



PORT OF
BELLINGHAM,
WASHINGTON

AN ASSESSMENT OF EXISTING AND POTENTIAL TREE CANOPY

17% TREE CANOPY (2023)
25% POTENTIAL PLANTING AREA
53% IMPERVIOUS SURFACES

PROJECT BACKGROUND

Tree canopy plays a crucial role in balancing the natural and built environments in urban areas. While industrial and commercial activity are vital to economic prosperity, they can also strain local ecosystems. Tree canopy in port landscapes serves as a powerful tool for mitigating these impacts—enhancing stormwater management by reducing runoff, filtering pollutants, and stabilizing coastal areas. Additionally, trees contribute to improved air quality, reduce the urban heat island effect, and create natural buffers that boost the aesthetic and ecological resilience of port operations.

This assessment analyzed tree canopy (TC) and possible planting areas (PPA) in designated subareas within the Port of Bellingham, providing essential data to support long-term environmental and climate-action planning. By identifying opportunities to expand and protect canopy cover, this factsheet offers actionable insights to help the Port of Bellingham optimize the benefits of its canopy.

PROJECT METHODOLOGY

This assessment, conducted by [PlanIT_Geo](#) in partnership with data provider [EarthDefine](#), utilized high-resolution (60-centimeter) multi-spectral imagery from the U.S. Department of Agriculture's National Agriculture Imagery Program (NAIP) collected in 2023 to classify land cover types within the Port of Bellingham's (PoB) Area of Interest (AOI).

The AOI for this assessment comprises five designated subareas within the Port of Bellingham as follows: Blaine, Bellingham International Airport, Marine Drive Park, Squalicum Harbor, and Fairhaven. A map of these areas can be found on Page 3 of this factsheet.

The results provide a near-current view of land cover and will support the development of new strategies and the revision of existing plans to protect and expand the tree canopy. Modern machine learning techniques were applied to create a reproducible land cover dataset, ensuring uniform comparisons in future tree canopy and land cover assessments. This factsheet follows US Forest Service standards, reporting tree canopy metrics as a percentage of the land area (excluding water bodies) unless stated otherwise.

Additionally, the ecosystem services have been evaluated using the i-Tree Landscape tool, which estimates their monetary value by applying standardized economic models and incorporating field-collected data to quantify benefits derived from current landscape conditions. These outputs are further refined using the tree canopy acreage obtained from this high-resolution assessment, ensuring more precise calculations. [See here](#) for more detailed methodology.

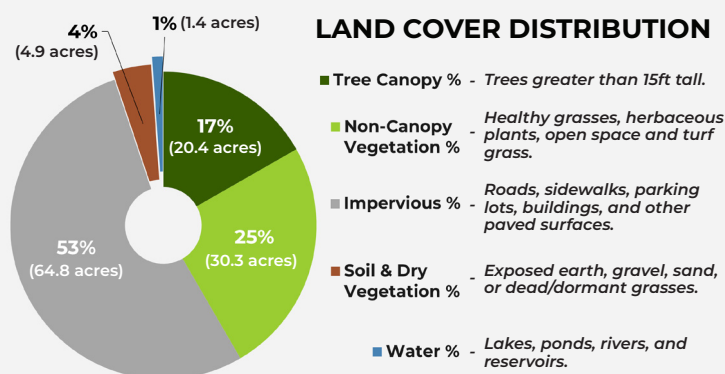


Figure 1. Total distribution of land cover classes within Port of Bellingham's Area of Interest.

PORT OF BELLINGHAM'S ECOSYSTEM SERVICES

CLEANER AIR \$8,177

Each year, PoB's trees remove 0.8 tons of particulate matter from the air.

STORMWATER MANAGEMENT \$5,323

PoB's trees intercept about 0.6 million gallons of runoff annually.

TOTAL ANNUAL BENEFITS

Port of Bellingham's (PoB) trees annually provide **\$17,284** in ecosystem benefits.

That equates to approximately **\$864 per acre of canopy.**

CARBON STORAGE \$134,353

PoB's urban forest stores 788 tons of carbon.

CARBON SEQUESTRATION \$3,784





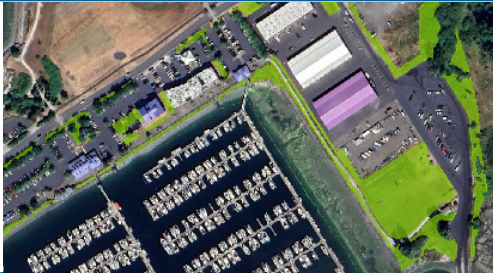


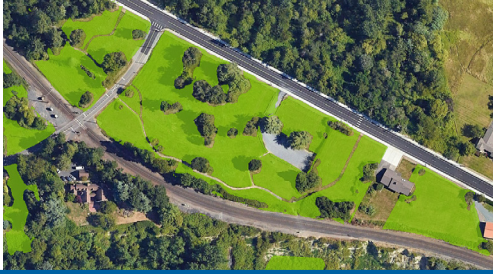








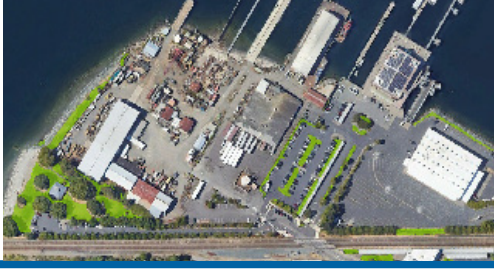
In one year, PoB's trees absorb 22 tons of CO₂ from the atmosphere.

Figure 2. Ecosystem services provided by the Port of Bellingham's urban forest.

TREE CANOPY ASSESSMENT RESULTS & PLANTING PRIORITIZATION

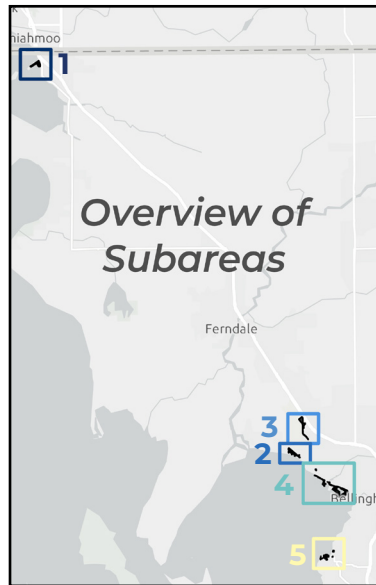
Protecting and increasing tree canopy cover in port areas offers a wide array of targeted benefits for the local community, as well as for the environment and port operations. Trees play a vital role in mitigating stormwater runoff by intercepting rainfall, reducing the burden on drainage infrastructure, and filtering pollutants before they reach coastal waterways. Additionally, they help reduce localized temperatures by mitigating the urban heat island effect, which can be intensified in industrial areas with large expanses of impervious surfaces.

To locate specific areas in need, each subarea was ranked based on two factors: urban heat island and stormwater management. Increasing and maintaining canopy in these locations can have far-reaching benefits, improving air and water quality and enhancing the Port's resilience to help meet its climate action goals.

 Urban Heat Island	Average surface temperature of the subarea during a hot summer day.	 Stormwater Reduction	Percentage of potential planting area within 100 feet of impervious surfaces and waterbodies.
Plantable Space Example:			
 93.7 °F  27%	<i>At Blaine, stormwater mitigation is the highest priority.</i> Blaine experiences both a high urban heat island effect and a high potential for stormwater mitigation. However, stormwater mitigation is the primary priority in this area. There is significant opportunity for tree planting in the parking lot planting strips and greenspaces near the marina. Adding trees in these areas would help lower surface temperatures and protect the Boating Center, Amphitheater, and other infrastructure from storm surges.		
 88.3 °F  48%	<i>At Marine Drive Park, stormwater mitigation is the highest priority.</i> Marine Drive Park has a very high potential for stormwater mitigation, making it a key consideration for the area. In contrast, the urban heat island effect is low and less of a concern. There are significant opportunities to enhance stormwater management by planting more trees in its greenspaces between Bellingham Bay and Marine Drive. Trees help manage stormwater by reducing runoff, filtering pollutants, stabilizing soil, protecting water quality, and minimizing coastal erosion.		
 99.3 °F  4%	<i>At Bellingham International Airport, mitigating the heat island effect is the highest priority.</i> Bellingham International Airport experiences a very high urban heat island effect, making heat retention a large concern. Efforts to manage stormwater runoff are limited. The subarea has a high percentage of impervious surfaces, primarily parking lots and access roads, which exacerbates surface temperatures. However, strategically planting trees in the medians can provide shade, reduce high temperatures experienced by airport patrons, and improve both comfort and aesthetics.		
 91.6 °F  25%	<i>At Squalicum Harbor, stormwater mitigation is the highest priority.</i> Squalicum Harbor has a moderate potential for stormwater mitigation. This factor is considered a higher priority compared to addressing the urban heat island effect. Planting opportunities are limited due to land use, as much of the open space in parks is designated for recreational activities. Despite this, strategically planting trees in the medians along the marina's edges can still help maximize tree canopy benefits.		
 91.4 °F  14%	<i>At Fairhaven, mitigating the heat island effect is the highest priority.</i> Fairhaven experiences a moderate urban heat island effect. Addressing this issue is a higher priority than stormwater mitigation. This area is dominated by impervious surfaces and has limited planting potential, resulting in fewer opportunities for impactful interventions. While some tree planting can occur in medians and along the edges of greenspaces and parking lots, the limited space for expansion makes it crucial to preserve and maintain existing canopy.		

PORT OF BELLINGHAM'S AREA OF INTEREST: FIVE SUBAREAS

This assessment identified five subareas within the Port of Bellingham: *Blaine*, *Bellingham International Airport*, *Marine Drive Park*, *Squalicum Harbor*, and *Fairhaven*. These areas were selected because their coastal placement and proximity to port operations make the benefits of trees—such as stormwater management, air quality improvement, and buffering against coastal winds—especially critical. Parcels with limited potential planting area, such as impervious industrial lots, were excluded from the assessment due to their lack of potential to support canopy expansion.



1. Blaine

13% 27%
1.6 ACRES OF TC 3.6 ACRES OF PPA

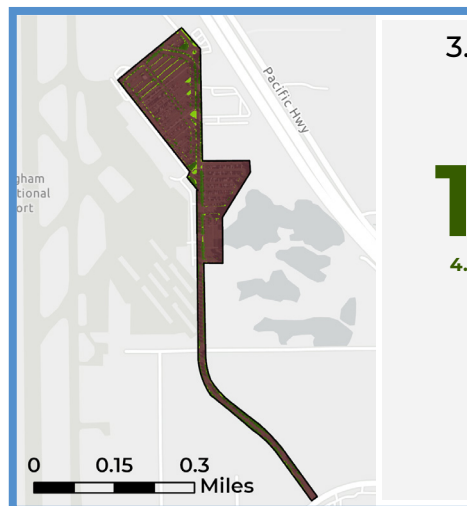
57%
7.5 ACRES OF IMPERVIOUS SURFACES



2. Marine Drive Park

41% 53%
7.7 ACRES OF TC 9.9 ACRES OF PPA

6%
1.0 ACRES OF IMPERVIOUS SURFACES



3. Bellingham International Airport

14% 4%
4.0 ACRES OF TC 1.2 ACRES OF PPA

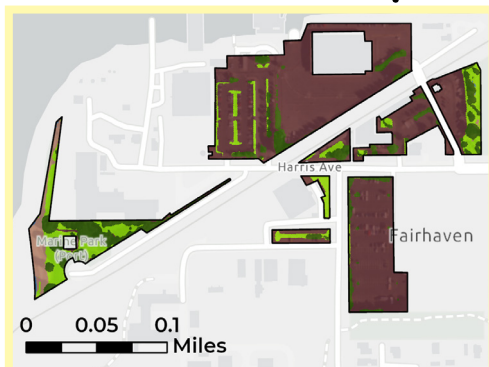
81%
22.6 ACRES OF IMPERVIOUS SURFACES



4. Squalicum Harbor

10% 28%
4.7 ACRES OF TC 13.3 ACRES OF PPA

53%
25.7 ACRES OF IMPERVIOUS SURFACES

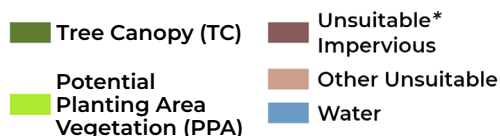


5. Fairhaven

19% 14%
2.4 ACRES OF TC 1.8 ACRES OF PPA

63%
8.0 ACRES OF IMPERVIOUS SURFACES

TREE CANOPY POTENTIAL CLASSIFICATION



*Unsuitable areas or areas where it is not feasible to plant trees are comprised of impervious surfaces, bare soil/sand, and areas specifically designated as recreational spaces. All non-canopy vegetation is considered potential planting area, although local contexts may limit actual canopy expansion in these areas. Ground-truthing and strategic planning are necessary.