Chapter 5: Conservation

The Redmond community has a strong commitment to conserving green space, and expanding the city's tree canopy is a key recommendation of this chapter. Historic park settings are also treasured; active management of these parks and cultural landscapes is vital to their longevity.

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Above: *Farrel-McWhirter Farm Park*

"To save nature we must solve human problems.

Through the prism of land, Forterra is committed to addressing the quality of the underlying social fabric that binds us. This place is who we are."

- Forterra

5.0 Introduction

The character of Redmond is largely determined by its beautiful setting of forests, streams, hills, the Sammamish River and valley, and older farmsteads and homes. Conservation and care of these resources are key factors in maintaining this character. "Conservation" in this context refers to a range of management techniques and approaches that protect and improve the quality or quantity of land, plants, water, wildlife and fish habitat, aesthetic character, and historic and cultural resources.

Conservation is a cross-departmental effort in Redmond. Public Works has purview over many of the city's natural assets such as water resources and the Planning Department regulates natural, historic and cultural resources. The Parks and Recreation Department has a unique role as the primary land manager of city properties, which contain all of these resources.

In preparing the 2016 update of the PARCC Plan, Redmond residents were clear in their desire to see a healthy forested natural environment and well-maintained historic properties. This chapter proposes conservation methods for achieving the vision expressed by the community—particularly retaining Redmond's distinctive character and improving the health of the ecosystem through the expansion of trees throughout the city, allowing reasonable and thoughtful access to sensitive areas, and preserving valuable elements of the region's past.

Elements of the Conservation Chapter include:

- Land with conservation value
- Natural resources on those lands including:
  - Water bodies and groundwater
  - Fish, wildlife and water quality
  - Streams
  - Forests and vegetation
- Historic and cultural resources

Redmond has a wealth of natural resources, historic properties and structures that contribute to the city's unique identity. Guidance for managing and protecting these is provided through several planning documents. The future vision for Redmond's

natural environment, community character and historic preservation is described in the Comprehensive Plan below:

> *"Redmond in 2030 has maintained a very green character. The city is framed within a beautiful natural setting, with open spaces and an abundance of trees continuing to define Redmond's physical appearance, including forested hillsides that flank the Sammamish Valley, Lake Sammamish and Bear Creek. An interconnected system of open spaces provides habitat for a variety of wildlife. Public access to shorelines has been enhanced while protecting the natural environment and property owners' rights."*

Above: *Luke McRedmond Landing Park*

The city's historic roots are still apparent through preservation of special sites, structures and buildings.

Protecting and enhancing these natural areas and cultural features are values that are strongly held by the local community and are a key component of the City's future plans.

In addition to its seventeen thematic elements, the Comprehensive Plan includes supporting functional plans to address physical infrastructure, including the Parks, Arts, Recreation, Culture and Conservation (PARCC) Plan. Because there is frequent overlap and coordination between departments, knowledge of other planning documents is helpful. Some of the most relevant to Conservation include:

- Capital Investment Strategy: Vision Blueprint and 2014 Progress Report
- Watershed Management Plan
- Redmond's Historic Core Plan
- Stormwater Comprehensive Plan
- Water Resources Strategic Plan (2015-2020) And 3-Year Action Plan (2015-2017)
- Cultural Resources Management Plan (new plan underway)

"Examine each question in terms of what is ethically and aesthetically right, as well as what is economically expedient."

- Aldo Leopold

5.1 Conservation Goals

The natural setting of Redmond is a large part of what makes the city unique. The riparian corridors along the Sammamish River, Bear Creek and Evans Creek and their many tributaries are home to plants, animals and fish, and these water bodies help to define the visual and cultural landscape as well. The flat valley of the Sammamish River was conducive to farming in the past, and over time has transitioned to a thriving small city with homes, multi-use developments, and business corporate headquarters. The steep valley walls are marked by the deep green of coniferous and deciduous forest, interspersed with housing, and provide a dramatic backdrop to the streets below and home for a variety of wildlife and birds.

Above: *Farrel-McWhirter Park*

"In the end we will conserve only what we love, we will love only what we understand, and we will understand only what we are taught"

- Baba Dioum

The City of Redmond is responsible for managing land that is publicly owned by the City, as well as guiding development on private properties. There are multiple conservation efforts occurring across the city that protect a significant percentage of our land mass. This happens through a variety of mechanisms including the overarching policy guidance of the City's Comprehensive Plan, functional plans prepared by different departments within the city, protective easements, and critical area policies and legislation. Each of these also influences the way that park land is managed. A brief description of the tools that guide management of natural resources on both public and private land follows.

The Comprehensive Plan vision describes a beautiful and healthy natural environment, marked by well-thought out stewardship practices and environmental sustainability. That vision is translated in the Natural Environment Element of the Comprehensive Plan into a series of policies meant to ensure that the vision is achieved. There are also natural resources related policies in the following elements of the comprehensive plan:

- Parks, Arts, Recreation, Conservation & Culture (PR)
- Natural Environment (NE)
- Community Character and Historic Preservation (CC)
- Urban Centers (DT or OV)
- Shoreline Master Program (SL or SF)

The most significant policies related to parks and trails are listed in *Appendix 5 A: Conservation Policies*.

Chapter 5: Conservation

5.1.1 Goals

The City's approach to conservation is multi-pronged, as described in the following paragraphs:

Collaboration between City Departments: Interdepartmental collaboration is a philosophy that infuses all the work undertaken in the City. It is common for the Parks and Recreation Department to coordinate with the Public Works and Planning Departments to accomplish conservation objectives. Concerns are addressed and projects are planned as a team, resulting in projects that are more comprehensive and fiscally efficient.

Partnerships: Working with other jurisdictions and organizations makes it possible to accomplish more than any single group can accomplish on its own. Redmond frequently partners with 4Culture, Lake Washington School District (LWSD), King County and adjacent jurisdictions, and maintaining and growing these relationships will help maximize public investment and strengthen regional efforts. The City has also teamed with Forterra to develop the Green Redmond Partnership, an alliance to develop and administer a forest management plan for Redmond's park system.[1] The program includes training volunteer forest stewards and using community volunteer groups to help manage forest health through removal of invasive species, replanting, and general maintenance.

Smart Growth Planning Principles: Smart growth planning is based on a set of principles designed to guide local communities in their efforts to promote and ensure development activities that yield improved quality of life, environmental sensitivity, economic revitalization and a sense of community. Strategies that reflect smart growth planning principles include preservation of open spaces and natural areas, direct development toward existing communities and infrastructure sustainable design and materials, walkable communities, and energy efficient planning during site and building design.[2]

Environmental Stewardship: It is important to be responsible stewards of our natural resources so that future generations may enjoy and benefit from them as we do today. It is equally important to recognize that resources exist for the benefit of not only humans but also for other living creatures and plants as well. Key strategies to maintaining the city's environmental assets are summarized in the Comprehensive Plan, and carried out through functional plans such as the PARCC Plan.

Historic and Cultural Resources Stewardship: The Redmond community prides itself in providing a variety of cultural and historic opportunities. The City has a strong historic preservation program, a Landmark Commission that reviews development related activities at historic properties, and a partnership with the Redmond Historical Society. The Redmond Historical Society collects, promotes preservation, and shares Redmond's history with the community at regularly scheduled meetings and special events.[3] The City's parks help foster this connection and build community awareness of Redmond's history through the rehabilitation and reuse of historic buildings and structures and associated interpretive elements and programs.

Education and Programming: Educating the public about protecting and managing natural areas helps them understand the benefits of natural systems and leads to a shared vision and action plan to protect resources.

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[1] https://www.google.com/?gws_rd=ssl#q=green+redmond+partnership
[2] https://smartgrowthamerica.org/our-vision/what-is-smart-growth/
[3] http://www.redmondhistoricalsociety.org/RHS/index.php

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Redmond's abundance of natural and historic resources offers excellent opportunities for classes, programs and experiences for all ages. Partnerships and/or contracts with Forterra, LWSD, Nature Vision, Washington Conservation Corps, EarthCorps and the Redmond Historical Society create multiple options for providing well-designed walks and tours; leading educational and hands-on events; and providing educational materials.

5.2 Inventory

As the City develops, there are changes in the location and extent of natural resources in the community, and with these changes come new management practices by a variety of landowners. Because the people of Redmond feel strongly about the environment it is necessary to provide a strong, proactive approach to managing and caring for natural resources throughout the community. This begins with knowing where these resources are located and maintaining key natural processes and functions, while acknowledging the need to accommodate growth. Understanding the property ownership patterns and underlying designated critical areas or property restrictions can be helpful in addressing some of the concerns that may arise over time. Addressing properties with historic resources is similar, in that having an inventory of known resources, both landmarked and not, is needed to manage these in a timely fashion.

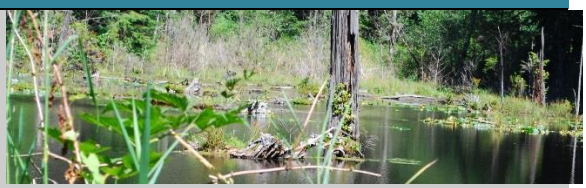
5.2.1 Land with Conservation Value

Three categories of properties contain the majority of the highest quality natural areas in the city. They are notable for the different types of protective mechanisms that enable them to maintain their conservation value. The three categories of land with conservation value include: city-owned properties, public properties, and properties with permanent protection.

	Property Category	Definition
1	City-owned properties	Includes resource parks and other park categories; trails and trail corridors; utility properties; and building sites
2	Other public properties	Lands owned by other agencies, such as King County
3	Properties with permanent protection	Public or private land with regulatory controls such as critical areas regulations or deed restrictions that protect the natural resource on the property.

The three property categories listed above are a starting point for developing a citywide system of conservation. These are described in more detail in *Exhibit 5.1: Protected Properties for Citywide Conservation*, with examples to illustrate each.

Exhibit 5.1: Protected Properties for Citywide Conservation

TYPE I: City-Owned Property	
Resource Parks are natural areas that may be lightly developed with features like trails and interpretive activities or signs. Typically they are not developed for active recreation uses. Neighborhood and Community Parks may also have areas with conservation value.	 *The Redmond Watershed Preserve*
Trail Corridors are select linear corridors that contain a developed trail usually adjacent to a stream, river, utility or other linear feature. The space surrounding the trail may have canopy and habitat value.	*Bear-Evans Creek Greenway*
Stormwater Tracts are created and designated as part of a land division specifically for management of stormwater. These may be public or private properties; an example of a public property is Scott's Pond, which is co-located with a park. Utility Properties are City-owned properties with facilities such as wells or water towers.	*Scott's Pond*
Building Sites include City-owned properties with buildings and associated land with conservation value. Fire Station #17 is an example of such a site.	*Fire Station #17*
TYPE II: Other Public Lands*	
King County Parks owns several parks and trails in or near Redmond that are not developed for active recreation, or that exhibit habitat or conservation value, such as the Sammamish River Trail.	*Sammamish River Trail*
Lake Washington School District has several properties with conservation value in Redmond, including Einstein Elementary that has an extensive area of wetland.	*Einstein Elementary Wetlands*

** Other public jurisdictions or agencies own property within Redmond city limits that may have substantial conservation value, and those agencies may be willing partners in actively managing their lands*

Exhibit 5.1: Protected Properties for Citywide Conservation (Continued)

TYPE III: Properties with Permanent Protection**	
Critical Areas are protected through regulations that safeguard their intrinsic environmental value and/or provide for the public health and safety. The City of Redmond recognizes five broad types of critical areas: • **Geologically Hazardous Areas** • **Wetlands** • **Frequently Flooded Areas** • **Fish and Wildlife Habitat Conservation Areas** • **Critical Aquifer Recharge Areas**	 *Redmond West Wetlands*
Native Growth Protection Areas (*NGPAs*) are in separate tracts typically owned in common by a Home Owners Association (HOA). These are used to protect critical areas during development and are required by the Critical Areas Ordinance. .	 *Native Growth Protection Areas are signed*
TDR Sites *(Transfer of Development Rights)*—A TDR program seeks to preserve landowners' asset value by moving the right to build from a location where development is prohibited (e.g., for environmental reasons) to a location where development is encouraged.	 *Keller Farm*
Private Parks are created in a residential development and are usually small neighborhood parks or native growth protection areas. The land is private property and is often managed by a homeowners' association. These parks serve a portion of the population or protect sensitive habitat, similar to the role of a public park.	 *Private Park in North Redmond*

***A range of zoning regulations specify the way that a property can be used, or place limitations on how property can be developed. The regulatory mechanisms listed below support the preservation of natural areas, though they vary in their ability to manage land effectively. These apply to both public and private properties; some are parcel-based, though some, such as stream buffers, are not. "Natural Areas" is the umbrella which includes all types of environmentally sensitive areas and open space, regardless of protective mechanism. Some of these protective measures are illustrated above.*

Map 5.1 in Appendix 5 C, illustrates the existing land that already has protected status across the city. It also reveals the public benefit of preserved green space whether it is in public ownership or not, including visual, ecological and social benefits. This map illustrates how the riverine system extends through most of the city, providing trees and habitat in proximity. However, the southeast and southwest quadrants of the city have noticeably fewer public properties or protected natural areas.

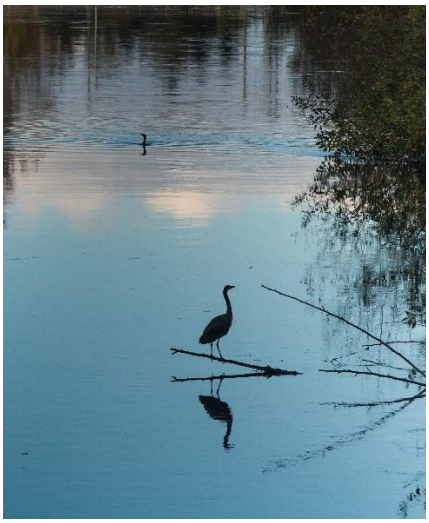
"A true conservationist is a man who knows that the world is not given by his fathers, but borrowed from his children."

- John Audubon

Kayakers in the Sammamish River

5.2.2 Natural Resources

The much loved landscape of Redmond and the Puget Sound is largely determined by the unique Northwest climate, which influences the creation of the region's hills, valleys, water bodies and lush vegetation.[4] The city experiences relatively mild, maritime weather conditions with most precipitation occurring in the cool, winter months. The high volume of rainfall received during the winter months is the primary water source for recharging groundwater supplies, which in turn replenish stream flows with cool, clean water during the warmer summer months. These stream flows are vital to the region's ecology, and most notably the salmon that are found in almost all streams in Redmond. The forests that shelter these streams are equally vital to the health of the entire ecosystem.



***Above**: Herons in the Sammamish*

Water Bodies and Groundwater

The most significant water bodies in Redmond include Lake Sammamish, the Sammamish River, Bear Creek, Evans Creek (Class I water bodies), and sixteen smaller creeks and tributaries (Class II streams). Only a small part of Lake Sammamish is within the Redmond city limits, but the rivers and streams which supply it have a major impact on shaping the layout of the city, as well as its parks and trails system.

[4] 2013, City of Redmond. *Watershed Management Plan*.

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Above: *Lake Sammamish from Idylwood Park*

> "Lake Sammamish is the 6th largest lake in the state, and is a designated natural resource of statewide significance."
>
> *- King County*

The Sammamish River valley bottom is relatively wide and flat, and prior to development was largely comprised of wetlands. The valley is bounded on the east and west by rolling hills that rise between 30 and 350 feet above the valley. The valleys for Bear and Evans Creek are also uniformly flat, rising gently to the east far outside the city limits. While idyllic in appearance, maintaining the health of the streams is necessary to support uses like salmon spawning, rearing and migration; recreation; aquifer recharge; wildlife habitat; and aesthetic values.

There is a shallow groundwater aquifer that underlies the Sammamish and Bear Creek Valley floor. This aquifer provides as much as 40 percent of the City's domestic water supply. Because it is shallow and has no natural barrier to protect it, this aquifer is vulnerable to contamination. In addition to its importance for human use, groundwater movement into local streams provides cool, clean base flow during summer months.

The Watershed Management Plan lays out the foundation and priorities for protection and restoration of streams within the City.

Fish, Wildlife Habitat and Water Quality

Clean air, natural surroundings, clear lakes and streams are all critical to preserving Redmond's natural resources and maintaining a high quality of life. Redmond has actively worked to meet lake and stream water quality standards that ensure our water is: safe for human contact, healthy for fish and animals, compliant with state water quality regulations, and aesthetically pleasing.
The Natural Resources Division monitors the city's stream water quality, and designs and implements stream improvements and stabilization projects.

Above: *Sammamish River Trail by Luke McRedmond Park*

Vegetation within stream buffers is also critical to the environmental functions of streams. The ever-growing public demand to maintain high water quality standards, regulations in the Clean Water Act Regulations and the endangered species listing of the Chinook salmon, requires an extensive monitoring of our city's lakes and streams.

Exhibit 5.2 provides an example of one regional effort to restore kokanee salmon to Lake Sammamish. In recent years, kokanee have been observed in Idylwood Creek which runs through Idylwood Park. Redmond is active in regional efforts to improve habitat for the kokanee, and to address shared resources around the lake.[5] Actions to date include City staff advising on the development of the regional Urban Wildlife Refuge Interpretation Plan, providing interpretive signage in Idylwood Park about the fish, and signs for anglers not to remove the Kokanee from the creek. Efforts to establish a larger population of kokanee in Idylwood Creek are underway in Redmond, and in other creeks around Lake Sammamish.

Stream improvement projects are a critical way in which the city can improve conditions for fish, wildlife habitat and water quality. Increasingly, stream improvement projects are collaborative efforts between Parks and Recreation and Natural Resources. The Watershed Management Plan, a functional plan developed in Public Works, outlines the proposed stream improvement projects planned for the next five years. *Exhibit 5.3* on the following page describes projects that have been performed in or near Redmond parks or trails in recent years.

[5] https://www.fws.gov/refuges/education/lakeSammamish_urbanWildlifeRefuge.html

Exhibit 5.2: Lake Sammamish Urban Wildlife Refuge

Redmond is a member of the Lake Sammamish Urban Wildlife Refuge Partnership, and the Lake Sammamish Kokanee Task Force. These efforts bring together residents, land owners, nonprofits, and local, state, tribal and federal governments coming together to restore native kokanee salmon populations and the ecological integrity of the greater Lake Sammamish Basin.

With historical runs estimated at 10,000 fish annually, Lake Sammamish kokanee salmon filled a critical ecological role within the watershed and were an important subsistence and cultural resource to the local tribes. The kokanee has seen decline, with a return of only 58 spawning adults in 2010-11.

In response to such declines, this partnership is implementing a multi-layered recovery approach including: habitat restoration; landscape scale conservation; climate change research; fish supplementation; citizen science; and educational programming.

Actions in Redmond:

- *Participating in an interpretive plan for the Urban Wildlife Refuge*
- *Installed interpretive signs in Idylwood Park and signs informing anglers not to remove kokanee*
- *Salmon eggs placed in incubator in Idylwood Creek*
- *Conducting spawner surveys*

Proposed Actions in Redmond:

- *Interpretive/celebratory action when Idylwood Creek develops and established kokanee run*

Source: *U.S. Fish & Wildlife Service: National Wildlife Refuge Service*

Exhibit 5.3: Recent Habitat Improvement Projects in Parks

Location	Creek	Year	Completed Restoration Work
Bear Creek Park	Bear Creek	2012	Water quality pond, restoration planting on east and west sides of Bear Creek, trail construction, mowed path through restored areas, and interpretive signs
Conrad Olsen Park	Bear Creek	1996	In-stream logs and riparian planting. Built by King County.
Farrel-McWhirter Park	Mackey Creek	2012 2016	Vegetation Planting Design work for channel rehabilitation
Idylwood Park and Neighborhood	Idylwood Creek	2002 2015/2016	Logs placed to stabilize the channel and enhance habitat. Rail fencing to protect riparian planting, and pedestrian bridges. Supplemental planting using volunteer events and EarthCorps
Juel Park	Juel Creek	2014/2015	Replaced culvert, installed logs and plants
Lower Bear Creek Restoration	Bear Creek	2015-Present	Realignment of a section of Bear Creek, with in-stream woody material and riparian planting.
Martin Park (aka Barrett Park)	Bear Creek	2005 2007	Small planting west of Evans Creek channel in 2005 Restoration planting installed as mitigation for trail impact.
Redmond Central Connector II	Willows Creek	2016	Culvert replacement for fish passage
Riverwalk II/90th Street	Sammamish River	2000	Riparian planting
Smith Woods	Monticello Creek	2015 2016	Emergency repair to pond spillway and channel Temporary repair to stabilize channel
The Watershed Preserve	Seidel Creek	2015	Removal of dam. Installation of logs and plants
Welcome Pond	Peters Creek	2004	Stormwater pond, surrounded by native planting

Forests and Vegetation

Upon first glance Redmond and its parks seem to be heavily wooded throughout many areas of the city. However, Redmond's forested lands face the same kinds of pressures and problems as many urban forests, including fragmentation of greenspaces, an invasive-dominated understory that inhibits native species from regenerating, a declining tree canopy, and inadequate resources for natural area management and restoration. These pressures diminish the benefits provided by these valuable urban forests, such as reduced stormwater runoff, improved water and air quality, attractive communities, increased property values, greenhouse gas reduction, habitat for native wildlife, and improved quality of life.

Historically, development has been considered the biggest threat to natural areas. Over the past few decades cities and other public and nonprofit agencies have responded by purchasing and conserving open space through some of the techniques described in *Exhibit 5.1*. The properties were set aside with the thought that the forest ecosystem had managed itself in the past, and that restricting human interaction would result in a healthy forest.

We have now learned, however, that urban natural areas face unique pressures, and that passive management is often inadequate to maintain a high quality of environmental health. Invasive species, litter, pollution, changes in surrounding land use, and fragmentation reduce the forest's ability to thrive within cities. Urban natural areas are disappearing, and with them critical services, such as the reduction of stormwater runoff and absorption of greenhouse gases.[6]

[6] *20-Year Forest Management Plan*, The Green Redmond Partnership, 2009, pp 2-3.

Above: Willows Creek daylighting project

Forests in urban areas face unique pressures and problems that require specific attention. There are five basic problems preventing urban forests from sustaining themselves as native habitat:

- Fragmentation
- Invasive-dominated understory
- Native species struggling to regenerate
- Inadequate resources for natural area management and restoration
- Declining canopy

Exhibit 5.4 illustrates some of the problems presented by invasive plants.

All of the factors above contribute to the loss of Redmond's forest canopy in parks, natural areas and on private land. Compared with the region's historic native forest composition, deciduous trees make up a higher proportion than is normal in a healthy Northwest forest. Native conifer regeneration is limited, as conifers do not regenerate as quickly as deciduous trees. Additionally, the landscape-scale loss of trees due to cutting and development for residential and commercial purposes has left a limited seed source for native trees. Ongoing urban pressures on natural areas, such as development, landscaping, and clearing for views, trails, and solar access, all play a significant role.

Exhibit 5.4: Excerpt of "What's wrong with English Ivy"

The dominance of non-native plant species is a major cause of biodiversity loss and ecosystem degradation in urban forests. Examples of non-native plants that are causing significant problems in the Pacific Northwest, including Redmond, are plants such as:

- *Himalayan and evergreen blackberry*
- *English ivy*
- *Scot's broom (or "Scotch" broom)*
- *Bindweed and knotweed*

These invasive weeds lack natural population control (e.g. predators, diseases) and are capable of rapid reproduction; they can quickly blanket the understory and prevent native plants from reseeding (Boersma et al. 2006). At the same time, invasive vines such as English ivy climb into treetops where their leaves can block light from reaching the tree's leaves and the weight of their trunk-like vines can topple trees. Without native plants in the understory, habitat and food supply for native wildlife is greatly reduced and the next generation of native tree canopy is lost.

This problem is exacerbated by the fact that a significant portion of forest canopy in the Puget Sound region is now composed of relatively short-lived bigleaf maple and red alder coming to the end of their life spans. As these trees succumb to age, new seedlings are not present to replace them, resulting in a loss of forests over time.

***Source:** 20-Year Forest Management Plan, The Green Redmond Partnership*

Additionally, the removal of vegetation along many streams and wetlands early in Redmond's history resulted in a complete loss of native species cover. Many streams are now buried under a canopy of invasive species such as blackberry, ivy, or reed canary grass. The loss of native vegetation along our waterways results in significant impacts on stream temperatures and water quality, loss of habitat, and erosion, negative influences on aquatic species, including several species of salmon. The benefits provided by urban forests are extensive, as outlined in *Exhibit 5.5* "Ecological and Social Benefits Provided by Urban Forests," from the *20-Year Forest Management Plan* by the Green Redmond Partnership.

Exhibit 5.5: Ecological and Social Benefits Provided by Urban Forests

How Urban Forests Work to Improve our Cities	
Reduce Stormwater Runoff	**Tree canopy reduces the rate at which rain falls to the earth. Water enters the ground more slowly under trees and is better absorbed and filtered into groundwater than when it runs off non-porous surfaces. Since conifers and other evergreen plants grow year-round, more water moves up from the ground, through plant tissues, and into the atmosphere as water vapor. The amount of water in the top 2 feet of the soil is reduced, leaving more room for additional rainwater to flow into the soil. (Geiger 2002, Saunders 1986).**
Improve Water Quality	**Plant roots absorb water, much of which is full of pollutants in an urban environment. Some pollutants are transformed by plants through metabolism. Others are trapped in woody tissues and released only when a tree decomposes. Forested buffers around streams have been shown to reduce sediment and nutrient pollution levels (Osborne & Kovacic 1993).**
Reduce Erosion	**As the canopy of trees slow the speed of rain falling on the earth, rainwater has less energy to displace soil particles. Soils under a canopy and the thick layer of leaf litter are protected from the erosive energy of rainwater (Xiao et al. 1998).**
Increase Property Values	**Homes that border urban forests may be valued at up to 5% more than comparable homes farther from parks (Tyrväinen and Miettiner 2000). Forested parklands provide residential properties with an adjacent natural area for walking and passive recreation activities such as bird watching.**
Improve Air Quality	**Plant leaves absorb carbon dioxide and produce oxygen through photosynthesis. The surfaces of leaves trap airborne dust and soot (McPherson et al. 1994).**
Make Communities More Attractive	**Vegetation provides visual relief from the built environment. Trees and stretches of parkland can soften the angular edges of buildings, while the natural tones of bark and foliage are easy on the eyes. Trees are known to be the most important factor in influencing the perception of a community's aesthetic value (Schroeder 1989).**
Combat Climate Change	**Trees absorb carbon dioxide and store the carbon in woody tissues, reducing the amount of carbon dioxide in the atmosphere. Urban forests have the capacity to lower energy consumption in urban environments by lowering ambient temperatures and to create microclimates conducive to air movement. Lowering energy consumption reduces electricity use and the amount of carbon dioxide emitted into the atmosphere from power plants (Nowak and Crane 2001).**
Provide Wildlife Habitat	**Native wildlife have unique requirements for food and shelter. Although raccoons and crows adapt well to urban environments, many native species do not. They require a variety of plants and multiple layers of canopy to forage and nest. Healthy urban forests under restoration have been demonstrated to increase species diversity (Ruiz-Jaén and Aide 2006).**
Buffer Noise	**Tree canopies dampen sound by intercepting sound waves (Herrington 1974)**

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Tree Canopy Coverage

To understand the magnitude of canopy needs, it is helpful to know the extent, location, condition and ownership of trees and forests currently found in the city. Using specialized photography techniques and Geographic Information Systems (GIS) mapping it is possible to estimate the amount of forest canopy in Redmond, determine where it is located and where there are opportunities for enhancement. The methodology is further explained in Appendix A.

Using these tools, overall citywide tree canopy coverage is estimated at 38.7%, and rounded up to 39%. The following areas are used in calculating "citywide" tree canopy cover:

- Public and private properties within the contiguous area of Redmond City limits
- Areas within the City limits, but not contiguous to the main part of the City:
    - Farrel-McWhirter Park
    - The Watershed Preserve
- City-owned properties in unincorporated King County
    - Martin Park
    - Perrigo Park Phase II
    - Conrad Olsen Park
    - Juel Park

Results of the 2012 aerial digitizing update indicate that on a citywide scale changes in tree canopy since 2007 are subtle. For this reason, only major impacts to canopy of more than 0.1 acre were recorded. *Map 5.2: Existing Tree Canopy, in Appendix 5 C* illustrates the extent of tree canopy and identifies the underlying type of land.

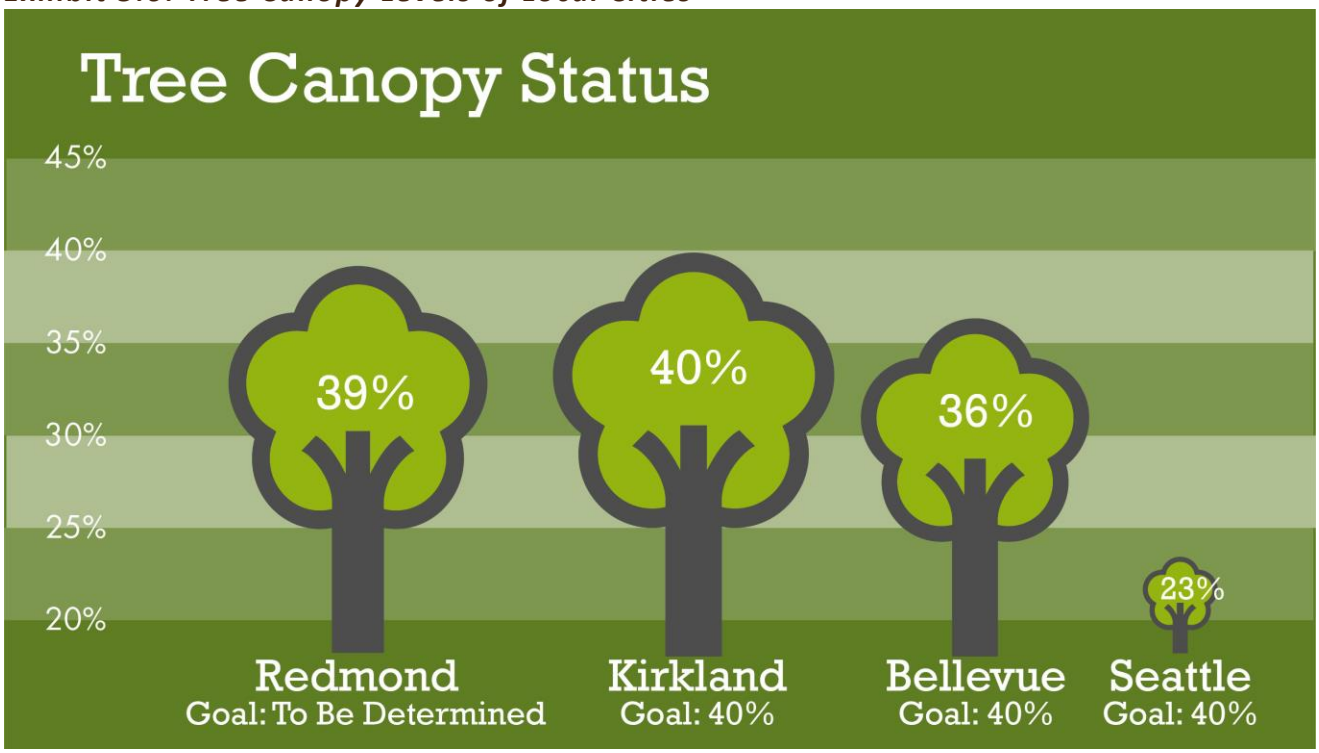
As expected, much of the existing canopy is found on public properties such as parks, utility and stormwater properties, and natural areas owned by the City. Other properties with tree canopy include both public and private lands that are protected with regulations, such as critical areas, or properties with easements or other protective mechanisms, such as Natural Growth Protection Areas, as described earlier. There is also measurable tree canopy on properties that do not have any identified protective measures.

In 1997 a nationwide forestry advocacy group, American Forests, recommended a target of 40 percent tree canopy coverage for cities. Recently American Forests discontinued that recommendation, citing that a tree canopy coverage goal is variable depending on the local conditions.[7] In spring 2017 American Forests will be launching a new online toolkit that can help managers assess the state of their urban forest, set realistic targets and chart a path toward long-term sustainability. Many cities across the country have developed a tree canopy goal.[8] A number of cities in the region have also identified the current status of their tree canopy, and their goals for the future, as shown below.

[7] http://www.americanforests.org/blog/no-longer-recommend-40-percent-urban-tree-canopy-goal/

[8] https://www.usmayors.org/trees/treefinalreport2008.pdf

Exhibit 5.6: Tree Canopy Levels of Local Cities



Redmond citywide tree canopy calculated here includes: public and private properties within the contiguous area of Redmond City limits, areas within the City limits, but not contiguous to the main part of the City, and City-owned properties in unincorporated King County

5.2.3 Historic and Cultural Properties

The City's park system includes a number of properties that reflect the history and culture of Redmond. These irreplaceable cultural resources–significant artifacts, buildings, structures, sites, objects, and places of significance–are assets for the current and future generations of our City. These facilities help tell the story of Redmond and the unique character of the City. Archaeological resources contribute to a collective shared heritage and provide opportunities for recognizing and celebrating local human presence spanning approximately 12,000 years in the past. Historic resources, such as buildings and places, also create a tangible sense of place and provide civic pride and community spirit. These resources can serve as educational tools and economic drivers for the community.

Chapter 5: Conservation

The City's Landmark Commission and the Redmond Historical Society have worked together over the years to develop policies to identify and protect historic resources. The Redmond Heritage Resource Register, adopted by the City Council, recognizes sixteen properties designated as historic landmarks.

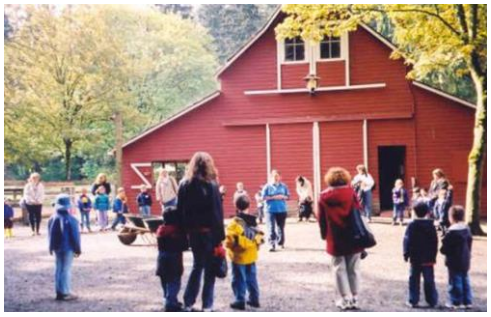
The following list includes the five landmark properties that are managed by the Parks and Recreation Department. In addition, there are several older buildings and farmsteads on park properties that are not landmarked, but have intrinsic historic and useful value.

Historic photo of Redmond City Park (now known as Anderson Park)

Redmond City Park, 7802 168th Avenue NE
Now known as Anderson Park, this park was the first park in the City and was developed in 1938 as part of the federal Works Progress Administration. In 2008 and 2009, Anderson Park was listed on the Washington Heritage Register and the National Register of Historic Places, respectively.

Current photo of Anderson Park

Conrad Olsen Farmstead, 18834 NE 95th Street
Now known as Conrad Olsen Park, this property was part of Conrad and Anna Olsen's farm established in 1905. The park is a reminder of the City's rural heritage and is included in the East Redmond Corridor Master Plan.



Conrad Olsen Farmstead

Haida House Studio, 7747 159th Avenue NE
This site is known for its association with local wood carver Dudley Carter, who lived and worked at this location in his later years. Carter built his Haida House studio elsewhere in the region and reassembled it on this site after he moved here in 1988. A master plan has been completed for the site, which is now known as Dudley Carter Park. Renovations to the roof and totems were performed in 2013. Photos below show conditions before and after renovation.

Haida House in Dudley Carter Park

Hutcheson Homestead, 19545 NE Redmond Road
Now known as Farrel-McWhirter Park, this property was originally the homestead of Charles and Sally Hutcheson. The McWhirters purchased the property in 1936 and donated it to the City of Redmond for a park in 1971.

Historic photo of Hutcheson Homestead

Current photo of house at Conrad Olsen Farmstead

Historic photo of Redmond School

Current photo of Old Redmond Schoolhouse

Redmond School, 16600 NE 80th Street
The Old Redmond Schoolhouse was built in 1922, with 12 classrooms, and served grades 1 through 12. It has been expanded and modified over the years but maintains significant historical integrity. This building is currently used as a community center and includes the office of the Redmond Historical Society. The building is owned by Lake Washington School District and leased to the City. The lease will be ending, and the building returned to LWSD in 2018. Some use for recreation purposes may continue, if agreed to by LWSD.

The City of Redmond works with King County's Office of Historic Preservation through an Interlocal Agreement between these agencies making the Redmond landmarks eligible for King County funding and incentive programs. The City also receives funding from 4Culture for preservation projects.

Recent projects that have been performed in Redmond parks that contain landmarked or other historic buildings include:

- **2009, 2011 - Anderson Park:** Adair House, Fullard House, gutter replacement, and picnic shelter roof, structural timber, and chimney restoration
- **2013 – Dudley Carter Park:** Haida House Replica No. 4, replace roof, preservation treatment to structure and totems, treated windows to protect against shattering

5.2.4 Archaeological Resources

Archaeological resources provide tangible evidence of past human cultures. In the United States archaeological sites are typically characterized as pre-contact (before the arrival of Europeans) or Historic. There are many types of archeological resources but the most common are artifacts and features. Artifacts are portable objects that reflect human activity. Examples of artifacts include pottery, cans, shards of glass, and projectile points. Artifacts found individually are referred to as isolates. If there are multiple features found in their original locations they may constitute a site. Features are non-moveable elements of an archaeological site.

"Archaeological sites are nonrenewable resources that contribute to our sense of history and place and define our collective shared heritage. The wise stewardship of these sites is our collective responsibility."

- Washington State Department of Archaeology and Historic Preservation

Above: Roof of the Haida House

Features are evidence of human activity that primarily consist of cultural materials which are integrated into natural layer. Features can include trash pits, hearths, walls, or pathways.

During recent construction to return Lower Bear Creek to a condition approximating its original form, a number of archaeological artifacts were discovered in Redmond. In response to this event the U.S. Army Corp of Engineers, Washington State Department of Archaeology and Historic Preservation (DAHP), affected Tribes, other agencies, and the City entered into an agreement committing the City to develop citywide protocols and procedures for protecting and managing cultural resources, including archaeological and historic resources. Redmond has a strong archaeological history, and the location and identity of the sites are confidential and governed by the Washington State Archaeology and Historic Preservation Office.[9] The City is in the process of developing a Cultural Resources Management Plan that will plan for, protect and manage archaeological and historic resources. As stated on DAHP's website:

The Department of Archaeology and Historic Preservation recognizes that archaeological sites are nonrenewable resources that contribute to our sense of history and place and define our collective shared heritage. The wise stewardship of these sites is our collective responsibility.[10]

[9] http://www.dahp.wa.gov/learn-and-research/preservation-laws
[10] http://www.dahp.wa.gov/programs/archaeology

Above: *Sammamish River Trail*

76%

of respondents state that "preserving more open space natural areas such as forested areas or wetland habitats" is a very high priority

5.3 Demand

To determine the needs and demands of the community, it is necessary to understand what the community values. As described in the Community Engagement chapter, a number of techniques were used to generate input from the public about what they care most about. It is also useful to explore trends and changes that are happening in recreation and conservation regionally and nationally, to see how those trends might apply here, and be incorporated into future work. In 2015 the City conducted a survey to determine residents' attitudes toward a number of park, recreation and cultural arts issues. One of the most compelling results from this survey revealed that the highest priority for the future of Redmond parks was **"preserving more open space natural areas such as forested areas or wetland habitats."** This was ranked as a moderate priority to very high priority by 76 percent of respondents. This and other responses to conservation related issues are illustrated in *Exhibit 5.7*.

This survey result coincided with a time when extensive and rapid changes had been happening in the city—construction of numerous single family home developments in north Redmond and multi-use/multi-story apartment buildings in Downtown, in addition to the redevelopment of property in the Overlake neighborhood that included the removal of many large trees. The highly visible loss of trees throughout the city may have clarified the aesthetic and ecological value of a forested environment for area residents.

Exhibit 5.7: Survey Results of Priorities

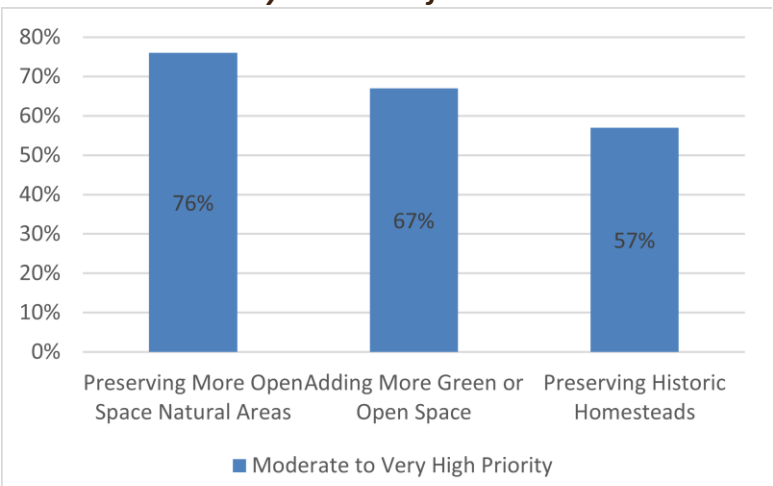
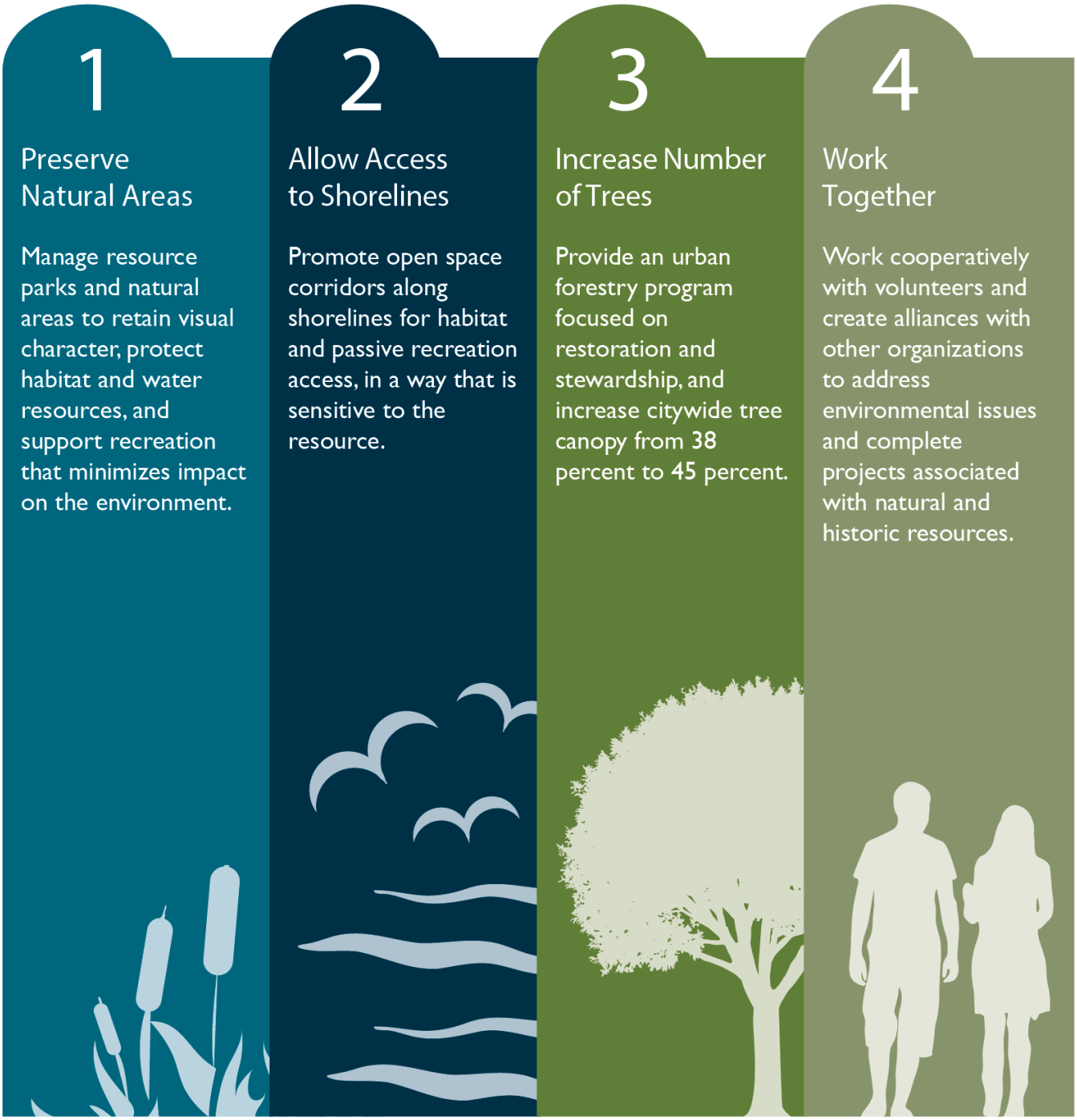


Exhibit 5.8 illustrates some of the most significant values of the Redmond community pertaining to stewardship and recreation in natural areas. These are derived from the survey results, public engagement, and policy statements in Chapter 3, which were developed in partnership with the Redmond Parks and Trails Commission, Arts and Culture Commission and Planning Commission. These values can help guide the City's future actions in these environments.

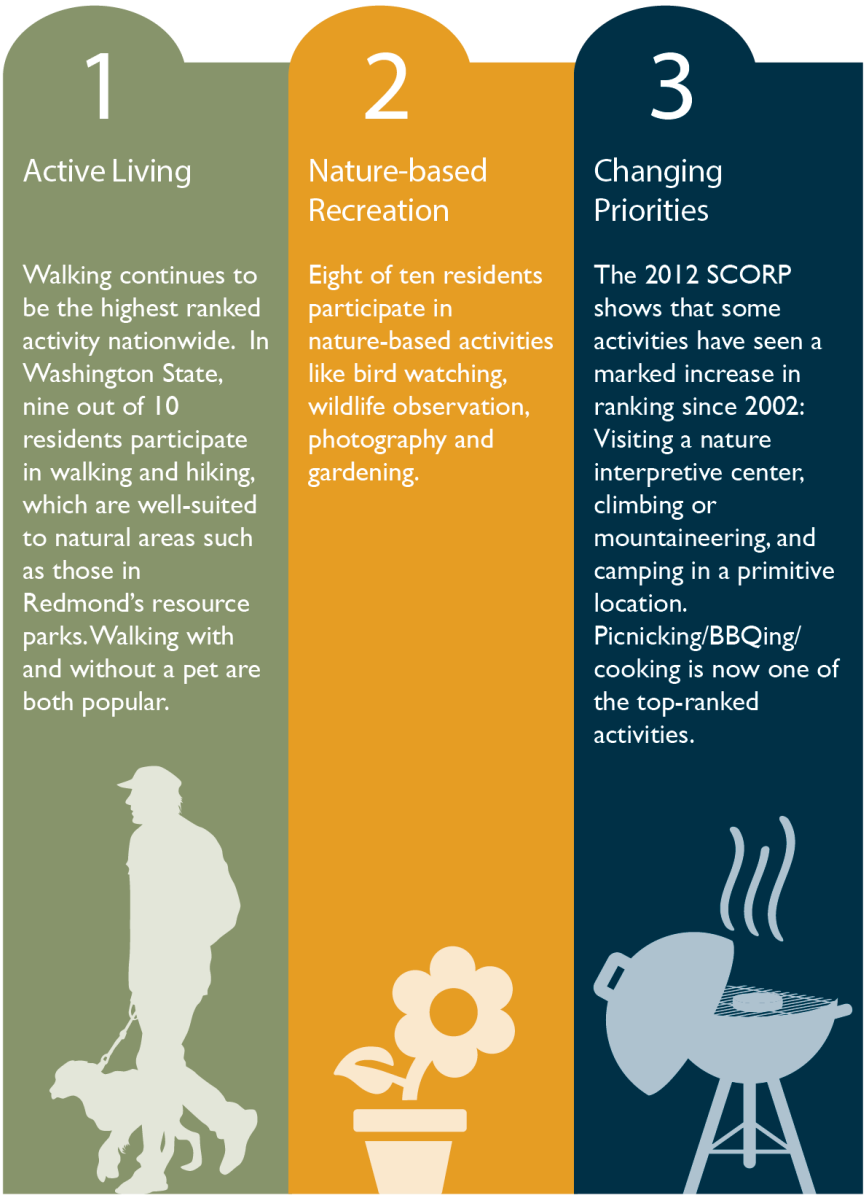
Exhibit 5.8: Community Values Summary



5.3.1 Recreation Trends

The 2013 Washington State Comprehensive Outdoor Recreation Plan (SCORP) is the result of collecting and analyzing data about participation, expectations, and needs of Washington's residents related to outdoor recreation activities. Researchers combined that information with data about other key factors such as sustainability, access, and maintenance. This results in a demand assessment that can be quantified and thus provide useful information for cities planning for the future. *Exhibit 5.9* illustrates some of the conclusions of the state's 2013 SCORP, in relation to resource-based parks and the natural environment.

Exhibit 5.9: Recreation Trends in Natural Areas



At a national level, a single book has been influential in highlighting the staggering divide between children and the outdoors. In *Last Child in the Woods: Saving our Children from Nature Deficit Disorder*, child advocacy expert Richard Louv directly links the lack of nature in the lives of today's wired generation—he calls it nature-deficit—to some of the most disturbing childhood trends, such as the rises in obesity, attention disorders, and depression.[11]

Last Child in the Woods was the first book to bring together a new and growing body of research indicating that direct exposure to nature is essential for healthy childhood development and for the physical and emotional health of both children and adults. Since 2005 this book, and

[11] Website reference: http://www.childrenandnature.org/author/rich/

ensuing ones, have spurred a national dialogue among educators, health professionals, parents, developers and conservationists to change the way we think about nature and its importance in children's lives.

Parks and trails are seen as a significant tool in the toolbox of techniques to improve public health. The benefits of physical activities such as walking, biking and playing sports are well-documented. Recently there have been additional studies about the mental and physical benefits of being in nature, and specifically taking a walk in the woods. Scientists have advanced a wide range of theories about the specific physical and mental benefits nature can provide, ranging from clean air and lack of noise pollution to apparent immune-boosting effects. [12] Redmond is fortunate to have several forested locations where residents and visitors are able to experience these effects close to home.

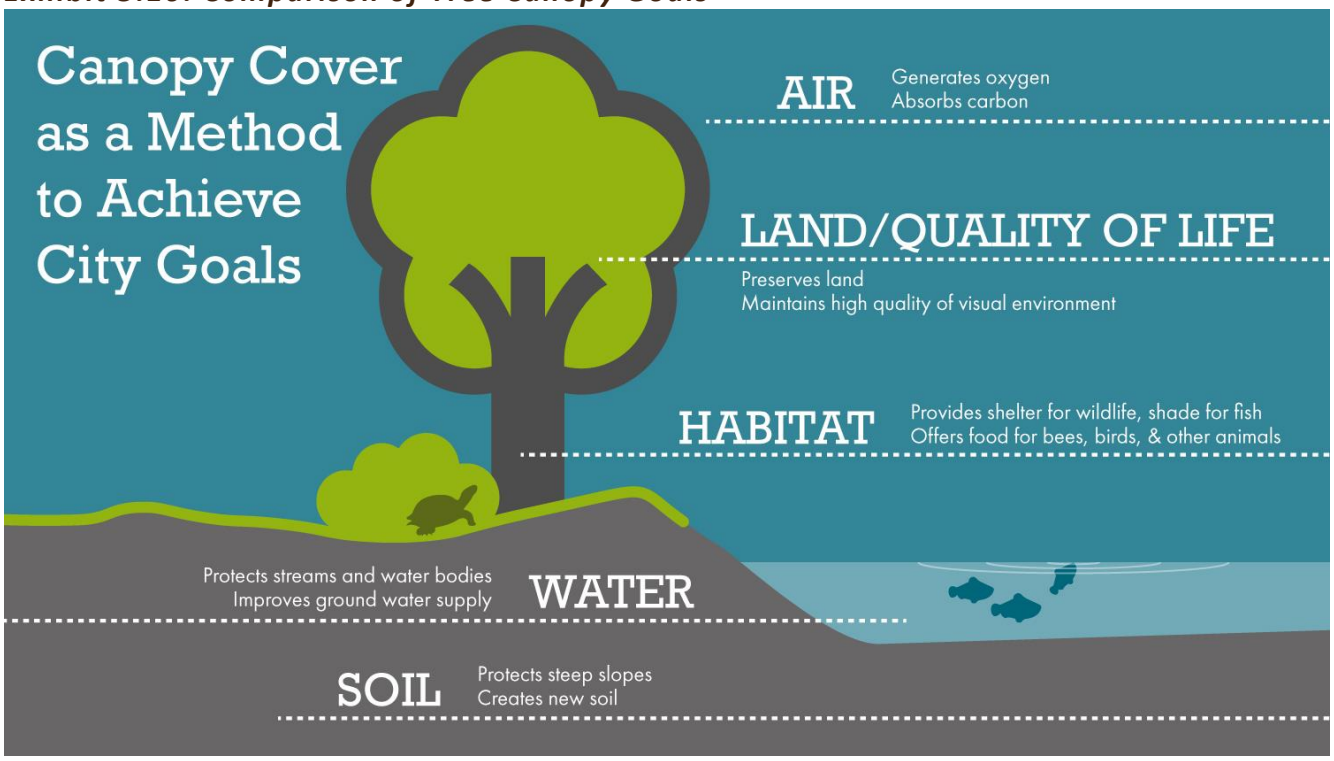
5.4 Level of Service

Upon review of the many factors affecting environmental conditions, visual quality and quality of life and health in Redmond, it is evident that loss of native forested lands contributes to almost every critical concern identified—from increased stormwater runoff to climate change. Reversing the trend of declining tree canopy is vital to achieving many of the city's objectives for a livable, sustainable environment. As indicated in the Demand section, Redmond community members value resource parkland. City staff proposed the development of a tree canopy goal to increase the number of trees and canopy coverage across the city and vetted the proposal with the community in the spring of 2015. The community, the Parks and Trails Commission, and the City Council support the general proposal. Based on the demands of the public and trends in national policy, the Parks and Recreation Department proposed a new policy in this plan to develop a new level of service for tree canopy. It will be implemented in a collaboration between the Parks and Recreation, Public Works, and Planning Departments.

A Tree Canopy Strategic Plan will explore and address the elements and resources required to accomplish the expansion of canopy in Redmond parks, as well as in other public and private properties. The plan will articulate a specific canopy goal, which will become a level of service, and outline program details and responsibilities.

[12] http://www.theglobeandmail.com/life/health-and-fitness/fitness/why-is-walking-in-the-woods-so-good-for-you/article4209703/

Exhibit 5.10: Comparison of Tree Canopy Goals



***Above**: Farrel-McWhirter Park*

"Build a sustainable network of healthy urban greenspace for the benefit and enjoyment of current & future generations by bringing 1,035 acres of Redmond's forested parkland into active management over the next 20 years."

- Green Redmond Partnership

5.5 Implementation

The following projects will be implemented in support of the Conservation goals and policies. These projects are on the work plan and capital improvement plan for the Parks and Recreation Department.

5.5.1 Tree Canopy Strategic Plan

Work in collaboration with Public Works and Planning Departments to develop a Tree Canopy Strategic Plan. The following six major steps will be undertaken to prepare the plan:

1. Estimate Current Conditions-- Refine and/or gather data to determine the quantity, location and health of existing tree canopy.
2. Identify Opportunities for Tree Canopy Expansion-- Use mapping and data collection to find properties and land types that offer the best opportunities for increasing the number of trees in Redmond.
3. Establish Goals for Tree Canopy Coverage-- Determine how much of the city's land area should be devoted to forested areas.
4. Evaluate current regulations and effectiveness?
5. Develop a Program to "Grow a Forest in Redmond"-- Explore ways to increase tree canopy by engaging the community and developing tree expansion programs on public and private properties. Identify ways to connect tree canopy.
6. Plan for Sustainability-- Monitor and care for the urban forest by preserving existing canopy and actively managing protected areas.

5.5.2 Proposed Natural Resources Conservation Projects

A number of conservation related projects are projected for upcoming years. These are listed in *Exhibit 5.11*, and include measures such as stream and habitat restoration, wetland creation and restoration, and detention vaults.

Many of these will be collaborative efforts with the Natural Resources Division.

Exhibit 5.11: Proposed Conservation Projects

Project	Location / Water Body	Sponsor	Proposed Work
2017 - 2022			
Bear Creek at 95th Street	Bear-Evans Creek Greenway, South of 95th Street	Natural Resources	In-stream and riparian improvements
Idylwood Park Renovations	Lake Sammamish	Parks	Renovate swimming dock Develop fishing dock
Mackey Creek Restoration	Farrel-McWhirter Park/ Mackey Creek	Natural Resources	Bridge replacement, in-stream improvements
Smith Woods Pond and Channel Restoration	Monticello Creek	Parks / Natural Resources	Evaluate options for restoring pond and/or channel
2023-2030			
Evans Creek Realignment	Near Martin Park/ Evans Creek	Natural Resources	Channel relocation, riparian enhancements
Keller Wetlands	Keller Farm/ Bear Creek,	Natural Resources	Wetland mitigation bank, plantings, coordination with future trail system
Juel Park	Bear Creek	Natural Resources	Remove rubble, evaluate conditions
Municipal Campus and Vault	Municipal Campus Lawn	Natural Resources	Stormwater vault, restore lawn area
Overlake Village North--Park and Stormwater Vault	NA	Parks/ Natural Resources	Acquisition, planning and design
Overlake Village South--Park and Stormwater Vault	NA	Parks/ Natural Resources	Acquisition, planning and design
Sammamish Valley Park Phase II (Restoration Area)	Wetlands	Parks	Remove invasive plants and create wetlands
The Watershed Preserve	Seidel Creek Colin Creek	Natural Resources	Fish barrier removals

5.5.3 Proposed Historic Preservation Projects

A number of projects are proposed for historic properties or structures. These are listed below and described in more detail in Chapter 4.

Exhibit 5.12: Proposed Historic Preservation Projects

Park	Structure/ Location	Proposed Work
2017 - 2022		
Anderson Park (City Park)	Adair House	Replace roof, remodel kitchen and restroom.
Farrel-McWhirter Park (Hutcheson Homestead)	Multiple Buildings	Repairs to electrical systems
2023 - 2030		
Conrad Olsen Park	House, barn	Park development and building repairs
Farrel-McWhirter Park (Hutcheson Homestead)	Multiple Buildings	Renovations to historic buildings

Appendix 5 A: Policies

The following is a compilation of policies from all elements of the City Comprehensive Plan that are related to conservation. Policies are arranged by the element name under which they appear in the Comprehensive Plan.

Environmental Stewardship

NE-2 Utilize Best Management Practices (BMPs) and technology in City projects and practices to achieve effective environmental stewardship while striving towards sustainable fiscal responsibility.

NE-9 Promote and lead education and involvement programs to raise public awareness of environmental issues, encourage respect for the environment, and show how individual actions and the cumulative effects of a community's actions can have significant effects on the environment.

NE-12 Encourage environmentally friendly construction practices, such as Leadership in Energy and Environmental Design (LEED), King County Built Green, and low-impact development.

NE-14 Cooperate with other local governments, State, federal and international agencies, and nonprofit organizations to protect and enhance the environment to foster sustainability, especially for issues that affect areas beyond Redmond's boundaries.

Environmentally Critical Areas

NE-21 Conserve and protect environmentally critical areas from loss or degradation. Maintain as open space hazardous areas and significant areas of steep slopes, undeveloped shorelines, and wetlands.

NE-65 Pursue opportunities to enhance and restore degraded wetlands.

NE-75 Protect and enhance rivers, streams and lakes, including riparian and shoreline habitat, to protect water quality, reduce public costs, protect fish and wildlife habitat, and prevent environmental degradation. Protect both perennial and intermittent streams to preserve natural hydraulic and ecological functions, fish and wildlife habitat, recreational resources, and aesthetics.

NE-79 Preserve and enhance the natural appearance of stream corridors.

NE-88 Maintain a rich ecosystem supporting a variety of wildlife, as well as opportunities for education and appreciation of native habitats.

NE-89 Preserve and restore regional biodiversity with a focus on promoting native species and avoiding and eliminating invasive species.

NE-93 Design developments, parks, and recreation areas, to minimize impact to, and retain the character of, Quality Habitat Areas.

NE-101 Consider impacts City projects have on wildlife corridors and connectivity.

NE-105 Use native vegetation on City capital projects, prevent the continued spread of invasive and noxious weeds to habitat areas, maintain a long-term management strategy to prevent noxious weeds, and manage these weeds where they are present on City-owned properties.

NE-110 Employ wildlife habitat-friendly practices in designing and maintaining city parks.

Tree Preservation and Landscape Enhancement

NE-113 Maintain no net loss of significant trees within the city over the long term.

NE-115 Design City capital improvement projects to preserve trees to the maximum extent possible.

NE-121 Provide information to community residents and property owners to encourage them to plant trees on their properties.

Climate Change

NE-128 Take positive actions such as increasing the number of trees in the city, to reduce carbons.

Historic and Cultural Resources

FW-37 Preserve Redmond's heritage, including historic links to native cultures, logging, and farming, and its image as the Bicycle Capital of the Northwest, as an important element of the community's character.

DT-13 Identify historic resources that are defining features of Redmond's Downtown and use the following techniques to preserve the historic character:

- Encourage landmark nomination,
- Encourage restoration and maintenance,
- Incorporate historic building facades or elements of the existing historic buildings into new development,
- Ensure that design of new developments adjacent to Historic Landmarks respect the historic character of those buildings where adjacent historic buildings are likely to qualify for landmarks, and
- Celebrate the history of Redmond through creative and meaningful presentations of historical objects and integrated historical features and art as part of public places and developments.

PR-37 Continue to support and enhance the historic resource of Farrel-McWhirter Park in its provision of farm animal programs, special programs for children and families, trails, and open space.

CC-43 Protect significant archaeological resources from the adverse impacts of development.

CC-49 Work with residents, property owners, cultural organizations, public agencies, tribes and school districts to develop an active preservation program, including:

- Walking tours, brochures and plaques;
- Online information; and
- Educational efforts to foster public awareness of Redmond's history.

CC-50 Partner with or provide staff support, when possible, for private businesses and nonprofit agencies in preservation and educational efforts.

SF-12 Require shoreline development to identify potential development impacts to, and to protect and respect, valuable archaeological and historic sites and cultural resources.

SL-83 Identify and protect valuable archaeological and historic sites and resources in shoreline development.

SL-84 Encourage acquisition of shoreline sites with major archaeological, historic or cultural value to the community by the City where feasible.

Parks, Arts, Recreation, Culture & Conservation (PARCC)

PR-55 Preserve and manage resource parkland and natural areas within parks whenever feasible to retain Redmond's visual assets and character, protect wildlife habitat and corridors, enhance urban forest canopy, and support recreational uses that do not compromise environmental integrity.

PR-56 Provide a comprehensive urban forestry program focused on restoration and stewardship that enriches natural areas and the environmental health of the city, and enhances the built environment.

PR-57 Provide a comprehensive urban forestry program focused on restoration and stewardship that enriches natural areas and the environmental health of the city, and enhances the built environment

Appendix 5 B: Tree Canopy Inventory Methodology

Two methods were used for calculating existing tree canopy coverage. These include the following:

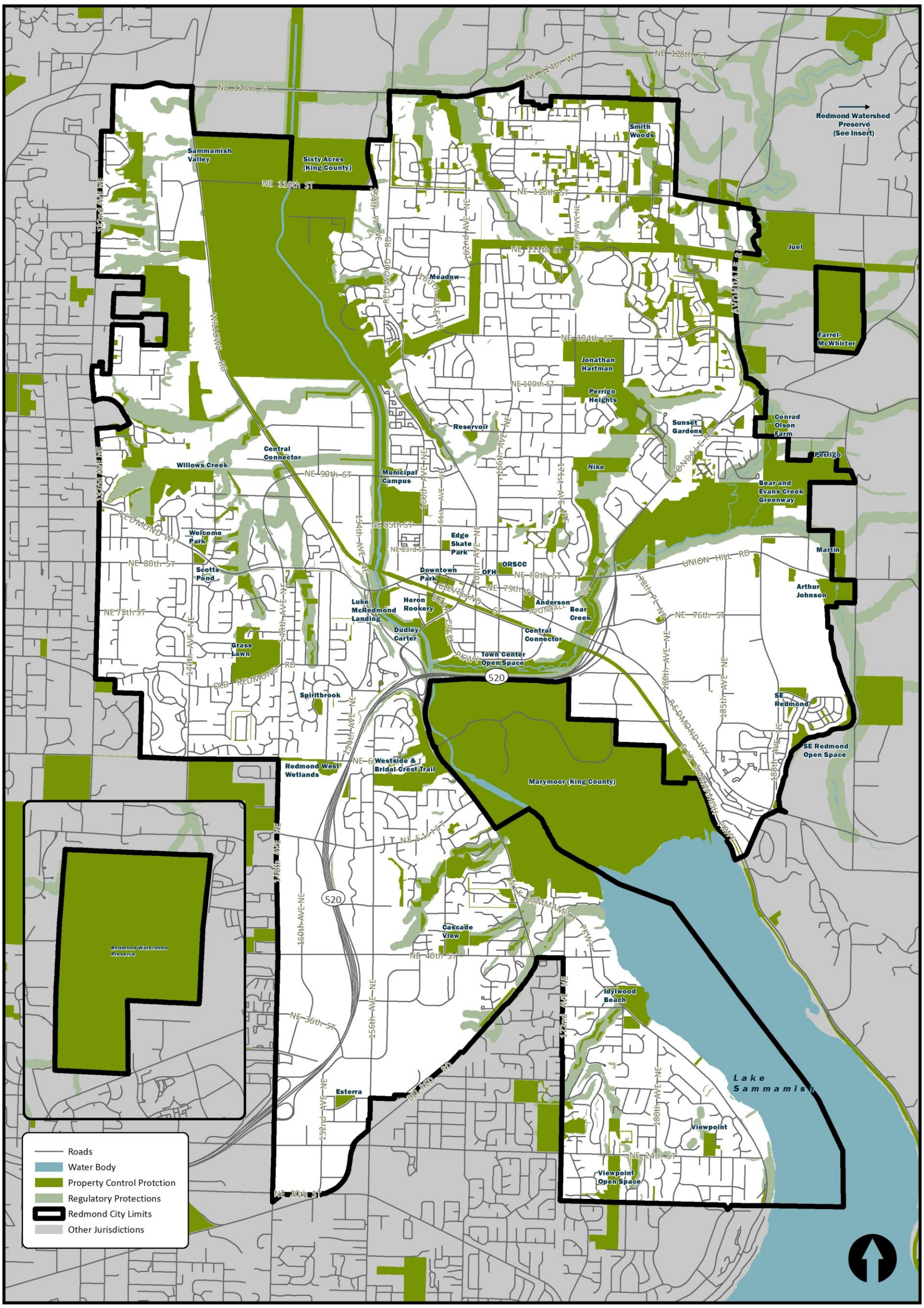
- Aerial Photography—Photos of the entire city are taken at approximately two year intervals. Aerial photographs can show the width of individual trees and tree canopy masses. This allows for easy tracking of changes over time, and creates an easily understandable image of how "green" the city is. However, it is less accurate when it comes to differentiating between different types of vegetation. For example, large shrubby vegetation, such as blackberries, can be difficult to distinguish from trees. Aerial photos from 2012 were used in this evaluation and calculation. New information will be available soon from the 2015 flight, and should be used in future planning.

- Lidar—Lidar is a surveying technology that measures distance by illuminating a target with a laser light. This allows for a more accurate calculation of canopy due to Lidar's ability to discern the height of elements such as trees. The first Lidar survey used to measure tree canopy was undertaken in 2015.

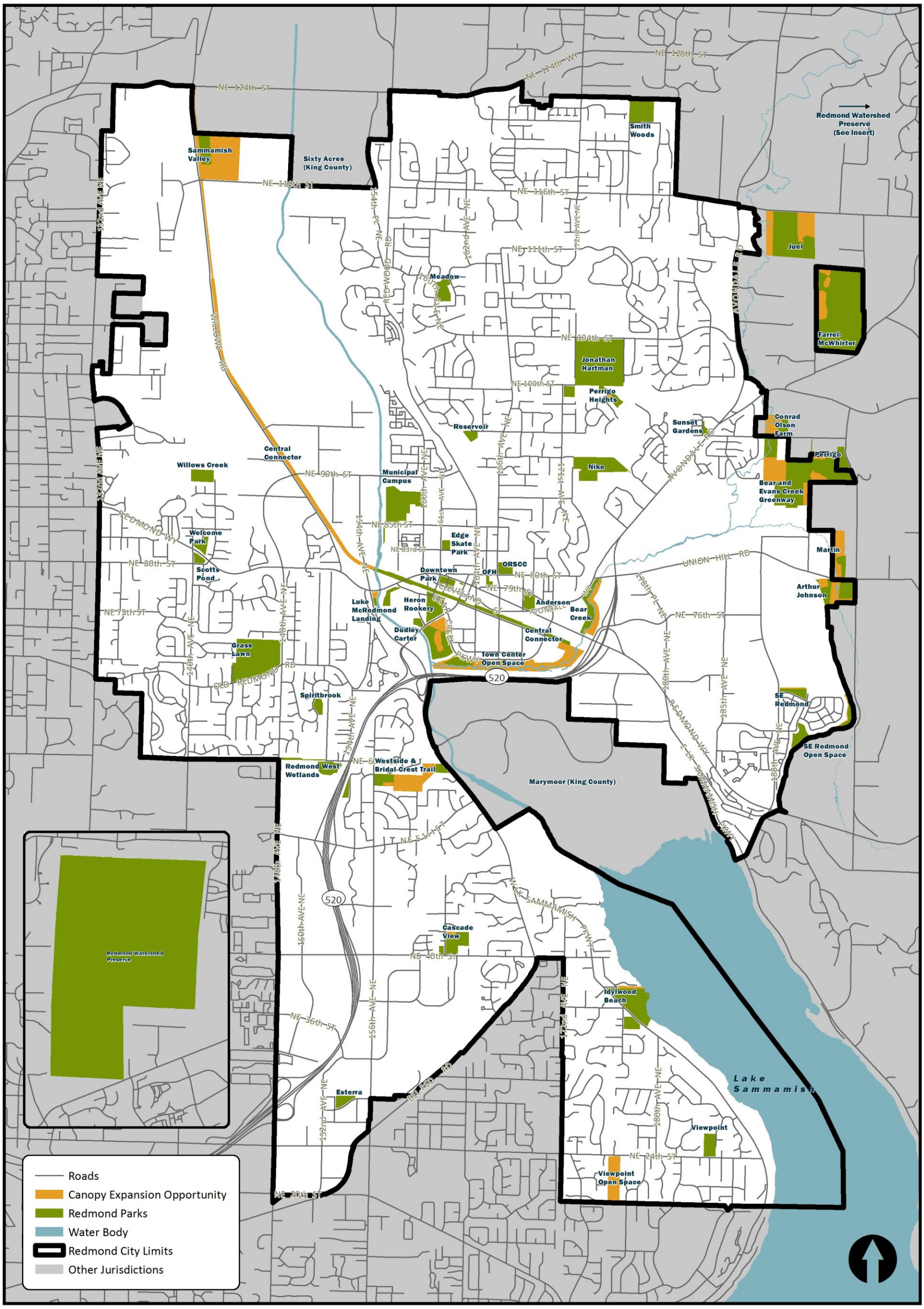
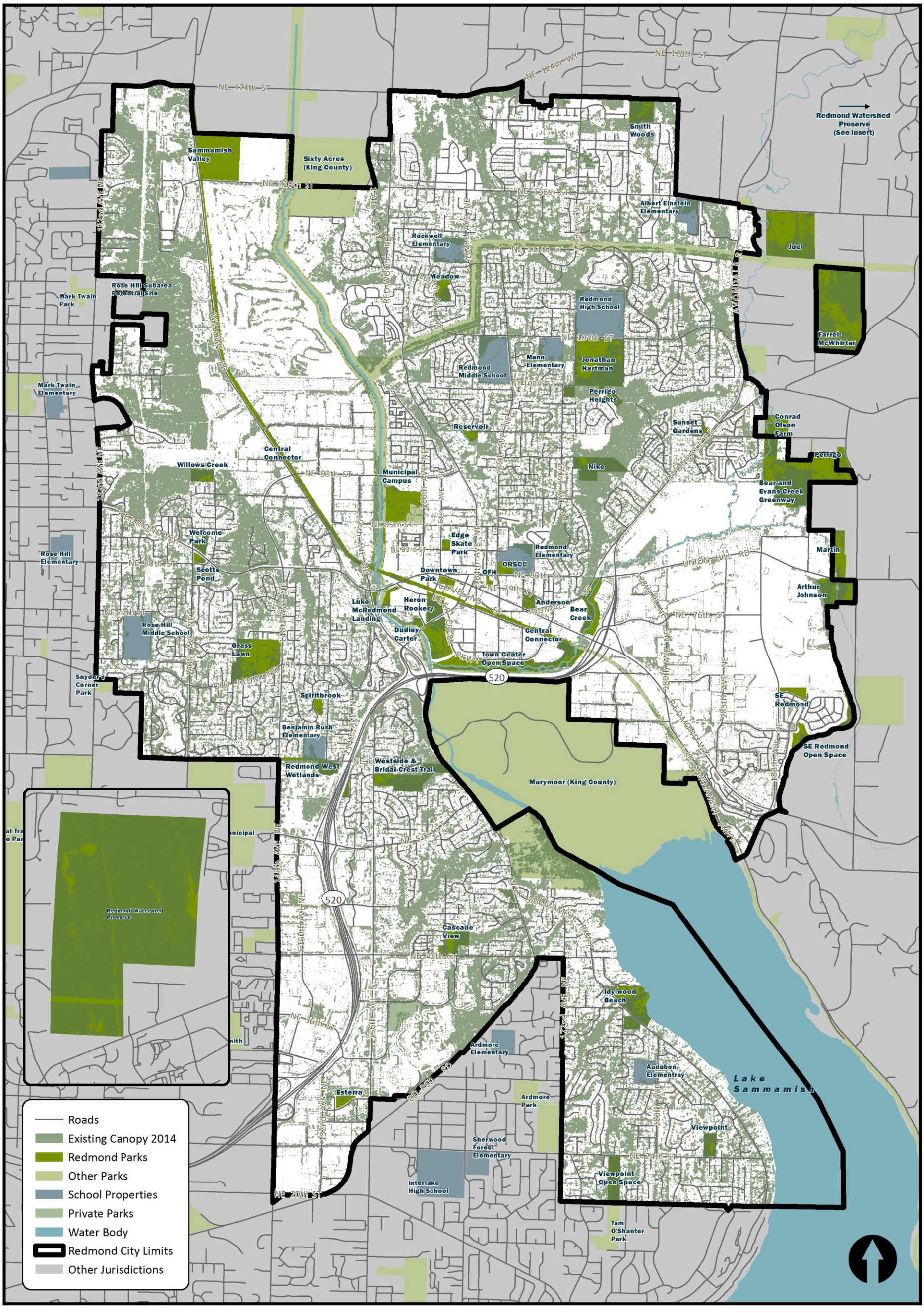
Vegetation of more than ten feet in height is classified as a tree or tree canopy. In addition, it typically takes five or more years of growth from the time of planting before new trees reach the 10-foot diameter canopy size to be tallied in the tree canopy coverage analysis. Therefore, repeating the Lidar survey (to identify trees, by measuring height) at approximately five year intervals would be useful to demonstrate change in canopy coverage. Due to the high cost of Lidar surveys, it is most likely that the City would join with King County or other jurisdictions to share costs. While no additional surveys are scheduled at this time, a Lidar survey performed around 2020 would be ideal for tracking tree canopy coverage.

Appendix 5 C: Maps

Map 5.1: Protected Lands in Redmond



Map 5.2: Canopy Expansion Opportunity Sites on Park Properties



Map 5.3: Tree Canopy in Redmond