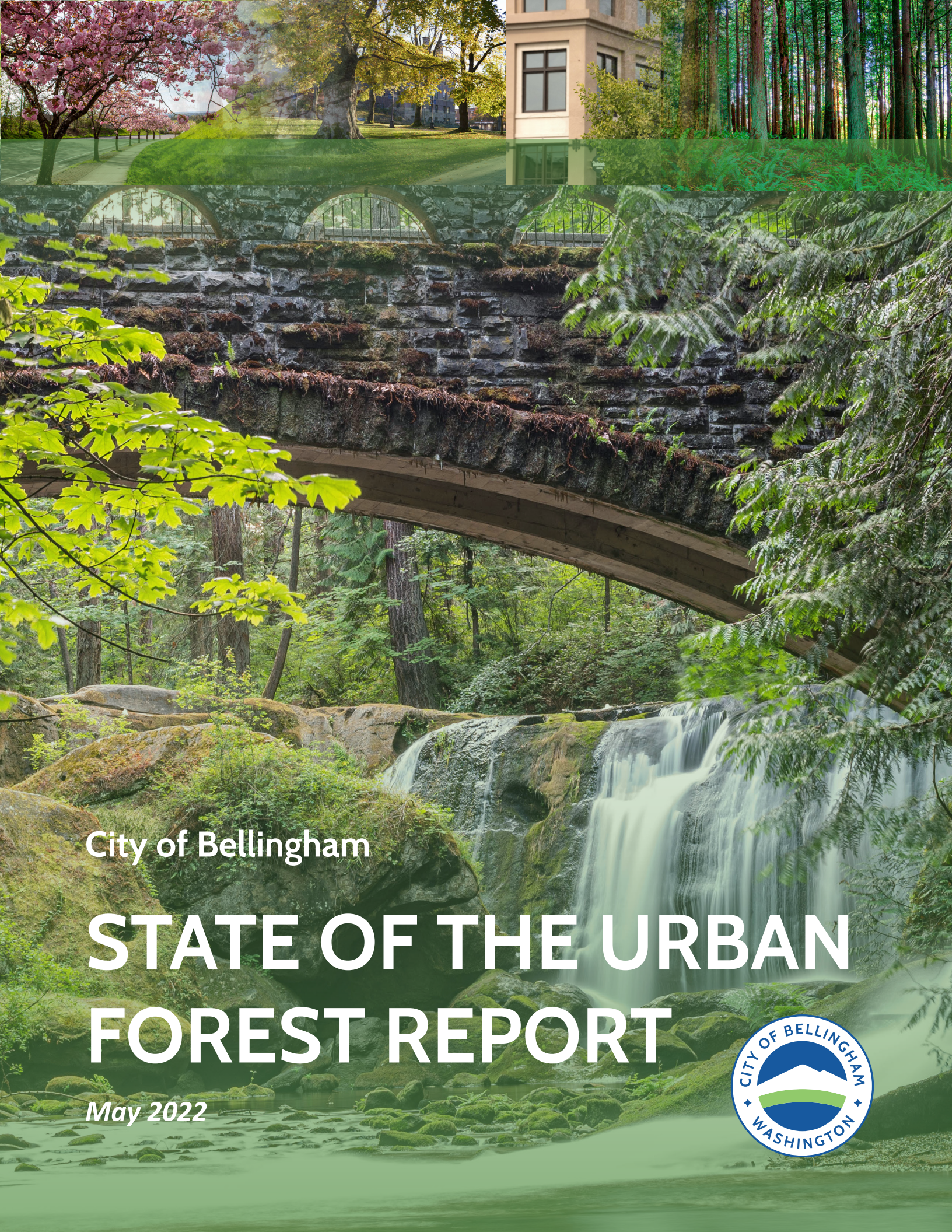


City of Bellingham

STATE OF THE URBAN FOREST REPORT

May 2022

ACKNOWLEDGEMENTS

Diamond Head Consulting (Ltd.) prepared this report for the City of Bellingham. DHC acknowledges the participation and support of City of Bellingham departments and staff in preparing this document.

Prepared by

DIAMOND HEAD

Date

May 2022

Consultant team

Amelia Needoba

Camille Lefrançois

Elliot Bellis

Vlad Romanescu

Nguyet-Anh Nguyen

Mike Coulthard

TABLE OF CONTENTS

1. INTRODUCTION

Bellingham's urban forest consists of all the trees in the city on both public and private property. Trees not only beautify an area, but they also provide shade, reduce levels of noise and dust, increase property values, reduce stormwater runoff, produce oxygen, absorb carbon dioxide, improve wellbeing, and provide habitat for wildlife. The City recognizes the value of trees and Bellingham is a proud Tree City USA community, recognized nationally for its citizen-based effort to sustain the urban forest. The City also recognizes the importance of the urban forest in the Comprehensive Plan as well as through goals set in Bellingham's Climate Protection Action Plan.

"The City's urban forest should be managed in a way that optimizes the environmental, economic and social benefits it provides. An urban forestry management plan is the best tool for maintaining a healthy and desirable urban forest." - **City of Bellingham Comprehensive Plan** (2016, p. 12)

In order to effectively manage the urban forest, we first need to understand what we have. This State of the Urban Forest Report presents the results of inventories and assessments that describe the current state of Bellingham's urban forest. The purpose of the report is to summarize information about Bellingham's urban forest to inform goal setting and to establish the baseline for measuring future change[1]. The report establishes a baseline for Bellingham's urban forest by quantifying its distribution, structure, and some of the value it provides to our community. The findings in this report are based on analyses completed in 2021 and 2022 using data available for 2003, 2013, and 2018 combined with limited ground truthing.

1 More detailed information is contained in the following technical reports: Canopy and Forest Structure Analysis Summary Report (Diamond Head Consulting, 2021) and Wildlife Corridor Analysis (Diamond Head Consulting, 2021). Reports are available here: www.cob.org/UFMP.

"Urban forestry is the 'art, science and technology of managing trees and forest resources in and around urban community ecosystems for the physiological, sociological, economic, and aesthetic benefits trees provide society" **(Helms, 1998)**

Learn about Bellingham's urban forest in the following four sections:

1. **Introduction** - an overview of what an urban forest is and why Bellingham developed this state of the urban forest report
2. **What is the urban forest?** – presents the definition of the urban forest and highlights key benefits provided to the community.
3. **State of the urban forest** – provides the current context of the urban forest resource including canopy cover, forest quality and maturity, ecosystem services, the Tree Equity Score, and fish and wildlife habitat.
4. **Canopy cover change** – provides the key drivers of canopy change and illustrates canopy loss and gain and associated trends between 2006 and 2018.
5. **Summary and conclusion** – summarizes key findings of the State of the Urban Forest Report

2. WHAT IS THE URBAN FOREST?

The urban forest includes all trees, vegetation, soils, associated natural processes, and cultural elements, found in towns, cities, and other communities where people reside. Bellingham's urban forest spans both public and private property, and includes the street trees, park trees, forested open spaces, trees on institutional campuses and trees in many private ownership settings, ranging from parking lots to backyards (Figure 1). The forests on the Coast Salish land and waters we call Bellingham today have been cared for by the peoples of the Lhaq'temish (Lummi) Nation and Nuxwsa'7aq (Nooksack) Tribe since time immemorial. The forests of this region were much altered with Euro-American settlement and, today, forested parks and riparian areas intermingle with urban trees to create the mosaic of native and introduced tree species that make up Bellingham's urban forest.

The urban forest provides significant benefits to our community and associated landscape (Figure 2 on the following page). Trees provide important habitat for a variety of fish and wildlife. Trees are also the lungs of our cities, cleaning air pollutants, sequestering carbon from the atmosphere and producing oxygen. On hot summer days, trees shade and cool streets and buildings, lowering energy costs and reducing risk of heat related illness, especially for vulnerable populations. Trees stabilize steep slopes and capture stormwater from heavy rainfall events and snowmelt, reducing pressure on our stormwater systems and keeping waterways healthy.

Trees also help reduce people's stress, encourage physical activity, and foster cultural and spiritual connections with our natural environment. Our local economy benefits when trees reduce heating and cooling costs, encourage people to spend more time in local shopping streets and attract tourism to our city. Prioritizing a healthy urban forest also prioritizes the health, wellbeing, and resilience of our community.

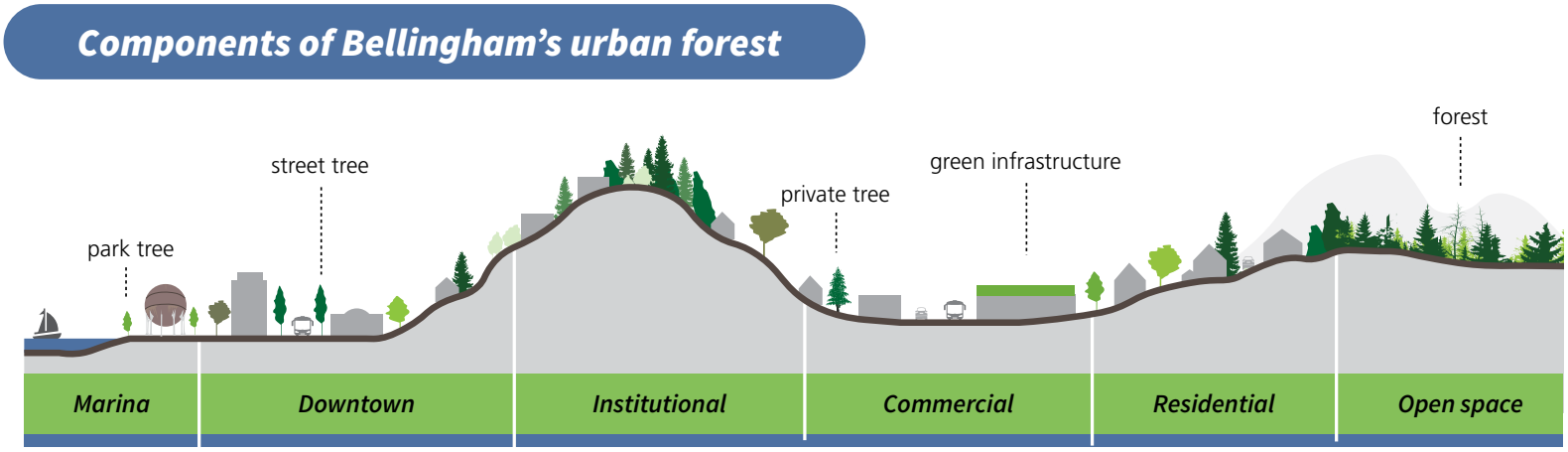


Figure 1. Bellingham's urban forest includes all trees, vegetation, soils, associated natural processes, and cultural elements spanning the marina, downtown, institutional lands, commercial, residential, and open space areas.

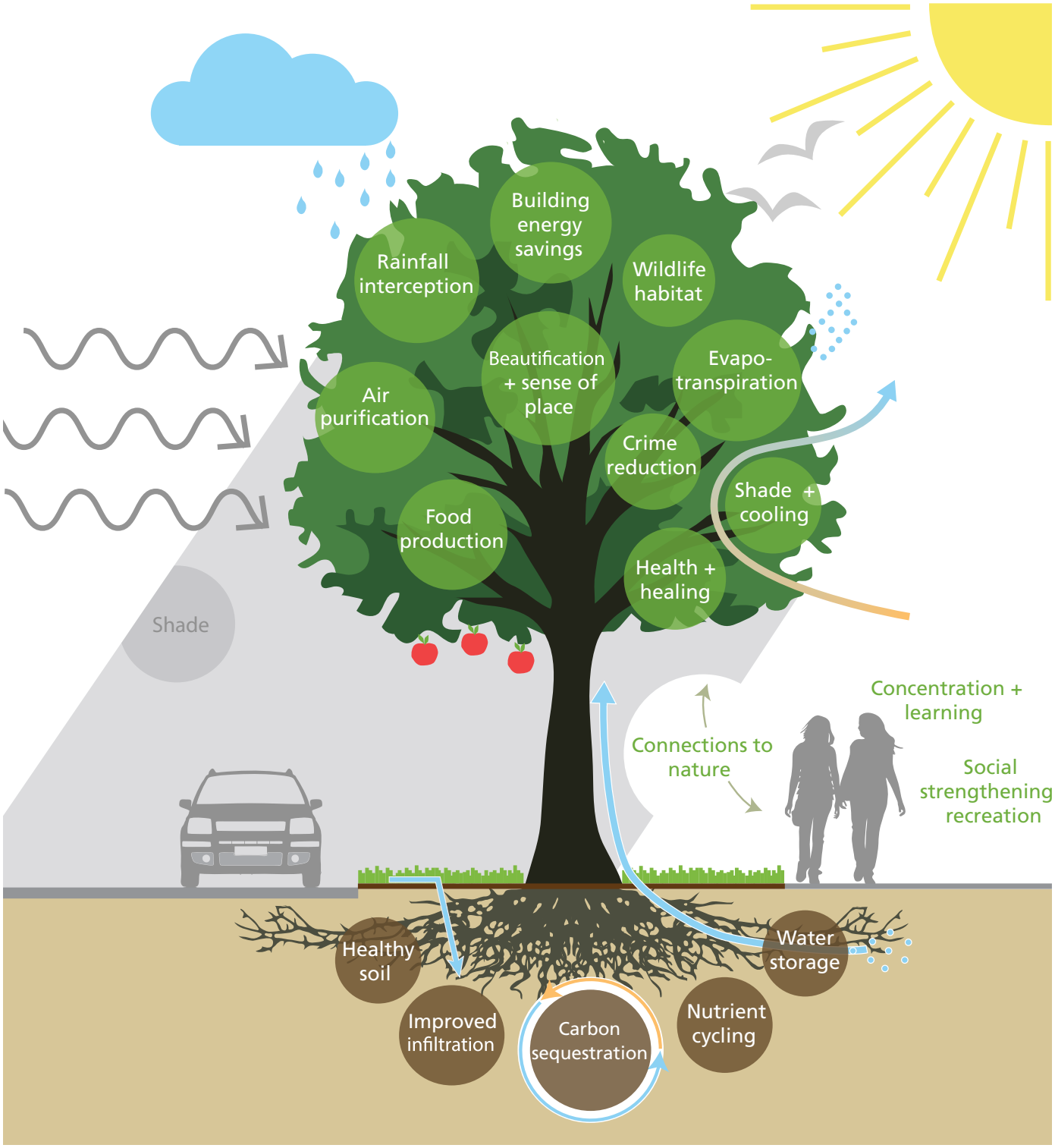


Figure 2. The urban forest provide numerous benefits that contribute to our community's overall wellbeing.

3. STATUS OF THE URBAN FOREST

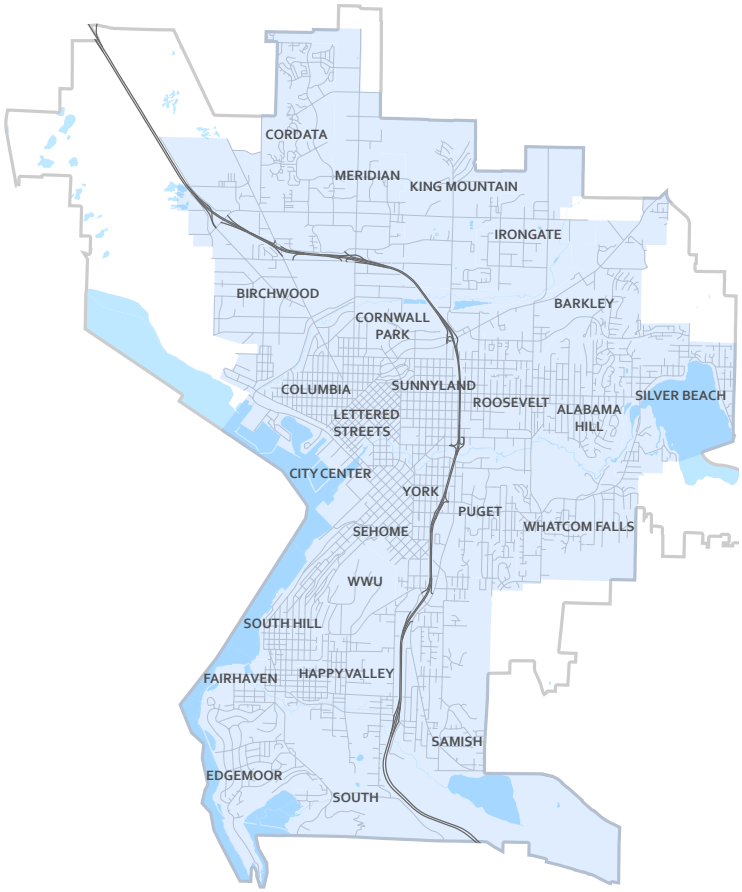
This section describes the results of the canopy cover analysis, forest quality analysis, ecosystem services estimates, tree equity score, and fish and wildlife habitat for Bellingham's urban forest. Results are from analyses completed in 2021 using data from 2013 and 2018.

Geographic scales use in this report

The geographic scales used to summarize key metrics are illustrated below:

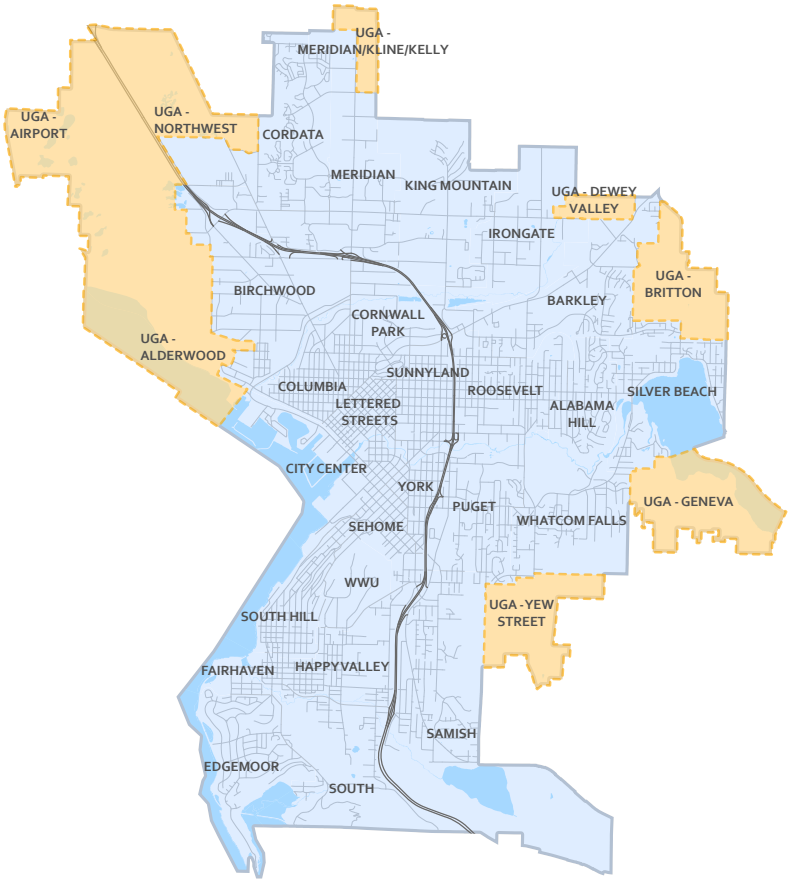
City of Bellingham boundary

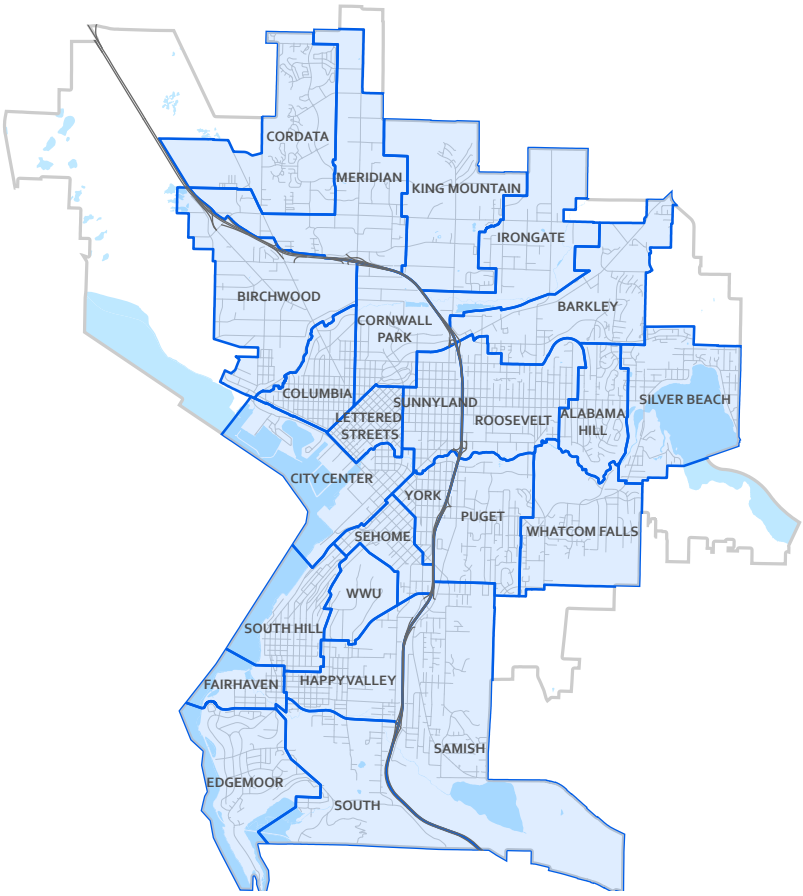
The **city boundary** excludes the urban growth areas in Bellingham.



City of Bellingham + Urban Growth Area (UGA) boundary

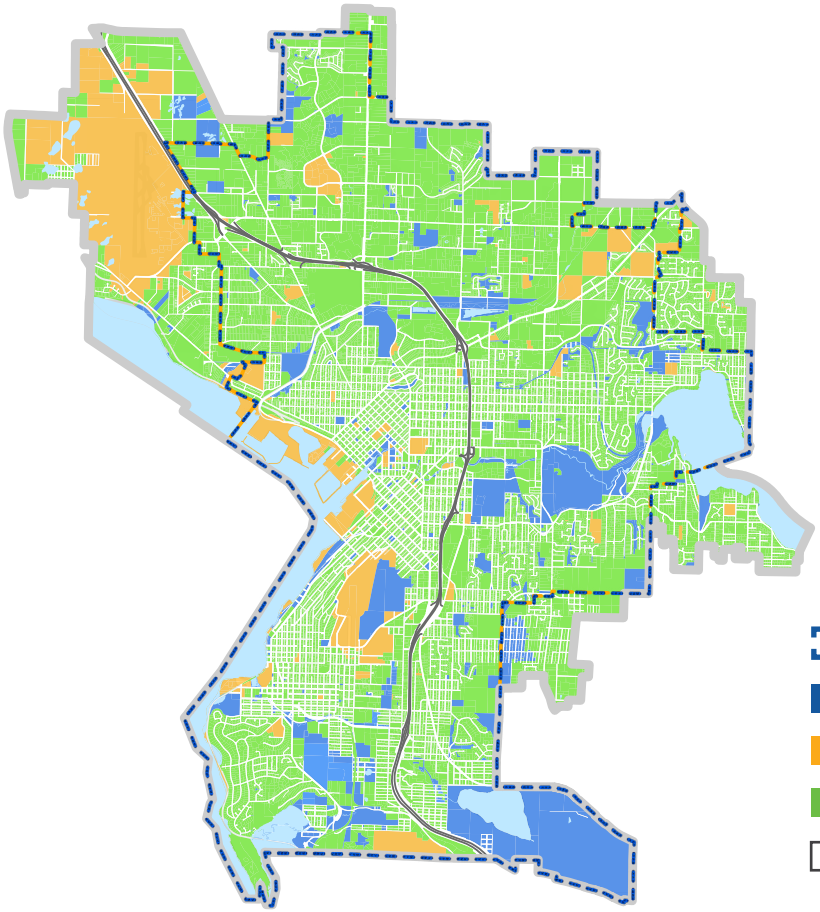
Includes all areas within the **city boundary** plus the **urban growth areas**, the adopted boundaries for anticipated city growth.





City neighborhoods

The city consists of 25 neighborhoods.



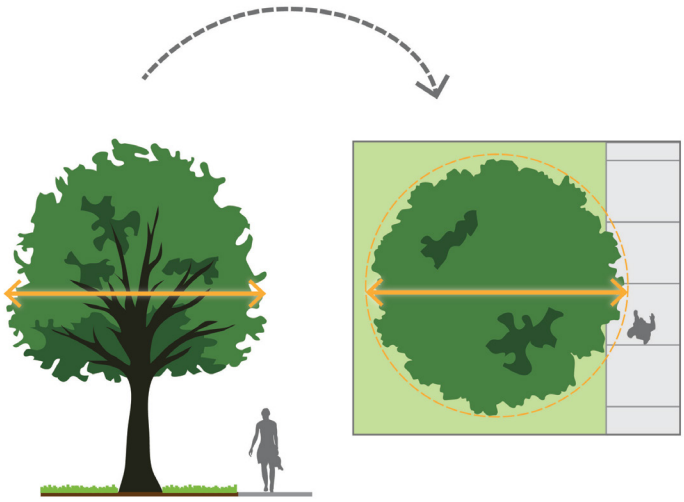
Management units

Management units represent areas of different ownership and uses including the City of Bellingham, private ownership, and other public ownership such as the Lummi Nation and Bellingham School District.

- City boundary
- City of Bellingham
- Other public
- Private
- ROW

Canopy cover change

Canopy cover is often used to describe the quantity or extent of the overall urban forest resource. Canopy cover measures the area occupied by tree crowns (the upper leafy surface) when viewed from above the tree from a bird's eye view. Canopy cover is often reported as a percent of total land area covered by trees. Canopy cover is one of the most important metrics for assessing the urban forest, is relatively easy to measure remotely, and can be compared between cities, neighborhoods and land uses.



Bellingham's canopy cover for 2018 was estimated using the most recent Light Detection and Ranging (LiDAR) imagery from 2013 and 2018 four-band orthoimagery (Figure 3). LiDAR enables estimation of tree height and location from an aircraft using a laser sensor that emits pulses to the ground. The time from when a pulse is emitted to when it is received is used to create a three-dimensional map of the surfaces. LiDAR data from 2006 and 2013 was also combined with orthoimages to generate maps of tree canopy for 2006 and 2013.

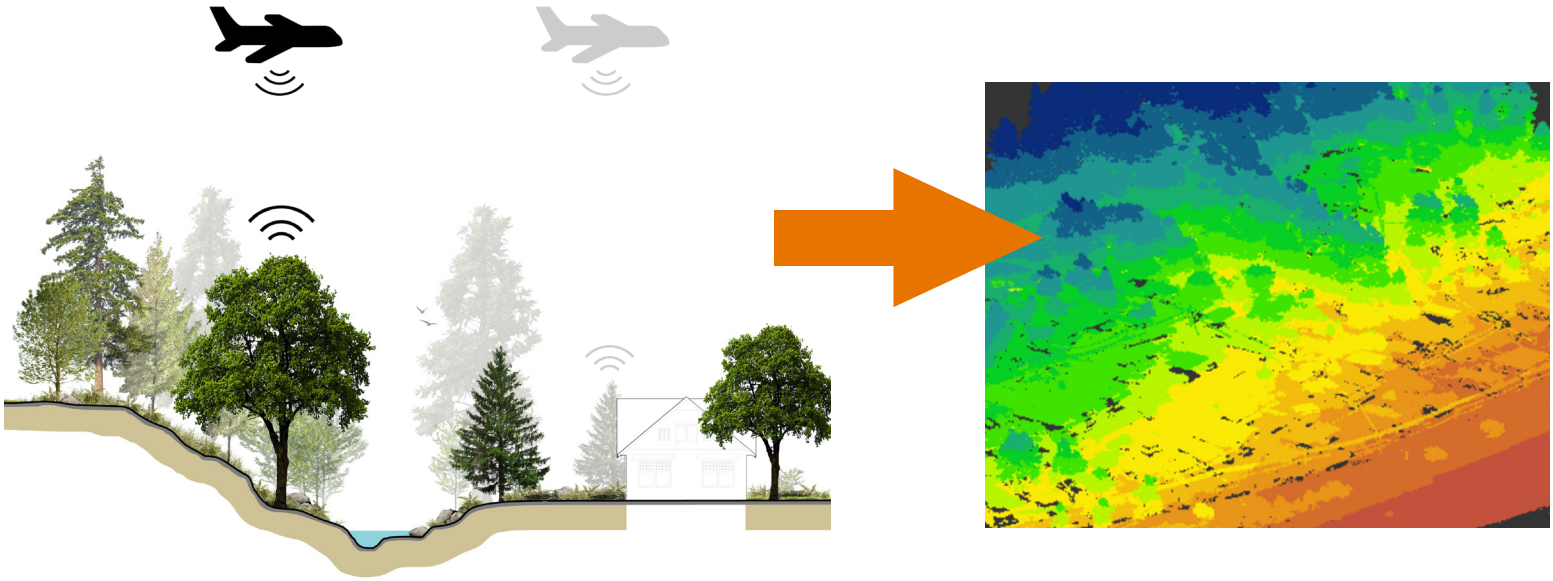


Figure 3. LiDAR is an aerial observation technology that enables us to map the City of Bellingham's tree canopy in three dimensions. In the image on the right, darker blue and green represent taller heights where yellow, orange, and red depict smaller heights.

Canopy cover citywide

Canopy cover within the City boundary was estimated at 40% (7,252 acres of canopy) in 2018, while canopy cover within the City and Urban Growth Area boundary was estimated at 42% (9,613 acres of canopy).

Figure 4 maps canopy cover in 5-acre grids, which show that canopy cover is not evenly distributed across the city. The more developed north-central, north-eastern, and central core areas typically had less than 15% canopy, while open space, riparian corridors, and the city fringes typically had more than 45% canopy cover.

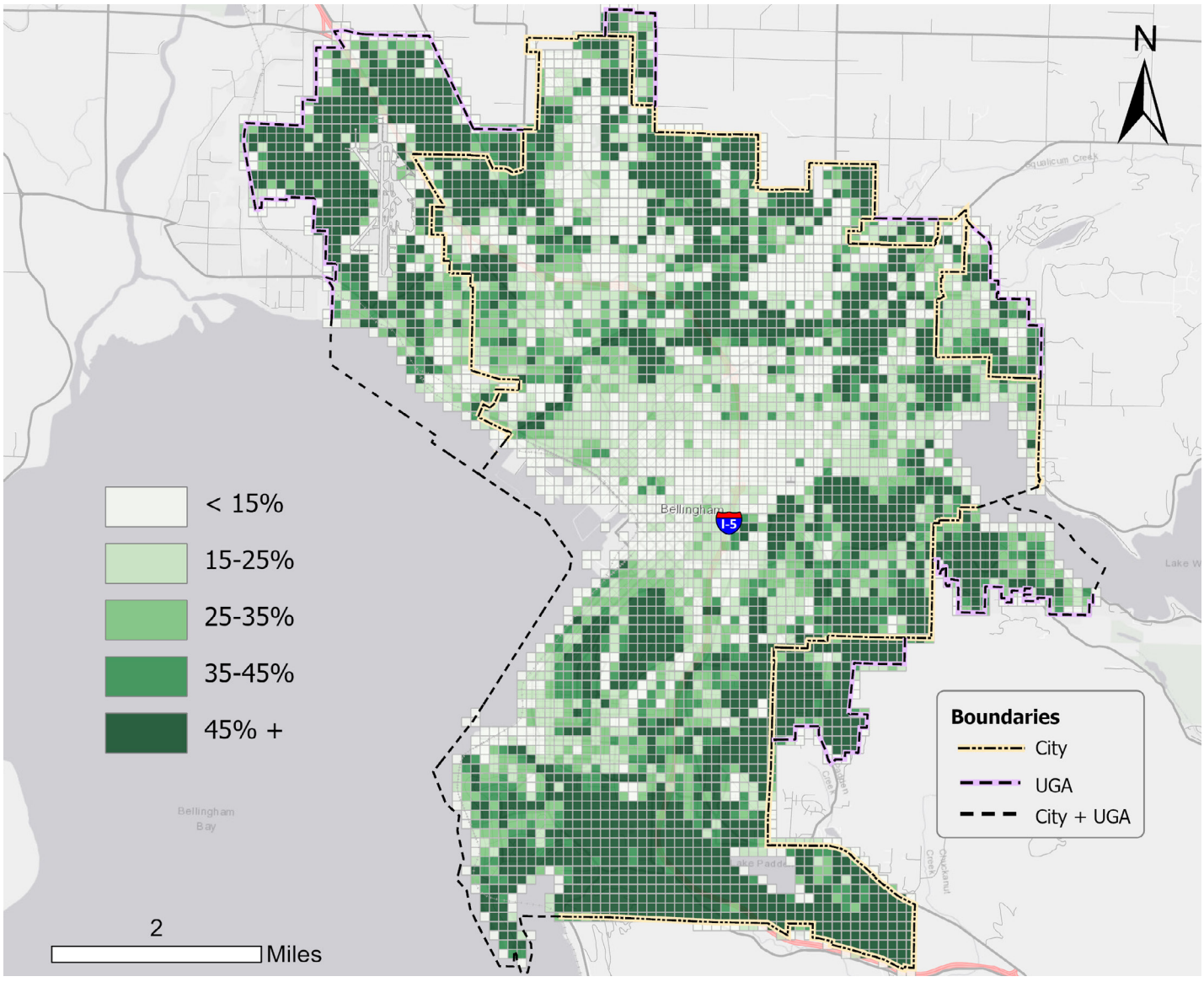


Figure 4. Bellingham's 2018 canopy cover percentage by 5-acre grid.

Canopy cover by neighborhood

Figure 5 maps canopy cover by neighborhood. The lowest cover neighborhoods were the City Center, Sunnyland, and Lettered Streets, which ranged from 10% to 16% canopy cover. The highest canopy cover neighborhoods were concentrated in the south of the city, and included Edgemoor, South, Samish, Whatcom Falls, and Western Washington University (WWU), which ranged from 51% to 73% canopy cover. In the north, King Mountain stood out as a high canopy cover neighborhood at 53%.

Street trees such as these flowering plums in Sunnyland are one example of trees contributing to a neighborhood's overall canopy cover.

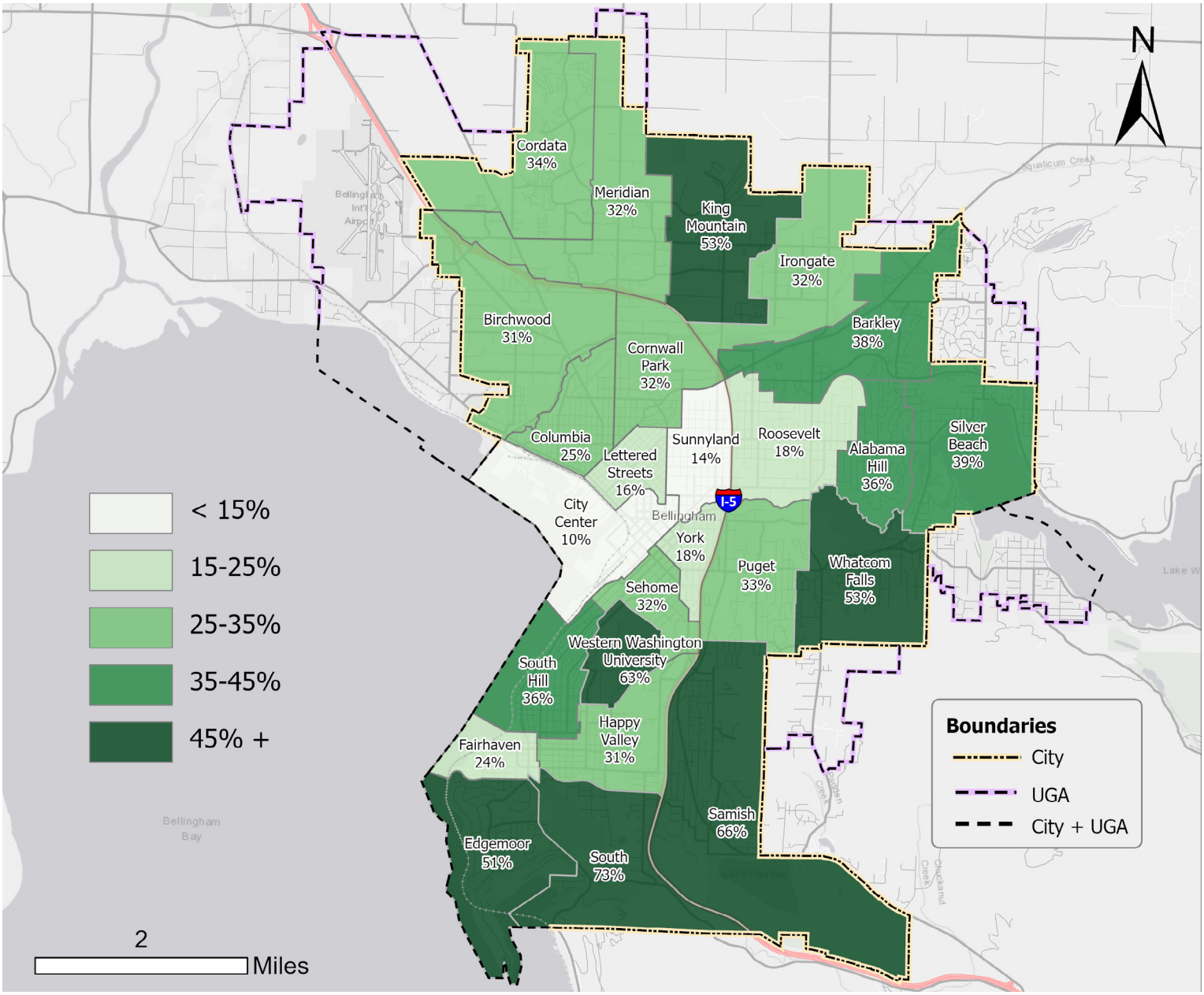


Figure 5. Canopy cover percentage by neighborhood in 2018.

Canopy cover by land use zoning

Canopy cover is not the same across Bellingham's land uses. Land use zones were grouped into ten larger classes for the purpose of this analysis. Table 1 presents the percentage of canopy land use contributes overall with the actual canopy cover by land use. Residential land use contributes the most canopy cover (46%) but has a relatively low canopy cover of 41%. While Recreation open space has the highest canopy cover, canopy area contributes just 1% of Bellingham's overall canopy cover. The distribution of land use zoning is graphed in Figure 6.

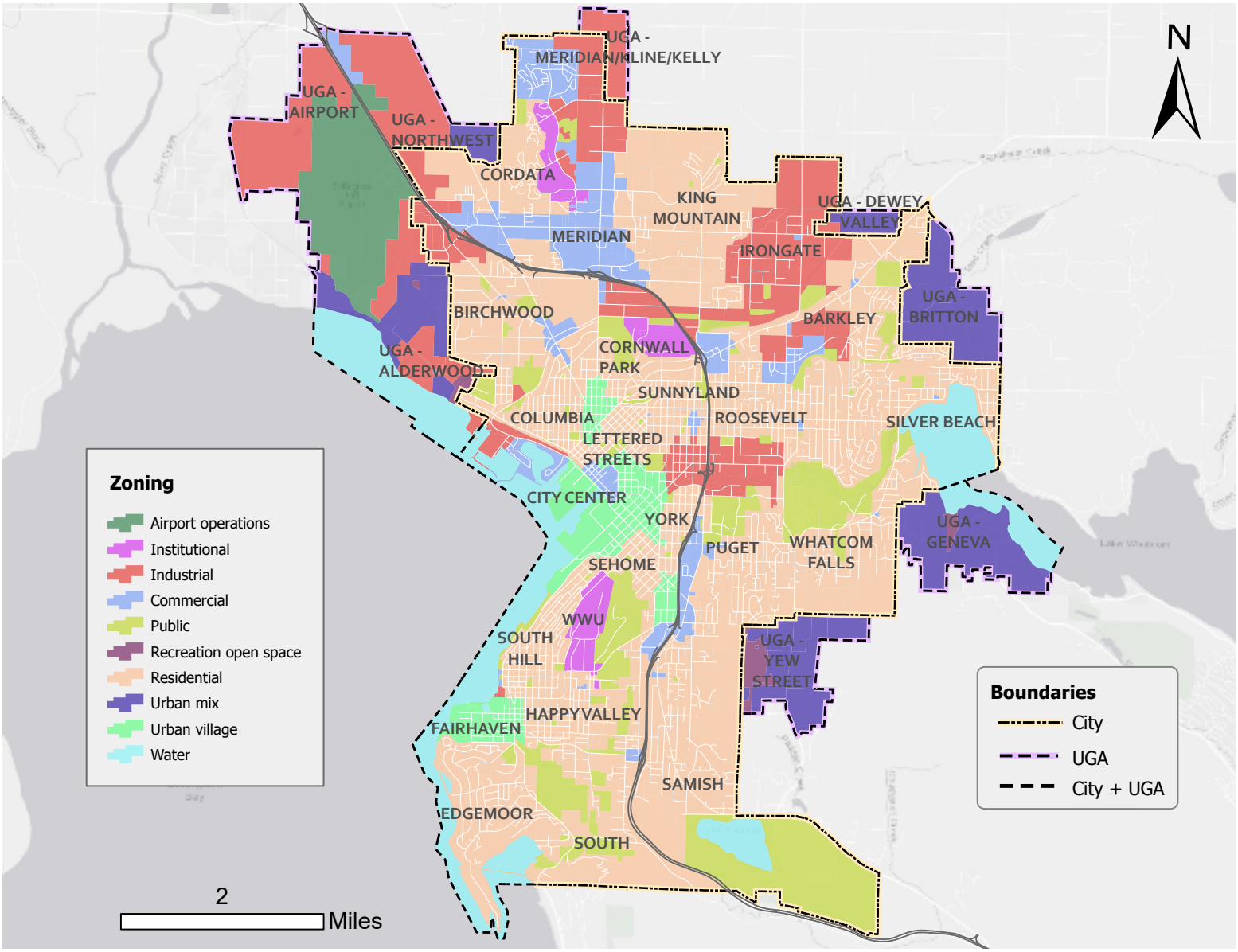


Figure 6. Map of Bellingham land use zones, grouped into 10 major classifications.

Canopy cover by land use zoning continued...

Table 1. Land use classes summarized by land and canopy area and proportion of canopy area and canopy cover by land use.

Land use class	Land area (acres)	Canopy area (acres)	% overall canopy area by land use	% canopy cover by land use
Airport operations	1,024	451	5%	44%
Institutional	447	137	1%	31%
Industrial	3,779	1,493	16%	40%
Commercial	1,532	275	3%	18%
Public	2,419	1,623	17%	67%
Recreation open space	139	124	1%	89%
Residential	10,622	4,407	46%	41%
Urban mix	2,162	978	10%	45%
Urban village	865	124	1%	14%
Total	**22,989**	**9,612**	**100%**	**Null**

Canopy cover by management unit

Figure 7 on the following page shows canopy cover by management unit. Management units represent different ownership and uses. The City manages trees within neighborhood and community parks, in special use areas, and in some rights of way. Residents and private landowners manage trees on private property and, in many cases, on abutting rights of way. Other public areas include non-City owned public land such as the Port of Bellingham-managed Zuanich Point Park.

Canopy cover by management unit continued...

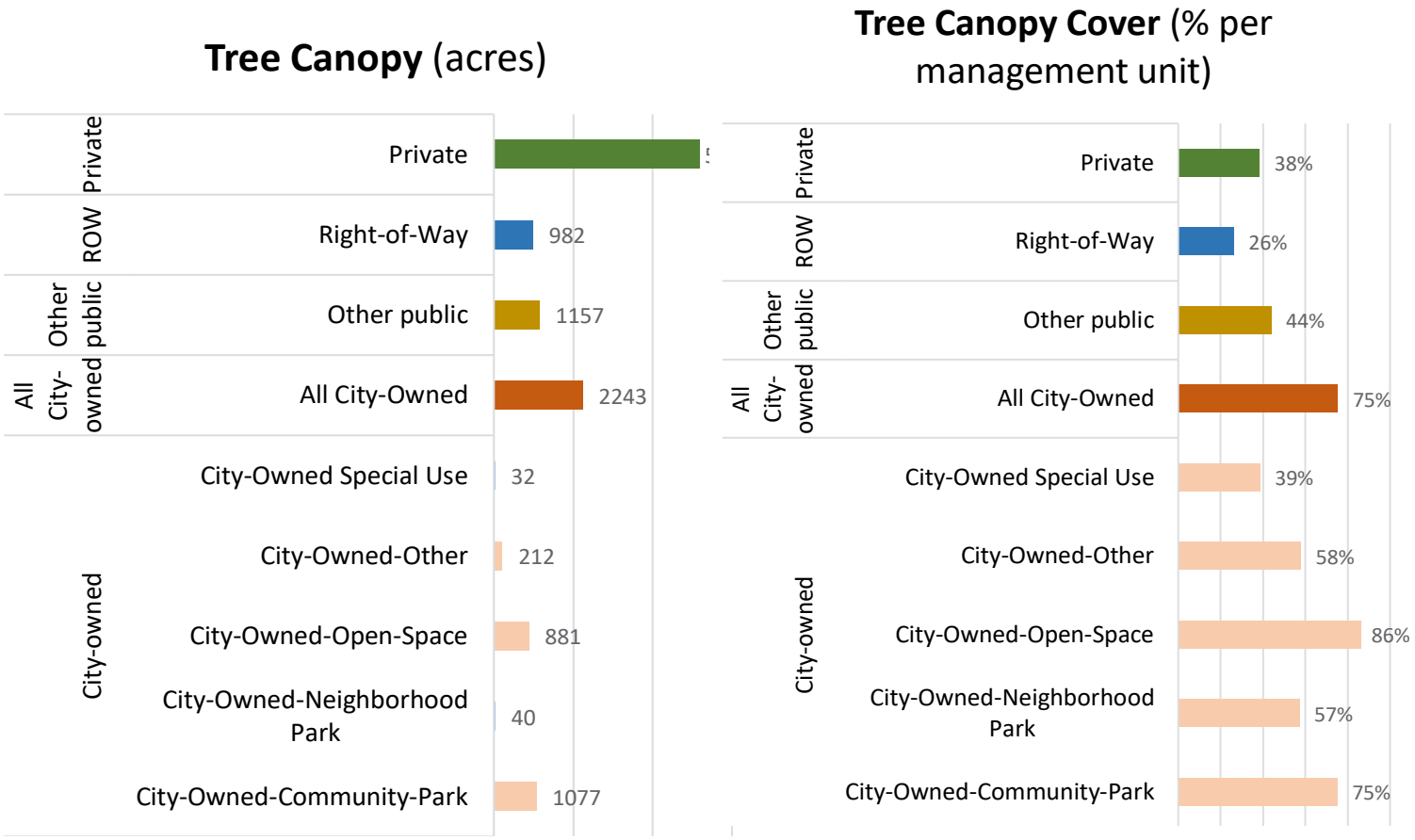


Figure 7. Tree canopy (acres) by management unit (left) and tree canopy cover as a percentage of management unit area (right)

The majority (54%) of tree canopy within the City + Urban Growth Area was found on private land (Figure 8). The average canopy coverage on private land was 38%. The second highest contributor to City canopy cover was City-owned property (23%). Average canopy coverage on city-owned property was 75%.

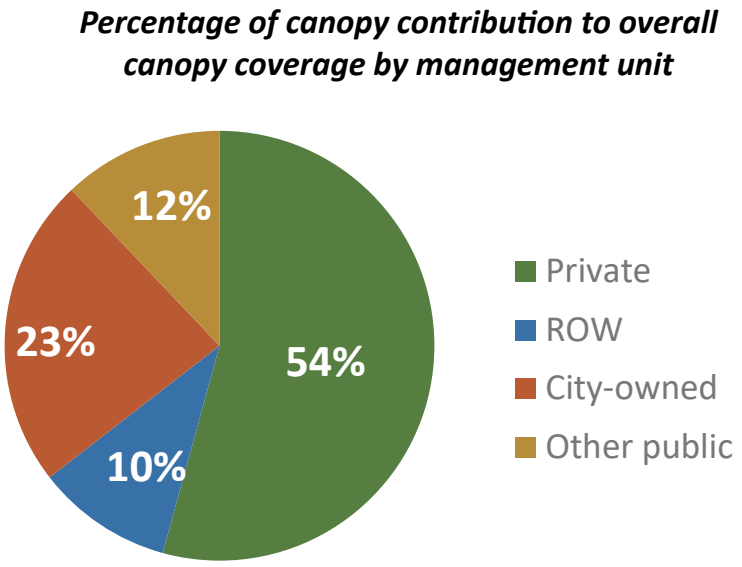


Figure 8. Percentage of canopy contribution to overall canopy coverage by management unit.

Forest quality

The quality of forests across the city was explored by mapping forest areas 5 acres or greater in size, and classifying them by successional stage, type, and height. Approximately 6,120 acres of forest was mapped within the City boundary, and an additional 2,325 acres was mapped within the Urban Growth Area.

Tree species common in Bellingham's forests include western redcedar, Douglas-fir, big-leaf maple, vine maple, red alder, black cottonwood, crab-apple, willow species and Sitka spruce. Forests in riparian areas, and younger forests, tend to have higher components of deciduous species. Older forests, and upland forests tend to have more conifers.

Forest quality and maturity

Forests were assigned to one of six forest structure classes based on height, imagery review and 16 ground sampling plots throughout the city. Figure 9 illustrates the six classes for successional stages used to describe forests in Bellingham. Detailed descriptions of the six classes are provided in Table 2.

Most forests were classified as young but many of these areas are at the point where they are transitioning between young and mature forest stages. Young forests have started to differentiate into distinct layers and this stage can begin as early as 20 years old in highly productive stands and can extend to approximately 80 years or more depending on when the stand structure becomes more complex.

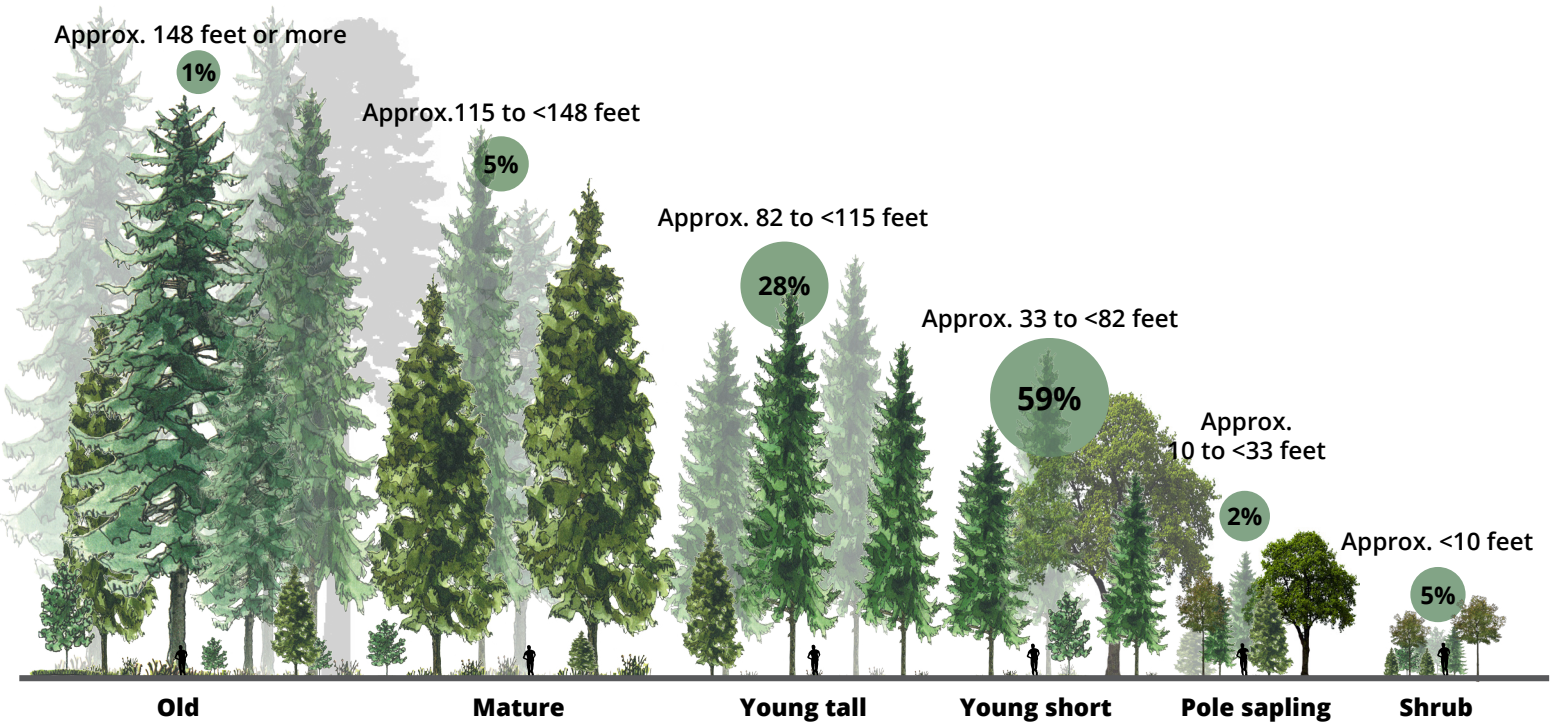


Figure 9. Composition of overall forest structure classes and criteria used in assessing the six forest structure classes.

Forest quality and maturity continued...

Table 2. Forest structure class descriptions including approximate height and representative details.

Forest structure class	Approximate height (feet)	Successional status description
Old Forests	148 or more	Stands that are very old with complex structure; patchy shrub and herb understories are typical; regeneration is usually of shade-tolerant species with composition similar to the overstorey; long-lived seral species may be present in some ecosystem types or on edaphic sites. Old growth structural attributes will differ across biogeoclimatic units and ecosystems. These forests are typically greater than 240 years.
Mature Forests	115 to <148	Trees are well established and large in size; stand openings exist and a second cycle of shade-tolerant trees may have become established; shrub and herb understories become well developed as the canopy opens up; habitat features such as standing dead trees and large stems on the ground exist. Forests with these attributes tend to be greater than 80 years old but this varies depending on the species and productivity of the site.
Young Forest Tall	82 to <115	Self-thinning has become evident and the forest canopy has begun to differentiate into distinct layers (dominant, main canopy, and overtopped); trees have vigorous growth and the canopy is more open compared to the Pole/Sapling stage; this stage can begin as early as 20 years old in highly productive stands and can extend to approximately 80 years or more depending on when the stand structure becomes more complex.
Young Forest Short	33 to <82	
Pole Sapling Forests	10 to <33	Trees > 10 ft tall, typically densely stocked, and have overtopped shrub and herb layers; vertical structure are not yet evident in the canopy; these stands are usually younger than 20 years old.
Shrub	<10	Early successional stage or a shrub community maintained by environmental conditions (e.g., wet soils, cold air accumulation) or disturbance (e.g., avalanche track); tree cover sparse, but tree seedlings and advance regeneration may be abundant; either dominated by shrubby vegetation, or if sparsely vegetated overall, shrub cover and stature characterizes the community as a shrubland.

Forest quality and maturity continued...

Forests are typically young deciduous or mixed stands in the northern part of the city, and in the south, forests are more mature, coniferous stands. The city centre and other highly developed commercial and industrial areas have very little native forest. Older forests in the city contain trees that are more than 150 years old. The distribution of forest successional stages is mapped in Figure 10.

Invasive species records were reviewed to identify forest that may benefit from future restoration. Of the 8,445 acres of forest mapped within the City and Urban Growth Area, approximately 481 acres overlapped with records of noxious weeds including English ivy or clematis that have the potential to impact tree growth.

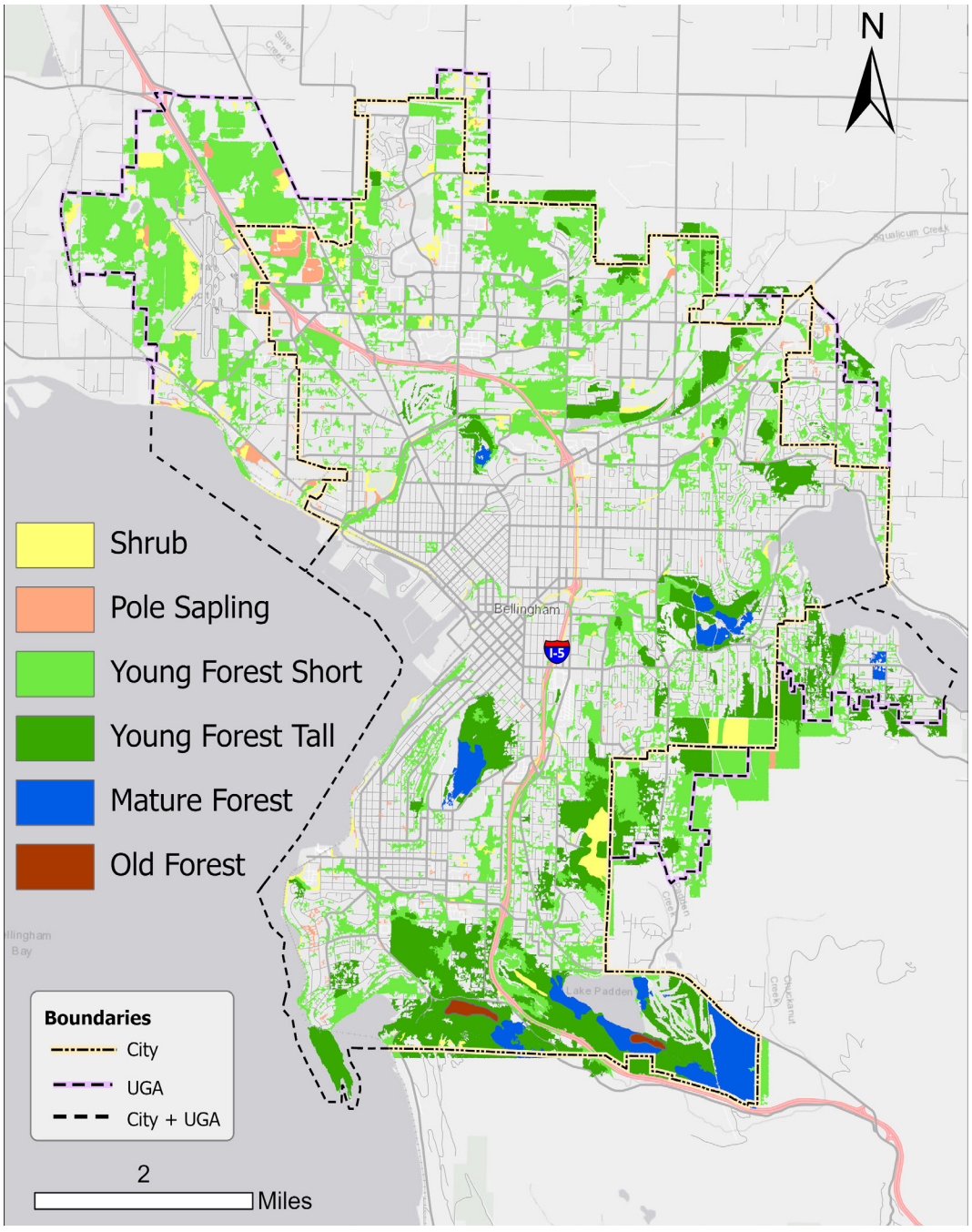


Figure 10. Forest structure classes derived from the 2013 LiDAR.

Forest height

Most of Bellingham's forests (87%) have an average height between 33 and 81 feet, equivalent to a two to six story building. The tallest and typically oldest forest areas have average heights of 148 feet or more. The tallest tree recorded in the city is a 251-foot Douglas fir tree, taller than Bellingham's tallest building, the 15 story Bellingham Towers. The distribution of tree heights identified from the 2013 LiDAR data can be seen in Figure 11.

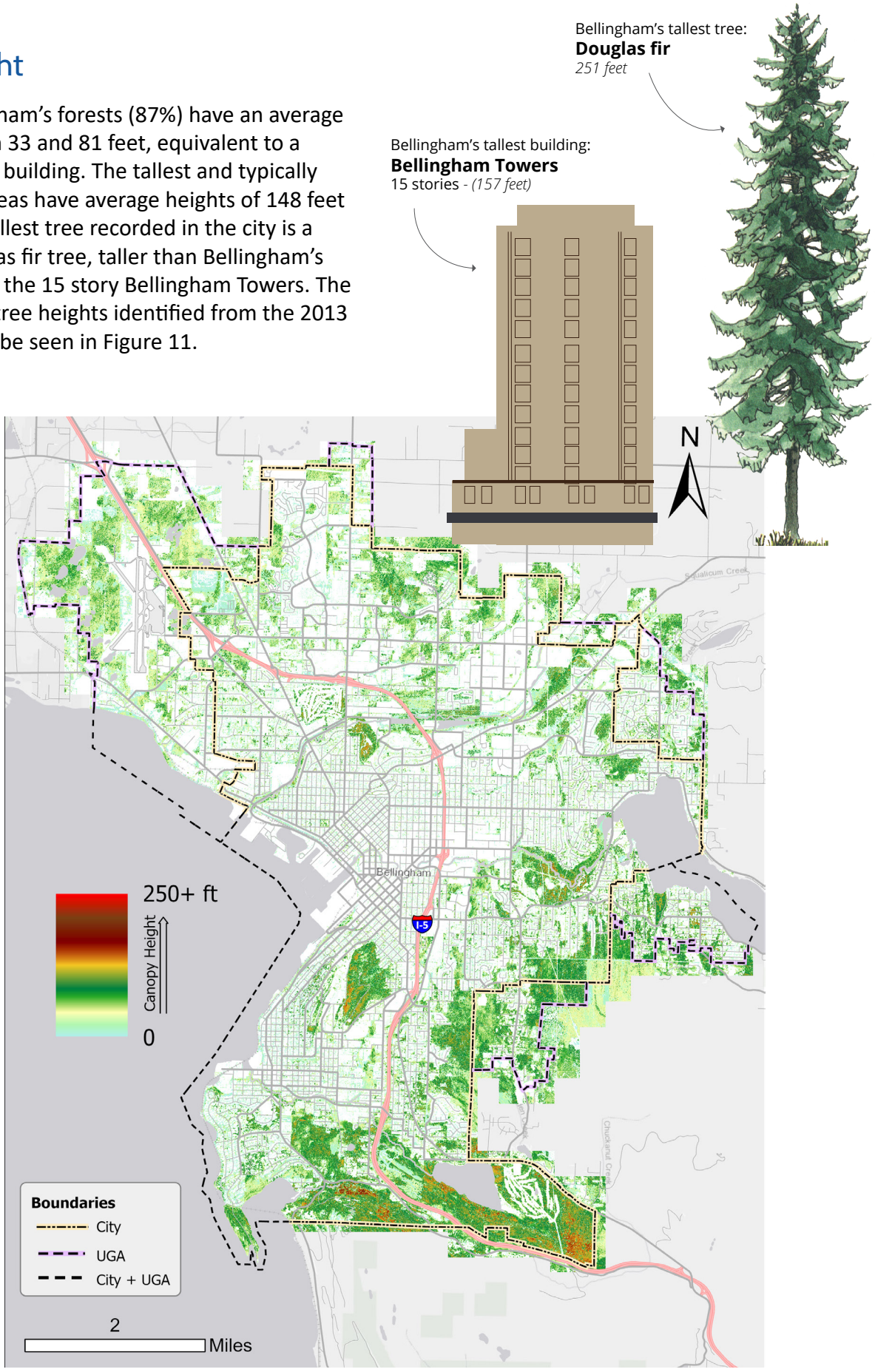


Figure 11. Canopy height model (CHM) and the tallest tree locations, derived from the 2013 LiDAR.

Forest fuel types

Wildfire is a natural part of our forests, but risk from fire must be managed, especially where forest meets homes and buildings which is referred as the wildland urban interface. To help manage risk from fire, the amount of burnable material (referred to as fuel load) was assessed in the City and Urban Growth Area. In the future, this fuel load map can be combined with the Washington State Department of Natural Resource's wildland urban interface mapping to identify areas of moderate to extreme fire hazard severity, according to the Wildland Urban Interface Code. The wildland urban interface mapping is currently under development.

Figure 12 maps the fuel types across Bellingham's forests. Most forests contain light or medium fuels with pockets of heavy fuels found throughout. To map fuel loads, types of burnable material were assigned to the City's forested areas using the United States Department of Agriculture's (USDA) National Fire Danger Rating System (NFDRs) fuel types. These fuel types were then grouped into light, medium, and heavy fuel classes using the International Wildland Urban Interface Codes:

1. Fuel, heavy – vegetation* consisting of round wood 3 to 8 inches in diameter
2. Fuel, medium – vegetation consisting of round wood ¼ to 3 inches in diameter
3. Fuel, light – vegetation consisting of plants and round wood less than ¼ inch in diameter

**Vegetation refers to living and dead shrubs, trees, and plants*

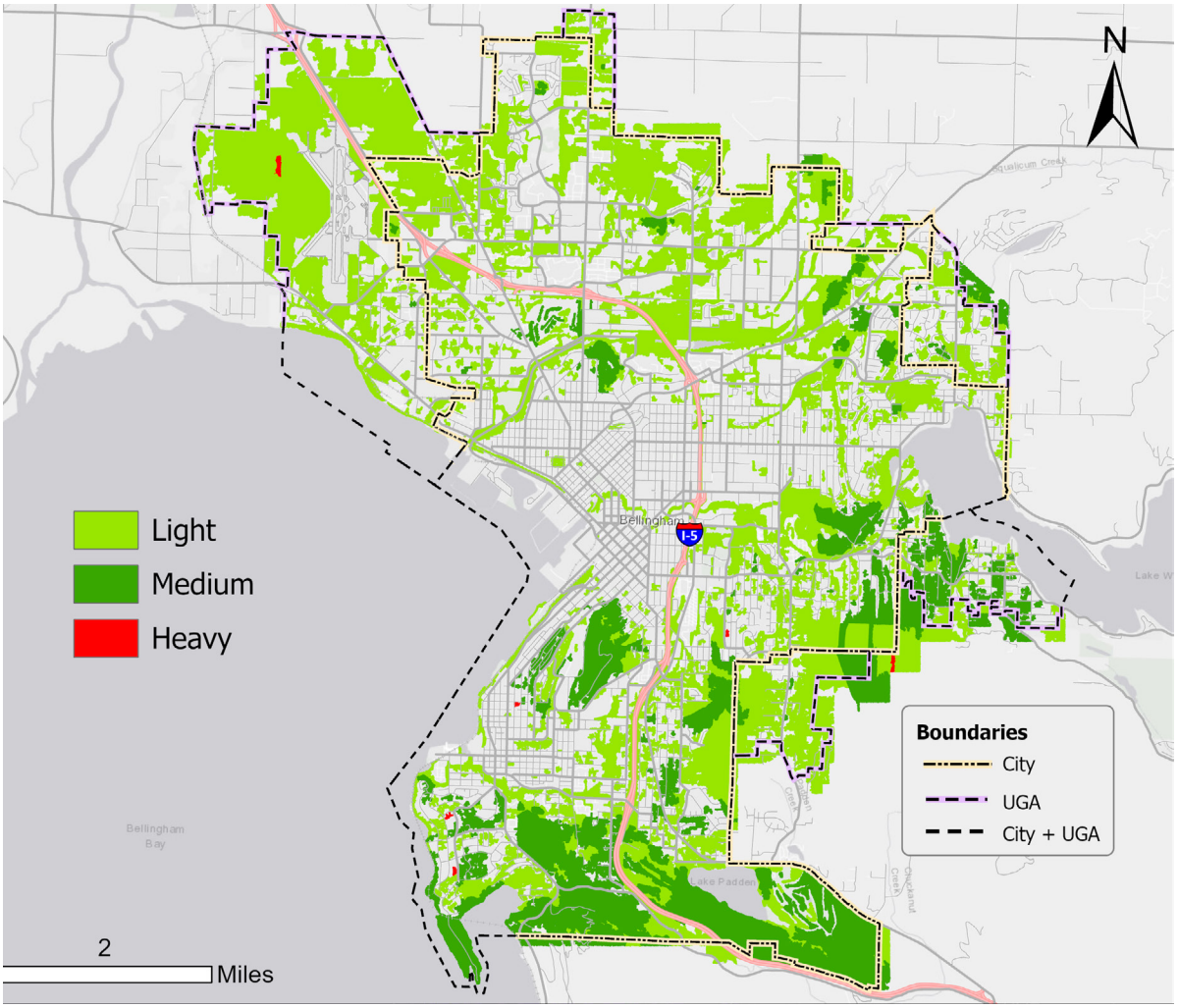
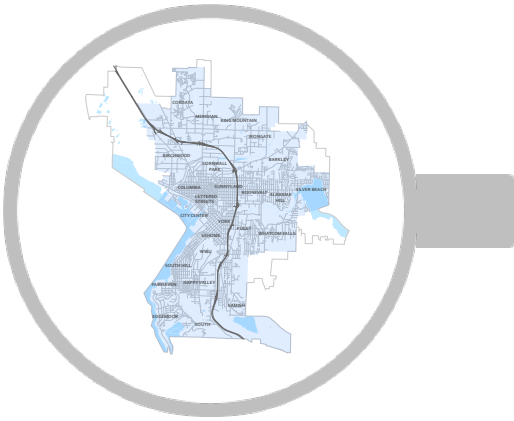


Figure 12. Fuel loading distribution of light, medium, and heavy fuels across Bellingham's forests.

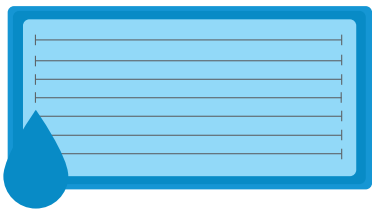
Ecosystem services

Benefits provided by trees, often referred to as ecosystem services, were quantified within the City boundary using the program i-Tree Canopy[2]. While the i-Tree Canopy tool has the advantage of being free and easy to repeat, benefit estimates are limited to carbon, air pollution removal and avoided stormwater runoff.

Bellingham's urban forest canopy, measured in 2018, provides an estimated $42 million in carbon storage benefits, and annual benefits of more than $6 million related to carbon sequestration, avoided stormwater runoff, and air pollution removal. Table 3 provides a summary of the quantity and dollar value of ecosystem services estimated by i-Tree Canopy.



i-Tree Canopy assessment evaluated Bellingham's city boundary only.



Did you know Bellingham's urban forest removes the equivalent of 327 Olympic sized swimming pools annually in stormwater runoff?

Did you know Bellingham's urban forest offsets 6,653 passenger vehicles through annual sequestration per year?

Table 3. Summary table of whole urban forest key findings from i-Tree Canopy analysis using 2018 LiDAR canopy area estimates. Carbon values are based on 2022 US carbon pricing of $170.55 per ton ($46.51 CO2).

Ecosystem service	Value (USD, 2022)	Amount
Carbon stored in trees	$42,399,626	248.61 kT
Carbon sequestered annually in trees	$1,423,587	8.35 kT
Total air pollution removed annually	$2,964,408	302.37 T
Annual avoided runoff	$1,924,401	215.93 Mgal
Total annual benefits	$6,312,395	
Total benefits	**$48,712,020**	

2 USDA Forest Service. (2021). i-Tree Canopy v7.1. . https://canopy.itreetools.org/

Tree Equity Score

The benefits from trees and forests are not experienced equally across Bellingham. Tree equity has health and wellbeing consequences for people living in low canopy areas, particularly when it comes to benefits that are important from community climate adaptation such as shade and cooling on hot summer days, air quality improvements, and flood reduction. Households with lower incomes, minority groups, seniors, and unemployed people are more vulnerable to the effects of climate change.

To evaluate tree equity across Bellingham neighborhoods including the UGA, we applied American Forest's Tree Equity Score methodology using 2018 canopy cover data and Bellingham's Census Block Groups[3]. The Tree Equity Score combines:

- Tree canopy cover need (based on a baseline canopy target of 40%[4] set by the USDA Forest Service, adjusted based on population density factors from The Nature Conservancy[5]).
- Priority index. A priority index is an equal weighting of the following from 2020 census data:
  - o Income: Percentage of population below 200% of poverty
  - o Employment: Unemployment rate
  - o Race: Percentage of people who are not white non-Hispanic
  - o Age: Ratio of seniors and children to working-age adults
  - o Climate: Urban Heat Island severity
  - o Health: Prevalence of poor mental, physical, respiratory, and cardiac health (composite index)

A lower Tree Equity Score indicates a greater priority for increasing canopy cover.

Overall, Bellingham has a Tree Equity Score of 89 as shown in Figure 13. This score is high when compared to nearby cities with similar population and area (Table 4). However, neighborhoods in central Bellingham have Tree Equity Scores lower than 75, which is the minimum target used by American Forests. Mapping tree equity will inform priorities for urban forest management.

How does Bellingham's Tree Equity Score compare?

Table 4. Tree Equity Scores compared between municipalities using data from the American Forest Tree Equity Score.

Comparable Washington State Municipality	Tree Equity Score *(0-100)*	Population size	Land area *(sq. miles)*
Bellingham	**89**	**91,482**	**27**
Auburn	76	87,256	30
Bothell	79	48,161	14
Vancouver	78	190,915	49
Kent	78	136,588	34
Bellevue	80	151,854	34

3 American Forests. (n.d.) Tree Equity Score Methodology. https://www.treeequityscore.org/methodology/

4 Baseline canopy target based on generalized biome target from the USDA Forest Service of 40% for Forest biome.

5 Canopy adjustment factors based on the following research from The Nature Conservancy: very low population density (ppl/km2) (<2k) = 1.2; low (2k-4k) = 1; moderate (4k-8k) = 0.8; high (>8k) = 0.5.

Tree Equity Score continued...

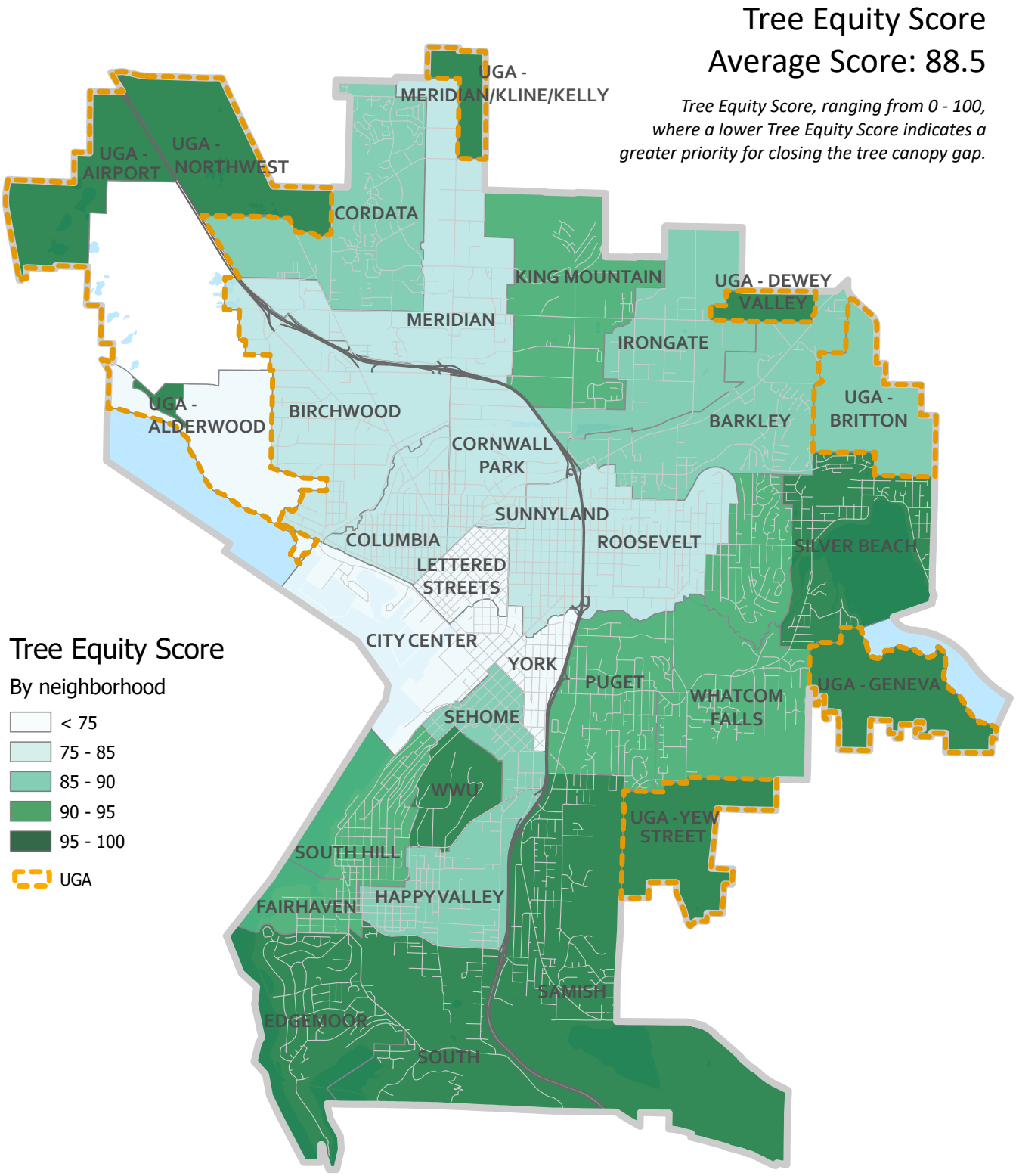


Figure 13. Tree Equity Score for Bellingham by neighborhood was adapted from American Forest's Tree Equity Score methodology using 2018 canopy cover and 2020 census data. A lower Tree Equity Score indicates a greater priority for increasing canopy cover.

Habitat

Fish habitat

Bellingham's urban forest is home to critical fish and wildlife habitat found throughout our forests including within riparian areas. Riparian areas are the forest interface area adjacent to rivers and streams. Riparian areas in the city averaged 45% canopy or higher in 2018. The riparian zones within each watershed all exceeded 40% canopy cover (Figure 14). Canopy cover gains between 2006 and 2018 were observed for almost all riparian zones except Little Squalicum Creek, which declined, and Whatcom Creek, which remained stable. Riparian zones in Chuckanut Creek and Chuckanut Bay watersheds had canopy cover exceeding 80%. Canopy cover is summarized by riparian areas in each watershed in Figure 15.

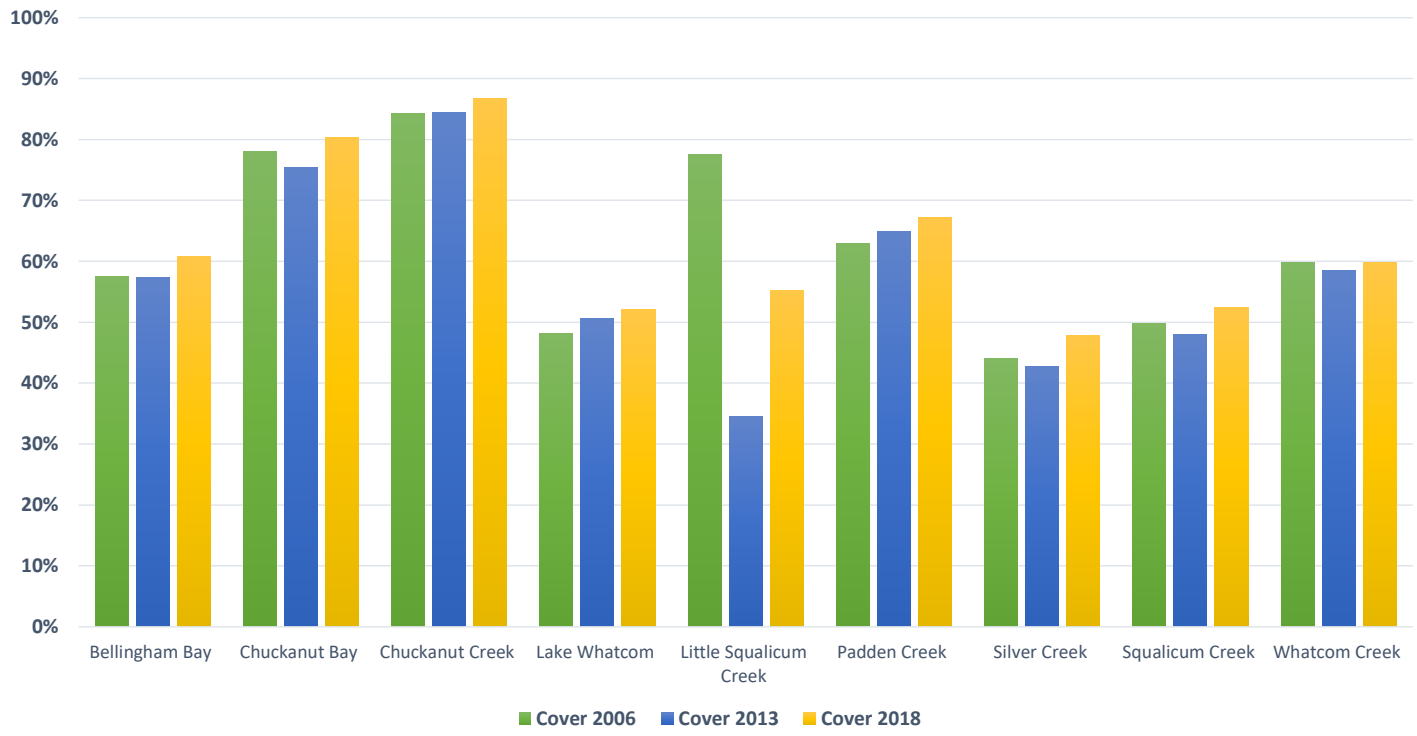


Figure 14. Canopy cover breakdown by riparian areas within each watershed in 2018 (City and UGA), as well as the general canopy trends between 2006 and 2018.

Fish habitat continued...

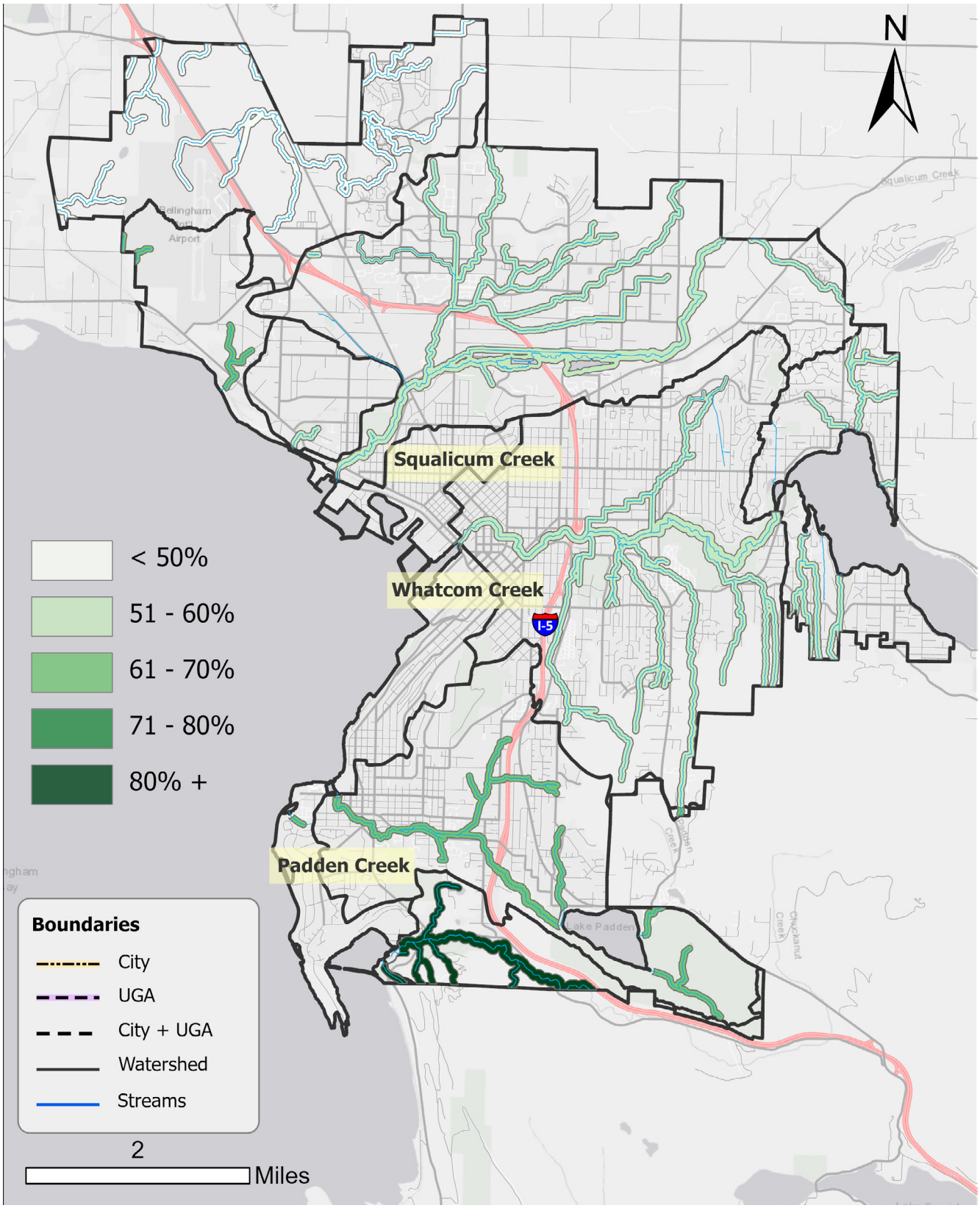


Figure 15. Canopy cover summarized by riparian areas within each watershed in 2018.

Wildlife habitat

Habitats important for terrestrial wildlife species exist throughout the city but are concentrated on the perimeters of the city. The most significant barriers to wildlife movement are associated with Interstate 5 in the southern and northern City boundaries. These important wildlife corridors, habitat areas, and significant movement barriers can be seen in Figure 16.

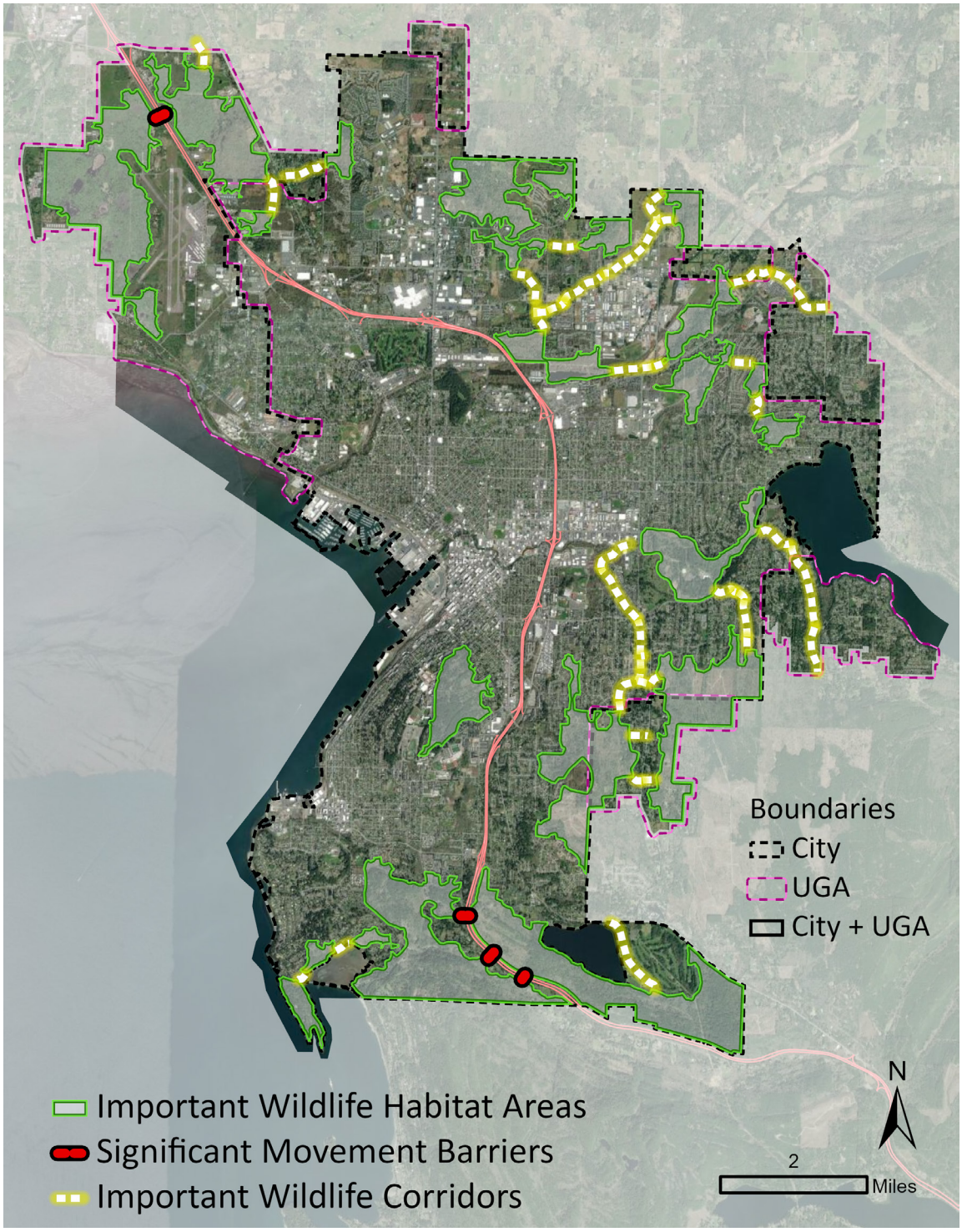


Figure 16. Terrestrial Wildlife Habitat Network. This analysis does not consider habitat extending outside of the City boundary, or habitat for marine or freshwater fish.

4. CANOPY COVER CHANGE

Canopy gain and loss was compared between 2006 and 2018. Bellingham's overall canopy cover was relatively stable between 2006 and 2018. While stable overall, individual locations had gains and losses. Some parts of the city gained canopy cover as new trees were planted or existing trees grew, other areas lost tree canopy due to land clearing for development or timber harvesting (Figure 17). Urban tree canopy is dynamic and always changing as trees are planted, grow, die, or are removed.

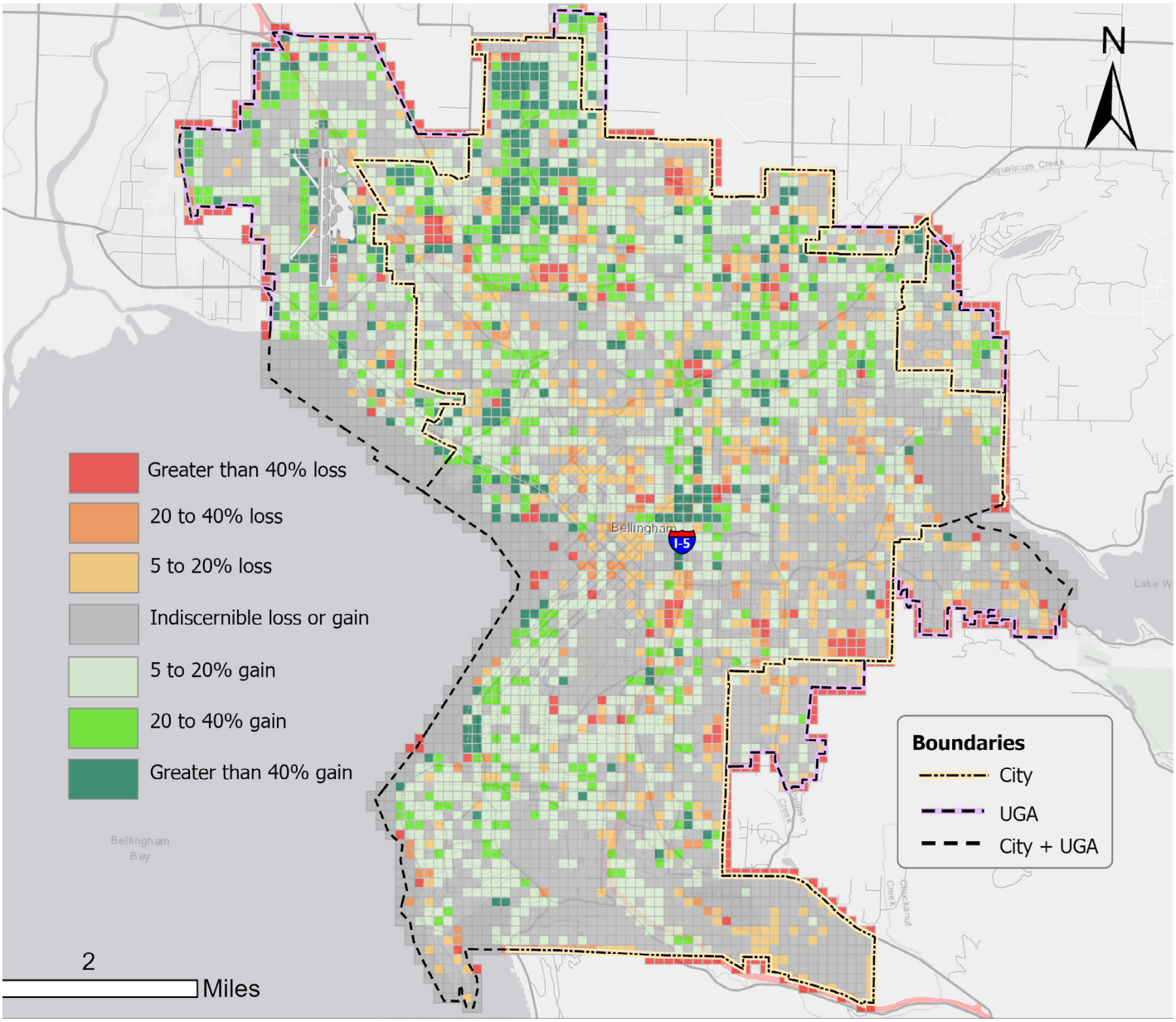


Figure 17. Canopy gain and loss between 2006 and 2018, summarized by five-acre grids.

Drivers of canopy change

Change in canopy cover overtime is caused by both humans and natural causes which can be referred to as the drivers of canopy change. The drivers of canopy change are described in detail below which determine the growth, stability, and loss of tree canopy over time. The drivers of canopy change include:

Forest management

In some areas of Bellingham, trees are removed for their wood products, resulting in a loss of tree canopy. Typically, this loss in canopy is temporary. As new trees are replanted or grow naturally from existing mature trees, canopy cover regrows overtime representing canopy gain.

Development

Trees are often removed on private property for new homes and other types of development, resulting in canopy loss. New or replacement trees are typically planted with development which result in canopy gain overtime. City regulations require planting trees in all new development and when development is near wetlands, streams, and shorelines. Regulations adopted by the City have resulted in many new and replaced trees.

Tree cutting and tree planting

Many parties, including the City and residents, manage trees on their land. People choose to plant trees for many reasons including providing habitat for animals, preventing soil loss on steep slopes, for shade, food, to restore habitat, to store carbon, decrease the effects of wind, for beautification, or to meet permit requirements. People also choose to remove trees when they conflict with other objectives such as risk management, views, sunlight, repair and replacement of older infrastructure such as sidewalks and pipes, new roads or trails, and so on.

Natural regeneration

In forests, trees naturally regrow from the seeds of older trees that fall to the forest floor and become seedlings. Productive and healthy forest stands in Bellingham naturally regenerate so that, as larger trees in the upper canopy die, seedlings regrow into the gap and help maintain forest canopy cover over time.

Drivers of canopy change continued...

Growth of existing trees

Under the right conditions, trees continue to grow until they reach their mature size. The speed at which they grow and the final size of each tree depends on the species and the quality of its growing conditions. Some trees, such as red maple and green ash, can grow up to three feet per year. Other trees, such as American hornbeam and Madrone, grow slowly at less than half a foot annually. The age of urban trees determines how much canopy gain is to be expected from existing trees.

Natural disturbance and climate change

Trees die due to insects and disease, dry conditions, or extreme events such as wildfire, floods, landslides, and extreme heat or cold which are referred to as natural disturbances. Climate change is expected to increase the number of natural disturbances and could lead to more tree death in Pacific Northwest forests. Native species like western redcedar and western hemlock have been experiencing decline from Oregon up to western Canada, likely due to warmer temperatures and stress from dry summer growing conditions.

Age-related decline

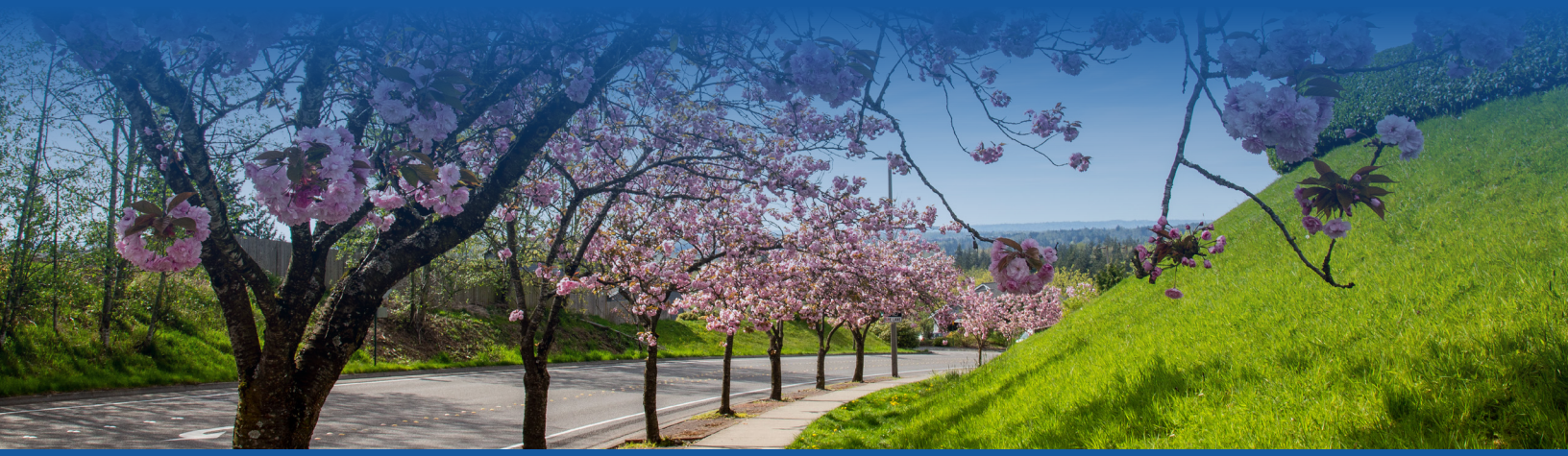
Trees naturally decline in health and die when they reach the end of their lifespan. Managing for many different tree ages in the urban forest is important for maintaining a stable tree canopy over time.

5. SUMMARY AND CONCLUSION

Bellingham's state of the urban forest can be summarized in the following key highlights:

- Canopy cover within Bellingham's City boundary was estimated at 40% as of 2018.
- The city's central and northern neighborhoods have lower canopy cover and younger forests. They also have higher density of development.
- The city's southern neighborhoods have higher canopy cover and older forests. They also have lower density of development.
- Bellingham's public lands average 75% canopy cover; private lands average 38%.
- Just over half (54%) of Bellingham's tree canopy is on private land, and the remainder (46%) is on public land including rights-of-ways, City-owned land and other public land.
- Overall canopy cover has remained relatively stable between 2006 and 2018.
- A total of 8,445 acres of native forest was mapped within the City boundary and Urban Growth Area.
- Most native forests in Bellingham were classified as young but many of these areas are at the point where they are transitioning between young and mature forest stages.
- Most native forests in Bellingham were classified as containing light forest fuels.
- Bellingham's urban forest canopy, measured in 2018, provides an estimated $42 million in carbon storage benefits, and annual benefits of more than $6 million related to carbon sequestration, avoided stormwater runoff, and air pollution removal.
- Bellingham's Tree Equity Score is 89, which is higher than other similar-sized Washington municipalities reviewed. However, some areas have Tree Equity Scores lower than 75, which is the minimum target used by American Forests.
- Riparian areas in the city averaged 45% canopy or higher in 2018.Habitats important for terrestrial wildlife species exist throughout the City but are concentrated on the perimeters of the City. The most significant barriers to wildlife movement are associated with Interstate 5.

The findings outlined in the State of the Urban Forest Report provide information about the distribution, structure, and some of the value the urban forest provides to our community. The findings are based on data available for 2006, 2013, and 2018. These findings can support goal setting for urban forest management and establish a baseline for measuring future change as new data becomes available.



City of Bellingham