BEFORE THE METRO COUNCIL

FOR THE PURPOSE OF COUNCIL APPROVING THE NORTH TUALATIN MOUNTAINS ACCESS MASTER PLAN	)))))))	RESOLUTION NO. 16-4679 INTRODUCED BY CHIEF OPERATING OFFICER, MARTHA BENNETT, IN CONCURRENCE WITH COUNCIL PRESIDENT TOM HUGHES

WHEREAS, in May 1995, area voters approved ballot Measure 26-26, authorizing Metro to issue $135.6 million for bonds for Open Spaces, Parks, and Streams to purchase land in regional target areas; and

WHEREAS, in November 2006, area voters approved Metro's Natural Areas Bond Measure, authorizing Metro to issue $227.4 million for bonds to purchase land in regional target areas; and

WHEREAS, using bond measure funds, Metro acquired approximately 1,300 acres of natural area in the North Tualatin Mountains, including upland forests and streams that wildlife depend on; and

WHEREAS, in May 2013, area voters approved a five-year local option levy for the purpose of preserving water quality, fish and wildlife habitat and maintaining Metro's parks and natural areas for the public; and

WHEREAS, as part of implementing the operating levy, Metro Parks and Nature's five-year work plan includes projects for natural area restoration and maintenance, improvements for visitors, park maintenance, volunteer programs, conservation education and community grants; and

WHEREAS, North Tualatin Mountains was identified as one of the 2013 levy access improvement projects in the five-year work plan; and

WHEREAS, a stakeholder advisory committee was created and included staff from the Metro Parks and Nature team, staff and citizens from the Forest Park Conservancy, Forest Park Neighborhood Association, Trackers Earth, Northwest Trails Alliance, Oregon Department of Forestry, Portland Community College, Portland Parks & Recreation, Skyline Ridge Neighbors, Skyline School, Oregon Recreation Trails Advisory Committee and West Multnomah Soil and Water Conservation District; and

WHEREAS, in order to identify desired and appropriate visitor improvements, Metro and its partners conducted extensive stakeholder interviews and public outreach, including open houses; and

WHEREAS, in 2016, the North Tualatin Mountains Access Master Plan was developed by and with the oversight, input and review of the Metro Parks and Nature team, project stakeholders, members of the community; and

WHEREAS, the North Tualatin Mountains Access Master Plan recommends continuing to protect water quality and preserve core habitat areas, including upland forests and streams that wildlife depend on while providing safe access for visitors to experience the North Tualatin Mountains; and

WHEREAS, the Metro Council's approval of the North Tualatin Mountains Access Master Plan does not establish final design improvements, is not a final land use decision, and is not binding on local

governments, but rather provides recommendations to guide Metro staff and partner jurisdictions as they continue design work; NOW THEREFORE

BE IT RESOLVED that the Metro Council hereby approves the North Tualatin Mountains Access Master Plan, attached hereto as Exhibit A.

ADOPTED by the Metro Council this 21st day of April, 2016.

Tom Hughes, Council President

Approved as to Form:

Alison R. Kean, Metro Attorney

NORTH TUALATIN MOUNTAINS
ACCESS MASTER PLAN

April 2016

Prepared by:
Metro Parks and Nature
600 NE Grand Avenue
Portland, Oregon 97232

Clean air and clean water do not stop at city limits or county lines. Neither does the need for jobs, a thriving economy, and sustainable transportation and living choices for people and businesses in the region. Voters have asked Metro to help with the challenges and opportunities that affect the 25 cities and three counties in the Portland metropolitan area.

Metro works with communities to support a resilient economy, keep nature close by and respond to a changing climate. Together we're making a great place, now and for generations to come.

Connecting with nature provides physical, mental and spiritual benefits for the Portland metropolitan area's 2 million residents, giving them a respite from urban life. Studies show that parks and natural areas make neighborhoods more desirable and increase home values. They also help young people get outdoors, exercise and appreciate the natural world,

As Metro invests in livable communities, connections with nature are as critical as homes, jobs and transportation. Metro's portfolio of land protects water quality and wildlife habitat. Parks and trails increase housing values and attract employers to the region, providing welcome access to the great outdoors for people who live in urban and suburban neighborhoods. Perhaps most importantly, Oregonians' sense of place is rooted in the forests, rivers and meadows that Metro is helping to protect.

ACKNOWLEDGEMENTS

Creating this access master plan required the commitment, support and involvement of many people who dedicated time and resources. The project team would like to thank the following individuals for their interest and involvement in developing a vision for North Tualatin Mountains Natural Area.

METRO COUNCIL

Tom Hughes, Council President

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Carlotta Collette, Council District 2

Craig Dirksen, Council District 3

Kathryn Harrington, Council District 4

Sam Chase, Council District 5

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Emily Roth , Portland Parks & Recreation

Jim Thayer, Oregon Recreation Trails Advisory Committee

Roger Warren, Oregon Department of Forestry

Susan Watt, Skyline Ridge Neighbors

EXECUTIVE SUMMARY

On the northwest edge of Forest Park sit four voter-protected natural areas in the North Tualatin Mountains, totaling 1,300 acres.

Thanks to 20 years of voter investments, Metro has been able to protect water quality, restore fish and wildlife habitat and – soon – provide new opportunities for people to connect with nature. Visitors will soon be able to enjoy hikes through lush forests, rides on trails optimized for off-road cycling, panoramic views of Sauvie Island and more, all while restoration continues.

The North Tualatin Mountains master plan is the culmination of two years of conversations with the community to craft a vision for the future of these four special places. Metro received hundreds of comments, ranging from wanting to keep all four sites completely closed to public access to wanting extensive trails and other improvements across all four sites.

Metro's recommendation falls in between those two bookends. At the North Tualatin Mountains, the top priority is to protect water quality and preserve core habitat areas 30 acres or larger, including upland forests and streams that wildlife depend on for connections between Forest Park and the Coast Range.

Within those parameters are opportunities to provide visitors with new destinations to experience nature. Metro is recommending official public access and visitor improvements at two of the four sites: Burlington Creek Forest and McCarthy Creek Forest natural areas. The recommendation calls for new multi-use trails and continued use of former logging roads at the two sites. Equestrian riders will continue to have local access to former logging roads at both sites. Improvements at Burlington would be made first, with improvements at McCarthy made later as money becomes available.

There are no planned visitor improvements at Ennis Creek Forest and North Abbey Creek Forest natural areas, except for a provision for the future Pacific Greenway Trail through Ennis.

Habitat restoration will continue at all four sites. Metro is committed to restoring old-growth habitat, increasing the biodiversity of forests, preserving habitat connectivity, supporting wildlife and protecting clean water. Unneeded roads will be decommissioned, dense stands of young trees will be thinned and native shrubs will be planted in areas formerly occupied by invasive plants. Metro's approach to conservation is to manage for habitats rather than individual species. Nurturing healthy forests and streams at the North Tualatin Mountains will create healthy habitat for a variety of native animals, such as elk, migratory birds and northern red-legged frogs, which are listed by the state as a sensitive species under threat.

The North Tualatin Mountains is just the type of place voters throughout the region had in mind when they invested in protecting natural resources and acquiring land for future parks. Metro intends to develop access to this treasured place in a way that ensures healthy habitats and meaningful experiences in nature.

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1. INTRODUCTION

Just north of Forest Park, a collection of four voter-protected properties form the North Tualatin Mountains. Old logging roads weave through clusters of mostly young Douglas fir trees and other upland forest habitat. On a clear day, joggers, hikers, horseback riders and mountain bikers can see Sauvie Island, and Cascade peaks to the east.

This plan plays an important role in delivering on Metro's Parks and Nature mission: protecting clean water, fish and wildlife habitat, and creating opportunities to enjoy nature close to home. It also advances the Metro Parks and Nature System Plan, which identifies the Tualatin Mountains naturehood – one of 11 distinct geographies in Metro's portfolio – as a focus area for managing and restoring large blocks of upland forest. Future investments are designed to build on an existing site conservation plan that protects biodiversity and connects wildlife habitat, while also inviting people to connect with nature in the North Tualatin Mountains.

Providing public access is a critical part of Metro's work to protect, restore and celebrate the landscape. Spending time outdoors supports healthy, active lifestyles and provides opportunities for peace, quiet and renewal.

NATURAL AREAS LEVY

In 2013, voters approved a five-year levy to help care for regional parks and natural areas. As a result, Metro is restoring habitat, and expanding opportunities to experience and learn about nature across the greater Portland metropolitan region. Roughly half of all levy funds go toward land restoration and management, including controlling invasive plants, planting native species, and improving habitat for fish and wildlife. The remainder of the levy pays for park maintenance and improvements, volunteer programs, conservation education, community grants and natural area improvements for visitors. The 2013 levy identified sites in the North Tualatin Mountains as opportunities to provide access to nature. This access master plan and visitor improvements at the North Tualatin Mountains are funded by the levy.

PLAN PURPOSE

Metro Parks and Nature protects water quality, fish and wildlife habitat and creates opportunities to enjoy nature close to home through a connected system of parks, trails and natural areas.

This access master plan is designed to provide a long-term vision and implementation strategy to guide future public use and development of the North Tualatin Mountains. This plan establishes project goals and objectives, outlines site resources and conditions, and summarizes the planning process. Employing principles of landscape ecology and landscape-level design strategies, this plan identifies access locations and approximate trail locations. It also presents a general plan for development of trailheads and strategies for implementing future development.

Metro intends to develop access to the North Tualatin Mountains in a sensitive and balanced way that ensures healthy habitats and continued preservation of the many ecological benefits this site provides for our region. Low levels of access are anticipated for the vast majority of the natural area.

SETTING AND LOCATION

An arm of the Oregon Coast Range, the Tualatin Mountains extend into the greater Portland area along the Columbia River, dividing the lowlands of the Willamette and Columbia rivers from the Tualatin Valley. Forest Park, managed by the City of Portland, stretches nearly eight miles along the northeast slope of the Tualatin Mountains, covering 5,000 acres and earning distinction as the nation's largest natural urban forest reserve. The North Tualatin Mountains is a collection of four discontinuous sites north of Forest Park, totaling approximately 1300 acres. Collectively, the sites that make up the North Tualatin Mountains preserve large blocks of upland forest, streams and habitat connectivity between Forest Park, Washington County and the Coast Range.

The area is in Multnomah County, outside of Portland city limits. It is generally located between Newberry Road and Cornelius Pass Road to the west of Highway 30. One of the sites, North Abbey Creek, is south and west of Skyline Road. In the North Tualatin Mountains, logging roads weave through forest that has been primarily managed for commercial timber and agriculture. Upland forests are mostly comprised of densely spaced Douglas fir trees, planted about twenty years ago. Patches of older forest are occasionally found, generally adjacent to streams; and a few open areas remain where forests were cleared for agriculture or home sites. The North Tualatin Mountains are home to wildlife typical of young Douglas fir forests such as deer, elk, frogs and salamanders. Metro is actively restoring the sites to improve forest health and habitat diversity, enhance wildlife habitat and protect water quality.

REGIONAL CONTEXT

In 1995 and 2006, voters approved two general obligation bond measures to protect water quality, wildlife habitat and outdoor recreation opportunities across the region. This public investment and commitment is responsible for the growth of Metro's portfolio of natural areas, which today totals roughly 17,000 acres.

Some properties have been identified for visitor improvements, designed to complement Metro's commitment to clean water and healthy wildlife habitat. However, the majority of Metro's portfolio is unlikely to be developed with formal public access. Most of the remaining land is managed as natural areas, where restoration is the focus and public access is not promoted. A handful of sites are designated as habitat preserves, where Metro actively discourages public use other than guided tours or special activities due to sensitive species and fragile habitats.

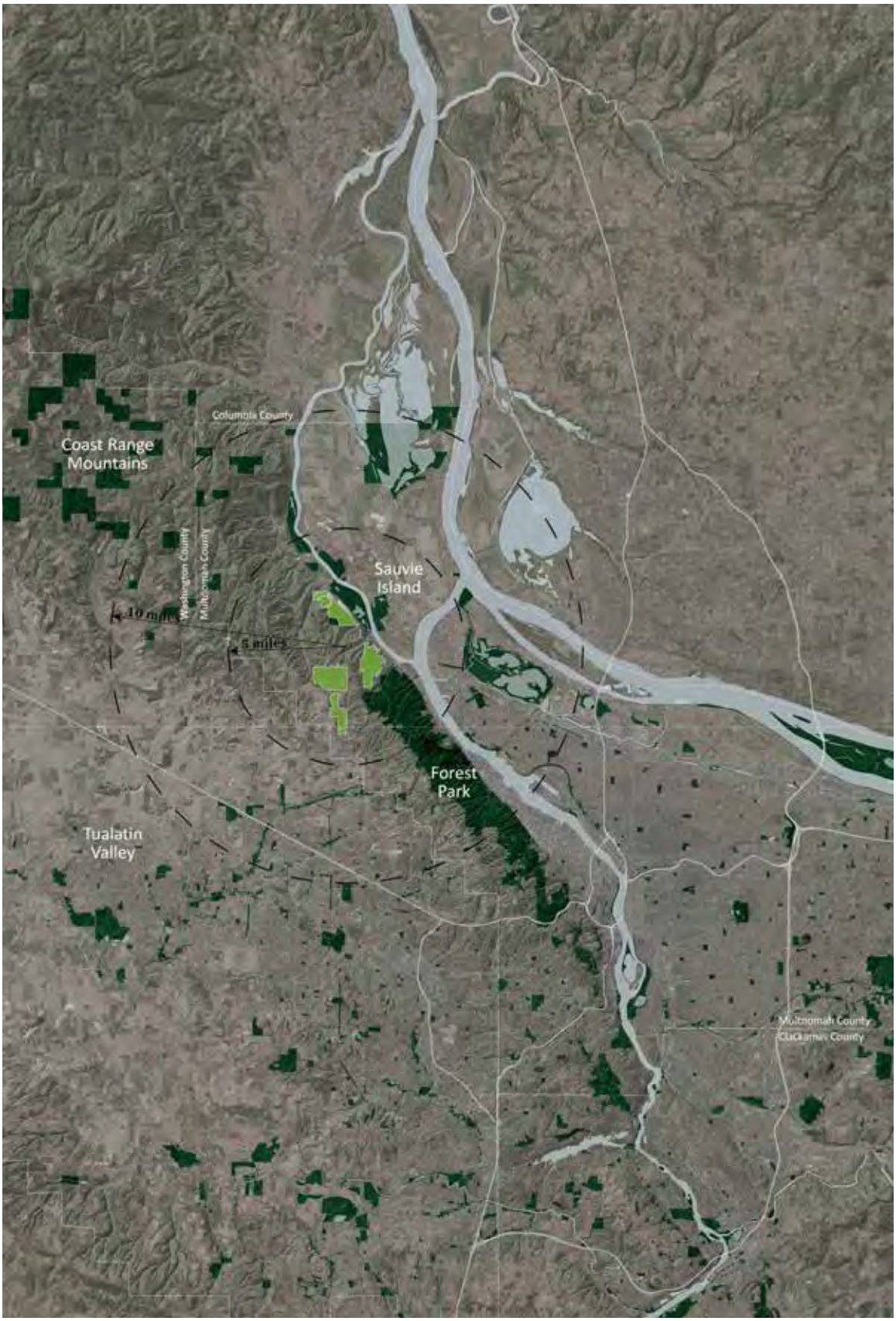


Figure 2.1: North Tualatin Mountains map

The North Tualatin Mountains comprise only a handful of properties in Metro's regional portfolio suitable for recreation access; in other words, we believe that with thoughtful planning, limited development will not threaten its value to regional conservation. These sites provides a variety of opportunities to allow people to experience the land they've helped protect, and share in the benefits of nature close to home.

In preparation for both bond measures, Metro identified target areas with specific conservation goals to guide acquisition throughout the region. North Abbey Creek Forest, was acquired to meet goals of the Rock Creek target area, including to protect the riparian corridors and important upland habitat in the Abbey Creek headwaters, and to acquire and protect a natural corridor along the main stem of Abbey Creek linking its confluence at Rock Creek to the Westside Trail and to Forest Park. Burlington Creek, Ennis Creek, and McCarthy Creek Forests, were acquired to meet goals of the Forest Park target area.

Metro acquired property in the North Tualatin Mountains in order to:

- keep important wildlife and riparian corridors intact;
- protect upland habitat and headwater areas important to preserving the region's water quality; and
- provide trail connections between the region's largest urban park and public lands in the Oregon Coast Range.

Burlington Creek Forest was slated to become housing prior to its acquisition.

Protecting habitat and water quality on these sites is at the heart of Metro's work. Providing opportunities to experience nature and provide regional trail connections is also central to our mission. People who experience nature are more likely to value and protect it.

PLANNING PROCESS OVERVIEW

The central goal of the master plan development process was to identify the best locations for formalized recreation access and amenities. To help answer this question, Metro engaged community members and scientists in looking at the four individual sites that together comprise the North Tualatin Mountains. A Stakeholder Advisory Committee was established for the project, and met five times to share technical expertise and insights into community needs and desires. Committee meetings, four community events, conversations with community members, and numerous comments submitted online helped to identify places to provide access, and where to prioritize protection of undisturbed core habitat areas.

This process relied on available data, principles of landscape ecology, the expertise and experience of local natural resource scientists and wildlife biologists, and landscape-scale design strategies to determine the most appropriate opportunities for public access and connecting with nature.

2. EXISTING CONDITIONS

THE FOUR SITES: CURRENT ACCESS, USES AND CHARACTER

The North Tualatin Mountains provide a variety of views and forest experiences. In areas that have been cleared for timber harvest, utilities or home sites, views across the Tualatin Valley, Sauvie Island and the Cascade mountains offer a broad perspective of how the sites fit into the region's geography. There are opportunities to see and hear wildlife, including elk, bobcat, songbirds and hawks, which have been frequently observed on the sites. Together with undeveloped private lands in the area, the North Tualatin Mountains provide habitat connectivity between Forest Park and the Coast Range.

Two of the sites, Burlington Creek Forest and Ennis Creek Forest, are located on the east-facing slopes of the mountain ridge and are similar in character to Forest Park, with fairly steep topography and forested hillsides. McCarthy Creek Forest and North Abbey Creek Forest are west of the main ridgeline and are more open, with areas of more gentle topography.

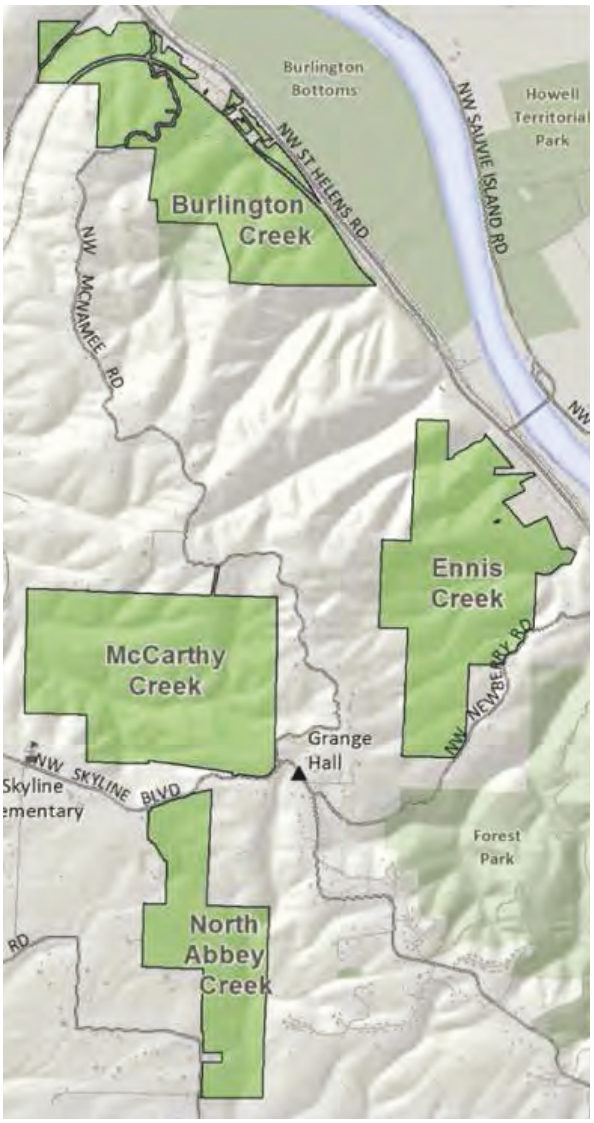


Figure 2.2: North Tualatin Mountains map

Burlington Creek Forest (339 acres)

Of the four sites, Burlington Creek Forest has the most current use by people. People walk and ride bikes and horses on existing logging roads and access the site primarily via McNamee Road. Visitors can walk about a mile and a half loop, or access the Ancient Forest Preserve, which is owned and managed by the Forest Park Conservancy. This patch of old growth forest offers a stark contrast to the forest that grows on most of the site. The old grove provides a good opportunity for visitors to see what most of Burlington Creek Forest will become over time. By and large, the site's steep ridges and valleys were logged about twenty years ago and replanted with Douglas fir.

McNamee Road, Cornelius Pass Road and the railroad along the northeast site boundary all cross through Burlington Creek Forest. Additional infrastructure includes logging roads and the Portland General Electric (PGE) power line corridor running the length of the site on the northeast side. The logging road that meanders along the power line corridor offers views of Sauvie Island and the peaks of the Cascade Range on a clear day.

Connectivity between Burlington Creek Forest and Burlington Bottoms Wetlands and Multnomah Channel is impeded by US Highway 30, residential development, and the Burlington Northern railroad. The Burlington Water District services the neighborhood below, and maintains a water tank on the site.

Figure 2.3: Burlington Creek Forest

Ennis Creek Forest (350 acres)

The northern half of Ennis Creek Forest is similar in character to Burlington Creek Forest, composed of young conifer and hardwood forest. The site is separated from Burlington Creek on the lower portions of the ridgeline by an operational rock quarry. On the southern part of the site, instead of alternating steep ridges and valleys typical of the Tualatin Mountains, the north and south forks of Ennis Creek flow through more gentle topography. The forest is older, and has a higher diversity of trees, shrubs and groundcover.

Existing infrastructure includes the power line corridor and infrastructure associated with the small operating farm and rental house at the south end of the property.

Figure 2.4: Ennis Creek Forest

McCarthy Creek Forest (402 acres)

McCarthy Creek Forest is located west of McNamee Road. A meadow at the northwest corner of the site offers spectacular views of the Tualatin Valley and the Coast Range, and is frequented by a local herd of elk. A second viewpoint offers a perspective of the McCarthy Creek Valley as it curves northward to follow Cornelius Pass to the Multnomah Channel. The site protects over five miles of McCarthy Creek and its tributaries, and approximately one-third of the entire McCarthy Creek watershed. A network of old logging roads traverses this former commercial tree farm. Most of the roads are in a degraded condition. Though the majority of the property was logged, there is a 20-acre patch of mature forest (60 to 80 years old) in the northwest corner of the natural area. Hikers and equestrians walk or ride the loop road at the south half of the site. Schools and youth organizations have also visited the site for field trips, managed by special use permit.

Figure 2.5: McCarthy Creek Forest

North Abbey Creek Forest (211 acres)

Burlington, Ennis and McCarthy Creek forests are all located on the northeast side of Skyline Ridge, which defines the edge of the Tualatin River watershed. North Abbey Creek Forest, located southwest of Skyline Ridge, is the only one of the four North Tualatin Mountains sites in the Tualatin River watershed. The site protects the headwaters of North Abbey Creek, which flows the length of the site through a steep canyon. The forest here includes bigleaf maple, Douglas fir and a diverse understory. Large open areas are frequented by a local herd of elk. Open areas also provide opportunities to develop shrub-dominated habitat for pollinators and neotropical migratory birds.

Maintenance access to North Abbey Creek Forest exists from the north and south of the site. Current public uses are primarily educational in nature, managed by special use permit. Additionally, residents from the neighborhood to the east occasionally access the east side of the property via informal trails that connect North Abbey to neighborhood association land.

Figure 2.6: North Abbey Creek Forest

LOCAL HISTORY

Before European settlement, the Atfalati (also called Tualatin) tribe of the Kalapuya inhabited villages on the Tualatin Plains and the hills around Forest Grove. It is thought that the northern areas of the Tualatin Mountains were used primarily for gathering and hunting rather than settlements. In 1883, Newberry Road was established as a County Road, and logging began around that time. The Skyline Neighbors have compiled a history of the area, and highlights are shown in Figure 2.7.

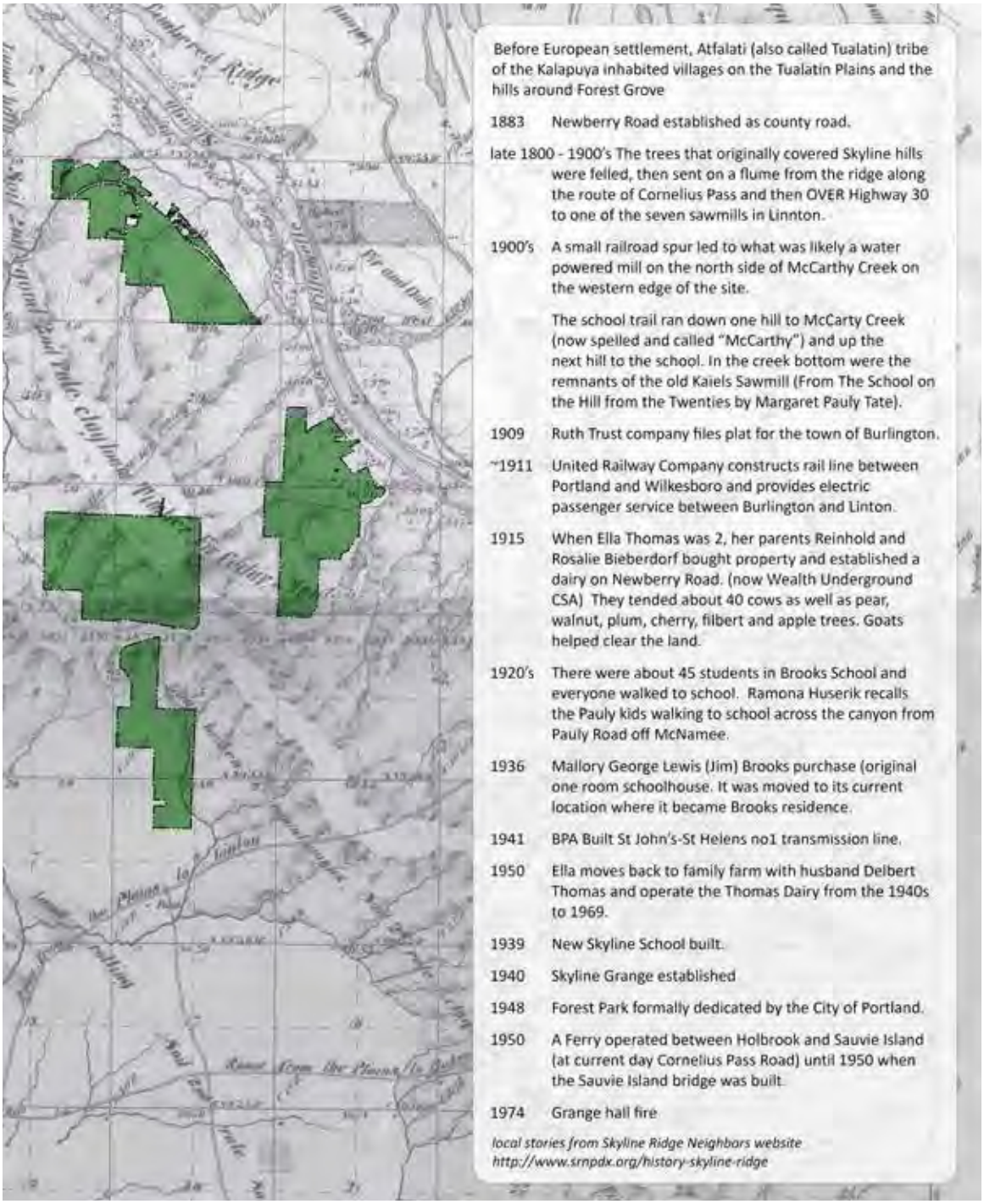


Figure 2.7: General Land Ordinance map (approximate site location highlighted in green). Local history excerpts of from Skyline Neighbors website.

GEOLOGY

The Tualatin Mountains are the forested ridgeline also referred to locally as the Tualatin Hills, or Portland's West Hills. They rise steeply from the edge of the Portland Basin and their western slopes descend gradually, becoming the Tualatin Valley.

The Tualatin Mountains are made of basalt which originated from the Grand Ronde Basalt Flows, a part of the larger Columbia River Basalt Flows. Masses of lava flowed from eastern Oregon tens of millions of years ago, before the formation of the Cascade Range. Columbia basalts are the base rocks of our entire region. As thick as 900 feet in places, these are the dark, sturdy rocks that form the bluffs of the North Tualatin Mountains, and along the Willamette River and Columbia River Gorge.

The Tualatin Mountains are bound by the Portland Hills Fault along their eastern edge. The formation of the ridgeline resulted from a fold in the surface known as an anticline, where the top of the ridgeline is the crease of the fold, and the oldest layers of rock are at the center of the fold. Layered on top of the basalt is a thick layer of glacial silt, called loess, which is believed to have been deposited by east winds, thought to be more prevalent during the ice ages. In some locations in the Tualatin Mountains the loess is over 100 feet thick.

SOILS

The soils of the Tualatin Mountains formed in the loess material known as Portland Hills Silt. The predominant soil classifications in the Tualatin Mountains are Goble silt loam, and Cascade silt loam. As seen in Figure 2.8, the Goble soils are primarily found on the east side of the ridge, and Cascade silt loam is found mostly west of the ridge. This pattern holds true as you look more closely at the four sites.

The Goble soils, which are moderately well drained, predominate at Burlington and Ennis. The Cascade soils, somewhat poorly drained soils, are more prevalent at McCarthy and North Abbey, where Goble soils are found in the stream corridors with Cascade silt loam on the ridges.

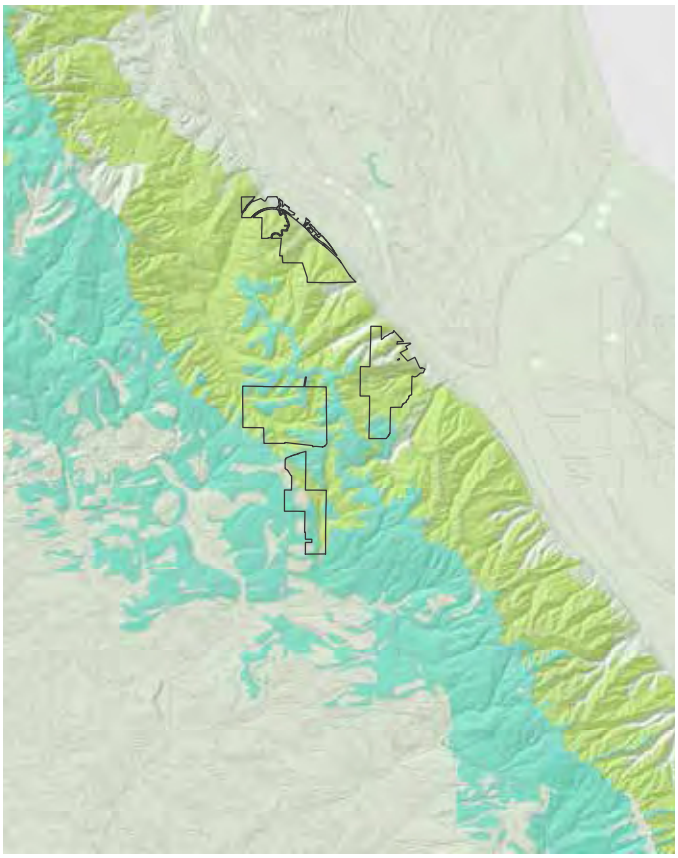


Figure 2.8: Map showing predominant soils: Cascade silt loam on the west side of skyline ridge, and Goble silt loam on the east side.

TOPOGRAPHY

Overall, the topography of the four sites is steep with typical slopes between 20 and 50 percent. The east-facing slopes of Burlington and Ennis Creek forests form the western boundary of the Columbia/ Willamette floodplain. These slopes fall from elevations of 600 to 800 feet to near sea level at their base.

Roads in the area generally align with the tops of ridgelines. As shown in Figure 2.9, Skyline Ridge divides at McNamee Road, and McCarthy Creek Forest sits just west of this intersection. West of this divide, the mountains slope more gradually toward the Tualatin Valley. At McCarthy and North Abbey, the ridgetop slopes are less steep, with steeper slopes near the stream corridors.

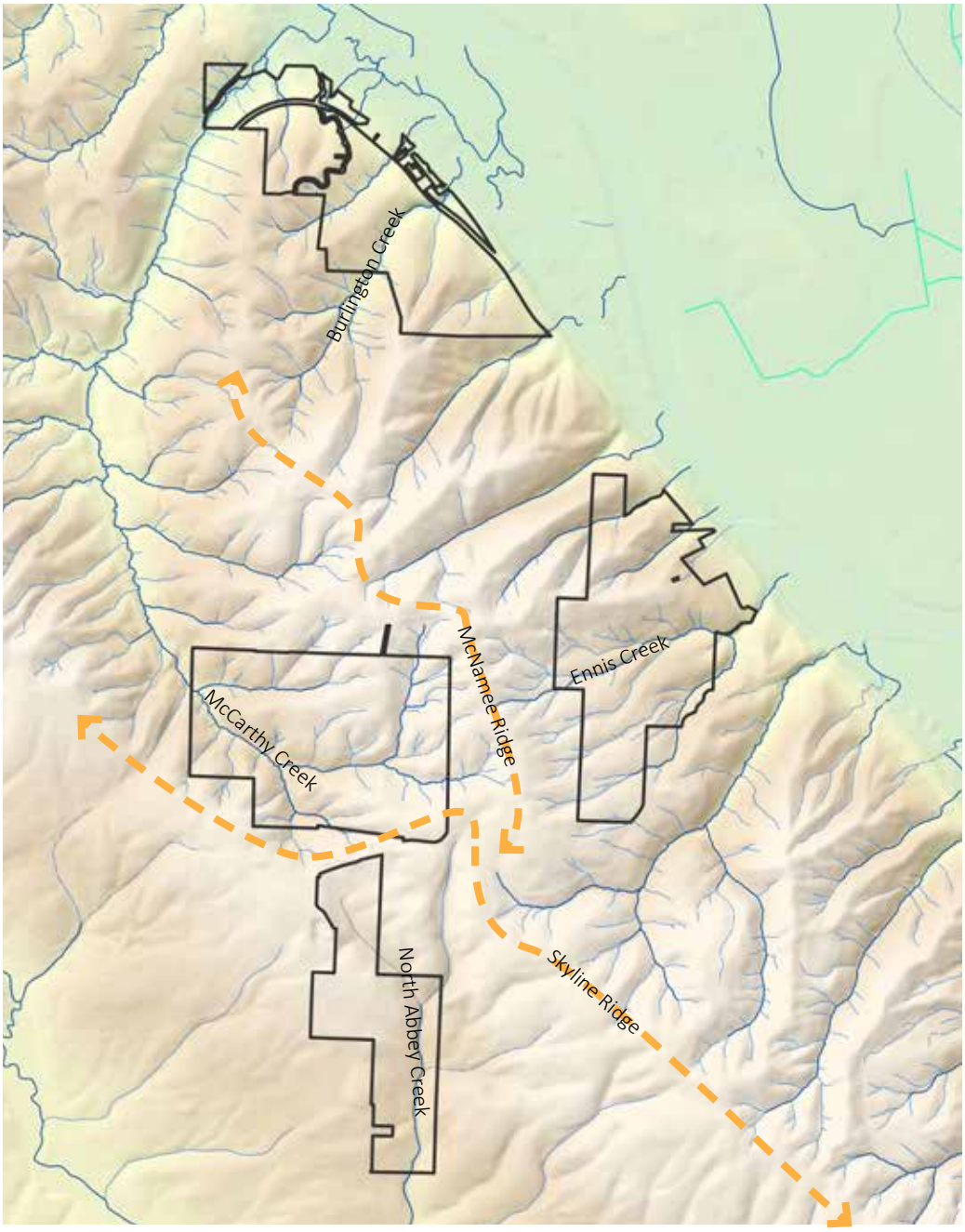


Figure 2.9: North Tualatin Mountains topography and drainages

HYDROLOGY AND WATER QUALITY

North Tualatin Mountains Natural Area protects significant sections of four streams and associated riparian forest habitat. The sites also protect headwater areas of McCarthy, Ennis and North Abbey creeks.

Burlington Creek, Ennis Creek and several unnamed streams flow eastward through steep valleys to the base of the ridge. At Ennis Creek, the Multnomah Channel flows along the base of the ridge. The roughly 400-acre J.R. Palensky Wildlife Mitigation Area (Burlington Bottoms), owned by the Bonneville Power Administration (BPA) and managed by Oregon Department of Fish and Wildlife (ODFW), lie at the base of Burlington Creek Forest.

Ennis Creek and its many unnamed tributaries occupy the southern half of the Ennis Creek Forest site. The southern half of Ennis Creek Forest is less steep, and field observations indicate that the area appears to have wetter soils and, potentially, a higher likelihood of forested wetlands.

McCarthy Creek drains a 400 acre area bounded by Skyline on the south and McNamee on the east. With over 5 miles of main stem and tributaries, the natural area protects about a third of the watershed of McCarthy Creek. Existing roads, developed for logging, are in various conditions including a north –south running road that crosses many small drainages and has experience road slumps and culvert failures. Current plans call for decommissioning roads north of the loop road.

North Abbey Creek Forest is the only one of the four sites located in the Tualatin River Watershed. The northern part of the site protects headwaters of North Abbey Creek, which flows through a steep ravine along the length of the eastern site boundary.

Large conifers and down wood have been removed from many of the North Tualatin riparian areas, resulting in incised (eroded) stream channels and slumping stream banks. Old logging roads are a significant source of sediment in North Tualatin Mountains streams. Sediment harms water quality and degrades amphibian and fish habitat. Water quality is also threatened by the many culverts found on-site; old and under-sized, they block wildlife movement and increase the risk of culvert failure and stream sedimentation. Specific Metro activities to protect and improve water quality are discussed in Chapter 3.

VEGETATION AND HABITAT

Historic Conditions

Historically, the North Tualatin Mountains were dominated by upland forest, described as mesic mixed conifer forest with mostly deciduous understory. The natural area may have included Douglas fir, western hemlock, red cedar, grand fir, bigleaf maple, yew, dogwood, white oak, red alder. Historic burns were recorded at the southern half of Burlington and the southern half of North Abbey.

Existing Condition

In recent history these lands have been managed primarily for commercial timber harvest and agriculture. Much of the area was logged in the early 1990s. Today, the North Tualatin Mountains natural areas have hundreds of acres of former commercial tree farms dominated by young stands of Douglas fir. As a result, the sites are characterized by upland forest with densely planted Douglas-fir trees that are about 20 to 30 years old. Standing dead trees (snags) and down wood have been removed by previous property owners through clearcut harvesting or other land uses. Metro is actively managing the forests to reduce the number of conifers per acre, to keep trees healthy, preserve hardwoods and native shrubs, and increase down dead wood. Several patches of older forest (60 to 80 years old) remain at the southern end of Ennis Creek Forest, and along McCarthy and North Abbey Creeks.

Open areas exist in places that had been cleared for pasture, agriculture or home sites. In addition, the PGE power line corridor runs generally north-south the length of Burlington Creek and Ennis Creek Forest sites. The open areas provide opportunities for shrub dominated plant communities which provide important feeding and breeding habitat for neotropical migrant birds as well as other wildlife. Metro has maintained some existing open areas by controlling tree encroachment.

Desired Future Condition

The Site Conservation Plan, available under separate cover, identifies desired future conditions for riparian and upland forests, upland early successional shrub, and oak savanna, shown in Figure 2.10 and described briefly below.

Upland Forest: Upland forests are composed primarily of native trees and shrubs such as Douglas fir, big-leaf maple, Oregon grape, salal and sword fern. Especially important to migrating and nesting songbirds, woodpeckers, mammals such as Douglas squirrel and deer, and seasonal habitat for salamanders, frogs and turtles. Urbanization has fragmented and reduced the amount of upland forest.

Riparian Forests: Riparian forests protect water quality and provide important habitat near the headwaters of Burlington, Ennis, and McCarthy Creeks, which flow into the Multnomah Channel, and North Abbey Creek, a tributary of the Tualatin River. Tributary creeks and confluence areas provide clean and cold water, nutrients and refuge areas for important fish species.

Upland Early Successional Shrub: Shrub dominated communities provide food and cover for neotropical migrant songbirds and create habitat for a variety of pollinator species. Small scale agricultural sites, recently logged areas, and utility clearings are opportunities to manage for early successional upland forest shrubs.

Oak Savanna: Oak savanna and oak woodlands harbor many unique plant and animal species. Once common, it is now rare in our region.

FISH AND WILDLIFE

There is a substantial body of research about Pacific Northwest forest habitats and the wildlife that use them at different stages of forest development. This research, input from external experts in habitat and wildlife, and application of conservation biology principles (discussed in Chapter 3) informs Metro's approach to site management. As such, a thorough ecological inventory and assessment has not been done for the North Tualatin Mountains.

The following is a brief summary of known information about wildlife in North Tualatin Mountains.

Mammals

While no formal mammal surveys have been conducted, staff, visitors and neighbors have observed a wide variety of mammals typically associated with upland forest habitat and riparian forests of this area including elk, black-tail deer, coyote, bobcat, Douglas squirrels, Townsend chipmunks, and mountain beavers. Elk and elk sign is commonly observed at North Abbey, McCarthy and Ennis. It is less frequently observed at Burlington.

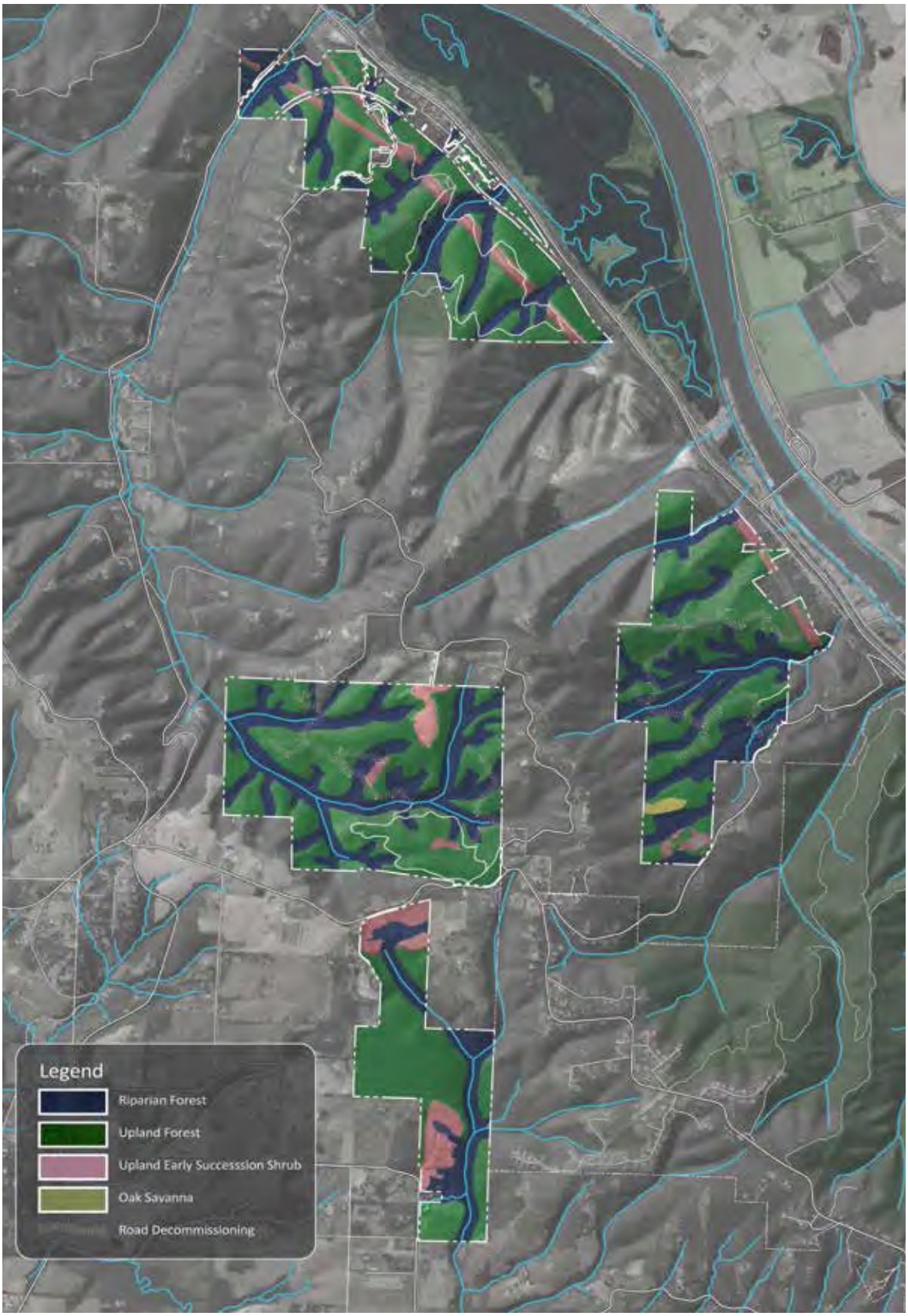


Figure 2.10: Site Conservation Plan map showing conservation targets for desired future condition.

Birds
Between May 15 and June 30, 2015, consultants hired by Metro conducted habitat-associated breeding bird point count surveys at all four natural areas to obtain baseline information on relative abundance. Eight or nine species were detected at each site during the count period. Staff has observed a greater diversity of species in past breeding seasons; food abundance was lower in 2015, an unusually dry year. Surveys will continue for a minimum of three years, through 2017.

Amphibians
Metro staff and volunteers conducted terrestrial amphibian surveys at McCarthy Creek in 2015. Two species, including northern red-legged frogs, were identified. Red-legged frogs have also been observed at Burlington and Ennis Creek Forests. Red-legged frogs are noteworthy for several reasons. Red-legged frogs are considered a conservation strategy species by ODFW and considered declining and vulnerable. They are also somewhat of a local celebrity. Although U.S. Highway 30 poses a significant barrier, some amphibians successfully migrate between Burlington Creek and Ennis Creek forests and breeding habitat on the opposite side of highway 30. A group of volunteers (Harborton Frog Rescue) catches and transports them across highway 30 near Ennis Creek Forest during late winter and early spring when they migrate to lay eggs in wetlands.

Fish

Coho salmon and steelhead utilize lower McCarthy Creek for spawning. McCarthy is listed by the Oregon Department of Fish and Wildlife as Essential Salmonid Habitat. Native cutthroat and brook lamprey are also present in the lower McCarthy watershed.

Both coho and steelhead utilize North Abbey Creek natural area for spawning and rearing, and other native fish are also likely present. Water quality in the upper watershed directly influences water quality in the lower watershed. There is no record of fish use in Burlington Creek or Ennis Creek although it is possible that native fish use the lower reaches with less steep gradients.

Insects
Insects play many invaluable roles in healthy ecosystems, such as pollinating flowering plants, decomposing organic matter and providing food for many species.

SURROUNDING LAND USES:
Three of the four North Tualatin Mountains sites are located within the Skyline Ridge neighborhood. The fourth site, North Abbey Creek Forest, is in the Forest Park neighborhood. The sites are surrounded by a mixture of land uses including residential, agriculture, timber harvest, and gravel extraction.

Surrounding land uses of note include the following:

- ***Quarry:*** An operational quarry, located along U.S. Highway 30 between Burlington Creek Forest and Ennis Creek Forest. There is a trail easement held by the Forest Park Conservancy on the property to establish a trail connection between Ennis Creek and Burlington Creek forests, once quarry operations are completed.
- ***Residential:*** Residential areas composed primarily of rural residential parcels typically one acre or more, and with many 20 acres or greater in size. Many of the large residential parcels adjacent to Burlington Creek Forest have conservation easements.
- ***Ancient Forest Preserve:*** The Ancient Forest, owned and managed by the Forest Park Conservancy, protects nearly 40 acres of old growth forest adjacent to the Burlington Creek Forest site. The conservancy welcomes visitors to the Ancient Forest and has recently extended the trail system.

- ***Burlington Bottoms:*** The roughly 400-acre Burlington Bottoms wetlands, owned by Bonneville Power Administration (BPA) and managed by Oregon Department of Fish and Wildlife (ODFW), lie northeast of Burlington Creek Forest
- ***Forest Park:*** The City of Portland's Forest Park lies south, across Newberry Road from Ennis Creek Forest. The northern section of Forest Park has the most intact habitat, and the least amount of public use relative to other areas of the park.
- ***Skyline School:*** Skyline School is located on Skyline Road, southwest of McCarthy Creek Forest. It is separated from the site by several privately owned residential parcels.

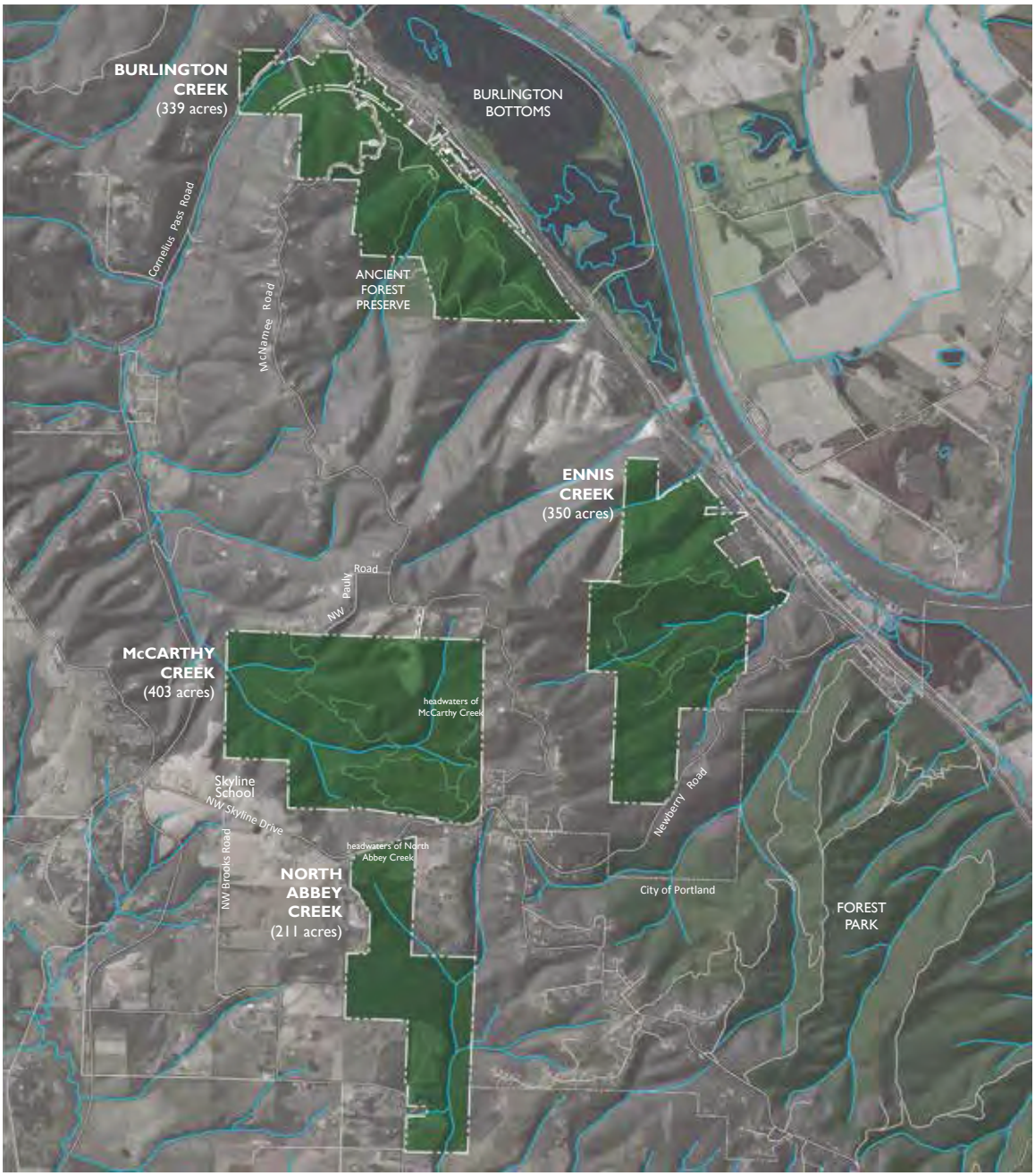


Figure 2.11: Site Conservation Plan map showing conservation targets for desired future condition.

3. MANAGEMENT AND ACCESS PLANNING

Development of this access master plan began in fall 2014. However, Metro's work to restore the land – purchased with voter-approved bond funds between 1995 and 2015 – began much earlier. This chapter presents a summary of Metro's science-based approach to site management and conservation, followed by a discussion of the planning process through which this plan was developed.

A SCIENCE-BASED APPROACH

During the access planning process, Metro scientists provide baseline information about current conditions, conservation targets and habitat restoration goals. Metro scientists draw on recognized conservation biology principles, site knowledge, research and external experts to provide a description of a natural area's natural resource values. They evaluate possible impacts of potential access opportunities and work with the planning team to develop access opportunities that are compatible with the wildlife and water quality goals for a natural area.

This process to identify priority locations and activities for recreation builds on the work of Metro scientists and land managers to stabilize and restore the ecological health of the site.

SITE STABILIZATION

Site transformation starts with a short-term strategy to mitigate degrading conditions and establish an improving trend in ecological function. This "stabilization" period typically lasts two to five years. Some tasks are nearly universal. Metro always works to control invasive plants, for example, replacing them with species that better support wildlife and improve water quality. Other tasks are property-specific, and many require specialty contract crews to ensure that Metro moves in a timely fashion across all its properties. Examples of stabilization actions include controlling erosion, forest thinning, reforestation and mitigating stream incision.

To date, vegetation management and site stabilization activities in the North Tualatin Mountains include thinning to improve forest health, which also reduces long-term fuel and fire risk; culvert maintenance to reduce sedimentation; and invasive species management. At all four sites, tree thinning is planned and/or underway, which will help to restore a more complex forest structure, provide more diverse habitat, and make forests more resilient to disease and wildfire. At Burlington, Ennis, McCarthy and North Abbey creeks, Metro is developing key wildlife habitat features like snags and down dead wood. Stream restoration is underway at North Abbey Creek.

Management activities related to current visitors has included installing and maintaining signs and gates to encourage appropriate use of the sites; addressing encroachment issues; surveys to identify property boundaries; maintaining safety for increased visitation; and addressing and removing unauthorized trails in partnership with Northwest Trail Alliance.

Metro is maintaining roads needed for management activities such as brushing and cleaning culverts and ditches. Roads not needed for ongoing management of the sites will be decommissioned to reduce road-related erosion, water quality impacts, habitat fragmentation and disturbance.

Staff has been fostering partnerships with West Multnomah Soil and Water Conservation District, City of Portland, Forest Park Conservancy, Trout Mountain Forestry and Portland Audubon to support this and future work.

RESTORATION

When Metro acquires a new natural area, we think about how to maximize the habitat value of the site given both the specific local conditions and the larger landscape context. There is strong science pointing to the importance of diverse communities of native plants in order to benefit numerous species.

Restoration begins with a Site Conservation Plan (SCP) which identifies conservation targets, key ecological attributes of each target, and an understanding of the greatest threats to achieving conservation goals. Restoration and long-term management strategies based on this analysis guide future efforts toward achieving the site's desired future condition.

The Site Conservation Plan for North Tualatin Mountains outlines strategies to restore old growth habitat and complex forest structure by thinning to favor large tree diameters and deep tree crowns, providing down wood, and increasing understory complexity. It also calls for creation of shrub communities to support neotropical migrants and pollinators.

Ecological Thinning

The North Tualatin Mountains have hundreds of acres of former commercial tree farms dominated by young stands of Douglas-fir. Reducing the number of conifers per acre helps keep trees healthy and preserves hardwoods and especially native shrubs that, in turn, support important elements of biodiversity. Large diameter trees are lacking in the North Tualatin Mountains and are valuable for wildlife and water quality. Thinning accelerates tree growth and makes forests more resilient to disease and wildfire. Many of the trees removed during thinning stay on site and provide habitat as down wood. Thinning has begun at North Abbey, McCarthy Creek, Ennis and Burlington Creek forests. Thinning may continue at Burlington, Ennis and McCarthy Creek in 2016-2017. Many of these stands will need a second round of thinning in 15 to 30 years to achieve habitat goals, at which time they will be large enough to provide significant standing and down dead wood.

Standing and Down Dead Wood

Standing dead trees (snags) and down wood have been removed by previous property owners through clearcut harvesting or other land uses. Adding them back into the forests by topping trees and dropping and leaving logs on the ground provides wildlife habitat, moisture retention, erosion protection and nutrient storage. Metro is developing key wildlife habitat like snags and down dead wood at all four North Tualatin Mountains sites.

Native Shrubs and Understory

From a larger landscape view, early seral habitat is an increasingly uncommon aspect of the landscape, contributing to regional declines in species that depend on those habitats. Metro plans to establish diverse native shrub communities at North Tualatin Mountains, which benefit neo-tropical migratory birds and invertebrate species that utilize the early seral shrub habitat for feeding and breeding.

Hardwoods and shrubs provide valuable food and shelter for many bird species but are typically suppressed or shaded out by fast-growing conifers in young forests.. At all four sites, forest thinning will help to retain hardwood trees, create growing space for native shrubs, provide more diverse

habitat, and make forests more resilient to disease and wildfire. Depending on the understory response after thinning, planting may be necessary to speed the establishment of native shrubs and the creation of a diverse understory

Stream Restoration

Large conifers and down wood have been removed from many of the North Tualatin Mountains riparian areas, resulting in incised (eroded) stream channels and slumping stream banks. Growing big conifers quickly and adding large wood into streams helps improve stream conditions and water quality. Metro is actively working on stream restoration at North Abbey Creek, and recently placed 16 downed wood logjams along the creek to help curb stream erosion.

Culvert Removal and Road Decommissioning

Old logging roads are a significant source of sediment in streams, which harms water quality and degrades fish habitat. Repairing or decommissioning and revegetating old roads reduce the risk of soil erosion and sediment in streams. Many culverts in the North Tualatin Mountains are old and under-sized, blocking wildlife movement and increasing the risk of failure and the amount of sediment into streams, resulting in decreased water quality. Removing or replacing culverts improves water quality and provides better wildlife connectivity. Metro will decommission unneeded roads and remove or replace undersized and failing culverts.

PLANNING FOR ACCESS

The master planning process began in fall 2014 and included strategic site analysis and a robust community engagement process. A brief summary follows.

Site Analysis

Feasibility of Access and Parking

Five potential entry locations were evaluated to understand the feasibility of providing safe ingress and egress. Analysis was done for existing maintenance entrances to Burlington from the south side of McNamee Road, to the southern end of Ennis from Newberry Road, to the northern end of North Abbey from Skyline Blvd., and two locations at McCarthy were evaluated: an entrance at the south end of the site from Skyline Blvd, and one at the north end of the site from McNamee Rd. The five locations were all determined to be feasible with varying degree of improvements needed to provide safe, visible access and the appropriate sight distances for vehicles turning in and out of the site.

Trail Construction Feasibility

The International Mountain Biking Association (IMBA) was engaged in the planning process to evaluate the feasibility of trail construction. IMBA generated a memo outlining recommended design, construction details, and construction methods for soft surface trail implementation.

Stakeholders and Community Engagement

The planning process followed a cyclical, four-step strategy involving a series of internal and external stakeholder meetings followed by Metro Council member updates and public open house events. A Stakeholder Advisory Committee was composed of local agency representatives, public officials, recreation advocates, environmental activists and residents. Internal coordination involved collaboration with Metro natural resource scientists, land managers, communications staff, operations supervisors, planners and various senior leadership from departmental and program management.

Stakeholder Advisory Committee

The project Stakeholder Advisory Committee (SAC) met five times, at key project milestones. The committee included representatives of Forest Park Conservancy, Forest Park Neighborhood Association, Northwest Trails Alliance, Oregon Department of Forestry, Oregon Recreation Trails Advisory Committee, Portland Community College, Portland Parks & Recreation, Skyline Ridge Neighbors, Skyline School, Trackers Earth, and West Multnomah Soil and Water Conservation District. In addition to contributing their time and insight to the planning discussion, the SAC was actively involved in neighborhood outreach and assisted at four community events.

Community Outreach and Engagement

Metro held four community events to engage the broader public in the planning process. The first two events were held at the Skyline Grange. To accommodate larger community events as the project generated interest, the third and fourth events took place at Skyline School. Approximately 40 people attended the first event, and between 150 and 250 people attended the following three events. Staff collected comments via questionnaires and one-on-one discussions.

Metro staff met informally with neighbors, providing additional opportunities to weigh in. Nearby neighbors had an opportunity to preview open house materials and talk with staff prior to the fourth event. In addition to the information presented at community events, Metro posted information online and solicited the public to submit comments online.

Figure 3.1: Open house at Skyline School in November 2015

Summary of Community Input

Members of the public weighed in on what they value about the sites; they also shared their experiences of the sites and wildlife in the area. They provided insight into the types of activities they'd like to participate in, the types of trail systems they think are appropriate, and where they think access should be accommodated and prioritized. Over 500 comments were received through surveys, Metro's website, emails and informal conversations. Below is a summary of what we heard.

Values

At the first open house Metro asked participants what they value about the North Tualatin Mountains, and what they would be excited to do there. Community members value that there are large areas of protected open space so close to the city. People expressed a desire for trails, and opportunities to experience nearby nature. The community also expressed the importance of continuing to protect wildlife habitat and water quality.

Activities

The discussion at the second community event was focused on identifying sensitive areas and opportunities for activity areas on the site. Participants shared the types of activities they want to participate in including hiking, cycling, being in nature, volunteering, horseback riding and dog walking. Metro also heard from community members who do not think access opportunities and new trails should be considered on the sites. We also heard about local wildlife including elk, red-legged frogs and other wildlife.

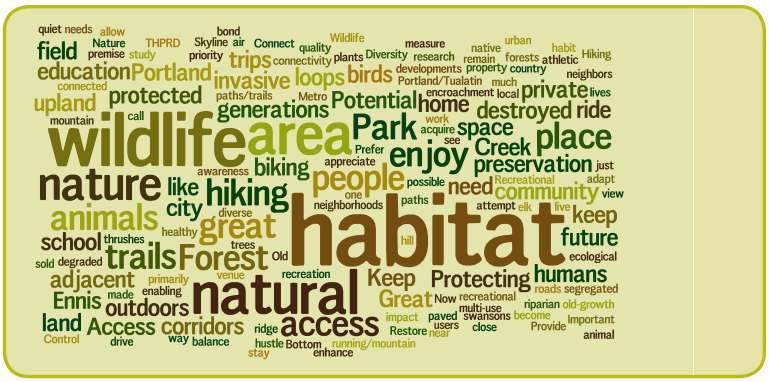


Figure 3.2: What is important to you about the North Tualatin Mountains?

Figure 3.3: What do you want to do in the North Tualatin Mountains?

Trail System

The third open house focused on a discussion about trail system types. The community was asked about the types of trails they want to experience. Many people expressed a preference for different types of uses, including hiking, off-road cycling and equestrian trails. We heard that loop trails are preferred to out and back trails, and to use existing road networks for access where possible to minimize new trail construction. Metro also heard that off-road cycling on a single track trail is preferred to logging roads. One of the alternatives shown at the third open house included a hiking trail through North Abbey Creek Forest. We heard significant opposition to this option, and the trail was subsequently removed from the proposed plan.

Preferred Alternative

At the fourth open house, a draft preferred alternative was presented that incorporates ideas and feedback brought forth at the previous open houses. Overall, Metro heard that we accurately captured feedback from previous drafts. We took further input at this open house and heard more information from neighbors about a local herd of elk, and concern about trails potentially impacting their movement. The true extent of the impact of this trail on elk use at the meadow is unknown at this time. Although the elk herd is not considered regionally significant by ODFW, it is highly valued by some members of the community. In response to this concern, the viewpoint trail is not included in the Master Plan recommendation.

4. MASTER PLAN RECOMMENDATIONS

GOALS AND OBJECTIVES

Protect fish and wildlife habitat and water quality.
Protecting and enhancing wildlife habitat and water quality are central to Metro's work and the goals of this project. Using the best available science as a guide, the project will provide new public access in a way that maintains the sites' core ecological function.

Objectives

- Protect large blocks of forest and core habitat areas.
- Integrate landscape-level analysis and regional thinking into decision-making about providing access and locating access features.
- Locate new trails where habitat is already fragmented and minimize new fragmentation.
- Provide appropriate setbacks from streams, wetlands, and seasonally wet and sensitive areas.
- Minimize stream crossings where other routes are possible and use bridges and boardwalks, instead of culverts, where appropriate.
- Avoid constructing new trails in areas of high natural resource value or high erodibility.
- Use best practices for sustainable trail construction such as cross-slope, rolling grades, and drainage dips to move water off-trail and avoid erosion.
- Monitor for water quality and habitat impacts.

Provide opportunities for meaningful experiences of nature.
Access to nature supports healthy, active outdoor lifestyles and people depend on nature for peace, quiet and renewal. The North Tualatin Mountains are an opportunity for all to share in these benefits. People experience and connect with nature in many different ways this project will provide a variety of opportunities.

Objectives

- Provide welcoming entries and clear way-finding and interpretive signs.
- Provide a system of trails that serve appropriate multiple uses including hiking, off-road cycling and wildlife viewing.
- Provide a variety of trail experiences (various widths, lengths, loops, and challenge levels) and trails designed to encourage proper trail use.
- Provide access to viewpoints and appropriate routes to key features.
- Provide information about accessibility and challenge level.
- Provide opportunities to learn about local habitat, site history, restoration and regional context.
- Increase visitors' awareness of natural resources on-site.
- Provide opportunities for volunteering and participating in education programs.
- Provide opportunities for discovery.

Consider safety, management and durability.
Metro is committed to ensuring the public's safety and enjoyment of North Tualatin Mountains and strives to manage the public's investment in the most effective and cost-efficient way. The access master plan and its implementation will protect the public's safety and welfare and maximize operational efficiencies to protect the public's investment.

Objectives

- Involve visitors in maintenance and site stewardship to promote a more intimate awareness of habitat and water quality.
- Promote stewardship through volunteer trail patrol.
- Develop partnerships with volunteer organizations.
- Provide simple and clear way-finding signs, use durable vandal-resistant materials.
- Design trails that are safe and challenging.
- Implement safety and security measures such as gated entries to control access at night, ranger patrols, and employment of security patrols as needed.
- Work with Multnomah County to address site-related transportation requirements.
- Assure privacy of neighbors by controlling access and providing setbacks and buffers.
- Coordinate with local fire and police service providers to help enforce rules and ensure safety.

SUMMARY OF MASTER PLAN RECOMMENDATIONS

Core Habitat Areas
The proposed plan preserves 970 acres of protected core habitat at the four sites. This includes preserving the Ennis Creek Forest (350 acres) and North Abbey Creek Forest (211 acres) sites as relatively undisturbed core habitat areas. No improvements are planned at these sites, other than a provision for the future Pacific Greenway Trail through Ennis Creek Forest. The plan also protects as many undisturbed habitat areas of 30 acres or greater as possible. Out of an existing 1300 acres, this plan preserves roughly 970 acres of core habitat, or nearly three-fourths of the total acreage of the North Tualatin Mountains sites. This includes about 90 acres at Burlington, 350 acres at Ennis, 320 acres at McCarthy Creek Forest, and 210 acres at North Abbey Creek.

Opportunities to Experience Nature
This access master plan identifies opportunities to discover, learn about and experience nature at Burlington Creek Forest and the southeastern portion of McCarthy Creek Forest. The plan recommends continued use of 4 miles of existing logging road in Burlington and McCarthy Creek forests, and proposed an additional 5.5 miles of new multi-use trails for Burlington Creek Forest. The recommendation includes trailheads at Burlington Creek and McCarthy Creek forests with non-flushing restroom facilities and parking areas to accommodate approximately 15 cars each.

Access improvements at Burlington Creek are planned to be developed first, and access improvements at McCarthy Creek would be developed in the future as phase two.

Streams and Water Quality
The North Tualatin Mountains protect significant sections of four streams, and portions of their headwaters. The plan recommends decommissioning over 3 miles of logging roads, a significant source of sediment in streams, in McCarthy Creek, North Abbey Creek and Ennis Creek forests. Trail design and engineering will employ best practices for sustainable trail construction. Well-designed trails will limit impacts to streams and headwater areas by minimizing erosion, locating trails away from stream corridors and limiting the number stream crossings.

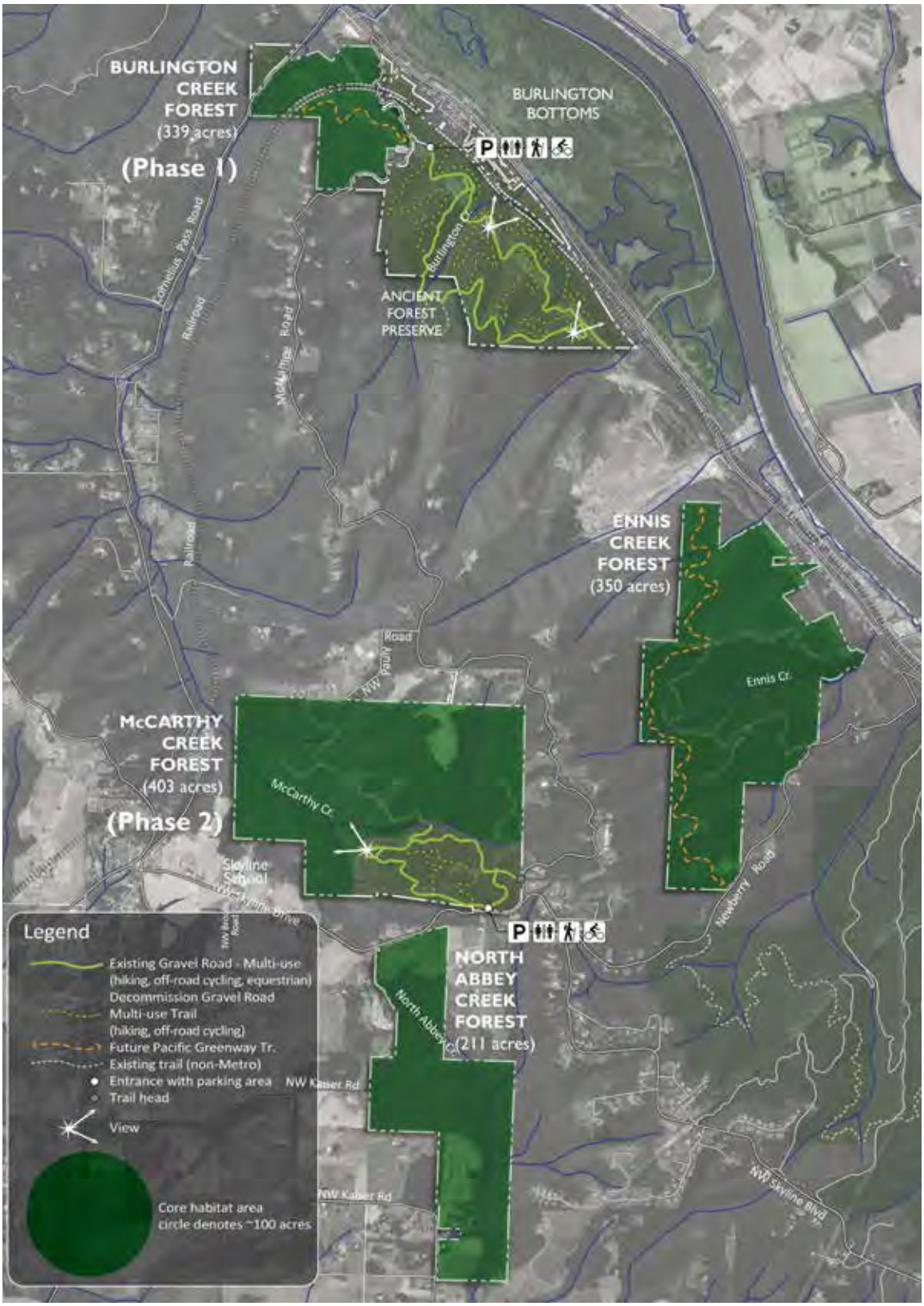


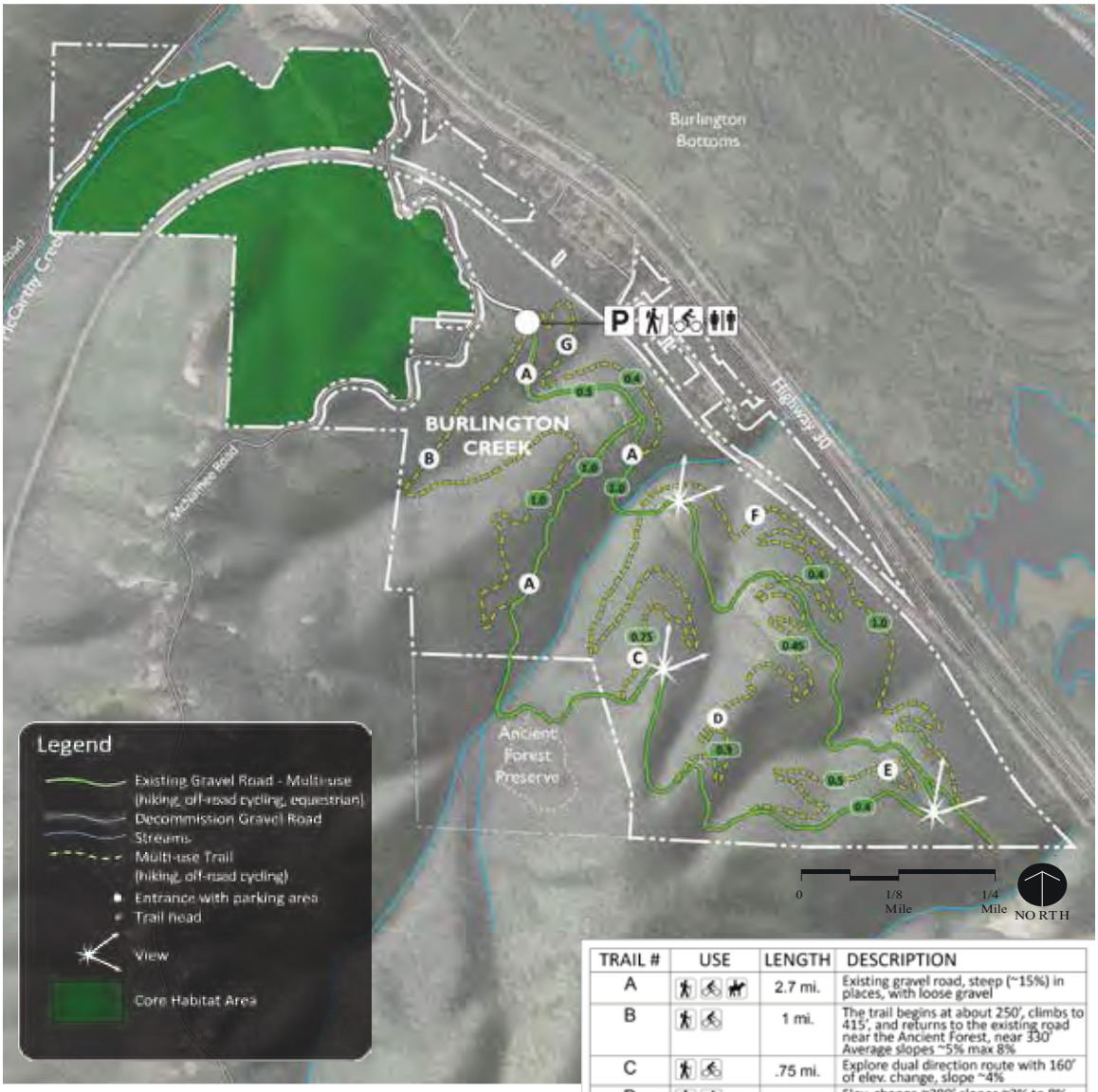
Figure 4.1: Master Plan Recommendation

Burlington Creek Forest

Proposed improvements at Burlington Creek Forest include parking for approximately 15 cars, a trailhead, shared use trails, designed specifically for hiking and off-road cycling. Visitors to Burlington Creek Forest will be able to continue walking, and riding bikes and horses on the nearly 3 miles of existing logging roads on the site. In addition, the plan recommends 5.5 miles of new multi-use trails.

Multi-use trails will accommodate hikers and beginner and intermediate riders, and provide several trail options. Visitors will be able to see views of Sauvie Island and the Cascade Range. Trails will be designed to minimize potential for conflicts between hikers, and cyclist through the use of speed checks and one-way trails where appropriate.

Plans call for construction of improvements at Burlington as part of Phase 1 implementation.



TRAIL #	USE	LENGTH	DESCRIPTION
A		2.7 mi.	Existing gravel road, steep (~15%) in places, with loose gravel
B		1 mi.	The trail begins at about 250', climbs to 415', and returns to the existing road near the Ancient Forest, near 330' Average slopes ~5% max 8%
C		.75 mi.	Explore dual direction route with 160' of elev. change, slope ~4%
D		1.2 mi.	Elev. change ~380' slopes ~3% to 8% with short steeper sections
E		.5	Explore descending route for off-road cyclists, elev. change ~180'; slopes average slopes ~7.5% with short steeper sections
F		1.0	Explore dual-direction collector trail, total grade change 180', max grades to ~8%
G		.4 mi	Potentially accessible trail

Figure 4.2: Proposed plan at Burlington Creek Forest

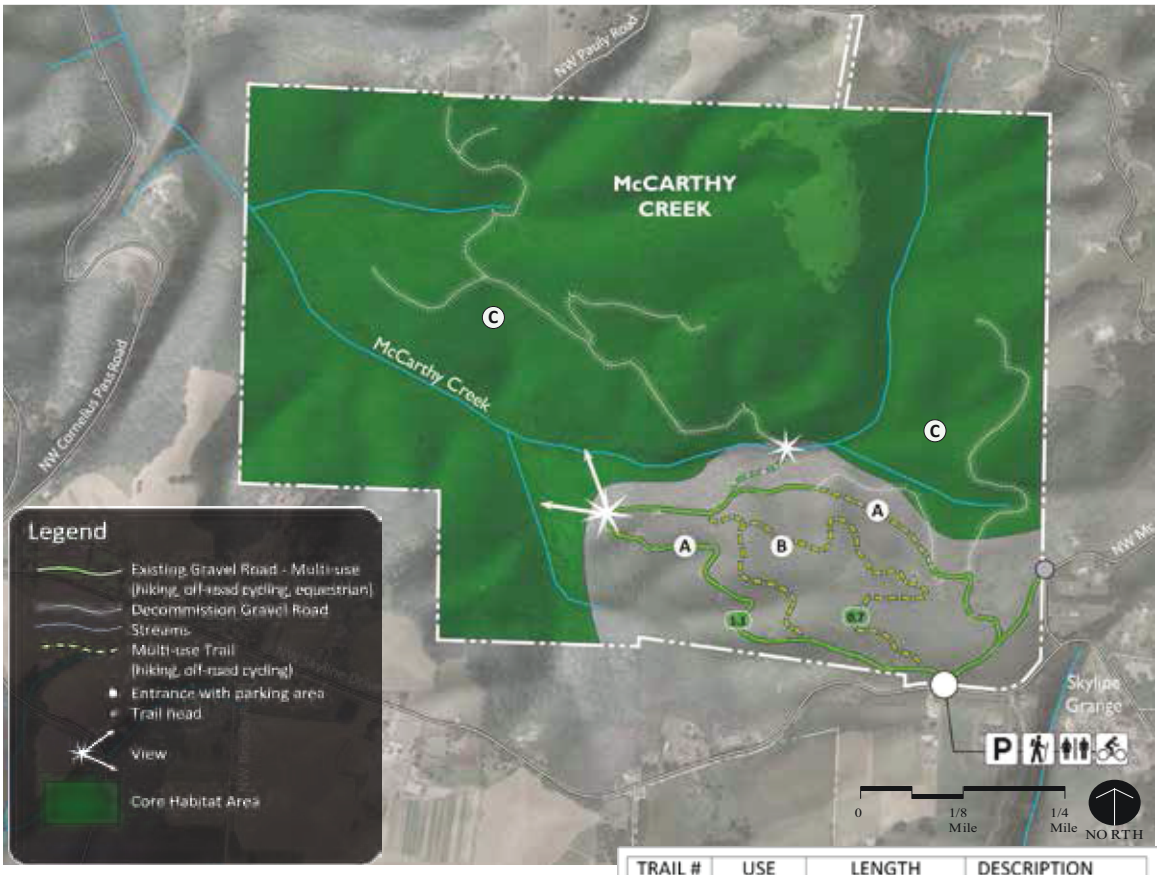
McCarthy Creek Forest

Proposed improvements at McCarthy Creek Forest include parking for approximately 15 cars, a trailhead, interpretive and way finding signs, picnic tables and shared use trails. An existing 1 mile loop road will continue to be enjoyed by hikers, cyclists and equestrians. Roughly 1 mile of new multi-use trail is recommended.

The visitor's experience at McCarthy Creek Forest will focus on the stream. A loop trail, along the old logging road, descends to an expansive view of the McCarthy Creek valley. A spur trail, also on an old logging road, leads visitors down to experience of creek. This concept-level design takes advantage of one of the site's best views while preserving core habitat along the north and west parts of the sites. It provides visitors opportunities to experience McCarthy Creek from multiple vantage points.

The earlier preferred alternative recommended including a trail through the northeastern portion of McCarthy that would have offered visitors access to a viewpoint with stunning vistas of the Tualatin Valley and Coast Range. To address concerns about elk that frequent a meadow in this area and because the extent of the potential impact of this trail on elk use at the meadow is unknown at this time, this trail is not included in this master plan. This trail may be considered in the future if further investigation compellingly demonstrates that access to the meadow is unlikely to affect elk persistence in the area.

The improvements at McCarthy will be built during a future project phase, which provides an opportunity to apply lessons learned during the first phase of the project implementation at Burlington Creek Forest.



TRAIL #	USE	LENGTH	DESCRIPTION
A		1.1 mi. loop	Existing, gravel road with short re-routed section
B		0.7 mi.	Beginner level,gentle slopes, wide path
C	Logging road to be decommissioned		

Figure 4.3: Proposed plan at McCarthy Creek Forest

Access and Parking

As standard practice, Metro controls vehicular access to parking using automatic gates. Gates will be closed and locked in the evenings. The parking area at Burlington Creek will provide parking for approximately 15 vehicles. An overflow area will accommodate an additional five cars. Parking will be closely monitored, and overflow parking on McNamee Road will not be allowed.

At McCarthy Creek, the parking lot will accommodate 15 to 20 cars. An additional non-vehicular entrance will be maintained at McNamee Road for visitors accessing the site from the neighborhood.

For the two sites where new parking lots are proposed, additional feasibility analysis was completed to determine feasibility and rough costs of building parking areas, and to understand how much parking each site can accommodate.

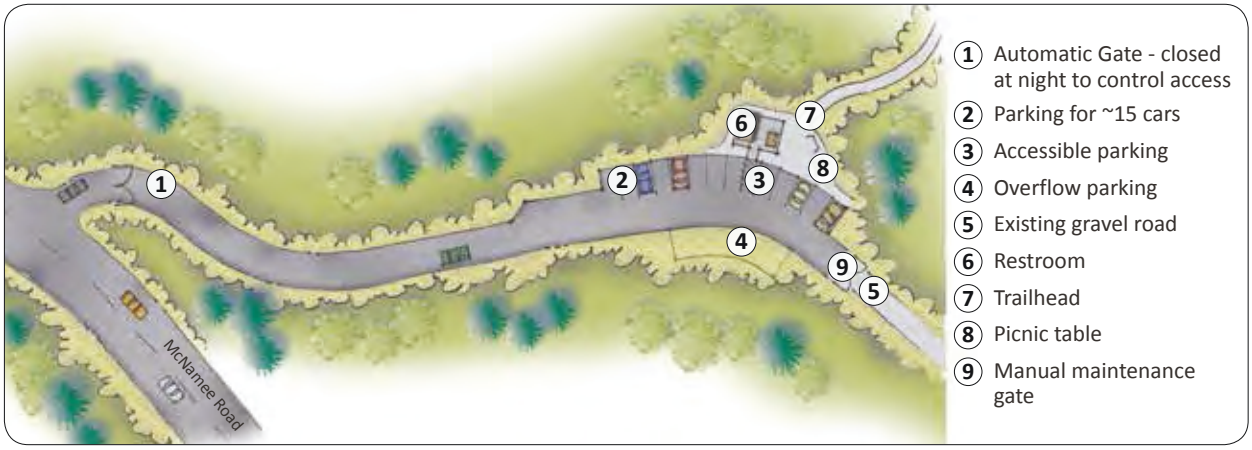


Figure 4.4 Proposed entry and parking lot at Burlington Creek Forest will accommodate ~15 cars.

Figure 4.5: Proposed entry and parking lot at McCarthy Creek Forest will accommodate ~15 cars.

Trailhead facilities are proposed at the parking areas. These include restrooms (vault toilets or port-a-potty), benches, picnic tables, trash receptacles, bike racks, and interpretive and directional signs. One or two picnic tables may be included at each trailhead.

Adaptive Management
Once this project is implemented, trails, parking and other access improvements should be monitored to make sure that they function as intended. In the future, as we learn more, plans should be adjusted to accommodate lessons learned. Additional trail or trail connections, seasonal or permanent trail closures, adjustments to parking areas, and additional amenities should be considered as need arises.

KEY CONSIDERATIONS

Regional Connectivity
Preserving core habitat and regional connectivity is the primary consideration in determining where to propose new access locations. Because there is no agreed upon standard for a "wildlife corridor", the planning effort relies on broadly accepted conservation principles that have been developed by researchers in the field of conservation science. These principles are the results of many studies that collect data over large areas and long periods of time. Metro staff scientists apply these principles at the site and landscape scale to help determine the best management approach on individual sites. Principles include:

- protecting large blocks of forest;
- maximizing unfragmented core habitat areas of 30 acres or greater;
- managing for no or very low use at many sites;
- restoring habitat to improve natural area value to wildlife and water quality;
- reducing the presence of dogs; and
- applying research-based practices to management activities

The recommended alternative for North Tualatin Mountains focuses most access in Burlington Creek Forest, which is the site that is currently most heavily used. The proposed plan preserves the Ennis Creek Forest and North Abbey Creek Forest sites as relatively undisturbed core habitat areas. No improvements are planned, other than a provision for the future Pacific Greenway Trail through Ennis Creek Forest.

Streams and Water Quality
The North Tualatin Mountains protect significant sections of four streams, and portions of their headwaters. Prior management has resulted in eroded stream channels and slumping stream banks. Old logging roads are a significant source of sediment in streams, which harms water quality and degrades fish habitat. Metro is actively restoring these streams to increase canopy cover, and reduce in stream sediment and erosion.

Species-Specific Considerations
In general, Metro manages for habitat conditions rather than targeting individual species. Exceptions are made when the needs of a high-priority species are not addressed via habitat-level approaches. Partners and community members have expressed particular interest or concern about several species known or thought to occur on-site. Following is a brief summary of key species considerations and how they have informed this plan.

Elk

Elk are found throughout areas in and around the North Tualatin Mountains. The North Tualatin Mountains herd is part of the Willamette Unit, which is an ODFW "de-emphasis area". Because of this, ODFW allows a longer hunting season and has more liberal tag regulations, including not tracking bull – cow ratios. Although the elk are born and raised around humans, and are relatively acclimated to some human activity, trail development at Burlington and McCarthy may change their movement patterns. That said, according to ODFW, available forage – and especially grass -- is one of the biggest issues limiting Elk in the North Tualatin Mountains; fragmented habitat has a lesser impact.

According to observations of the North Tualatin Mountains as a whole, elk frequent several meadows in the area and migrate between these sites and into Forest Park. Given that these elk move within a relatively large area, frequently cross busy roads, and use backyards and farm fields, an increase in human use of a small portion of the North Tualatin Mountains sites is not likely to cause significant effects on the elk population.

Elk are charismatic and great to see along the Tualatin Mountains Ridge. Through this planning process, participating community members have expressed how important this herd of elk is to people who live in the area. For this reason, and to minimize disturbances to local elk movement, this plan does not propose access to the view across the Tualatin Valley to the Coast Range, at this time.

Amphibians

Amphibians, including red-legged frogs, are known to move seasonally between Burlington Creek and Ennis Creek forests and breeding habitat on the opposite side of highway 30, including the Palensky Wildlife Area (Burlington Bottoms), managed by ODFW. Both Burlington Creek and Ennis Creek forests provide important foraging and overwintering habitat for red-legged frogs.

There are some concerns that proposed trail development in Burlington Creek Forest may negatively affect red legged frogs and other native amphibians. Trails are not proposed at Ennis Creek Forest, where amphibians are also known to seasonally migrate.

Trail design and engineering will minimize stream crossings and employ amphibian friendly crossings where needed, minimize soil erosion and trail rutting. Trails will be closed at night when the seasonal movement of red-legged frogs typically occurs, and seasonal closure will be considered.

Restoration work at both Burlington Creek and Ennis Creek forests will improve foraging and overwintering habitat including creating down wood and maintaining a diverse understory and tree canopy.

In addition, increased access provides a unique opportunity to raise awareness of red-legged frogs' yearly migration. Metro is partnering with the Harborton Frog Shuttle volunteers to collect frog and salamander data as well as documenting culvert conditions and suitability for amphibian crossing of HWY 30. We are in year two of a three year study, the results may help inform ODOT culvert replacement design to improve wildlife crossings in the area.

Dog Walking

Throughout the process we heard from people who want to walk their dogs in the North Tualatin Mountains. Metro acknowledges that this is a desire from members of the community. We also heard from others in the community who support Metro's no dog policy. Dogs and other pets can damage sensitive habitat and threaten wildlife the region has worked hard to protect. People have many options when they want to spend time outdoors with their pets, but very few places they can depend on to experience nature without dogs. For these reasons, the policy will continue to apply at all of our sites, including the North Tualatin Mountains.

Regional Trails

Dating back to the 1992 Greenspaces Master Plan, providing regional trail connections from Forest Park to the north has been identified as a long-term goal. Proposed trail alignments accommodate the Pacific Greenway Trail, a regional trail envisioned to connect Forest Park to the Coast Range. Determining which trail segments will become the regional trail in the future will require additional evaluation and work with partners. For this reason, they are not designated as part of this plan.

Trails Design

The proposed trail network responds to the Metro Parks and Nature System Plan by creating a diversity of trail experiences with respect to location, story-telling, and challenge level. A sustainably designed multi-use trail system will connect visitors to nature and wildlife.

Trails will employ best practices in design and construction, such as appropriate surface materials and wildlife-friendly drainageway crossings to minimize impacts to habitat. Trail layout will include setbacks from private properties, streams, and sensitive habitat, and alignments that will discourage shortcuts. Interpretive points and distance markers will be incorporated throughout the trail system. "You are here" orientation maps and messages to help enhance wayfinding and minimize impacts to the resources will be incorporated into interpretive signs.

The proposed trail alignments pay close attention to the locations of existing streams and drainages, using existing stream crossing locations when possible to minimize new stream crossings. If a new drainageway crossing is unavoidable, it will be designed to minimize impact by crossing perpendicular to streams, and using bridges instead of culverts where possible. The proposed trail alignments avoid trails running along streams.

Existing Gravel Roads

At McCarthy and Burlington Creek, about 4 miles of existing gravel roads will remain to provide continued access for walkers, cyclists and equestrians. These existing roads are typically about 14 feet wide, and steep in places. Existing gravel roads will also provide maintenance access.

Multi-Use Trails

New multi-use trails will be designed to accommodate hikers and cyclists. This includes about 1 mile at McCarthy and 5.5 miles at Burlington Creek.

Shared trails will be designed to accommodate multiple uses. Where topography allows, trail grades will be gentle, though some sections may still exceed guidelines for accessibility. Where grades are within guidelines for accessibility and outdoor recreation, a firm, stable crushed rock trail surface will be constructed. Best practices, such as sight distances and passing areas will be employed to minimize potential for conflicts between different user groups. Trail design will control off-road cyclists' speed with short uphill sections.

In some places, where topography is steeper, multi-use trails may include off-road cyclists in the one direction only. Travel direction will be evaluated during the design and engineering phase, and will be based on topography, trail alignment and safety considerations.

Hiking

The multi-use trails at Burlington and McCarthy Creek forests will meander up and down forested slopes. Hiking experiences will generally be of moderate to high challenge level. Over the years, visitors will be able to see the forest mature as the young trees grow and the forests gain complexity and habitat value. Trails are all recommended to be multi-use. The following strategies ensure trails are safe for both cyclists and hikers:

- Provide sight distances;
- Slow cyclists through trail design;
- Providing passing and resting places along the trail.

Off-Road Cycling

Off-road cycling is a growing trend statewide as well as in the greater Portland metro region. It is one way that people experience and spend time in nature. This plan recommends providing off-road cycling opportunities in the North Tualatin Mountains. Any trail or access to nature has some impact on wildlife, however based on available research, a definitive conclusion can't be made about whether experiencing nature by hiking or by off-road cycling poses greater impacts to wildlife. Many potential impacts to habitat from trails such as erosion, trail widening, and ruts can be prevented using best practices for trail construction and management.

Trails will be designed to provide a variety of beginner and intermediate challenge levels, and the trail network offers opportunities to enjoy a variety of loops. The following design strategies help make a fun and safe experience for hikers and off-road cyclists:

- Control speed through trail design;
- Avoid long sustained grades, stacking switchbacks and incorporating climbing turns;
- Limit overall average longitudinal slope of each trail segment to ten percent;
- Use curves to create interest, manage storm water runoff, control speed, and have fun;
- Provide clear visibility and long sight distances at curves and intersections; and
- Provide resting points and passing opportunities.

Beginner trails will be designed with wider trail beds and gentler grades. These are appropriate for inexperienced riders, helping develop skills and build confidence. Related design guidelines include:

- Building shorter trails, closer to the parking area;
- Offering trails that are wider, with average grades of less than five percent;
- Using trail surfaces that are generally firm and stable;
- Potentially offering flowing, single-track-style sections; and
- Integrating limited challenging features and limiting small obstacles such as roots and rocks.

Intermediate-level trails will be designed with more narrow trails and steeper grades for more confident riders and offer a variety of moderate level challenges. Such trails may:

- Be located farther from entry and designed to be more challenging;
- Include loose or uneven trail surfaces;
- Offer moderate grades, and possibly short steep sections; and
- Be designed with turns, obstacles and uphill sections to moderate speeds and naturally slow riders.

Accessible Trails

While topographic conditions within the Burlington Creek and McCarthy Creek sites make it challenging to develop a trail network that meets accessible trail guidelines, this plan recommends identifying opportunities to provide access to nature at both sites, for people with varying levels of ability. The opportunity to provide an accessible trail to the McCarthy Creek viewpoint should be explored. In addition, information about trail grades, width, and surfacing will be provided at trailheads and on Metro's website, so visitors can evaluate for themselves whether the trail meets their level of ability.

Bridges

The trail system takes advantage of two existing crossings of Burlington Creek. However, several bridges of varying types and sizes will be necessary to cross smaller drainages on the site. Bridges of wood and steel construction may be required. Additionally, small, hand-built drainage crossings will likely be needed to ensure that trails hold intended alignments without unreasonable detours during the wetter months.

Viewpoints

Viewpoints with supplemental interpretive signs are proposed at key locations. Interpretive signs at these locations will focus on context of the North Tualatin Mountains within the region, different types of habitat, views and watershed restoration. These viewpoints create the opportunity to discuss the critical importance of water quality in urban streams and the connections between Burlington Creek, McCarthy Creek, Burlington Bottoms wetlands, and the Multnomah Channel.

Bird-Watching Opportunities

One of the key conservation targets in the North Tualatin Mountains is young shrub habitat. This type of shrub habitat is becoming less common in the region and specifically targets pollinators and neotropical migrant birds. This plan recommends enhancing bird-watching opportunities by offering amenities such as bird blinds in areas where shrub habitat is being maintained. At Burlington Creek, spots along the existing powerline corridor provide great opportunities to watch for birds in this unique habitat.

Education and Interpretive Story-Telling

The North Tualatin Mountains have many stories to tell. The following are central themes for future nature education and interpretive features throughout the natural area:

Tualatin Mountains Geology and Geography
The local geology and geography of North Tualatin Mountains share the Columbia River Basalt with areas throughout the region, but the uplift that has created the Tualatin Mountain range plays a unique role in the region's geography.

Forestry Practices (old growth vs young forest)
The proximity of Burlington Creek to the Ancient Forest Preserve will give visitors an opportunity to experience how different a twenty-five year-old forest feels to walk through compared to one with trees that are over a hundred years old. Visitors will be able to learn from and participate in forest restoration activities, and watch the Burlington Creek Forest change over time. They will be able to witness the benefit of down wood, and watch the understory develop and layers of duff collect over time.

Streams, Hydrology and Habitat
The McCarthy Creek watershed is an opportunity to teach about the health of the watershed. Stories and experiences include: the big picture view of McCarthy Creek valley, the close up experience of water cascading through the stream, the wildlife that rely on cold clean streams, and the importance of clean water close to home.

The proximity of Burlington Creek Forest to Burlington Bottoms provides a unique opportunity to talk about the historic hydrologic connection between the wetlands in the floodplain, and the upland and riparian forests of the Tualatin Mountains. Prior to urbanization, similar wetlands were likely found all along the eastern edge of the Tualatin Mountains. It provides an opportunity to highlight red-legged frogs' migration patterns and habitat loss due to urbanization, and fortify efforts to improve their chances.

The Tualatin Mountains Elk
The interpretation and planning of programs at McCarthy Creek has an opportunity to celebrate the local elk herd.

Local History
There are many local stories that can be told about the North Tualatin Mountains. School children used to cross through the McCarthy Valley to get to the Skyline School. There was a wooden flume along the route of the railroad used to transport logs to the base of McCarthy Creek. Ferries transported people to local dances on Sauvie Island. These are just some of the stories that can be found on the Skyline Neighbors website.

5. IMPLEMENTATION

PHASING

The access improvements identified in the access master plan will be implemented through a phased approach. The first phase will focus on enabling safe, code compliant public access to Burlington Creek. Building McCarthy Creek as part of phase two will provide an opportunity to apply lessons learned from Burlington Creek Forest. Phase 1 elements at Burlington will include:

- Parking lot
- Gates and security elements
- Restrooms (non-flushing)
- Trails
- Signs and interpretive elements

DESIGN AND ENGINEERING

Parking Lot Construction

A preliminary feasibility analysis was completed for a proposed 15 car parking lot at Burlington Creek. Because of the site's steep slopes, a geotechnical engineer will need to be consulted during the design and engineering phase of the project.

Trail Design and Construction

Trails alignments are conceptual, meaning they give a general feel for the path – but are not yet fine-tuned. The next step will be to work closely with the Metro science team, professional trail contractors, professional trail building consultants and engineers to determine the actual alignment of trails on the ground. This effort will refine the trail routes to best fit the site. Trails will be routed around sensitive areas, wet areas, trees, stumps, springs, boulders and other habitat features.

Trail construction will employ best practices to construct a sustainable trail system that minimizes erosion, including Forest Service and National Park Service standards, guidelines and specifications, and follow guidelines outlined in Metro's trail design documents: "Green Trails: Guidelines for environmentally friendly trails" and Portland's Trail Design Guidelines.

The following should be considered in design and engineering of the trails:

Trail Alignment

Once alignment has been flagged, the alignment will be surveyed by biologists for sensitive habitat such as wetlands, and nesting areas.

Trail Construction

While it is important for the trail construction to be led by professional trail contractors, there are also opportunities to include volunteers in this process. From trail clearing to finish grading and planting, activities appropriate for including volunteers should be identified throughout the construction process.

Throughout the planning process, interest in participating in this work was expressed by several trail user groups including Northwest Trails Alliance representatives, the equestrian community, and other open house attendees. Established trail volunteer groups offer an opportunity to include volunteers in helping to help build, maintain, and monitor trails on an ongoing basis.

Wayfinding and Interpretive Design
Wayfinding signs need to be simple and clear to ensure that trail users understand the appropriate use of trails. At Burlington Creek Forest, interpretive signs should highlight red-legged frogs' use of the site, their life-cycle and what is known about their migration. This is an important opportunity to raise awareness of the importance of this amphibian in our region. At McCarthy Creek, interpretive signs should highlight the stream, its tributaries, and important habitat and connectivity along the stream corridor between the ridge and the Multnomah Channel. Interpretive design should reflect site stories outlined in Chapter 4.

PERMITTING

The project will need to be permitted through Multnomah County prior to construction. Land use approval will be required, as well as building permits to meet construction codes.

ANTICIPATED COST

A planning level cost estimate was prepared based on elements shown in the draft master plan for the parking lots and trail networks. The estimate is based on the diagrammatic plans and assumptions made for materials, quality and construction, and is based on 2015 unit costs for each specific work item.

Escalation index numbers through 2019 are as follows:

- 2016 – 0.045
- 2017 – 0.045
- 2018 – 0.045
- 2019 – 0.045

As we move forward through permitting, design and engineering, we will make modifications to align with the budget amounts. Planning level cost estimates for access improvements for Burlington Creek and McCarthy Creek forests are included Appendix C.

PARTNERSHIP OPPORTUNITIES

Partnerships and volunteers have proven valuable in all aspects of park management throughout the region and are essential in leveraging limited public funds. There will be a number of ways that volunteers can become involved at North Tualatin Mountains to enhance habitat quality for wildlife and help ensure a quality experience for the public. Key opportunities are described briefly below.

Site Stewardship
Site Stewardship provides "eyes and ears" above and beyond what staff can provide. Through routine walking and monitoring of the trails, volunteer site stewards can alert staff early to issues that need addressing. They can also serve as "ambassadors" for North Tualatin Mountains, answer questions and ensure that visitors are abiding by rules and trail etiquette.

Site stewardship agreements with organizations representing individual user groups are an opportunity to foster an ethic of taking care of the land, trails and helping to improve habitat. Stewardship agreements would include responsibility to encourage appropriate use of trails and the site.

Nature Education
Volunteer naturalists help expand program offerings beyond what staff alone offer. Metro has a well-established volunteer naturalist program in place and relies on these very dedicated and highly trained volunteers to lead nature walks for the general public and civic groups, and to deliver outdoor education programs such as school field trips.

Restoration
Currently, Metro uses volunteers to assist in restoration efforts. Many of these volunteers perform ongoing monitoring to help assess and evaluate the success of restoration and other management activities. Other volunteer activities will include invasive plant removal and native seed collection.

6. OPERATIONS AND MAINTENANCE

PARK REGULATIONS

All rules and regulations at North Tualatin Mountains will be consistent with Metro's Title 10, which outlines regulations "governing the use of Metro owned and operated regional parks and greenspaces facilities by members of the public in order to provide for protection of wildlife, plants and property, and to protect the safety and enjoyment of persons visiting these facilities."

For public security and safety, hours of operation and regulatory signs will be installed at each access point. An orientation map of the natural area will be installed at the parking area to assist visitors and emergency and police response teams with way-finding. Regulatory signs will include public use restrictions on dogs, fires, camping, motorized vehicles, hunting, smoking, intrusive noise, plant collecting and other uses outlined in Metro's Title 10. Due to conflicts with wildlife, a "no dogs " policy will be enforced consistent with all other Metro-managed natural areas.

STAFFING

Once the Burlington Creek Forest and McCarthy Creek Forest sites are formally open, staff in three distinct program areas will be required to ensure successful maintenance and operation of the site. Key responsibilities for each are noted below.

Rangers:

- Manage day-to-day operations of the site
- Maintain gravel and paved trails
- Provide security and manage illegal camping

Land Managers:

- Oversee and/or perform monitoring, restoration and enhancement projects
- Maintain natural areas
- Maintain soft surface trails and all trail clearance corridors
- Manage and clean up illegal camping

Scientists:

- Coordinate monitoring, restoration and enhancement projects

ADAPTIVE MANAGEMENT

Once this project is implemented, trails and trail use will need to be monitored for appropriate use, and to make sure that they function as intended. The system of trails, and trail uses should be modified in the future to adapt to new information, new site conditions and lessons learned about how people and wildlife use the site.

SAFETY AND SECURITY

Access Control

Vehicle access will be controlled to prevent after hours use. Each of the vehicular entrances will be controlled with automatic gates, which will be locked after hours. Site boundaries are marked with carsonite posts to clearly delineate the public/private edge. Fencing will be considered and installed only on an as-needed basis to control access in problem locations where other measures are not sufficient.

Trail Monitoring and Maintenance

Routine trail maintenance on a year-round basis will not only improve trail safety, but will also prolong the longevity of North Tualatin Mountains' trails. The key to trail maintenance will be to institute regularly scheduled monitoring to identify trail problems early, and to catch and address "social" or "demand" trails. Monitoring can be a time consuming task. Trail volunteer groups will provide vital assistance in monitoring the site above and beyond what staff can provide.

During the first year after construction, and after the first heavy rains, close attention should be paid to drainage and erosion patterns on soft surface trails. It is common for trails to need additional maintenance and adjustment during the first season. Ongoing trail maintenance activities will typically include vegetation clearing and pruning along trails to keep passages and selected views open, erosion control measures, trail pavement surfacing and stabilization, bridge and culvert clearing and upkeep, litter and illegal dumping clean-up, replacing signs, and closing "social trails" through the use of natural barriers and vegetation.

Managing Parking

The parking lot at Burlington Creek will be designed to accommodate about 15 cars, including one ADA parking space. Overflow parking cannot be accommodated on McNamee Road. Metro may need to coordinate with Multnomah County to install "no parking" signs to ensure people don't park on McNamee. Parking rules will be strictly enforced by Metro staff and an on-contract security service .

Maintenance of Park Facilities and Amenities

Routine maintenance of the park will include cleaning the restrooms, litter pick-up and general monitoring. Routine seasonal maintenance of the natural area facilities will include upkeep of the restroom building, benches and picnic tables, signs, and mowing of grass areas.

Fire Suppression Plan

Metro's restoration work and long term management strategy includes identifying and reducing fire risks where possible. Additionally, an Incident Action Plan is developed for each site that includes information to assist Metro and cooperating agencies responding to a fire on Metro property. Incident actions plans shall be developed for both Burlington and McCarthy prior to implementing formal public access. We follow the Oregon Department of Forestry Industrial Fire Precaution Levels and restrictions, may close areas in very high fire conditions, may prohibit fires and smoking on properties during high fire conditions, and work with local fire prevention and suppression agencies.

APPENDIX A: COMMUNITY FEEDBACK

Metro | *Meeting minutes*

Meeting: North Tualatin Mountains Comprehensive Plan
Date/time: September 18th, 2014
Place: Skyline Grange Hall
Purpose: First public engagement event

Over 40 attendees at the event
80 comments

Comment Summary is as follows, organized by Value:

- Conservation
  - Volunteer work
  - Stream restoration
  - Wildlife surveying
  - Invasive species removal
  - Habitat restoration
  - No access to the public
  - Protection against impacts from recreation
  - Wildlife corridor to the Coast Range
  - Proximity to Forest Park and Burlington Bottoms
  - Oak woodlands
  - Continued land acquisition to connect sites
  - Proximity to the city
  - Diverse upland habitat
  - Bird habitat
  - No paved trails
  - Preservation for future generations
  - Clean air

- Education
  - Teaching water quality monitoring
  - Teaching stream ecology
  - School field trips
  - Proximity to Skyline School
  - Proximity to PCC Rock Creek
  - Proximity to city provide opportunities to educate the general public
  - Parking for school buses
  - Nature workshops
  - Wildlife surveying

- Recreation
  - Birding
  - Hiking
  - Trail running
  - Mountain biking
  - Nature viewing
  - Horseback riding

- Dog walking
- Dog walking via a permit system
- Fishing
- Taking pictures and nature photography
- Restrooms at trailheads
- Soft-surface (opposed to paved) trails
- Loop trails
- Access to site via TriMet
- Relaxation and tranquility
- Wildlife viewing
- Backcountry camping
- Mushroom hunting
- Separation of bikes from hikers
- Sketching/drawing
- Proximity to city

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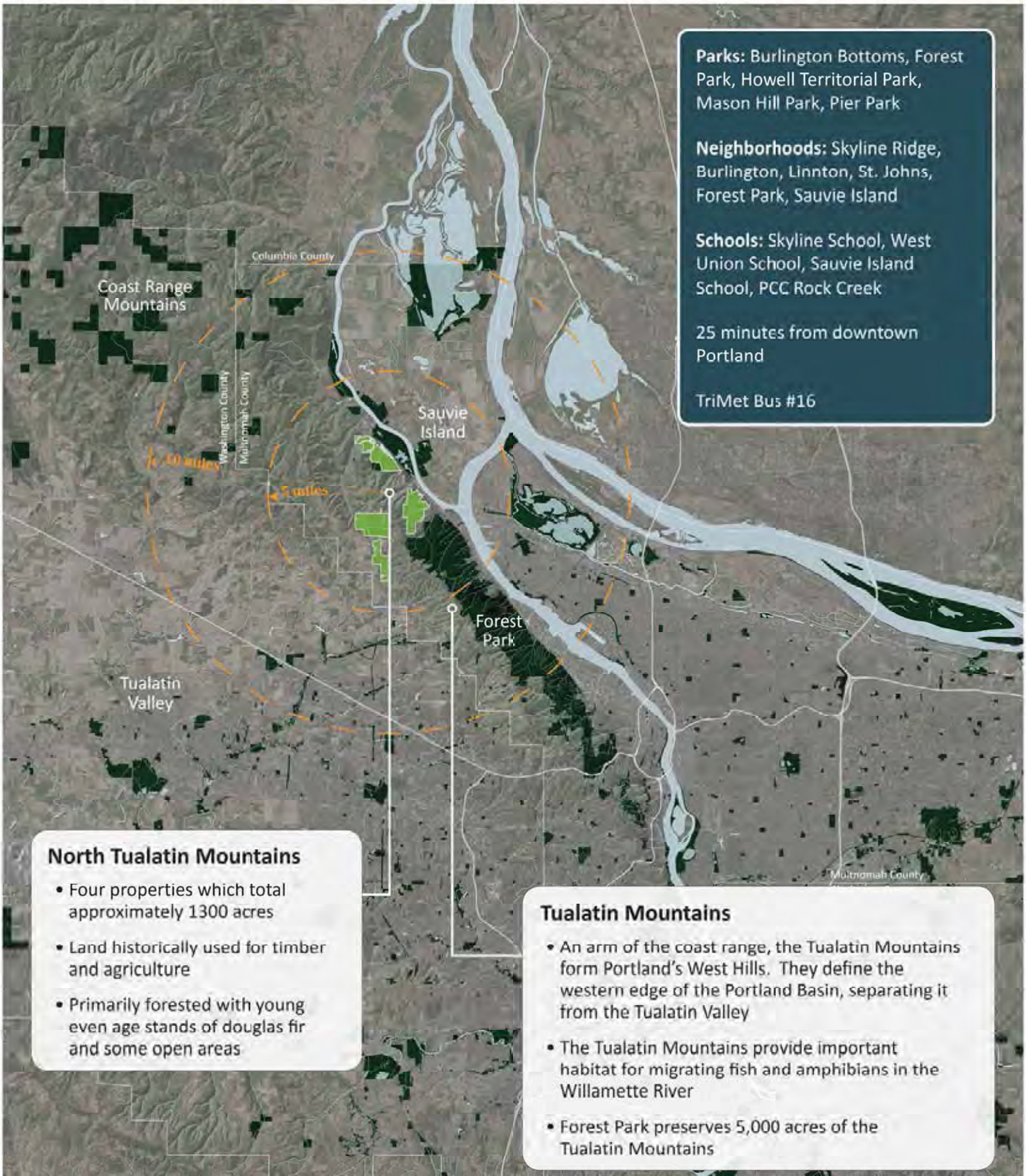
NORTH TUALATIN MOUNTAINS

CONTEXT



Parks: Burlington Bottoms, Forest Park, Howell Territorial Park, Mason Hill Park, Pier Park

Neighborhoods: Skyline Ridge, Burlington, Linnton, St. Johns, Forest Park, Sauvie Island

Schools: Skyline School, West Union School, Sauvie Island School, PCC Rock Creek

25 minutes from downtown Portland

TriMet Bus #16

North Tualatin Mountains

- Four properties which total approximately 1300 acres
- Land historically used for timber and agriculture
- Primarily forested with young even age stands of douglas fir and some open areas

Tualatin Mountains

- An arm of the coast range, the Tualatin Mountains form Portland's West Hills. They define the western edge of the Portland Basin, separating it from the Tualatin Valley
- The Tualatin Mountains provide important habitat for migrating fish and amphibians in the Willamette River
- Forest Park preserves 5,000 acres of the Tualatin Mountains

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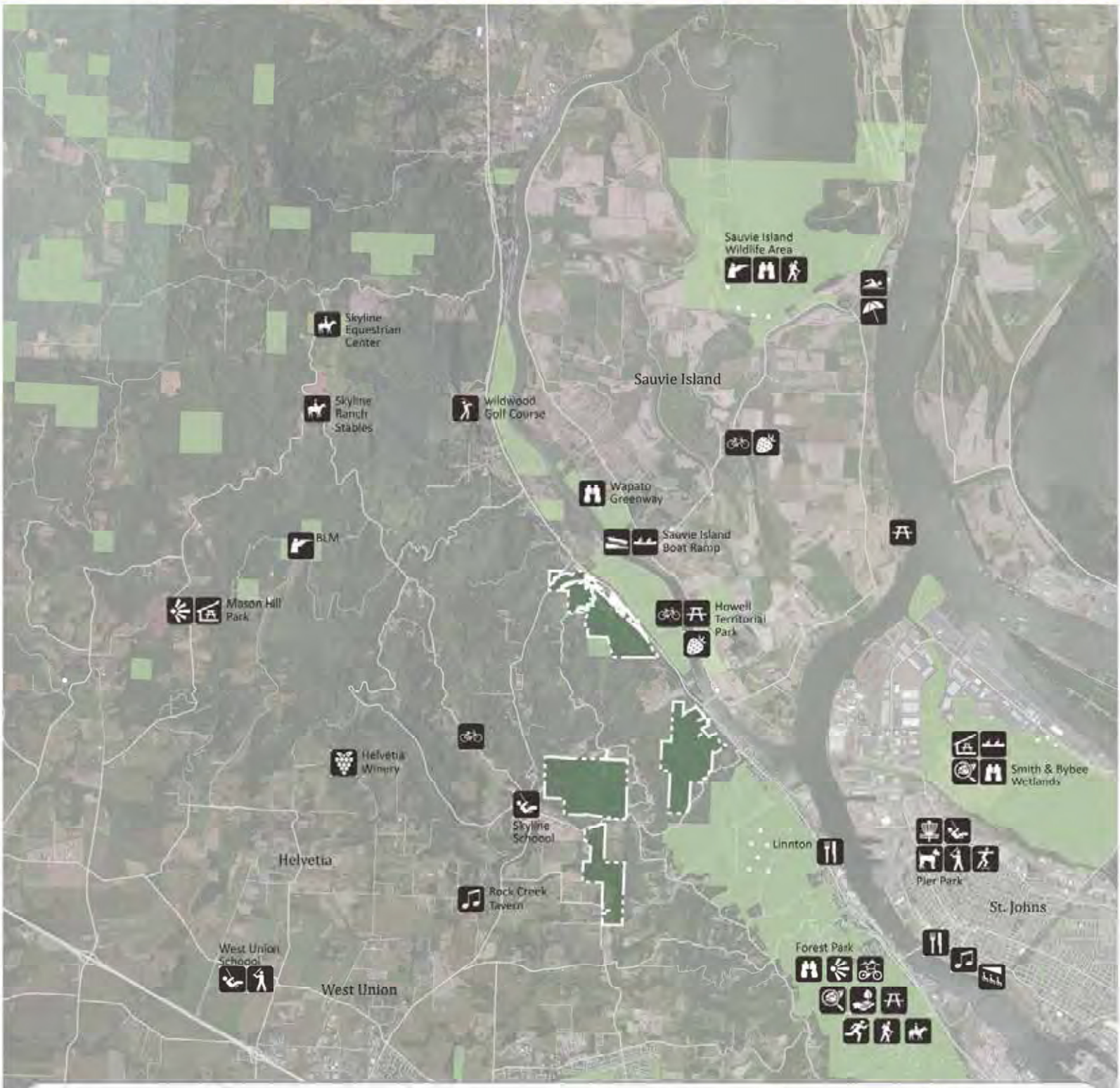
NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

NEARBY ACTIVITIES



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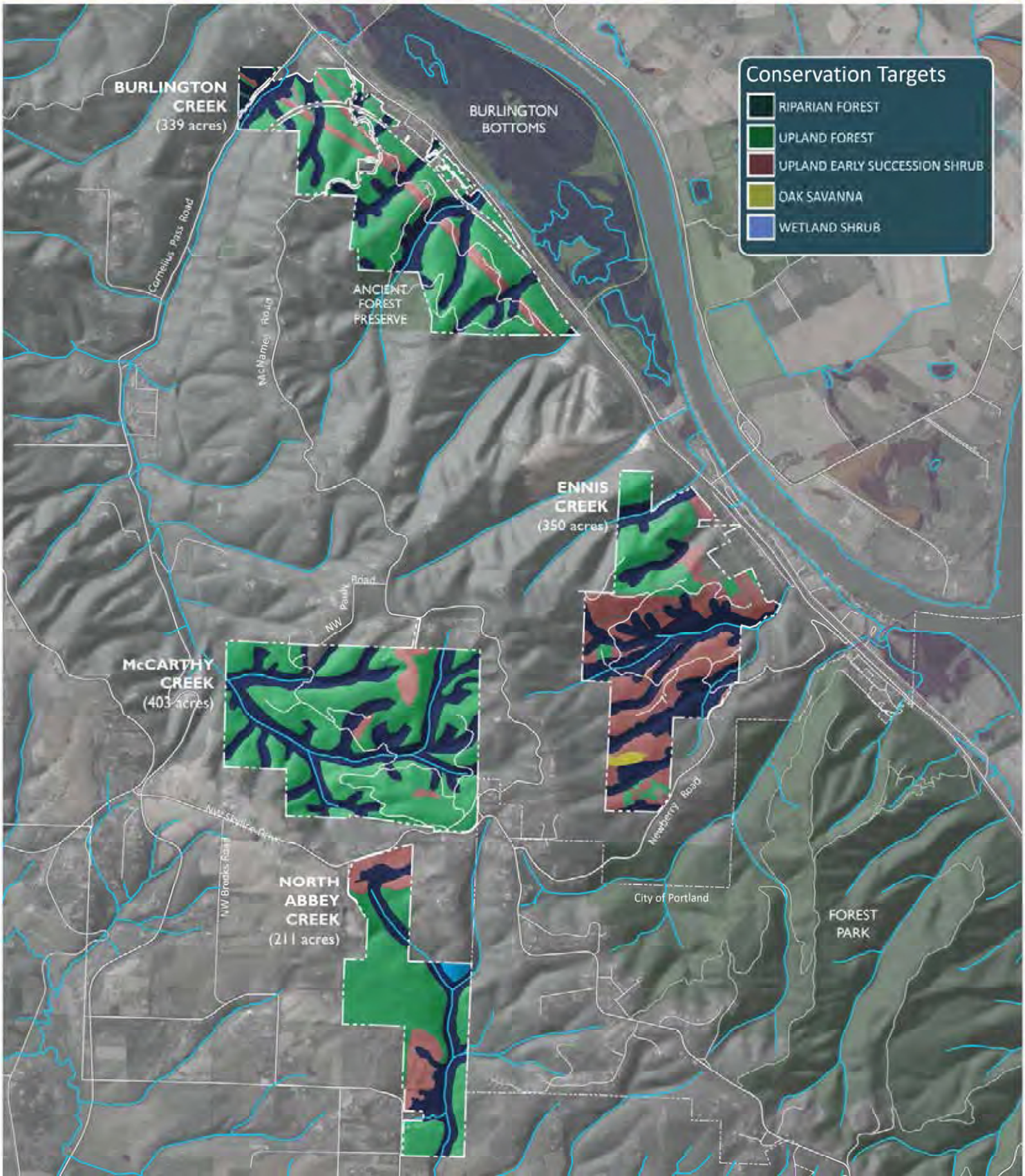
NORTH TUALATIN MOUNTAINS CONSERVATION

Exhibit A to Resolution No 16-4679



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NORTH TUALATIN MOUNTAINS

HABITAT

Riparian Forest

- Riparian forests protect water quality and provide important habitat near the headwaters of Burlington, Ennis, and McCarthy Creeks, which flow into the Multnomah Channel, and North Abbey Creek, a tributary of the Tualatin River
- Tributary creeks and confluence areas provide clean and cold water, nutrients and refuge areas for important fish species.

Upland Forest

- Upland forest is composed primarily of native trees and shrubs such as Douglas fir, big-leaf maple, Oregon grape, salal and sword fern.
- Especially important to migrating and nesting songbirds, woodpeckers, mammals such as Douglas squirrel and deer, and seasonal habitat for salamanders, frogs and turtles.
- Urbanization has fragmented and reduced the amount of this habitat.

Upland Early Successional Shrub

- Shrub dominated communities provide food and cover for neotropical migrant songbirds and create habitat for a variety of pollinator species.
- Small scale agricultural sites, recently logged areas, and utility clearings are opportunities to manage for early successional upland forest shrubs.

Oak Savanna

Oak savanna harbors many unique plant and animal species. Once common, it is now rare in our region.

Shrub Wetland

Shrub wetlands are important to many at-risk species and provide invertebrate food for songbirds and other animals.

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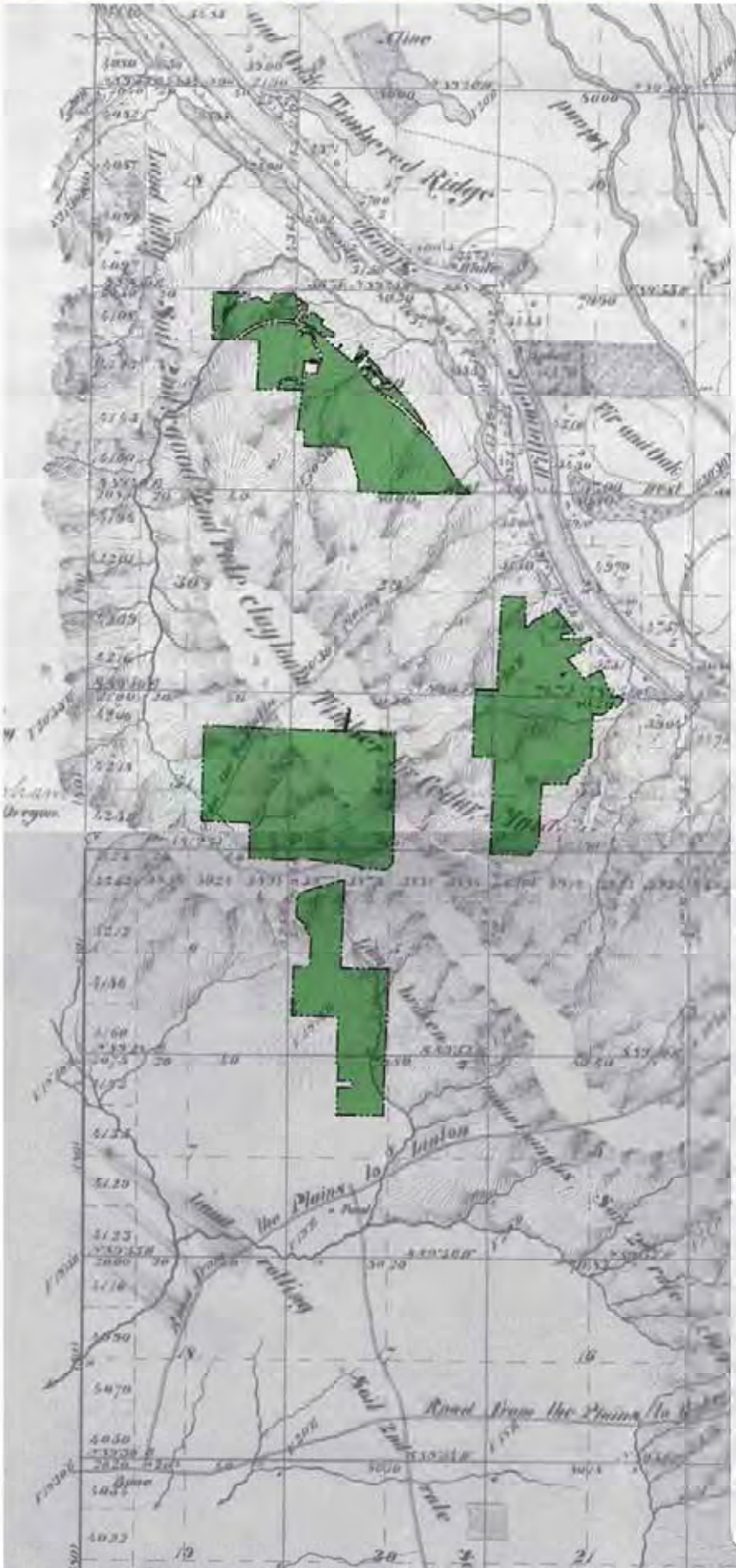
NORTH TUALATIN MOUNTAINS

HISTORY



Before European settlement, Atfalati (also called Tualatin) tribe of the Kalapuya inhabited villages on the Tualatin Plains and the hills around Forest Grove

1883 Newberry Road established as county road.

late 1800 - 1900's The trees that originally covered Skyline hills were felled, then sent on a flume from the ridge along the route of Cornelius Pass and then OVER Highway 30 to one of the seven sawmills in Linnton.

1900's A small railroad spur led to what was likely a water powered mill on the north side of McCarthy Creek on the western edge of the site.

The school trail ran down one hill to McCarty Creek (now spelled and called "McCarthy") and up the next hill to the school. In the creek bottom were the remnants of the old Kaiels Sawmill (From The School on the Hill from the Twenties by Margaret Pauly Tate).

1909 Ruth Trust company files plat for the town of Burlington.

~1911 United Railway Company constructs rail line between Portland and Wilkesboro and provides electric passenger service between Burlington and Linton.

1915 When Ella Thomas was 2, her parents Reinhold and Rosalie Bieberdorf bought property and established a dairy on Newberry Road. (now Wealth Underground CSA) They tended about 40 cows as well as pear, walnut, plum, cherry, filbert and apple trees. Goats helped clear the land.

1920's There were about 45 students in Brooks School and everyone walked to school. Ramona Huserik recalls the Pauly kids walking to school across the canyon from Pauly Road off McNamee.

1936 Mallory George Lewis (Jim) Brooks purchase (original one room schoolhouse. It was moved to its current location where it became Brooks residence.

1941 BPA Built St John's-St Helens no1 transmission line.

1950 Ella moves back to family farm with husband Delbert Thomas and operate the Thomas Dairy from the 1940s to 1969.

1939 New Skyline School built.

1940 Skyline Grange established

1948 Forest Park formally dedicated by the City of Portland.

1950 A Ferry operated between Holbrook and Sauvie Island (at current day Cornelius Pass Road) until 1950 when the Sauvie Island bridge was built.

1974 Grange hall fire

local stories from Skyline Ridge Neighbors website
http://www.srnpdx.org/history-skyline-ridge

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NORTH TUALATIN MOUNTAINS MANAGEMENT

Exhibit A to Resolution No 16-4679

Access control and site management

- Managing gates
- Installing signs to manage encourage appropriate use of the sites (ie no hunting, no dogs)
- Addressing encroachments issues
- Maintaining safety for increased visitation
- Evaluating slope stability
- Addressing and removing rogue trails (partnership with Northwest Trail Alliance)

Existing roads

- Assess roads to mitigate water quality impacts, and evaluate future need for maintenance access
- Road maintenance for fire access and maintenance
- Culvert replacement

Vegetation management & restoration opportunities

- Fuel reduction to reduce fire risk
- Invasive species management, including mapping, allocating resources, and controlling invasives
- Fostering partnerships with West Multnomah Soil and Water Conservation District, City of Portland and, Forest Park Conservancy, Trout Mountain Forestry, The National Audubon Society
- Identification of opportunities and strategy to restore old growth habitat and complex forest structure by thinning to select for future legacy trees, providing down wood, and increasing understory complexity
- Development of shrub communities to support neotropical migrants and pollinators

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NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

BURLINGTON CREEK

Logie Pass Road
US 30
Multnomah Channel
Burlington Bottoms
Cornelius Pass Road
McCarthy Creek
McNamee Rd
BURLINGTON CREEK
Burlington Creek
Ancient Forest Preserve

Burlington Creek

- 339 acres
- Northeast slopes of Tualatin Mountains
- Adjacent to the Ancient Forest Preserve (managed by the Forest Park Conservancy)
- Forest is primarily a young, even-aged stand of Douglas fir
- Connection to Burlington Bottoms and Multnomah Channel blocked by US 30, residential development, and the railroad along the NE edge of the site
- McNamee Road and the railroad bisect the site
- Existing logging roads
- BPA power line through the site
- Views toward Sauvie Island

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NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

ENNIS CREEK

Ennis Creek

- 350 acres
- Northeast slopes of Tualatin Mountains
- Forest is primarily a young, even-aged stand of Douglas fir
- Ennis Creek was most recently logged
- A CSA (community sustained agriculture) operates at south end of site
- Elk are present on the site

US 30

ENNIS CREEK

Ennis Creek

McCarthy Creek

McNamee Road

Newberry Road

Forest Park

photo by Tracy Waters

MAKING A GREAT PLACE

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NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

MCCARTHY CREEK

McCarthy Creek

- 403 acres
- Southwest slopes of Tualatin Mountains
- Headwaters of McCarthy Creek
- Elk are present on the site
- Views of Tualatin Valley/Coast Range
- Mostly young forest with some older trees

McCARTHY CREEK

NW Pauly Road

McCarthy Creek

NW Cornelius PassRoad

NW McNamee

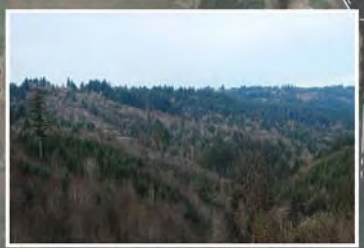
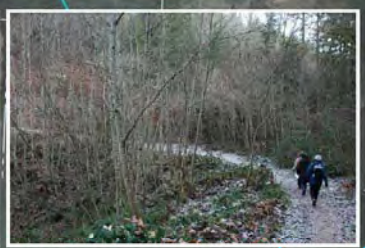
Skyline School

NW Skyline Drive

NW Brooks Road

Skyline Grange

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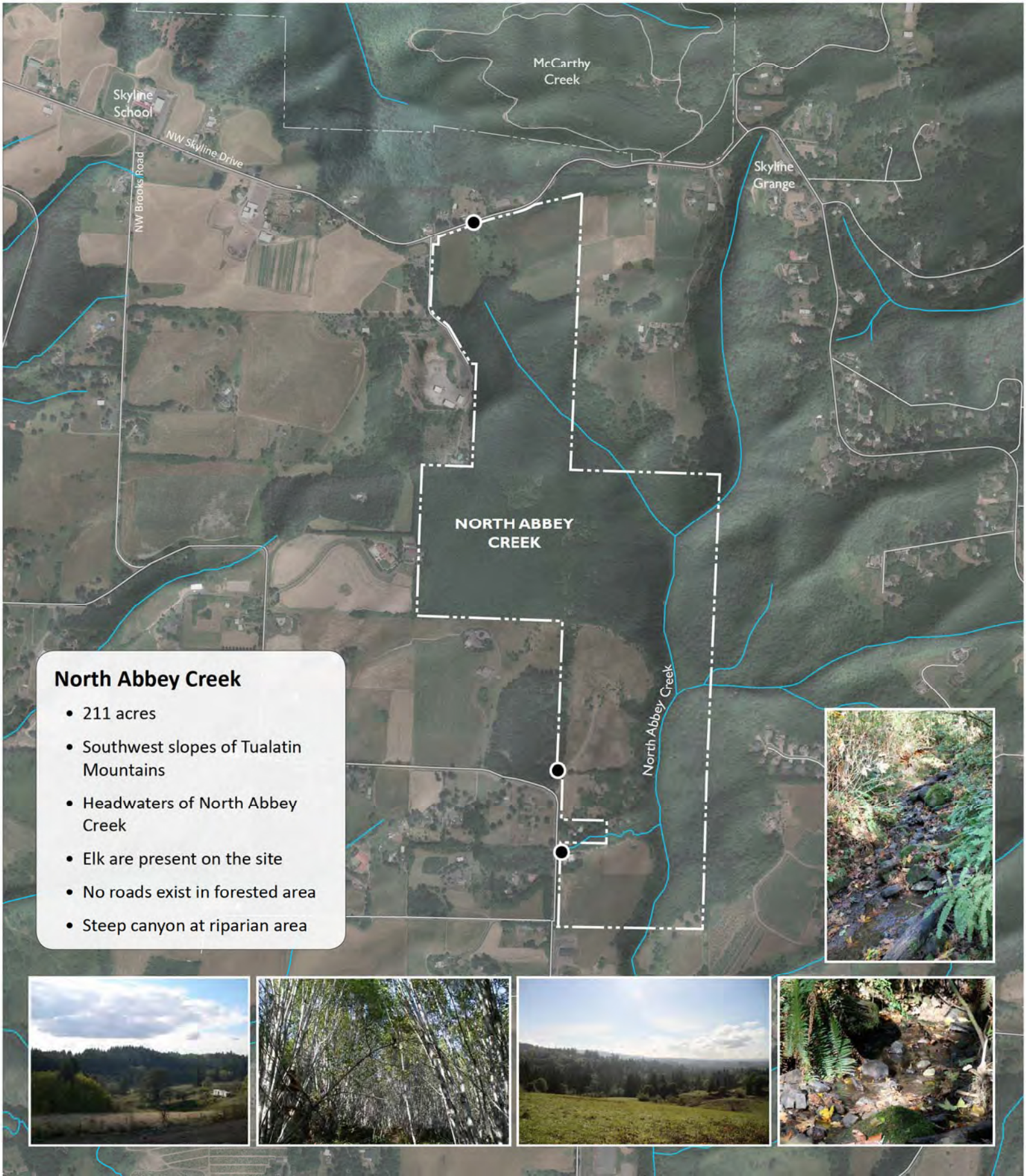
NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

NORTH ABBEY CREEK



North Abbey Creek

- 211 acres
- Southwest slopes of Tualatin Mountains
- Headwaters of North Abbey Creek
- Elk are present on the site
- No roads exist in forested area
- Steep canyon at riparian area

Metro | *Meeting minutes*

Meeting:	North Tualatin Mountains Comprehensive Plan
Date/time:	December 2nd, 2014 5:30-7:30
Place:	Skyline Grange Hall
Purpose:	Second public engagement event, review phase 2 of Comprehensive Planning

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Approximately 250 attendees at the event
135 Comment cards were received

- The community even format was generally informal, with brief presentations at 6:00. Mark Davison introduced the project. He was followed by Counselor Chase, and then Dave Elkin gave an overview of the information presented on boards around the room.

- Overall the message from the Metro project team was that we know there are a lot of mountain bikers in the room as well as neighbors and people concerned for wildlife and we are here to listen.

- Feedback was gathered through comment cards (135 total), A dot exercise, Where do you see elk exercise and through many one on one conversations

- We planned for about 100 people, and had 2 sign tables at the entry, and 10 pies

- Displays included the following Boards from Community Event #1

    - Project Map
    - Project Context ("where do you live?" pins)
    - Nearby Activities
    - Local History
    - Habitat conservation targets (2 boards)

- Displays included the following new displays
    - What we heard at Community Event 1
    - Where do you see elk (I will look for stickers) might be fun to add other wildlife to this too birds/ bob cats/ bears? Oh my!
    - Habitat Area (Kate)
    - Opportunity Areas (Olena)
    - Opportunity Areas at each site (4 boards)
    - 3 Activities boards for Dot Exercise

- There was a volunteer/ Naturalist table, where Shielagh had a model of an elk hoof and other cool wildlife stuff

- Dot exercise:
    - People were given 3 dots numbered 1-3, and asked to priorities their top 3 activities that they want to do at North Tualatin Mountains
    - Results of the dot exercise were as follows:

Activity	Most Important	Very Important	Important	Total
Volunteer Work	0	7	10	17
Conservation Education	7	6	13	26
Wildlife Viewing	17	9	14	40
Art	1	2	0	3
Being in Nature	19	29	35	83
Scenic Viewing	0	3	10	13
Picnicking	0	0	3	3
Playing	1	10	11	22
Hiking	7	47	35	89
Trail Running	2	43	22	67
Horseback Riding	3	0	2	5
Mountain Biking	191	56	41	288
Added by participants:				
Paragliding	1		2	3
Hiking with Dog	2	2	2	6

- Overall, the response from the mountain biking community was generally positive, happy that Metro is listening and very enthusiastic and anxious about building trails

- Response from neighbors and other community members was also generally positive, and though there are concerns about mountain biking, there was also acknowledgement that there is a demand in the region that needs to be addressed.

MAKING A GREAT PLACE

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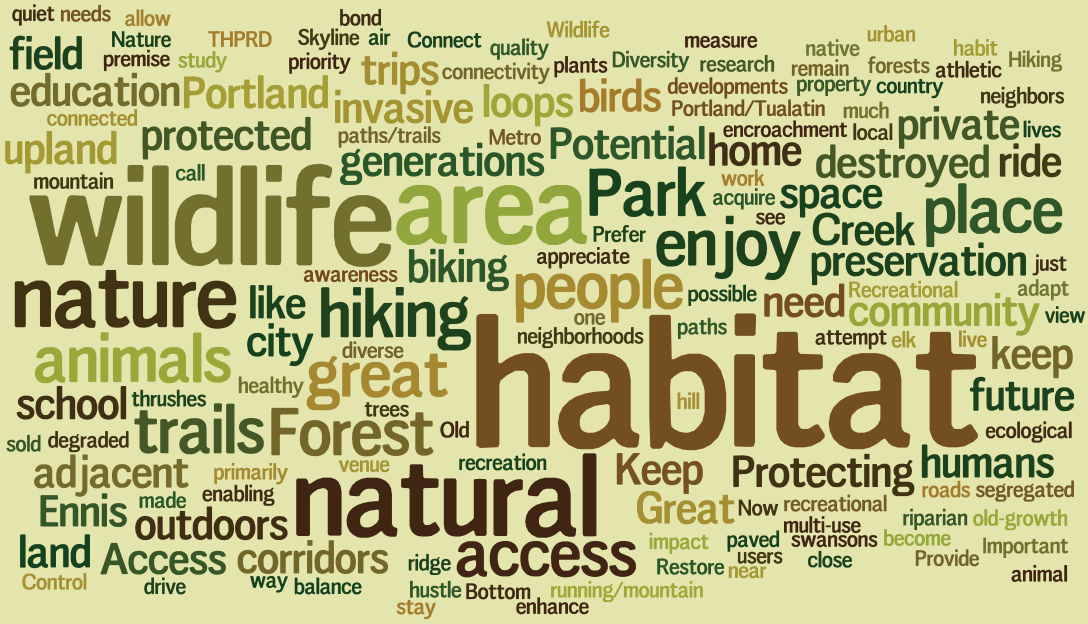
NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

WHAT WE HEARD

WHAT IS IMPORTANT TO YOU ABOUT THE NORTH TUALATIN MOUNTAINS?



WHAT DO YOU WANT TO DO AT THE NORTH TUALATIN MOUNTAINS?

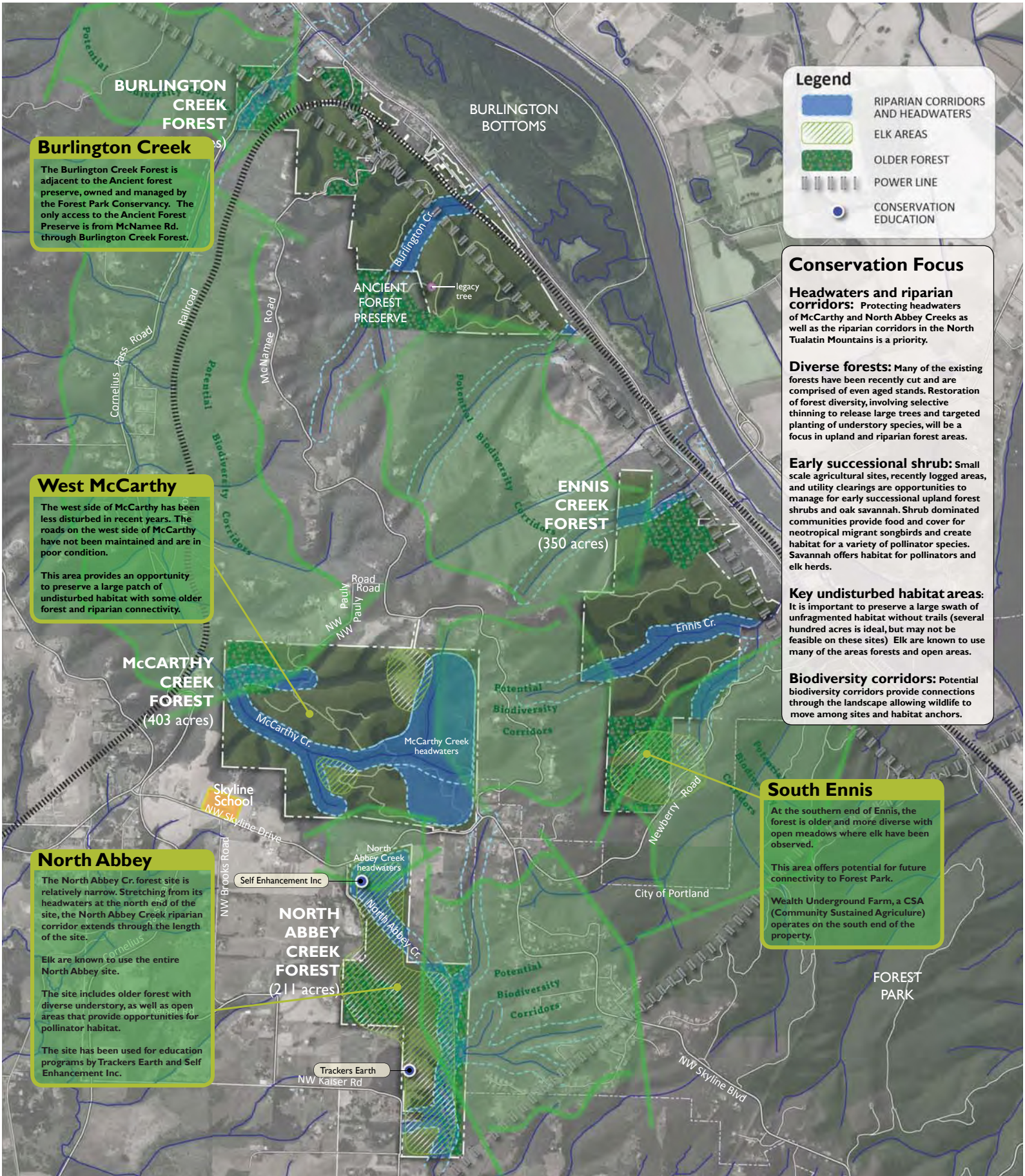
MAKING A GREAT PLACE

Metro

NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

HABITAT AREAS



Burlington Creek

The Burlington Creek Forest is adjacent to the Ancient forest preserve, owned and managed by the Forest Park Conservancy. The only access to the Ancient Forest Preserve is from McNamee Rd. through Burlington Creek Forest.

West McCarthy

The west side of McCarthy has been less disturbed in recent years. The roads on the west side of McCarthy have not been maintained and are in poor condition.

This area provides an opportunity to preserve a large patch of undisturbed habitat with some older forest and riparian connectivity.

North Abbey

The North Abbey Cr. forest site is relatively narrow. Stretching from its headwaters at the north end of the site, the North Abbey Creek riparian corridor extends through the length of the site.

Elk are known to use the entire North Abbey site.

The site includes older forest with diverse understory, as well as open areas that provide opportunities for pollinator habitat.

The site has been used for education programs by Trackers Earth and Self Enhancement Inc.

Conservation Focus

Headwaters and riparian corridors: Protecting headwaters of McCarthy and North Abbey Creeks as well as the riparian corridors in the North Tualatin Mountains is a priority.

Diverse forests: Many of the existing forests have been recently cut and are comprised of even aged stands. Restoration of forest diversity, involving selective thinning to release large trees and targeted planting of understory species, will be a focus in upland and riparian forest areas.

Early successional shrub: Small scale agricultural sites, recently logged areas, and utility clearings are opportunities to manage for early successional upland forest shrubs and oak savannah. Shrub dominated communities provide food and cover for neotropical migrant songbirds and create habitat for a variety of pollinator species. Savannah offers habitat for pollinators and elk herds.

Key undisturbed habitat areas: It is important to preserve a large swath of unfragmented habitat without trails (several hundred acres is ideal, but may not be feasible on these sites) Elk are known to use many of the areas forests and open areas.

Biodiversity corridors: Potential biodiversity corridors provide connections through the landscape allowing wildlife to move among sites and habitat anchors.

South Ennis

At the southern end of Ennis, the forest is older and more diverse with open meadows where elk have been observed.

This area offers potential for future connectivity to Forest Park.

Wealth Underground Farm, a CSA (Community Sustained Agriculture) operates on the south end of the property.

MAKING A GREAT PLACE

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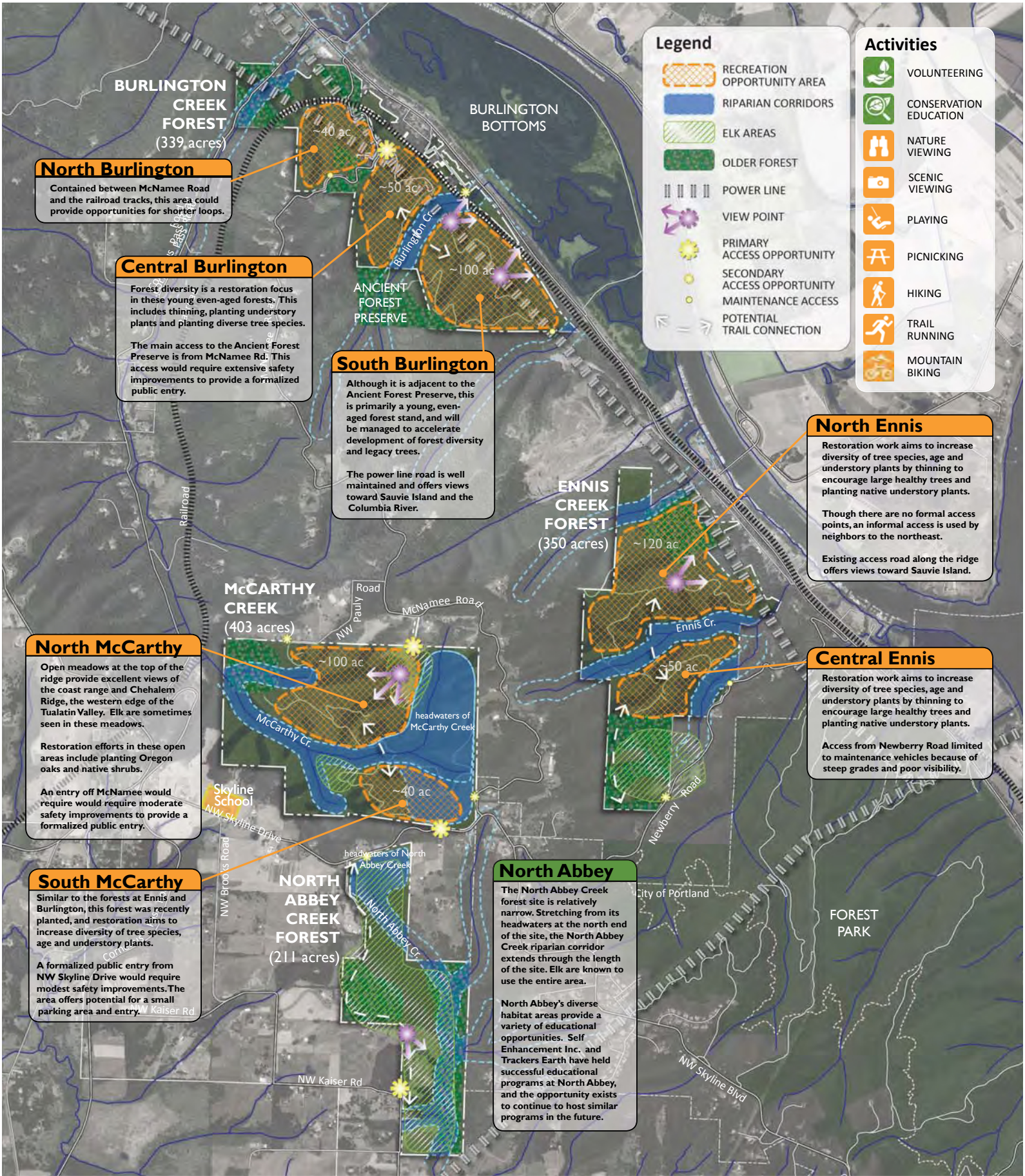
NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

OPPORTUNITY AREAS



North Burlington

Contained between McNamee Road and the railroad tracks, this area could provide opportunities for shorter loops.

Central Burlington

Forest diversity is a restoration focus in these young even-aged forests. This includes thinning, planting understory plants and planting diverse tree species.

The main access to the Ancient Forest Preserve is from McNamee Rd. This access would require extensive safety improvements to provide a formalized public entry.

South Burlington

Although it is adjacent to the Ancient Forest Preserve, this is primarily a young, even-aged forest stand, and will be managed to accelerate development of forest diversity and legacy trees.

The power line road is well maintained and offers views toward Sauvie Island and the Columbia River.

North Ennis

Restoration work aims to increase diversity of tree species, age and understory plants by thinning to encourage large healthy trees and planting native understory plants.

Though there are no formal access points, an informal access is used by neighbors to the northeast.

Existing access road along the ridge offers views toward Sauvie Island.

Central Ennis

Restoration work aims to increase diversity of tree species, age and understory plants by thinning to encourage large healthy trees and planting native understory plants.

Access from Newberry Road limited to maintenance vehicles because of steep grades and poor visibility.

North McCarthy

Open meadows at the top of the ridge provide excellent views of the coast range and Chehalem Ridge, the western edge of the Tualatin Valley. Elk are sometimes seen in these meadows.

Restoration efforts in these open areas include planting Oregon oaks and native shrubs.

An entry off McNamee would require would require moderate safety improvements to provide a formalized public entry.

South McCarthy

Similar to the forests at Ennis and Burlington, this forest was recently planted, and restoration aims to increase diversity of tree species, age and understory plants.

A formalized public entry from NW Skyline Drive would require modest safety improvements. The area offers potential for a small parking area and entry.

North Abbey

The North Abbey Creek forest site is relatively narrow. Stretching from its headwaters at the north end of the site, the North Abbey Creek riparian corridor extends through the length of the site. Elk are known to use the entire area.

North Abbey's diverse habitat areas provide a variety of educational opportunities. Self Enhancement Inc. and Trackers Earth have held successful educational programs at North Abbey, and the opportunity exists to continue to host similar programs in the future.

MAKING A GREAT PLACE

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NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

BURLINGTON CREEK

Burlington Creek Forest

- 339 acres
- Northeast slopes of Tualatin Mountains
- Adjacent to the Ancient Forest Preserve (managed by the Forest Park Conservancy)
- Forest is primarily a young, even-aged stand of Douglas fir
- Connection to Burlington Bottoms and Multnomah Channel blocked by US 30, residential development, and the railroad along the NE edge of the site
- McNamee Road and the railroad bisect the site
- BPA power line through the site
- Views toward Sauvie Island

Logie Pass Road
US 30
Multnomah Channel
Burlington Bottoms
Cornelius Pass Road
McCarthy Creek
McNamee Rd
BURLINGTON CREEK
Burlington Creek
Ancient Forest Preserve

Legend

- RECREATION OPPORTUNITY AREA
- RIPARIAN CORRIDORS
- VIEW POINT
- PRIMARY ACCESS OPPORTUNITY
- SECONDARY ACCESS OPPORTUNITY
- POTENTIAL TRAIL CONNECTION

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NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

ENNIS CREEK

Ennis Creek Forest

- 350 acres
- Northeast slopes of Tualatin Mountains
- Forest is primarily a young, even-aged stand of Douglas fir
- Ennis Creek was most recently logged
- A CSA (community sustained agriculture) operates at south end of site
- Elk have been observed on the site

ENNIS CREEK

US-30

Ennis Creek

McCarthy Creek

Newberry Road

Forest Park

Legend

- RECREATION OPPORTUNITY AREA
- RIPARIAN CORRIDORS
- VIEW POINT
- PRIMARY ACCESS OPPORTUNITY
- SECONDARY ACCESS OPPORTUNITY
- POTENTIAL TRAIL CONNECTION

photo by Tracy Waters

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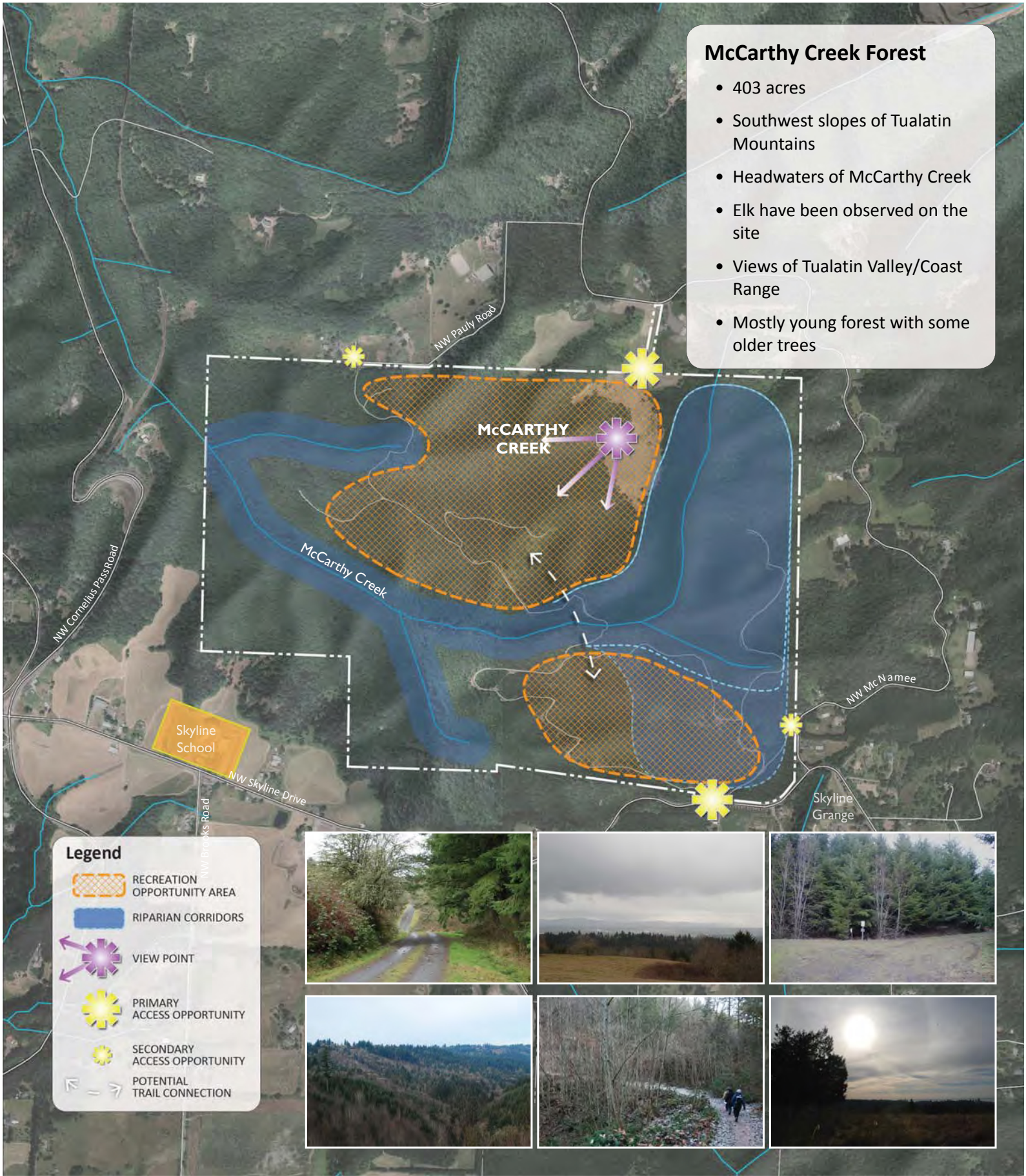
NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

MCCARTHY CREEK

McCarthy Creek Forest

- 403 acres
- Southwest slopes of Tualatin Mountains
- Headwaters of McCarthy Creek
- Elk have been observed on the site
- Views of Tualatin Valley/Coast Range
- Mostly young forest with some older trees



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NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

NORTH ABBEY CREEK

North Abbey Creek Forest

- 211 acres
- Southwest slopes of Tualatin Mountains
- Headwaters of North Abbey Creek
- Elk have been observed on the site
- No roads exist in forested area
- Steep canyon at riparian area

McCarthy Creek

Skyline School

NW Skyline Drive

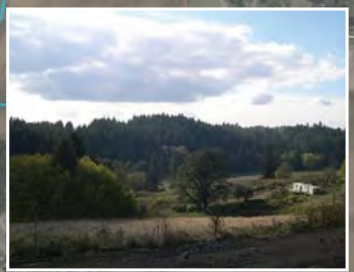
NW Brooks Road

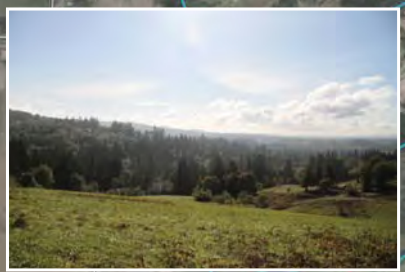
NORTH ABBEY CREEK

North Abbey Creek

Legend

- RECREATION OPPORTUNITY AREA
- RIPARIAN CORRIDORS
- VIEW POINT
- PRIMARY ACCESS OPPORTUNITY
- SECONDARY ACCESS OPPORTUNITY
- POTENTIAL TRAIL CONNECTION





NORTH TUALATIN MOUNTAINS ACTIVITIES

Exhibit A to Resolution No 16-4679

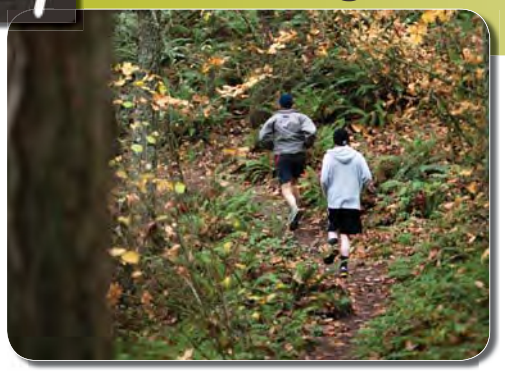
Rank your top 3 activities for the project. Place one dot next to each of your 3 priorities.

1. most important
2. very important
3. important

Volunteer Work

Playing

Trail running



Scenic Viewing

NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

ACTIVITIES

Rank your top 3 activities for the project. Place one dot next to each of your 3 priorities.

1 most important
2 very important
3 important

Conservation Education

Picnicking

Mountain biking

Horseback riding

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NORTH TUALATIN MOUNTAINS ACTIVITIES

Exhibit A to Resolution No 16-4679

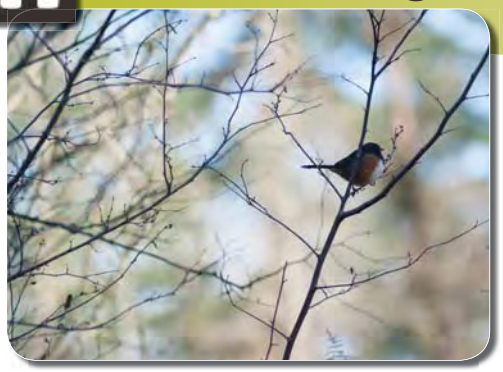
Rank your top 3 activities for the project. Place one dot next to each of your 3 priorities.

1 most important

2 very important

3 important

Wildlife Viewing



Hiking

Art

Being in Nature

Meeting: North Tualatin Mountains Comprehensive Plan
Date/time: May 6th, 2015 6:00-8:00
Place: Skyline School
Purpose: Third public engagement event, review phase 3 of Comprehensive Planning

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Approximately 75 attendees at the event
64 Comment cards were received

- The community even format was generally informal, with brief presentations at 6:30. Dan Moeler introduced the project. He was followed by Counselor Chase, and then Robert Spurlock gave an overview of the information presented on boards around the room.

- Media were given the opportunity for a briefing at 5:15. Jonathan Maus attended

- Overall the message from the Metro project team was that protecting habitat and water quality is our first priority, but access to nature is also important. We believe that we can provide access to these sites while protecting habitat. Three types of trail networks (shared, a mix of shared and separated and all separated) were shown on 3 of the sites. Only hiking trails were proposed for North Abbey Creek.

- Feedback was gathered through surveys (64 total), and through many one on one conversations

- We planned for about 200 people, and had 2 sign tables at the entry, and ?? pies

- Displays included the following Boards from Community Event #1 and 2
    - Project Context
    - Local History
    - Habitat conservation targets (2 boards)
    - Habitat areas
    - project timeline

- Displays included the following new displays
    - What we heard at mtg 2
    - Facilities 1
    - Facilities 2
    - Day use area
    - Restoration projects
    - Restoration projects map
    - Values

- Displays included the following for each of the sites
    - Visitor Experience
    - Trail network concepts

- There was a Naturalist table, where Shielagh had a model of an elk hoof and other cool wildlife stuff

- What we heard:
    - People were generally supportive of the approach to protecting habitat while providing trail access opportunities
    - A group of neighbors that live to the south and west of North Abbey Creek were not supportive of any trail access or day use area at North Abbey Creek site

- Survey results: (still working on this)

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NORTH TUALATIN MOUNTAINS WHAT WE HEARD

Exhibit A to Resolution No 16-4679

At Community Event 2 in December we asked attendees to rank their top 3 activities (most important/very important/ important) for the project. See below for what we heard.

TOP THREE ACTIVITIES

Off-road Cycling

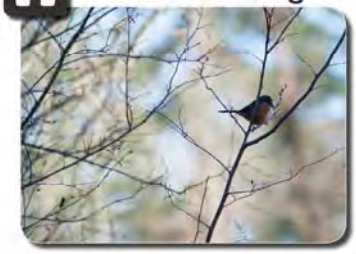
Hiking

Being in Nature

OTHER ACTIVITIES

Trail running

Wildlife Viewing



Conservation Education

Playing

Volunteer Work

Scenic Viewing

Horseback riding

Art

Picnicking

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NORTH TUALATIN MOUNTAINS

VALUES

The North Tualatin Mountains Natural Area preserves valuable habitat, streams and biodiversity corridors between Forest Park and the Coast Range. Protecting habitat and water quality on these sites is Metro's first priority.

Access to nature supports healthy, active outdoor lifestyles and people depend on nature for peace, quiet and renewal. The North Tualatin Mountains are an opportunity for all to share in these benefits.

Metro intends to develop access to these sites in a sensitive and balanced way that ensures healthy habitats and a meaningful experience of nature.

We plan to develop trail access on some, but not all, of the sites. We do not intend to develop all the trails shown.

The trail concepts show examples of trails sytem types and the range of possibilities.

Please fill out the survey and give us your feedback on the types of trails, trail systems and visitor experiences that you like.

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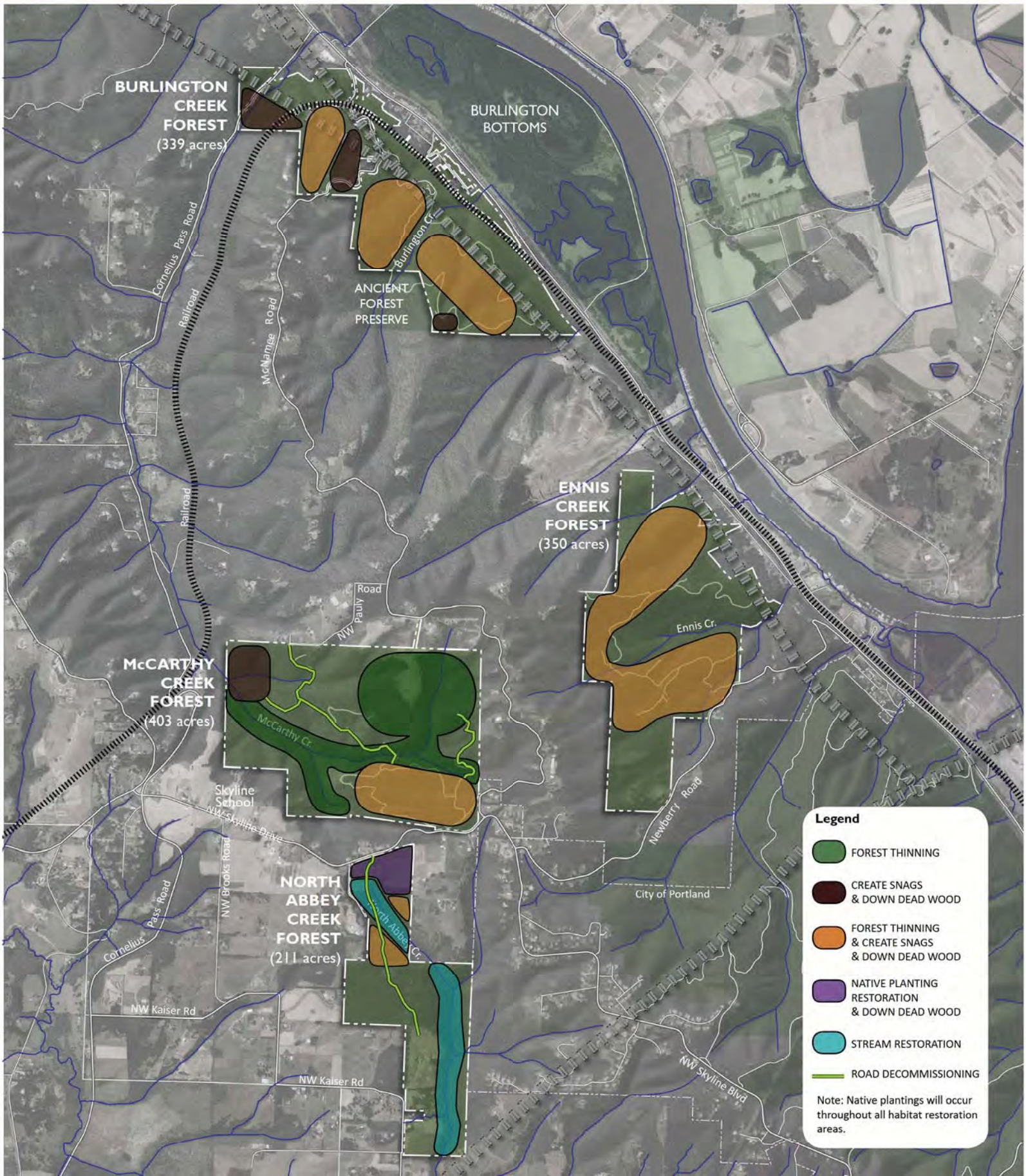
NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

HABITAT RESTORATION



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NORTH TUALATIN MOUNTAINS HABITAT RESTORATION

Exhibit A to Resolution No 16-4679

Forest Thinning

The North Tualatin Mountains natural areas have hundreds of acres of former commercial tree farms dominated by young stands of Douglas fir. Reducing the number of conifers per acre helps keep trees healthy and preserves hardwoods and native shrubs. Large diameter trees are lacking in the North Tualatin Mountains natural areas and are valuable for wildlife and water quality. Thinning accelerates tree growth and makes forests more resilient to disease and wildfire. Many of the trees removed during the thinning will stay on site and provide habitat as down wood.

Create Snags and Down Dead Wood

Standing dead trees (snags) and down wood have been removed by previous property owners through clearcut harvesting or other land uses. Adding them back into the forests by topping trees and dropping and leaving logs on the ground provides wildlife habitat and nutrient storage.

Native Plantings

Hardwoods and shrubs provide valuable food and shelter for many bird species but are often shaded out by fast growing conifers in young forests. Planting after thinning will help jump start the establishment of native shrubs and the creation of a diverse understory.

Stream Restoration

Large conifers and down wood have been removed from many of the North Tualatin riparian areas, resulting in incised (eroded) stream channels and slumping stream banks. Growing big conifers quickly and adding large wood into streams helps improve stream conditions and water quality.

Remove or Replace Culverts

Many culverts in the North Tualatin Mountains natural areas are old and under-sized, blocking wildlife movement and increasing the risk of failure and the amount of sediment into streams, resulting in decreased water quality. Removing or replacing culverts improves water quality and provides better wildlife connectivity.

Road Decommissioning

Old logging roads are a significant source of sediment in streams, which harms water quality and degrades fish habitat. Regrading and revegetating old roads reduce the risk of soil erosion and sediment in streams.

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NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

BURLINGTON CREEK

Burlington Creek Forest is part of the North Tualatin Mountains. This site's steep ridges and valleys were logged about twenty years ago and replanted with Douglas fir. The landscape is generally accessible due to existing logging roads. The southwest corner of the Burlington Creek Forest is adjacent to the Forest Park Conservancy's Ancient Forest Preserve.

HABITAT

Burlington Creek Forest protects an important link in habitat connectivity between Forest Park and coast range forest. This type of upland forest is especially important to migrating and nesting songbirds, woodpeckers, mammals such as Douglas squirrel and deer, and seasonal habitat for salamanders, frogs and turtles. Shrub dominated communities along the powerline corridor provide food and cover for neotropical migrant songbirds and create habitat for a variety of pollinator species.

TRAIL EXPERIENCE

Trails in Burlington Creek Forest would explore the ridges and valleys of the site. Burlington Creek Forest offers a great setting for a day hike or family picnic. Glimpses of a wooden railroad trestle recall the area's timber and railroad history. The Pacific Greenway Trail, a potential future regional trail connection, might someday connect coast range trails and Forest Park through the site. The Ancient Forest Preserve, managed by the Forest Park Conservancy would also be accessed from Burlington's day use area.

VIEWPOINTS

A power transmission corridor traverses the site, providing a clearing in the forest canopy. The trail crosses the corridor in several places, allowing visitors openings in the trees to see views of Sauvie Island and on a clear day several Cascade peaks.

ENTRANCE/DAY USE AREA

The primary access to this site is via McNamee Road, which requires safety improvements in order to accommodate a public entrance and day use area. A day use area could provide a small parking area, shelter and restrooms.

EDUCATION OPPORTUNITIES

Burlington Creek Forest and the Ancient Forest Preserve provide a delightful setting in the trees, and a dynamic place to observe a variety of forest ages, and learn about restoration and healthy forest habitat. Views of Sauvie Island and Columbia River provide a first hand observation of the region's geography.

Exhibit A to Resolution No 16-4679

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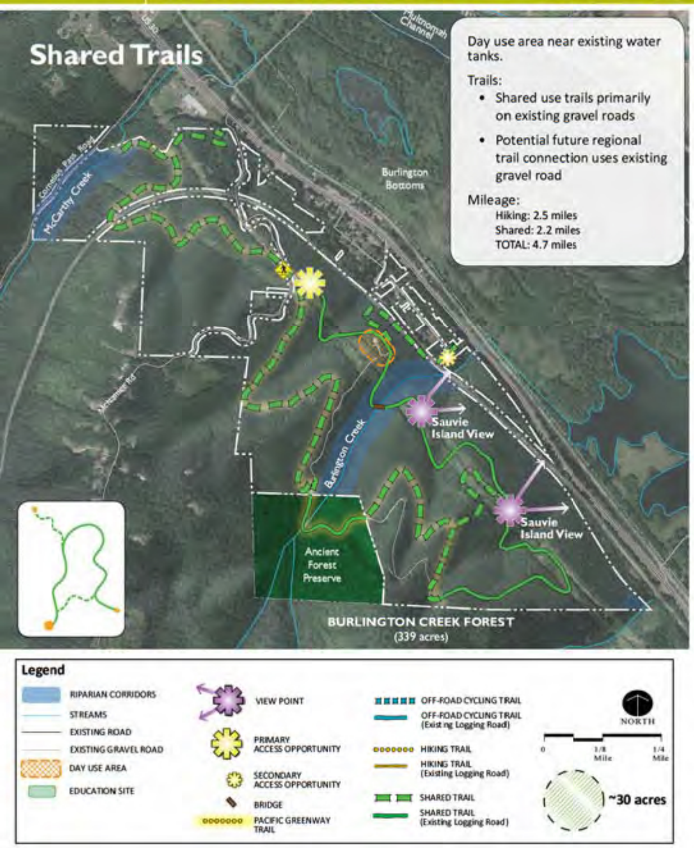
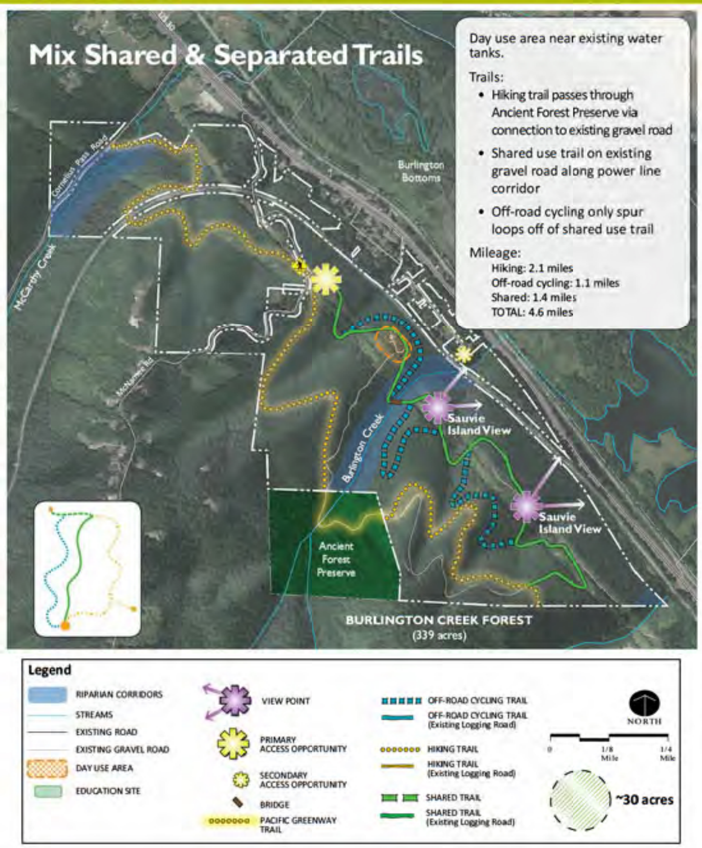
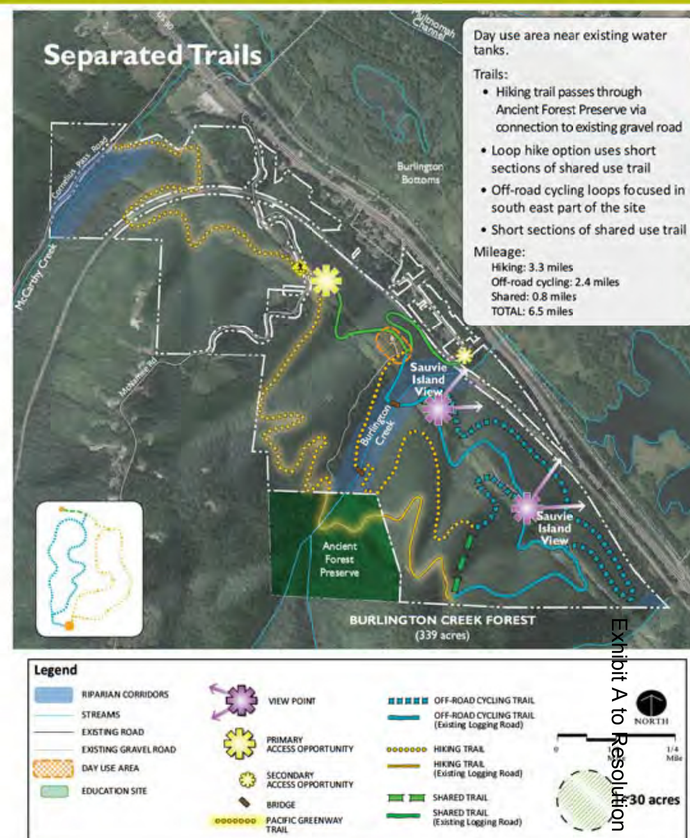
NORTH TUALATIN MOUNTAINS
BURLINGTON CREEK







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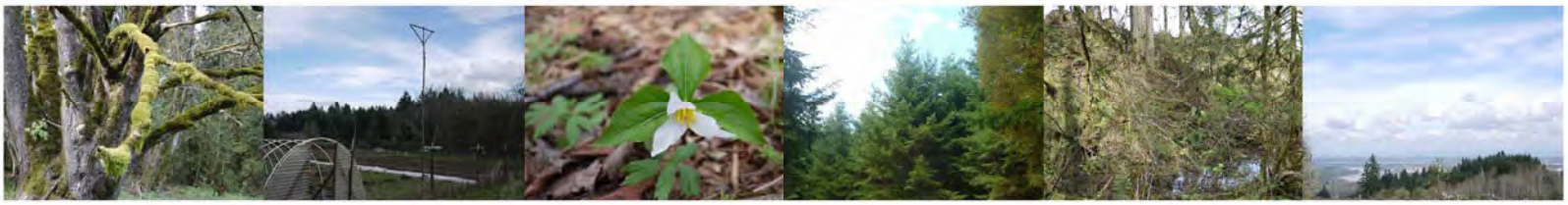
NORTH TUALATIN MOUNTAINS

ENNIS CREEK



Instead of alternating steep ridges and valleys that are typical of the Tualatin Mountains, the north and south forks of Ennis Creek flow through more gentle topography. Forested wetlands provide habitat for amphibians, like red-legged frogs, a local celebrity species that plays an important ecological role. This site also has a rich agricultural history and includes an active small farm.

HABITAT

Like Burlington to the north, Ennis Creek Forest protects an important link in habitat connectivity between Forest Park and coast range forest. Habitat corridors like this one support local species biodiversity. Ennis Creek's Forested wetlands provide habitat for red-legged frogs. Elk can sometimes be seen moving through the power line corridor or grazing in that areas that remain open from past agricultural operations.

TRAIL EXPERIENCE

Gentle sloping trails would allow visitors to meander through second growth forests. Boardwalks and footbridges help protect habitat while inviting visitors to learn about Ennis Creek's plants, mammals, birds, and amphibians. At the edge of a small clearing there might be a sunny spot to picnic and the possibility of seeing elk graze. In the future, the Pacific Greenway Trail may provide a regional trail connection between coast range trails and Forest Park.

VIEWPOINTS

A trail climbs to a ridge-top vista of Sauvie Island and the Columbia River. On a clear day, the backdrop includes several Cascade peaks.

ENTRANCE/DAY USE AREA

An access point off of Newberry Road provides the best opportunity for a day use area at the site. It is currently developed as a home site and the area has been in agricultural use for decades. In the future, visitors could be greeted by a small parking lot nested between the forest edge and farmstead site. The day use area could provide restrooms, picnicking, and a short nature trail with opportunities to learn about the site's history and habitat.

EDUCATION OPPORTUNITIES

Educational opportunities are abundant in Ennis Creek Forest. The forest provides a good home for red-legged frogs. Views of Sauvie Island and Columbia River are an opportunity to observe the region's geography first hand. The site's agricultural history offers many opportunities for connecting with and learning about nature and history.

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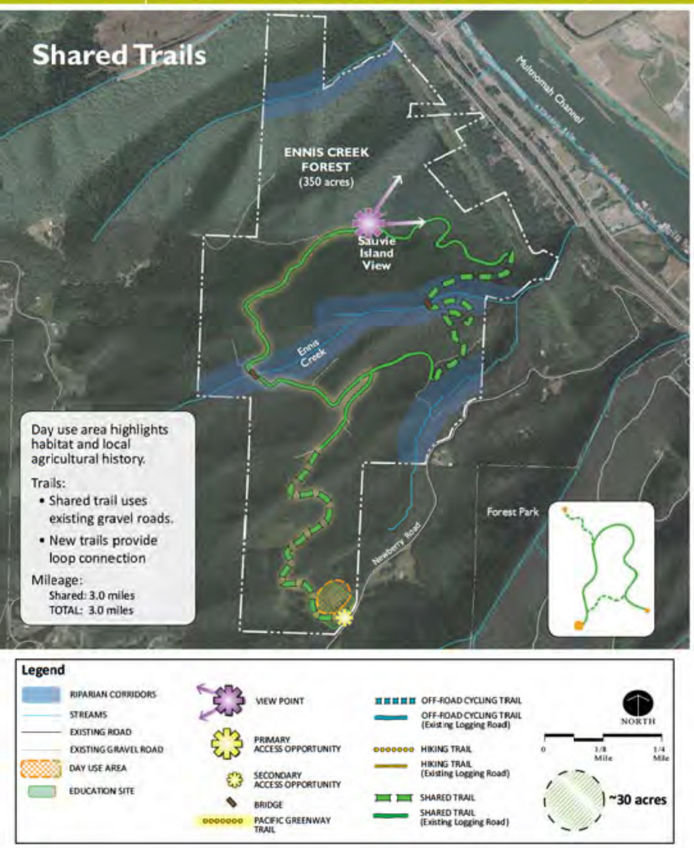
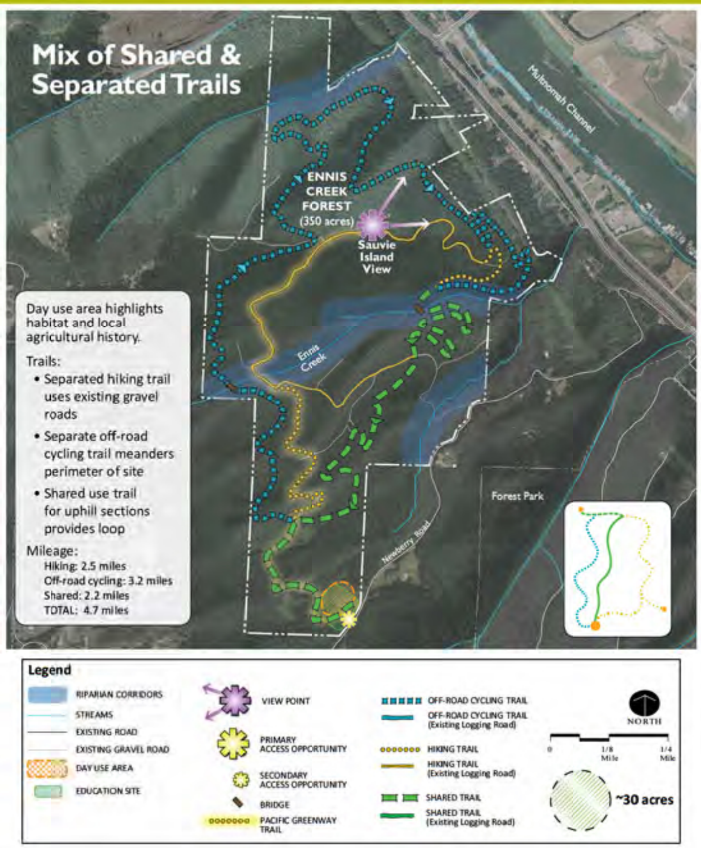
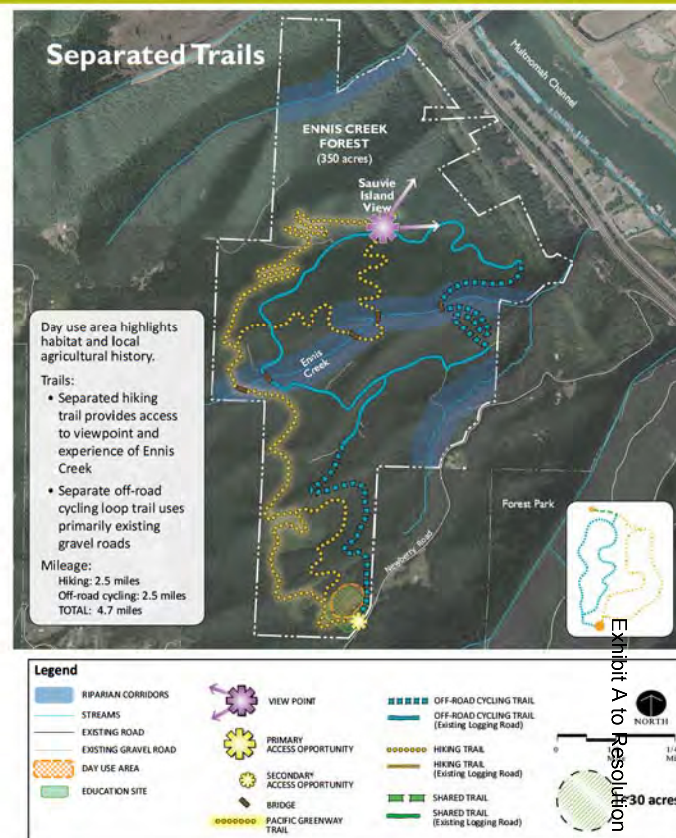
NORTH TUALATIN MOUNTAINS

ENNIS CREEK







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NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

MCCARTHY CREEK

McCarthy Creek Forest is part of the Tualatin Mountains, the ridge which extends from the coast range along the Columbia River and separates the Columbia/Willamette floodplain from the Tualatin Valley. The Tualatin Mountains are characterized by steep ridges and valleys dominated by upland and riparian forest. McCarthy Creek flows west then north, through the Tualatin Mountains ridge via Cornelius Pass before emptying into the Multnomah Channel.

HABITAT

Riparian forests protect water quality and provide important habitat near the headwaters of McCarthy Creek. Older forests provide diverse canopy along the stream. The upland forest is composed primarily of second growth Douglas fir, big-leaf maple, Oregon grape, salal and sword fern. Upland forests are especially important to migrating and nesting songbirds, woodpeckers, mammals such as Douglas squirrel and elk, and seasonal habitat for salamanders, frogs and turtles.

TRAIL EXPERIENCE

The varied topography of the site offers opportunities for a variety of family friendly trail experiences. There is an opportunity for a gently graded trail that culminates in a beautiful vista across the Tualatin Valley. For off-road cycling, there might be a choice of descending routes with varying levels of challenge. For hiking, a loop trail could explore McCarthy Creek's valley.

VIEWPOINTS

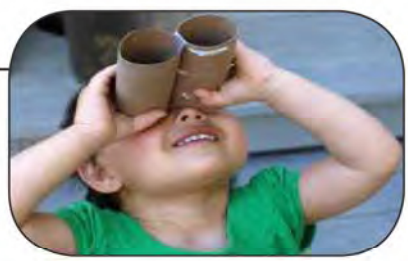
The Tualatin Valley View offers a unique vantage point across Hillsboro and Cornelius to Chehalem Ridge and the Coast Range. This vista provides a good vantage point from which to experience how the site fits into the region's geography. The McCarthy Creek View offers a perspective of the creek's valley as it curves toward the north on it's way to Multnomah Channel.

ENTRANCE/DAY USE AREA

An access point off of Skyline Drive offers an opportunity for a day use area at the southern end of the site. A day use area at this location could include a small parking lot, shelter and restrooms.

EDUCATION OPPORTUNITIES

Stories of the local area include early settlers' kids walking to school along a route which crossed the valley, led down to McCarthy Creek and back up to Skyline School. For Skyline School students, this could be an opportunity to connect kids to nature and the local history of the community. Volunteer stewardship opportunities could focus on improving the forest understory, and monitoring trails to ensure they are well maintained and used properly.



MAKING A GREAT PLACE
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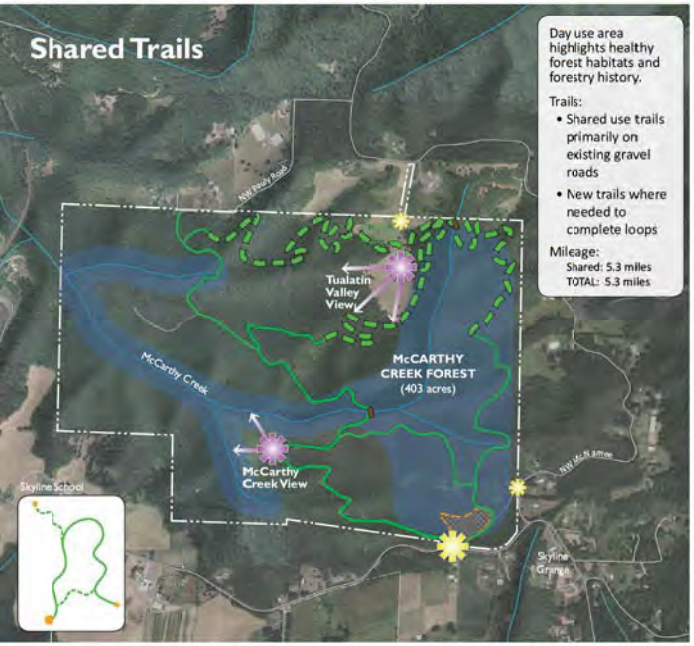
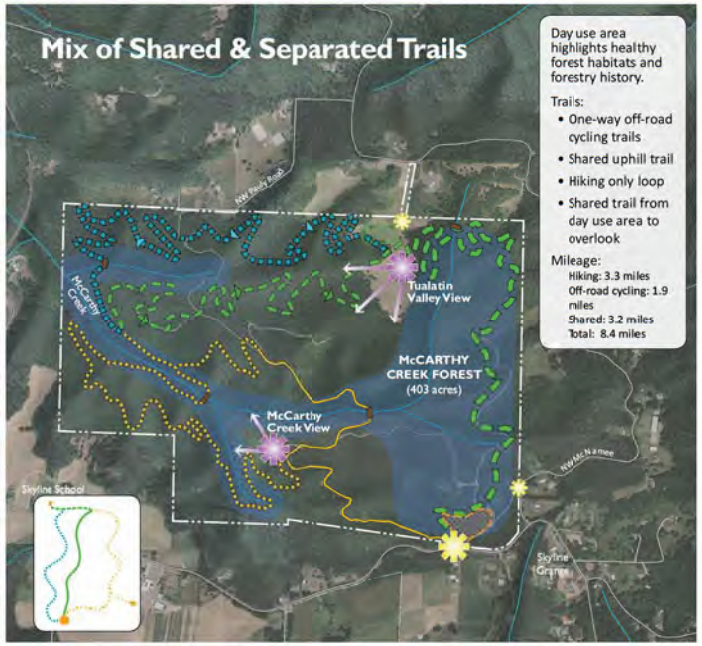
NORTH TUALATIN MOUNTAINS
MCCARTHY CREEK





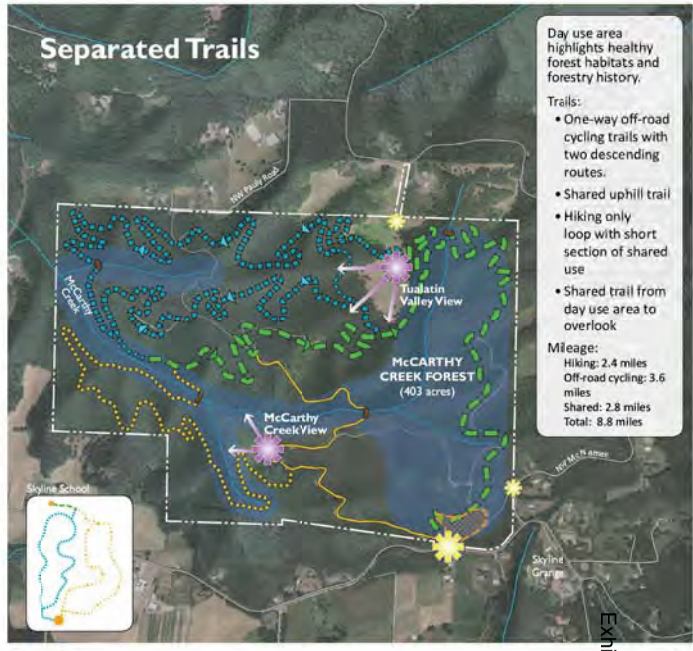


Exhibit A to Resolution No 16-4679

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NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

NORTH ABBEY CREEK

At the north boundary of the site, Skyline Ridge defines the edge of the Tualatin River watershed. North Abbey Creek Forest is the only North Tualatin Mountains site that is in the Tualatin River watershed. The site includes the headwaters of North Abbey Creek. Its forest is older and more diverse, with big leaf maple, Douglas fir and a diverse understory. Large open areas offer elk habitat, opportunities for early successional pollinator habitat, and a unique bird watching experience. The site offers a potential opportunity for a future regional trail connection to the Waterhouse Trail (to the south).

HABITAT

Native shrub dominated restoration areas provide pollinator habitat, and food and cover for neotropical migrant songbirds. Riparian forests protect water quality and provide important habitat near the headwaters of North Abbey Creek, a tributary of the Tualatin River. Tributary creeks and confluence areas provide clean and cold water, nutrients and refuge areas for many important local species.

TRAIL EXPERIENCE

North Abbey Creek offers an opportunity for a narrow trail to meander through pollinator habitat, descend into the forest, and follow an old logging road grade above North Abbey Creek. Stop here to listen for varied thrush or black headed grosbeak. Look for some of your favorite understory plants, waterleaf, trillium or fringe cup. How many different ferns can you find? This trail opportunity offers the potential for a future connection to the Waterhouse Trail in Washington County.

VIEWPOINTS

The open areas offer views out across the west hills looking east and south. Views include pastoral landscapes and nearby hills.

ENTRANCE/DAY USE AREA

The south access offers opportunities to support education and volunteer programs. A small day use area at the north end of the site could provide a unique bird watching experience or an opportunity to walk along a short trail through the woods.

EDUCATION OPPORTUNITIES

Local schools' field trips can focus on birds, pollinators, frogs, stream ecology, or wildlife tracking. Metro's recent educational partnerships with Self Enhancement Inc, an organization supporting at-risk urban youth, and Trackers Earth, which promotes outdoor leadership and nature education for all ages, have focused on North Abbey Creek.

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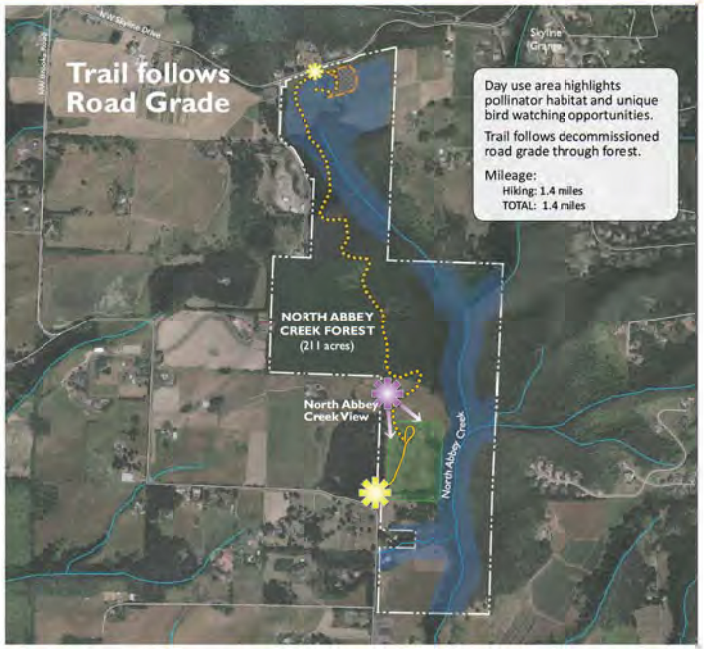
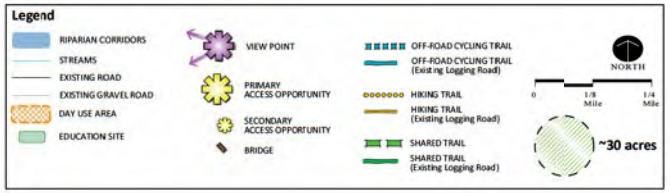
NORTH TUALATIN MOUNTAINS

NORTH ABBEY CREEK





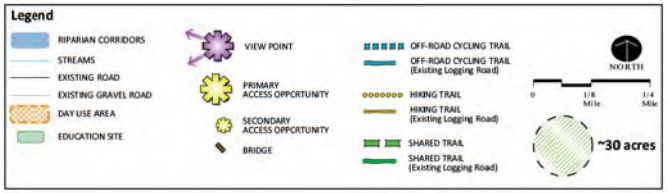


Exhibit A to Resolution No 16-4679

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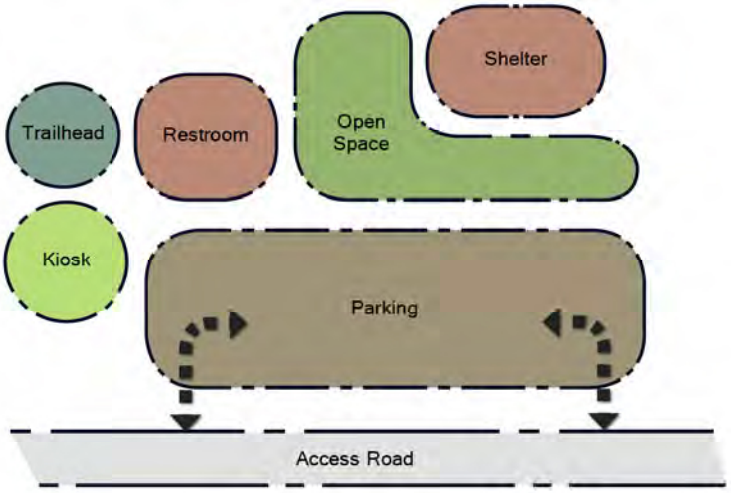
NORTH TUALATIN MOUNTAINS DAY USE AREA

Exhibit A to Resolution No 16-4679

Shelters

Trailheads

Schematic



Parking Lots

Restrooms

Birding Features

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NORTH TUALATIN MOUNTAINS FACILITIES

Exhibit A to Resolution No 16-4679

Bridges

Overlooks

Boardwalks

Resting Places

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NORTH TUALATIN MOUNTAINS FACILITIES

Trails

Trail Types

Shared

Designed to minimize user conflicts

- Long sight lines ensure both hikers and off-road cyclists are aware of each other.
- Trail design can slow cyclists down often with choke points, obstacles and turns
- Wide spots allow passing

Hiking

Designed to maximize hiking experience

- Offer more direct connection to viewpoints and other destinations
- Opportunities for nature trails and interpretation
- Grades can be steeper for hikers

Off-Road Cycling

Optimized for off-road cycling

- Many curves and turns
- Varied topography with alternating ascent and decent
- Offer a variety of challenge levels
- Trails will be family friendly

Metro | *Meeting minutes*

Meeting: North Tualatin Mountains Comprehensive Plan
Date/time: November 16th and 17th, 2015 5:30-7:30
Place: Skyline Grange Hall
Purpose: Second public engagement event, review phase 2 of Comprehensive Planning

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Approximately 200 attendees attended two back-to-back community events and shared the comments below. Another 29 people filled out an online comment form.

- Increased traffic
- Mt. biking trails fragmenting habitat
- Too many trails, maintain/protect wildlife connectivity
- Too much recreation, not enough wildlife protection
- Already enough trails
- Would like a safe place to ride horses close to the city, other than Tryon Creek State Park
- Parking for horse trailer
- Have someone from equestrian community be a part of the stakeholder advisory committee in the future
- Horse trails and parking in the developed areas of the plans
- Bike trails are too close to the ancient forest in the Burlington Creek area, bikers may not follow rules
- Respect and understand the wisdom of residents
- Nature over recreation
- Mountain bikers have a commercial interests (from a neighbor)
- Good job of informing neighbors of public meetings
- Recreation with the smallest impact possible
- Mountain bikes are not compatible with wildlife, equestrians and hikers are more so
- Portland area is severely lacking in off road cycling access
- Cyclists are villainized by other nature enthusiasts. Mountain bikers are experienced stewards of open spaces. We all want the similar ends.
- I voted to protect wildlife and land, not to turn into parks for the city
- These plans do not live up to the bond measure. Wildlife first.
- Ensure wildlife is not impacted through preservation
- Limit trail development
- Hikers only
- Show trail plans sooner
- Providing off road cycling trails near the city would reduce hundreds of long distance car trips every week.
- Trail separation would be better for mountain bikers and hikers
- Would like to see more miles of bike only trails – off road cyclists will continue to drive long distances to “real trail networks”

- Mountain bike users are trail builders, nature lovers, athletes and responsible people who just want to experience our natural resources just like any other users.
- Less trail intersections and longer sections of trail would make them more user friendly
- A 15 mile loop with three entry points, but none of those should be within this zone.
- Off-road cyclists care about the environment they ride in.
- People need to experience nature to appreciate it.
- Forest Park has enough trails and there are new trails in Vernonia. Mountain bikers should earn their right to go back to Forest Park and use the trail already in place.
- How will these trails be treated differently than the mis-used trails at Forest Park?
- I want legal single track mountain bike trails.
- Parking access areas look too small in volume of parking
- Excited to play outside as a family in our neighborhood
- I want to walk and bicycle in the North Tualatin Mountains.
- How does this plan connect to the regional trail system?
- Bikers and hikers conflict with elk calving
- Consider the maintenance of roads proposed to be used for access to trails.
- Could improve the process by having planning meetings in Portland
- Listen to science, not just NIMBY
- Maximize “bad” land by roads/rail to increase trail mileage
- Clear signage and maps along the entries and trails so users know which type of activity is allowed.
- Interpretive signage will help encourage people to protect what’s there.
- These metro properties provide a clean slate for sustainable trail design and evaluation for impact on nature without historic political baggage.
- Allow NWTA to build the trails so they will be built with a strong knowledge of sustainability and trail erosion protection
- Make meetings closer Portland
- Boot brush station at trail heads
- Create a bike trail park north of Cornelius Pass Rd.
- Conservation Bond is being used to build a parking lot
- Add more “challenge” to the type if mountain bike trails
- Create a forum for online comments to engage people that cannot attend meetings
- All metro residents to be able to experience mountain biking since we all pay taxes
- A legal trail would be nice
- How does having horses maintain water quality? What about waste?
- Create more multiuse trails
- Seasonal closures of impending trails would satisfy wildlife needs and demands of trail use
- Avid riders would love to lead a group of skeptical folks to show that mountain biking can be safe, fun and friendly to all ages
- Consider “one way” trails to avoid conflicts
- Trails will bring unwanted traffic and upset neighbors
- Traffic will be hazardous to existing roads and dangerous for bikers
- Creating trails closer to Portland creates access to nature for low income families who cannot afford to drive all the way to Bend for recreation

- Concern that metro is not fulfilling it's obligation under measure no. 26-80 to protect wildlife. Some of the public land is being put to harm wildlife.
- Volunteers for trail work would be easy to find
- The trails proposed would be too short to support a good mountain biking experience.
- Creation of Mountain bike trails would exclude hikers based on safety issues & uses taxpayer dollars to appease special interest group.
- Designs at current trailheads. Use QR codes
- Conservation and mountain biking can co exist. They are not mutually exclusive
- Just as Bybee, Smith and Oxbow have educational opportunities, so should this project. Connecting students with native habitat/ restoration is ideal
- Metro has done a great job listening to the community
- What funds will be used to maintain, repair and patrol the trails in years to come?
- Secondary service provides fire, medical, police and road maintenance- RR trestle improvement. How will these be addressed?
- Staggered rollout (focus on one area first) is good
- This is a limited scope and does not satisfy the needs of the cycling community by limiting to two sites then limiting those sites leaves everyone unsatisfied.
- Both times, upon arrival it wasn't clear what I was looking at.T he organizers are helpful in explaining but I find its not intuitive.
- Make meeting times user friendly. NOT in the middle of the week
- How does metro acquire land anyway?
- Have meetings closer to downtown
- Horses destroy trails, like in the Wallowas
- Protection of natural areas does not include mountain bike trails or horses
- Like the idea of proposed closures during key periods for wildlife
- Consult specialists, professionals and biologists on the impact before any planning
- There was mention of "stakeholders." – seems we all are
- Metros policy of "no dogs" in natural areas is great
- Trimet access to the trailhead
- Bike paths to trails with smaller parking lots and secure bike storage at hiking trail heads would be great
- High fees for car parking
- Dog friendly hiking areas would be ideal
- A wildlife corridor must be established to link forest park with the coastal mountain range to preserve the diverse gene pool of wildlife
- I am confused by the limit metro has placed on developing of access to there public spaces
- The proposed plan does not provide meaningful ways to experience nature
- Do not show trails in areas and then remove them
- Think bigger! We need a comprehensive trail network & greater access to nature & transportation options that don't involve cars
- Plan a dirt trail to the coast
- Plan carefully because once activity is institutionalized, it's impossible to change it back

- Provide published scientific papers on the website in advance of the meetings so the audience can be educated about the basic ecological, social, geographic tenets by which the system will be designed
- Monitor which trails are being used by horses to study impact
- Be sure to design trails to follow hillside contours and for bike trails, slight vertical alignment changes to encourage water runoff & naturally slow bikes
- This has been a great public involvement process. I look forward to helping build and maintain these trails
- Human access and development should be limited to existing logging roads
- Metro did a bait and switch and is not honoring the 2006 bond that we all voted for-No new trails
- Entrance to corridor is 12 feet from my front door. I don't want activity at my front door
- The lands were better off privately owned. They existed better in nature that way
- There are already too many trails at Burlington Creek
- McCarthy Creek Trails will disturb elk calving areas
- We do not want the North Tualatin Mountains turned into an adventure park
- Metro should do a scientific study on the elk and other wildlife prior to planning recreation areas
- Mountain bikes and wildlife are not compatible
- This plan creates fragmentation
- This land will provide vital recreational access to a growing community

Displays included the following boards

- Project Overview
- History
- Habitat Types
- Conservation
- Restoration Work
- What we've heard
- Conservation Principles
- Design Strategies
- Recommended Alternative
- Burlington Creek
- Burlington Entry
- McCArthy Creek
- McCarthy Entry
- Trail Design
- Next Steps

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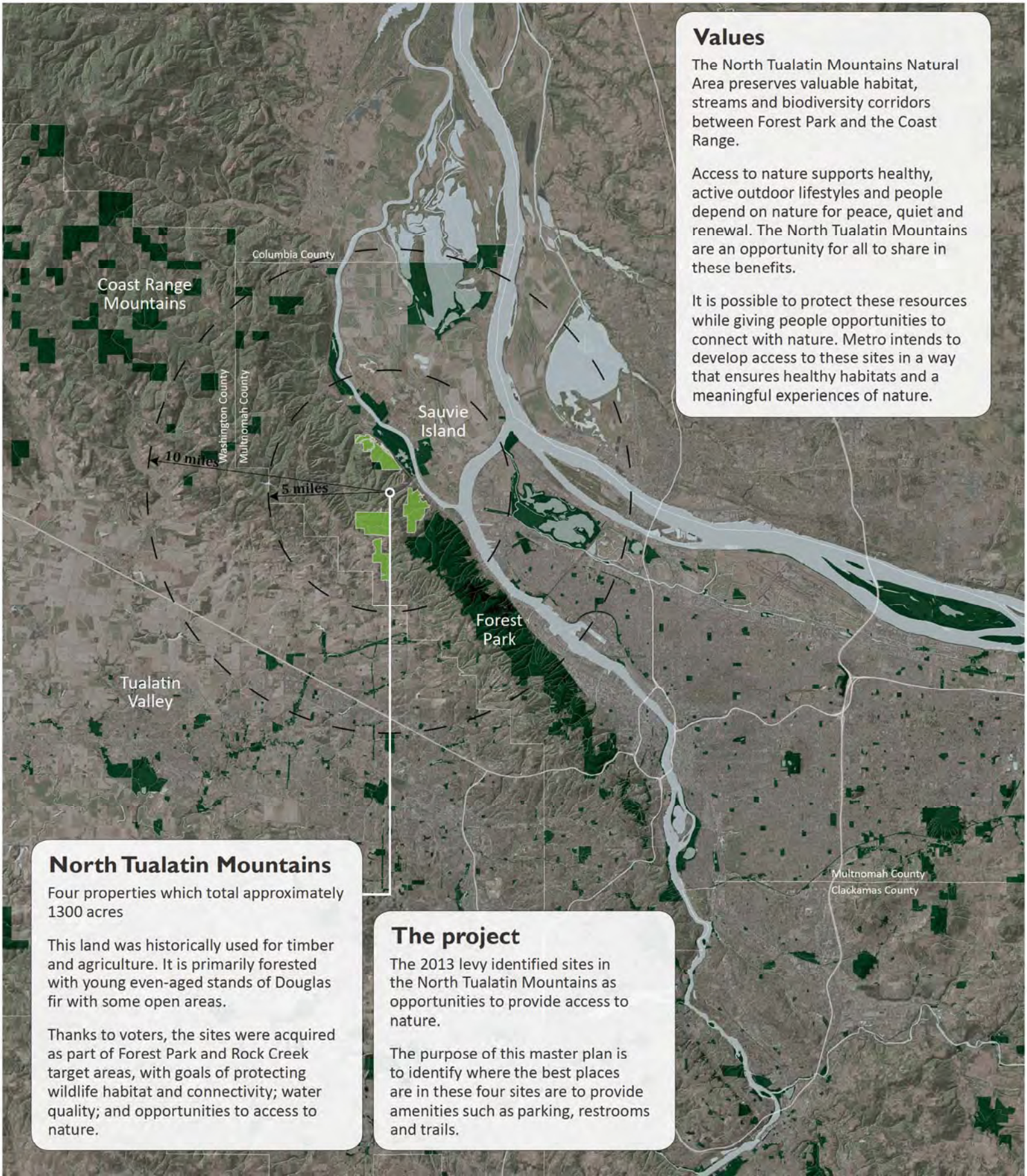
NORTH TUALATIN MOUNTAINS PROJECT OVERVIEW

Exhibit A to Resolution No 16-4679



Values

The North Tualatin Mountains Natural Area preserves valuable habitat, streams and biodiversity corridors between Forest Park and the Coast Range.

Access to nature supports healthy, active outdoor lifestyles and people depend on nature for peace, quiet and renewal. The North Tualatin Mountains are an opportunity for all to share in these benefits.

It is possible to protect these resources while giving people opportunities to connect with nature. Metro intends to develop access to these sites in a way that ensures healthy habitats and a meaningful experiences of nature.

North Tualatin Mountains

Four properties which total approximately 1300 acres

This land was historically used for timber and agriculture. It is primarily forested with young even-aged stands of Douglas fir with some open areas.

Thanks to voters, the sites were acquired as part of Forest Park and Rock Creek target areas, with goals of protecting wildlife habitat and connectivity; water quality; and opportunities to access to nature.

The project

The 2013 levy identified sites in the North Tualatin Mountains as opportunities to provide access to nature.

The purpose of this master plan is to identify where the best places are in these four sites are to provide amenities such as parking, restrooms and trails.

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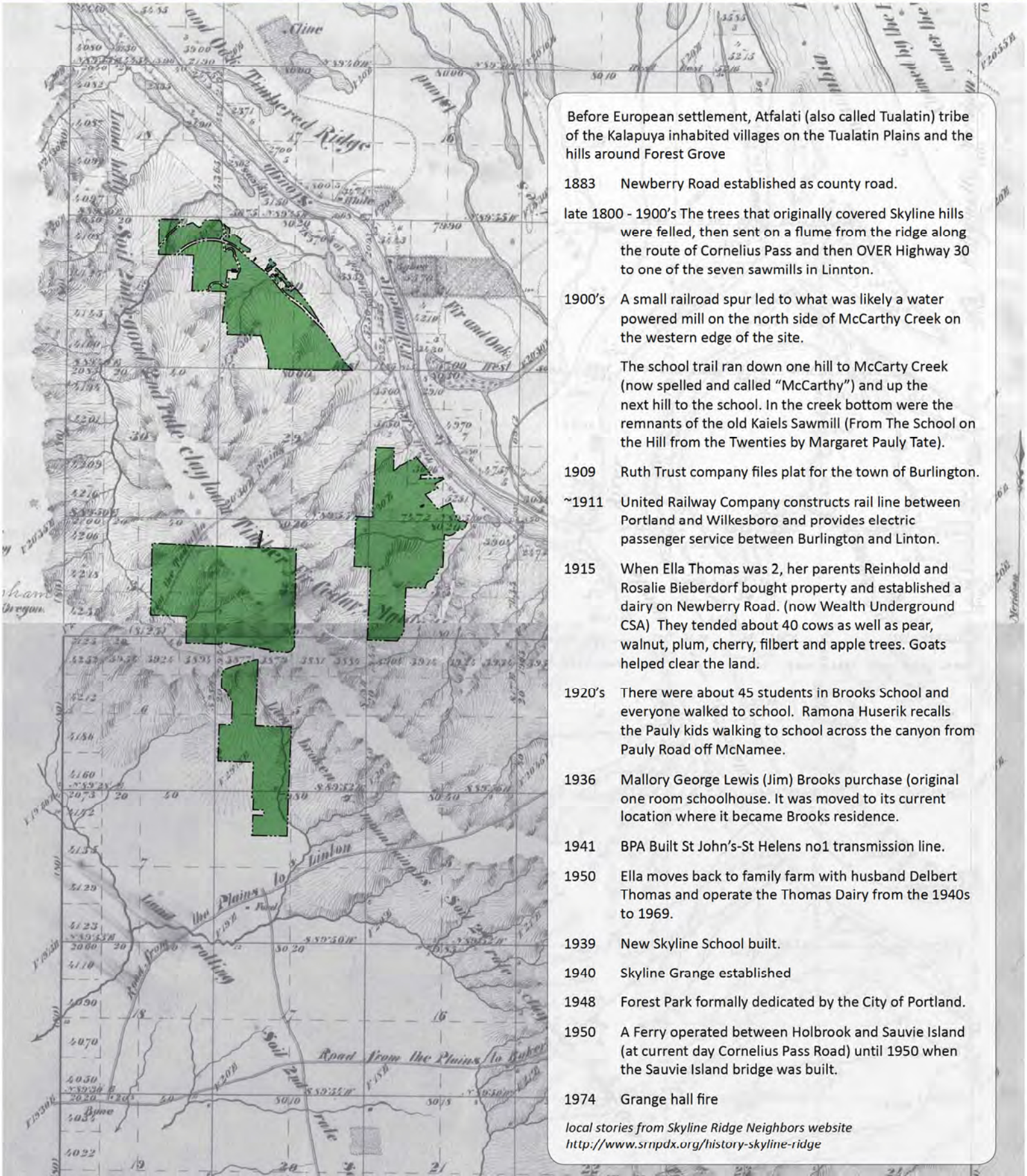
NORTH TUALATIN MOUNTAINS

HISTORY



Before European settlement, Atfalati (also called Tualatin) tribe of the Kalapuya inhabited villages on the Tualatin Plains and the hills around Forest Grove

1883 Newberry Road established as county road.

late 1800 - 1900's The trees that originally covered Skyline hills were felled, then sent on a flume from the ridge along the route of Cornelius Pass and then OVER Highway 30 to one of the seven sawmills in Linnton.

1900's A small railroad spur led to what was likely a water powered mill on the north side of McCarthy Creek on the western edge of the site.

The school trail ran down one hill to McCarty Creek (now spelled and called "McCarthy") and up the next hill to the school. In the creek bottom were the remnants of the old Kaiels Sawmill (From The School on the Hill from the Twenties by Margaret Pauly Tate).

1909 Ruth Trust company files plat for the town of Burlington.

~1911 United Railway Company constructs rail line between Portland and Wilkesboro and provides electric passenger service between Burlington and Linton.

1915 When Ella Thomas was 2, her parents Reinhold and Rosalie Bieberdorf bought property and established a dairy on Newberry Road. (now Wealth Underground CSA) They tended about 40 cows as well as pear, walnut, plum, cherry, filbert and apple trees. Goats helped clear the land.

1920's There were about 45 students in Brooks School and everyone walked to school. Ramona Huserik recalls the Pauly kids walking to school across the canyon from Pauly Road off McNamee.

1936 Mallory George Lewis (Jim) Brooks purchase (original one room schoolhouse. It was moved to its current location where it became Brooks residence.

1941 BPA Built St John's-St Helens no1 transmission line.

1950 Ella moves back to family farm with husband Delbert Thomas and operate the Thomas Dairy from the 1940s to 1969.

1939 New Skyline School built.

1940 Skyline Grange established

1948 Forest Park formally dedicated by the City of Portland.

1950 A Ferry operated between Holbrook and Sauvie Island (at current day Cornelius Pass Road) until 1950 when the Sauvie Island bridge was built.

1974 Grange hall fire

local stories from Skyline Ridge Neighbors website
http://www.snpdx.org/history-skyline-ridge

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NORTH TUALATIN MOUNTAINS HABITAT TYPES

Exhibit A to Resolution No 16-4679

Riparian Forest

Riparian forests protect water quality and provide important habitat near the headwaters of Burlington, Ennis, and McCarthy Creeks, which flow into the Multnomah Channel, and North Abbey C`reek, a tributary of the Tualatin River

Tributary creeks and confluence areas provide clean and cold water, nutrients and refuge areas for important fish species.

Upland Forest

Upland forest is composed primarily of native trees and shrubs such as Douglas fir, big-leaf maple, Oregon grape, salal and sword fern.

Especially important to migrating and nesting songbirds, woodpeckers, mammals such as Douglas squirrel and deer, and seasonal habitat for salamanders, frogs and turtles.

Urbanization has fragmented and reduced the amount of upland forest habitat.

Upland Early Successional Shrub

Shrub dominated communities provide food and cover for neotropical migrant songbirds and create habitat for a variety of pollinator species.

Small scale agricultural sites, recently logged areas, and utility clearings are opportunities to manage for early successional upland forest shrubs.

Oak Savanna

Oak savanna harbors many unique plant and animal species. Once common, it is now rare in our region.

Shrub Wetland

Shrub wetlands are important to many at-risk species and provide invertebrate food for songbirds and other animals.

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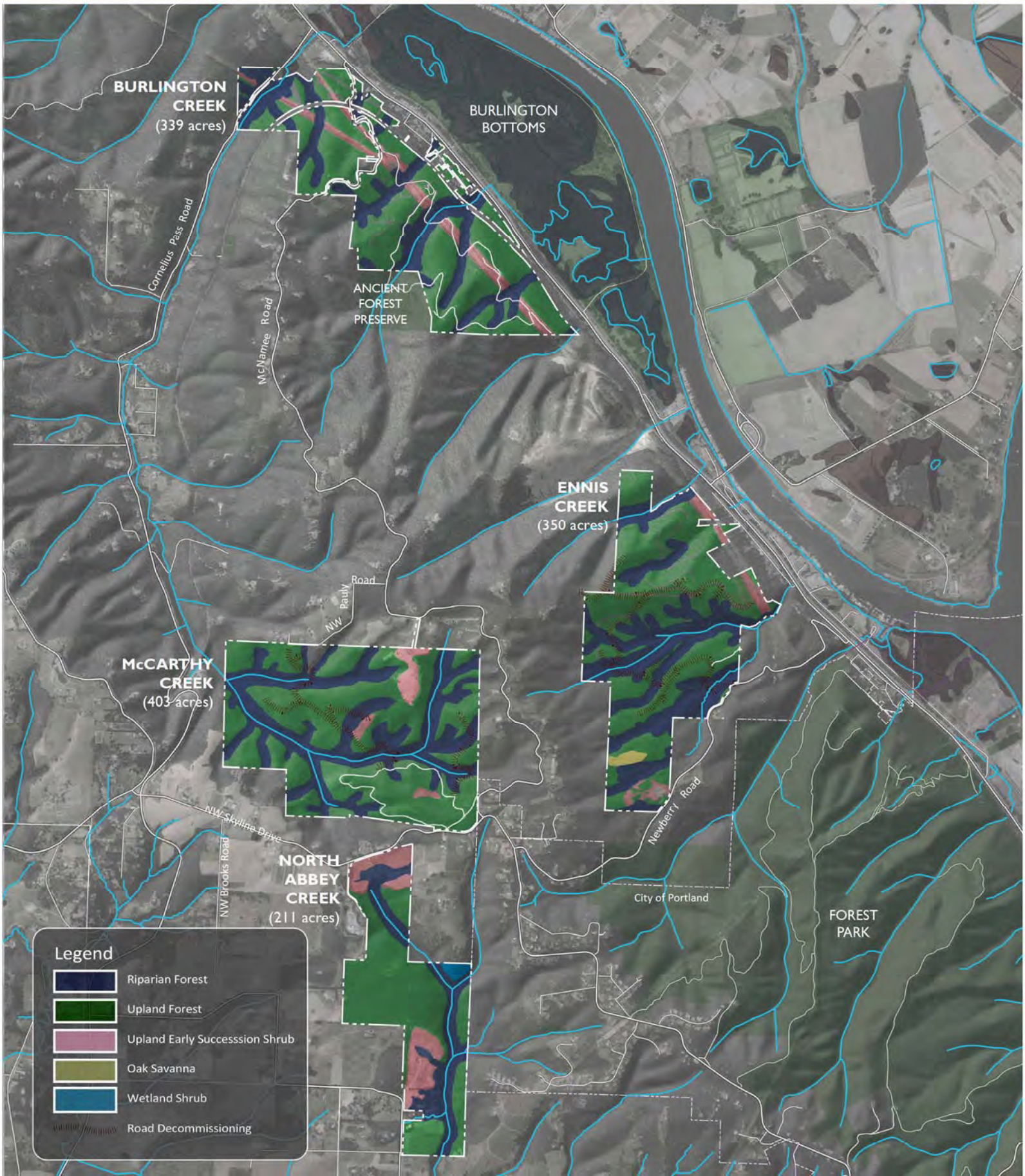
NORTH TUALATIN MOUNTAINS CONSERVATION

Exhibit A to Resolution No 16-4679



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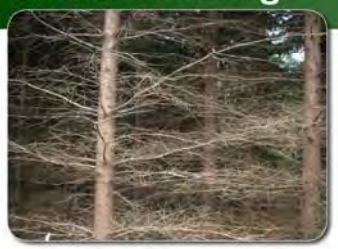
NORTH TUALATIN MOUNTAINS RESTORATION WORK

Exhibit A to Resolution No 16-4679

Forest Thinning



The North Tualatin Mountains natural areas have hundreds of acres of former commercial tree farms dominated by young stands of Douglas fir. Reducing the number of conifers per acre helps keep trees healthy and preserves hardwoods and native shrubs. Large diameter trees are lacking in the North Tualatin Mountains natural areas and are valuable for wildlife and water quality. Thinning accelerates tree growth and makes forests more resilient to disease and wildfire. Many of the trees removed during thinning stay on site and provide habitat as down wood.

Thinning has begun at North Abbey and McCarthy Creek. Forests. Burlington and Ennis will be thinned over the next year.

Create Snags and Down Dead Wood

Standing dead trees (snags) and down wood have been removed by previous property owners through clearcut harvesting or other land uses. Adding them back into the forests by topping trees and dropping and leaving logs on the ground provides wildlife habitat and nutrient storage.

At Burlington, Ennis, McCarthy and North Abbey, Metro is developing key wildlife habitat like snags and down dead wood.

Native Plantings

Hardwoods and shrubs provide valuable food and shelter for many bird species but are often shaded out by fast growing conifers in young forests. Planting after thinning will help jump start the establishment of native shrubs and the creation of a diverse understory.

At all four sites, forest thinning will help to retain hardwood trees, create "breathing room" for native shrubs to grow, provide more diverse habitat, and make forests more resilient to disease and wildfire..

Stream Restoration

Large conifers and down wood have been removed from many of the North Tualatin riparian areas, resulting in incised (eroded) stream channels and slumping stream banks. Growing big conifers quickly and adding large wood into streams helps improve stream conditions and water quality.

Metro is actively working on stream restoration at North Abbey Creek. We recently placed 16 downed wood logjams along the creak to help curb stream erosion.

Decommission Roads and Remove / Replace Culverts

Metro will decommissioning unneeded roads and remove or replace undersized and failing culverts.

Old logging roads are a significant source of sediment in streams, which harms water quality and degrades fish habitat. Regrading and revegetating old roads reduce the risk of soil erosion and sediment in streams.

Many culverts in the North Tualatin Mountains natural areas are old and under-sized, blocking wildlife movement and increasing the risk of failure and the amount of sediment into streams, resulting in decreased water quality. Removing or replacing culverts improves water quality and provides better wildlife connectivity.

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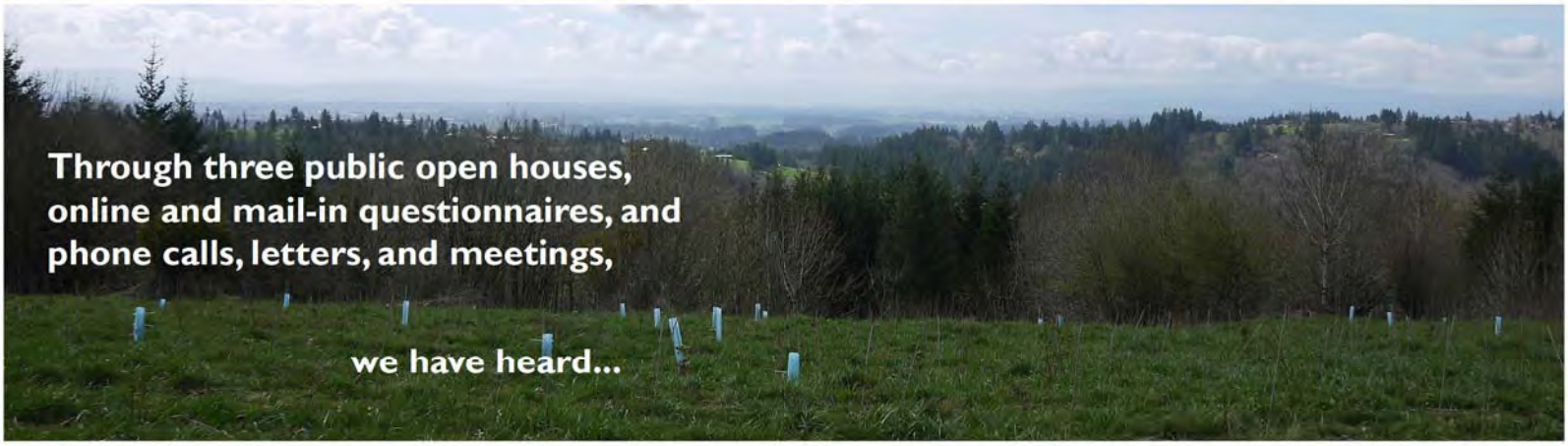
NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

WHAT WE'VE HEARD



Protect open space

- You value that there are large areas of protected open space so close to the city
- Balance conservation with recreation, accommodate ecological function and human use
- Protect wildlife habitat and water quality
- Protect elk habitat

Access to nature close to home

- Opportunities to access close-in "wilderness"
- Ride to ride opportunities

Protect wildlife and water quality

- You value elk, red-legged frogs, and other wildlife in the North Tualatin Mountains
- Concern that activities will impact wildlife habitat
- We should be thoughtful about where and how much access we provide
- Please use best practices to build trails that don't impact water quality
- Avoid wetlands and frog habitat

Type and amount of access is important

- We've heard concern that activities will impact wildlife habitat
- Consider carrying capacities
- We have heard from some that only very limited access should be provided to the sites
- We've heard from some who don't think off-road cycling is appropriate here

Excitement for opportunities to be in nature

- Without having to drive too far outside of the city
- Desire to experience the sites by hiking, off-road cycling, or horseback riding
- Desire to be in nature
- Interest in wildlife viewing, scenic viewing, and opportunities to learn about nature, and volunteer

Trail design

- Preference for trails that are separate for different types of uses, or a mix of shared and separated trails.
- We heard that Loop trails are preferred to out and back trails
- Use existing road networks for access, where possible
- Use best practices in trail design like cross-slope and rolling grades to move water off the trail

Trail management

- We have heard concern about conflicts between different trail uses, and that trails need to be designed specifically for their specific uses

Other amenities

- Provide designated parking areas
- Garbage cans and restrooms

MAKING A GREAT PLACE
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NORTH TUALATIN MOUNTAINS CONSERVATION PRINCIPLES

Exhibit A to Resolution No 16-4679

At a regional scale, the sites that Metro manages have been identified as either opportunities for nature parks, natural areas or nature preserves, depending on the sensitivity of the sites. The most fragile habitats preclude all but the lightest use by people.

North Tualatin Mountains have been identified as an opportunity for access. While the sites contribute greatly to conservation at a regional scale, the area's contribution to regional conservation is not necessarily compromised by access via hiking or off-road cycling.

The master planning process, which identifies access locations and broad trail corridors, relies on species habitat needs, landscape ecology principles, the expertise and experience of local wildlife biologists and landscape scale design strategies to determine where the most appropriate opportunities are for public access and connection to nature.

Maintain regional connectivity

- Acquire **lands to connect regional significant focal areas and connect our region to surrounding public lands**
- **Restore habitat to improve natural area value to wildlife and water quality**

North Tualatin Mountains acquisitions increase connectivity between Forest Park and the Coast Range. Restoration at all four North Tualatin Mountains sites is improving wildlife habitat and water quality.

Protect large areas of habitat

- **Protect large blocks of forest**
- **Maximize unfragmented core habitat areas of 30 acres or greater**
- **Maintain some sites in a low or no use state**

The recommended alternative identifies Ennis Creek and North Abbey Creek Forests for protection as large blocks of core habitat. The western half of McCarthy Creek Forest is also identified as core habitat.

The plan maximizes protection of undisturbed habitat areas of 30 acres or greater and regional habitat connectivity.

Protect wetlands and streams

- **Minimize stream crossings, and when necessary cross streams at a perpendicular angle and use bridges instead of culverts where possible.**
- **Avoid trails running adjacent to and parallel to streams**

The recommended alternative uses existing stream crossings when possible, avoids stream corridors.

Reduce fragmentation

- **Decommission roads that are not needed for maintenance**
- **Locate access in areas that have existing use and in places that are fragmented by existing roads or trails**
- **Use old road networks for trails when possible**

The recommended alternative identifies 3.5 miles of old road in McCarthy Creek and Ennis Creek Forests to be decommissioned. The recommended alternative focuses most access in Burlington Creek Forest, which is the site that is currently most heavily used.

Manage for habitat protection

- **Minimize presence of dogs**
- **Restrict access at times when wildlife is more sensitive to human disturbance such as during breeding (nesting, elk calving, amphibian migration)**
- **Rely on local subject area experts for guidance on important species, including elk, amphibians and birds**

Metro employes several staff biologists, has worked with local wildlife experts and enforces a no-dogs policy.

Improve habitat via restoration

- **Restoration activities such as thinning, road decommissioning creating standing and down dead wood, and planting natives improve conditions for wildlife and create a forest that is more resilient to disease and wildfire**

Metro is actively restoring forests and stream, habitat on all four sires. (see restoration boards for details)

MAKING A GREAT PLACE

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NORTH TUALATIN MOUNTAINS DESIGN STRATEGIES

Exhibit A to Resolution No 16-4679

In the design and engineering phase, we will refine trail locations and design. During this process, we look more closely to make sure specific trail routes avoid sensitive areas, and use best practices in trail design to build trails that are durable, and do not cause erosion.

Habitat protection

- Locate new trails where habitat is already fragmented
- Avoid habitat for sensitive and listed species; provide appropriate setbacks from streams, corridors and sensitive areas
- Use bridges and boardwalks, instead of culverts, where appropriate
- Avoid constructing new trails in areas of high natural resource value

Water quality

- Decommission roads that are failing
- Minimize stream crossings where other routes are possible
- Align trails parallel rather than perpendicular to contours
- Maintain appropriate setbacks from wetlands and seasonally wet areas
- Be aware of seasonal moisture at toes of slope, north slopes and intermittent drainages
- Use best management practices such as cross-slope, rolling grades, and drainage dips to move water off trail and avoid erosion

Meaningful experience of nature

- Provide welcoming entries and clear way-finding signs
- Provide a variety of trail experience (various width, length, loops, challenge level) and trails designed appropriately for anticipated use to encourage proper trail use
- Provide access to viewpoints, and appropriate routes to key features
- Provide information about accessibility and challenge level
- Provide opportunities to learn about local habitat, site history, restoration and regional context
- Increase visitors' awareness of natural resources on site
- Provide opportunities for discovery

Safety, management & durability

- Involve visitors in maintenance and site stewardship to promote a more intimate awareness of habitat and water quality
- Promote stewardship through volunteer trail patrol
- Develop partnerships with volunteer organizations
- Simple and clear way-finding signs, use durable vandal resistant materials
- Design trails that are safe and challenging
- Safety and security measures include gated entries to control access at night, daily ranger patrols, and employment of security patrols as needed

MAKING A GREAT PLACE

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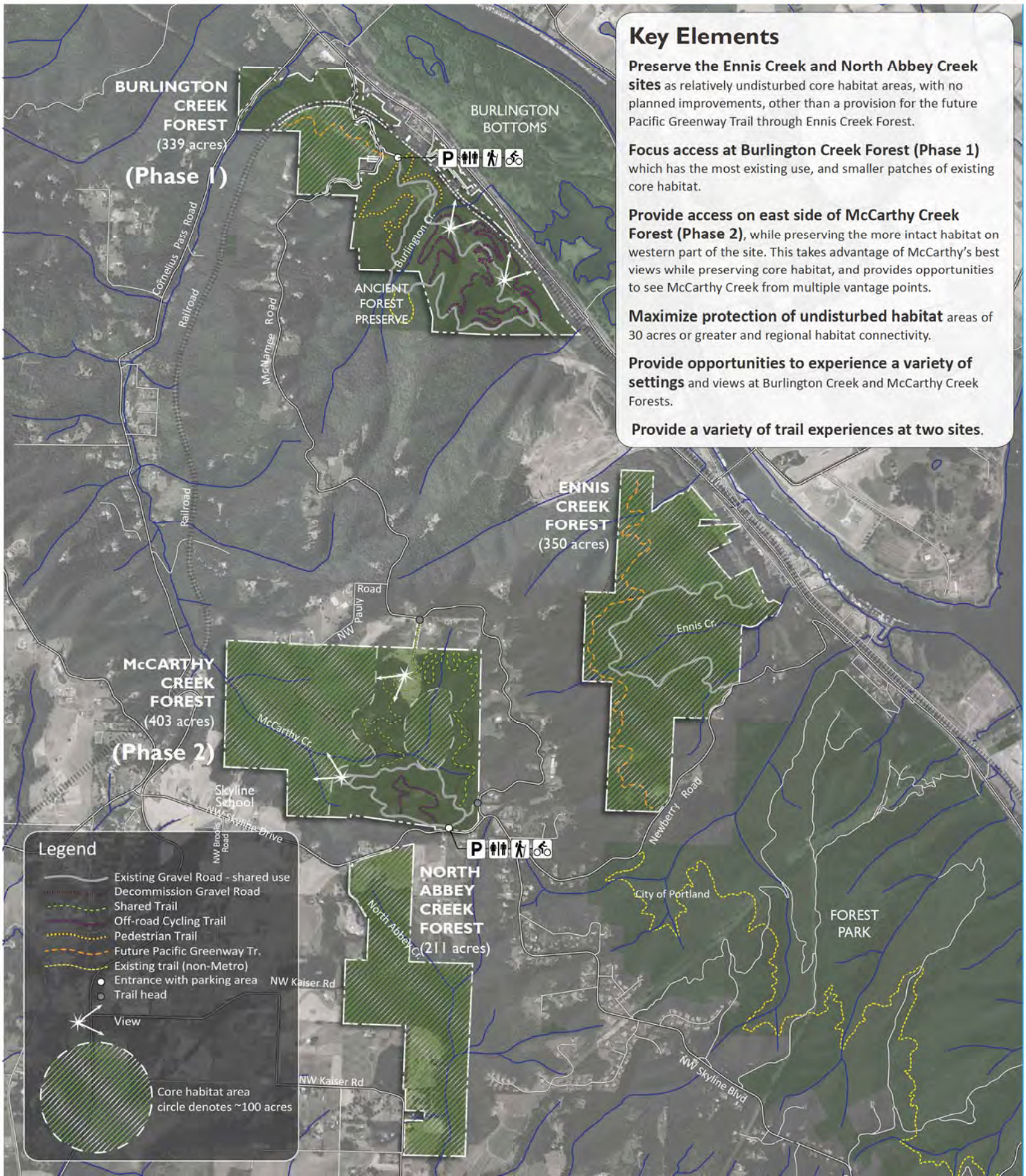
NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

RECOMMENDED ALTERNATIVE



Key Elements

Preserve the Ennis Creek and North Abbey Creek sites as relatively undisturbed core habitat areas, with no planned improvements, other than a provision for the future Pacific Greenway Trail through Ennis Creek Forest.

Focus access at Burlington Creek Forest (Phase 1) which has the most existing use, and smaller patches of existing core habitat.

Provide access on east side of McCarthy Creek Forest (Phase 2), while preserving the more intact habitat on western part of the site. This takes advantage of McCarthy's best views while preserving core habitat, and provides opportunities to see McCarthy Creek from multiple vantage points.

Maximize protection of undisturbed habitat areas of 30 acres or greater and regional habitat connectivity.

Provide opportunities to experience a variety of settings and views at Burlington Creek and McCarthy Creek Forests.

Provide a variety of trail experiences at two sites.

MAKING A GREAT PLACE
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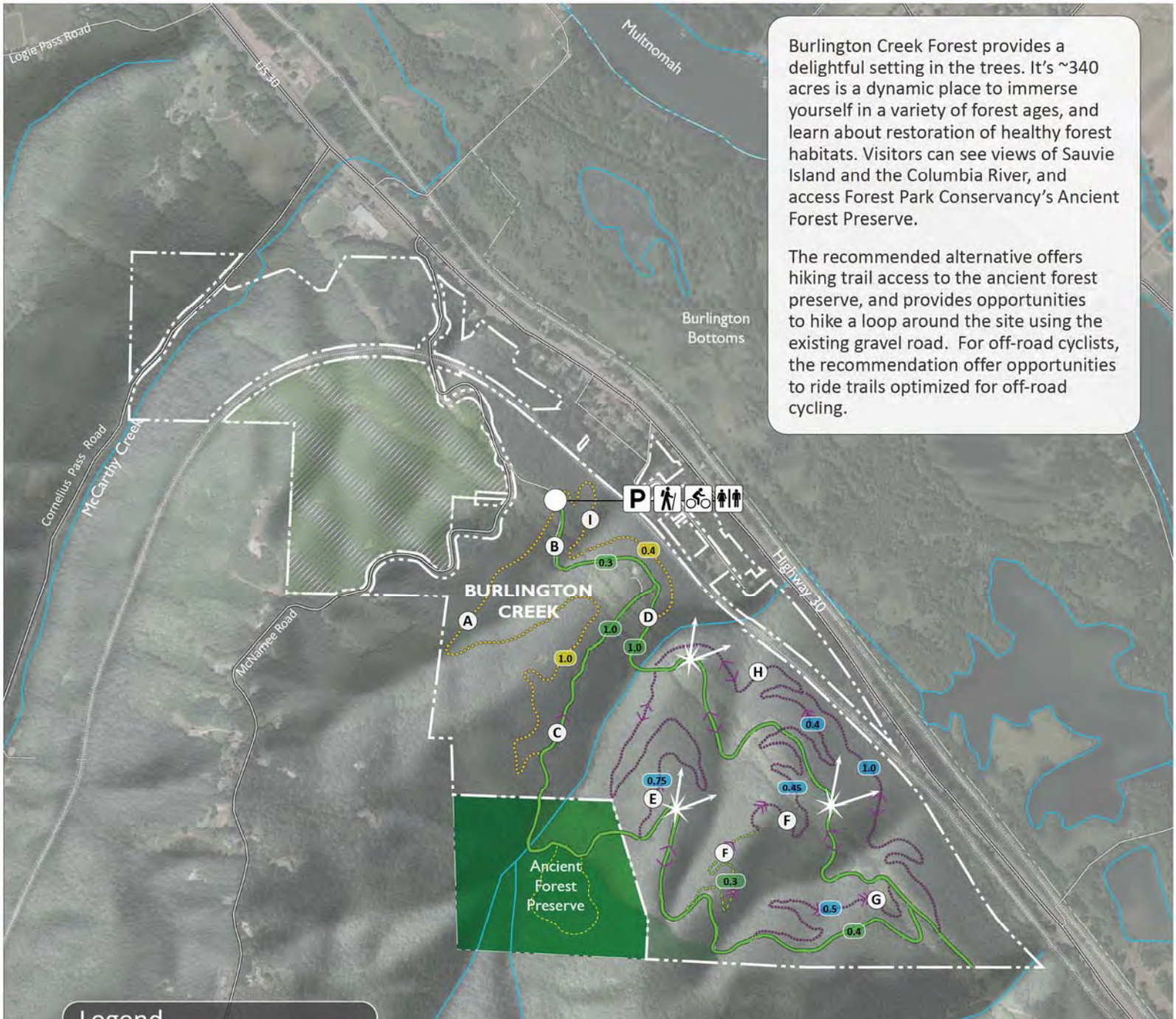
NORTH TUALATIN MOUNTAINS
BURLINGTON CREEK

Exhibit A to Resolution No 16-4679

Burlington Creek Forest provides a delightful setting in the trees. It's ~340 acres is a dynamic place to immerse yourself in a variety of forest ages, and learn about restoration of healthy forest habitats. Visitors can see views of Sauvie Island and the Columbia River, and access Forest Park Conservancy's Ancient Forest Preserve.

The recommended alternative offers hiking trail access to the ancient forest preserve, and provides opportunities to hike a loop around the site using the existing gravel road. For off-road cyclists, the recommendation offer opportunities to ride trails optimized for off-road cycling.



Legend

- Existing gravel road - shared use
- Decommission gravel road
- Streams
- Shared use trail
- Off-road cycling optimized trail
- Pedestrian trail
- Future Pacific Greenway Tr.
- Existing trail (non-Metro)
- Entrance with parking area
- Trail head
- View

NORTH

0 1/8 Mile 1/4 Mile

TRAIL #	USE	LENGTH	DESCRIPTION
A		1 mi.	The trail begins at about 250', climbs to 415', and returns to the existing road near the Ancient Forest, near 330' Average slopes ~5% max 8%
B,C & D		2.7 mi.	Existing gravel road, steep (~15%) in places, with loose gravel
E		.75 mi.	Dual direction route with 160' of elev. change, slope ~4%
F		1.2 mi.	Shared to viewpoint, then descending route, elev. change ~380' slopes ~3% to 8% with short steeper sections
G		.5	Descending route for off-road cyclists, elev. change ~180'; slopes average slopes ~7.5% with short steeper sections
H		1.0	Dual-direction collector trail, total grade change 180', max grades to ~8%
I		.4 mi	Potentially accessible trail (could be shared)

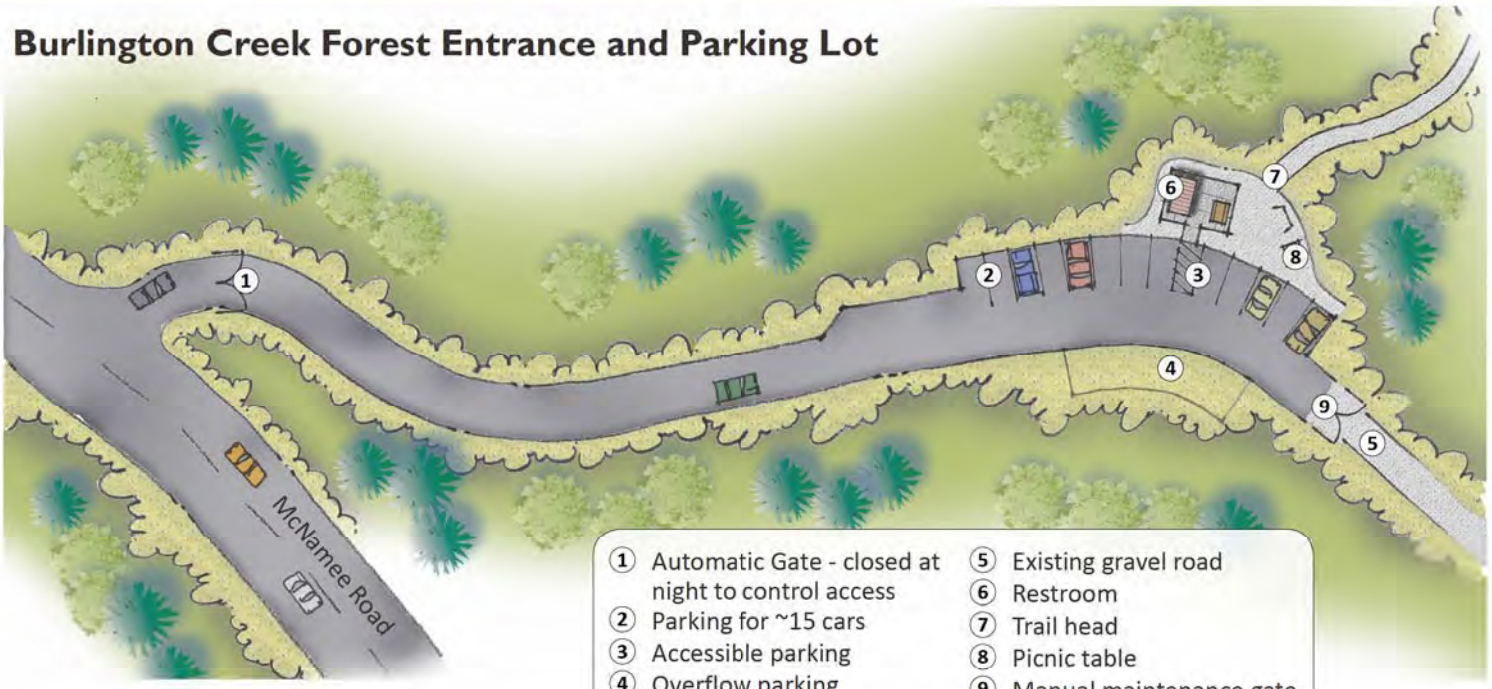
MAKING A GREAT PLACE
Metro

NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

BURLINGTON ENTRY

Burlington Creek Forest Entrance and Parking Lot



1. Automatic Gate - closed at night to control access
2. Parking for ~15 cars
3. Accessible parking
4. Overflow parking
5. Existing gravel road
6. Restroom
7. Trail head
8. Picnic table
9. Manual maintenance gate


Resting / wildlife viewing


Parking Lot


Picnic Area

Trailhead

MAKING A GREAT PLACE
Metro

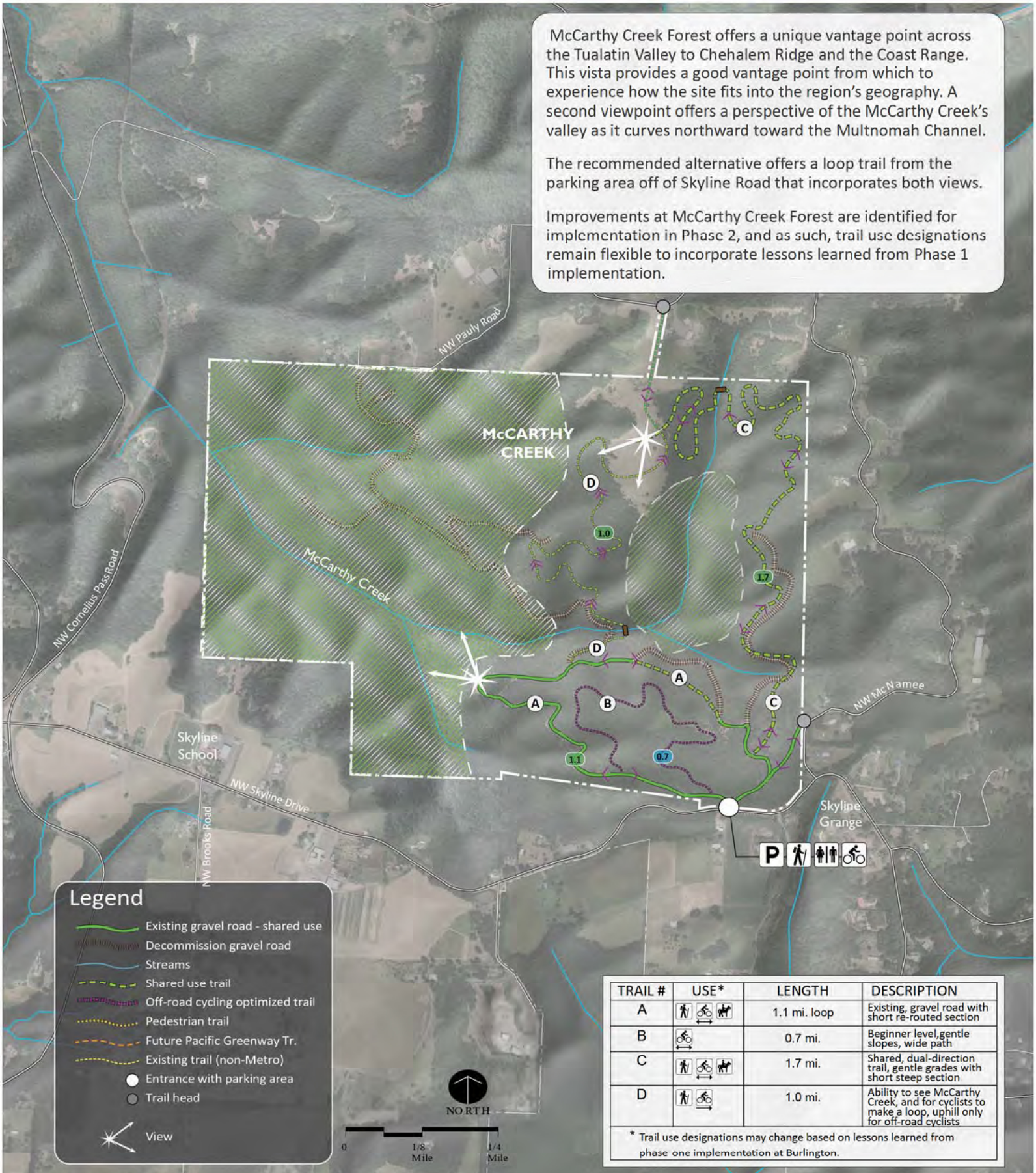
NORTH TUALATIN MOUNTAINS
McCARTHY CREEK

Exhibit A to Resolution No 16-4679

McCarthy Creek Forest offers a unique vantage point across the Tualatin Valley to Chehalem Ridge and the Coast Range. This vista provides a good vantage point from which to experience how the site fits into the region's geography. A second viewpoint offers a perspective of the McCarthy Creek's valley as it curves northward toward the Multnomah Channel.

The recommended alternative offers a loop trail from the parking area off of Skyline Road that incorporates both views.

Improvements at McCarthy Creek Forest are identified for implementation in Phase 2, and as such, trail use designations remain flexible to incorporate lessons learned from Phase 1 implementation.



TRAIL #	USE*	LENGTH	DESCRIPTION
A		1.1 mi. loop	Existing, gravel road with short re-routed section
B		0.7 mi.	Beginner level,gentle slopes, wide path
C		1.7 mi.	Shared, dual-direction trail, gentle grades with short steep section
D		1.0 mi.	Ability to see McCarthy Creek, and for cyclists to make a loop, uphill only for off-road cyclists

* Trail use designations may change based on lessons learned from phase one implementation at Burlington.

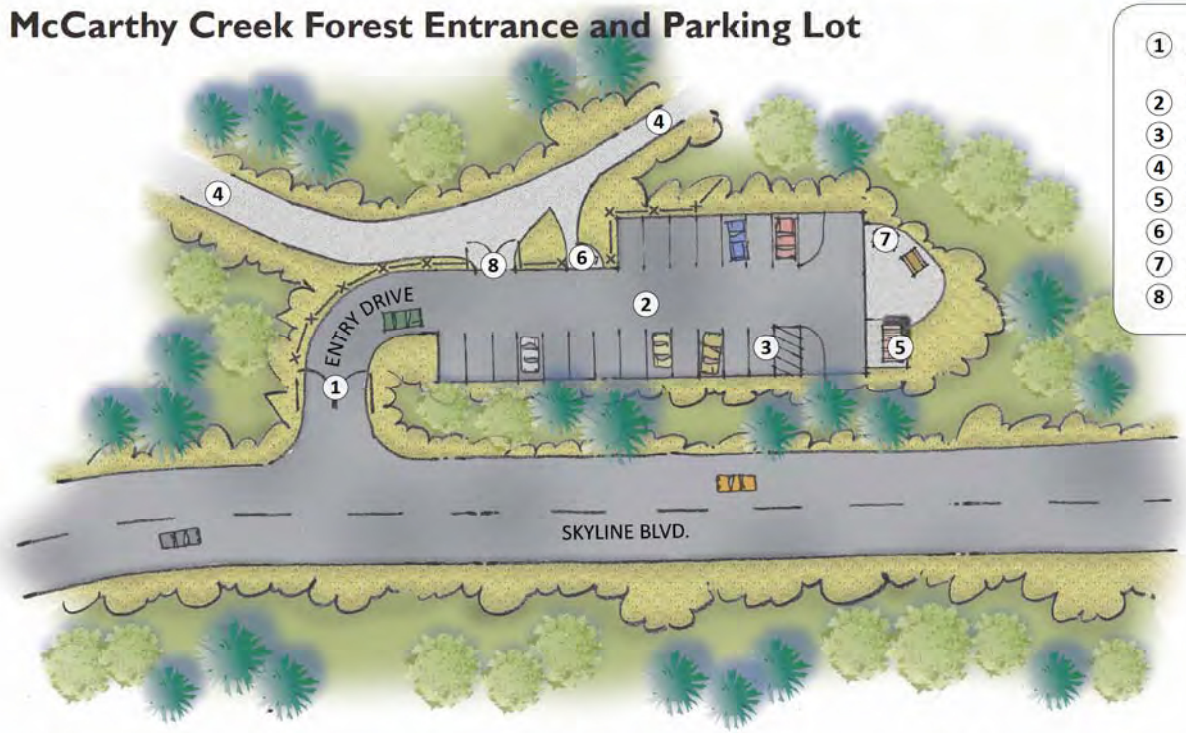
MAKING A GREAT PLACE
Metro

NORTH TUALATIN MOUNTAINS

Exhibit A to Resolution No 16-4679

McCARTHY ENTRY

McCarthy Creek Forest Entrance and Parking Lot



1. Automatic Gate - closed at night to control access
2. Parking for ~15-20 cars
3. Accessible parking
4. Existing gravel road
5. Restroom
6. Trail head
7. Picnic table
8. Manual maintenance gate


Trailhead


Viewpoints


Picnic Area


Parking Lot

MAKING A GREAT PLACE
Metro

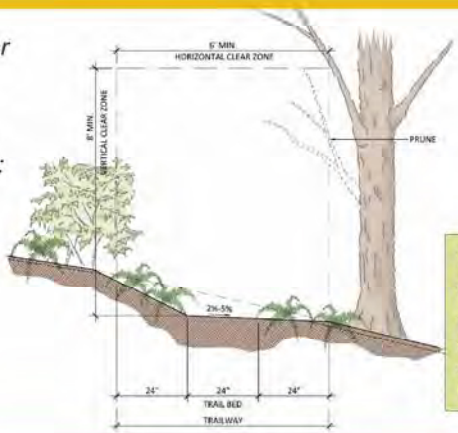
NORTH TUALATIN MOUNTAINS TRAIL DESIGN

Exhibit A to Resolution No 16-4679

Hiking trails

The trails at Burlington and McCarthy Creek forests will meander up and down steep forested topography. Hiking experience will generally be of moderate to high challenge level. Over the years, hikers can see younger forests take on characteristics of mature forests. Design strategies specific to hiking trails include:

- Provide resting points and passing opportunities
- Indentify opportunities for loop trails where possible, or trail segments that access a destination, like views or the Ancient Forest
- Locate trails so that the visitors see views, vegetation, and wildlife, rather than one another



Width: 18"-30"

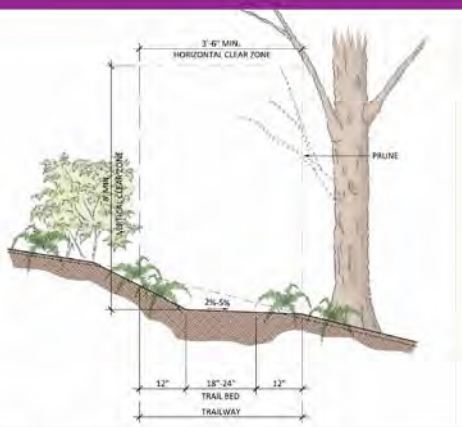
Surface: Soil

Trail grade (moderate challenge): to 8% (short segments may be steeper); **(high challenge):** to 15% (short segments steeper than 15%)

Off-road cycling trails

Burlington and McCarthy Creek Forests offer opportunities to ride trails optimized for off-road cycling. Trails will be designed to provide a variety of challenge levels, and opportunities to create loops. The following design strategies help make a fun and safe experience for all.

- Control speed through trail design
- Avoid long sustained grades, stacking switchbacks and incorporate climbing turns
- Limit overall average longitudinal slope of each trail segment to 10%
- Use curves to create interest, manage runoff, control speed, and have fun
- Provide clear visibility and long sight distances at curves and intersections
- Provide resting points and passing opportunities



Beginner

Width: 18" (one way singletrack) to 4' (add width & super-elevation at curves as needed)

Surface: varies, typically mineral soils firm and stable

Trail grade: Avg. 5% or less with short sections up to 15%

Natural obstacles/Trail features: Limited obstacles 2" or less

Sight Distance: 10'-100' depending on speed/flow

Beginner trails will be designed with wider trail bed and gentler grades. These are appropriate for inexperienced riders, helping develop skills and build confidence.

- Shorter trails, closer to parking area
- Trails that are wider, with average grades <5%
- Trail surface generally firm and stable
- May include flowing single track style sections
- Trail may include small obstacles of roots or rock
- Limited challenging features

Intermediate

Width: 18" (one way singletrack) to 4' (add width & super-elevation at curves as needed)

Surface: Mineral soils, mostly stable with some variability

Trail grade: Avg. 10% or less with short sections up to 15% or greater

Natural obstacles/Trail features: Unavoidable obstacles 8" tall or less

Sight Distance: 10'-100' depending on speed/flow

Intermediate level trails will be designed with more narrow trails and steeper grades for more confident riders and offer a variety of moderate level challenges.

- Trails that are farther from entry will be designed to be more challenging
- Trail surface may be loose or uneven
- Moderate grades, but may include short steep sections
- Designed with tuns, obstacles and uphill sections to moderate speeds and naturally slow riders

MAKING A GREAT PLACE
Metro

NORTH TUALATIN MOUNTAINS TRAIL DESIGN

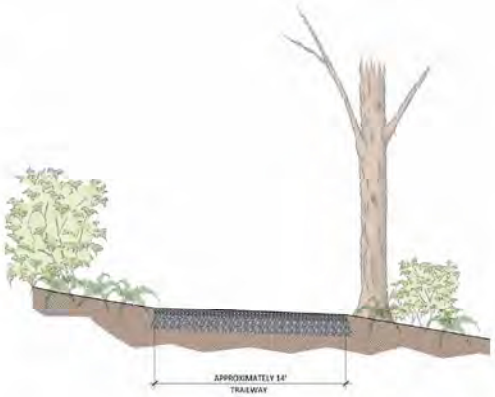
Exhibit A to Resolution No 16-4679

Shared Trails

Existing gravel road

Existing gravel roads will remain where they are needed for maintenance. They are currently used by hikers, off-road cyclists, and horseback riders, and will continue to provide opportunities to experience the sites.

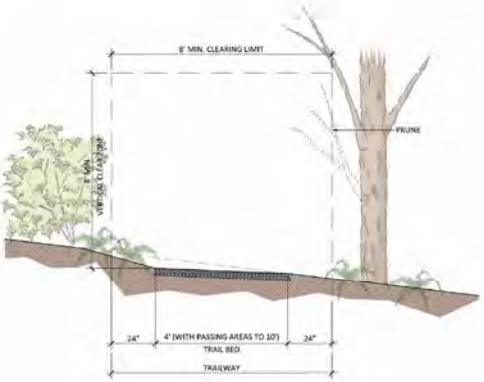
- Provide dual direction for off-road cyclists hikers, and equestrians
- Typically about 14 feet wide, and steep in places.
- Surface is steep and may be loose or uneven
- Maintenance vehicles will use the roads at times to access the site and powerline corridor



Dual Direction

In some places where topography is more gentle, shared trails will accommodate multiple uses in two directions. Trail grades will be gentle, though some sections may still exceed guidelines for accessibility.

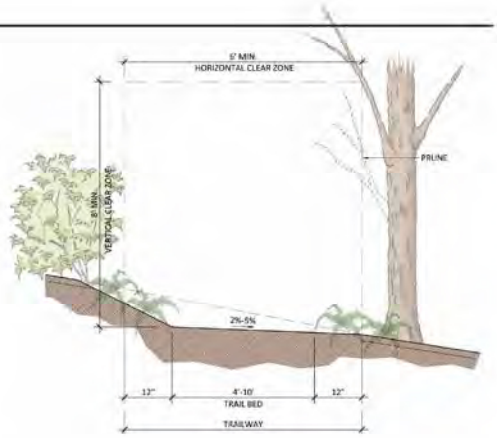
- Where grades are within guidelines for accessibility a smooth crushed rock trail surface will be constructed
- Sight Distance: 40'-100' depending on speed/flow of uses
- Trail grade: 0-5% (to 12% if needed)
- Trail design will control cyclists speed with short uphill sections
- Shared with off road cyclists, hikers, and equestrians
- Moderate grades, may include short steep sections greater than 8%



Uphill for off-road cyclists

In some places, where topography is steeper, shared trails will include off-road cyclists in the uphill direction, with separate single use trails in the descending direction for cyclists.

- One-way (uphill) for off road cycling
- Dual direction for hiking
- Sight Distance: 40'-100' depending on speed
- Moderate grades, may include short steep sections
- Provide resting points and places to pass



MAKING A GREAT PLACE
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NORTH TUALATIN MOUNTAINS NEXT STEPS

TIMELINE

Acquisition, Conservation and Stabilization | Planning | Design | Construction | Visit North Tualatin Mountains

1992
Voters pass Open Spaces Bond Measure

2006
Voters pass Natural Areas Bond Measure

2013
Voters pass Parks & Natural Areas Operating Levy

ONGOING SITE & VEGETATION MANAGEMENT
Includes controlling access to the site, monitoring uses, addressing safety concerns, invasive species management, and fuel reduction.

SITE CONSERVATION PLAN
A site conservation plan guides restoration efforts, and provides a baseline for master planning.

SEPTEMBER 18
1st Community Event

DECEMBER 2
2nd Community Event

MAY 6
3rd Community Event

NOVEMBER 17, 2015
4th Community Event

FALL 2014
Begin Master Planning

SPRING 2016
Master Plan Complete

2016
Phase 1 Design & Engineering

FALL 2017
Burlington Creek Forest Grand Opening

NEXT STEPS

Final Recommendation

- We will incorporate comments on the recommended alternative into an access master plan for the North Tualatin Mountains

Master Plan

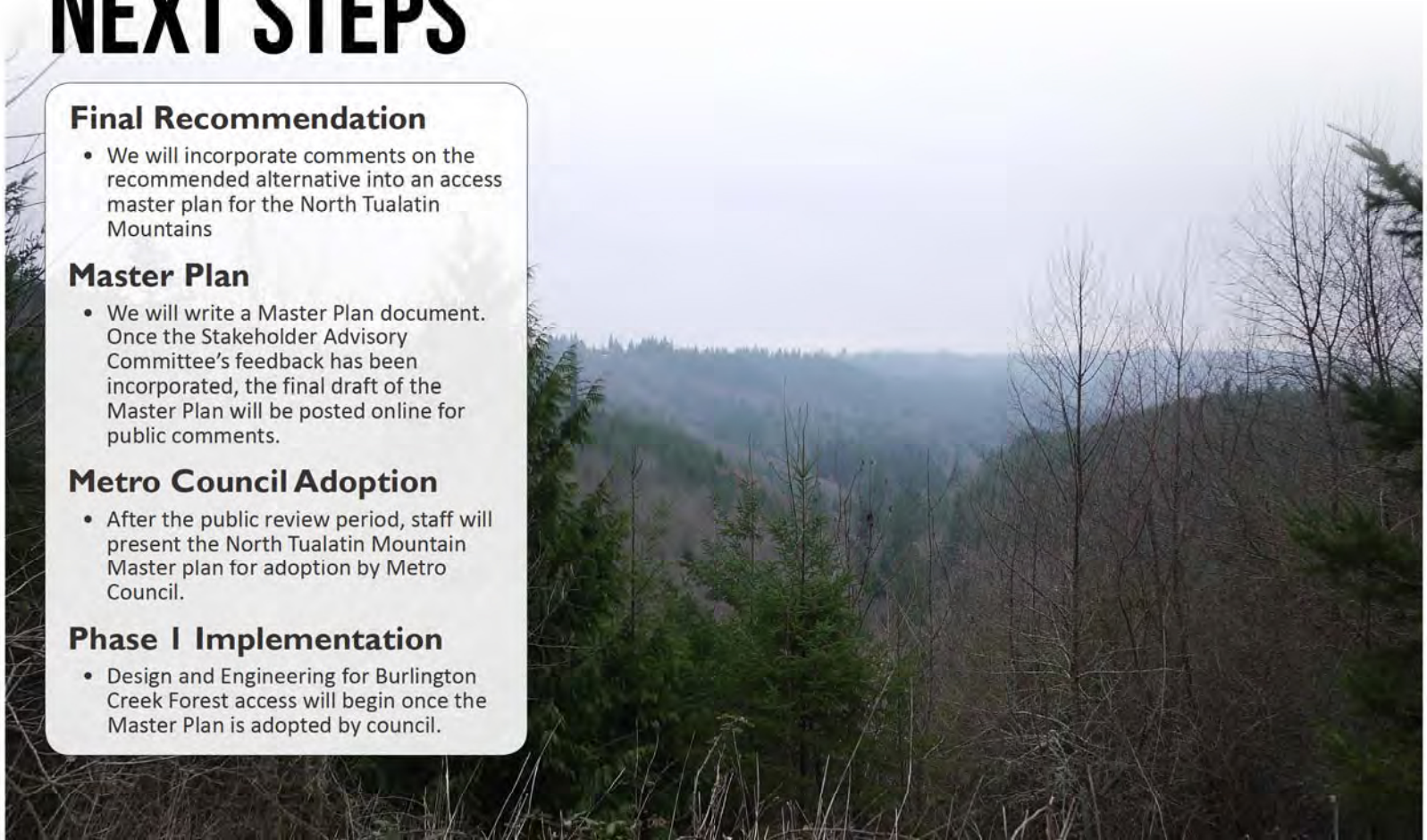
- We will write a Master Plan document. Once the Stakeholder Advisory Committee's feedback has been incorporated, the final draft of the Master Plan will be posted online for public comments.

Metro Council Adoption

- After the public review period, staff will present the North Tualatin Mountain Master plan for adoption by Metro Council.

Phase I Implementation

- Design and Engineering for Burlington Creek Forest access will begin once the Master Plan is adopted by council.



APPENDIX B:
PLANNING LEVEL COST ESTIMATE

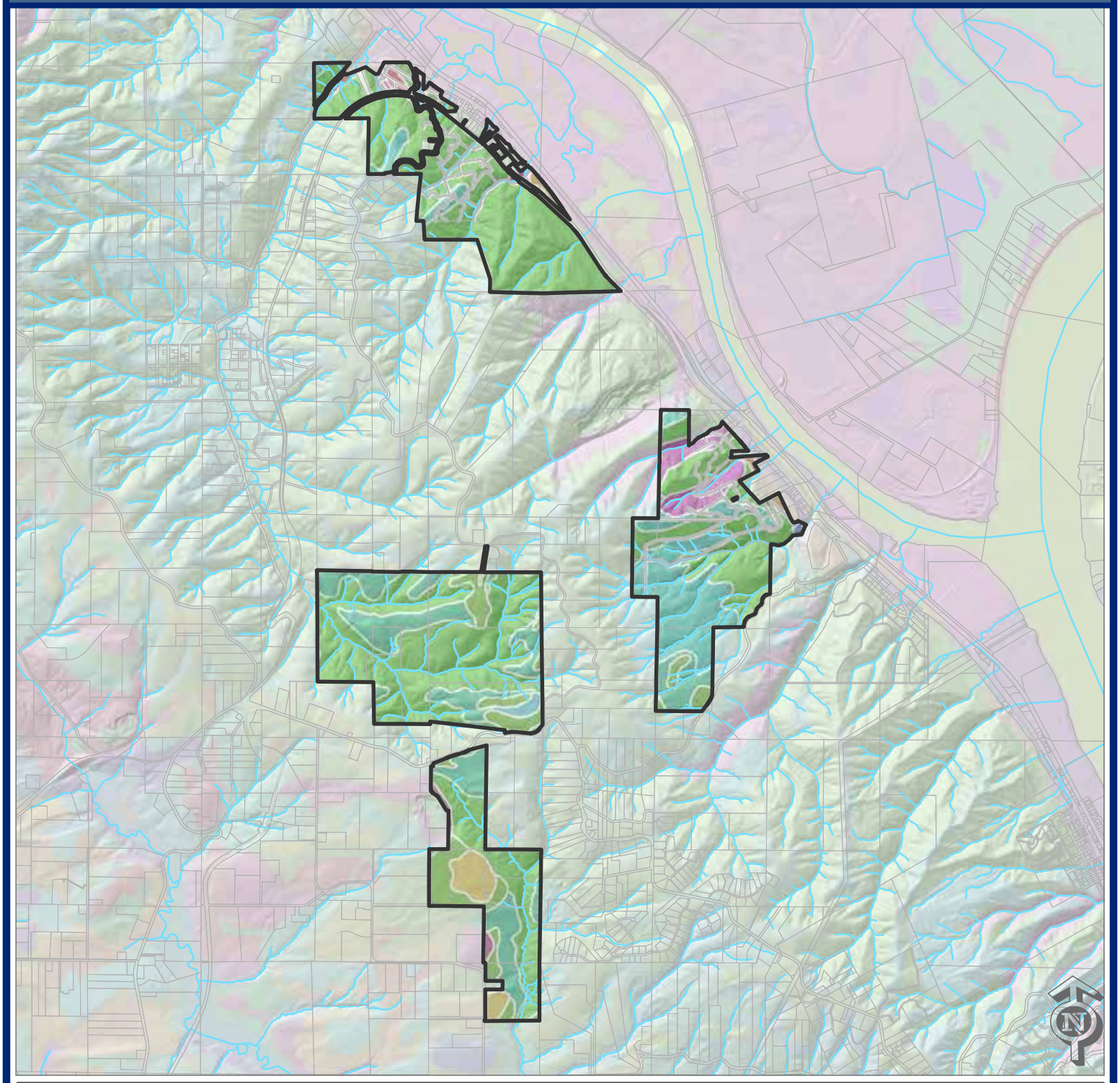
Planning level Cost Estimate						
Item of Work	**Quantity**	**Unit**	**Unit Price**	**Total Amount**	**Category Total**	**Contingency (25%)**
BURLINGTON CREEK FOREST					*$95,000*	***$118,750***
Right of way improvements for site access	1	LS	95000.00	$95,000	*$0*	*$118,750*
Driveway and parking lot improvements	1	LS	276075.00	$276,075	*$0*	*$345,094*
Restroom Facility (port-a-potty)	1	LS	20000.00	$20,000	*$0*	*$25,000*
Multi-use trail	29040	LF	$8.00	$232,320	*$0*	*$290,400*
Trails on gravel road (enter miles to right)	15840	LF	2.00	$31,680	*$0*	*$39,600*
Amenities	1	LS	40000.00	$40,000	*$0*	*$50,000*
Electrical Service	1	EA	5000.00	$5,000	*$0*	*$6,250*
Construction Subtotal				$700,075	*$700,075*	*$875,094*
Mobilization @ 10%	10%	EA	700075.00	$70,008	*$70,008*	***$87,509***
Construction Total				**$770,083**	***$770,083***	***$962,603***
DESIGN, ENGINEERING, PERMITING					*$266,025*	***$332,531***
Planning	1	EA	35000.00	$35,000		
Design & Engineering	22%	EA	770082.50	$169,418		
Permitting	8%	EA	770082.50	$61,607		
Total					*$1,106,115*	***$1,382,643***
Escalation index numbers through 2019 are as follows:						***$1,382,643***
2016 – 0.045						
2017 – 0.045						
2018 – 0.045						
2019 – 0.045						

Planning level Cost Estimate						
Item of Work	**Quantity**	**Unit**	**Unit Price**	**Total Amount**	**Category Total**	**Contingency (25%)**
McCARTHY CREEK FOREST					*$53,000*	***$66,250***
Right of way improvements for site access	1	LS	53000.00	$53,000	*$0*	*$66,250*
Driveway and parking lot improvements	1	LS	165660.00	$165,660	*$0*	*$207,075*
Restroom Facility (port-a-potty)	1	LS	20000.00	$20,000	*$0*	*$25,000*
Multi-use trail	5280	LF	$8.00	$42,240	*$0*	*$52,800*
Trails on gravel road (enter miles to right)	5280	LF	2.00	$10,560	*$0*	*$13,200*
Amenities	1	LS	40000.00	$40,000	*$0*	*$50,000*
Electrical Service	1	EA	5000.00	$5,000	*$0*	*$6,250*
Construction Subtotal				$336,460	*$336,460*	*$420,575*
Mobilization @ 10%	10%	EA	336460.00	$33,646	*$33,646*	***$42,058***
Construction Total				**$370,106**	***$370,106***	***$462,633***
DESIGN, ENGINEERING, PERMITING					*$146,032*	***$182,540***
Planning	1	EA	35000.00	$35,000		
Design & Engineering	22%	EA	370106.00	$81,423		
Permitting	8%	EA	370106.00	$29,608		
Total					*$549,784*	***$687,230***
Escalation index numbers through 2019 are as follows:						***$687,230***
2016 – 0.045						
2017 – 0.045						
2018 – 0.045						
2019 – 0.045						

APPENDIX C: SOILS

SOILS

Exhibit A to Resolution No 16-4679



Oxbow Regional Park site

NRCS soils (munam)

- Burlington fine sandy loam, 0 to 8 percent slopes
- Cascade silt loam, 15 to 30 percent slopes
- Cascade silt loam, 3 to 8 percent slopes
- Cascade silt loam, 30 to 60 percent slopes
- Cascade silt loam, 8 to 15 percent slopes
- Cornelius silt loam, 8 to 15 percent slopes
- Goble silt loam, 15 to 30 percent slopes
- Goble silt loam, 30 to 60 percent slopes
- Haploxerolls, steep
- Haplumbrepts, moderately steep
- Haplumbrepts, very steep
- Pits
- Quatama loam, 15 to 30 percent slopes
- Quatama loam, 3 to 8 percent slopes
- Quatama loam, 8 to 15 percent slopes
- Saum silt loam, 8 to 15 percent slopes
- Sauvie silt loam
- Urban land-Quatama complex, 8 to 15 percent slopes
- Wapato silt loam
- Wauld very gravelly loam, 30 to 70 percent slopes

0 4,000 8,000 Feet

Metro

Oxbow Regional Park Site Conservation Plan

map date: 2/22/2016

SYMBOL	MAP UNIT NAME	DESCRIPTION
	Burlington fine sandy loam	The Burlington series consists of deep, somewhat excessively drained soils that formed in mixed alluvium. Burlington soils are on wind-reworked, dune-like terraces and have slopes of 0 to 15 percent. The Burlington soils are on terraces along the lower Columbia River and its tributaries at elevations of 20 to 50 feet.
	Cornelius silt loam	The Cornelius series consists of moderately deep to a fragipan, moderately well drained soils that formed in silty loess-like materials. Cornelius soils are on uplands and have slopes of 2 to 60 percent. The Cornelius soils are on gently sloping to rolling low hills and steep hill slopes with convex, long slopes and ridgetops at elevations of 350 to 800 feet. The soils formed in loess-like material over mixed, fine-silty old alluvium of mixed origin.
	Cascade silt loam	The Cascade series consists of moderately deep to a fragipan, somewhat poorly drained soils that formed in silty materials. Cascade soils are on uplands and have slopes of 3 to 60 percent. The Cascade soils are on smooth or rolling, convex, long slopes and ridgetops at elevations of 250 to 1,400 feet. Slopes range from 3 to 60 percent. The soils formed in loess-like materials.
	Haploxerolls steep	
	Haplumbrepts, very steep	
	Saum silt loam	The Saum series consists of very deep, well drained soils that formed in basalt colluvium. The Saum soils are on summits and side slopes in areas affected by mass movement. Slopes range from 2 to 90 percent. The Saum soils are on summits and side slopes in areas that have been affected by mass movement. Slopes are 2 to 90 percent. The soils occur at elevations of 250 to 1600 feet. The soils formed in colluvium and residuum from various members of the Columbia River Basalt Group (CRBG).
	Sauvie silt loam	The Sauvie series consists of deep, poorly drained soils that formed mainly in alluvium. Sauvie soils are on flood plains and have slopes of 0 to 3 percent. The Sauvie soils are on flood plains along the lower Columbia River and its tributaries. Slopes are 0 to 3 percent. The soils formed in recent alluvium with some mixing with volcanic ash. They are at elevations of 10 to 40 feet in a climate with cool dry summers and cool moist winters.
	Urban land quatama complex	
	Wauld very gravelly loam	The Wauld series consists of moderately deep, well drained soils that formed in residuum and colluvium weathered from basalt. Wauld soils are on north slopes of uplands and have slopes of 30 to 70 percent. The Wauld soils are commonly on north-facing escarpments along the Columbia River and its major tributaries at elevations of 250 to 1,000 feet. Slopes range from 30 to 70 percent. The soils formed in eolian material mixed with colluvium from mixed sources and residuum weathered from basalt.

17 D, E	Goble silt loam	The Goble series consists of moderately deep to a fragipan, moderately well drained soils that formed in silty loess over old alluvium of mixed origin. Goble soils are on long convex upland slopes and ridgetops and have slopes of 2 to 80 percent. The Goble soils are on smooth or rolling hills with convex, long slopes and ridgetops on all exposures at elevations of 200 to 1,800 feet. The soils formed in loess over mixed old alluvium or slope wash. (Moderately well-drained soils on rolling ridgetops and convex side slopes of ridgetops).
37 B, C	Quatama loam	The Quatama series consists of deep, moderately well drained soils that formed in stratified glaciolacustrine deposits. Quatama soils are on low terraces and have slopes of 0 to 30 percent. Quatama soils are on nearly level to gently sloping, low terraces with short, steep escarpment fronts at elevations of 95 to 400 feet. The soils formed in loamy, old alluvium of mixed origin. (Moderately well-drained soil on low terraces, elevation 75-400 feet.)
55	Wapato silt loam	The Wapato series consists of very deep, poorly drained soils that formed in loamy mixed alluvium. Wapato soils are on flood plains. Slopes are 0 to 3 percent. The Wapato soils are in depressions on flood plains and basin-like areas. Elevations are 100 to 2,500 feet. The slope is 0 to 3 percent. The soils formed in silty recent alluvium. (Poorly drained floodplain soil. Present along lower Burlington Creek Forest in the site's northern extent.)

STAFF REPORT

IN CONSIDERATION OF RESOLUTION NO. 16-4679, FOR THE PURPOSE OF COUNCIL APPROVING THE NORTH TUALATIN MOUNTAINS ACCESS MASTER PLAN

Date: April 14, 2016 Prepared by: Olena Turula, 503- 813-7542

BACKGROUND

The North Tualatin Mountains natural areas are a collection of four voter-protected sites north of Forest Park, totaling approximately 1,300 acres. The properties were purchased thanks to two voter approved general obligation bond measures to protect water quality, wildlife habitat and outdoor recreation opportunities across the region. Collectively, the four sites preserve large blocks of upland and riparian forest, protect several streams, and provide habitat connectivity between Forest Park, Washington County and the Coast Range.

In the North Tualatin Mountains, former logging roads weave through forests that were previously managed primarily for commercial timber and agriculture prior to Metro's acquisition. Upland forests are mostly composed of dense stands of Douglas fir trees, planted about 20 years ago. Scattered patches of older forest are occasionally found, generally adjacent to streams; a few open areas remain where forests were cleared for agriculture or home sites. The North Tualatin Mountains are home to wildlife typical of young Douglas fir forests, such as deer, elk, birds, and amphibians; some of the streams support salmon and steelhead. Metro is actively restoring all four sites to improve forest health and habitat diversity, enhance wildlife habitat and protect water quality.

The natural areas levy, approved by voters in 2013, identified sites in the North Tualatin Mountains as opportunities to provide access to nature. This access master plan will provide a long-term vision and implementation strategy to guide future public use and development of the North Tualatin Mountains. This plan establishes project goals and objectives, outlines site resources and conditions, and summarizes the planning process. Employing principles of landscape ecology and landscape-level design strategies, this plan identifies access locations and approximate trail locations. It also presents a general plan for development of trailheads and strategies for implementing future development in the North Tualatin Mountains. Metro intends to develop access to the North Tualatin Mountains in a sensitive and balanced way that ensures healthy habitats and continued preservation of the many ecological benefits these sites provide for the region.

The access master plan was shaped by Metro Parks and Nature staff and extensive public outreach, including members of the community and stakeholders. A stakeholder advisory committee was established for the project and met five times to share technical expertise and insights into community needs and desires. The committee included staff and residents representing Forest Park Conservancy, Forest Park Neighborhood Association, Northwest Trails Alliance, Oregon Department of Forestry, Oregon Recreation Trails Advisory Committee, Portland Community College, Portland Parks & Recreation, Skyline Ridge Neighbors, Skyline School, Trackers Earth, and West Multnomah Soil and Water Conservation District.

Committee meetings, four community events, an open house for neighbors, conversations with community members, over twenty meetings with individual stakeholders and interested parties, and numerous comments submitted online helped to identify places to provide access, and where to prioritize

protection of undisturbed core habitat areas. Members of the public weighed in on what they value about the sites; they also shared their experiences of the sites and wildlife in the area. They provided insight into the types of activities they'd like to participate in, the types of trail systems they think are appropriate, and where they think access should be accommodated and prioritized. Over 500 comments were received through surveys, Metro's website, emails and informal conversations.

The proposed improvements will take place at two of the four sites, Burlington Creek Forest and McCarthy Creek Forest. The recommendation calls for new multi-use trails for hikers and off-road cyclists, and continued use of some of the former logging roads at the two sites. Equestrian riders will continue to have local access to former logging roads at both sites. Access improvements at Burlington Creek Forest are planned to be initiated first, with improvements at McCarthy made later as money becomes available.

The master plan proposes preserving 970 acres of protected core habitat at the four sites. No improvements are planned at two of the sites, Ennis Creek Forest and North Abbey Creek Forest, other than a provision for the future Pacific Greenway Trail through Ennis Creek Forest. In addition, the plan protects undisturbed habitat areas of 30 acres or greater in all four sites. Out of an existing 1,300 acres, this plan preserves nearly three-fourths as core habitat. This includes about 90 acres at Burlington, 350 acres at Ennis, 320 acres at McCarthy Creek Forest and 210 acres at North Abbey Creek.

The access master plan identifies opportunities to discover, learn about and experience nature at Burlington Creek Forest and the southeastern portion of McCarthy Creek Forest. The plan recommends continued use of 4 miles of existing logging roads in Burlington and McCarthy Creek forests, and proposes an additional 5.5 miles of new multi-use trails for Burlington Creek Forest. The recommendation includes trailheads at Burlington Creek and McCarthy Creek forests with non-flushing restroom facilities and parking areas to accommodate approximately 15 cars each.

The plan recommends protecting water quality by decommissioning over 3 miles of logging roads in McCarthy Creek, North Abbey Creek and Ennis Creek forests. The roads are a significant source of sediment in streams. Trail design and engineering will employ best practices for sustainable trail construction. Well-designed trails will limit impacts to streams and headwater areas by minimizing erosion, locating trails away from stream corridors and limiting the number stream crossings.

Off-road cycling is a growing trend statewide and in the metro region, and it is one way that people experience nature. This plan recommends providing off-road cycling opportunities at the North Tualatin Mountains. Based on available research, a definitive conclusion can't be made about whether experiencing nature by hiking or by off-road cycling poses greater impacts to wildlife. Many potential impacts to habitat such as erosion, trail widening, and ruts can be prevented using best practices for trail construction and management. The multi-use trails, for off-road cycling and hiking, will be family friendly and will be designed for beginning and intermediate riders. Trails will be designed to slow riders down using speed checks, such as short uphill sections, turns and obstacles. The trails will be monitored and maintained in partnership with trail user groups.

ANALYSIS/INFORMATION

Known opposition
During the community engagement process, concerns were raised regarding the compatibility of trails and off-road cycling in the North Tualatin Mountains with protecting wildlife habitat, especially for elk and red-legged frogs.

The point of view of the primary opposition to the master plan asserts that more wildlife studies should be completed prior to developing any trails in the North Tualatin Mountains and that the proposed trail development represents an existential threat to the viability of the area as a critical connection between Forest Park and the Coast Range.

The access master plan acknowledges that any trail or access to nature has some impact on wildlife. Metro's planning team made every effort to locate trails in such a way as to minimize such impact, and nearly three-fourths of the total acreage of the North Tualatin Mountains sites will have no trails at all. Trail alignments will be refined during the design and engineering phase.

In creating the access master plan for the North Tualatin Mountains, Metro relied on formal and informal studies of wildlife in the North Tualatin Mountains and similar habitats throughout the Pacific Northwest and also consulted with other agencies and organizations. There is an extensive body of scientific and academic literature on the type of habitat found in and around Forest Park, especially the second-growth Douglas fir forest habitats, found in the North Tualatin Mountains. We are confident that our efforts to restore quality habitat throughout our 4 sites in the North Tualatin Mountains will create and maintain diverse habitats for native species including elk, red-legged frogs and others. Metro also received input from regional conservation experts, such as the Oregon Department of Fish and Wildlife (ODFW), the Urban Greenspaces Institute and the Audubon Society of Portland.

Given the extensive studies that have already been done on site and concerning this type of habitat, it is unlikely that additional studies would produce significant new information that would affect management decisions. We focus our inventory and monitoring efforts on cases in which such information can empower better management decision-making and adaptive management.

Additionally, Metro intends to implement project-based monitoring to inform ongoing management of access and to ensure uses remain compatible with wildlife habitats.

In addition to the general concern about wildlife studies, concerns have been raised about elk and red-legged frogs.

Elk are found throughout the area in and around the North Tualatin Mountains, and neighbors raised concerns that access could negatively affect their movement patterns. Although the elk herd is not considered regionally significant by ODFW, it is highly valued by some members of the community and the North Tualatin Mountains master plan takes this into consideration.

The earlier preferred alternative recommended including a trail through the northeastern portion of McCarthy that would have offered visitors access to a viewpoint with stunning vistas of the Tualatin River Valley and Coast Range. To address concerns about elk that frequent a meadow in this area and because the extent of the potential impact of this trail on elk use at the meadow is unknown at this time, this trail is not included in this master plan. This trail may be considered in the future if further investigation compellingly demonstrates that access to the meadow is unlikely to affect elk persistence in the area.

While we have heard from the off-road cycling community that they generally support the master plan, removing the trail through the northeastern portion of McCarthy Creek Forest generated vocal criticism from members of Northwest Trail Alliance.

Amphibians, including red-legged frogs are known to move seasonally between Burlington Creek and breeding habitat on the opposite side of Highway 30, including the Palensky Wildlife Area (aka

Burlington Bottoms). Concerns have been raised by ODFW and others that the proposed trails in Burlington Creek Forest may negatively affect red-legged frogs and other amphibians.

Trail design and construction will minimize stream crossings, employ amphibian friendly crossings where needed, and minimize soil erosion and trail rutting. Access to the site will be controlled with an automatic gate. The site and trails will be closed at night, which is when seasonal movement of red-legged frogs typically occurs, and seasonal closures will be considered if monitoring demonstrates significant mortality on the trails. Restoration work at both Burlington Creek and Ennis Creek forests will improve foraging and overwintering habitat, including creating down wood and maintaining a diverse understory and tree canopy.

Legal Antecedents
North Tualatin Mountains is identified in the 2013 natural areas levy as an access project. Completion of this project is an effort to complete the legal obligation of the levy.

Anticipated Effects
Following adoption of the access master plan, the next steps in the project are to pursue land-use approvals and building permits from Multnomah County. Paralleling this effort, Metro Parks and Nature Planning staff will work with a team of design consultants to produce construction documents. The latter effort will lead to Phase 1 improvements which are expect to take place in fiscal year 2017-18.

Budget Impacts
The 2013 parks and natural areas levy funded this master plan work. Preliminary cost exercises estimate that construction of elements in Burlington Creek Forest will cost approximately $1.4 million, and elements in McCarthy Creek Forest will cost approximately $700,000. When design and construction documents are complete a phase 1 construction budget will be developed to match available dollars. Parks and Nature has identified $727,500 in FY 16-17 and 17-18 for design and construction from the 2013 parks and natural areas levy. Alternative funding sources such as grants may also be pursued to help provide additional funding for construction.

RECOMMENDED ACTION

Staff recommends adoption of Resolution No. 16-4679, for the purpose of approving North Tualatin Mountains Access Master Plan as presented