> <li>■ Area north of Watkiss Way; acute flooding issue in subdivision bordering rural Saanich (in proximity to Highland Golf course)</li> <li>■ Rural lands north of Thetis Lake – single access to neighbourhoods via Highland Rd., fire access at Munn Rd.</li> <li>■ Stone Ridge wetlands – water lets out into Hospital Creek</li> </ul>
<b>District of Oak Bay</b>	<ul style="list-style-type: none"> <li>■ Bowker Creek watershed</li> <li>■ Hobbs Creek watershed</li> <li>■ Marine shoreline (federal migratory bird sanctuary)</li> </ul>	
<b>District of Highlands</b>	<ul style="list-style-type: none"> <li>■ Tod Creek watershed</li> <li>■ Forested areas west of Prospect Lake</li> </ul>	

Table 33: Feedback Provided by Participants

## QUESTION 2

Is your organization currently involved in any natural asset management, or natural infrastructure conservation work in these shared areas?

### Feedback:

General conservation activities are carried out by CRD regional parks.

**The Gorge Park** — Township of Esquimalt is preparing for large riparian restoration project in Gorge Park in Fall 2024 (pending permit approval). Goal to build up riparian area and serve as an example project for homeowners and other landowners interested in similar work.

**Hagan-Graham Creek** — Central Saanich has property in the Maber Flats area and are currently collaborating with the WSÁNEĆ Land Trust Society on a restoration project for climate adaptation and flood control. Will be doing a hydrology study; there is potential interest in assessing the whole watershed (including areas in the District of Saanich).

**Cecelia Ravine Creek watershed** — CRD is seeking interest from local governments to address the watershed, which is experience a number of challenges, including: poor water quality, storm surges, heavily overrun with invasive species and poor riparian construct and impacts from misuse. Seeking to revitalize park area with collaborators, Cecelia Creek will likely be a future topic for the CRD Integrated Watershed Management (IWM) committee.

**Stone Ridge wetland** — Town of View Royal is currently carrying out the Stone Ridge wetland project to address flooding and runoff related to nearby subdivision. Project includes restoration work and efforts with volunteer groups to control invasive species in the area, which is proving successful. This wetland also lets out into Hospital Creek, which flows through the District of Saanich and View Royal.

## QUESTION 3

Is your organization currently engaged in mitigating any risks in these shared natural areas? (e.g., erosion, illegal dumping, etc.)

### Feedback:

Town of View Royal is monitoring the acute flooding situation in subdivision near Watkiss; currently engaged with Saanich public works to address excess water from rural area in Saanich.

**Oak Beaver Reservoir** — CRD has implemented a project to restabilize the water quality in the Oak Beaver Reservoir. There is currently a partnership with the province, who is funding water quality efforts, and District of Saanich. CRD has proceeded with oxygenation system to support lake health and mitigate blue green algae blooms.

CRD working with a number of municipalities and some First Nations to collaborate on upcoming grant funding through Canada’s 2 Billion Trees program to plant a number of native trees across the region.

**Final announcements**

- The next Regional Asset Management Community of Practice meeting is June 21st, 2024. If you/your organization is not on this community of practice list, you are still invited and encouraged to connect with Laura Hardiman (lhardiman@crd.bc.ca) for more information.
- Information gathered from this workshop will be included in the final project report for the District of Saanich’s natural asset inventory – this report will be made public on the District’s website when completed later this year.
- If you have further comments or would like to inquire further about planning for natural assets with the District of Saanich, please contact Jacqueline Weston (Jacqueline.Weston@Saanich.ca)

**Service Awareness Exercise**

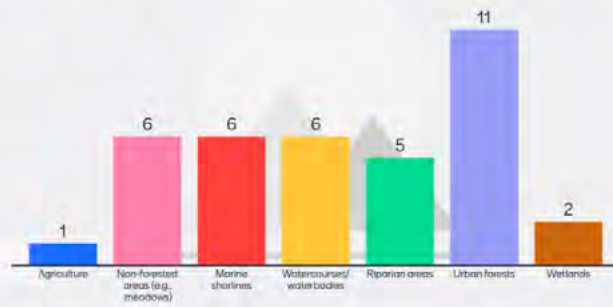
General questions to gauge natural asset awareness across participants. Results taken from Mentimeter survey.



*Figure 26: Survey Responses for Use of Natural Asset Management by Participants  
Note: service categorization based on hierarchy implemented by the District of Saanich*



## Is your organization currently managing any natural areas/assets for the purposes of service delivery?



**Figure 27: Survey of Management of Natural Areas for Service Delivery**

Note: service categorization based on hierarchy implemented by the District of Saanich

## Has your organization completed a natural asset inventory or natural asset management plan?

9 responses

We are in the early stages of asset management with current focus on engineered assets. Natural asset management is likely to be next

Soon. We hope

I believe we are planning to soon :)

I believe that we intend to :)

No, not that I am aware of

Not yet but we are currently planning our approach

We are hoping to do a natural asset inventory this year/next year.

No. We've created a bookmark for it in our long-term financial plan.

In Part

**Figure 28: Responses Regarding any Efforts in Natural Asset Management Planning**

The Township of Esquimalt is currently working towards asset management considerations with focus on buildings & construction, likely followed by natural asset management (top left answer).

Central Saanich (last cell in centre column in Figure 28) is starting the process to begin a natural asset inventory, likely in 2025.

