This document can be made available in other accessible formats as soon as practicable and upon request

Staff Report

Operations – Sustainability & Solid Waste

Report To:	**COW - Operations, Planning and Building Services**
Meeting Date:	October 28, 2025
Report Number:	OPS.25.046
Title:	Natural Asset Inventory – State of the Infrastructure Report
Prepared by:	Jeffery Fletcher, Manager of Sustainability & Solid Waste

A. Recommendations

THAT Council receive Staff Report OPS.25.046, entitled "Natural Asset Inventory – State of the Infrastructure Report";

AND THAT Council identifies natural assets—such as wetlands, forests, trees, and water bodies—as critical infrastructure that provide essential services such as stormwater management, flood control, and climate resilience;

AND THAT Council endorses an approach to proactive natural asset management beginning with street trees in the Town's urban settlement areas, to be developed by staff in consultation with the Biodiversity and Urban Forest Strategy (BUFS) Task Force, with consideration for budget and staffing implications.

B. Overview

The Town began a joint Natural Asset Inventory and Natural Heritage Study in fall 2023, culminating in a recommendation report, PDS.24.067 Recommendation Report – Natural Asset Inventory and Natural Heritage Study. A Natural Asset Inventory has been prepared for the Town, covering a wide range of natural and enhanced assets, as outlined in a State of the Infrastructure (SIR) report, which identifies the areas of land within each asset class and assesses various asset types for condition, risk, replacement cost, ecosystem services, and priority. Completing the street tree inventory for the Town's urban settlement areas to inform a tree and canopy management program is the recommended first step towards comprehensive accounting and management of natural assets.

C. Background

Ontario Regulation 588/17 "Asset Management Planning for Municipal Infrastructure" requires all Ontario municipalities to develop and maintain asset management plans for their municipal infrastructure. The regulation's definition of "municipal infrastructure asset" includes any infrastructure assets, including green infrastructure assets, directly owned by a municipality or

included on the consolidated financial statements of a municipality. The definition of "green infrastructure asset" under the regulation includes infrastructure "consisting of natural or human-made elements that provide ecological and hydrological functions and processes and includes natural heritage features and systems, parklands, stormwater management systems, street trees, urban forests, natural channels, permeable surfaces and green roofs".

Green infrastructure assets typically include three sub-categories: Natural Assets, Enhanced Assets, and Engineered Assets, as outlined in the following table, adapted from Figure 2-1. Defining natural assets, on page 10 of Attachment 1.

Green Infrastructure			**Grey Infrastructure**
Natural Assets	**Enhanced Assets**	**Engineered Assets**	
Wetlands Swamps Forests Meadows Watercourses Lakes and ponds Soils	Rain gardens Green roofs and walls Bioswales Street and park trees Naturalized stormwater ponds Manicured lawns	Permeable pavement Rain barrels Cisterns Perforated pipes Infiltration trenches	Bridges Roads Parking lots Culverts Pipes
Additional notes: Natural Assets and Enhanced Assets are examples of "Nature-Based Solutions" Enhanced Assets and Engineered Assets are examples of "Low Impact Development"			

Like many other municipalities, the Town's Asset Management Plan does not currently include natural assets, and a natural assets inventory was first needed to identify the types and geographic expanse of natural assets in the Town, and to assess their overall condition, risk levels, replacement costs and valuation of ecosystem services. This work directly supports Bold Action 5: Develop an action plan to create a natural asset inventory, in The Blue Mountains Future Story.

Two consultants in partnership, North South Environmental and Green Analytics, were retained by the Town to complete both an updated natural heritage study (for the Town's Official Plan review) and a natural asset inventory, with the work beginning in fall 2023 – further detailed in Staff Report PDS.23.116 Natural Asset Inventory-Natural Heritage Study Project Update on November 7, 2023. The development of these deliverables involved the creation of a dedicated project webpage and several Public Information Centres. More detail on this project's public engagement activities and project outcomes was presented to Council in Staff Report PDS.24.067 Recommendation Report – Natural Asset Inventory and Natural Heritage Study on August 27, 2024. The motion passed by Council directed, among other things, "that the "Natural Asset Inventory & Natural Heritage Study Recommendations Report May 2024" by North South Environmental be the basis for further advancing implementation of natural asset management planning, natural heritage and environmental initiatives subject to availability of resources, work program planning and further Council approval as applicable."

Green Analytics prepared a final "State of Infrastructure Report" (SIR) identifying the extent and character of natural assets within the Town's Natural Asset Inventory in February, 2025 – included as Attachment 1. Staff provided feedback and received an updated version of the SIR in May 2024, and after several internal discussions and the addition of a new Urban Forestry Coordinator position, staff are prepared to recommend next steps to begin operationalizing the natural assets inventory – in other words, identifying pathways to proactive management and enhancement of the Town's natural assets. It is recommended that staff begin this process with street trees in the Town's urban settlement areas.

D. Analysis

The Natural Asset Inventory (NAI) includes a dataset that can function as a tool for future integration of Town owned natural assets with the Town's Asset Management Plan (AMP). By quantifying the related beneficial ecological and infrastructure functions of natural assets across the Town, the NAI establishes a baseline for long-term monitoring and evaluation. The identification of Town-owned and privately held assets, related risks and associated benefits also allows for the future development of management policies, incentive programs, partnerships, or other interventions to maintain or improve the Town's natural assets and introduces a natural asset lens that may be applied to asset management decisions.

Staff continue to mature the Town's AMP for conventional assets. While it isn't yet feasible to directly incorporate natural assets into the AMP, staff will consider the feasibility of doing so in future years. Identifying and valuing natural features as asset classes is a relatively new field for most municipalities.

The State of Infrastructure Report (SIR) included in Attachment 1 analyzes the information in the NAI, underscoring the high ecological and economic value of natural assets to the Town, and makes a case for strategic investment in preservation, restoration, and risk management.

For the purposes of this report, the term "assets" refers to the three asset types contained within the inventory:

- Natural assets, which are comprised of natural features.
- Enhanced assets, which are comprised of semi-natural features that are more manicured and actively maintained.
- Agricultural assets, which were included to provide a complete picture of non-built landcover within the municipal boundary. These assets are not included in the condition or risk assessments nor were they included in the valuation of the Town's natural and enhanced assets.

The SIR analyzes natural assets across six key areas: Inventory, Condition, Risk, Replacement Cost, Ecosystem Service Valuation, and Asset Prioritization. High-level findings for each of those six areas include:

Natural Asset Inventory	The Geographic Information System-based inventory categorized natural assets at a high level as agricultural (35%), natural (62%), and enhanced (2%). The total land area assessed is 25,375 hectares.
Condition Assessment	Using indicators like patch size and proximity to water, 77% of natural assets were rated in good condition, with none rated as very poor.
Risk Assessment	Hazards such as invasive species, flooding, and erosion were evaluated. Most assets face moderate risk levels.
Replacement Cost	The estimated replacement cost for all natural assets is approximately $4.03 billion. For Town-managed assets specifically, the replacement cost is $146.2 million.
Ecosystem Services	Services such as recreation, carbon sequestration, and stormwater management were valued at $75–$92 million per year.
Prioritization	5,139 hectares (ha) of assets in good condition but at high risk, and mostly privately owned, will need preservation and monitoring. An additional 242 ha of assets in poor condition at high risk, including 11% Town-owned, are a priority for future restoration efforts. 9,053 ha of watercourse-connected assets should be preserved; only 0.6% are Town-owned. 276 ha of high-value but degraded assets and 1,425 ha of high-risk, high-value assets are flagged for restoration and monitoring.

A more complete overview of findings can be found on page 61 of the SIR (Attachment 1).

Natural asset categories and hierarchies were developed for the Town to identify and value local ecologically beneficial land uses, as presented in Tables 2-1 “Natural asset hierarchy” and 2-2 “Other land asset hierarchy” in the SIR (Attachment 1, page 11). These hierarchies represent the types of assets and lands identified, mapped and assessed in the SIR and are summarized in the table below. As noted above, agricultural lands were identified for the inventory but were excluded from the condition, risk and valuation assessments.

Level 1	**Level 2**	**Level 3**
Natural Asset	Aquatic	Open Aquatic
	Hedgerow	Hedgerow
	Meadow	Meadow
	Wetland	Meadow Marsh, Swamp, Treed Swamp
	Woodland	Coniferous Plantation, Cultural Woodland, Deciduous Plantation, Thicket, Treed Area, Woodland
	Shoreline	Beach, Rocky
	Watercourse	Permanent Stream, Intermittent Stream, Virtual Connector, Virtual Flow

Level 1	Level 2	Level 3
Agriculture	Agriculture	Active Orchard, Open Agriculture
Enhanced	Built-Up Pervious	Golf, Park, Ski Hill
	Street and Park Trees	

Several natural asset types have some protections under federal or provincial regulations; for example, certain wetlands are protected from development and other land use changes under the Provincial Planning Statement. Additional examples of existing protections for the Town's natural assets include: Grey County's Forest Management By-Law, which promotes woodland preservation; the Niagara Escarpment Commission, which applies policies to protect and enhance the Niagara Escarpment's environmental features; and Conservation Authorities, which regulate development and activities in or near flood-prone areas, wetlands, and shorelines.

Natural assets will change over time due to land use development and other human and natural influences. Tree canopy targets are commonly used by municipalities to work towards or maintain a minimum level of canopy as their communities grow and develop. Many larger urban areas have a target canopy cover of 30% to 40%. The SIR has estimated the tree canopy cover for each of the Town's settlement areas, with values ranging between 17% and 50% cover and an overall average of 32% tree cover. The table below highlights the approximate level of tree canopy cover for each settlement area. This information could help prioritize the location of future tree planting or other initiatives to improve tree canopy cover.

Tree Canopy Cover by Settlement Area (2023/2024)

Settlement	Settlement Area (ha)	Canopy Area (ha)	Percent Canopy Cover
Banks	25	10	40%
Camperdown	734	274	37%
Clarksburg	191	80	42%
Craigleith	1,467	422	29%
Gibraltar	23	11	48%
Heathcote	24	5	21%
Lora Bay	437	166	38%
Ravenna	12	2	17%
Redwing	3	1	33%
Slabtown	11	4	36%
Swiss Meadows	62	31	50%
Thornbury East	99	21	21%
Thornbury West	307	76	25%
Total	**3,395**	**1,103**	**Average – 32%**

Street Trees

The SIR counts and identifies the locations of trees on all lands across the municipality. While individual trees on municipal lands and streets are categorized as “enhanced assets” (and not “natural assets”) they are still within the broader green infrastructure definition and provide measurable ecosystem and community benefits. These valued services include carbon sequestration, air quality regulation, urban air cooling, stormwater regulation, habitat, and more. Street trees are the Town’s responsibility to manage or remove as necessary, but management of Town street trees has so far been reactive (e.g. removing a hazard tree) rather than proactive.

The following table summarizes the number of trees within the road right-of-way (ROW) counted in the SIR across the entire municipality. Obtaining an exact count of street trees without field proofing is challenging, due to mapping accuracy, canopy interpretation and the difficulty of identifying small, young or newly planted trees from LiDAR data. Despite the challenges, the new street tree mapping layer is a starting point for building a street tree inventory that can be included in the Town’s Asset Management Plan that can be improved with future ground-proofing.

The following table highlights the approximate number of trees to manage in the municipal right-of-way (ROW). Trees strictly within the ROW as detected by the LiDAR with a 0-metre buffer represent the most likely count of trees within the Town’s responsibility. Ground-truthing is ultimately required to determine if a tree is the Town’s responsibility, meaning the following numbers are shared as an initial approximation only.

Road Right-of-Way (ROW) category	**Tree Count – Overall**	**Tree Count – Excluding natural and enhanced areas**
Unopened Road ROW	21,012	2,357
Open Road ROW	24,498	15,282
Open Road ROW outside of Settlement Areas	16,324	8,288
Open Road ROW within Settlement Areas	8,174	**6,994**

Staff recommend building out the Town’s street tree inventory by initially focusing on the approximately 6,994 trees identified within the open road ROW, staying entirely within the Town’s settlement areas. Under this approach, trees within the Town’s ROW but that are either outside the settlement areas, part of unopened road allowances, or are adjacent to natural areas, will not be a priority for active management by the Town.

Trees located in the road ROW will be mapped in the Town’s Geographic Information System (GIS) with identification numbers assigned to each tree point. Staff are exploring tools to assist in tracking tree health and maintenance activities in order to harmonize this on-the-ground data with the Town’s GIS tree registry. Over time, the improved data will assist in planning and budgeting for asset renewal projects and operational priorities.

A street tree inventory was first initiated by a Master of Forestry student with the University of Toronto, under Town supervision and with the support of volunteers in the summers of 2023 and 2024. These efforts identified 1,666 trees with partial tree condition data in the Thornbury, Clarksburg, Swiss Meadows and Lora Bay communities, providing on-the-ground observational data for many of these trees that will be used in the completed inventory of trees.

As recommended in OPS.25.042 Terms of Reference for Biodiversity and Urban Forest Strategy (BUFS) Task Force, at the October 28, 2025 Committee of the Whole, the BUFS Task Force will identify further direction for proactive street tree and canopy management.

Preservation, Restoration, and Risk Management

The Town faces several challenges that impact and limit what the Town can do to effectively monitor and manage natural assets:

- Most of the Town's natural assets are privately owned. As a result, many assets and services provided by the Town's natural assets are outside the Towns direct control. Therefore, effective management of natural assets and the community services they provide requires a combination of strong natural heritage policy along with stewardship, education, and outreach programing.
- The Town currently has limited capacity to actively monitor and manage natural assets through a formal natural asset management program. The Town must carefully prioritize specific actions.
- The Town has been under significant development pressure in recent years. This combined with (1) most natural assets being privately owned, and (2) limited management capacity by the Town, has the potential to lead to irreversible losses of the Town's natural assets and undermine the services they provide as well as the Town's strategic sustainability priorities.

The proposed BUFS Task Force will be pivotal in helping the Town identify policy and program proposals that can help to preserve trees and provide a consistent approach to tree management in capital projects.

In addition to street tree and canopy management, Town staff can explore opportunities to invest in restoration, such as in-kind or small financial donations to community-led restoration projects (several have already been supported by the Environmental Sustainability Fund or with third-party tree-planting funds). Partnerships with Grey County, Conservation Authorities, land trusts, and other stakeholders can also be explored and acted upon where there are clear benefits to the Town's tree canopy and/or health of other key natural assets. Identifying key projects and seeking third-party funding may also be important activities to enable new restoration work.

Managing infrastructure risk is a key goal of asset management and the Town's existing Asset Management Plan. Monitoring and measuring asset conditions is a critical aspect of reducing risk. The SIR and the related inventories, beginning with the urban street tree inventory, will

allow the Town to begin the process of better accounting for the Town's broader range of natural assets.

Summary of Conclusions and Next Steps

This report and the associated natural asset inventory allow the Town to begin the process of better accounting for their natural assets. The SIR and the supporting data provide a starting point for integrating natural assets into the Town's broader asset management planning process.

This integration will be a long-term effort, and it is recommended to complete the Town's urban street tree inventory for use in developing a tree and canopy management program. This approach will provide an understanding of natural asset management with assets that are within the Town's ownership and control, and the processes and lessons learned from managing street trees can then provide a good foundation for expanding to other important natural assets as well as for inclusion in the Asset Management Plan.

As outlined in Staff Report PDS.24.067 Recommendation Report – Natural Asset Inventory and Natural Heritage Study and in CSOPS.24.032 Biodiversity and Urban Forestry Strategy, a net-gain approach has been adopted by the Town. Per OPS.25.042 Terms of Reference for Biodiversity and Urban Forest Strategy (BUFS) Task Force, also presented at the October 28, 2025 Committee of the Whole, the Town will begin to organize a Task Force that will consider the details of a tree and canopy management program. The BUFS can consider how the Town can integrate a net gain approach.

Developing a tree and canopy management program and initiating the BUFS Task Force are recommended as primary next steps for staff. Investments in the maintenance of canopy cover (where it is high) and increased canopy cover (where it is low) can then occur over time. To manage costs, a schedule for investments in maintaining existing trees and planting new trees can be developed. Outreach and stewardship programs will continue to support maintaining and enhancing canopy cover on privately owned lands.

E. Strategic Priorities

1. Communication and Engagement

We will enhance communications and engagement between Town Staff, Town residents and stakeholders

2. Organizational Excellence

We will continually seek out ways to improve the internal organization of Town Staff and the management of Town assets.

3. Community

We will protect and enhance the community feel and the character of the Town, while ensuring the responsible use of resources and restoration of nature.

4. Quality of Life

We will foster a high quality of life for full-time and part-time residents of all ages and stages, while welcoming visitors.

F. Environmental Impacts

Natural assets have myriad benefits for the community, including ecosystem services such as flood risk mitigation, shade and cooling, habitat and biodiversity, carbon sequestration, and more. The Town's role in protecting and/or enhancing natural assets to retain their benefits for the community will be informed by the SIR and associated natural asset inventory.

The natural asset inventory, presented in the SIR and also held by Town staff as GIS information, marks the completion of Bold Action 5 in The Blue Mountains Future Story: "Develop an action plan to create a natural asset inventory to include climate vulnerabilities and inform asset management planning". Further steps to implement the natural asset inventory are recommended in this report and will be explored by staff and local stakeholders for future partnerships or recommendations to Council.

G. Financial Impacts

Recommended interventions to preserve, remediate and/or enhance the Town's natural assets, such as proposed policies, programs, or tools, may come before Council for direction on implementation, with possible budget and/or staffing implications. Staff will continue to explore third-party funding and partnership opportunities to support the health of and reduce risks to local natural assets.

H. In Consultation With

Nicholas Cloet, Sustainability Coordinator

John McMullen, Urban Forestry Coordinator

Monica Quinlan, Director of Corporate & Financial Services / Treasurer

Vicky Bouwman, Asset Management Specialist

I. Public Engagement

The topic of this Staff Report has not been the subject of a Public Meeting and/or a Public Information Centre as neither a Public Meeting nor a Public Information Centre are required.

However, any comments regarding this report should be submitted to Jeffery Fletcher, Manager of Sustainability & Solid Waste managersolidwaste@thebluemountains.ca.

J. Attached

1. Attachment 1: State of Infrastructure Report

Respectfully submitted,

Jeffery Fletcher,
Manager of Sustainability & Solid Waste

Alan Pacheco
Director of Operations

For more information, please contact:
Jeffery Fletcher, Manager of Sustainability & Solid Waste
managersolidwaste@thebluemountains.ca
519-599-3131 extension 238

Report Approval Details

Document Title:	OPS.25.046 Natural Asset Inventory - State of the Infrastructure Report.docx
Attachments:	- Attachment 1 State of Infrastructure Report.pdf
Final Approval Date:	Oct 3, 2025

This report and all of its attachments were approved and signed as outlined below:

Jeff Fletcher - Oct 3, 2025 - 11:23 AM

Alan Pacheco - Oct 3, 2025 - 12:51 PM