

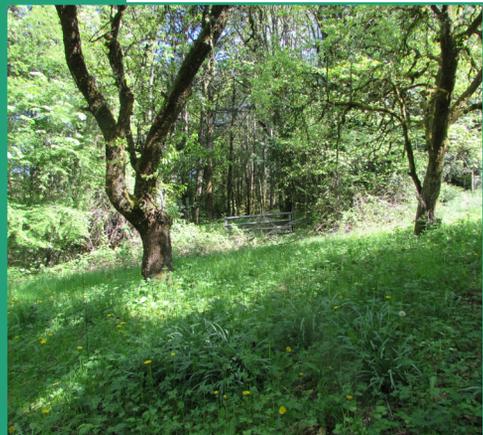
ENVIRONMENTAL OVERLAY ZONE MAP CORRECTION PROJECT



VOLUME 3, PART B: Skyline West, Natural Resources Inventory and ESEE Decisions



Discussion Draft
November 2019



Bureau of Planning and Sustainability
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COMMENTS DUE: January 31, 2020

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Acknowledgements

This plan is the culmination of three years of work across the City of Portland. Many thanks to the thousands of stakeholders, property owners, renters, business owners and interested people who attended dozens of neighborhood and community meetings and invited staff to their homes and businesses to perform site visits.

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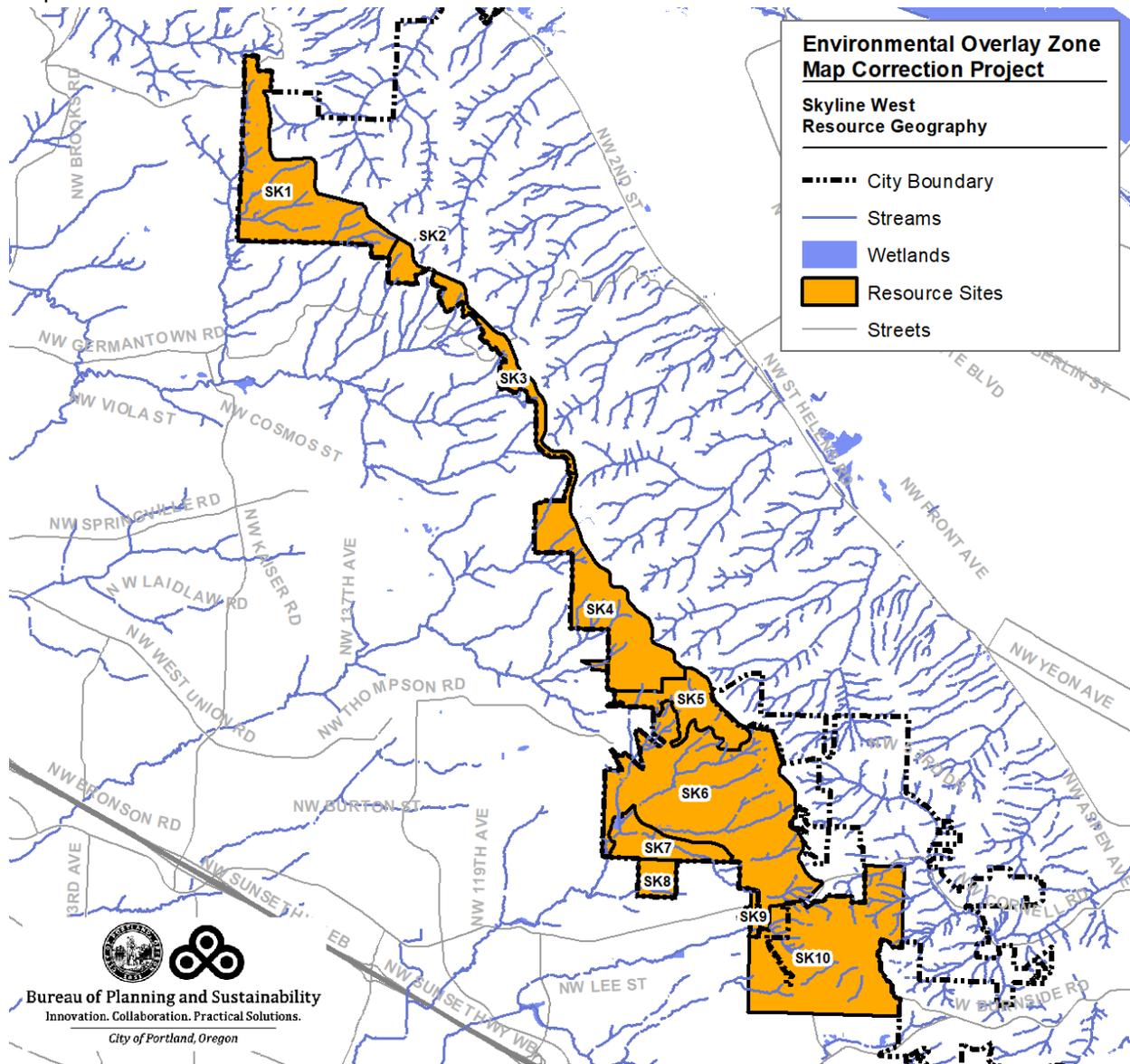
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A. Introduction

Volume 3, Part B, includes the results for resource site in the Skyline West geography of Portland (see Map 1). For each resource site the following is presented:

1. Natural resources inventory of riparian corridors and wildlife habitat pursuant to OAR 660-023-0030, 660-023-0090 and 660-023-0110.
2. Economic, Social, Environmental and Energy analysis pursuant to OAR 660-023-0040.
3. Economic, Social, Environmental and Energy decisions pursuant to OAR 660-023-0040.
4. Program implementation recommendations pursuant to OAR 660-023-0050.

The program to implement the inventory, ESEE decisions and recommendations are the updated zoning maps and codes found in Volume 1.



Map 1: Skyline West Resource Geography

B. How to Use this Document

Below is a description of how to use the information found in this volume during quasi-judicial reviews.

Significant Natural Resource Feature and Functions Descriptions and Maps

Natural resource features include rivers, streams, wetland, flood area, vegetation (forest, woodland, shrubland and herbaceous), steep slopes and Special Habitat areas. These features are factual data that are mapped in the natural resources inventory. The descriptions are based on supplemental inventories, reports and site visits. Natural resource functions are the riparian corridor and wildlife habitat benefits provided by the features. The methodology used to map and identify the natural resource features and function is documented in the Natural Resources Inventory and Wetland Inventory Project (Appendix C).

The natural resource features maps can be updated at any time based on more current and accurate data, such as a wetland delineation. The environmental overlay zone boundaries may be further corrected based on new topographic feature data through 33.885.070, Correction to the Official Zoning Maps, or through 33.430.250.D, Modification of Zone Boundaries.

Economic, Social, Environmental and Energy Analysis

The general ESEE analysis and recommendations are found in Volume 2. For each resource site, the general ESEE analysis and recommendations are affirmed, clarified or modified based on resource site-specific information. An ESEE decision is made for each resource site. The ESEE decision describes which significant natural resource features and functions should be protected from the impacts of conflicting uses.

Implementation

The results of the inventory and ESEE decision for each resource site are implemented by updates to the zoning code and maps found in Volume 1.

C. Natural Resources Definitions

Additional details can be found in Volume 4, Appendix B: Natural Resources Inventory, and Appendix C: Updated Wetland Mapping Protocols.

Waterbodies

Stream: A stream is a channel that has a defined bed and bank and carries water continuously for a week or more during at least the wet season (October through April). Streams may be naturally occurring or may be a relocated, altered or created channel. Streams may contribute water into another waterbody or the water may flow into a pipe or culvert. Streams may flow for some distance underground. Streams are also referred to as *drainageways*, *ditches*, or *drainages* in other City of Portland reports, codes and rules or by other agencies including but not limited to Oregon Department of State Land or US Army Corps of Engineers. Streams include:

- the water itself, including any vegetation, aquatic life or habitat;
- the channel, bed and banks located between the top-of-bank; the channel may contain water, whether or not water is actually present;
- intermittent streams, which flow continuously for weeks or months during the wet season and normally cease flowing for weeks or months during dry season;
- sloughs, which are slow-moving, canal-like channels that are primarily formed by tidal influences, backwater from a larger river system, or groundwater;
- oxbows and side channels connected by surface flow to the stream during a portion of the year; and
- drainage from wetlands, ponds, lakes, seeps or springs, which may or may not form a defined bed and bank.

Drainage: A drainage is an area on the land that conveys flowing water for only hours or days following a rainfall. If a drainage drains water from a wetland, pond, lake, seep, or spring even if it does not have a defined bed and bank, then it is classified as a stream.

Roadside Ditch: A roadside ditch is a constructed channel typically parallel and directly adjacent to a public or private road. A roadside ditch is designed to capture and convey stormwater runoff from the road and is routinely cleaned (i.e., mechanically scoured or scraped of vegetation and debris) to maintain water conveyance capacity. Naturally occurring streams and drainages that have been relocated due to the construction of a road are not considered a *roadside ditch*.

Wetlands: Areas where shallow water is present long enough to create hydric soils and could support hydrophilic vegetation, although due to landscaping, seeding, mowing or grazing hydrophilic vegetation may not be present.

Floodplain: Areas with a 1% or greater chance of flooding in any given year and areas that were inundated with water during the 1996 floods.

Vegetation

Vegetation Patch: An area of contiguous vegetation greater than ½ acre in size containing a distinct pattern, distribution, and composition of vegetation relative to surrounding vegetated and non-vegetated areas.

Forest: Trees with their crowns overlapping, generally forming 60-100% of cover.

Woodland: Open stands of trees with crowns not usually touching, generally forming 25-60% of cover. Tree cover may be less than 25% in cases where it exceeds shrubland and herbaceous vegetation.

Shrubland: Shrubs generally greater than 0.5 m tall with individuals or clumps overlapping to not touching, generally forming more than 25% of cover with trees generally less than 25% of cover. Shrub cover may be less than 25% where it exceeds forest, woodland, and herbaceous vegetation. Vegetation dominated by woody vines (i.e., blackberry) is generally included in this class.

Herbaceous: Herbs (graminoids, forbs, ferns and shrubs less than 0.5m tall) dominant, generally forming at least 25% of cover. Herbaceous cover may be less than 25% where it exceeds forest, woodland and shrubland vegetation. This includes shrubs less than 0.5 m tall.

Steep slopes: Land with a 25% or greater slope.

Riparian Corridors: Rivers, streams, wetlands and floodplains plus the areas bordering the waterbodies; the width of the riparian corridor varies by waterbody as well as the vegetation and slopes surrounding the waterbody.

Wildlife Habitat: Waterbodies, floodplain, land, vegetation and other features that support fish and wildlife during one or more life cycle phase; manmade features may provide wildlife habitat.

Special Habitat Areas: Designated by the City of Portland in accordance with Metro's Urban Growth Management Functional Plan Title 13, Nature in Neighborhoods, areas that contain or support special status species, sensitive/unique plant populations, or other unique natural or manmade habitat features.

D. Resource Site Boundaries

Statewide Land Use Planning Goal 5 requires local jurisdictions to establish resource sites within which the natural resources are inventoried and the ESEE analysis is performed. OAR 660-023-0010 defines resource site, or site, as “a particular area where resources are located. A site may consist of a parcel or lot or portion thereof or may include an area consisting of two or more contiguous lots or parcels.”

Portland established resource sites through the previously adopted conservation and protection plans. This project is remapping resource site boundaries to be more consistent and easier to implement.

The resource sites were remapped in the following way:

- E. The previous resource site boundaries were used to the maximum extent practicable. The intent is to maintain consistency between the past plans and this project.
- F. Resource site boundaries were expanded to capture contiguous or similar and adjacent natural resource features.
- G. Resource site boundaries were expanded to eliminate unnecessary gaps between resource sites.
- H. Very small resource sites, with similar natural resource features and functions, were consolidated into one single larger resource site.
- I. Resource site boundaries were adjusted to include entire properties within a single resource site. In some cases, adjacent lots under the same ownership may be in different resource sites; however, in these situations the resource site boundary follows lot lines.
- J. Centerlines of streets, bridges, railroad tracks or other transportation facilities are often used to delineate resource site boundaries.
- K. The City Boundary or Urban Service Boundary is used along the edges of Portland to provide the outer edge of resource sites.

E. Results

The results begin with a description of the Johnson Creek natural resources generally. The general description is applicable to each resource site. Following the general description are results for the resource sites. For each resource site the following information is provided:

1. Inventory of Natural Resources – The quantity and quality of natural resource features, such as streams miles or acres of forest, based on the Natural Resources Inventory methodology (Appendix B), Wetland Inventory Project (Appendix C) and site visits is presented. A description of the natural resources is also provided.
2. Determination of Significance – Statement of which natural resources are significant for purposes of State Land Use Planning Goal 5.
3. Resource Site-Specific ESEE – Additional analysis addressing site-specific conditions resulting in a decision for the resource site. The decision may confirm, clarify or modify the general ESEE recommendation found in Volume 2.
4. Maps
 - A. Zoning – base zones
 - B. Water Features – rivers, streams, wetlands and flood areas
 - C. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes, Special Habitat Areas
 - D. Riparian Corridors – natural resource features providing one or more riparian corridor functions
 - E. Wildlife Habitat – natural resource features providing one or more wildlife habitat functions
 - F. Determination of Significance – Goal 5 significant natural resources
 - G. ESEE Decision – where to strictly limit, limit and allow conflicting uses in areas of significant natural resources

Skyline West Natural Resources

The Northwest Hills forest protects and conserves important resources such as watersheds and soils. Forest vegetation moderates the effects of winds and storms, stabilizes and enriches the soil, and slows runoff from precipitation, thereby minimizing erosion and allowing the forest floor to filter out sediments and nutrients as the water soaks down into groundwater reserves or passes into streams. By decreasing runoff and increasing groundwater infiltration, the forest protects downstream neighborhoods from flooding. Also, by stabilizing the soil and reducing runoff and erosion, the forest protects the community from landslides and other land hazards.

By protecting watershed resources in this manner, the forest also protects habitat for terrestrial and aquatic organisms. The different layers of tree tops, branches, trunks, shrubs and plants on the forest floor provide breeding, feeding and refuge areas for many species of insects, birds and mammals. The forest canopy helps to maintain stream flows, filter out potential pollutants and moderate stream temperatures, thereby sustaining viable habitat for fish, amphibians and aquatic organisms as well as providing an important upland water source for terrestrial wildlife. Also, by filtering out water pollutants, the forest maintains good quality drinking water for local residents who use wells. The ability of these diverse and interdependent elements of the forest community to function properly is an important measure of the general health and vitality of the local environment. A healthy forest ecosystem is crucial to the forest's value as a scenic, recreational and educational resource, and to its continued contribution to Portland's high quality of life.

The forest provides additional values which accrue to local landowners and broader segments of society. The dense, coniferous and deciduous forest acts as a buffer from the sights and sounds of the large urban metropolis. The forest mutes the noise of highways and nearby industrial activities and absorbs some air pollutants caused by auto and industrial emissions. The forest also moderates climate extremes. The microclimate of the forest, created in part by the shade of the vegetation and the transpiration of water from the leaves, keeps surrounding air at an even temperature. The forest thus acts as a natural "air conditioner" for adjacent residential areas, cooling the air during the day and warming it at night.

Geology

Portland has been the site of a series of spectacular geologic events dating back 22 million years. These events have included some of the largest lava and water floods on the face of the earth (Price 1987).

The major events leading to the formation of the Portland Hills (Tualatin Mountains) began sixteen million years ago during the Miocene period. Volcanic fissures far to the east of Portland began discharging hundreds of cubic miles of molten lava which flowed through an ancient Columbia River Gorge, flooding the Willamette River Basin region. The solidified lava, known today as Columbia River Basalt, covered the Scappoose Formation, a siltstone and shale deposit which had formed 22 million years ago when the Portland area was submerged under marine waters. Today, after millions of years of weathering, the basalt measures roughly 700 feet in depth below the West Hills (Houle 1988).

Geologic disturbances continued through the late Miocene period, when the present-day Cascade and Coast Ranges were formed. At the same time, a large upheaval of Portland's basalt base created the Tualatin Mountain ridge and simultaneously formed the Portland and Tualatin valleys. The valley floors settled over the course of several million years until, in the Pliocene period, their basins breached,

forming eddies in the Columbia River into which large quantities of quartzite and granite river rock were deposited. Today these deposits, known as the Troutdale Formation, cover the original basalt layer along the lower half of the West Hills and provide an excellent aquifer (Price 1987). Later in the Pliocene period, the West Hills became volcanically active. Small volcanoes along the Tualatin Mountain ridge began erupting Boring Lava, evident today in the form of a grey basalt found at several sites along the West Hills.

The last major activity affecting The soils of the Northwest Hills area were formed through the deposition of up to 100 feet of Portland Hills Silt at elevations above 600 feet. This silt was eroded from the Columbia River flood plain, carried down the gorge, and finally wind-deposited on the West Hills. In the more recent geological past, silt and sand (alluvium) deposits formed along the Willamette River flood plain.

The presence of Portland Hills Silt along the Tualatin Mountains has important implications for land use and development. The silt becomes very unstable when wet and the potential for slope failure is particularly high after winter rains have saturated the soil. Landslides, mud slides, and slumps are common on steep areas in the West Hills. These slope failures, often associated with logging and building activities, have substantially altered the face of the hillside over the last century.

Soils

Soils in Northwest Hills belong to the Goble-Wauld series as identified in the Multnomah County Soil Survey (Soil Conservation Service 1983). This soil group is comprised predominantly of silt and gravel loams high in volcanic ash weathered from the parent material, Columbia River Basalt.

Approximately 75 percent of the study area is made up of Goble soils. The soil is dark, greyish brown silt loam to a depth of about 14 inches, below which a silty clay loam mixes with silt loam forming a yellowish brown, mottled fragipan at a depth of 30 to 48 inches. This fragipan is a hard, brittle soil layer with low permeability: a hardpan that impedes percolation of groundwater causing a thin groundwater table to develop, perched above the regional water table.¹ The fragipan restricts rooting depth for plants to 30 to 48 inches. The Goble silt loams have severe limitations for building site development and sanitary facilities.² According to the Soil Conservation Service (SCS), this means: "Soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, major soil reclamation, special designs, or intensive maintenance is required." (SCS 1983:98)

The Wauld soils are made up of gravelly loams and commonly occur on steep slopes along the larger drainages in the planning area. The top six inches of the soil are dark brown gravelly loam. Below the surface layer is a gravelly clay loam 24 inches thick, which overlies basalt bedrock at a depth of 30 inches. Soil permeability is moderate and effective rooting depth is 20 to 40 inches. The Wauld soils also have severe limitations for building site development and sanitary facilities.

The soils along the broad, rolling slopes of the Tualatin Mountain ridge are classified as Cascade silt loam, an associate of the Goble-Wauld soils. The soil's top layer is a dark brown silt loam which overlies a dark brown, mottled, silt loam fragipan at a depth of 20 to 30 inches. Permeability is slow and effective rooting depth is limited by the fragipan layer.

¹ Perched water tables in the West Hills normally develop during the fall, winter and spring seasons.

² Public sewers only serve properties along St. Helens Road; most areas rely on on-site septic systems.

The Willamette River lowlands are dominated by silty alluvium deposits and are largely urbanized (i.e., covered by structures, paved, or otherwise altered). Sauvie silt loam occurs at the north end of the study area, near the mouth of the Multnomah Channel. The Sauvie soils are hydric and are subject to frequent flooding between the months of December and June. During May and June, the water table is within 12 inches of the soil surface. This area is identified in the National Wetlands Inventory as palustrine wetlands of varying classes: emergent, scrub/shrub and forested wetlands.

Topography and Slopes

The eastern face of the Tualatin Mountain range is highly dissected by creeks (and creek channels) flowing northeast to the Willamette River. The lowland area between the Willamette River and St. Helens Road is flat with elevations ranging from 30 to 40 feet mean sea level (msl). Climbing southwest from St. Helens Road, the hillside slopes become steep before leveling off near the ridgetop along Skyline Boulevard. Elevations range between 900 and 1,180 feet msl along the crest of the Tualatin Mountains.

The principle creeks and secondary ridges descend from the main Tualatin Mountain ridge northeast to the Willamette River lowlands, creating a marked dichotomy between northwest- and southeast-facing slopes which can reach a gradient of 50 percent or more locally.

A physiographic inventory of Portland (Redfern 1976) classified slopes in excess of 30 percent as generally having "severe landslide potential."3 Between 90 and 95 percent of the upland slopes within the study area exceed 30 percent. Slopes of only 15 percent have been known to fail in the West Hills, particularly during the saturated soil conditions in mid-winter (Redfern 1976). In determining areas with "severe landslide potential," Redfern included slopes of less than 30 percent which had a history of failures (e.g., major slumps and landslides).

Surface Water

Surface water resources within the study area were identified using USGS topographic and National Wetlands Inventory maps, aerial photos, and field reconnaissance. The "Portland Storm Drainage Study" (BSE 1982) was consulted for information on drainage systems and flood history. Drainage basin areas were calculated using a planimeter.

There are approximately 25 miles of perennial and intermittent creeks within the project study area. All but one of the creeks drain east/northeast into the Willamette River; Miller Creek drains into the Multnomah Channel near the channel's juncture with the Willamette. The largest three of the creeks, Saltzman, Doane and Miller, have drainage areas of 972, 770 and 763 acres, respectively.

Most of these creeks as intermittent riverine systems; portions of Saltzman, Doane and Miller Creeks however are classified as upper perennial (high gradient, fast water velocity, year round flow). As described earlier, all the creek channels have steep to moderately steep gradients which result in high flow velocities and a relatively large capacity for sediment transport and erosion.

Associated with the creeks are several palustrine wetlands formed principally as a result of mining and roadway excavations, beaver damming activity, and natural depressions in the uplands and along the Willamette River flood plain. The NWI mapping identifies a large forested wetlands and smaller emergent and scrub/shrub wetlands near the juncture of the Multnomah Channel and the Willamette. Four miles south, a remnant of Doane Lake (the lake was bisected by railway embankments) is also

identified as a palustrine wetlands. Three additional palustrine wetlands were identified through field reconnaissance: an emergent and scrub/shrub wetland at the abandoned Rivergate quarry site on St. Helens Road and two small emergent and forested wetlands near the Newton Road parking lot off of Skyline Boulevard.

Surface water drainage between the crest the Tualatin Mountains and St. Helens Road is primarily through natural channels. Small sewers located in the Linnton area are exceptions. Most of the creeks pass through culverts under St. Helens Road and the Burlington Northern Railroad and from there enter natural channels, ditches, concrete flumes or sewers, or a combination of these systems before flowing into the Willamette River.

Most recorded flood events in the plan area have occurred along St. Helens Road. Flooding of Doane and Saltzman Creeks, and near N.W. 35th and N.W. 105th Avenues occurs on a regular, if not annual, basis.

Aquatic Environment

Data on aquatic habitat resources were gathered on field visits between February, 1990, and January, 1991. On August 9, 1990, two biologists assisted Planning Bureau staff with a survey of aquatic habitats in several creeks within the study area. On August 15, 1990 a fisheries biologist from the Oregon Department of Fish and Wildlife (ODFW) and planning staff conducted fish sampling surveys in Saltzman and Miller Creeks using a backpack electro-fisher. Additional data was collected from relevant published sources.

The palustrine wetlands at the mouth of the Multnomah Channel support an abundance of aquatic and terrestrial fauna. Most of the creeks and creek tributaries flowing through the study area are cool, well-shaded, and well-aerated freestone aquatic systems. Miller and Saltzman Creeks, and at least three smaller unnamed creeks, were found to have persistent flows during August, 1990, after 40 days without measurable rainfall. Of the creeks with persistent flow, Miller was found to support the greatest variety of aquatic life. The data on aquatic habitat resources for Miller Creek are described in the resource sites.

Vegetation

Information of plant communities, successional patterns and general vegetation resources was compiled from several sources. Data on vegetation types, distribution and resource values was gathered through aerial photointerpretation and on-site reconnaissance. Field surveys were conducted throughout the study area between February 1990, and January, 1991. Current scientific literature on the subject was consulted during this time, with primary sources including *Natural Vegetation of Oregon and Washington* (Franklin and Dyrness 1973), *Flora of the Pacific Northwest* (Hitchcock and Cronquist 1973), "Forest Park--One City's Wilderness: Its Wildlife and Habitat Interrelationships" (Houle 1982), and "Portland Bureau of Planning Goal Five Study: West Hills" (Lev 1986).

The eastern slopes of the Tualatin Mountains are clothed by coniferous forest of the *Tsuga heterophylla* (western hemlock) vegetation zone.¹⁰ This zone extends throughout the wet, mild, maritime climate of British Columbia, western Washington and Oregon. A vegetation zone, as defined by Franklin and Dyrness (1973), delineates a region of essentially uniform macroclimatic conditions with similar moisture and temperature gradients where one plant association predominates. The lowlands

immediately adjacent to the forest are part of the more prairie-like Willamette Valley Zone.³ Emergent, scrub-shrub and forested wetland plant communities reside along some of the creeks and in the palustrine wetlands that occur within the study area.

Western hemlock and western red cedar (*Thuja plicata*) are considered climax species within the Western Hemlock Zone based on their potential as dominants. The subclimax Douglas fir (*Pseudotsuga menziesii*), however, tends to dominate large areas within this region. Historically, Douglas fir has dominated forest regeneration over much of the zone in the last 150 years (Munger 1930, 1940).

While virtually all of the plants characteristic to the Western Hemlock Zone occur in the Tualatin Mountain forests, two less common hardwood species, bigleaf maple and red alder, have become widely established as a result of repeated disturbance to the natural vegetation caused by intensive logging and brush fires. Over time, these events have depleted nutrients from the soil. The depletion of nutrients, coupled with the depletion of mycorrhizal fungi which help to process nutrients for plant uptake and are particularly important to conifers, has given the hardwoods an edge over the firs, cedars and hemlocks. Pioneer species such as red alder, a species common only in riparian areas under natural conditions, quickly colonize these disturbed areas and are now widely established on the upland slopes.⁴ Thus, past disturbances have strongly influenced the composition of the plant communities in the Northwest Hills.

The *Tsuga heterophylla/Polystichum munitum* (western hemlock/sword fern) association generally characterizes the herb-rich community found in the Northwest Hills forests.⁵ Overstory species of this association typically include Douglas fir, western red cedar and western hemlock. The understory is dominated by a lush growth of herb species including sword fern, wild ginger, inside-out flower, Oregon oxalis, trillium, Smith's fairybells and deerfern. Shrubs occurring in the understory include red huckleberry, Oregon grape, trailing blackberry, Wood's rose and salmonberry (Franklin and Dyrness 1973:58).

While factors such as soils, slope aspect, moisture and topography have an important influence on plant associations within the Northwest Hills forest, the composition and distribution of most forest types can most clearly be traced to past logging activities and fires. Logging of the forests began with the arrival of the area were also recorded during this time. The last major fire, in August of 1951, burned some 1,200 acres of what had only three years earlier been dedicated as "Forest Park."

Early observations of Portland's Tualatin Mountains point to the dynamic pattern of successional stages active within the forest community over the past two centuries. The predominantly old growth coniferous forest that William Clark, of Lewis and Clark, recorded in 1806 has been transformed through

³ Differences in vegetation composition of the lowlands and uplands are pronounced; Douglas fir, for instance, a prominent component of the upland forest, is uncommon on the lowlands, where red alder, cottonwood, and willow species predominate. Because of the relatively small lowland area included in this study, inventories of lowland vegetation are presented in the resource site descriptions.

⁴ Red alder helps to heal degraded land by replenishing the soil with nutrients: they can provide 40-150 kg/ha of nitrogen per year. Alders also colonize sites that are plagued by laminated root rot and facilitate regeneration of the pre-existing plant community. Recent studies have shown that alders serve as hosts to mycorrhizal fungi, the same fungi which colonize Douglas fir roots, process nutrients and enable the trees to grow (Norse 1990).

⁵ Related West Hills plant associations include *Tsuga heterophylla/Berberis nervosa/Polystichum munitum*, *Tsuga heterophylla/Athyrium filix-femina*, *Tsuga heterophylla/Tiarella trifoliata*, *Tsuga heterophylla/Holodiscus discolor*, and *Tsuga heterophylla/Gaultheria shallon*.

logging and fire into a younger, mixed hardwood/coniferous forest (Munger 1960). Despite these disturbances, signs of a returning Western Hemlock climax forest community are widely apparent. A significant portion of the forest (over 60 percent) is presently composed of later seral vegetation stages, where young to mid-aged conifers rise above the maturing hardwood canopy (Houle 1982).

Thus, the forest types occurring in the Northwest Hills can be seen as a sequence of successional stages of forest regeneration following logging and fire. These stages closely parallel those of the Western Hemlock Zone as described by Franklin and Dyrness (1973) and Hall (1980). Six distinct successional stages are evident within the study area; their patchwork distribution reflects the location, degree and chronology of past disturbances.

Houle (1982) describes the stages of the West Hills forest succession as: grass-forb, shrub, hardwood with young conifer, hardwood topped by conifer, mid-aged conifer and old growth vegetation types (see Figure 2 below). One additional vegetation type, mature hardwood, is also recognized but is not related to the Western Hemlock Zone successional sequence. This type, making up ten percent of the study area, typically occurs in moist to wet areas at lower elevations although occasionally it is found on dryer, upland sites. The distinguishing characteristics of the mature hardwood type are the dense stands of bigleaf maple and red alder and the near absence of conifers.

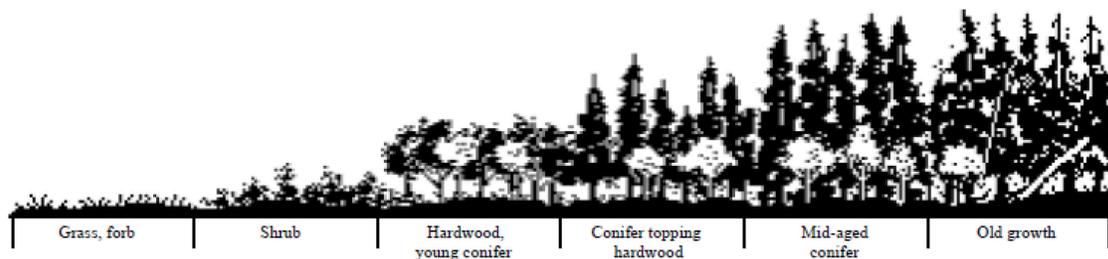


Figure 2. Stages of Northwest Hills forest succession

The grass-forb stage is comprised of low, herbaceous plants such as fireweed, bracken fern and Canadian thistle which initially colonize an area after removal of vegetation. This stage (two percent of the study area) lasts approximately two to five years and occurs along firelanes, power-line rights-of-way and in open fields along the crest of the hills and in lowland areas.

The early seral shrub stage often develops as a thicket of such species as thimbleberry, salmonberry, blackberry, red huckleberry, salal and Indian plum. This stage (5.5 percent of the study area) typically lasts between three and ten years, but will persist as long as 30 years in the absence of conifer regeneration.

The hardwood with young conifer stage is a young, vigorous broadleaf forest predominantly made up of red alder and big-leaf maple, though often includes bitter cherry, black cottonwood and juvenile Douglas fir. Understory species include sword fern, Oregon grape and red elderberry. This young, second growth forest usually occurs ten to 35 years following a disturbance and covers approximately 20 percent of the study area.

The fourth stage of succession, conifer topping hardwood, is still a vigorous, though now mixed, hardwood and conifer forest. While the alders and maples approach 100 feet in height during this stage, conifers, primarily Douglas fir, break through the hardwood canopy and grow to heights of 180 feet or more. Characteristic conifer species also include young western red cedar and western hemlock. This mixed stage of second growth forest follows 30 to 80 years after disturbance and is the most widely distributed vegetation type within the study area, covering approximately 38 percent.

The next successional stage, mid-aged conifer, occupies approximately 23 percent of the study area and is dominated by Douglas fir. Young, shade-tolerant western hemlock, western red cedar and pacific yew are gradually making their way up through the understory, while some of the older hardwoods such as alder and cherry are beginning to fall to the forest floor. Sword fern, salal, Oregon grape, red huckleberry and vine maple thrive as the older trees begin to fall. Eighty to 250 years have passed since the last major disturbance.

If the forest is left undisturbed following the *mid-aged conifer* stage, it progresses into an old growth forest community. The *old growth* stage is self-perpetuating and will continue indefinitely unless fire, logging or other disturbance sets back the forest to an earlier stage of succession. Though western hemlock and western red cedar are climax species, long-lived seral species can remain a component of the community for several hundred years. Remnant old growth stands in the Northwest Hills, for example, are dominated by Douglas fir. In addition to large trees of 250 or more years of age, the old growth stage is characterized by the presence of large snags and downed logs in various stages of decay. Old growth stands within the study area are rare; remnant stands occur in small isolated pockets, three to twelve acres in size, near Germantown, Newton and Newberry Roads. These old growth stands make up 0.5 percent of the study area.

Special Habitat Areas

The Tualatin Mountain forest is home to several special or unique flora features. The following discussion illustrates some of these features, others are described later in the report in connection with wildlife, scenic and educational resources.

The pacific yew (*Taxus brevifolia*), is an exceptionally slow growing climax tree species most abundant in ancient forests of the Pacific Northwest. In recent years, a cancer fighting substance known as "taxol" was discovered in the bark of the yew. Taxol has proven effective in fighting ovarian cancer and early results indicate that the substance may also prove effective for treating leukemia and colon, lung, mammary, prostrate and pancreatic cancers (Wood 1990, Norse 1990). In September, 1990, a petition was filed with the U. S. Fish and Wildlife Service to list the pacific yew as a threatened species under the Endangered Species Act.

Though virtually all of the forest clothing the Northwest Hills is second growth, a substantial proportion of it is mature enough to support rare saprophytic orchids such as the phantom orchid (*Eburophyton austinae*), fairy slipper (*Calypso bulbosa*), rattlesnake-plantain (*Goodyera oblongifolia*), and three coral root species (*Corallorhiza maculata*, *C. striata* and *C. mertensiana*). The western wahoo (*Euonymus occidentalis*) inhabits moist, creek side habitats in the Northwest Hills. The wahoo was placed on the "1976 Provisional List of Rare and Endangered Plants in Oregon." Its populations have now substantially recovered.

The forest as a whole represents a unique urban amenity. The West Hills provide a fine example of the Pacific Northwest's western hemlock forest community, unique among all temperate forests in the world (Waring and Franklin 1979).⁶ A large forested peninsula reaches into the center of Portland providing a biological link to the natural areas of the Coast Range. Located within this peninsula is one of the country's largest city parks: Forest Park. In addition to its value as a recreational, educational and scenic resource (discussed later in this report), the forested hills help to define Portland as a place and contribute to the identity of the region.

Wildlife

Resource experts and current scientific literature on the subject were consulted during this time, with primary sources including "Forest Park--One City's Wilderness: Its Wildlife and Habitat Interrelationships" (Houle 1982), "Portland Bureau of Planning Goal Five Study: West Hills" (Lev 1986) and *Management of Wildlife and Fish Habitats in Forests of Western Oregon and Washington* (USDA Forest Service 1985). Information on rare, threatened and endangered species was obtained from resource agencies.

Wildlife use different portions of the Northwest Hills forest habitat to complete different portions of their life cycle such as mating, feeding and denning. The vegetative structure of the habitat (e.g., owned logs, snags, herb, shrub and tree layers) is a key factor in determining the distribution and abundance of wildlife (Thomas 1979). Each stage of forest succession in the Northwest Hills has its own specific structure. Wildlife species have known preferences for structural components found in distinct successional stages and use these vegetative types to meet all or part of their life cycle requirements (Maser and Thomas 1978, Harris 1984). This map is based on information on vegetation types and surface water features which are described in previous sections of this chapter.

A broad range of terrestrial vertebrates use the forested riparian and upland habitats found in the Northwest Hills. At least eight different kinds of salamanders use the creekside habitat and moist uplands, where they feed on insects and other invertebrates such as slugs, and are prey to other amphibians (frogs), reptiles (snakes), birds (hawks), and mammals (weasels, raccoons). These local salamanders are dependent on a moist forested environment and cool water of good quality. The rare Cope's giant salamander is listed as a sensitive species in Oregon.

Five frog species are also dependent on the moist forested environment found in the Northwest Hills. These species feed on salamanders, insects and other invertebrates and are prey to many local snakes, birds and mammals. Significantly, both spotted and red-legged frogs have been identified along several of the creeks. These species are listed as threatened and sensitive, respectively. The presence of these native amphibians is of further significance because of the decline of amphibian populations worldwide due in part to predation (e.g., by bullfrogs) and to ultra-violet radiation. The spotted frog, for example, is believed to be close to extinction in Oregon (Lev 1986).

Several species of snakes and lizards are also found in the area. Undeveloped forest areas provide good breeding grounds for these non-poisonous, beneficial reptiles, serving as a source of replenishment to developed areas. Snakes are also an important source of food for birds of prey and carnivorous

⁶ The western hemlock forest of the Pacific Northwest has the greatest biomass accumulation of any plant community in the temperate zone and in it are found the largest and (usually) longest lived species of conifers within the zone.

mammals. The study area is on the western edge of the northwestern fence lizard's range. This species and the northern alligator lizard are likely to be found in woodlands and open places in the area.

Over 80 species of birds have been identified in the study area. Many of these species are year-round residents of the Northwest Hills forest. The mature conifer, conifer topping hardwood and old growth stages of the forest described in the previous section support the highest populations of breeding birds. The greater diversity of species in the later successional stages is generally due to the greater vegetation complexity found there. At least two sightings of adult bald eagles have been made in the study area. Other birds of prey include accipiter hawks such as Cooper's hawk and sharp-shinned hawk which rely on tall conifers for nest sites. Several nocturnal avian predators including screech, sawwhet and northern pygmy owls also occur in the Northwest Hills. These owls are cavity-nesters that rely on snags with holes excavated by pileated woodpeckers or flickers. The pileated woodpecker is an important indicator species for the retention of a complete community of hole nesting birds and small mammals (McClelland 1979). Most of these cavity-nesters are beneficial insectivores which help to control insect populations in the area; similarly, the birds of prey noted above help to control rodent populations. The pileated woodpecker, and the saw-whet and pygmy owls are all listed as sensitive species in Oregon. The Lewis woodpecker is uncommon and is considered threatened in Oregon.

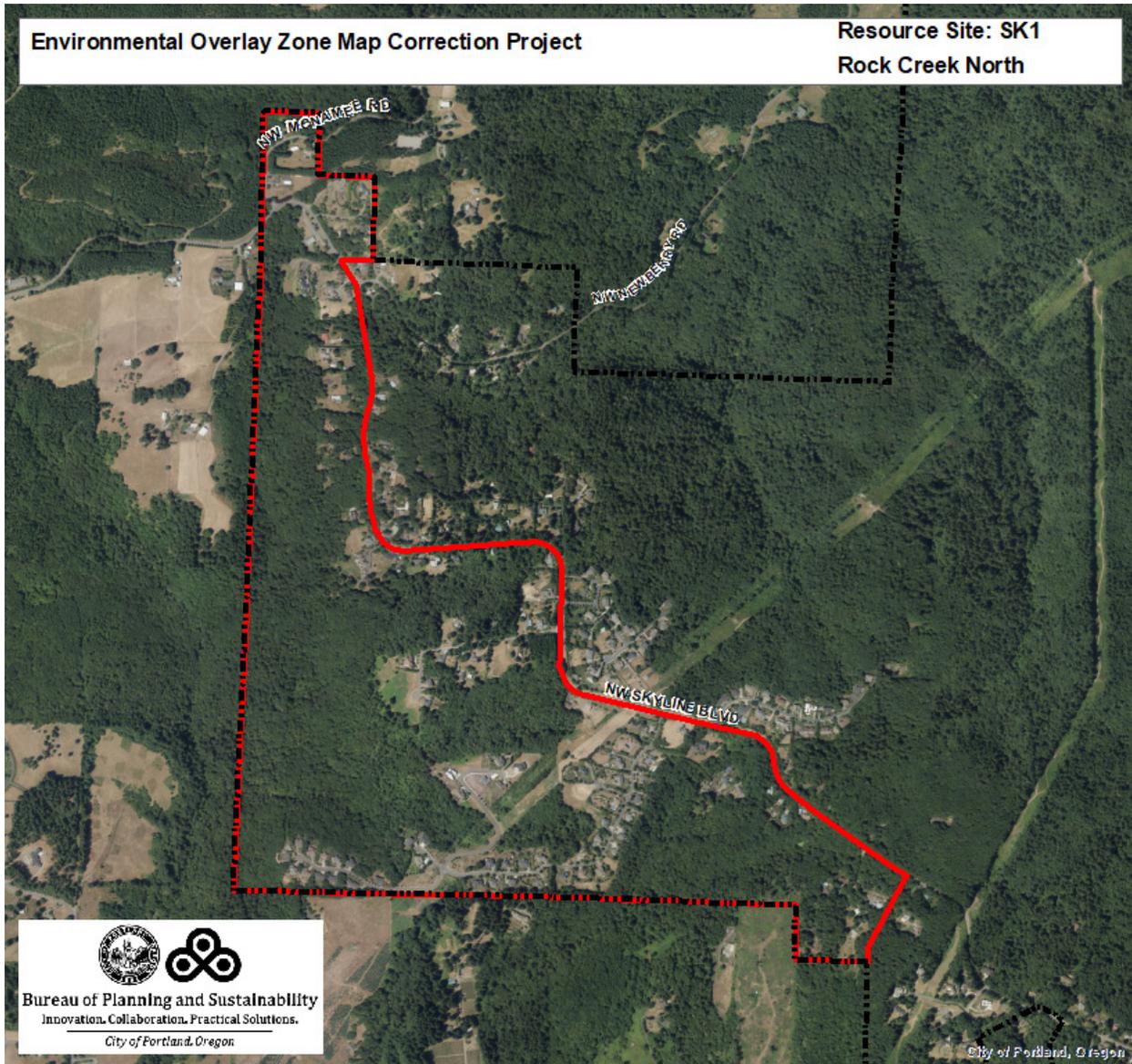
Wildlife biologists and forest managers often use the presence or absence of one or more "indicator species" to predict whether an area of habitat is suitable for a variety of species having similar habitat requirements (USDA Forest Service 1985). Several species serve as indicators of the health of the Northwest Hills ecosystem. The pileated woodpecker is one such species; other indicator species in the Northwest Hills are sharp-shinned hawk, Roosevelt elk, white-footed vole and red-legged frog.

Several migratory bird species, which typically nest at higher elevations or further north, use the Northwest Hills forest as an over-wintering ground due in part to the area's mild climate. Still other species, which migrate from Central and South America, use the forest as a stop-over and resting place on their journey along the Pacific Flyway. These birds (e.g., flycatchers, warblers, vireos, etc.) use prominent geographic landforms such as the western terminus of the Columbia Gorge and the confluence of the Willamette and Columbia Rivers to orient themselves when migrating. Many of these species are "forest-interior" birds that only use large forested areas, and the Northwest Hills provides the largest forest near the river confluence.

As many as 62 mammal species use the Northwest Hills forest habitat. These species include northern flying squirrel, Townsend's chipmunk, blacktailed deer, mountain beaver, bobcat, coyote and long tailed weasel. Tracks and droppings of black bear and cougar have also been observed in recent years. Many of the species found in the area are also found in the natural areas of the Oregon Coast Range. In addition to its habitat functions, the forested hills extend northwest from Portland toward the coast and serve as a travel corridor for wildlife, facilitating the seasonal and longer-term dispersal of individuals, thus maintaining genetic and biological diversity.

Resource Site No.: SK1 Resource Site Name: Rock Creek North

Previous Plan: Skyline West Conservation Plan **Previous Resource Site No.:** 143



Natural Resources Inventory

| Table A: Quantity of Natural Resource Features in Resource Site | | SK1 |
|---|-----------------------|-------------------|
| | | Study Area |
| Stream (Miles) | | 1.7 |
| Wetlands (acres) | | 2.2 |
| Vegetated Areas >= 1/2 acre (acres) | | 277.7 |
| | Forest (acres) | 204.8 |
| | Woodland (acres) | 17.9 |
| | Shrubland (acres) | 3.7 |
| | Herbaceous (acres) | 51.3 |
| Flood Area* | | 0.0 |
| | Vegetated (acres) | 0.0 |
| | Non-vegetated (acres) | 0.0 |
| Steep Slopes (acres)** | | 227.7 |
| Impervious Surface (acres) | | 26.4 |
| * The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area. | | |
| **Slopes are derived from LiDAR. Steep slopes are area with a slope greater than 25%. | | |

This is the rural outpost at the northwestern limits of Portland. Scattered single dwelling residences, agricultural uses, an old grange building and undeveloped woodlands border Skyline Blvd. as it meanders along the broad, rolling ridgetop. The site is long and fairly narrow, stretching between Skyline Blvd. and the western city limits, from NW Springville Rd. north to NW McNamee Rd.

This site marks the source, or headwaters, of two tributaries to Rock Creek. Rock Creek flows south and west into the Tualatin Valley until, near Beaverton, it merges with the Tualatin River. The bulk of the elevation change for the Rock Creek tributaries occurs in Portland and unincorporated Multnomah County. From a high point of 1,110 ft. at the southern boundary of the resource site, and 850 ft. at the northern boundary, the creeks drop to less than 200 ft. before entering Washington County two or three miles away. The upper basin location of this site provides a biological link to and exerts a significant influence upon downstream land and water resources. The site's location also serves as a ridgetop link between Portland's habitat areas and the natural areas to the northwest.

This site is a sensitive headwaters area and contains the source and upper reaches of two primary tributaries to Rock Creek. The total length of the creeks and associated drainages within the site is approximately four lineal miles. In addition to the riverine creek system, three palustrine wetlands are identified in the National Wetlands Inventory. One additional emergent wetland and other wetlands directly associated with the site's creeks were identified in the field inventory. As is common elsewhere on the west slope, the older and more diverse forest generally occurs within the broad ravines.

The site slopes from the ridge along Skyline southwest towards the Tualatin Valley. The topography ranges from gentle slopes along the ridgetop to precipitous ravine slopes exceeding 80 percent.

The site's creeks and associated tributaries, wetlands and ravines provide important forage, cover and nesting habitat for a variety of bird, mammal, amphibian and reptile species. The pileated woodpecker is a state-listed sensitive species identified within the site. The pileated is an important indicator species for the retention of a complete community of hole-nesting birds and small mammals (McClelland 1979). Most of these cavity-nesters are beneficial insectivores which help to control insect populations in the area. The pileated woodpecker is an indicator of the health of the Rock Creek watershed ecosystem.

The site's water features are important for a variety of reasons not least of which is their influence on downstream water quality and fish production. The Tualatin River system supports state-listed sensitive coho and fall chinook salmon, cutthroat trout, pacific lamprey and northern red-legged frog. The Tualatin River is also under a DEQ enforcement order requiring all jurisdictions within the watershed to take actions to improve water quality, including control of erosion and reduction of sediment and nutrient loads. Though the site's intermittent and upper perennial creeks are generally not inhabited by fish, they do provide primary habitat for amphibians and reptiles. Pacific tree frog, ensatina and pacific giant salamander, and roughskin newt are sensitive amphibians that rely on the moist, wooded areas of the site with cool water of good quality. Downed logs and woody debris are common at this site and provide important cover and food sources for amphibians and other wildlife. Several non-poisonous, beneficial reptiles also use the site, including the uncommon western fence lizard (open, rocky areas and forest edges), garter snakes (forest and edge areas), and turtles (ponds).

Among the more notable mammal species observed within the site are bobcat, grey fox and Roosevelt elk. Black-tail deer use both forest and edge habitat and are occasionally observed crossing Skyline Boulevard in the vicinity of the BPA power lines. As many as 70 bird species also use the site, including the pileated woodpecker, sharp shinned and red-tailed hawks, white-crowned and song sparrows, evening grosbeaks, Townsend's solitaire and Swainson's thrush. Several of these species depend on both wetland and upland habitat for survival; for example, the deer, bobcat, frogs, and forest bird species depend on either daily or seasonal shifts in habitat to forage, escape flooding or predation, and breed.

In addition to providing habitat for wildlife, the site's forest cover protects soil and watershed resources, and contribute to the rural character of the site. Some of the resource values include slope stabilization, dissipation of erosive forces, and sediment and pollutant removal. The forest helps to purify the air as well as the water, and provides shelter from storms and cold winds. The forest also adds to the scenic qualities of the area, giving it a semi-rural character.

The forest provides a good example of the Pacific Northwest's western hemlock forest community. This community is unique among all temperate forests in the world (Waring and Franklin 1979). This site contains the pacific yew (*Taxus brevifolia*), the bark of which contains a cancer-fighting substance known as taxol." Another important forest component found at the site is grand fir (*Abies grandis*), This tree and its later successional associates red cedar and hemlock are well established at the site.

The far northern portion of the site is composed primarily of Goble silt loam soils. This silt loam is high in volcanic ash weathered from the parent material, Columbia River Basalt. Because of steep slopes, a seasonal perched water table, slowly permeable fragipan and low bearing strength, this soil has severe limitations for building site development and sanitary facilities (Mult. Co. Soil Survey, 1983). The remainder of the site is composed of Cascade silt loam along the ridgetop, with a small inclusion of Cornelius silt loam at the intersection of Skyline and Germantown. These soils have similar limitations for development though with less precipitous slopes.

| Table B: Quality of Natural Resource Functions in Resource Site SK1 | | | | |
|---|-------------|---------------|------------|--------------|
| Resource Site (acres) = 330.159246 | | | | |
| | High | Medium | Low | Total |
| Riparian Corridors* | | | | |
| acres | 91.1 | 70.0 | 90.5 | 251.6 |
| percent total inventory site area | 27.6% | 21.2% | 27.4% | 76.2% |
| Wildlife Habitat* | | | | |
| acres | 207.6 | 3.5 | 0.0 | 211.1 |
| percent total inventory site area | 62.9% | 1.1% | 0.0% | 63.9% |
| Special Habitat Areas** | | | | |
| acres | | | | 0.0 |
| percent total inventory site area | | | | 0.0% |
| Combined Total⁺ | | | | |
| acres | 209.6 | 14.1 | 29.2 | 252.9 |
| percent total inventory site area | 63.5% | 4.3% | 8.9% | 76.6% |
| <p>* High-ranked riparian resources, Special Habitat Areas, and wildlife habitat include open water. ** Special Habitat Areas rank high for wildlife habitat. +Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.</p> | | | | |

Determination of Significance

Natural resource features mapped in the resource site that provide functions identified in the Natural Resources Inventory are determined to be significant (Map F). Within resource site SK1 the following significant features and functions are present:

Significant Natural Resource Features: open stream, wetlands, forest vegetation within 300 feet of waterbodies; forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies; woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; developed land within 50 feet of waterbodies; forest patches and associated and contiguous woodland patches two acres in size or larger; and Special Habitat Areas.

Significant Riparian Corridor Functions: microclimate and shade; stream flow moderation and water storage; bank function and sediment, pollution and nutrient control; large wood and channel dynamics; organic inputs, food web and nutrient cycling; and riparian wildlife movement corridor.

Significant Wildlife Habitat Functions: interior area; food and water; resting, denning, nesting and rearing; movement and migration; reduction of noise, light and vibration; and habitat patches that support special status wildlife species.

Resource Site Specific ESEE

The General ESEE analysis, Volume 2, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

Conflicting Uses

The common impact of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; add impervious surface; modifying streams and floodplains; generating pollution; landscaping with non-native or invasive vegetation; building fences or other wildlife barriers; and other impacts such as noise, light, litter and pets.

Within the resource site residential uses are allowed outright or conditionally in the RF base zones. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

ESEE Analysis

The analysis of economic, social, environmental and energy consequences provided in Volume 2 is confirmed for resource site SK1, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses generally would retain the riparian corridor and wildlife habitat functions of the significant natural resource features including maintaining habitat for at risk species, maintaining the flow moderation, water quality and flood control functions of streams and

wetlands, maintaining vegetation on steep slopes, and maintaining the stormwater management and air-cooling functions of the tree canopy. Mitigation for negative consequences of additional development in areas of high or medium ranked natural resources should be required. New or expanded development should be setback from a minimum distance streams and wetlands.

Steep slopes are susceptible to erosion and landslides. Development should be clustered away from steep slopes and trees and vegetation should be maintained to reduce the landslide risks. New or expanded development on steep slopes should be *limited*.

ESEE Decisions

Based on the ESEE general recommendations (Volume 2) and resource site-specific ESEE, the ESEE decisions for Resources Site SK1 are:

1. *Strictly limit* conflicting uses within stream channels from top-of-bank to top-of-bank, wetlands, land within 50 feet of stream top-of-bank and land within 50 feet of wetlands.
2. *Strictly limit* conflicting uses on specific dedicated natural resource tracts that are jointly owned by the Skyview HOA or the Parkridge HOA.
3. *Limit* conflicting uses within areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
4. *Limit* conflicting uses within areas of forest or woodland vegetation located on steep slopes and contiguous to but more than 50 feet from stream top-of-bank.
5. *Allow* conflicting uses within all other areas containing significant natural resources.

| Table C: ESEE Decision for Resource Site SK1 | |
|---|--------------|
| ESEE Decision | Acres |
| Strictly Limit | 102.4 |
| Limit | 103.6 |
| Allow | 124.2 |



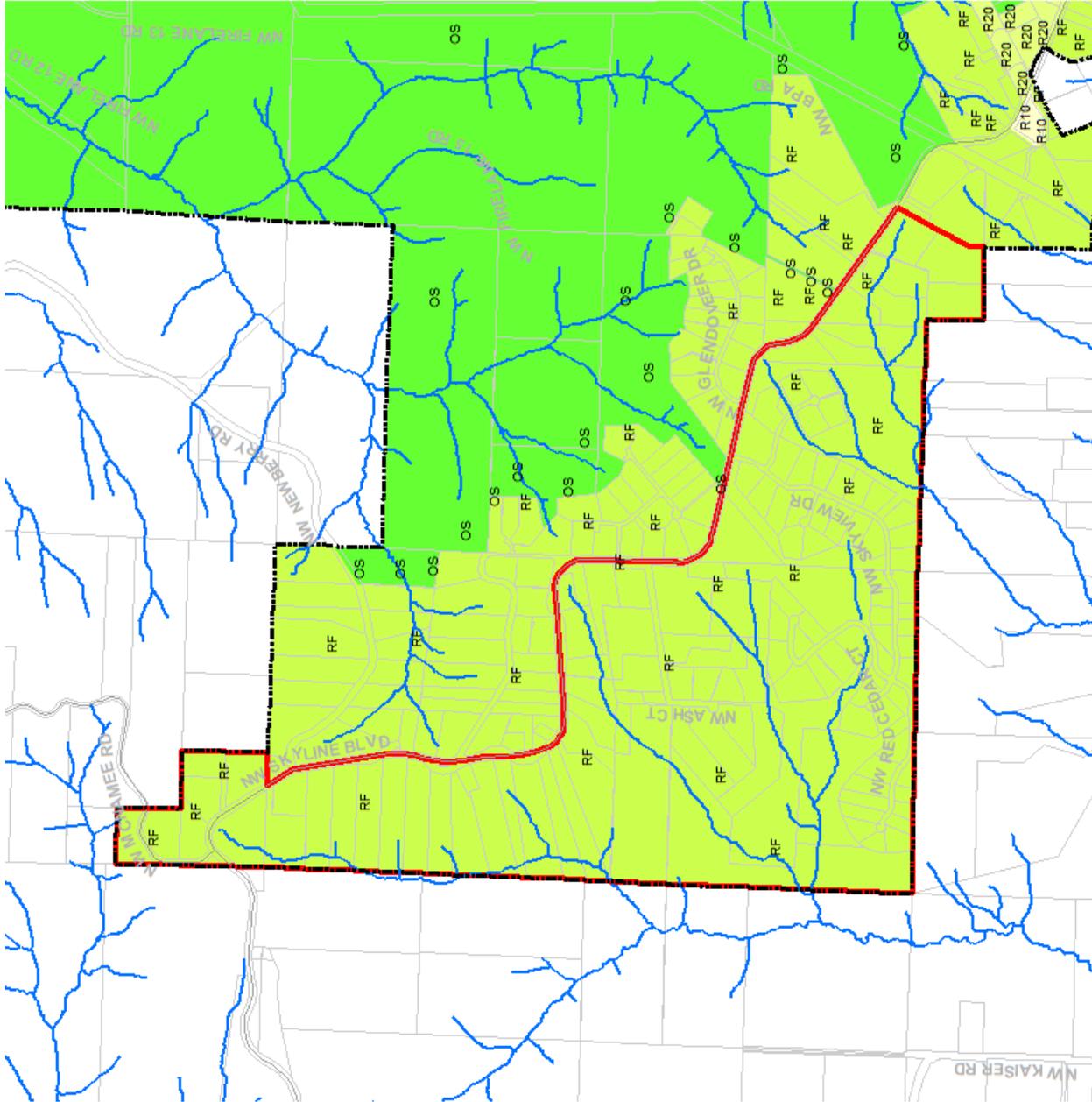
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**Resource Site: SK1
Rock Creek North**

Map A: Base Zones

- Resource Site
- Streams
- Taxlots
- City of Portland

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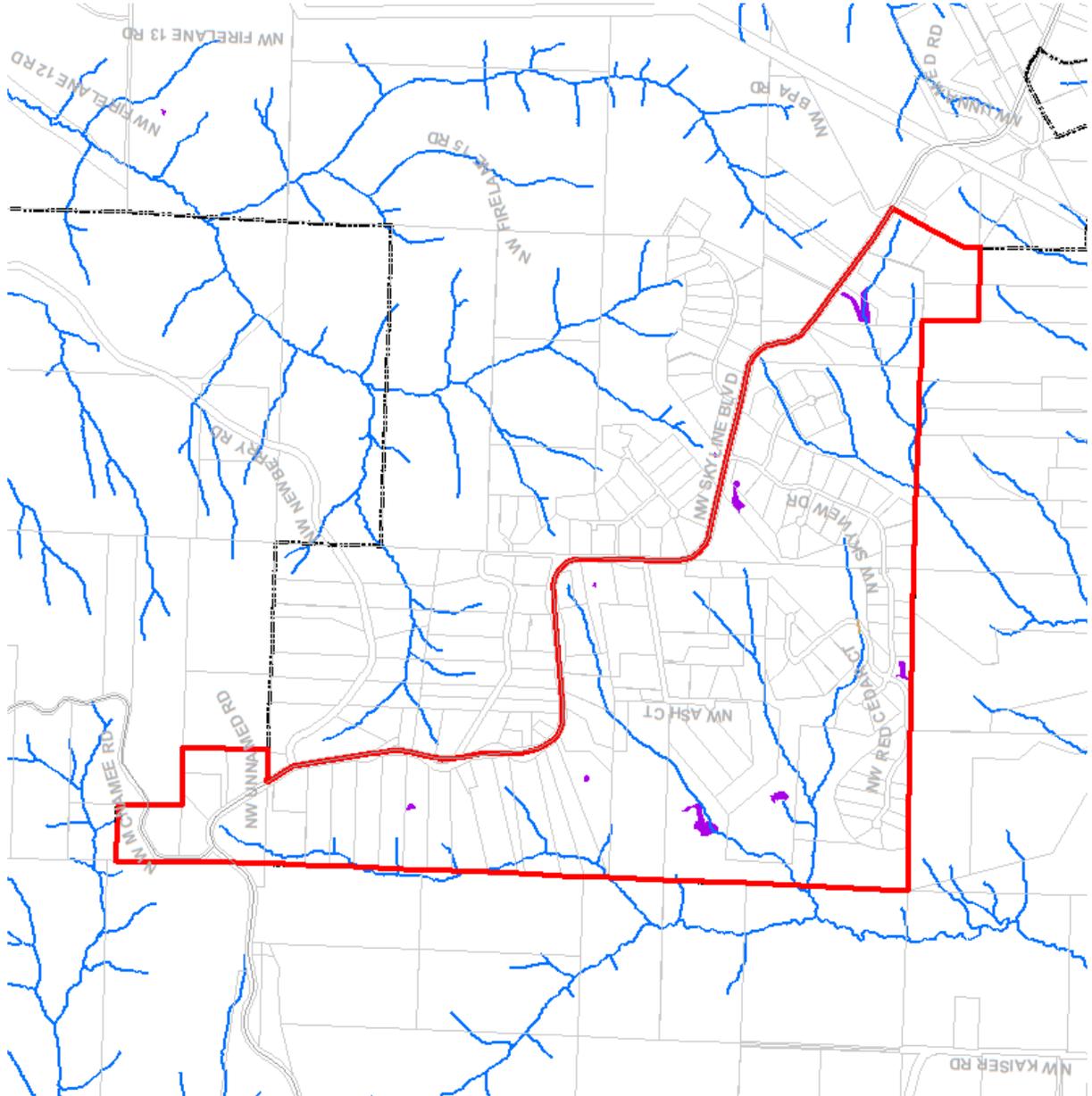


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Resource Site: SK1
Rock Creek North

Map B: Water Related Features

-  Resource Site
-  Open stream channel
-  Piped stream segment
-  Wetlands
-  Floodplain
-  Taxlots
-  City of Portland



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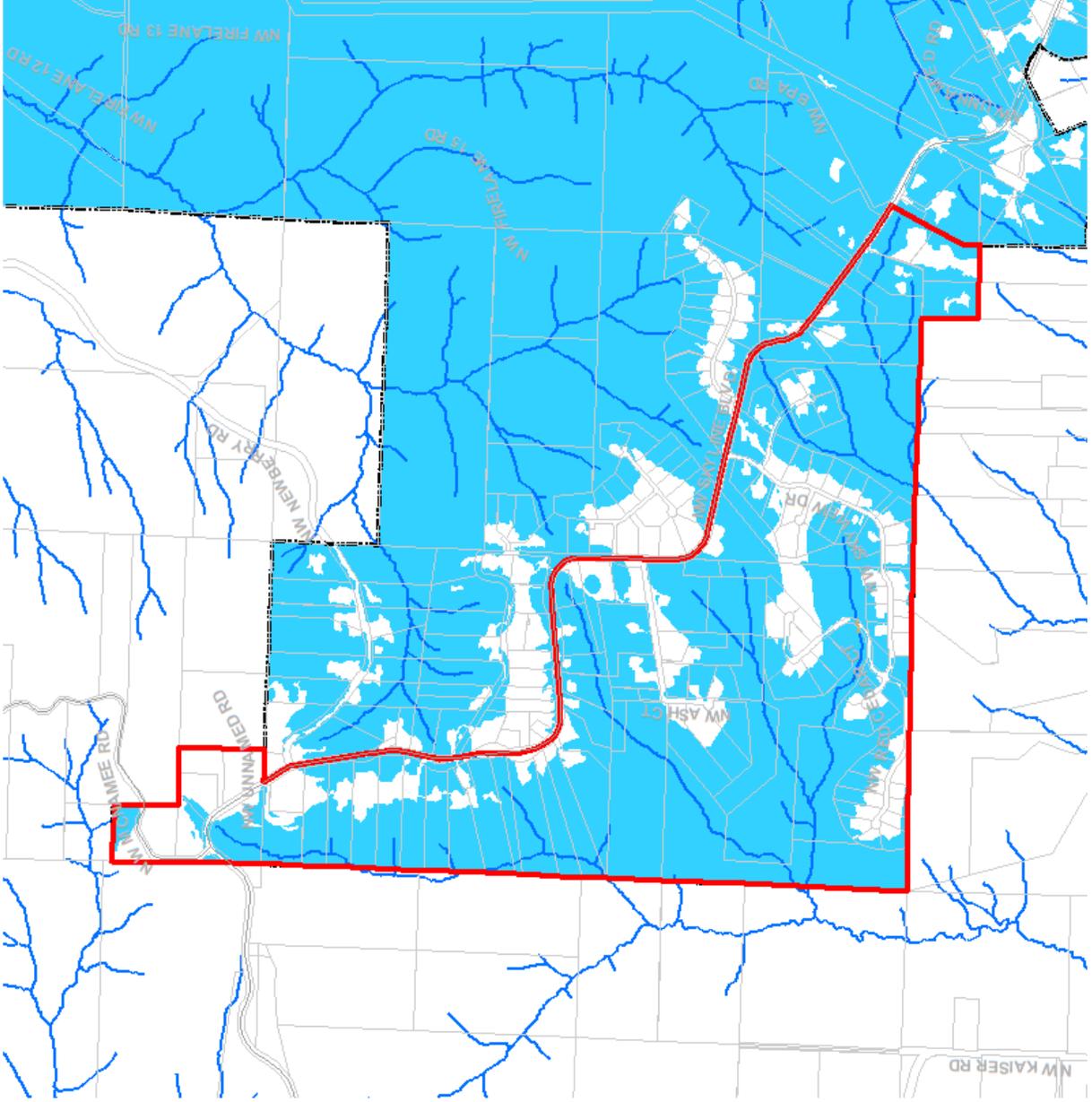
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**Resource Site: SK1
Rock Creek North**

**Map F: Determination of
Significance**

-  Resource Site
-  Significant natural resources
-  open stream channel
-  piped stream segment
-  Taxlots
-  City of Portland

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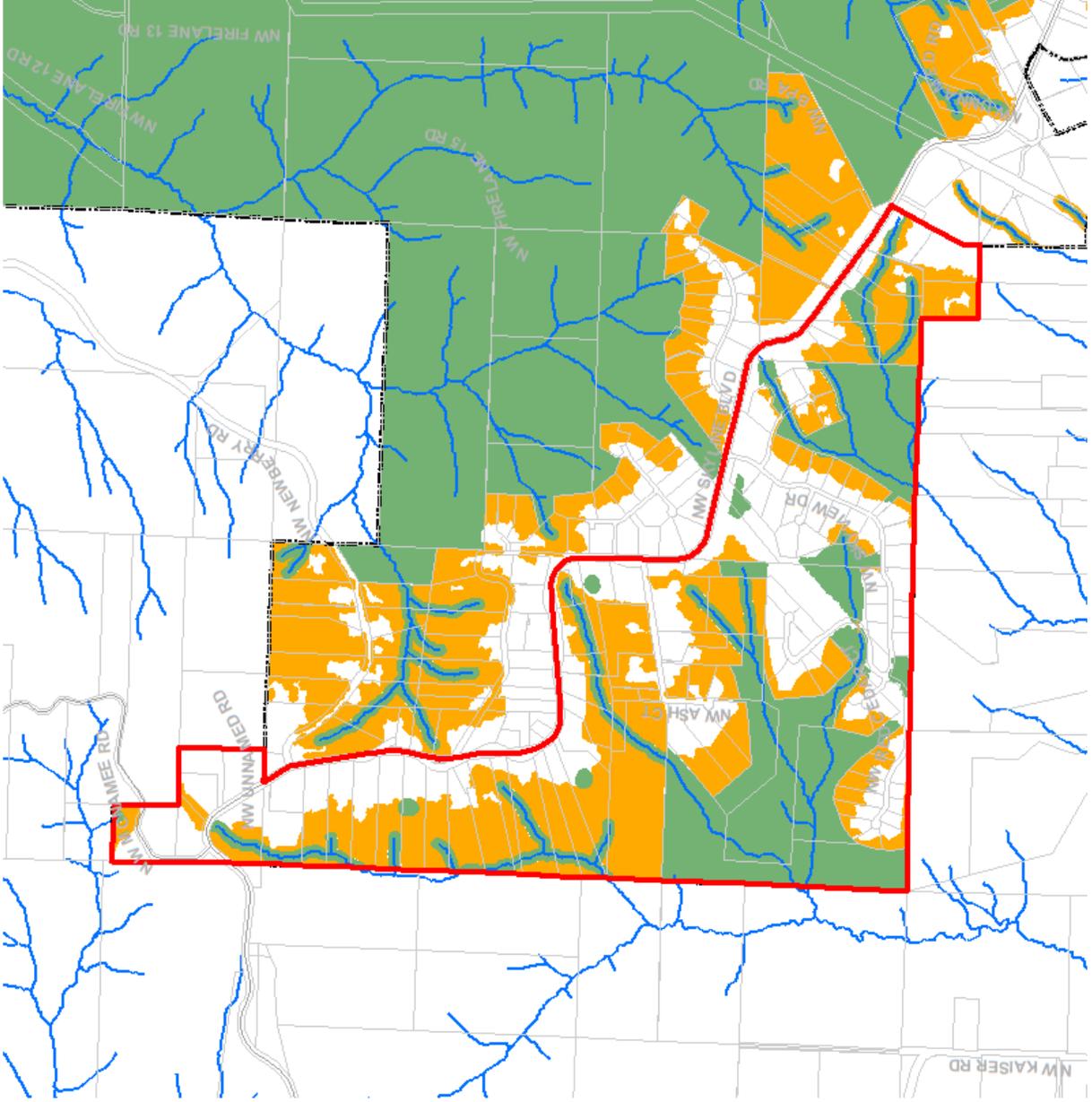
Resource Site: SK1

Rock Creek North

Map G: ESEE Decision

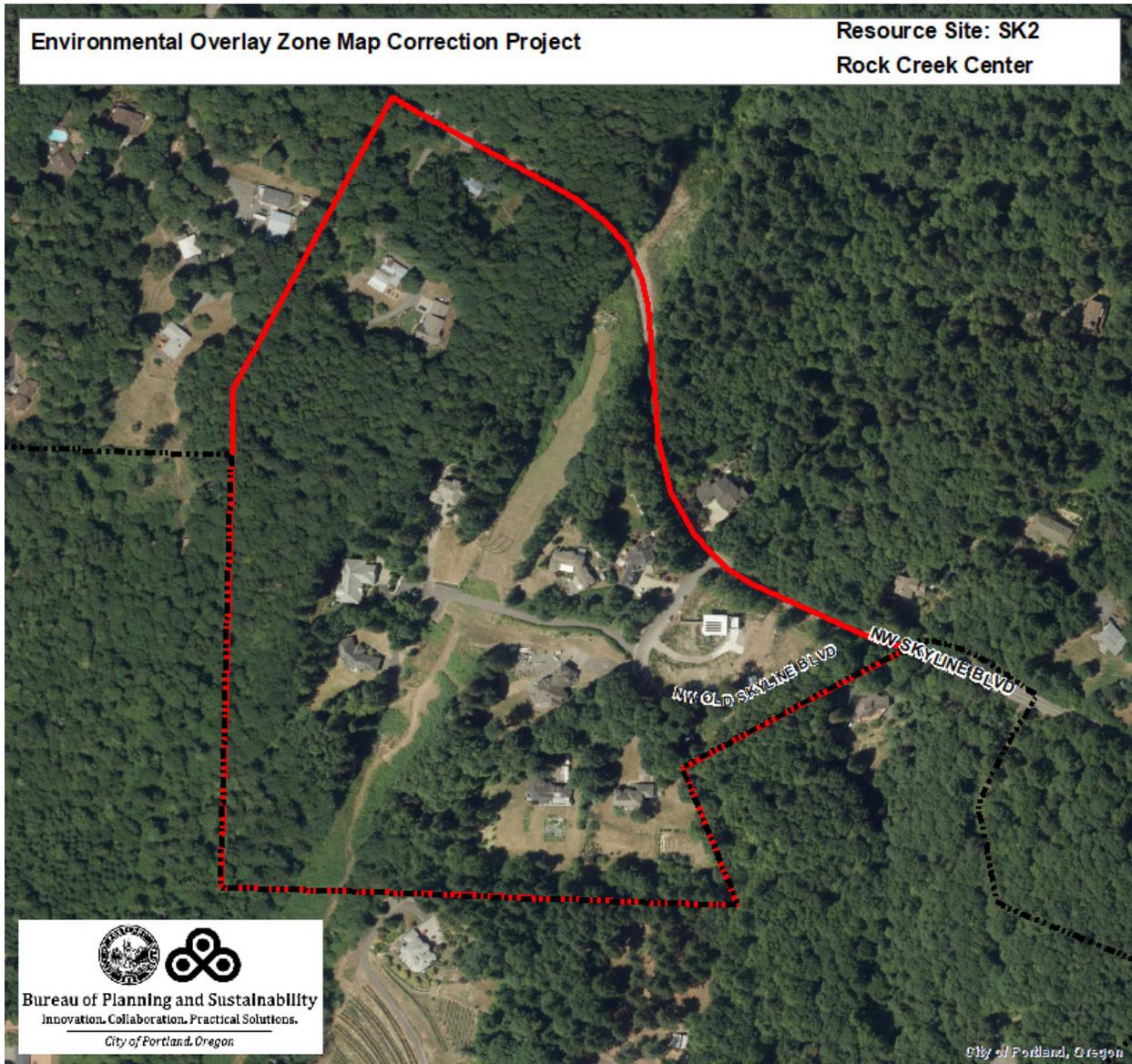
-  Resource Site
-  Limit conflicting uses
-  Strictly limit conflicting uses
-  open stream channel
-  piped stream segment
-  Taxlots
-  City of Portland

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Resource Site No.: SK2 Resource Site Name: Rock Creek Center

Previous Plan: Skyline West Conservation Plan Previous Resource Site No.: 143



Natural Resources Inventory

| Table A: Quantity of Natural Resource Features in Resource Site | | SK2 |
|---|-----------------------|-------------------|
| | | Study Area |
| Stream (Miles) | | 6.0 |
| Wetlands (acres) | | 0.0 |
| Vegetated Areas >= 1/2 acre (acres) | | 26.1 |
| | Forest (acres) | 13.4 |
| | Woodland (acres) | 6.8 |
| | Shrubland (acres) | 1.4 |
| | Herbaceous (acres) | 4.5 |
| Flood Area* | | 0.0 |
| | Vegetated (acres) | 0.0 |
| | Non-vegetated (acres) | 0.0 |
| Steep Slopes (acres)** | | 12.9 |
| Impervious Surface (acres) | | 5.6 |
| * The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area. | | |
| **Slopes are derived from LiDAR. Steep slopes are area with a slope greater than 25%. | | |

This is the rural outpost at the northwestern limits of Portland. Scattered single dwelling residences, agricultural uses, an old grange building and undeveloped woodlands border Skyline Blvd. as it meanders along the broad, rolling ridgetop. The site is long and fairly narrow, stretching between Skyline Blvd. and the western city limits, from NW Springville Rd. north to NW McNamee Rd.

This site marks the source, or headwaters, of two tributaries to Rock Creek. Rock Creek flows south and west into the Tualatin Valley until, near Beaverton, it merges with the Tualatin River. The bulk of the elevation change for the Rock Creek tributaries occurs in Portland and unincorporated Multnomah County. From a high point of 1,110 ft. at the southern boundary of The resource site, and 850 ft. at the northern boundary, the creeks drop to less than 200 ft. before entering Washington County two or three miles away. The upper basin location of this site provides a biological link to and exerts a significant influence upon downstream land and water resources. The site's location also serves as a ridgetop link between Portland's habitat areas and the natural areas to the northwest.

This site is a sensitive headwaters area and contains the source and upper reaches of two primary tributaries to Rock Creek. The total length of the creeks and associated drainages within the site is approximately four lineal miles. In addition to the riverine creek system, three palustrine wetlands are identified in the National Wetlands Inventory. One additional emergent wetland and other wetlands directly associated with the site's creeks were identified in the field inventory. As is common elsewhere on the west slope, the older and more diverse forest generally occurs within the broad ravines.

The site slopes from the ridge along Skyline southwest towards the Tualatin Valley. The topography ranges from gentle slopes along the ridgetop to precipitous ravine slopes exceeding 80 percent.

The site's creeks and associated tributaries, wetlands and ravines provide important forage, cover and nesting habitat for a variety of bird, mammal, amphibian and reptile species. The pileated woodpecker is

a state-listed sensitive species identified within the site. The pileated is an important indicator species for the retention of a complete community of hole-nesting birds and small mammals (McClelland 1979). Most of these cavity-nesters are beneficial insectivores which help to control insect populations in the area. The pileated woodpecker is an indicator of the health of the Rock Creek watershed ecosystem.

The site's water features are important for a variety of reasons not least of which is their influence on downstream water quality and fish production. The Tualatin River system supports state-listed sensitive coho and fall chinook salmon, cutthroat trout, pacific lamprey and northern red-legged frog. The Tualatin River is also under a DEQ enforcement order requiring all jurisdictions within the watershed to take actions to improve water quality, including control of erosion and reduction of sediment and nutrient loads. Though the site's intermittent and upper perennial creeks are generally not inhabited by fish, they do provide primary habitat for amphibians and reptiles. Pacific tree frog, ensatina and pacific giant salamander, and roughskin newt are sensitive amphibians that rely on the moist, wooded areas of the site with cool water of good quality. Downed logs and woody debris are common at this site and provide important cover and food sources for amphibians and other wildlife. Several non-poisonous, beneficial reptiles also use the site, including the uncommon western fence lizard (open, rocky areas and forest edges), garter snakes (forest and edge areas), and turtles (ponds).

Among the more notable mammal species observed within The resource site are bobcat, grey fox and Roosevelt elk. Black-tail deer use both forest and edge habitat and are occasionally observed crossing Skyline Boulevard in the vicinity of the BPA power lines. As many as 70 bird species also use the site, including the pileated woodpecker, sharp shinned and red-tailed hawks, white-crowned and song sparrows, evening grosbeaks, Townsend's solitaire and Swainson's thrush. Several of these species depend on both wetland and upland habitat for survival; for example, the deer, bobcat, frogs, and forest bird species depend on either daily or seasonal shifts in habitat to forage, escape flooding or predation, and breed.

In addition to providing habitat for wildlife, the site's forest cover protects soil and watershed resources, and contribute to the rural character of the site. Some of the resource values include slope stabilization, dissipation of erosive forces, and sediment and pollutant removal. The forest helps to purify the air as well as the water, and provides shelter from storms and cold winds. The forest also adds to the scenic qualities of the area, giving it a semi-rural character.

The forest provides a good example of the Pacific Northwest's western hemlock forest community. This community is unique among all temperate forests in the world (Waring and Franklin 1979). This site contains the pacific yew (*Taxus brevifolia*), the bark of which contains a cancer-fighting substance known as taxol." Another important forest component found at the site is grand fir (*Abies grandis*), This tree and its later successional associates red cedar and hemlock are well established at the site.

The far northern portion of the site is composed primarily of Goble silt loam soils. This silt loam is high in volcanic ash weathered from the parent material, Columbia River Basalt. Because of steep slopes, a seasonal perched water table, slowly permeable fragipan and low bearing strength, this soil has severe limitations for building site development and sanitary facilities (Mult. Co. Soil Survey, 1983). The remainder of the site is composed of Cascade silt loam along the ridgetop, with a small inclusion of Cornelius silt loam at the intersection of Skyline and Germantown. These soils have similar limitations for development though with less precipitous slopes.

| Table B: Quality of Natural Resource Functions in Resource Site SK2 | | | | |
|---|-------------|---------------|------------|--------------|
| Resource Site (acres) = 30.928518 | | | | |
| | High | Medium | Low | Total |
| Riparian Corridors* | | | | |
| acres | 4.1 | 6.7 | 12.7 | 23.5 |
| percent total inventory site area | 13.2% | 21.7% | 41.1% | 76.0% |
| Wildlife Habitat* | | | | |
| acres | 18.8 | 0.0 | 0.0 | 18.8 |
| percent total inventory site area | 60.9% | 0.0% | 0.0% | 60.9% |
| Special Habitat Areas** | | | | |
| acres | | | | 0.0 |
| percent total inventory site area | | | | 0.0% |
| Combined Total⁺ | | | | |
| acres | 19.4 | 0.4 | 3.7 | 23.5 |
| percent total inventory site area | 62.8% | 1.5% | 11.8% | 76.0% |
| <p>* High-ranked riparian resources, Special Habitat Areas, and wildlife habitat include open water. ** Special Habitat Areas rank high for wildlife habitat. +Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.</p> | | | | |

Determination of Significance

Natural resource features mapped in the resource site that provide functions identified in the Natural Resources Inventory are determined to be significant (Map F). Within resource site SK2 the following significant features and functions are present:

Significant Natural Resource Features: open stream; wetland; forest vegetation within 300 feet of waterbodies; forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies; developed land within 50 feet of waterbodies; forest patches and associated and contiguous woodland patches two acres in size or larger; and Special Habitat Areas.

Significant Riparian Corridor Functions: microclimate and shade; stream flow moderation and water storage; bank function and sediment, pollution and nutrient control; large wood and channel dynamics; organic inputs, food web and nutrient cycling; and riparian wildlife movement corridor.

Significant Wildlife Habitat Functions: interior area; food and water; resting, denning, nesting and rearing; movement and migration; reduction of noise, light and vibration; and habitat patches that support special status fish and wildlife species.

Resource Site Specific ESEE

The General ESEE analysis, Volume 2, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

Conflicting Uses

The common impact of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; add impervious surface; modifying streams and floodplains; generating pollution; landscaping with non-native or invasive vegetation; building fences or other wildlife barriers; and other impacts such as noise, light, litter and pets.

Within the resource site residential uses are allowed outright or conditionally in the RF and R10 base zones. Commercial uses are allowed in the CM1 base zone. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

ESEE Analysis

The analysis of economic, social, environmental and energy consequences provided in Volume 2 is confirmed for resource site SK2, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses generally would retain the riparian corridor and wildlife habitat functions of the significant natural resource features including maintaining habitat for at risk species, maintaining the flow moderation, water quality and flood control functions of streams and

wetlands, maintaining vegetation on steep slopes, and maintaining the stormwater management and air-cooling functions of the tree canopy. Mitigation for negative consequences of additional development in areas of high or medium ranked natural resources should be required. New or expanded development should be setback from a minimum distance streams and wetlands.

Steep slopes are susceptible to erosion and landslides. Development should be clustered away from steep slopes and trees and vegetation should be maintained to reduce the landslide risks. New or expanded development on steep slopes should be *limited*.

ESEE Decisions

Based on the ESEE general recommendations (Volume 2) and resource site-specific ESEE, the ESEE decisions for Resources Site SK2 are:

1. *Strictly limit* conflicting uses within stream channels from top-of-bank to top-of-bank, wetlands land within 25 feet of stream top-of-bank, and land within 50 feet of wetlands.
2. *Limit* conflicting uses within land between 25 and 50 feet of stream top-of-bank.
3. *Allow* conflicting uses within all other areas containing significant natural resources.

| Table C: ESEE Decision for Resource Site SK2 | |
|---|--------------|
| ESEE Decision | Acres |
| Strictly Limit | 1.3 |
| Limit | 1.5 |
| Allow | 28.1 |

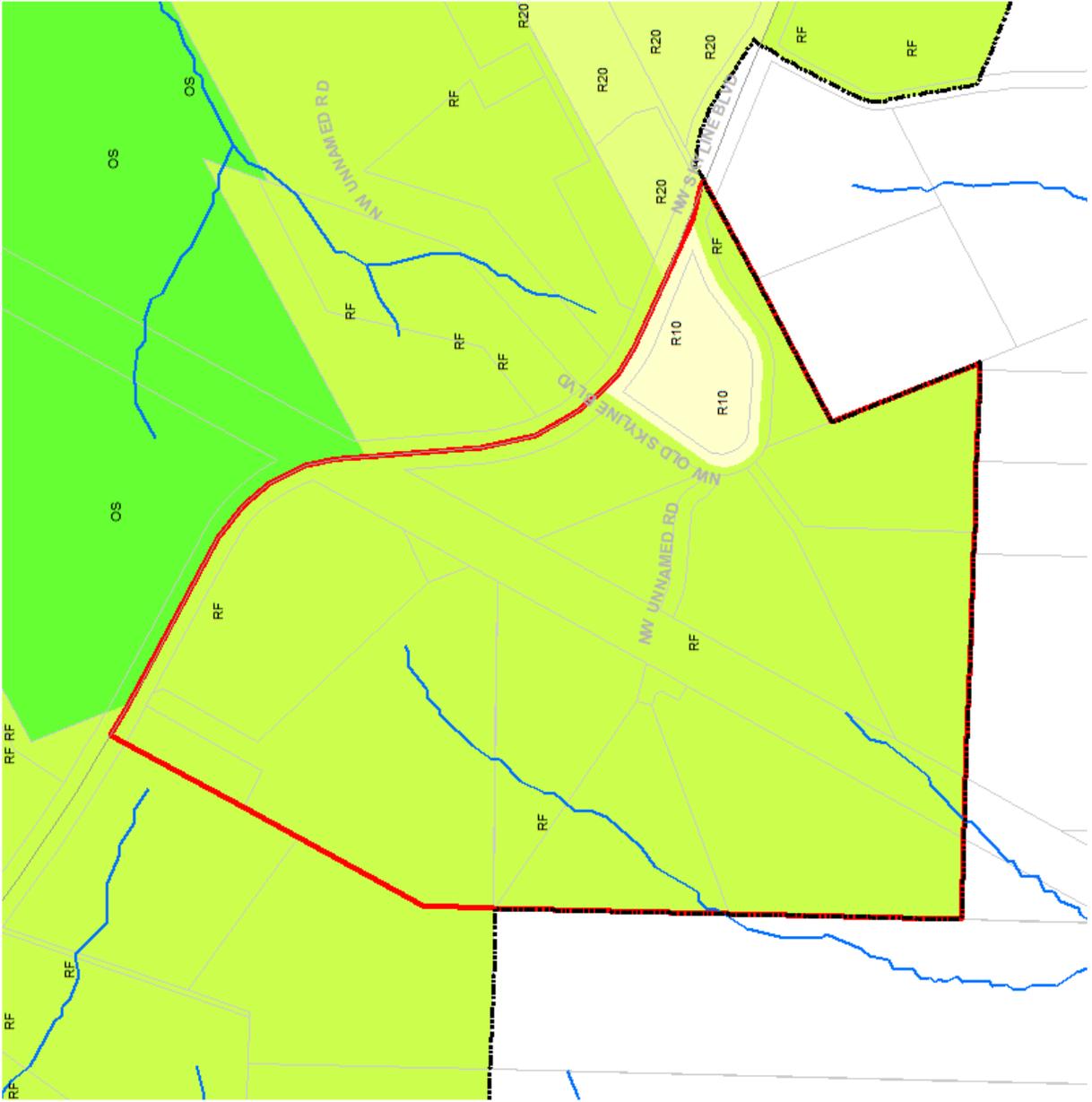


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**Resource Site: SK2
Rock Creek Center**

Map A: Base Zones

- Resource Site
- Streams
- Taxlots
- City of Portland



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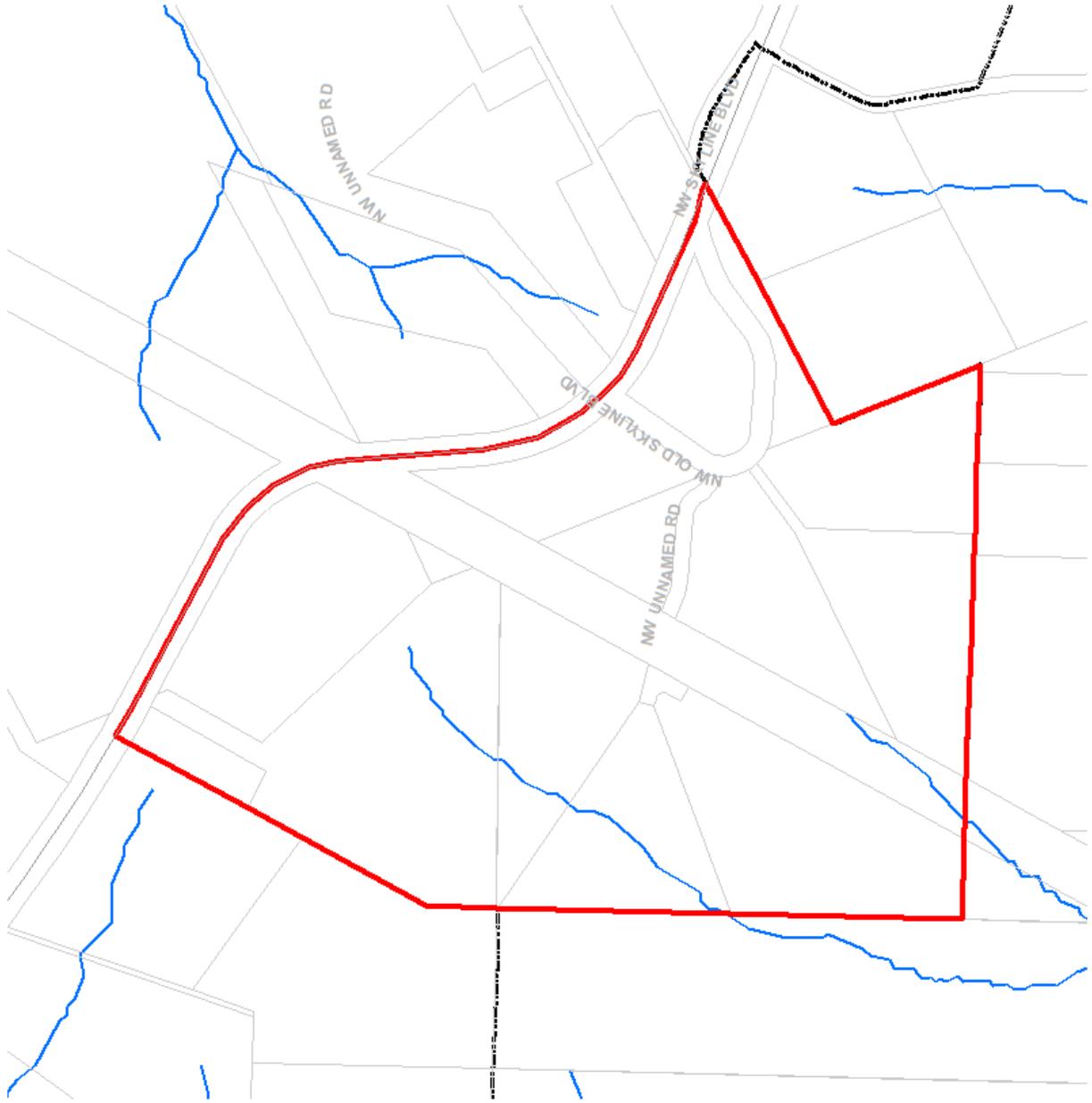


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**Resource Site: SK2
Rock Creek Center**

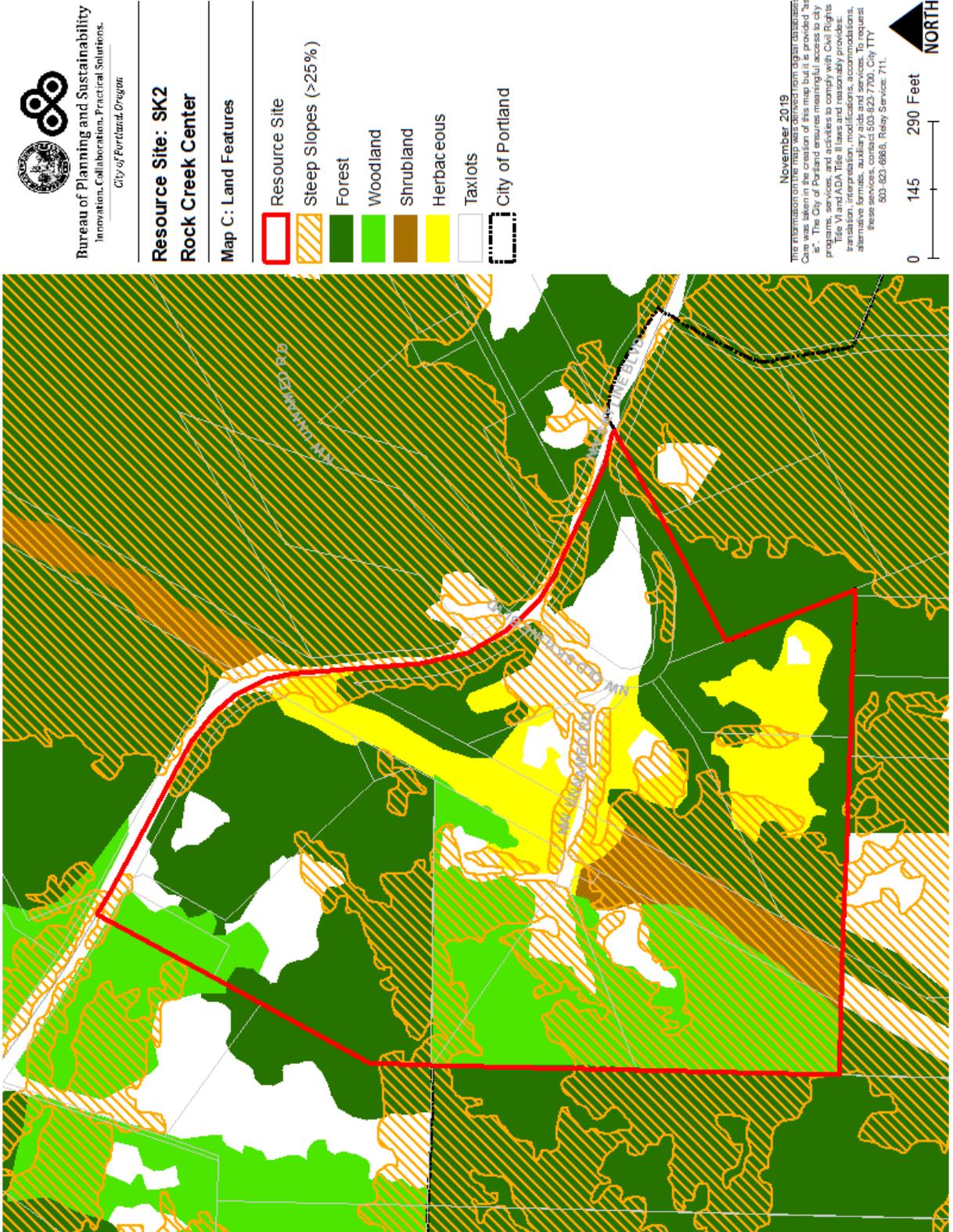
Map B: Water Related Features

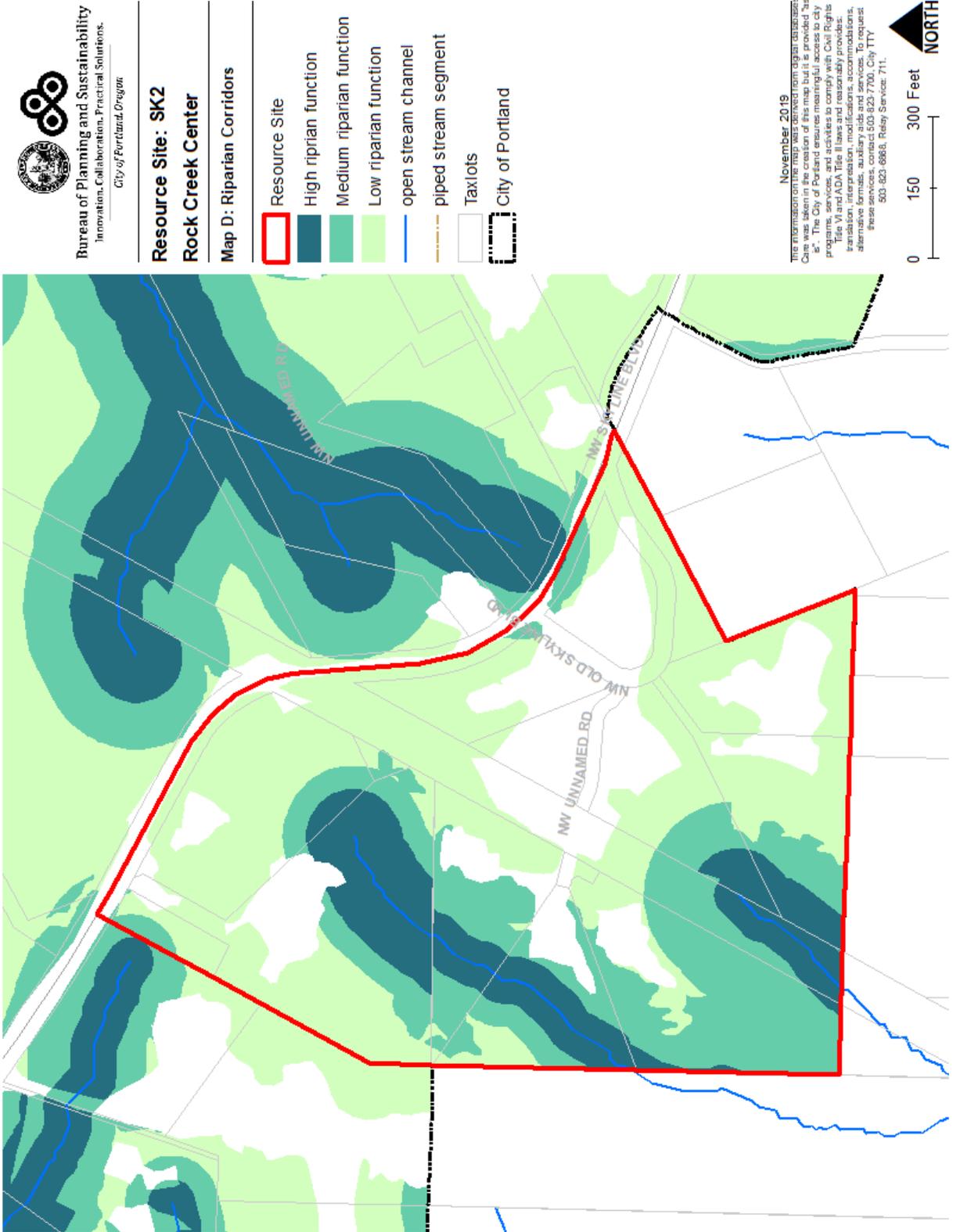
-  Resource Site
-  Open stream channel
-  Piped stream segment
-  Wetlands
-  Floodplain
-  Taxlots
-  City of Portland

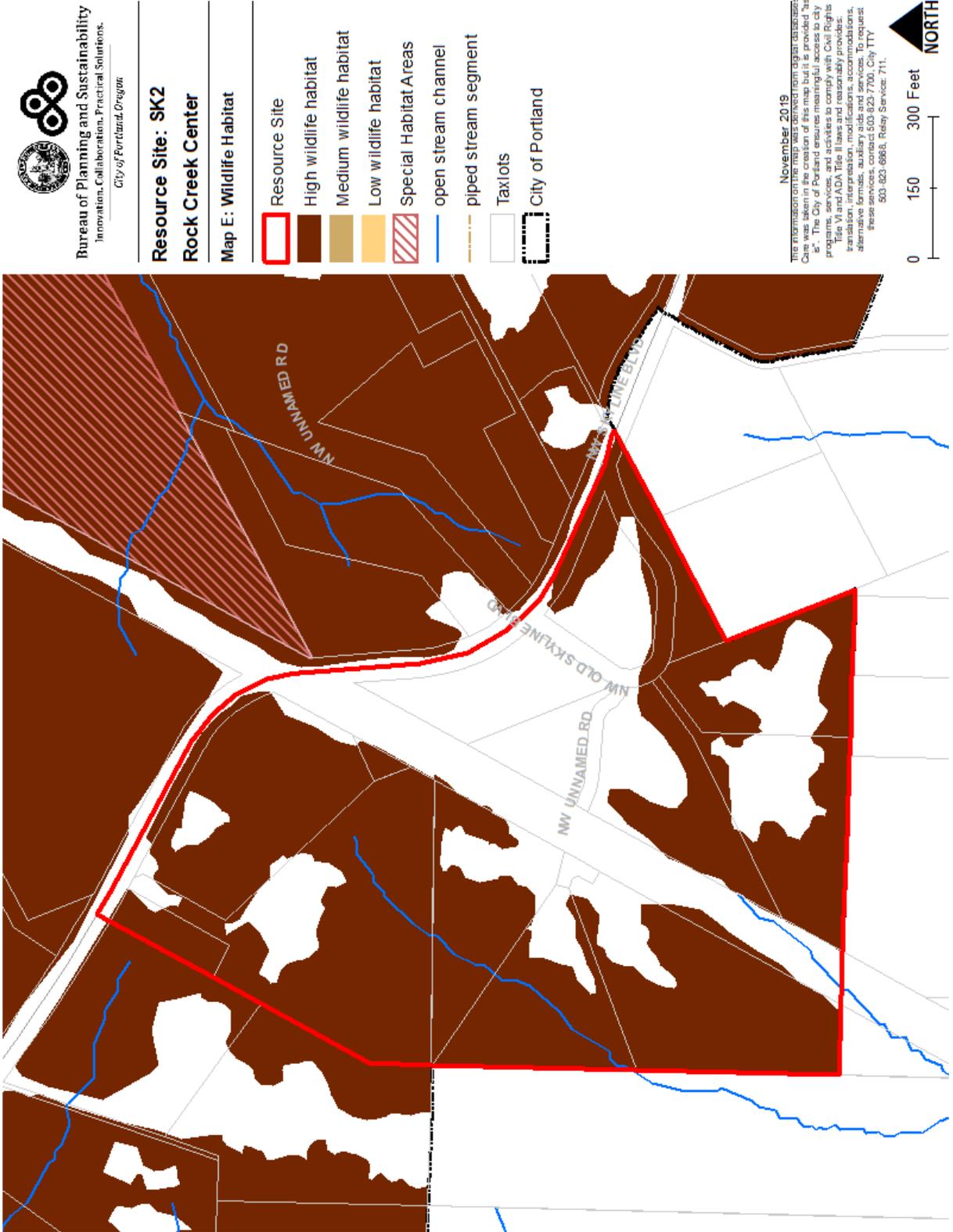


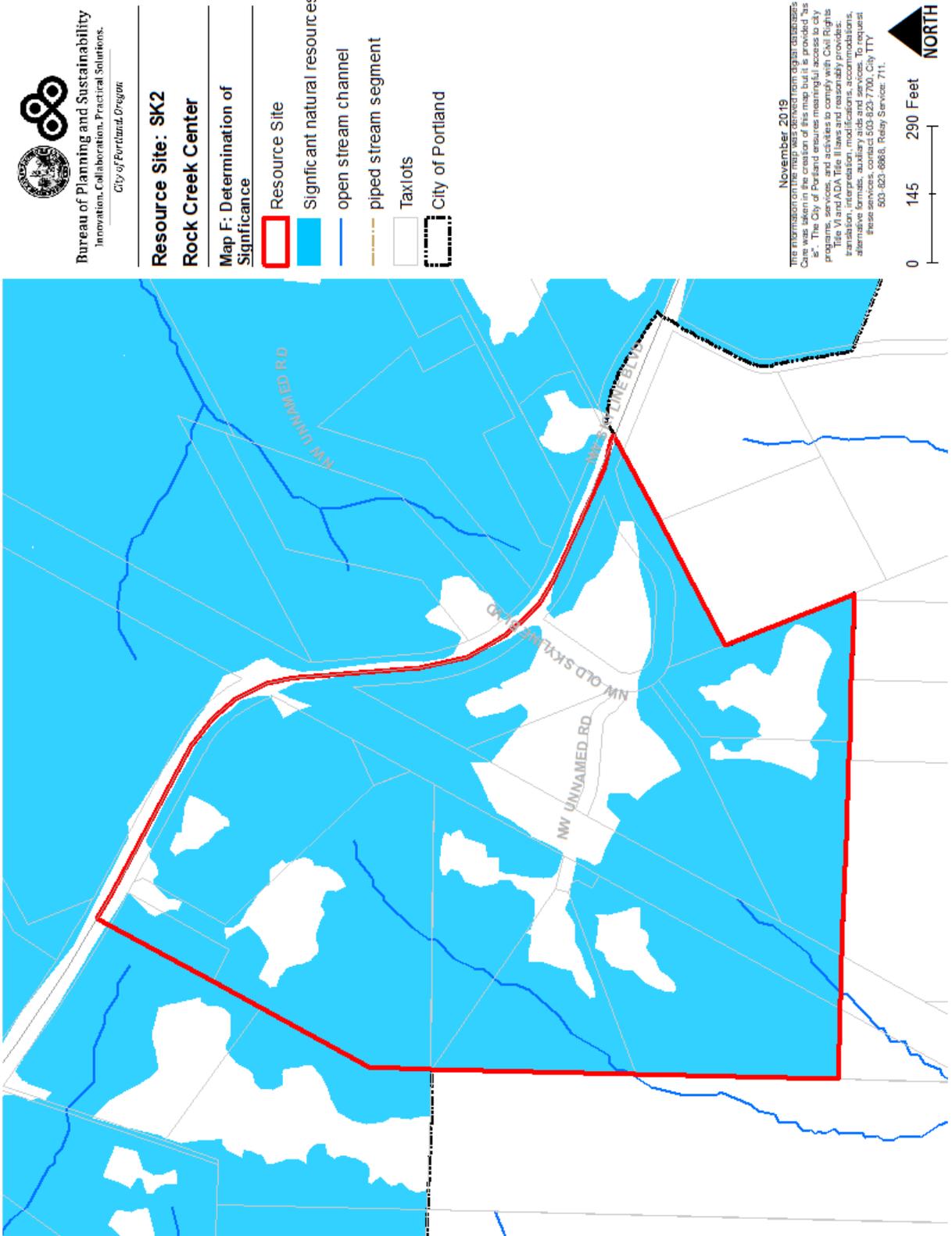
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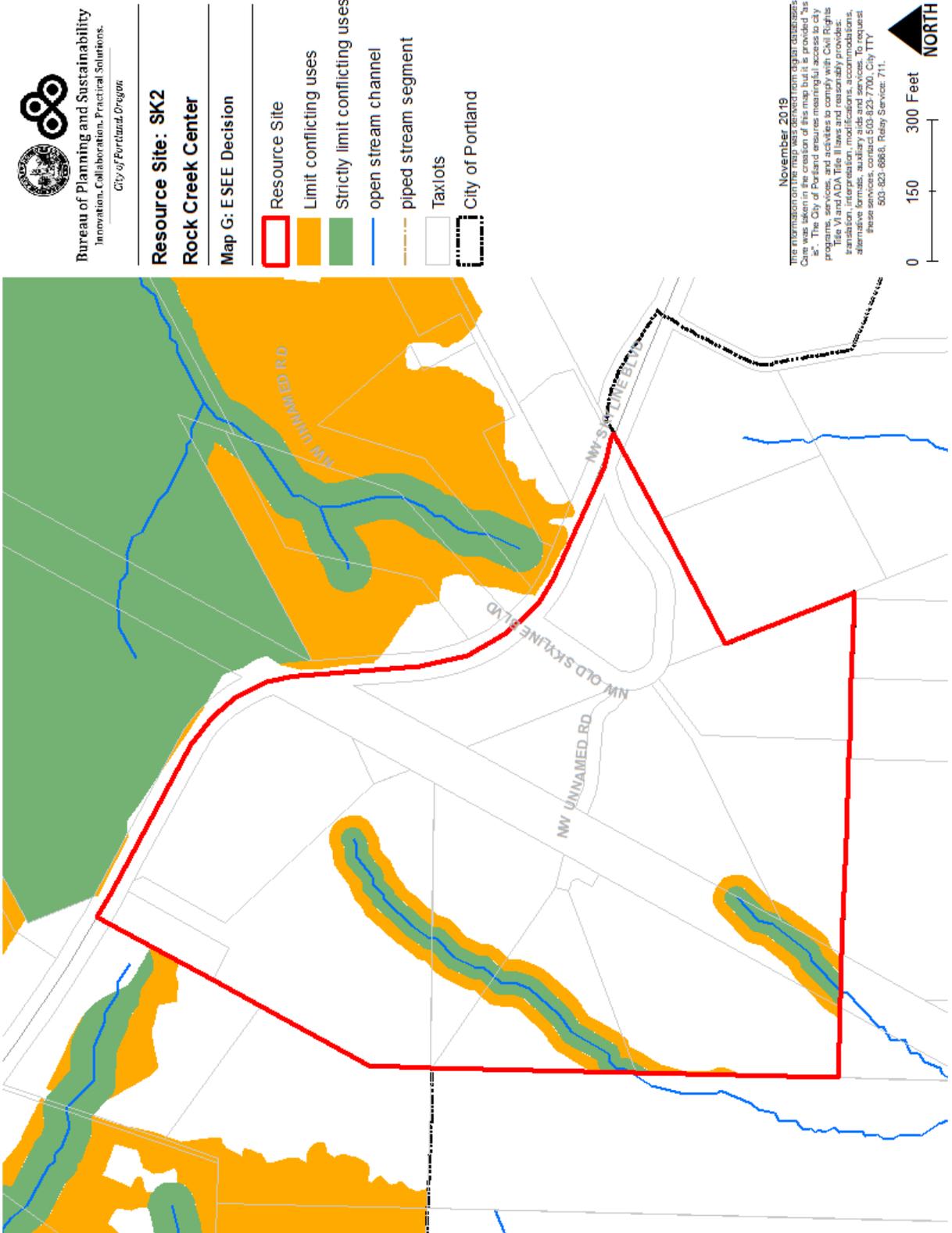






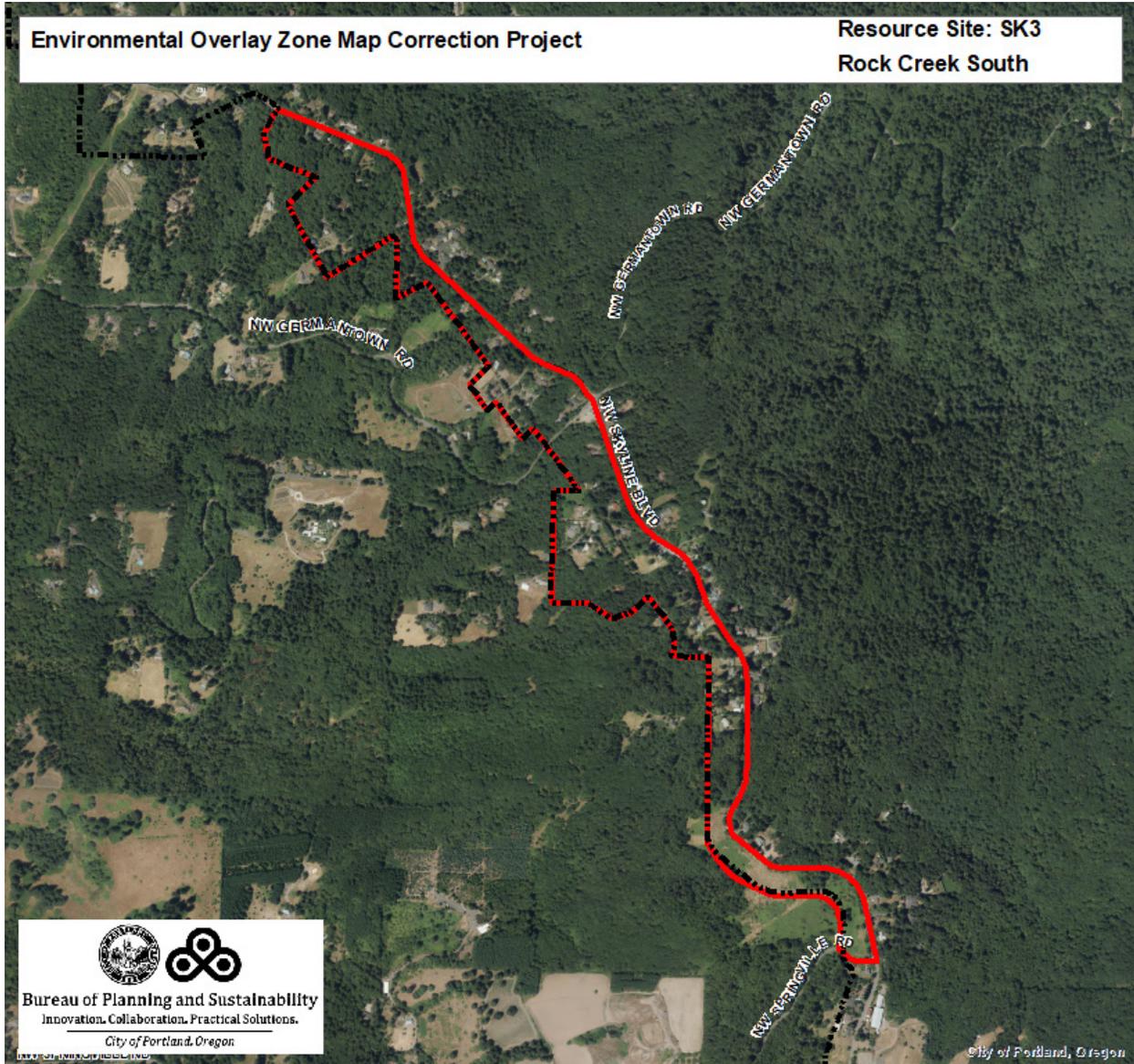






Resource Site No.: SK3 Resource Site Name: Rock Creek South

Previous Plan: Skyline West Conservation Plan **Previous Resource Site No.:** 143



Natural Resources Inventory

| Table A: Quantity of Natural Resource Features in Resource Site | | SK3 |
|---|-----------------------|-------------------|
| | | Study Area |
| Stream (Miles) | | 0.3 |
| Wetlands (acres) | | 0.1 |
| Vegetated Areas >= 1/2 acre (acres) | | 66.8 |
| | Forest (acres) | 51.7 |
| | Woodland (acres) | 1.4 |
| | Shrubland (acres) | 0.0 |
| | Herbaceous (acres) | 13.6 |
| Flood Area* | | 0.0 |
| | Vegetated (acres) | 0.0 |
| | Non-vegetated (acres) | 0.0 |
| Steep Slopes (acres)** | | 47.2 |
| Impervious Surface (acres) | | 13.6 |
| * The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area. | | |
| **Slopes are derived from LiDAR. Steep slopes are area with a slope greater than 25%. | | |

This is the rural outpost at the northwestern limits of Portland. Scattered single dwelling residences, agricultural uses, an old grange building and undeveloped woodlands border Skyline Blvd. as it meanders along the broad, rolling ridgetop. The site is long and fairly narrow, stretching between Skyline Blvd. and the western city limits, from NW Springville Rd. north to NW McNamee Rd.

This site marks the source, or headwaters, of two tributaries to Rock Creek. Rock Creek flows south and west into the Tualatin Valley until, near Beaverton, it merges with the Tualatin River. The bulk of the elevation change for the Rock Creek tributaries occurs in Portland and unincorporated Multnomah County. From a high point of 1,110 ft. at the southern boundary of the resource site, and 850 ft. at the northern boundary, the creeks drop to less than 200 ft. before entering Washington County two or three miles away. The upper basin location of this site provides a biological link to and exerts a significant influence upon downstream land and water resources. The site's location also serves as a ridgetop link between Portland's habitat areas and the natural areas to the northwest.

This site is a sensitive headwaters area and contains the source and upper reaches of two primary tributaries to Rock Creek. The total length of the creeks and associated drainages within the site is approximately four lineal miles. In addition to the riverine creek system, three palustrine wetlands are identified in the National Wetlands Inventory. One additional emergent wetland and other wetlands directly associated with the site's creeks were identified in the field inventory. As is common elsewhere on the west slope, the older and more diverse forest generally occurs within the broad ravines.

The site slopes from the ridge along Skyline southwest towards the Tualatin Valley. The topography ranges from gentle slopes along the ridgetop to precipitous ravine slopes exceeding 80 percent.

The site's creeks and associated tributaries, wetlands and ravines provide important forage, cover and nesting habitat for a variety of bird, mammal, amphibian and reptile species. The pileated woodpecker is

a state-listed sensitive species identified within the site. The pileated is an important indicator species for the retention of a complete community of hole-nesting birds and small mammals (McClelland 1979). Most of these cavity-nesters are beneficial insectivores which help to control insect populations in the area. The pileated woodpecker is an indicator of the health of the Rock Creek watershed ecosystem.

The site's water features are important for a variety of reasons not least of which is their influence on downstream water quality and fish production. The Tualatin River system supports state-listed sensitive coho and fall chinook salmon, cutthroat trout, pacific lamprey and northern red-legged frog. The Tualatin River is also under a DEQ enforcement order requiring all jurisdictions within the watershed to take actions to improve water quality, including control of erosion and reduction of sediment and nutrient loads. Though the site's intermittent and upper perennial creeks are generally not inhabited by fish, they do provide primary habitat for amphibians and reptiles. Pacific tree frog, ensatina and pacific giant salamander, and roughskin newt are sensitive amphibians that rely on the moist, wooded areas of the site with cool water of good quality. Downed logs and woody debris are common at this site and provide important cover and food sources for amphibians and other wildlife. Several non-poisonous, beneficial reptiles also use the site, including the uncommon western fence lizard (open, rocky areas and forest edges), garter snakes (forest and edge areas), and turtles (ponds).

Among the more notable mammal species observed within The resource site are bobcat, grey fox and Roosevelt elk. Black-tail deer use both forest and edge habitat and are occasionally observed crossing Skyline Boulevard in the vicinity of the BPA power lines. As many as 70 bird species also use the site, including the pileated woodpecker, sharp shinned and red-tailed hawks, white-crowned and song sparrows, evening grosbeaks, Townsend's solitaire and Swainson's thrush. Several of these species depend on both wetland and upland habitat for survival; for example, the deer, bobcat, frogs, and forest bird species depend on either daily or seasonal shifts in habitat to forage, escape flooding or predation, and breed.

In addition to providing habitat for wildlife, the site's forest cover protects soil and watershed resources, and contribute to the rural character of the site. Some of the resource values include slope stabilization, dissipation of erosive forces, and sediment and pollutant removal. The forest helps to purify the air as well as the water, and provides shelter from storms and cold winds. The forest also adds to the scenic qualities of the area, giving it a semi-rural character.

The forest provides a good example of the Pacific Northwest's western hemlock forest community. This community is unique among all temperate forests in the world (Waring and Franklin 1979). This site contains the pacific yew (*Taxus brevifolia*), the bark of which contains a cancer-fighting substance known as Iltaxol." Another important forest component found at the site is grand fir (*Abies grandis*), This tree and its later successional associates red cedar and hemlock are well established at the site.

The far northern portion of the site is composed primarily of Goble silt loam soils. This silt loam is high in volcanic ash weathered from the parent material, Columbia River Basalt. Because of steep slopes, a seasonal perched water table, slowly permeable fragipan and low bearing strength, this soil has severe limitations for building site development and sanitary facilities (Mult. Co. Soil Survey, 1983). The remainder of the site is composed of Cascade silt loam along the ridgetop, with a small inclusion of Cornelius silt loam at the intersection of Skyline and Germantown. These soils have similar limitations for development though with less precipitous slopes.

| Table B: Quality of Natural Resource Functions in Resource Site SK3 | | | | |
|---|-------------|---------------|------------|--------------|
| Resource Site (acres) = 88.758959 | | | | |
| | High | Medium | Low | Total |
| Riparian Corridors* | | | | |
| acres | 14.4 | 14.1 | 32.0 | 60.6 |
| percent total inventory site area | 16.3% | 15.9% | 36.1% | 68.2% |
| Wildlife Habitat* | | | | |
| acres | 49.7 | 3.4 | 0.0 | 53.1 |
| percent total inventory site area | 56.0% | 3.8% | 0.0% | 59.8% |
| Special Habitat Areas** | | | | |
| acres | | | | 0.0 |
| percent total inventory site area | | | | 0.0% |
| Combined Total⁺ | | | | |
| acres | 49.8 | 4.6 | 6.3 | 60.6 |
| percent total inventory site area | 56.1% | 5.2% | 7.0% | 68.3% |
| <p>* High-ranked riparian resources, Special Habitat Areas, and wildlife habitat include open water. ** Special Habitat Areas rank high for wildlife habitat. +Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.</p> | | | | |

Determination of Significance

Natural resource features mapped in the resource site that provide functions identified in the Natural Resources Inventory are determined to be significant (Map F). Within resource site SK3 the following significant features and functions are present:

Significant Natural Resource Features: open stream; wetland; forest vegetation within 300 feet of waterbodies; forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies; developed land within 50 feet of waterbodies; forest patches and associated and contiguous woodland patches two acres in size or larger; and Special Habitat Areas.

Significant Riparian Corridor Functions: microclimate and shade; stream flow moderation and water storage; bank function and sediment, pollution and nutrient control; large wood and channel dynamics; organic inputs, food web and nutrient cycling; and riparian wildlife movement corridor.

Significant Wildlife Habitat Functions: interior area; food and water; resting, denning, nesting and rearing; movement and migration; reduction of noise, light and vibration; and habitat patches that support special status fish and wildlife species.

Resource Site Specific ESEE

The General ESEE analysis, Volume 2, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

Conflicting Uses

The common impact of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; add impervious surface; modifying streams and floodplains; generating pollution; landscaping with non-native or invasive vegetation; building fences or other wildlife barriers; and other impacts such as noise, light, litter and pets.

Within the resource site residential uses are allowed outright or conditionally in the RF and R10 base zones. Commercial uses are allowed in the CM1 base zone. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

ESEE Analysis

The analysis of economic, social, environmental and energy consequences provided in Volume 2 is confirmed for resource site SK3, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses generally would retain the riparian corridor and wildlife habitat functions of the significant natural resource features including maintaining habitat for at risk species, maintaining the flow moderation, water quality and flood control functions of streams and

wetlands, maintaining vegetation on steep slopes, and maintaining the stormwater management and air-cooling functions of the tree canopy. Mitigation for negative consequences of additional development in areas of high or medium ranked natural resources should be required. New or expanded development should be setback from a minimum distance streams and wetlands.

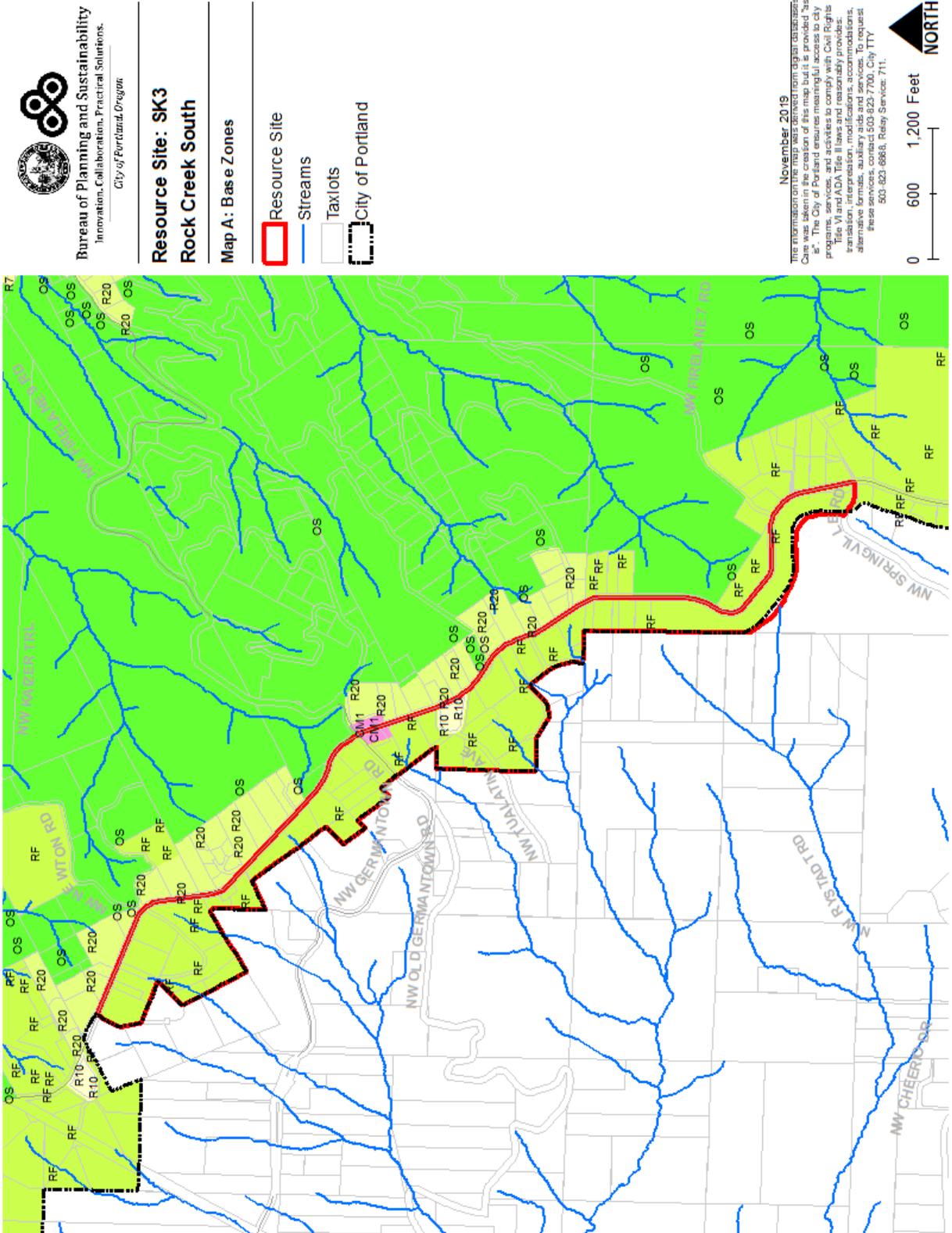
Steep slopes are susceptible to erosion and landslides. Development should be clustered away from steep slopes and trees and vegetation should be maintained to reduce the landslide risks. New or expanded development on steep slopes should be *limited*.

ESEE Decisions

Based on the ESEE general recommendations (Volume 2) and resource site-specific ESEE, the ESEE decisions for Resources Site SK3 are:

4. *Strictly limit* conflicting uses within stream channels from top-of-bank to top-of-bank, wetlands land within 25 feet of stream top-of-bank, and land within 50 feet of wetlands.
5. *Limit* conflicting uses within land between 25 and 50 feet of stream top-of-bank.
6. *Limit* conflicting uses on forest vegetation between 50 and 100 feet of stream top-of-bank.
7. *Allow* conflicting uses within all other areas containing significant natural resources.

| Table C: ESEE Decision for Resource Site SK3 | |
|---|--------------|
| ESEE Decision | Acres |
| Strictly Limit | 3.4 |
| Limit | 9.7 |
| Allow | 75.7 |





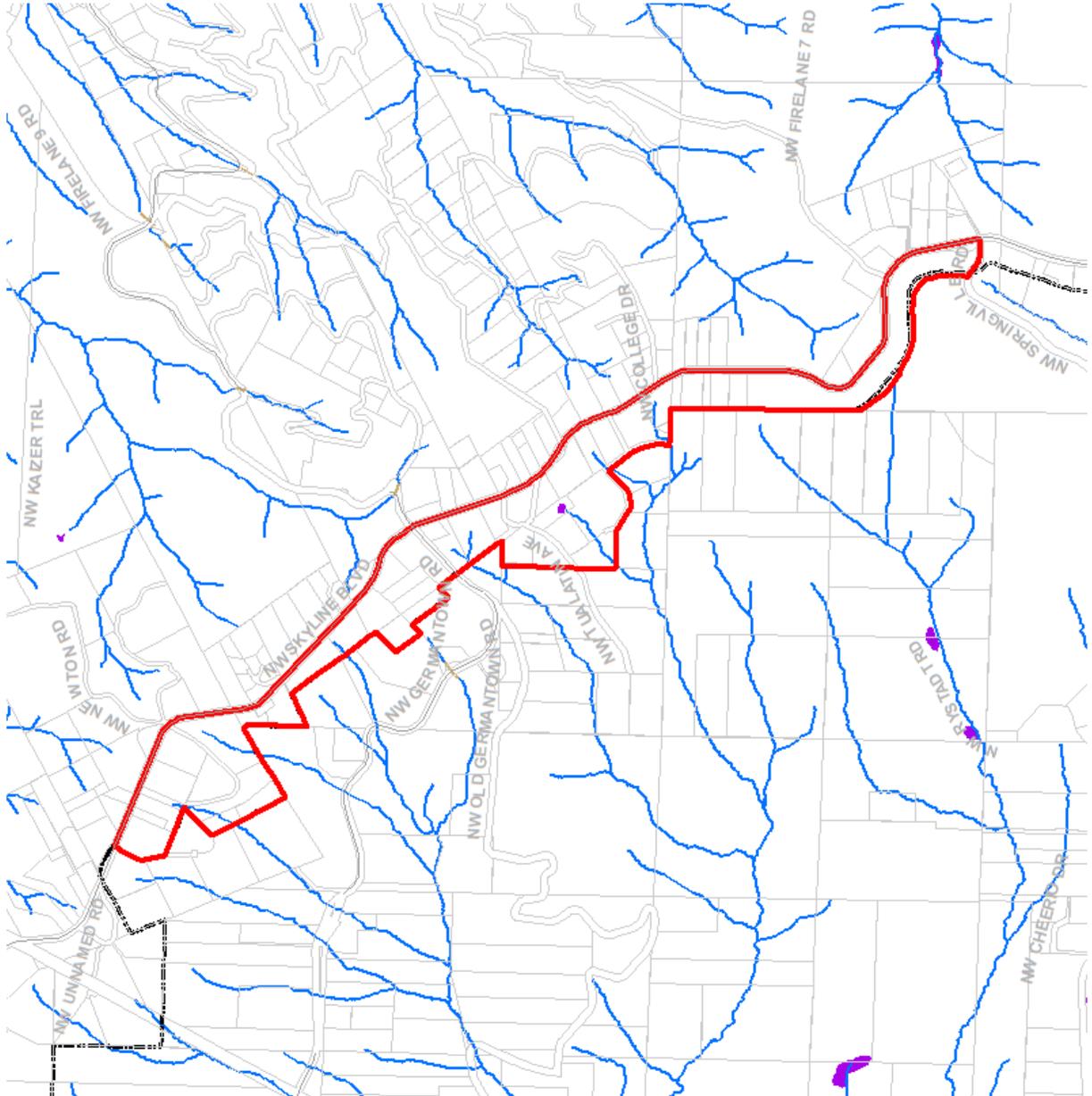
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**Resource Site: SK3
Rock Creek South**

Map B: Water Related Features

-  Resource Site
-  Open stream channel
-  Piped stream segment
-  Wetlands
-  Floodplain
-  Taxlots
-  City of Portland

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**Resource Site: SK3
Rock Creek South**

Map C: Land Features

-  Resource Site
-  Steep Slopes (>25%)
-  Forest
-  Woodland
-  Shrubland
-  Herbaceous
-  Taxlots
-  City of Portland

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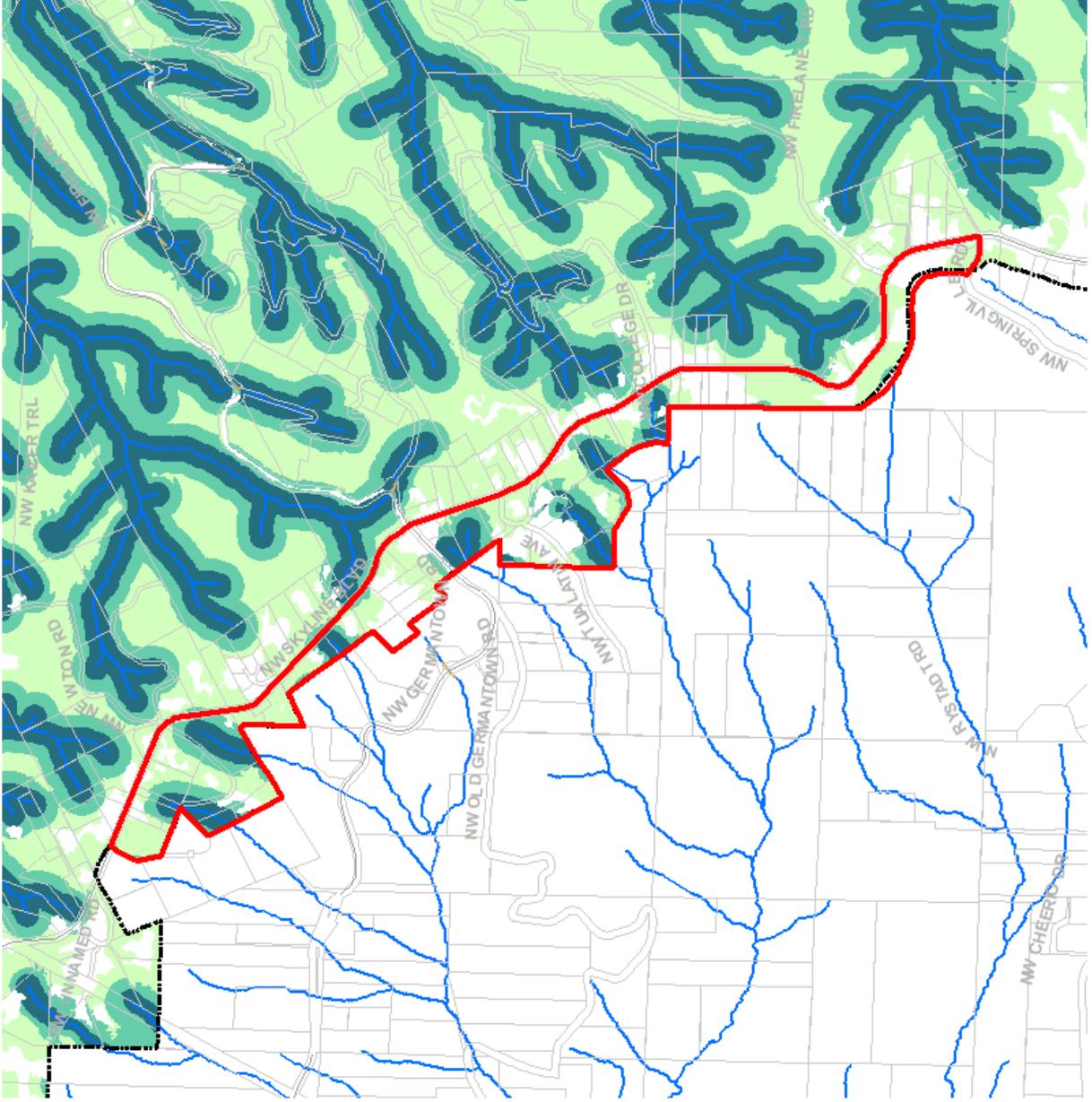
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Resource Site: SK3
Rock Creek South

Map D: Riparian Corridors

-  Resource Site
-  High riparian function
-  Medium riparian function
-  Low riparian function
-  open stream channel
-  piped stream segment
-  Taxlots
-  City of Portland

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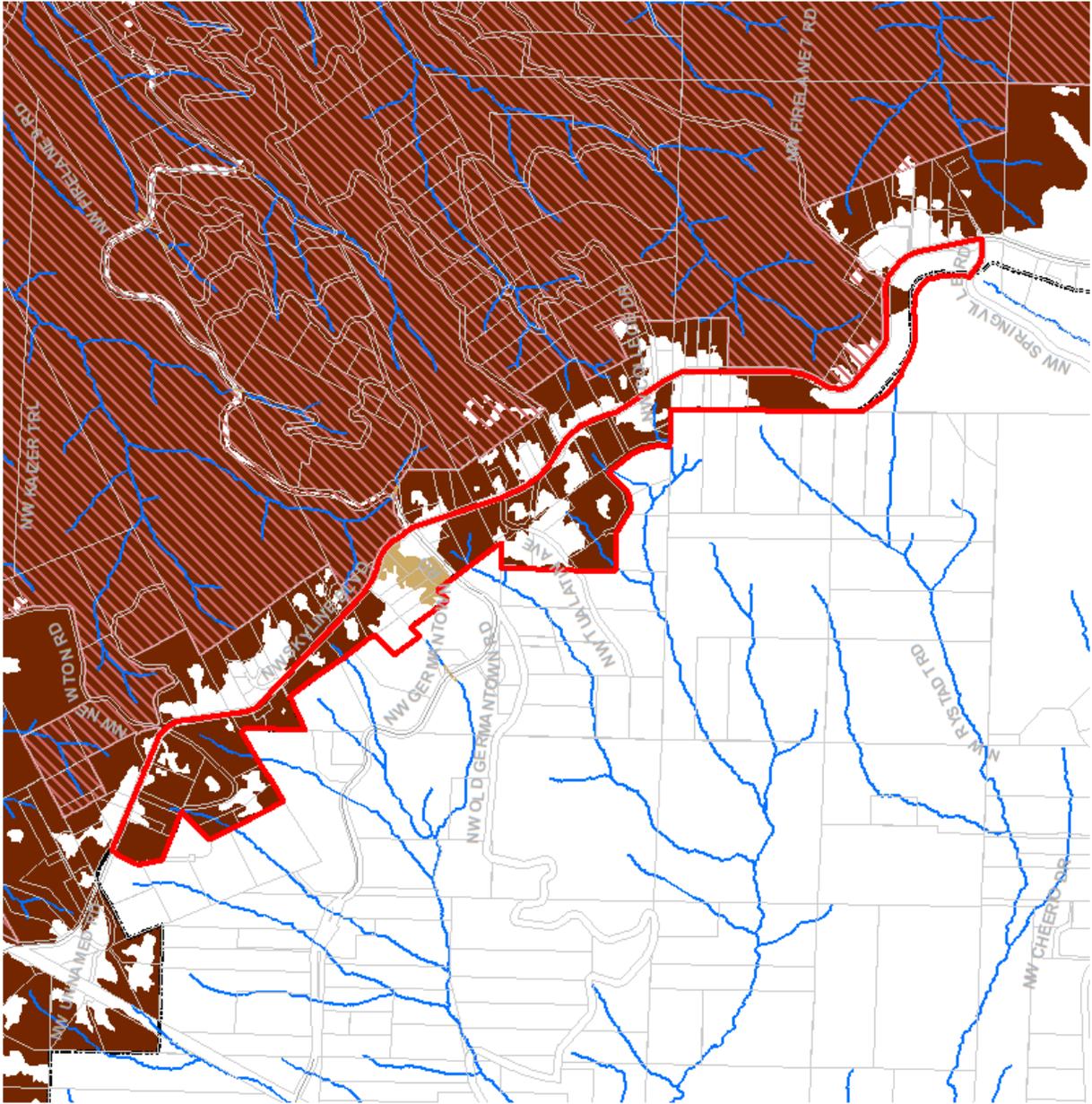




Resource Site: SK3
Rock Creek South
Map E: Wildlife Habitat

- Resource Site
- High wildlife habitat
- Medium wildlife habitat
- Low wildlife habitat
- Special Habitat Areas
- open stream channel
- piped stream segment
- Taxlots
- City of Portland

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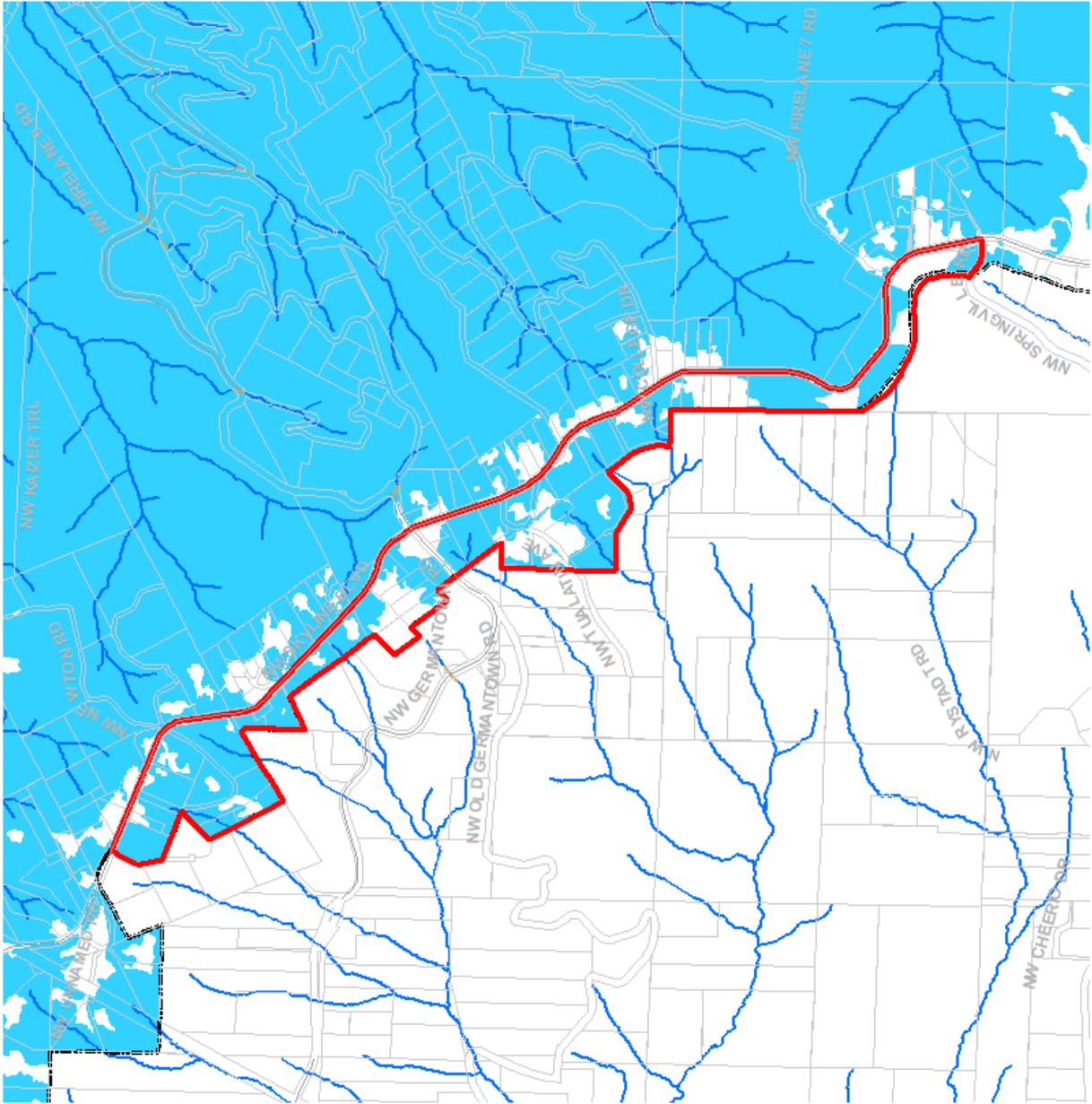


**Resource Site: SK3
Rock Creek South**

**Map F: Determination of
Significance**

- Resource Site
- Significant natural resources
- open stream channel
- piped stream segment
- Taxilots
- City of Portland

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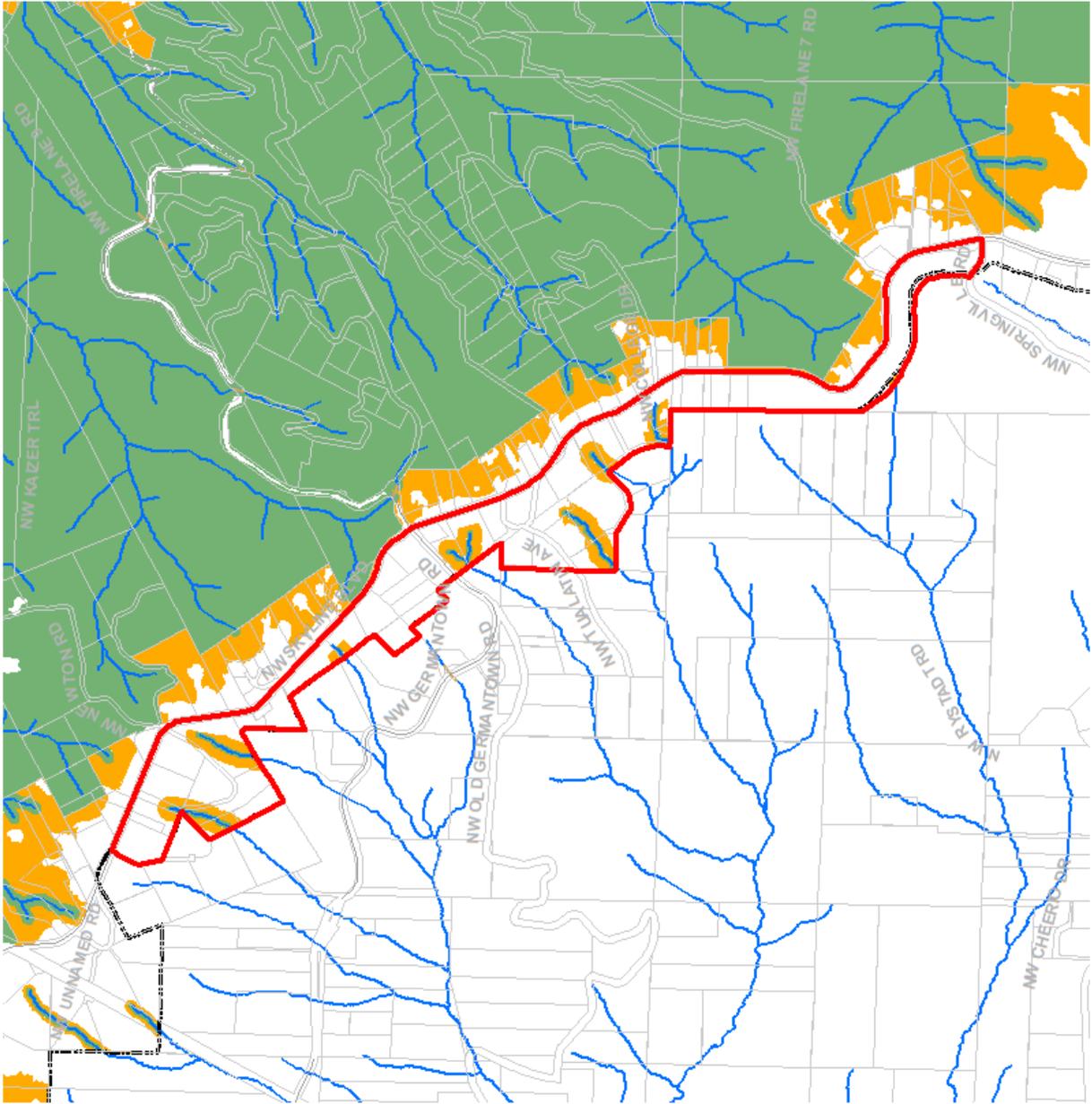




Resource Site: SK3
Rock Creek South
Map G: ESEE Decision

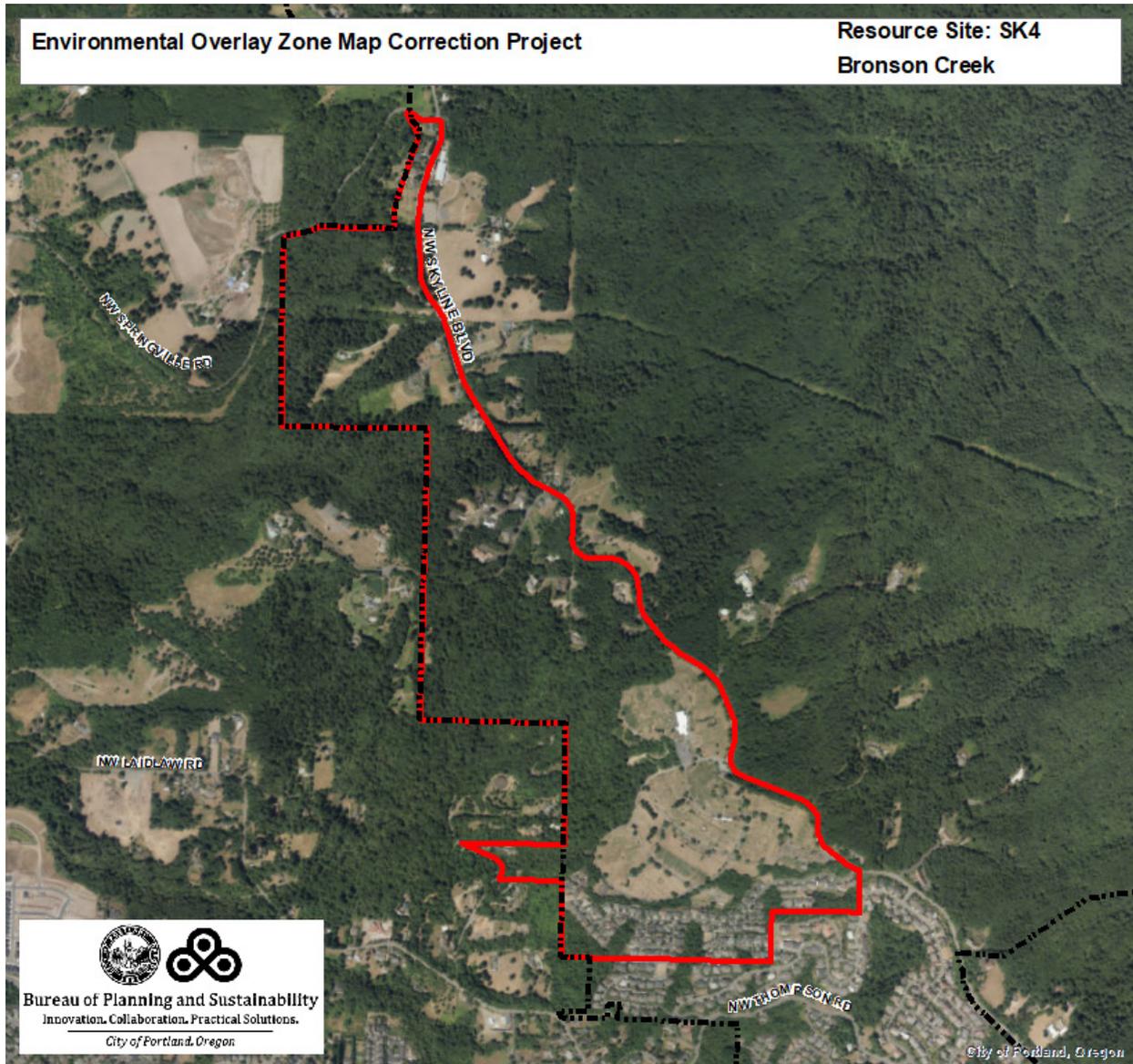
- Resource Site
- Limit conflicting uses
- Strictly limit conflicting uses
- open stream channel
- piped stream segment
- Taxlots
- City of Portland

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Resource Site No.: SK4 Resource Site Name: Bronson Creek

Previous Plan: Skyline West Conservation Plan Previous Resource Site No.: 144



Natural Resources Inventory

| Table A: Quantity of Natural Resource Features in Resource Site | | SK4 |
|---|-----------------------|-------------------|
| | | Study Area |
| Stream (Miles) | | 0.5 |
| Wetlands (acres) | | 0.0 |
| Vegetated Areas >= 1/2 acre (acres) | | 230.7 |
| | Forest (acres) | 158.9 |
| | Woodland (acres) | 2.0 |
| | Shrubland (acres) | 5.8 |
| | Herbaceous (acres) | 63.9 |
| Flood Area* | | 0.0 |
| | Vegetated (acres) | 0.0 |
| | Non-vegetated (acres) | 0.0 |
| Steep Slopes (acres)** | | 175.1 |
| Impervious Surface (acres) | | 22.4 |
| * The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area. | | |
| **Slopes are derived from LiDAR. Steep slopes are area with a slope greater than 25%. | | |

This site is the headwaters area for Bronson Creek which eventually merges with Rock Creek near NW 185th Avenue and Germantown Road. The creek basin is southwest sloping and predominantly forested and remains so as it leaves the city into unincorporated Multnomah County; it then meanders through rural farmland and scattered housing in Washington County. About a dozen single dwelling residences are distributed along Skyline Blvd. intermixed with wooded areas and agricultural uses. The site is situated between Skyline Blvd. and the western city limits, from NW Springville Rd. south to Skyline Memorial Gardens. The site's steep, upper basin location provides an important biological link to downstream land and water resources. The site also serves as a migratory link for mammals, birds and herptiles along and across the ridgetop.

This site contains two headwaters tributaries to Bronson Creek. The total length of the tributaries and associated drainages within the site is approximately two lineal miles. In addition to the riverine creek system, one pond and several emergent wetlands associated with creeks are located in the site. The forest ranges from early to mid successional stages, approximately 20 to 120 years in age. Slopes across the site range from level on the ridgetop at Skyline Memorial Gardens to as much as 100 percent in the ravines.

The site's headwater tributaries, wetlands, ravines and forest provide important forage, cover and nesting habitat for a variety of bird, mammal, amphibian and reptile species. Two state-listed sensitive species occur within the site. The northern red-legged frog (also a Federal candidate species) breeds in a downstream pond and migrates up through the northern tributary (its presence in the southern tributary is expected but not known). One frog was identified in 1994 near the intersection of Skyline and Springville Road (Hayes 1994). The sensitive pileated woodpecker is also present in the ravines where older conifers and snags are common. The woodpecker and frog both serve as indicators of the health of the Bronson Creek watershed ecosystem.

Though not inhabited by fish, the sites' creeks do exert a significant influence on downstream water quality and fish production. Bronson Creek feeds into the Tualatin River system which supports a variety of fish including several state-listed sensitive species such as coho and fall chinook salmon, cutthroat trout, pacific lamprey. The Tualatin River is also under a DEQ enforcement order requiring all jurisdictions within the watershed to take actions to improve water quality, including control of erosion and reduction of sediment and nutrient loads.

The watercourses are in forest cover and contain dispersed large woody debris. These features help to retain moisture and provide important sources of food and cover for amphibian species such as the ensatina and pacific giant salamanders, roughskin newt and red-legged frog. Reptiles include northwestern and common garter snakes, and the northern alligator lizard. The creek and creek tributaries also provide a seasonal water source for terrestrial vertebrates such as bobcat, black-tailed deer, coyote, vagrant shrew, shrew-mole, deer mouse and Townsend's vole which use the site. Bird species identified at this site include hawks, owls, woodpeckers, warblers, wrens and numerous other forest bird species. The site's interspersed with downstream and adjacent forest allows for free migration of wildlife and increases its value as habitat.

In addition to providing habitat for wildlife, the forest protects soil and watershed resources, and contribute to the rural character of the site. Some of the resource values include slope stabilization, dissipation of erosive forces, and sediment and nutrient removal. The forest helps to purify the air as well as the water, and provides shelter from storms and cold winds. The forest also adds to the scenic qualities of the area, giving it a semi-rural character.

The site's forest provides a good example of the Pacific Northwest's western hemlock forest community. This community is unique among all temperate forests in the world (Waring and Franklin 1979). Some of the site's ravines contain significant stands of western red cedar (*Thuja plicata*) and western hemlock (*Tsuga heterophylla*), two later successional associates of the western hemlock community.

With one exception, the entire site is composed of Cascade silt loam soils. This silt loam is formed in silty materials and has a seasonally high water table, slow permeability, and a fragipan at 20 to 30 inches. Except in relatively level areas along the ridgetop, this soil has severe limitations for building site development and sanitary facilities, particularly during the wet winter months (Mult. Co. Soil Survey, 1983). A small Delena silt loam inclusion borders Skyline Blvd. approximately 2000 ft. south of Springville Rd. This soil also has severe limitations for building site development and sanitary facilities due primarily to wetness.

| Table B: Quality of Natural Resource Functions in Resource Site SK4 | | | | |
|---|-------------|---------------|------------|--------------|
| Resource Site (acres) = 280.091557 | | | | |
| | High | Medium | Low | Total |
| Riparian Corridors* | | | | |
| acres | 52.5 | 37.4 | 88.3 | 178.3 |
| percent total inventory site area | 18.8% | 13.4% | 31.5% | 63.6% |
| Wildlife Habitat* | | | | |
| acres | 82.9 | 65.3 | 8.7 | 156.9 |
| percent total inventory site area | 29.6% | 23.3% | 3.1% | 56.0% |
| Special Habitat Areas** | | | | |
| acres | | | | 0.0 |
| percent total inventory site area | | | | 0.0% |
| Combined Total⁺ | | | | |
| acres | 104.0 | 46.0 | 28.5 | 178.4 |
| percent total inventory site area | 37.1% | 16.4% | 10.2% | 63.7% |
| <p>* High-ranked riparian resources, Special Habitat Areas, and wildlife habitat include open water. ** Special Habitat Areas rank high for wildlife habitat. +Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.</p> | | | | |

Determination of Significance

Natural resource features mapped in the resource site that provide functions identified in the Natural Resources Inventory are determined to be significant (Map F). Within resource site SK4 the following significant features and functions are present:

Significant Natural Resource Features: open stream; wetlands; forest vegetation within 300 feet of waterbodies; forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies; developed land within 50 feet of waterbodies; forest patches and associated and contiguous woodland patches two acres in size or larger; and Special Habitat Areas.

Significant Riparian Corridor Functions: microclimate and shade; stream flow moderation and water storage; bank function and sediment, pollution and nutrient control; large wood and channel dynamics; organic inputs, food web and nutrient cycling; and riparian wildlife movement corridor.

Significant Wildlife Habitat Functions: interior area; food and water; resting, denning, nesting and rearing; movement and migration; reduction of noise, light and vibration; and habitat patches that support special status fish and wildlife species.

Resource Site Specific ESEE

The General ESEE analysis, Volume 2, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

Conflicting Uses

The common impact of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; add impervious surface; modifying streams and floodplains; generating pollution; landscaping with non-native or invasive vegetation; building fences or other wildlife barriers; and other impacts such as noise, light, litter and pets.

Within the resource site residential uses are allowed outright or conditionally in the RF and R10 base zones. Open space uses are allowed in the OS base zone. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

ESEE Analysis

The analysis of economic, social, environmental and energy consequences provided in Volume 2 is confirmed for resource site SK4, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses generally would retain the riparian corridor and wildlife habitat functions of the significant natural resource features including maintaining habitat for at risk species, maintaining the flow moderation, water quality and flood control functions of streams and

wetlands, maintaining vegetation on steep slopes, and maintaining the stormwater management and air-cooling functions of the tree canopy. Mitigation for negative consequences of additional development in areas of high or medium ranked natural resources should be required. New or expanded development should be setback from a minimum distance streams and wetlands.

Steep slopes are susceptible to erosion and landslides. Development should be clustered away from steep slopes and trees and vegetation should be maintained to reduce the landslide risks. New or expanded development on steep slopes should be *limited*.

ESEE Decisions

Based on the ESEE general recommendations (Volume 2) and resource site-specific ESEE, the ESEE decisions for Resources Site SK4 are:

1. *Strictly limit* conflicting uses within stream channels from top-of-bank to top-of-bank, wetlands, land within 25 feet of stream top-of-bank, and land within 50 feet of wetlands.
2. In RF or OS base zones, *strictly limit* conflicting uses within land within 25 and 50 feet of stream top-of-bank.
3. In all other base zones, *limit* conflicting uses within land between 25 and 50 feet of stream top-of-bank.
4. *Limit* conflicting uses within areas of forest or woodland vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
5. *Limit* conflicting uses within areas of forest or woodland vegetation that are contiguous to streams and are located on steep slopes.
6. *Allow* conflicting uses within all other areas containing significant natural resources.

| ESEE Decision | Acres |
|----------------------|--------------|
| Strictly Limit | 26.7 |
| Limit | 117.2 |
| Allow | 136.1 |

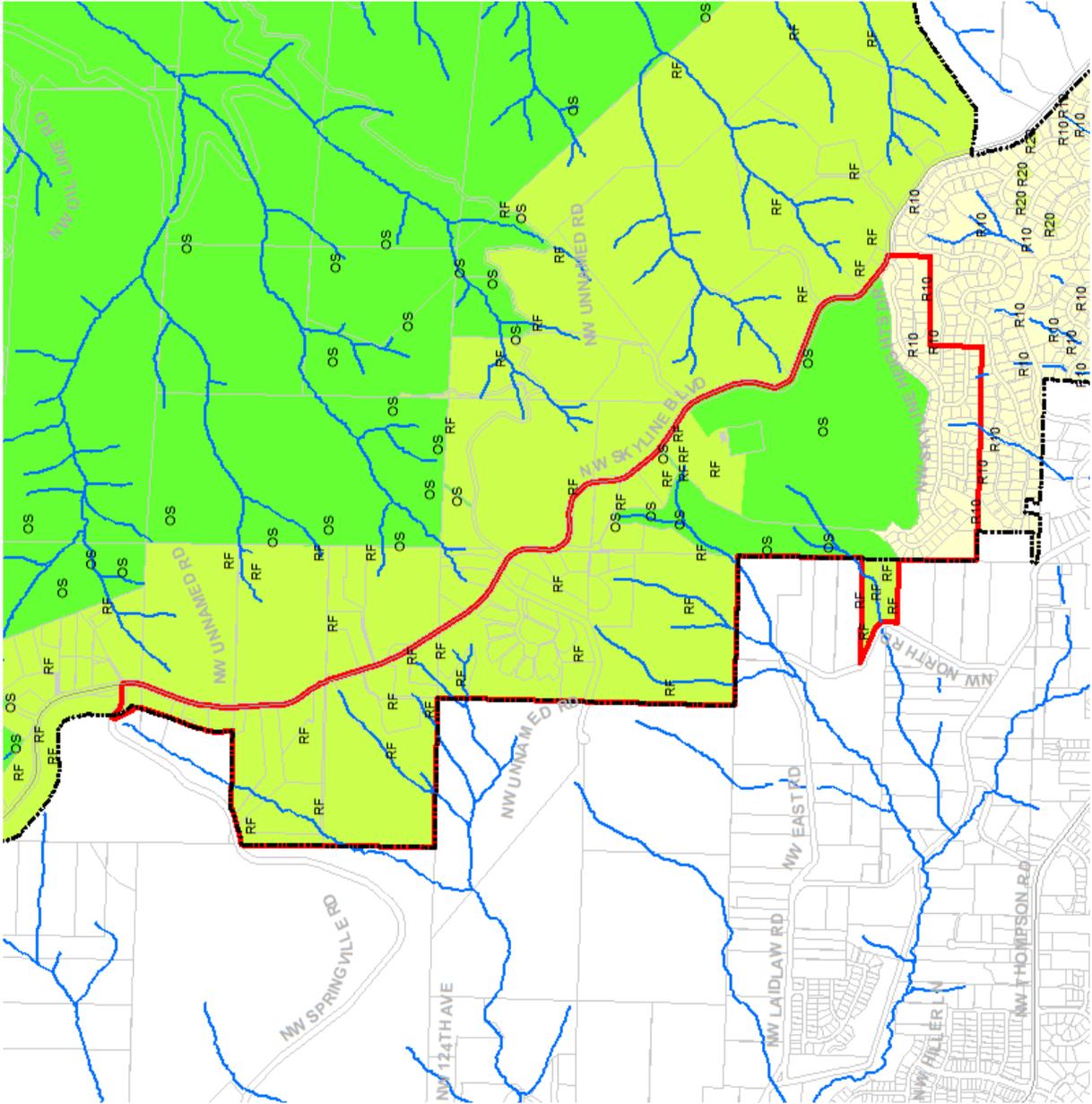


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**Resource Site: SK4
Bronson Creek**

Map A: Base Zones

- Resource Site
- Streams
- Taxlots
- City of Portland



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0 650 1,300 Feet

NORTH

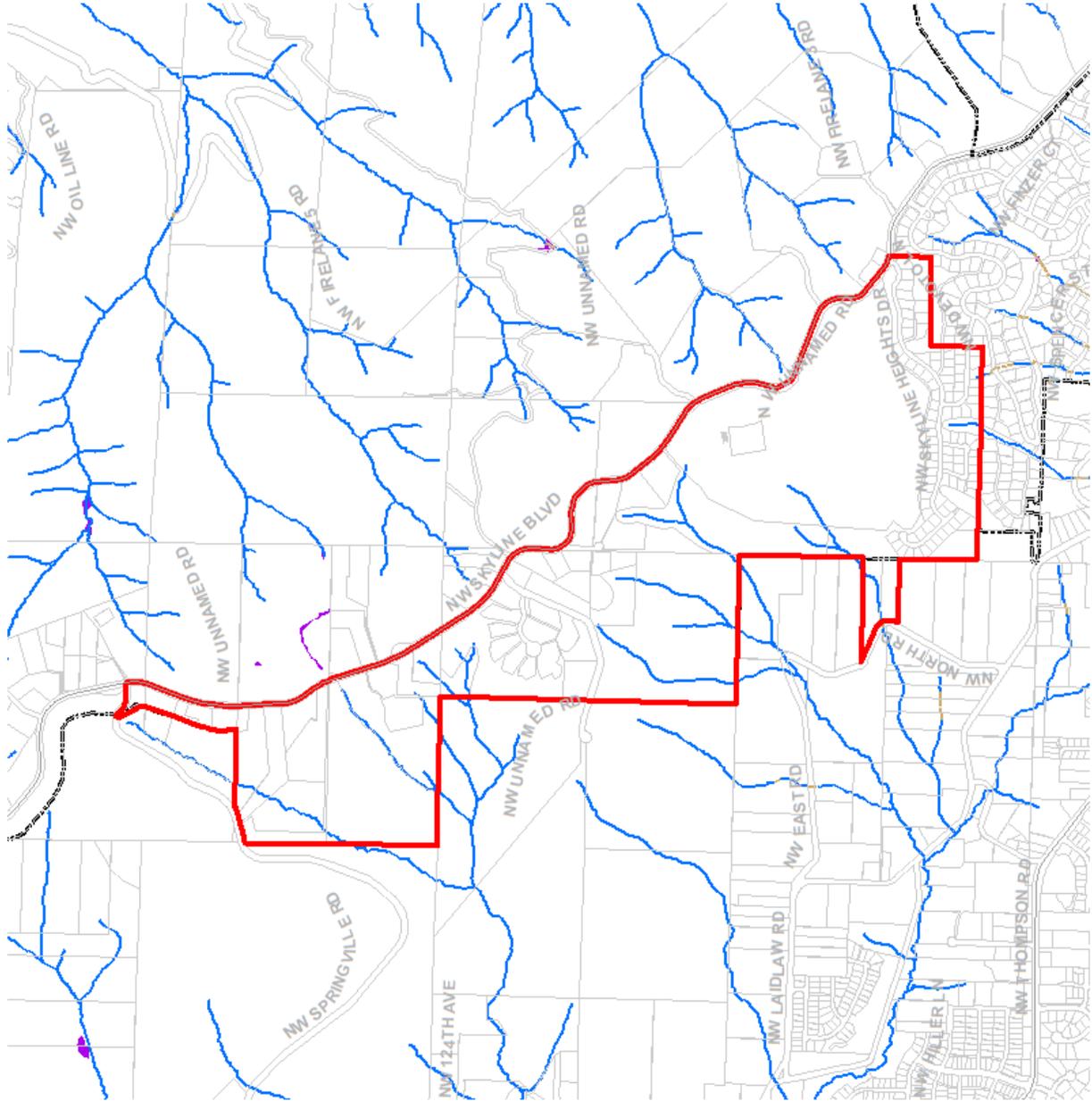


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City of Portland, Oregon

**Resource Site: SK4
Bronson Creek**

Map B: Water Related Features

-  Resource Site
-  Open stream channel
-  Piped stream segment
-  Wetlands
-  Floodplain
-  Taxlots
-  City of Portland



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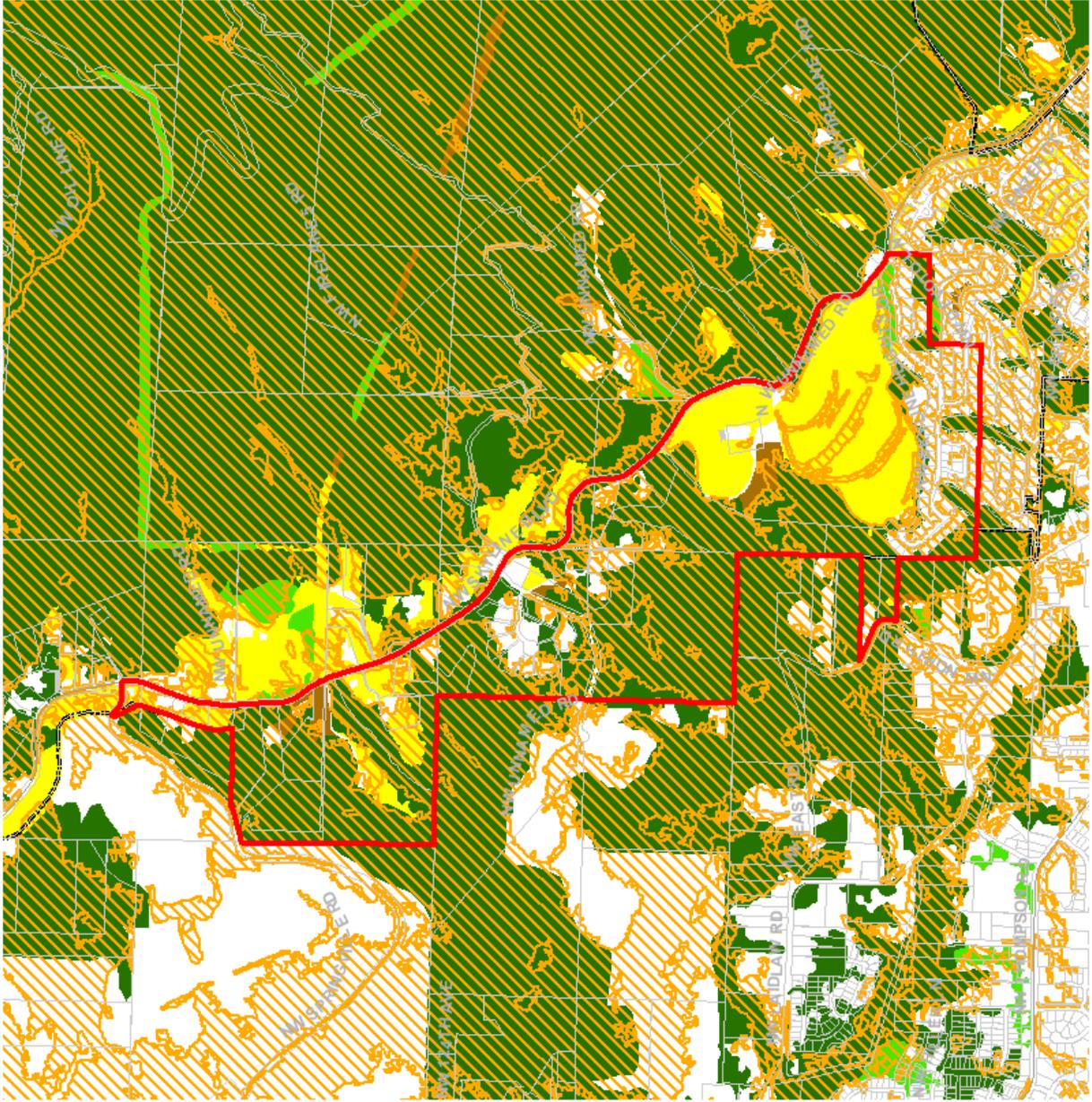




**Resource Site: SK4
Bronson Creek**

Map C: Land Features

-  Resource Site
-  Steep Slopes (>25%)
-  Forest
-  Woodland
-  Shrubland
-  Herbaceous
-  Taxlots
-  City of Portland



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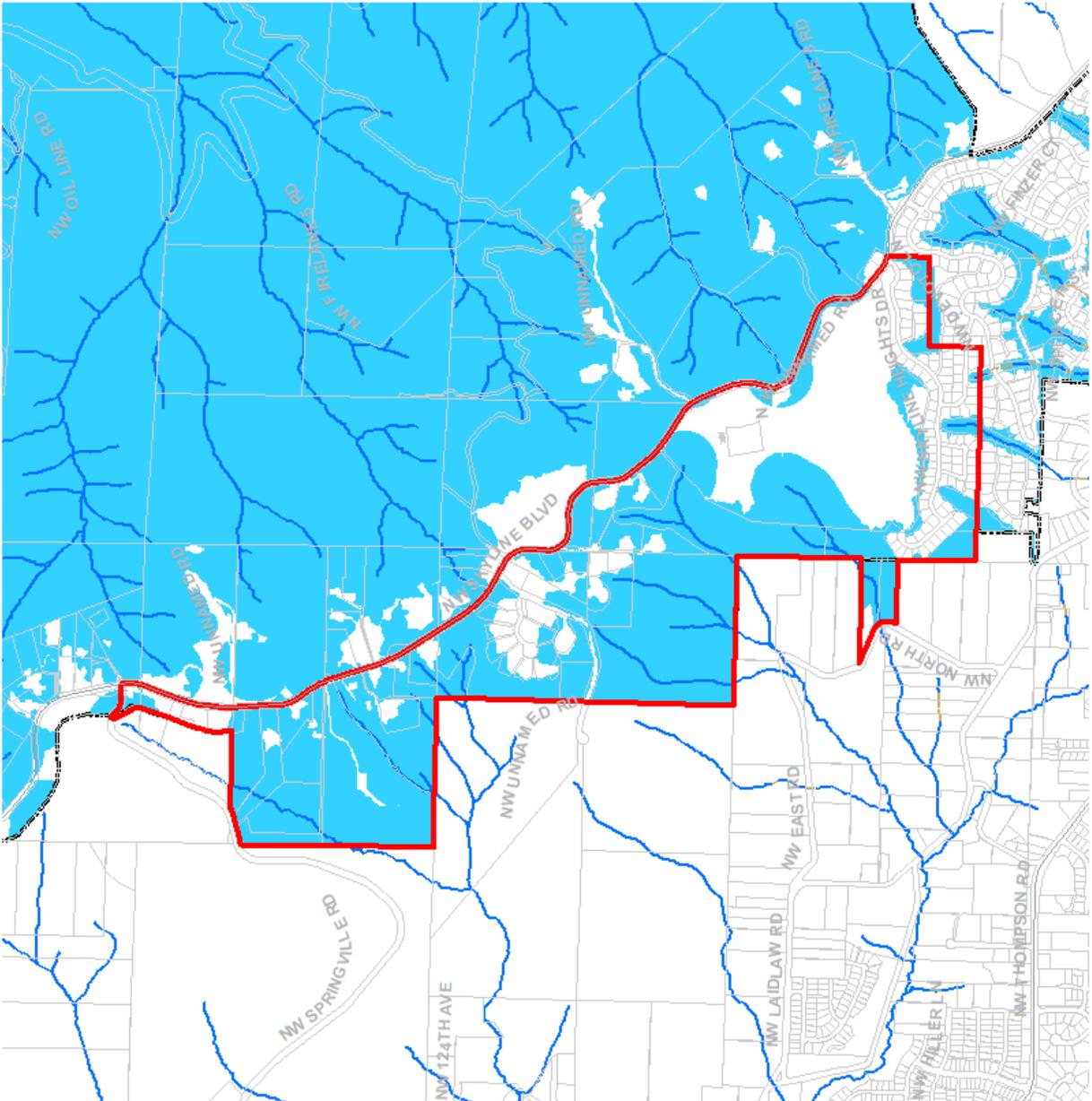
 NORTH



**Resource Site: SK4
Bronson Creek**

Map F: Determination of
Significance

- Resource Site
- Significant natural resources
- open stream channel
- piped stream segment
- Taxilots
- City of Portland



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0 650 1,300 Feet

NORTH

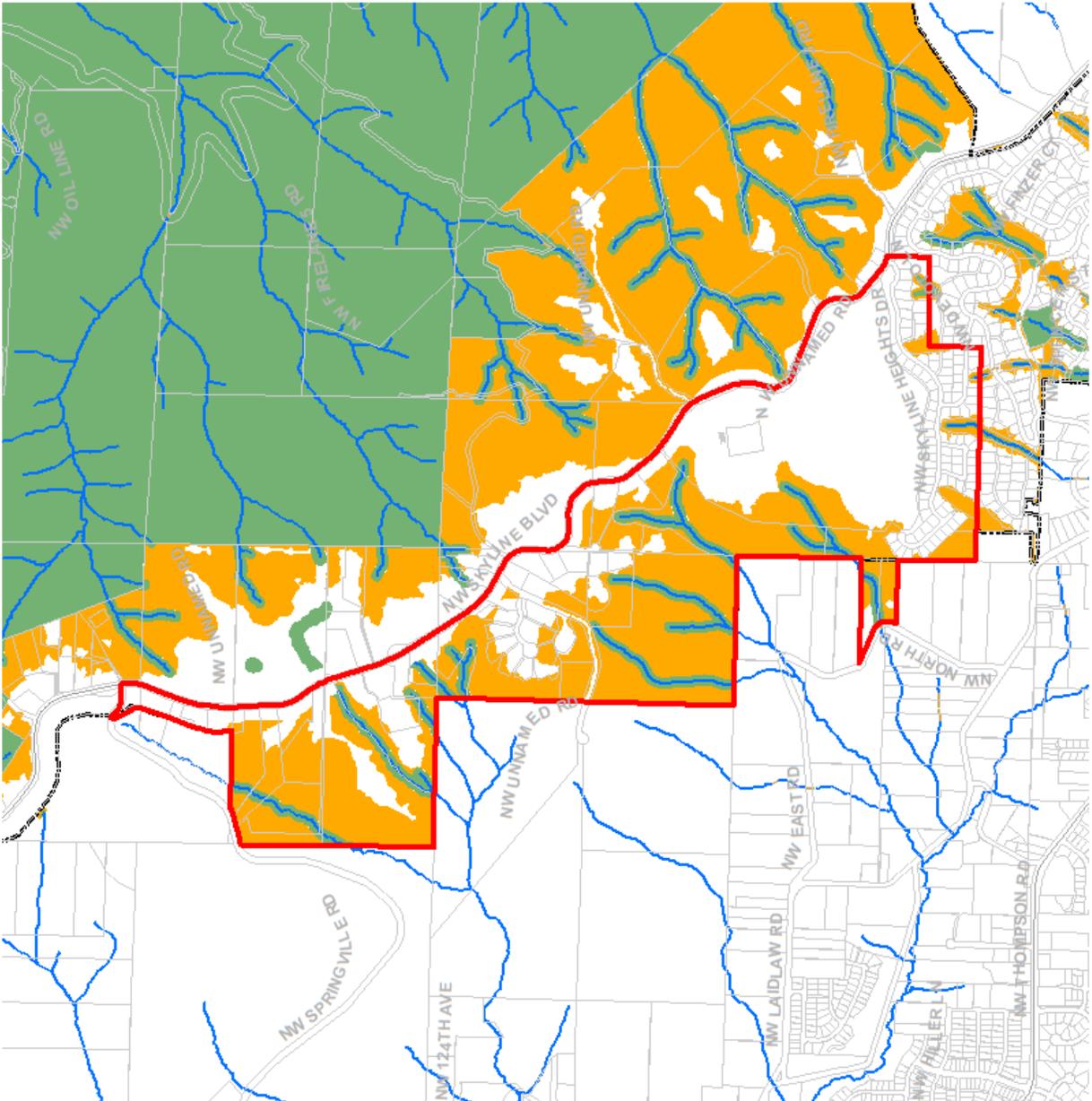


Resource Site: SK4

Bronson Creek

Map G: ESEE Decision

- Resource Site
- Limit conflicting uses
- Strictly limit conflicting uses
- open stream channel
- piped stream segment
- Taxilots
- City of Portland

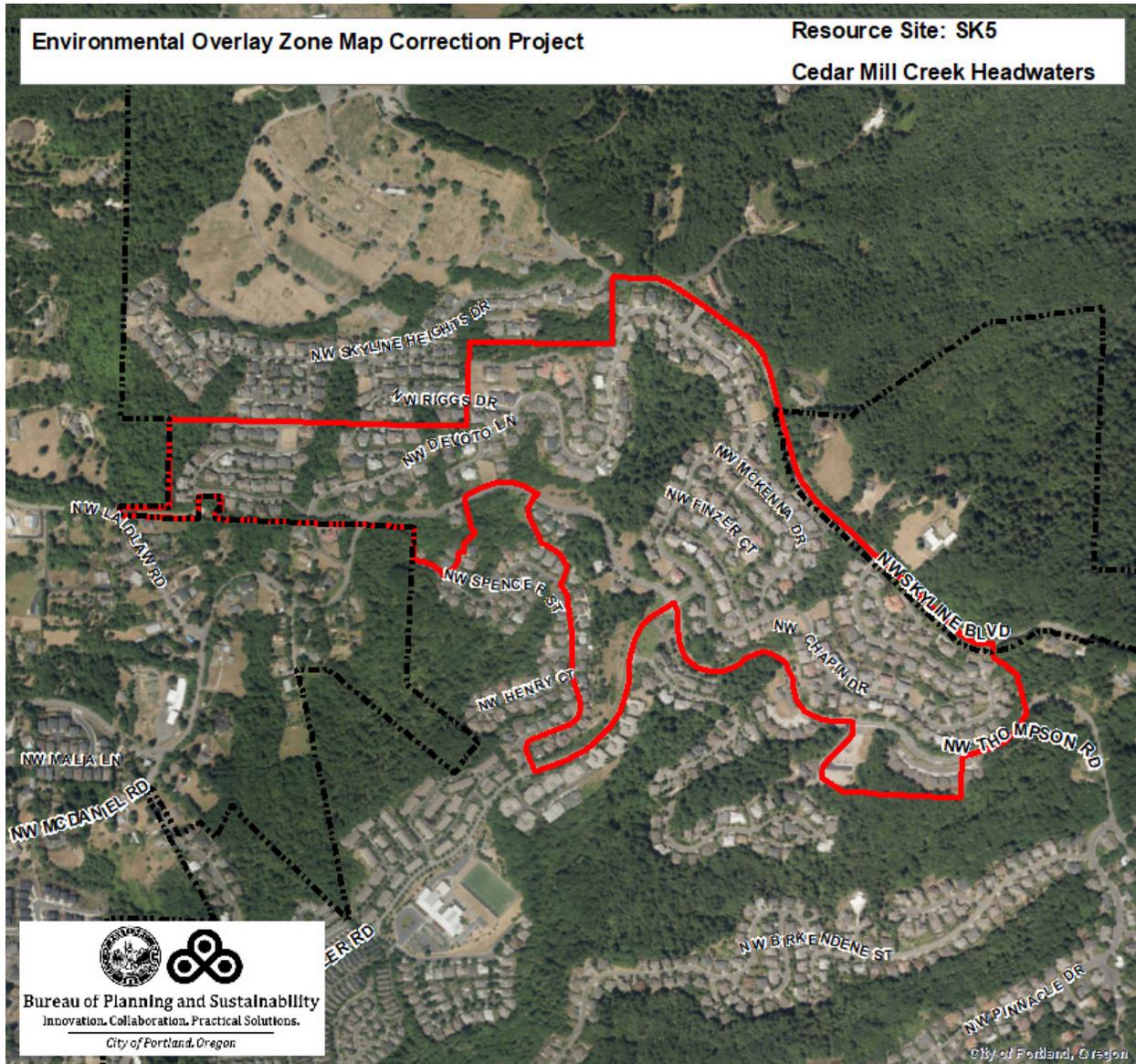


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0 650 1,300 Feet

NORTH

Resource Site No.: SK5 **Resource Site Name:** Cedar Mill Creek Headwaters
Previous Plan: Skyline West Conservation Plan **Previous Resource Site No.:** 145



Natural Resources Inventory

| Table A: Quantity of Natural Resource Features in Resource Site | | SK5 |
|---|-----------------------|-------------------|
| | | Study Area |
| Stream (Miles) | | 2.7 |
| Wetlands (acres) | | 0.0 |
| Vegetated Areas >= 1/2 acre (acres) | | 36.2 |
| | Forest (acres) | 24.3 |
| | Woodland (acres) | 0.6 |
| | Shrubland (acres) | 0.5 |
| | Herbaceous (acres) | 10.8 |
| Flood Area* | | 0.0 |
| | Vegetated (acres) | 0.0 |
| | Non-vegetated (acres) | 0.0 |
| Steep Slopes (acres)** | | 89.1 |
| Impervious Surface (acres) | | 38.0 |
| * The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area. | | |
| **Slopes are derived from LiDAR. Steep slopes are area with a slope greater than 25%. | | |

This is the largest resource site in the plan area and forms a sub-basin of the Cedar Mill Creek basin. The site is located west of NW Skyline Boulevard, north of the city limits along NW Cornell Road, east of the city limits, and south of Skyline Memorial Gardens.

An array of first and second order creeks pass through steep, forested ravines and merge in the southwest corner of the site at Mill Pond. The ravines are separated by southwest trending forested ridges or recently developed residential areas which are part of large area subdivisions. Downstream of Mill Pond, another creek in the Washington County portion of the site merges with the main stem and eventually forms Cedar Mill Creek. Cedar Mill Creek becomes Beaverton Creek (and passes through the towns of Cedar Mill and Beaverton) before flowing into the Tualatin River. The steep, upper basin location of this site provides an important biological link to downstream land and water resources. The site also serves as a migratory link for mammals, birds and herptiles along and across the West Hills ridge.

Multiple first order creek branches feed the site's five primary creeks which meet to form Cedar Mill Creek. The total length of the creeks and creek branches within the site is approximately ten lineal miles. In addition to the riverine creek system, three palustrine wetlands are identified in the National Wetlands Inventory. Three additional wetlands were identified in the field inventory, as well as numerous forested and emergent wetlands directly associated with the site's creeks. The wetlands range in size from 1,000 sq. ft. to three acres and cover a total area of approximately 12 acres.

The forest ranges from early to mid-successional stages, or roughly ten to 100 years in age. The older forest is typically situated in creek ravines and is relatively dense with diverse species composition (over

125 species); the younger forest tends to be sparse (open canopy) with lower species diversity. The creek ravines also typically provide more significant wildlife habitat values, though habitat along certain ridges and upland plateaus is also significant.

The site's creeks and associated tributaries, wetlands and ravines provide important forage, cover and nesting habitat for a variety of bird, mammal, amphibian and reptile species. Two state-listed sensitive species have been identified within the site to date. The northern red-legged frog, which also is a Federal candidate species, is a rare amphibian that breeds in January and February in local ponds or creek pools (including at least one wetland identified above), travels upstream through neighboring ravines to terrestrial habitats during the summer, and eventually returns to breed in downstream ponds. Juvenile frogs were identified in 1994 in the creek south of Reed Drive (Hayes 1994).

The pileated woodpecker, a sensitive species distributed widely within the site, is an important indicator species for the retention of a complete community of hole-nesting birds and small mammals (McClelland 1979). Most of these cavity-nesters are beneficial insectivores which help to control insect populations in the area.

Wildlife biologists often use the presence or absence of one or more "indicator species" to predict whether an area of habitat is suitable for a variety of species having similar habitat requirements. The pileated woodpecker and red-legged frog both serve as indicators of the health of the Cedar Mill Creek watershed ecosystem.

Black-tailed deer, Townsend's chipmunk and chickaree are common throughout the site; other mammals include bobcat, beaver, coyote, vagrant shrew, shrew-mole, Townsend's mole, little brown myotis, Mazama pocket gopher, deer mouse, Townsend's vole, muskrat, long-tailed weasel, raccoon and striped skunk. Pacific tree frog, ensatina and pacific giant salamander, roughskin newt, northern alligator lizard, northwestern and common garter snake are resident herptiles. Several of these species depend on both wetland and upland habitat for survival; for example, the deer, bobcat, beaver, chipmunk, frogs, and forest bird species depend on either daily or seasonal shifts in habitat to forage, escape flooding or predation, and breed.

Birds recorded at the Cedar Mill Creek site include the following:

- hairy woodpecker
- downy woodpecker
- pileated woodpecker
- red-br. sapsucker
- Cooper's hawk
- sharp-shinned hawk
- red-tailed hawk
- barn swallow
- bank swallow
- cliff swallow
- tree swallow (s)
- violet-green s.
- olive-s. flycatcher
- western flycatcher
- w. wood peewee
- red-br. nuthatch
- brown creeper
- chestnut-b chickadee
- black-cap chickadee
- nighthawk
- common merganser
- red-wing blackbird
- Brewer's blackbird
- Bewick' s wren
- winter wren
- ruffled grouse
- Oregon junco
- r. hummingbird
- bushtit
- song sparrow {s}
- golden-crowned s.
- white-crowned s.
- golden-er. kinglet
- ruby-er. kinglet
- Swainson's thrush
- varied thrush
- American crow
- robin
- cedar waxwing
- northern flicker
- common flicker
- solitary sandpiper
- American kestrel great blue heron
- California quail green-backed heron
- band-tailed pigeon wood duck
- mourning dove green-winged teal
- western screech-ow blue-winged teal
- great horned owl cinnamon teal
- vaux' s swift mallard
- Steller's jay American wigeon
- scrub jay belted kingfisher
- yellow warbler (w) evening grosbeak
- Tennessee w. bl.-headed grosbeak
- orange-crowned w. rufous-s. towhee
- Audubon w. c. yellowthroat
- yellow-rumped w. northern oriole
- bl.-throated grey w. purple finch
- Townsend's w. house finch
- MacGillivray's w. goldfinch
- Wilson's w. pine siskin
- band-tailed pigeon br.-headed cowbird
- bufflehead gadwall
- western tanager

The site's creeks, wetlands and forested ravines exert a significant influence on downstream water quality and on fish and amphibian production within the larger Tualatin River system. This system supports a broad range of species including the state-listed sensitive coho and fall chinook salmon, cutthroat trout, pacific lamprey and northern red-legged frog.

The Tualatin River is under a DEQ order requiring all jurisdictions within the watershed to take actions to improve water quality, including control of erosion and reduction of sediment and nutrient loads.

In addition to providing habitat for wildlife, the site's forest cover protects soil and watershed resources. Forest resource values include slope stabilization, dissipation of erosive forces, and sediment and nutrient removal. The forest helps to purify the air as well as the water, and provides shelter from storms and cold winds. The forest also adds to the scenic qualities of the area, giving local neighborhoods a semirural character and providing buffers between them.

The site's forest contains several notable floral features. Forest species include the pacific yew (*Taxus brevifolia*), a slow growing tree species commonly associated with later successional forests. In recent years, a cancer-fighting substance known as "taxol" was discovered in the bark of the yew. Several significant stands of western red cedar (*Thuja plicata*) and grand fir (*Abies grandis*) are also found in this site.

These trees are later successional associates of the western hemlock forest community. Also of note is the presence of madrone (*Arbutus menziesii*) with limited distribution in the region.

Approximately 95 percent of the site is composed of Cascade silt loam soils. This soil is formed in silty materials and has a seasonally high water table, slow permeability, and a fragipan at 20 to 30 inches. Except in relatively level areas along the ridgetop, this soil has severe limitations for building site development and sanitary facilities due primarily to slope, wetness and low bearing strength (SCS Soil Survey 1983).

Several small soil inclusions are scattered along the edges of the site. These inclusions are the Cascade-Urban land complex (along the developed, middle section of Skyline Blvd.), Cornelius silt loam, Cornelius-Urban land complex and Faloma silt loam (all found in the southwest, Washington County portion of the site). Faloma is a hydric soil; it and the other inclusions all have moderate to severe limitations for building site development and sanitary facilities similar to the Cascade soils.

| Table B: Quality of Natural Resource Functions in Resource Site SK5 | | | | |
|---|-------------|---------------|------------|--------------|
| Resource Site (acres) = 118.44015 | | | | |
| | High | Medium | Low | Total |
| Riparian Corridors* | | | | |
| acres | 14.8 | 5.9 | 8.1 | 28.7 |
| percent total inventory site area | 12.5% | 5.0% | 6.8% | 24.2% |
| Wildlife Habitat* | | | | |
| acres | 3.8 | 13.4 | 1.6 | 18.9 |
| percent total inventory site area | 3.2% | 11.3% | 1.4% | 15.9% |
| Special Habitat Areas** | | | | |
| acres | | | | 0.0 |
| percent total inventory site area | | | | 0.0% |
| Combined Total⁺ | | | | |
| acres | 17.3 | 5.6 | 5.8 | 28.7 |
| percent total inventory site area | 14.6% | 4.7% | 4.9% | 24.2% |
| <p>* High-ranked riparian resources, Special Habitat Areas, and wildlife habitat include open water. ** Special Habitat Areas rank high for wildlife habitat. +Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.</p> | | | | |

Determination of Significance

Natural resource features mapped in the resource site that provide functions identified in the Natural Resources Inventory are determined to be significant (Map F). Within resource site SK5 the following significant features and functions are present:

Significant Natural Resource Features: open stream; wetlands; forest vegetation within 300 feet of waterbodies; forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies; developed land within 50 feet of waterbodies; forest patches and associated and contiguous woodland patches two acres in size or larger; and Special Habitat Areas.

Significant Riparian Corridor Functions: microclimate and shade; stream flow moderation and water storage; bank function and sediment, pollution and nutrient control; large wood and channel dynamics; organic inputs, food web and nutrient cycling; and riparian wildlife movement corridor.

Significant Wildlife Habitat Functions: interior area; food and water; resting, denning, nesting and rearing; movement and migration; reduction of noise, light and vibration; and habitat patches that support special status wildlife species.

Resource Site Specific ESEE

The General ESEE analysis, Volume 2, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

Conflicting Uses

The common impact of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; add impervious surface; modifying streams and floodplains; generating pollution; landscaping with non-native or invasive vegetation; building fences or other wildlife barriers; and other impacts such as noise, light, litter and pets.

Within the resource site residential uses are allowed outright or conditionally in the R20 and R10 base zones. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

ESEE Analysis

The analysis of economic, social, environmental and energy consequences provided in Volume 2 is confirmed for resource site SK5, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses generally would retain the riparian corridor and wildlife habitat functions of the significant natural resource features including maintaining habitat for at risk species, maintaining the flow moderation, water quality and flood control functions of streams and wetlands, maintaining vegetation on steep slopes, and maintaining the stormwater management and

air-cooling functions of the tree canopy. Mitigation for negative consequences of additional development in areas of high or medium ranked natural resources should be required. New or expanded development should be setback from a minimum distance streams and wetlands.

Steep slopes are susceptible to erosion and landslides. Development should be clustered away from steep slopes and trees and vegetation should be maintained to reduce the landslide risks. New or expanded development on steep slopes should be *limited*.

ESEE Decisions

Based on the ESEE general recommendations (Volume 2) and resource site-specific ESEE, the ESEE decisions for Resources Site SK5 are:

1. *Strictly limit* conflicting uses within stream channels from top-of-bank to top-of-bank, wetlands, land within 25 feet of stream top-of-bank, and land within 50 feet of wetlands.
2. *Strictly limit* conflicting uses on land between 25 and 50 feet of top-of-bank streams that are located on natural resource tracts to the northwest of NW Chapin Ln.
3. *Limit* conflicting uses within land between 25 and 50 feet of stream top-of-bank and within areas of forest or woodland vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
4. *Limit* conflicting uses on forest vegetation on steep slopes that is contiguous to but more than 50 feet from stream top-of-bank.
5. *Allow* conflicting uses within all other areas containing significant natural resources.

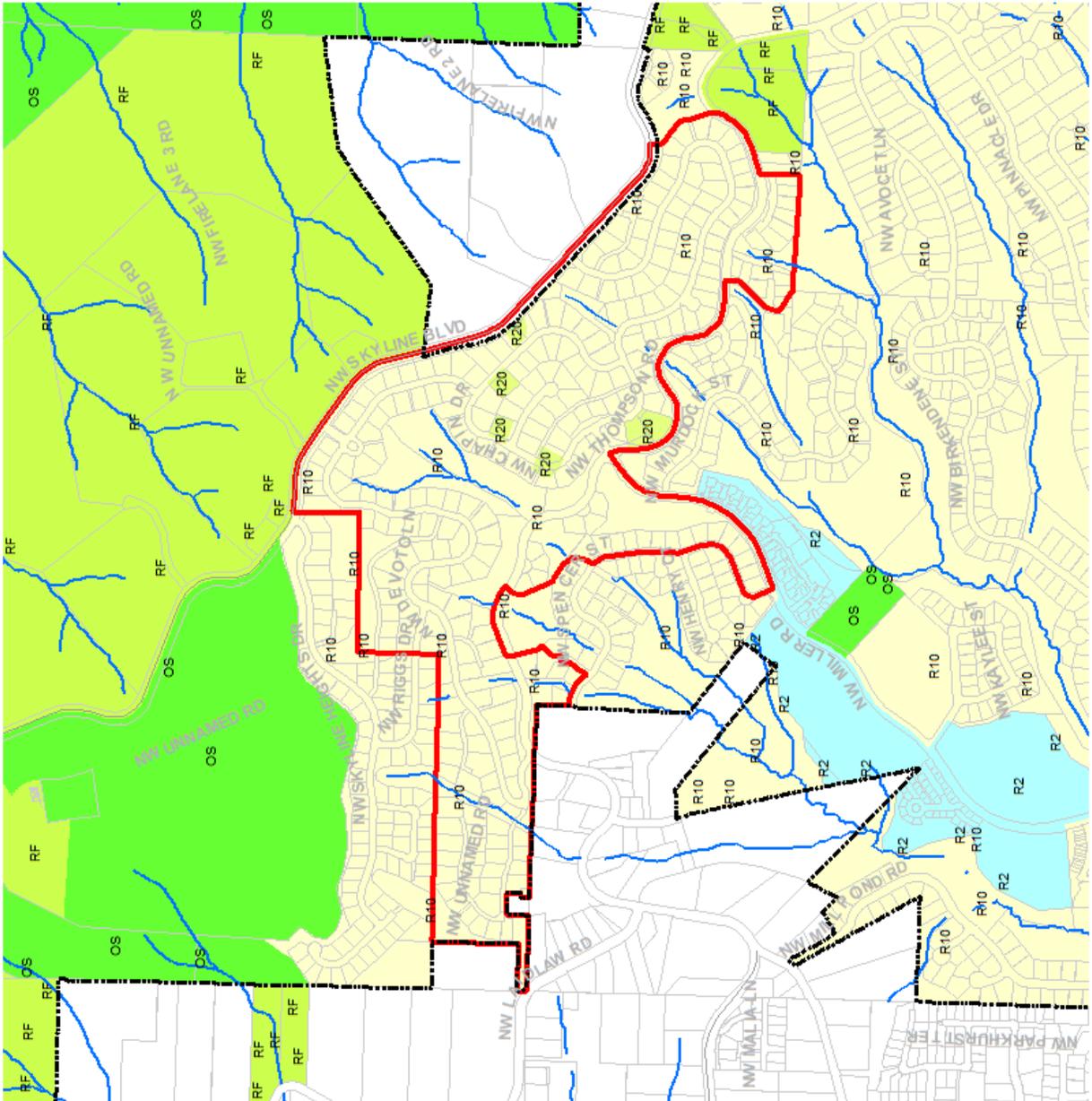
| Table C: ESEE Decision for Resource Site SK5 | |
|---|--------------|
| ESEE Decision | Acres |
| Strictly Limit | 7.2 |
| Limit | 16.1 |
| Allow | 95.2 |



Resource Site: SK5
Cedar Mill Creek Headwaters

Map A: Base Zones

- Resource Site
- Streams
- Taxlots
- City of Portland



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Resource Site: SK5
Cedar Mill Creek Headwaters

Map C: Land Features

-  Resource Site
-  Steep Slopes (>25%)
-  Forest
-  Woodland
-  Shrubland
-  Herbaceous
-  Taxlots
-  City of Portland



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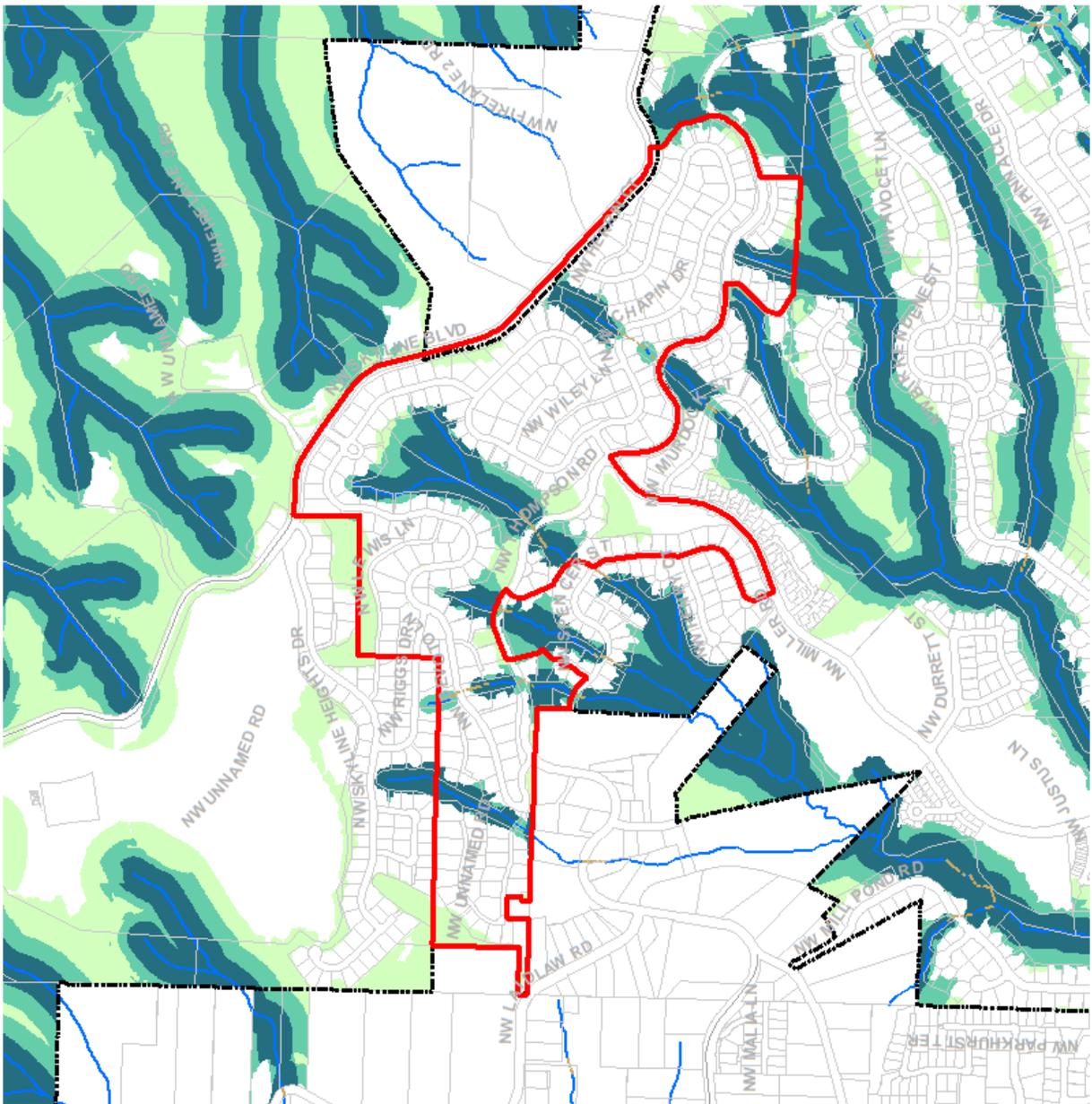
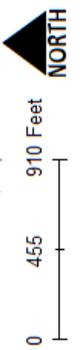


Resource Site: SK5
Cedar Mill Creek Headwaters

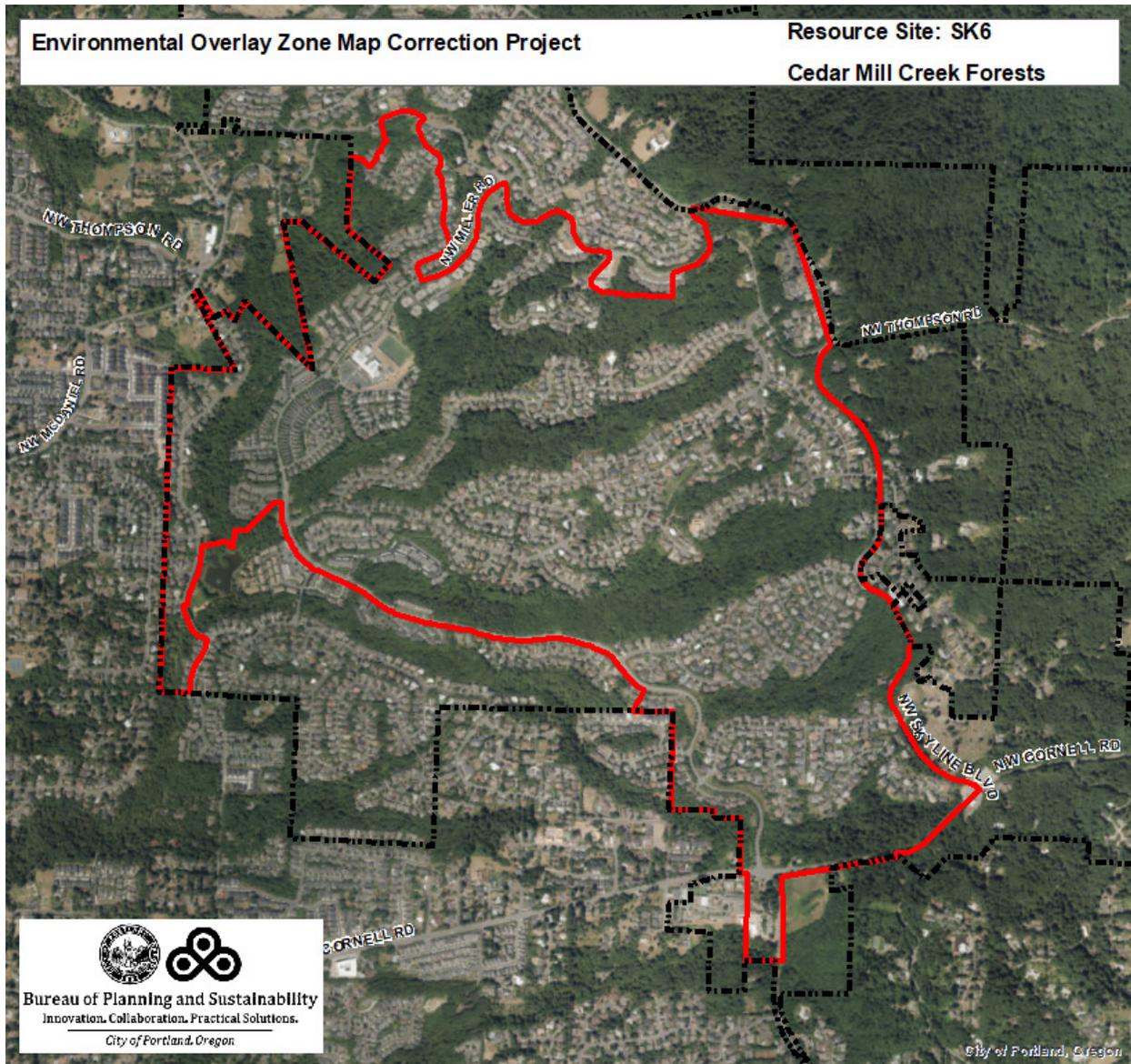
Map D: Riparian Corridors

- Resource Site
- High riparian function
- Medium riparian function
- Low riparian function
- open stream channel
- piped stream segment
- Taxlots
- City of Portland

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Resource Site No.: SK6 Resource Site Name: Cedar Mill Creek Forests
Previous Plan: Skyline West Conservation Plan Previous Resource Site No.: 145



Natural Resources Inventory

| Table A: Quantity of Natural Resource Features in Resource Site | | SK6 |
|---|-----------------------|-------------------|
| | | Study Area |
| Stream (Miles) | | 3.0 |
| Wetlands (acres) | | 2.4 |
| Vegetated Areas >= 1/2 acre (acres) | | 294.6 |
| | Forest (acres) | 264.2 |
| | Woodland (acres) | 10.1 |
| | Shrubland (acres) | 5.5 |
| | Herbaceous (acres) | 14.9 |
| Flood Area* | | 0.0 |
| | Vegetated (acres) | 0.0 |
| | Non-vegetated (acres) | 0.0 |
| Steep Slopes (acres)** | | 470.1 |
| Impervious Surface (acres) | | 146.7 |
| * The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area. | | |
| **Slopes are derived from LiDAR. Steep slopes are area with a slope greater than 25%. | | |

An array of first and second order creeks pass through steep, forested ravines and merge in the southwest corner of the site at Mill Pond. The ravines are separated by southwest trending forested ridges or recently developed residential areas which are part of large area subdivisions. Downstream of Mill Pond, another creek in the Washington County portion of the site merges with the main stem and eventually forms Cedar Mill Creek. Cedar Mill Creek becomes Beaverton Creek (and passes through the towns of Cedar Mill and Beaverton) before flowing into the Tualatin River. The steep, upper basin location of this site provides an important biological link to downstream land and water resources. The site also serves as a migratory link for mammals, birds and herptiles along and across the West Hills ridge.

Multiple first order creek branches feed the site's five primary creeks which meet to form Cedar Mill Creek. The total length of the creeks and creek branches within the site is approximately ten lineal miles. In addition to the riverine creek system, three palustrine wetlands are identified in the National Wetlands Inventory. Three additional wetlands were identified in the field inventory, as well as numerous forested and emergent wetlands directly associated with the site's creeks.

The forest ranges from early to mid-successional stages, or roughly ten to 100 years in age. The older forest is typically situated in creek ravines and is relatively dense with diverse species composition (over 125 species); the younger forest tends to be sparse (open canopy) with lower species diversity. The creek ravines also typically provide more significant wildlife habitat values, though habitat along certain ridges and upland plateaus is also significant.

The site's creeks and associated tributaries, wetlands and ravines provide important forage, cover and nesting habitat for a variety of bird, mammal, amphibian and reptile species. Two state-listed sensitive

species have been identified within the site to date. The northern red-legged frog, which also is a Federal candidate species, is a rare amphibian that breeds in January and February in local ponds or creek pools (including at least one wetland identified above), travels upstream through neighboring ravines to terrestrial habitats during the summer, and eventually returns to breed in downstream ponds. Juvenile frogs were identified in 1994 in the creek south of Reed Drive (Hayes 1994).

The pileated woodpecker, a sensitive species distributed widely within the site, is an important indicator species for the retention of a complete community of hole-nesting birds and small mammals (McClelland 1979). Most of these cavity-nesters are beneficial insectivores which help to control insect populations in the area.

Wildlife biologists often use the presence or absence of one or more "indicator species" to predict whether an area of habitat is suitable for a variety of species having similar habitat requirements. The pileated woodpecker and red-legged frog both serve as indicators of the health of the Cedar Mill Creek watershed ecosystem.

Black-tailed deer, Townsend's chipmunk and chickaree are common throughout the site; other mammals include bobcat, beaver, coyote, vagrant shrew, shrew-mole, Townsend's mole, little brown myotis, Mazama pocket gopher, deer mouse, Townsend's vole, muskrat, long-tailed weasel, raccoon and striped skunk. Pacific tree frog, ensatina and pacific giant salamander, roughskin newt, northern alligator lizard, northwestern and common garter snake are resident herptiles. Several of these species depend on both wetland and upland habitat for survival; for example, the deer, bobcat, beaver, chipmunk, frogs, and forest bird species depend on either daily or seasonal shifts in habitat to forage, escape flooding or predation, and breed.

Birds recorded at the Cedar Mill Creek site include the following:

- hairy woodpecker
- downy woodpecker
- pileated woodpecker
- red-br. sapsucker
- Cooper's hawk
- sharp-shinned hawk
- red-tailed hawk
- barn swallow
- bank swallow
- cliff swallow
- tree swallow (s)
- violet-green s.
- olive-s. flycatcher
- western flycatcher
- w. wood peewee
- red-br. nuthatch
- brown creeper
- chestnut-b chickadee
- black-cap chickadee
- nighthawk
- common merganser
- red-wing blackbird
- Brewer's blackbird
- Bewick's wren
- winter wren
- ruffled grouse
- Oregon junco
- r. hummingbird
- bushtit
- song sparrow {s}
- golden-crowned s.
- white-crowned s.
- golden-er. kinglet
- ruby-er. kinglet
- Swainson's thrush
- varied thrush
- American crow
- robin
- cedar waxwing
- northern flicker
- common flicker
- solitary sandpiper
- American kestrel
- great blue heron
- California quail
- green-backed heron
- band-tailed pigeon
- wood duck
- mourning dove green-winged teal
- western screech-owl
- blue-winged teal
- great horned owl
- cinnamon teal
- vaux's swift
- mallard
- Steller's jay
- American wigeon
- scrub jay belted
- kingfisher
- yellow warbler (w)
- evening grosbeak
- Tennessee w. bl.-headed grosbeak
- orange-crowned w. rufous-s. towhee
- Audubon w. c. yellowthroat
- yellow-rumped w.
- northern oriole
- bl.-throated grey w.
- purple finch
- Townsend's w. house finch
- MacGillivray's w.
- goldfinch
- Wilson's w. pine siskin
- band-tailed pigeon
- br.-headed cowbird
- bufflehead gadwall
- western tanager

The site's creeks, wetlands and forested ravines exert a significant influence on downstream water quality and on fish and amphibian production within the larger Tualatin River system. This system supports a broad range of species including the state-listed sensitive coho and fall chinook salmon, cutthroat trout, pacific lamprey and northern red-legged frog.

The Tualatin River is under a DEQ order requiring all jurisdictions within the watershed to take actions to improve water quality, including control of erosion and reduction of sediment and nutrient loads.

In addition to providing habitat for wildlife, the site's forest cover protects soil and watershed resources. Forest resource values include slope stabilization, dissipation of erosive forces, and sediment and nutrient removal. The forest helps to purify the air as well as the water, and provides shelter from storms and cold winds. The forest also adds to the scenic qualities of the area, giving local neighborhoods a semirural character and providing buffers between them.

The site's forest contains several notable floral features. Forest species include the pacific yew (*Taxus brevifolia*), a slow growing tree species commonly associated with later successional forests. In recent years, a cancer-fighting substance known as "taxol" was discovered in the bark of the yew. Several significant stands of western red cedar (*Thuja plicata*) and grand fir (*Abies grandis*) are also found in this site. These trees are later successional associates of the western hemlock forest community. Also of note is the presence of madrone (*Arbutus menziesii*) with limited distribution in the region.

Approximately 95 percent of the site is composed of Cascade silt loam soils. This soil is formed in silty materials and has a seasonally high water table, slow permeability, and a fragipan at 20 to 30 inches. Except in relatively level areas along the ridgetop, this soil has severe limitations for building site development and sanitary facilities due primarily to slope, wetness and low bearing strength (SCS Soil Survey 1983).

Several small soil inclusions are scattered along the edges of the site. These inclusions are the Cascade-Urban land complex (along the developed, middle section of Skyline Blvd.), Cornelius silt loam, Cornelius-Urban land complex and Faloma silt loam (all found in the southwest, Washington County portion of the site). Faloma is a hydric soil; it and the other inclusions all have moderate to severe limitations for building site development and sanitary facilities similar to the Cascade soils.

| Table B: Quality of Natural Resource Functions in Resource Site SK6 | | | | |
|---|-------------|---------------|------------|--------------|
| Resource Site (acres) = 629.303756 | | | | |
| | High | Medium | Low | Total |
| Riparian Corridors* | | | | |
| acres | 156.8 | 73.4 | 54.3 | 284.5 |
| percent total inventory site area | 24.9% | 11.7% | 8.6% | 45.2% |
| Wildlife Habitat* | | | | |
| acres | 67.8 | 186.0 | 0.0 | 253.8 |
| percent total inventory site area | 10.8% | 29.6% | 0.0% | 40.3% |
| Special Habitat Areas** | | | | |
| acres | | | | 0.0 |
| percent total inventory site area | | | | 0.0% |
| Combined Total⁺ | | | | |
| acres | 183.9 | 85.6 | 15.1 | 284.6 |
| percent total inventory site area | 29.2% | 13.6% | 2.4% | 45.2% |
| <p>* High-ranked riparian resources, Special Habitat Areas, and wildlife habitat include open water. ** Special Habitat Areas rank high for wildlife habitat. +Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.</p> | | | | |

Determination of Significance

Natural resource features mapped in the resource site that provide functions identified in the Natural Resources Inventory are determined to be significant (Map F). Within resource site SK6 the following significant features and functions are present:

Significant Natural Resource Features: open stream; wetlands; forest vegetation within 300 feet of waterbodies; forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies; developed land within 50 feet of waterbodies; forest patches and associated and contiguous woodland patches two acres in size or larger; and Special Habitat Areas.

Significant Riparian Corridor Functions: microclimate and shade; stream flow moderation and water storage; bank function and sediment, pollution and nutrient control; large wood and channel dynamics; organic inputs, food web and nutrient cycling; and riparian wildlife movement corridor.

Significant Wildlife Habitat Functions: interior area; food and water; resting, denning, nesting and rearing; movement and migration; reduction of noise, light and vibration; and habitat patches that support special status wildlife species.

Resource Site Specific ESEE

The General ESEE analysis, Volume 2, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

Conflicting Uses

The common impact of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; add impervious surface; modifying streams and floodplains; generating pollution; landscaping with non-native or invasive vegetation; building fences or other wildlife barriers; and other impacts such as noise, light, litter and pets.

Within the resource site residential uses are allowed outright or conditionally in the RF, R10 and R2 base zones. Open space uses are allowed in the OS base zone. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

ESEE Analysis

The analysis of economic, social, environmental and energy consequences provided in Volume 2 is confirmed for resource site SK6, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses generally would retain the riparian corridor and wildlife habitat functions of the significant natural resource features including maintaining habitat for at risk species, maintaining the flow moderation, water quality and flood control functions of streams and

wetlands, maintaining vegetation on steep slopes, and maintaining the stormwater management and air-cooling functions of the tree canopy. Mitigation for negative consequences of additional development in areas of high or medium ranked natural resources should be required. New or expanded development should be setback from a minimum distance streams and wetlands.

Steep slopes are susceptible to erosion and landslides. Development should be clustered away from steep slopes and trees and vegetation should be maintained to reduce the landslide risks. New or expanded development on steep slopes should be *limited*.

ESEE Decisions

Based on the ESEE general recommendations (Volume 2) and resource site-specific ESEE, the ESEE decisions for Resources Site SK6 are:

1. *Strictly limit* conflicting uses within stream channels from top-of-bank to top-of-bank, wetlands, land within 50 feet of stream top-of-bank, and land within 50 feet of wetlands
2. In resource tracts, *strictly limit* conflicting uses within areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
3. Outside of resource tracts, *limit* conflicting uses within areas of forest or woodland vegetation that are contiguous to but more than 50 feet from stream top-of-bank, including but not limited to on steep slopes.
4. Outside of resource tracts, *limit* conflicting uses within areas of forest or woodland vegetation on steep slopes that are contiguous to but more than 50 feet from stream top-of-bank, including but not limited to on steep slopes.
5. *Allow* conflicting uses within all other areas containing significant natural resources.

As part of creating subdivisions, large areas of forest vegetation surrounding streams were placed in common-ownership tracts. The forest and streams are maintained by the homeowners for protection of the resources.

| ESEE Decision | Acres |
|----------------------|--------------|
| Strictly Limit | 207.9 |
| Limit | 65.8 |
| Allow | 355.6 |

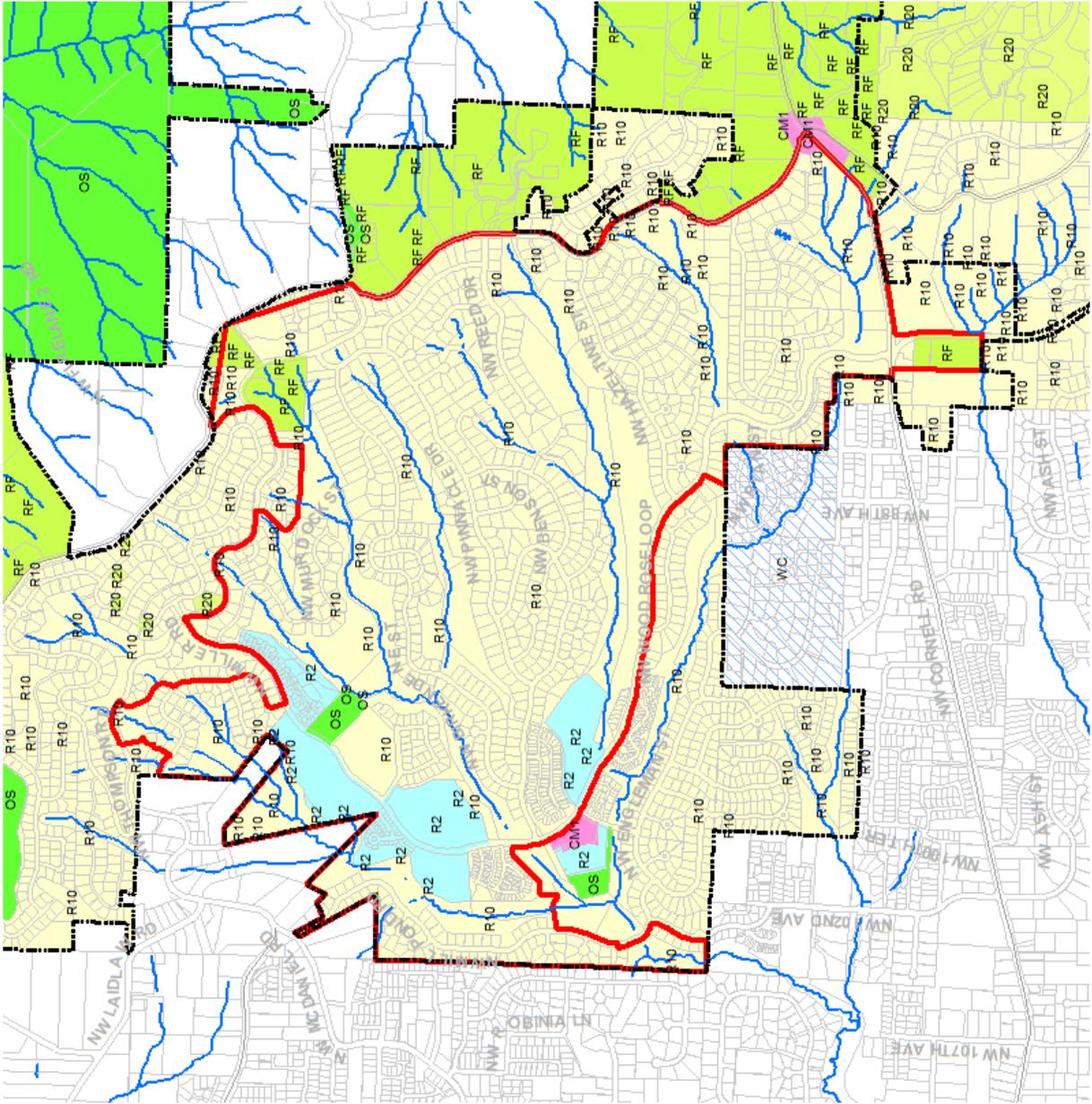


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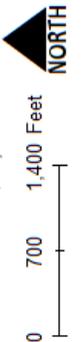
Resource Site: SK6
Cedar Mill Creek Forests

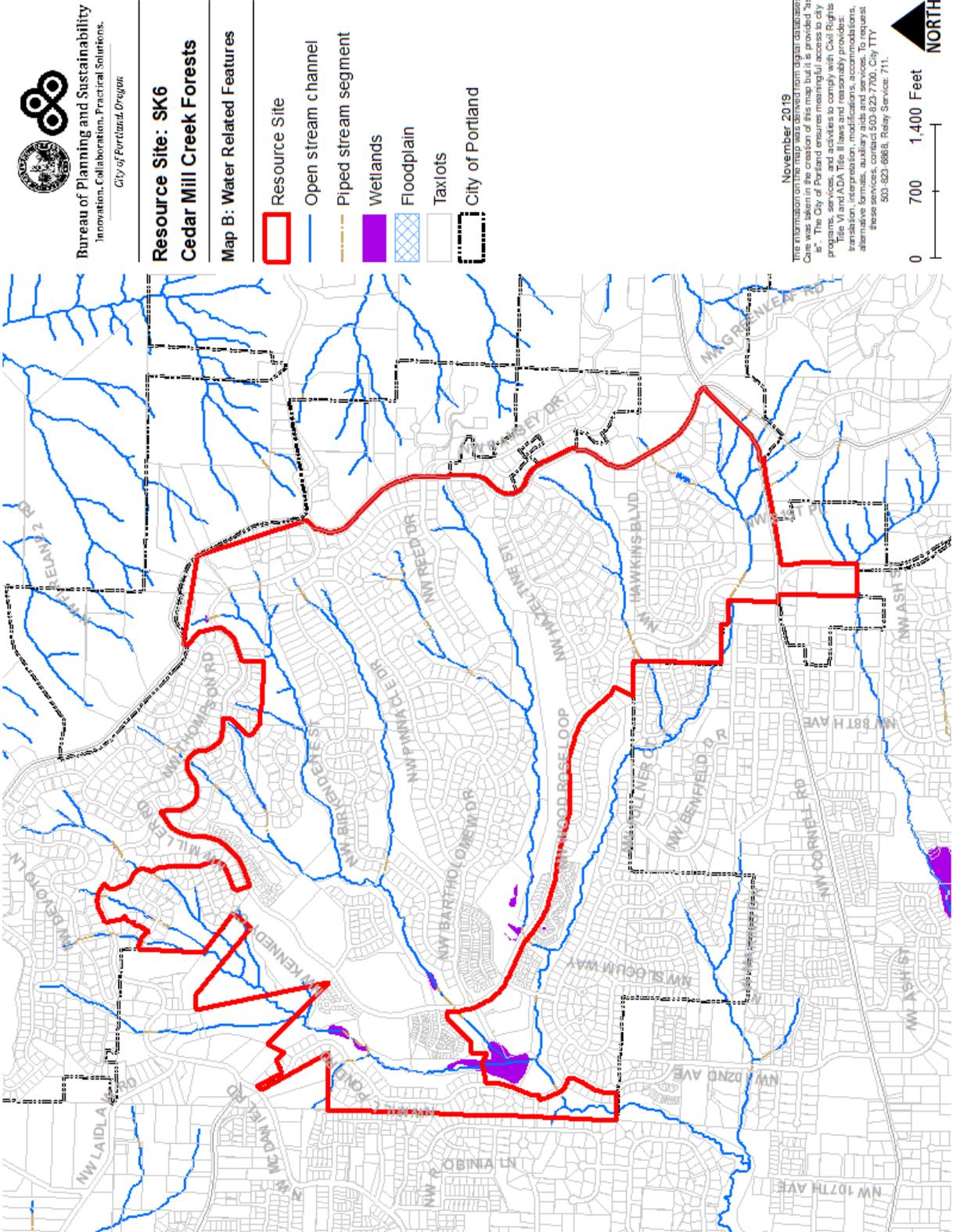
Map A: Base Zones

- Resource Site
- Streams
- Taxlots
- City of Portland



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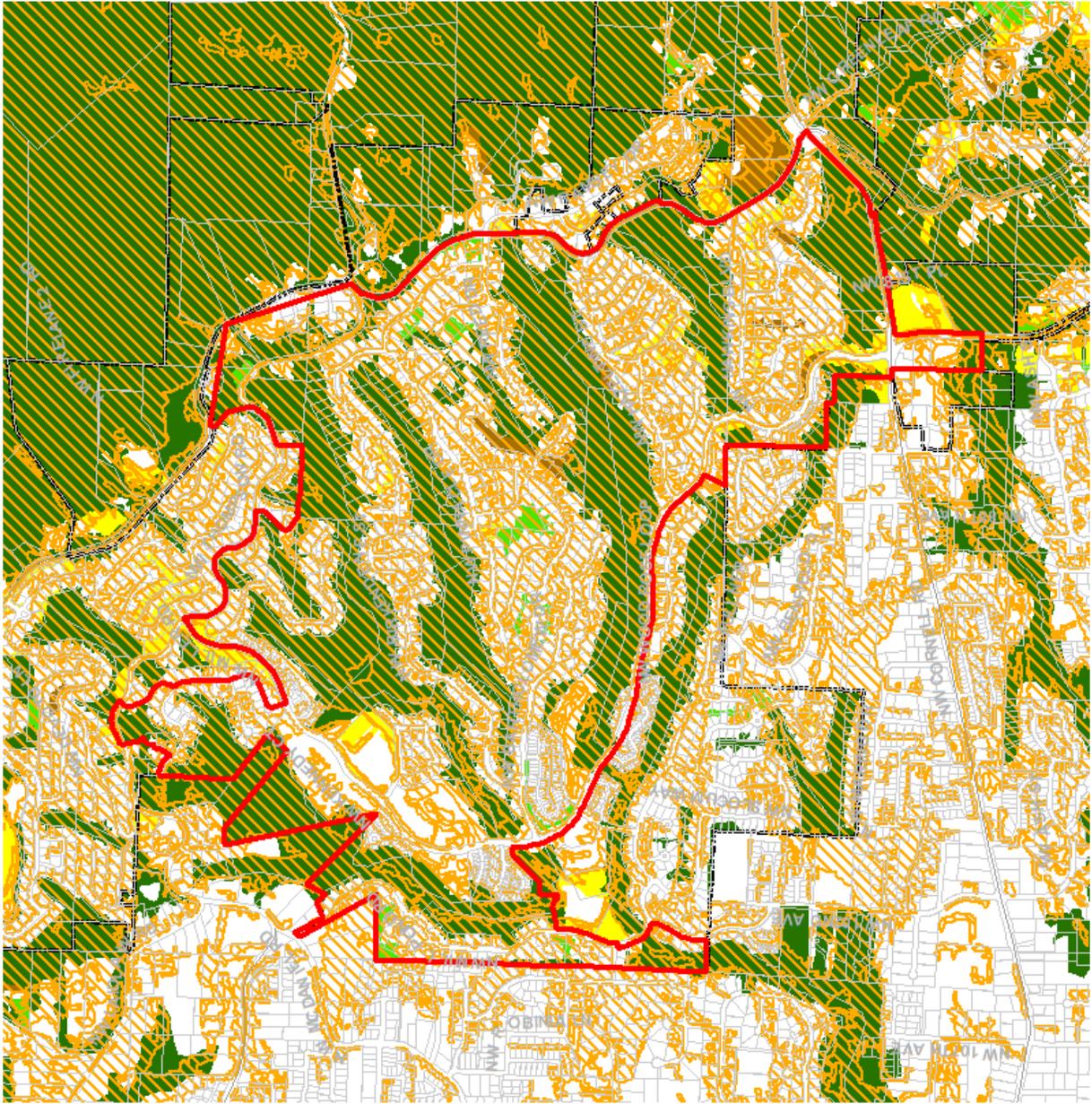




Resource Site: SK6
Cedar Mill Creek Forests

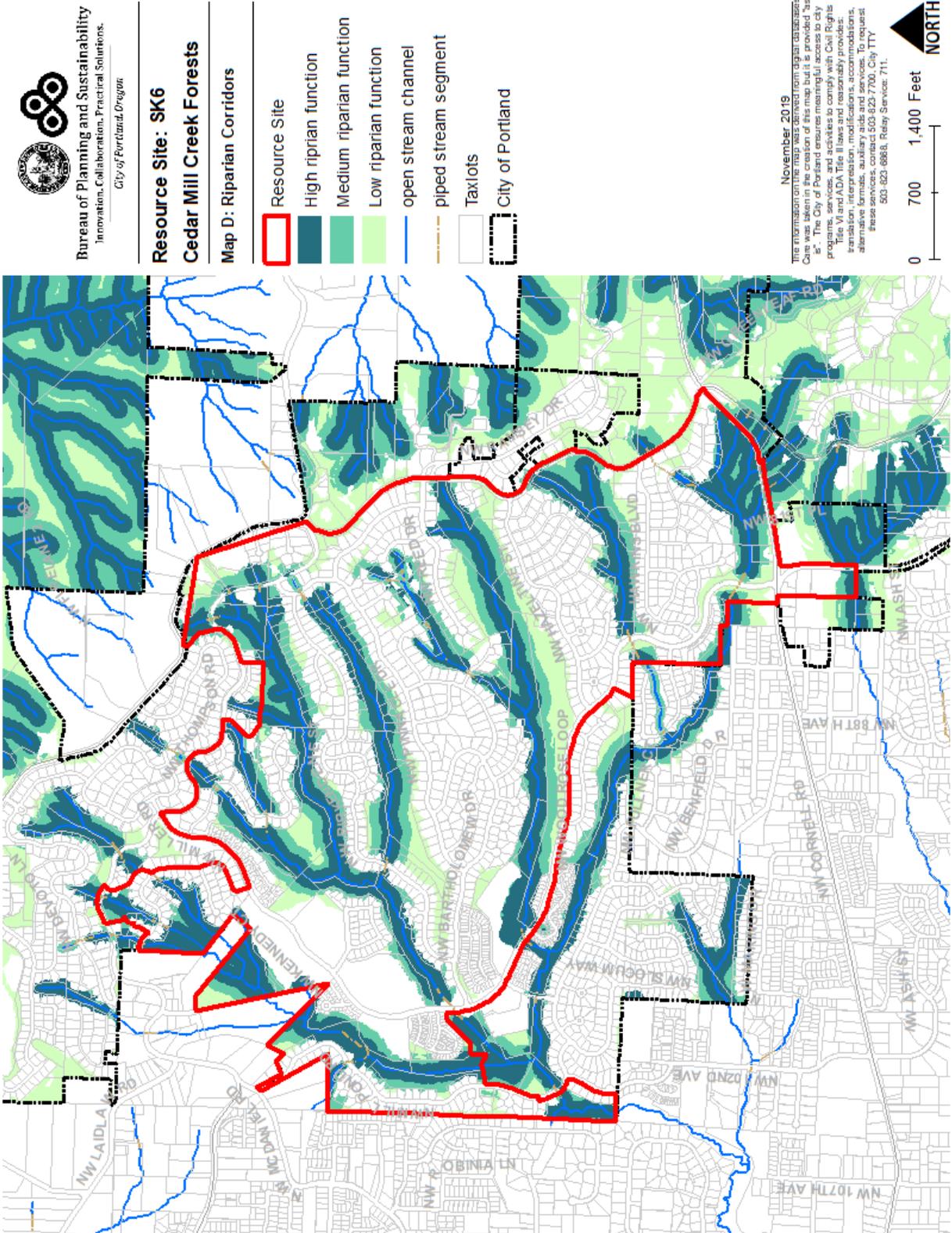
Map C: Land Features

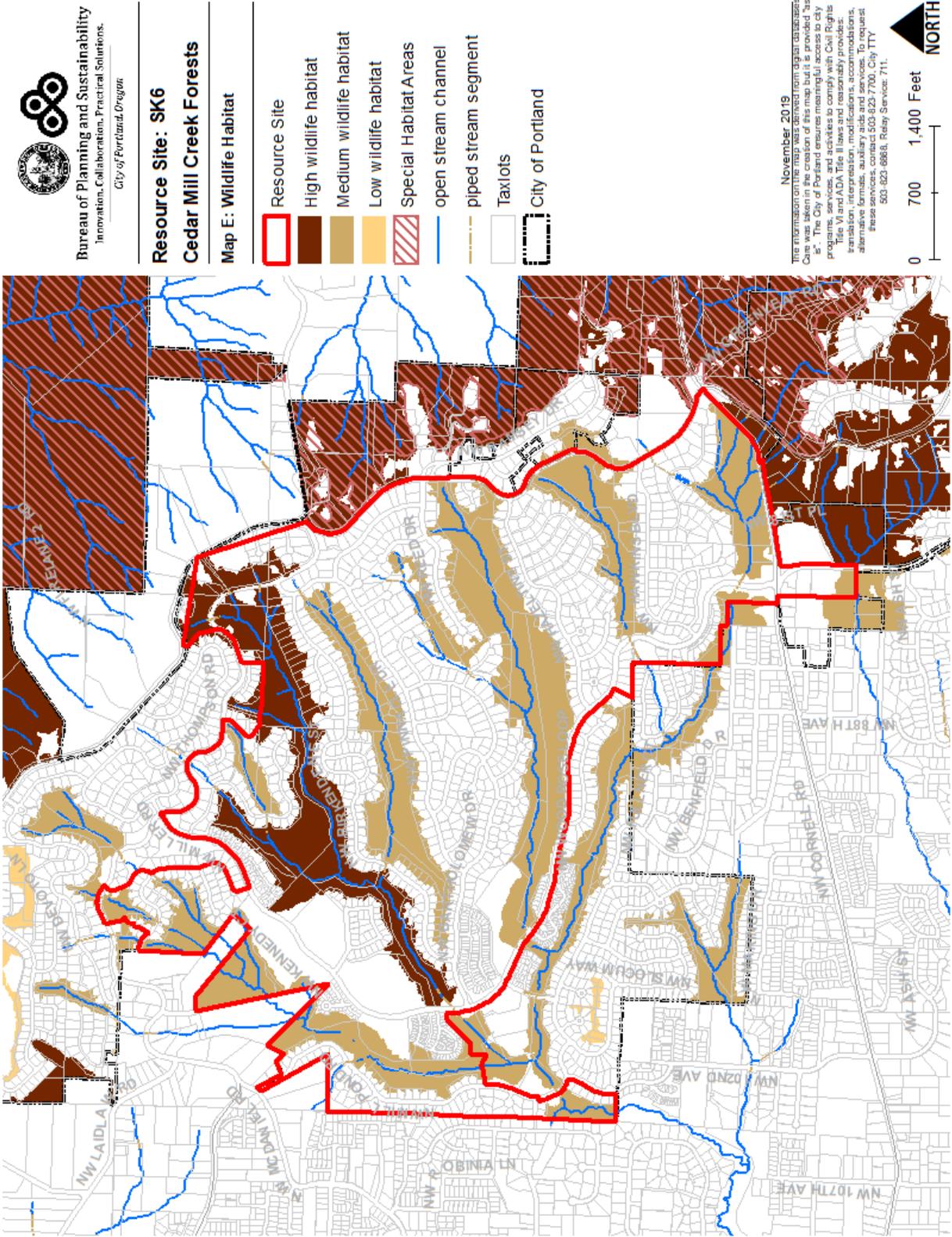
-  Resource Site
-  Steep Slopes (>25%)
-  Forest
-  Woodland
-  Shrubland
-  Herbaceous
-  Taxlots
-  City of Portland

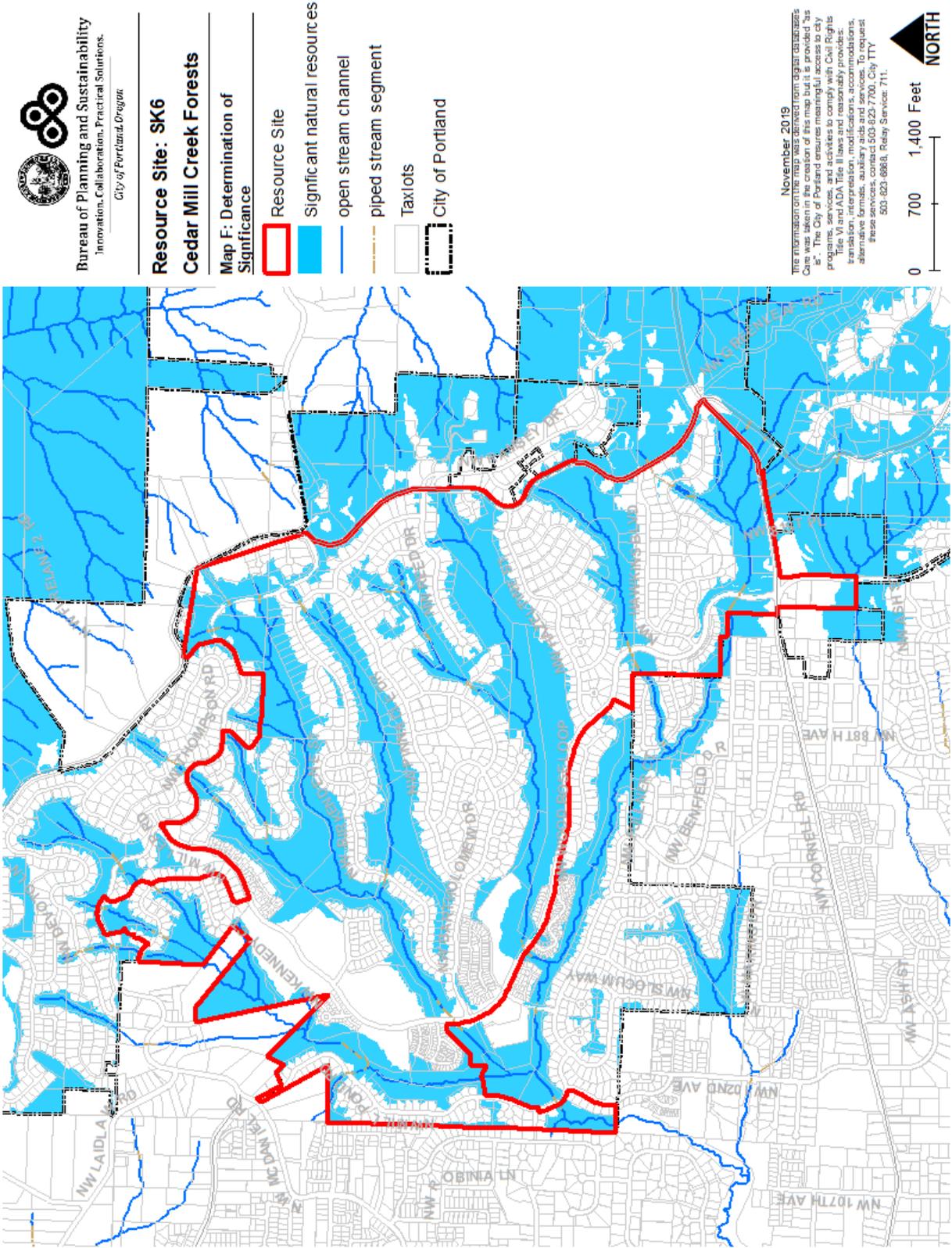


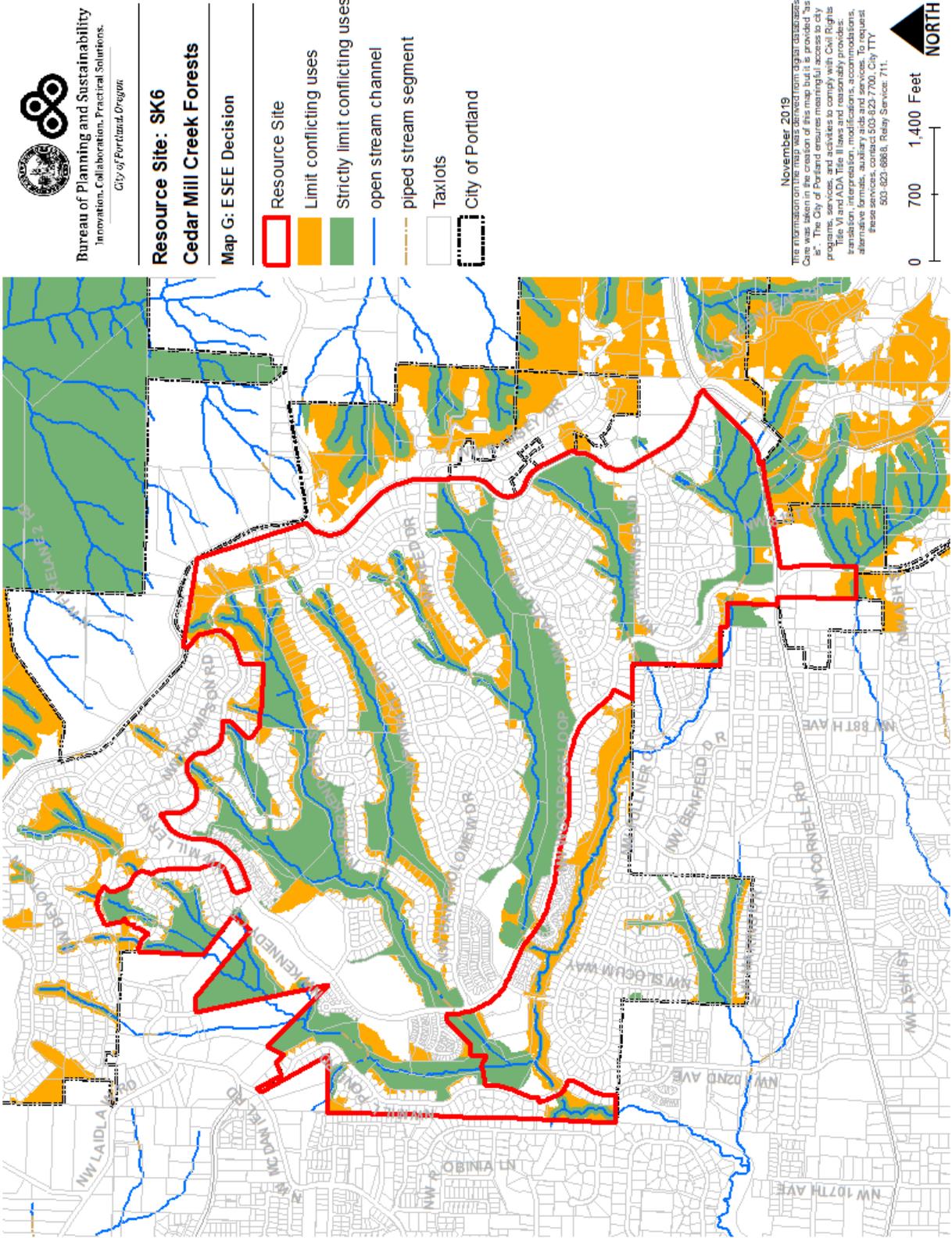
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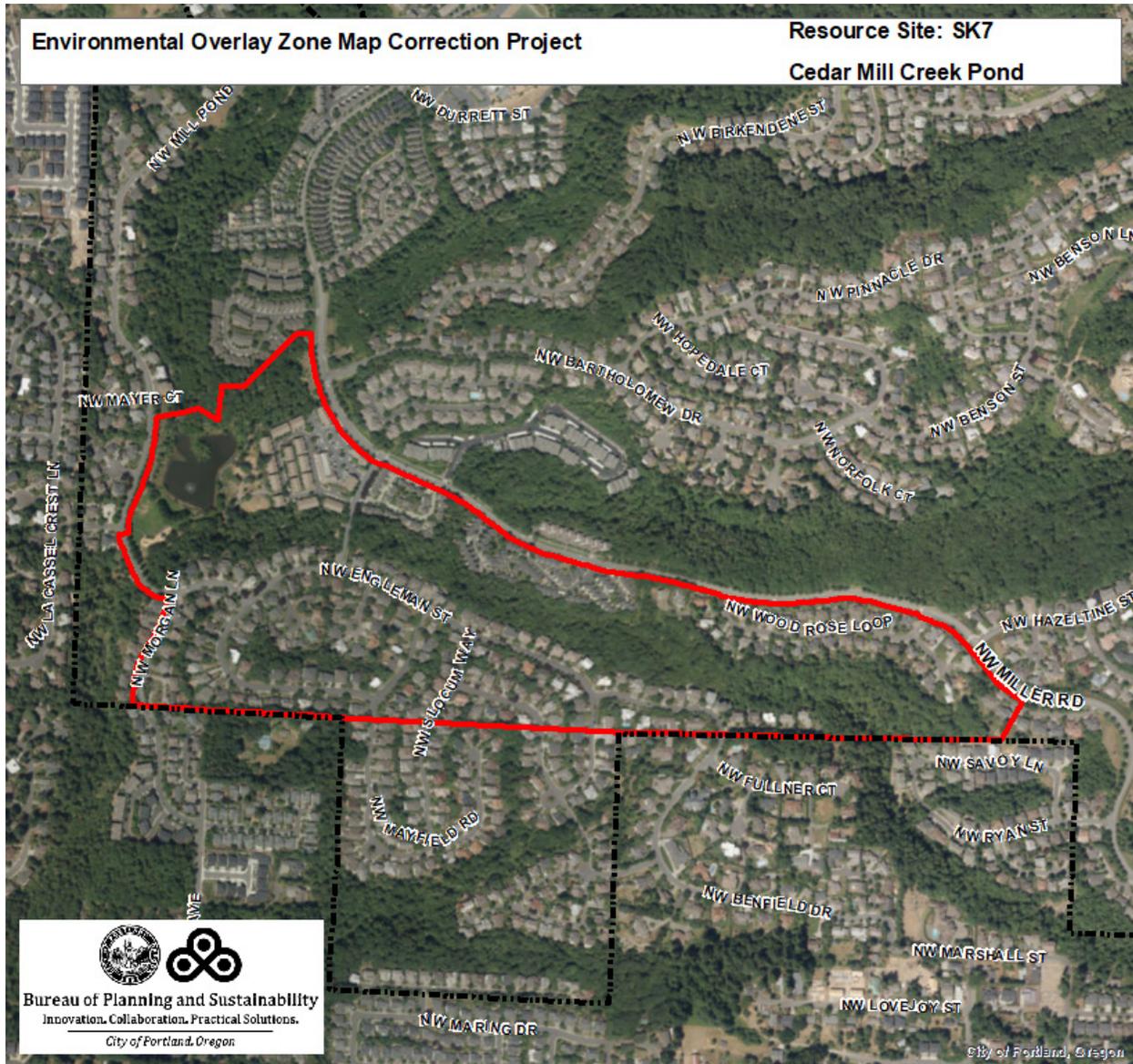








Resource Site No.: SK7 Resource Site Name: Cedar Mill Creek Pond
Previous Plan: Skyline West Conservation Plan Previous Resource Site No.: 145



Natural Resources Inventory

| Table A: Quantity of Natural Resource Features in Resource Site | | SK7 |
|---|-----------------------|-------------------|
| | | Study Area |
| Stream (Miles) | | 9.3 |
| Wetlands (acres) | | 3.1 |
| Vegetated Areas >= 1/2 acre (acres) | | 33.5 |
| | Forest (acres) | 29.2 |
| | Woodland (acres) | 0.2 |
| | Shrubland (acres) | 0.0 |
| | Herbaceous (acres) | 4.2 |
| Flood Area* | | 0.0 |
| | Vegetated (acres) | 0.0 |
| | Non-vegetated (acres) | 0.0 |
| Steep Slopes (acres)** | | 52.4 |
| Impervious Surface (acres) | | 25.3 |
| * The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area. | | |
| **Slopes are derived from LiDAR. Steep slopes are area with a slope greater than 25%. | | |

An array of first and second order creeks pass through steep, forested ravines and merge in the southwest corner of the site at Mill Pond. The ravines are separated by southwest trending forested ridges or recently developed residential areas which are part of large area subdivisions. Downstream of Mill Pond, another creek in the Washington County portion of the site merges with the main stem and eventually forms Cedar Mill Creek. Cedar Mill Creek becomes Beaverton Creek (and passes through the towns of Cedar Mill and Beaverton) before flowing into the Tualatin River. The steep, upper basin location of this site provides an important biological link to downstream land and water resources. The site also serves as a migratory link for mammals, birds and herptiles along and across the West Hills ridge.

Multiple first order creek branches feed the site's five primary creeks which meet to form Cedar Mill Creek. The total length of the creeks and creek branches within the site is approximately ten lineal miles. In addition to the riverine creek system, three palustrine wetlands are identified in the National Wetlands Inventory. Three additional wetlands were identified in the field inventory, as well as numerous forested and emergent wetlands directly associated with the site's creeks. The wetlands range in size from 1,000 sq. ft. to three acres and cover a total area of approximately 12 acres.

Of the total 970 acres, approximately 700 acres of this site is forested (as of Spring, 1994). The forest ranges from early to mid-successional stages, or roughly ten to 100 years in age. The older forest is typically situated in creek ravines and is relatively dense with diverse species composition (over 125 species); the younger forest tends to be sparse (open canopy) with lower species diversity. The creek ravines also typically provide more significant wildlife habitat values, though habitat along certain ridges and upland plateaus is also significant.

The site's creeks and associated tributaries, wetlands and ravines provide important forage, cover and nesting habitat for a variety of bird, mammal, amphibian and reptile species. Two state-listed sensitive species have been identified within the site to date. The northern red-legged frog, which also is a Federal candidate species, is a rare amphibian that breeds in January and February in local ponds or creek pools (including at least one wetland identified above), travels upstream through neighboring ravines to terrestrial habitats during the summer, and eventually returns to breed in downstream ponds. Juvenile frogs were identified in 1994 in the creek south of Reed Drive (Hayes 1994).

The pileated woodpecker, a sensitive species distributed widely within the site, is an important indicator species for the retention of a complete community of hole-nesting birds and small mammals (McClelland 1979). Most of these cavity-nesters are beneficial insectivores which help to control insect populations in the area.

Wildlife biologists often use the presence or absence of one or more "indicator species" to predict whether an area of habitat is suitable for a variety of species having similar habitat requirements. The pileated woodpecker and red-legged frog both serve as indicators of the health of the Cedar Mill Creek watershed ecosystem.

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Birds recorded at the Cedar Mill Creek site include the following:

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- sharp-shinned hawk
- red-tailed hawk
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- golden-crowned s.
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- golden-er. kinglet
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- Swainson's thrush
- varied thrush
- American crow
- robin
- cedar waxwing
- northern flicker
- common flicker
- solitary sandpiper
- American kestrel
- great blue heron
- California quail
- green-backed heron
- band-tailed pigeon
- wood duck
- mourning dove green-winged teal
- western screech-owl
- blue-winged teal
- great horned owl
- cinnamon teal
- vaux' s swift
- mallard
- Steller's jay
- American wigeon
- scrub jay belted
- kingfisher
- yellow warbler (w)
- evening grosbeak
- Tennessee w. bl.-headed grosbeak
- orange-crowned w. rufous-s. towhee
- Audubon w. c. yellowthroat
- yellow-rumped w.
- northern oriole
- bl.-throated grey w.
- purple finch
- Townsend's w. house finch
- MacGillivray's w. goldfinch
- Wilson's w. pine siskin
- band-tailed pigeon
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- western tanager

The site's creeks, wetlands and forested ravines exert a significant influence on downstream water quality and on fish and amphibian production within the larger Tualatin River system. This system supports a broad range of species including the state-listed sensitive coho and fall chinook salmon, cutthroat trout, pacific lamprey and northern red-legged frog.

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The site's forest contains several notable floral features. Forest species include the pacific yew (*Taxus brevifolia*), a slow growing tree species commonly associated with later successional forests. In recent years, a cancer-fighting substance known as "taxol" was discovered in the bark of the yew. Several significant stands of western red cedar (*Thuja plicata*) and grand fir (*Abies grandis*) are also found in this site. These trees are later successional associates of the western hemlock forest community. Also of note is the presence of madrone (*Arbutus menziesii*) with limited distribution in the region.

Approximately 95 percent of the site is composed of Cascade silt loam soils. This soil is formed in silty materials and has a seasonally high water table, slow permeability, and a fragipan at 20 to 30 inches. Except in relatively level areas along the ridgetop, this soil has severe limitations for building site development and sanitary facilities due primarily to slope, wetness and low bearing strength (SCS Soil Survey 1983).

Several small soil inclusions are scattered along the edges of the site. These inclusions are the Cascade-Urban land complex (along the developed, middle section of Skyline Blvd.), Cornelius silt loam, Cornelius-Urban land complex and Faloma silt loam (all found in the southwest, Washington County portion of the site). Faloma is a hydric soil; it and the other inclusions all have moderate to severe limitations for building site development and sanitary facilities similar to the Cascade soils.

| Table B: Quality of Natural Resource Functions in Resource Site SK7 | | | | |
|---|-------------|---------------|------------|--------------|
| Resource Site (acres) = 91.186576 | | | | |
| | High | Medium | Low | Total |
| Riparian Corridors* | | | | |
| acres | 21.9 | 7.7 | 4.4 | 34.0 |
| percent total inventory site area | 24.0% | 8.4% | 4.8% | 37.3% |
| Wildlife Habitat* | | | | |
| acres | 0.0 | 29.5 | 2.0 | 31.5 |
| percent total inventory site area | 0.0% | 32.4% | 2.2% | 34.6% |
| Special Habitat Areas** | | | | |
| acres | | | | 0.0 |
| percent total inventory site area | | | | 0.0% |
| Combined Total⁺ | | | | |
| acres | 21.9 | 10.5 | 3.6 | 36.0 |
| percent total inventory site area | 24.0% | 11.5% | 4.0% | 39.5% |
| <p>* High-ranked riparian resources, Special Habitat Areas, and wildlife habitat include open water. ** Special Habitat Areas rank high for wildlife habitat. +Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.</p> | | | | |

Determination of Significance

Natural resource features mapped in the resource site that provide functions identified in the Natural Resources Inventory are determined to be significant (Map F). Within resource site SK7 the following significant features and functions are present:

Significant Natural Resource Features: open stream; wetlands; forest vegetation within 300 feet of waterbodies; forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies; developed land within 50 feet of waterbodies; forest patches and associated and contiguous woodland patches two acres in size or larger; and Special Habitat Areas.

Significant Riparian Corridor Functions: microclimate and shade; stream flow moderation and water storage; bank function and sediment, pollution and nutrient control; large wood and channel dynamics; organic inputs, food web and nutrient cycling; and riparian wildlife movement corridor.

Significant Wildlife Habitat Functions: interior area; food and water; resting, denning, nesting and rearing; movement and migration; reduction of noise, light and vibration; and habitat patches that support special status wildlife species.

Resource Site Specific ESEE

The General ESEE analysis, Volume 2, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

Conflicting Uses

The common impact of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; add impervious surface; modifying streams and floodplains; generating pollution; landscaping with non-native or invasive vegetation; building fences or other wildlife barriers; and other impacts such as noise, light, litter and pets.

Within the resource site residential uses are allowed outright or conditionally in the R10 and R2 base zones. Commercial uses are allowed in the CM1 base zone. Open space uses are allowed in the OS base zone. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

ESEE Analysis

The analysis of economic, social, environmental and energy consequences provided in Volume 2 is confirmed for resource site SK7, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses generally would retain the riparian corridor and wildlife habitat functions of the significant natural resource features including maintaining habitat for at risk species, maintaining the flow moderation, water quality and flood control functions of streams and

wetlands, maintaining vegetation on steep slopes, and maintaining the stormwater management and air-cooling functions of the tree canopy. Mitigation for negative consequences of additional development in areas of high or medium ranked natural resources should be required. New or expanded development should be setback from a minimum distance streams and wetlands.

Steep slopes are susceptible to erosion and landslides. Development should be clustered away from steep slopes and trees and vegetation should be maintained to reduce the landslide risks. New or expanded development on steep slopes should be *limited*.

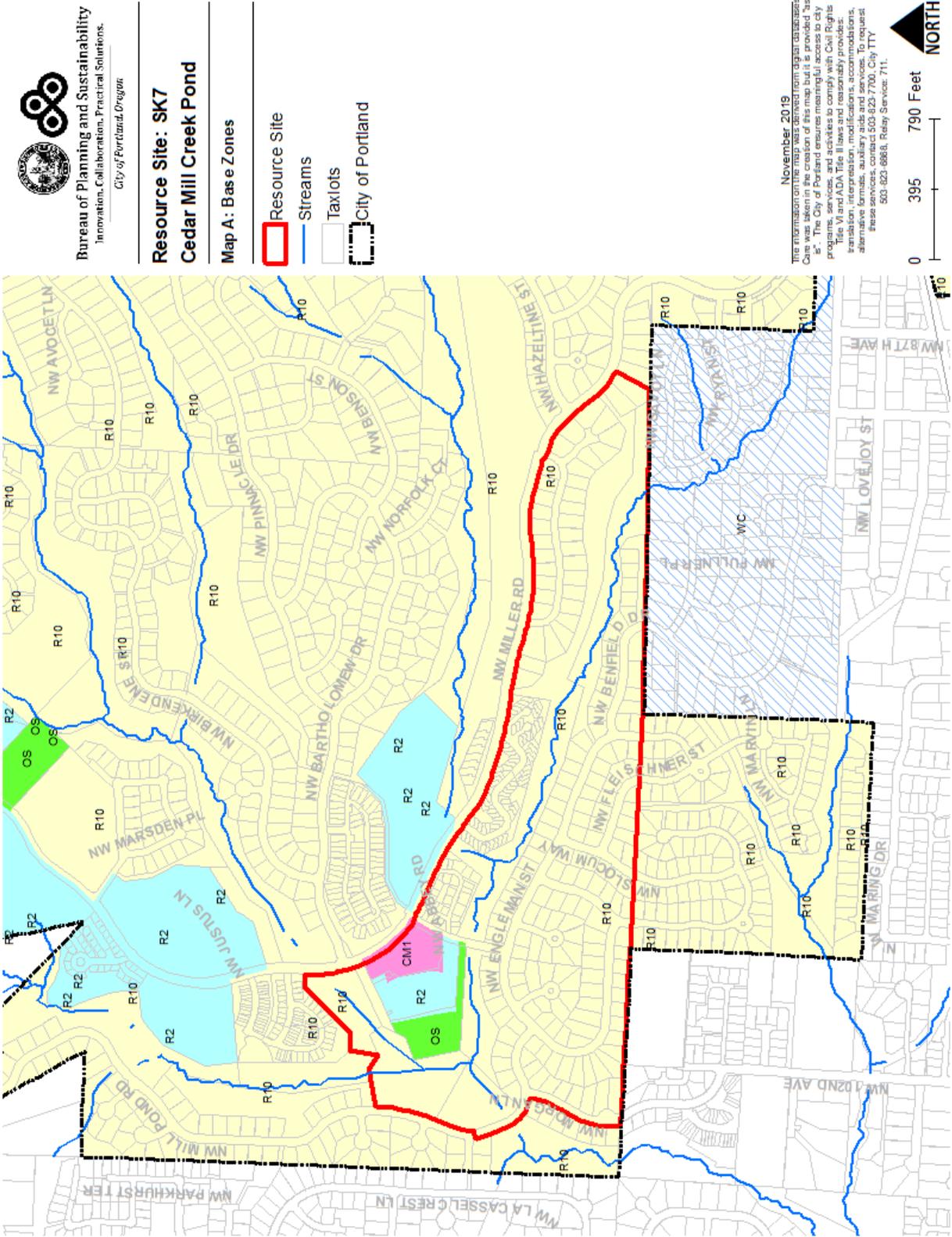
ESEE Decisions

Based on the ESEE general recommendations (Volume 2) and resource site-specific ESEE, the ESEE decisions for Resources Site SK7 are:

1. *Strictly limit* conflicting uses within stream channels from top-of-bank to top-of-bank, wetlands, land within 25 feet of stream top-of-bank, and land within 50 feet of wetlands
2. *Limit* conflicting uses on land between 25 and 50 feet of stream top-of-bank.
3. *Limit* conflicting uses within areas of forest or woodland vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
4. *Limit* conflicting uses within areas of forest or woodland on steep slopes that are contiguous to but more than 50 feet from stream top-of-bank.
5. *Allow* conflicting uses within all other areas containing significant natural resources.

As part of creating subdivisions, large areas of forest vegetation surrounding streams were placed in common-ownership tracts. The forest and streams are maintained by the homeowners for protection of the resources.

| ESEE Decision | Acres |
|----------------------|--------------|
| Strictly Limit | 12.5 |
| Limit | 19.2 |
| Allow | 59.5 |

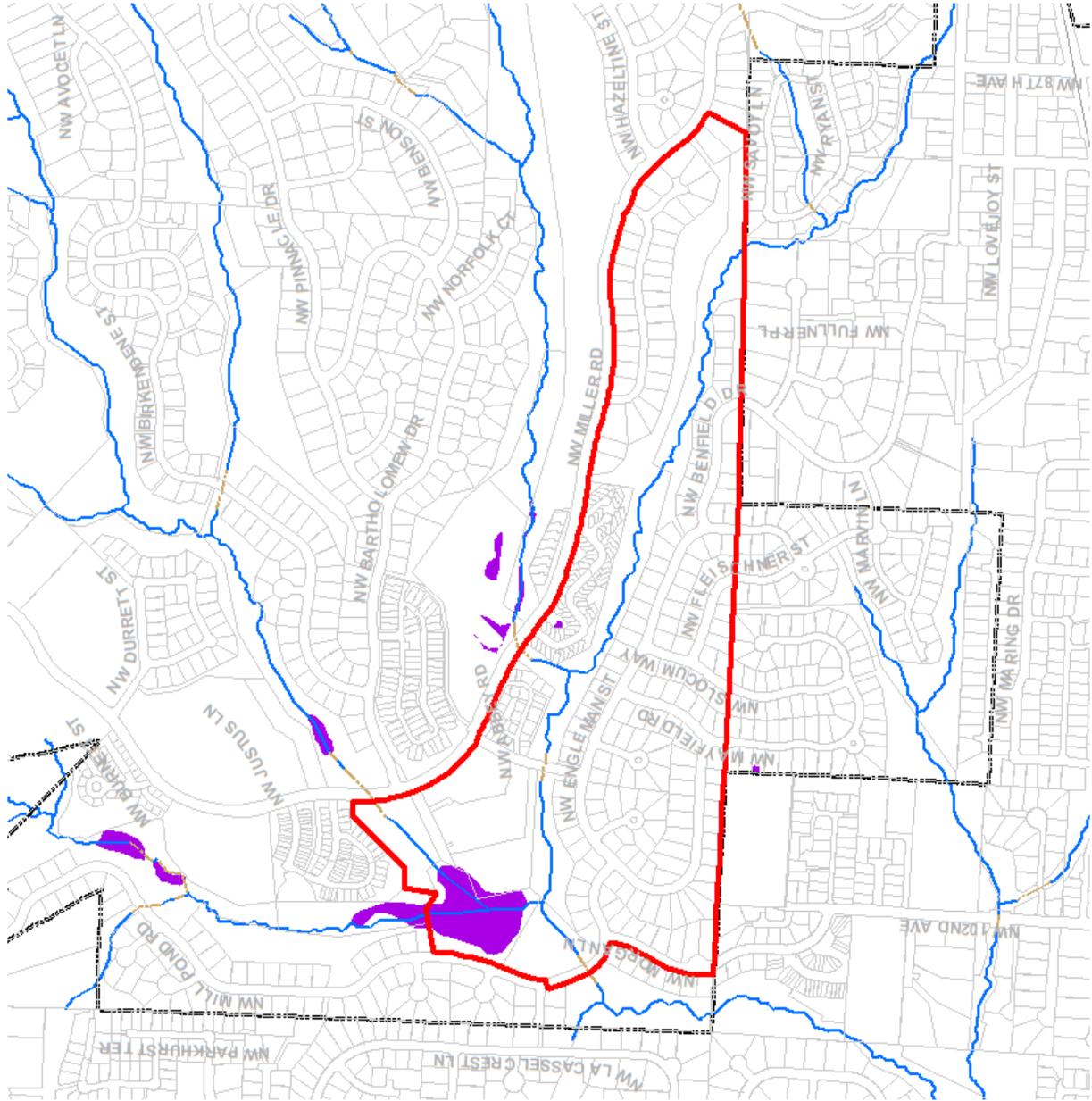
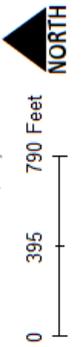




Resource Site: SK7
Cedar Mill Creek Pond
Map B: Water Related Features

- Resource Site
- Open stream channel
- Piped stream segment
- Wetlands
- Floodplain
- Taxlots
- City of Portland

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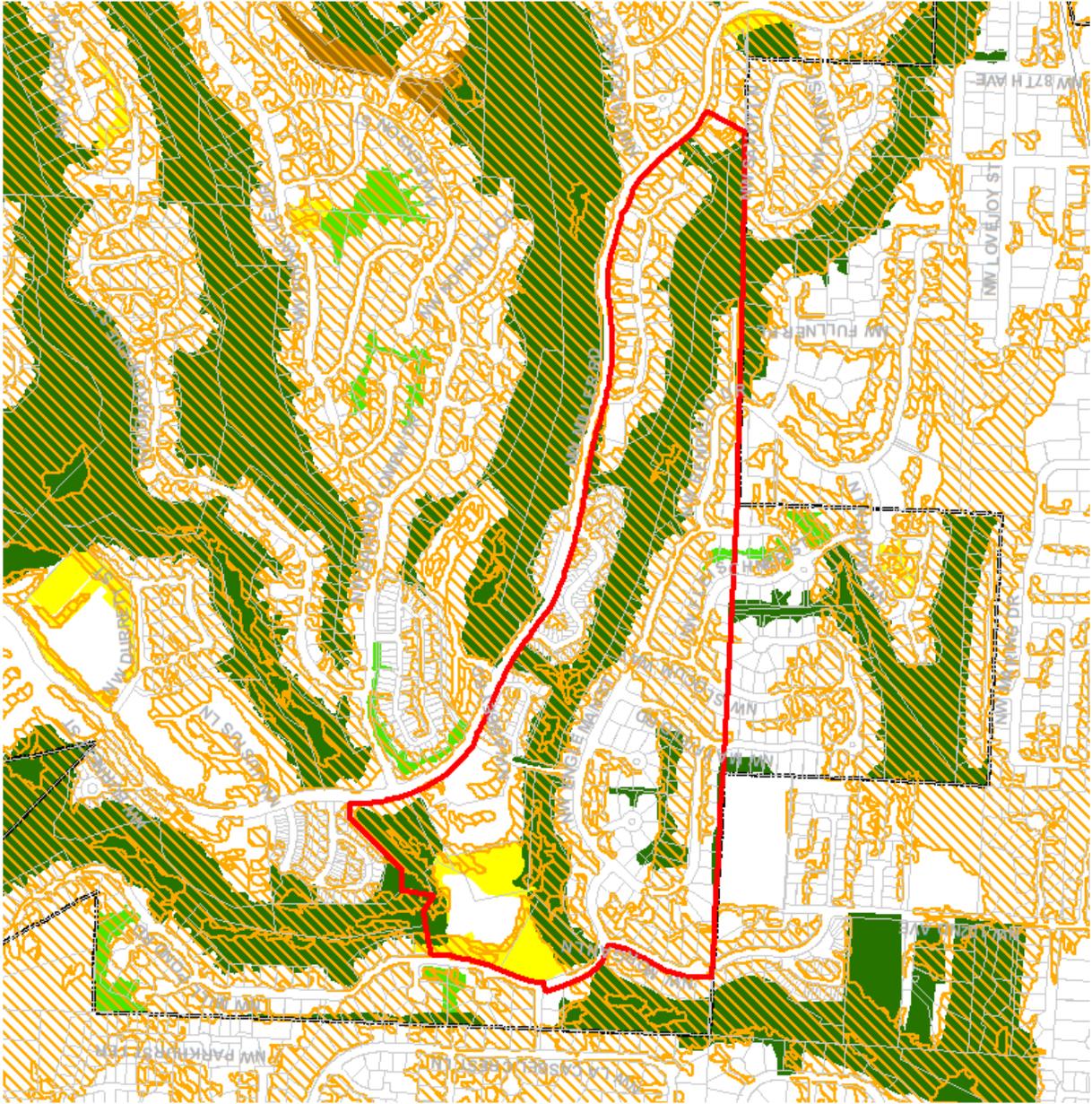




Resource Site: SK7
Cedar Mill Creek Pond

Map C: Land Features

- Resource Site
- Steep Slopes (>25%)
- Forest
- Woodland
- Shrubland
- Herbaceous
- Taxlots
- City of Portland



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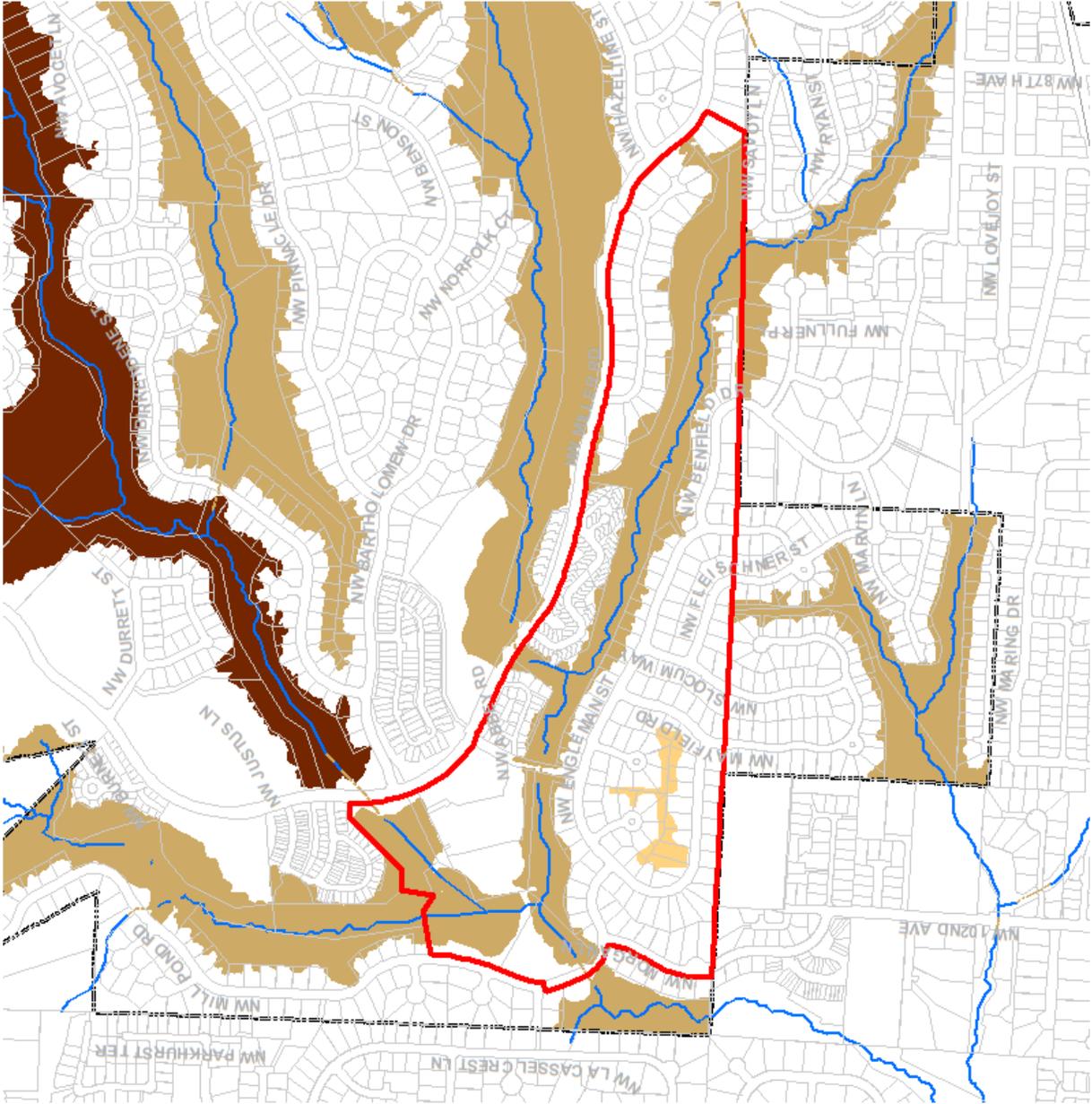


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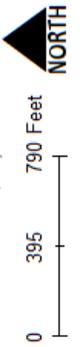
Resource Site: SK7
Cedar Mill Creek Pond

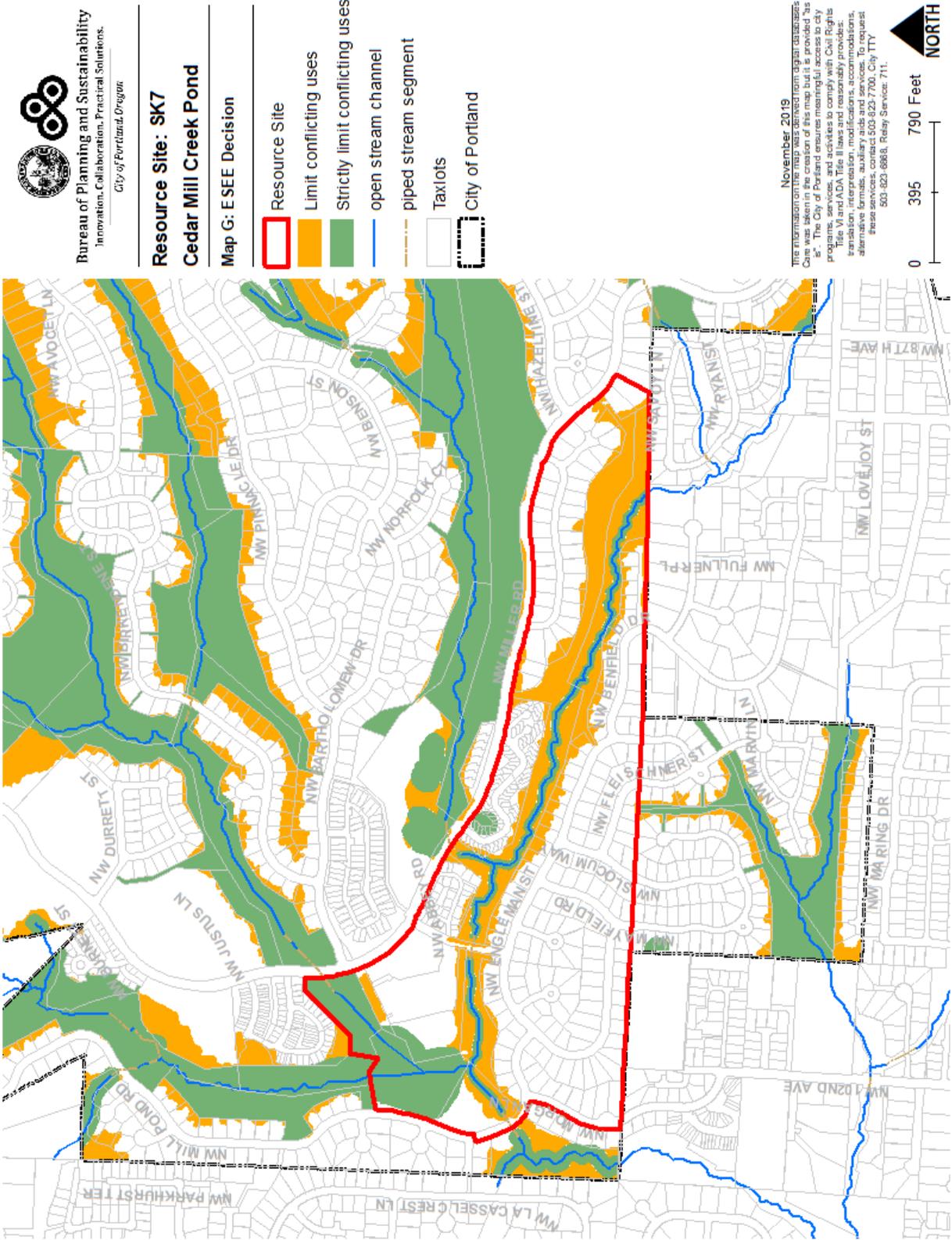
Map E: Wildlife Habitat

- Resource Site
- High wildlife habitat
- Medium wildlife habitat
- Low wildlife habitat
- Special Habitat Areas
- open stream channel
- piped stream segment
- Taxlots
- City of Portland



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The information on this map was derived from digital orthophotos. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, and other services. For more information about these services, contact 503.823.7700, City TTY: 503.823.8888, Relay Service: 711.





Resource Site No.: SK8 **Resource Site Name:** Cedar Mill Creek South
Previous Plan: Skyline West Conservation Plan **Previous Resource Site No.:** 145



Natural Resources Inventory

| Table A: Quantity of Natural Resource Features in Resource Site | | SK8 |
|---|-----------------------|-------------------|
| | | Study Area |
| Stream (Miles) | | 1.3 |
| Wetlands (acres) | | 0.0 |
| Vegetated Areas >= 1/2 acre (acres) | | 14.9 |
| | Forest (acres) | 13.5 |
| | Woodland (acres) | 0.8 |
| | Shrubland (acres) | 0.0 |
| | Herbaceous (acres) | 0.6 |
| Flood Area* | | 0.0 |
| | Vegetated (acres) | 0.0 |
| | Non-vegetated (acres) | 0.0 |
| Steep Slopes (acres)** | | 22.2 |
| Impervious Surface (acres) | | 8.1 |
| * The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area. | | |
| **Slopes are derived from LiDAR. Steep slopes are area with a slope greater than 25%. | | |

An array of first and second order creeks pass through steep, forested ravines and merge in the southwest corner of the site at Mill Pond. The ravines are separated by southwest trending forested ridges or recently developed residential areas which are part of large area subdivisions. Downstream of Mill Pond, another creek in the Washington County portion of the site merges with the main stem and eventually forms Cedar Mill Creek. Cedar Mill Creek becomes Beaverton Creek (and passes through the towns of Cedar Mill and Beaverton) before flowing into the Tualatin River. The steep, upper basin location of this site provides an important biological link to downstream land and water resources. The site also serves as a migratory link for mammals, birds and herptiles along and across the West Hills ridge.

Multiple first order creek branches feed the site's five primary creeks which meet to form Cedar Mill Creek. The total length of the creeks and creek branches within the site is approximately ten lineal miles. In addition to the riverine creek system, three palustrine wetlands are identified in the National Wetlands Inventory. Three additional wetlands were identified in the field inventory, as well as numerous forested and emergent wetlands directly associated with the site's creeks.

Of the total 970 acres, approximately 700 acres of this site is forested (as of Spring, 1994). The forest ranges from early to mid-successional stages, or roughly ten to 100 years in age. The older forest is typically situated in creek ravines and is relatively dense with diverse species composition (over 125 species); the younger forest tends to be sparse (open canopy) with lower species diversity. The creek ravines also typically provide more significant wildlife habitat values, though habitat along certain ridges and upland plateaus is also significant.

The site's creeks and associated tributaries, wetlands and ravines provide important forage, cover and nesting habitat for a variety of bird, mammal, amphibian and reptile species. Two state-listed sensitive species have been identified within the site to date. The northern red-legged frog, which also is a Federal candidate species, is a rare amphibian that breeds in January and February in local ponds or creek pools (including at least one wetland identified above), travels upstream through neighboring ravines to terrestrial habitats during the summer, and eventually returns to breed in downstream ponds. Juvenile frogs were identified in 1994 in the creek south of Reed Drive (Hayes 1994).

The pileated woodpecker, a sensitive species distributed widely within the site, is an important indicator species for the retention of a complete community of hole-nesting birds and small mammals (McClelland 1979). Most of these cavity-nesters are beneficial insectivores which help to control insect populations in the area.

Wildlife biologists often use the presence or absence of one or more "indicator species" to predict whether an area of habitat is suitable for a variety of species having similar habitat requirements. The pileated woodpecker and red-legged frog both serve as indicators of the health of the Cedar Mill Creek watershed ecosystem.

Black-tailed deer, Townsend's chipmunk and chickaree are common throughout the site; other mammals include bobcat, beaver, coyote, vagrant shrew, shrew-mole, Townsend's mole, little brown myotis, Mazama pocket gopher, deer mouse, Townsend's vole, muskrat, long-tailed weasel, raccoon and striped skunk. Pacific tree frog, ensatina and pacific giant salamander, roughskin newt, northern alligator lizard, northwestern and common garter snake are resident herptiles. Several of these species depend on both wetland and upland habitat for survival; for example, the deer, bobcat, beaver, chipmunk, frogs, and forest bird species depend on either daily or seasonal shifts in habitat to forage, escape flooding or predation, and breed.

Birds recorded at the Cedar Mill Creek site include the following:

- hairy woodpecker
- downy woodpecker
- pileated woodpecker
- red-br. sapsucker
- Cooper's hawk
- sharp-shinned hawk
- red-tailed hawk
- barn swallow
- bank swallow
- cliff swallow
- tree swallow (s)
- violet-green s.
- olive-s. flycatcher
- western flycatcher
- w. wood peewee
- red-br. nuthatch
- brown creeper
- chestnut-b chickadee
- black-cap chickadee
- nighthawk
- common merganser
- red-wing blackbird
- Brewer's blackbird
- Bewick' s wren
- winter wren
- ruffled grouse
- Oregon junco
- r. hummingbird
- bushtit
- song sparrow {s}
- golden-crowned s.
- white-crowned s.
- golden-er. kinglet
- ruby-er. kinglet
- Swainson's thrush
- varied thrush
- American crow
- robin
- cedar waxwing
- northern flicker
- common flicker
- solitary sandpiper
- American kestrel
- great blue heron
- California quail
- green-backed heron
- band-tailed pigeon
- wood duck
- mourning dove green-winged teal
- western screech-owl
- blue-winged teal
- great horned owl
- cinnamon teal
- vaux' s swift
- mallard
- Steller's jay
- American wigeon
- scrub jay belted
- kingfisher
- yellow warbler (w)
- evening grosbeak
- Tennessee w. bl.-headed grosbeak
- orange-crowned w. rufous-s. towhee
- Audubon w. c. yellowthroat
- yellow-rumped w.
- northern oriole
- bl.-throated grey w.
- purple finch
- Townsend's w. house finch
- MacGillivray's w. goldfinch
- Wilson's w. pine siskin
- band-tailed pigeon
- br.-headed cowbird
- bufflehead gadwall
- western tanager

The site's creeks, wetlands and forested ravines exert a significant influence on downstream water quality and on fish and amphibian production within the larger Tualatin River system. This system supports a broad range of species including the state-listed sensitive coho and fall chinook salmon, cutthroat trout, pacific lamprey and northern red-legged frog.

The Tualatin River is under a DEQ order requiring all jurisdictions within the watershed to take actions to improve water quality, including control of erosion and reduction of sediment and nutrient loads.

In addition to providing habitat for wildlife, the site's forest cover protects soil and watershed resources. Forest resource values include slope stabilization, dissipation of erosive forces, and sediment and nutrient removal. The forest helps to purify the air as well as the water, and provides shelter from storms and cold winds. The forest also adds to the scenic qualities of the area, giving local neighborhoods a semirural character and providing buffers between them.

The site's forest contains several notable floral features. Forest species include the pacific yew (*Taxus brevifolia*), a slow growing tree species commonly associated with later successional forests. In recent years, a cancer-fighting substance known as "taxol" was discovered in the bark of the yew. Several significant stands of western red cedar (*Thuja plicata*) and grand fir (*Abies grandis*) are also found in this site. These trees are later successional associates of the western hemlock forest community. Also of note is the presence of madrone (*Arbutus menziesii*) with limited distribution in the region.

Approximately 95 percent of the site is composed of Cascade silt loam soils. This soil is formed in silty materials and has a seasonally high water table, slow permeability, and a fragipan at 20 to 30 inches. Except in relatively level areas along the ridgetop, this soil has severe limitations for building site development and sanitary facilities due primarily to slope, wetness and low bearing strength (SCS Soil Survey 1983).

Several small soil inclusions are scattered along the edges of the site. These inclusions are the Cascade-Urban land complex (along the developed, middle section of Skyline Blvd.), Cornelius silt loam, Cornelius-Urban land complex and Faloma silt loam (all found in the southwest, Washington County portion of the site). Faloma is a hydric soil; it and the other inclusions all have moderate to severe limitations for building site development and sanitary facilities similar to the Cascade soils.

| Table B: Quality of Natural Resource Functions in Resource Site SK8 | | | | |
|---|-------------|---------------|------------|--------------|
| Resource Site (acres) = 38.702153 | | | | |
| | High | Medium | Low | Total |
| Riparian Corridors* | | | | |
| acres | 9.4 | 2.8 | 1.5 | 13.7 |
| percent total inventory site area | 24.3% | 7.1% | 4.0% | 35.4% |
| Wildlife Habitat* | | | | |
| acres | 0.0 | 13.2 | 0.0 | 13.2 |
| percent total inventory site area | 0.0% | 34.0% | 0.0% | 34.0% |
| Special Habitat Areas** | | | | |
| acres | | | | 0.0 |
| percent total inventory site area | | | | 0.0% |
| Combined Total⁺ | | | | |
| acres | 9.4 | 4.2 | 0.1 | 13.7 |
| percent total inventory site area | 24.3% | 10.7% | 0.4% | 35.4% |
| <p>* High-ranked riparian resources, Special Habitat Areas, and wildlife habitat include open water. ** Special Habitat Areas rank high for wildlife habitat. +Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.</p> | | | | |

Determination of Significance

Natural resource features mapped in the resource site that provide functions identified in the Natural Resources Inventory are determined to be significant (Map F). Within resource site SK8 the following significant features and functions are present:

Significant Natural Resource Features: open stream; wetlands; forest vegetation within 300 feet of waterbodies; forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies; developed land within 50 feet of waterbodies; forest patches and associated and contiguous woodland patches two acres in size or larger; and Special Habitat Areas.

Significant Riparian Corridor Functions: microclimate and shade; stream flow moderation and water storage; bank function and sediment, pollution and nutrient control; large wood and channel dynamics; organic inputs, food web and nutrient cycling; and riparian wildlife movement corridor.

Significant Wildlife Habitat Functions: interior area; food and water; resting, denning, nesting and rearing; movement and migration; reduction of noise, light and vibration; and habitat patches that support special status fish and wildlife species.

Resource Site Specific ESEE

The General ESEE analysis, Volume 2, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

Conflicting Uses

The common impact of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; add impervious surface; modifying streams and floodplains; generating pollution; landscaping with non-native or invasive vegetation; building fences or other wildlife barriers; and other impacts such as noise, light, litter and pets.

Within the resource site residential uses are allowed outright or conditionally in the R10. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

ESEE Analysis

The analysis of economic, social, environmental and energy consequences provided in Volume 2 is confirmed for resource site SK8, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses generally would retain the riparian corridor and wildlife habitat functions of the significant natural resource features including maintaining habitat for at risk species, maintaining the flow moderation, water quality and flood control functions of streams and wetlands, maintaining vegetation on steep slopes, and maintaining the stormwater management and

air-cooling functions of the tree canopy. Mitigation for negative consequences of additional development in areas of high or medium ranked natural resources should be required. New or expanded development should be setback from a minimum distance streams and wetlands.

Steep slopes are susceptible to erosion and landslides. Development should be clustered away from steep slopes and trees and vegetation should be maintained to reduce the landslide risks. New or expanded development on steep slopes should be *limited*.

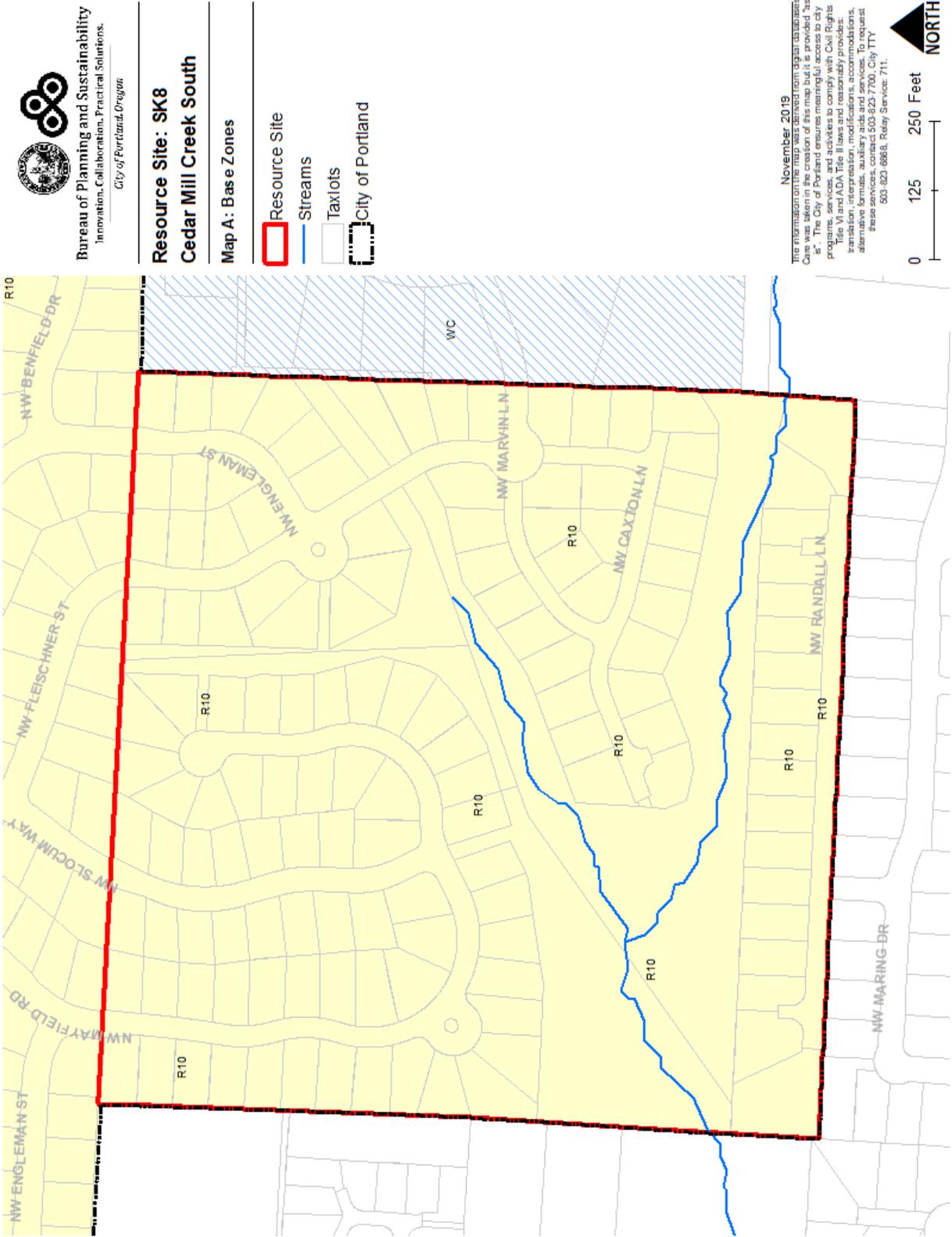
ESEE Decisions

Based on the ESEE general recommendations (Volume 2) and resource site-specific ESEE, the ESEE decisions for Resources Site SK8 are:

6. *Strictly limit* conflicting uses within stream channels from top-of-bank to top-of-bank, wetlands, land within 50 feet of stream top-of-bank, and land within 50 feet of wetlands
7. In resource tracts, *strictly limit* conflicting uses within areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
8. Outside of resource tracts, *limit* conflicting uses within areas of forest or woodland vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
9. Outside of resource tracts, *limit* conflicting uses within areas of forest or woodland vegetation that are located on steep slopes that are contiguous to but more than 50 feet from stream top-of-bank.
10. *Allow* conflicting uses within all other areas containing significant natural resources.

As part of creating subdivisions, large areas of forest vegetation surrounding streams were placed in common-ownership tracts. The forest and streams are maintained by the homeowners for protection of the resources.

| Table C: ESEE Decision for Resource Site SK8 | |
|---|--------------|
| ESEE Decision | Acres |
| Strictly Limit | 10.4 |
| Limit | 3.4 |
| Allow | 25.0 |

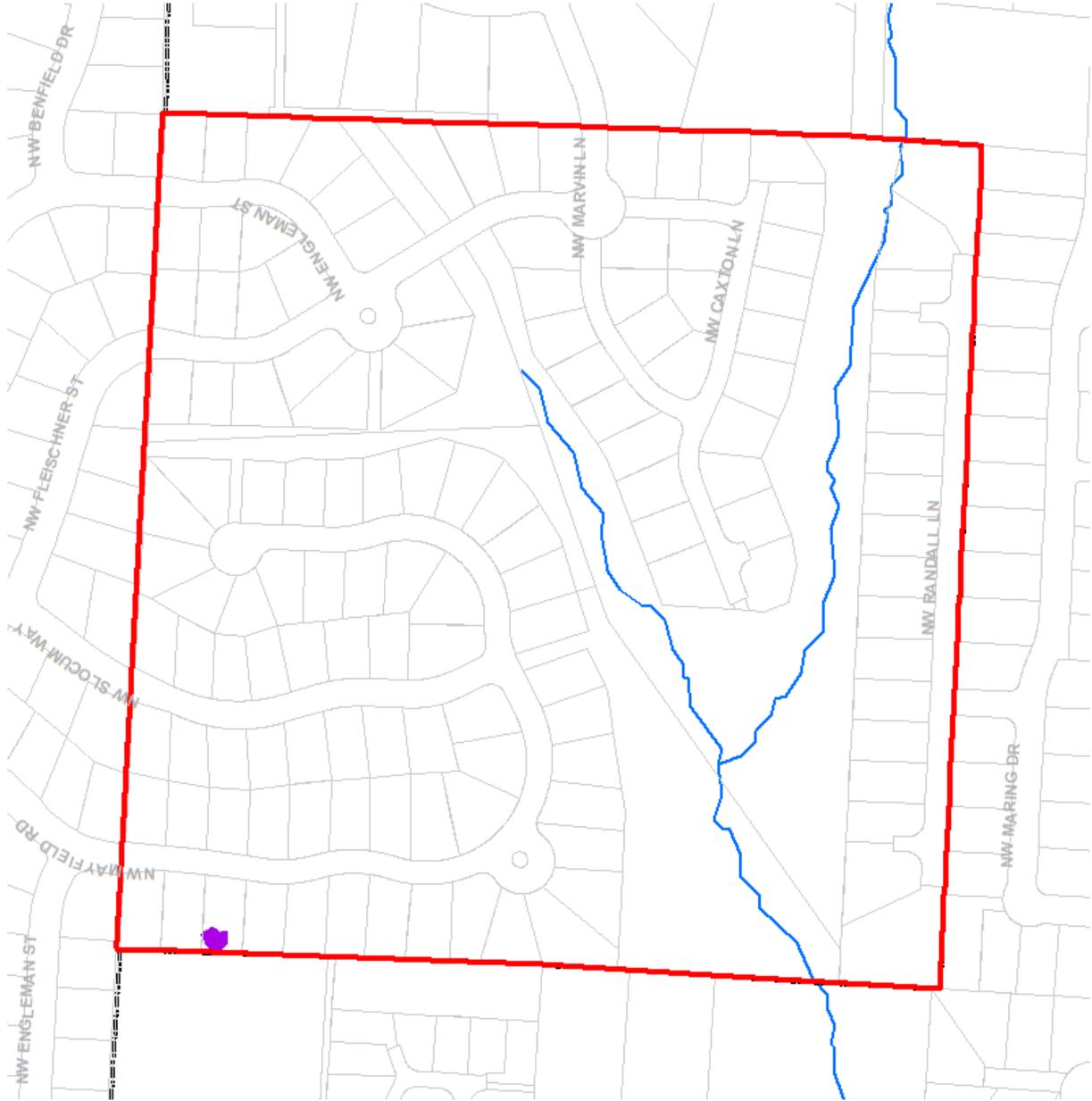




Resource Site: SK8
Cedar Mill Creek South

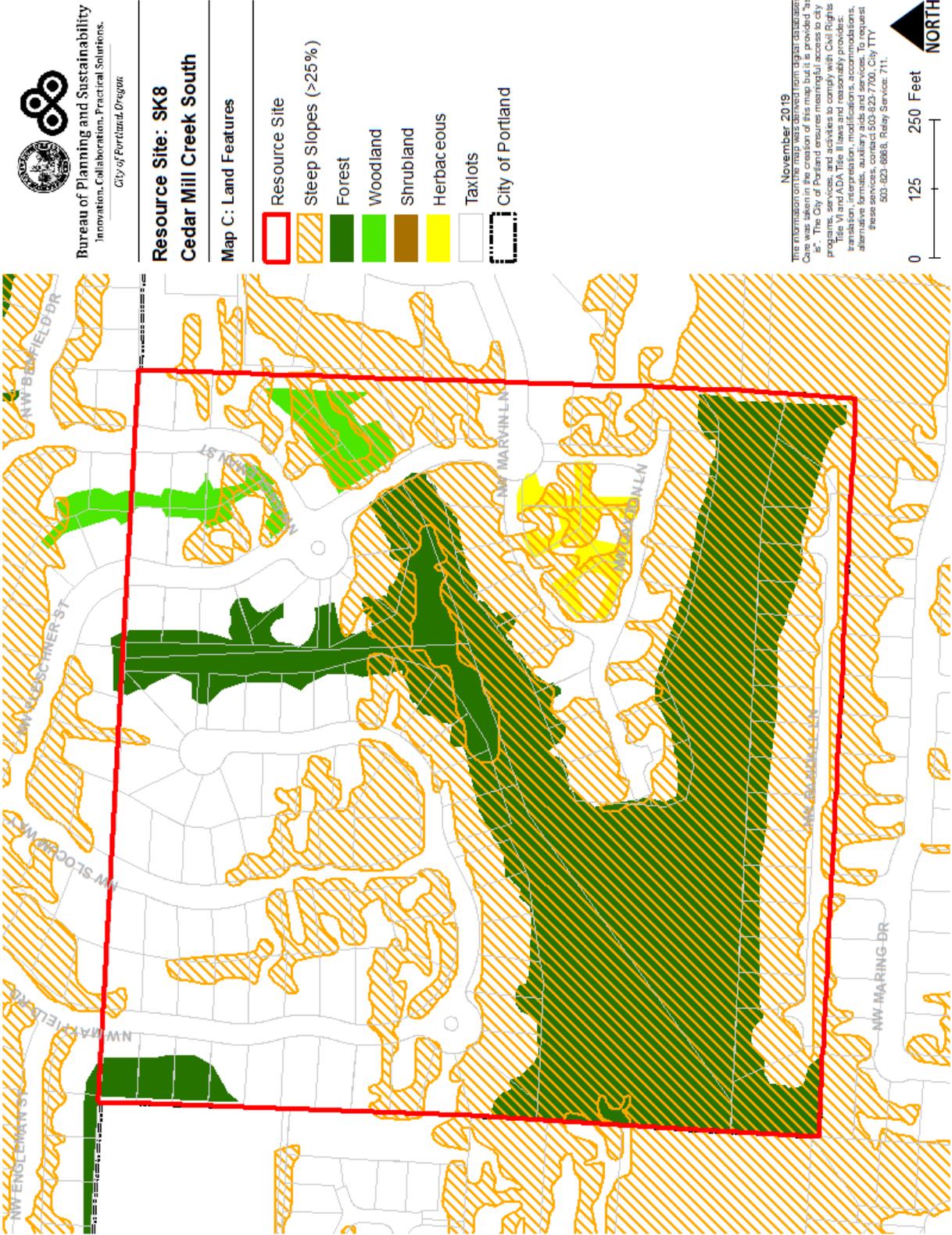
Map B: Water Related Features

-  Resource Site
-  Open stream channel
-  Piped stream segment
-  Wetlands
-  Floodplain
-  Taxlots
-  City of Portland



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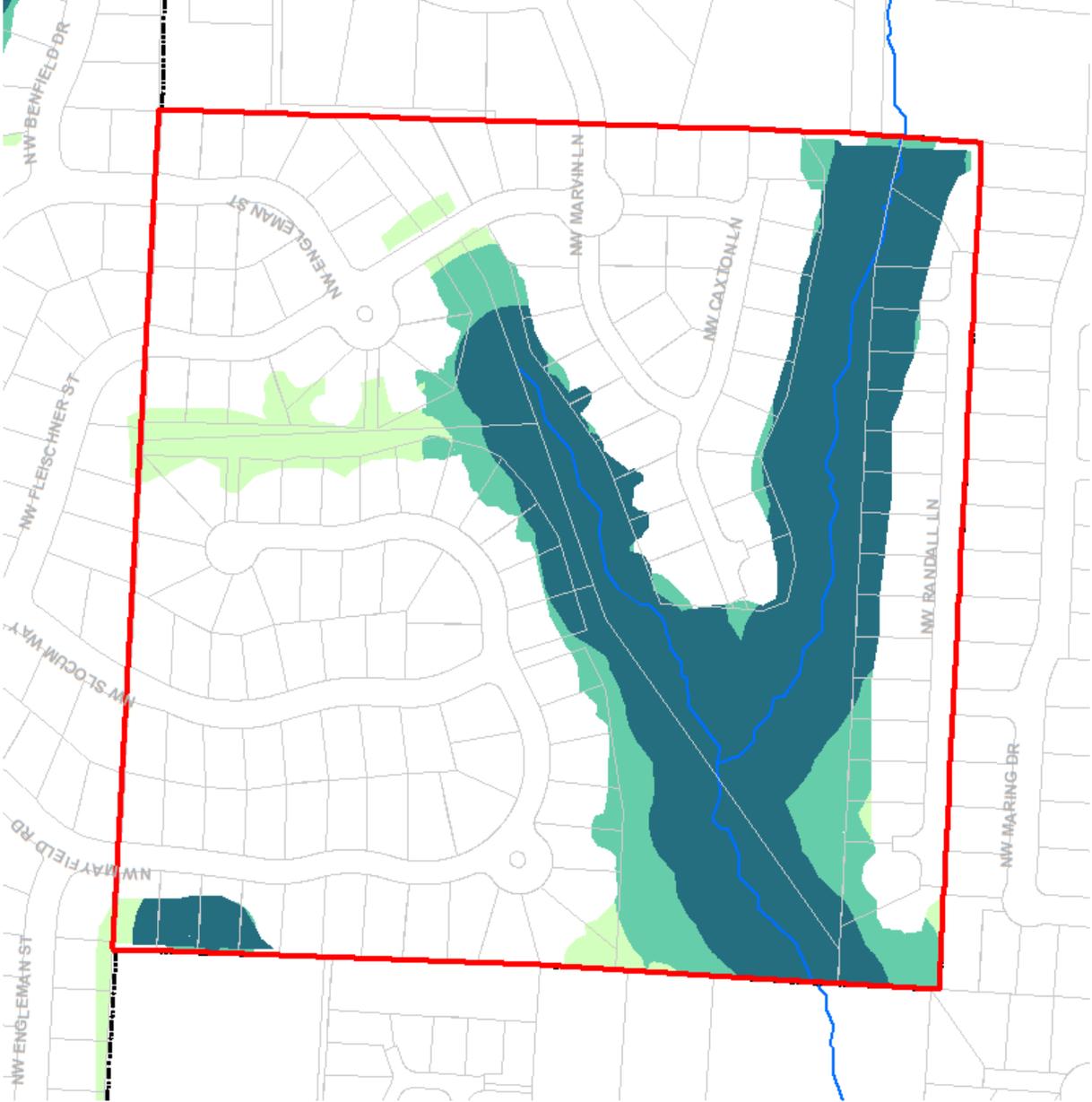






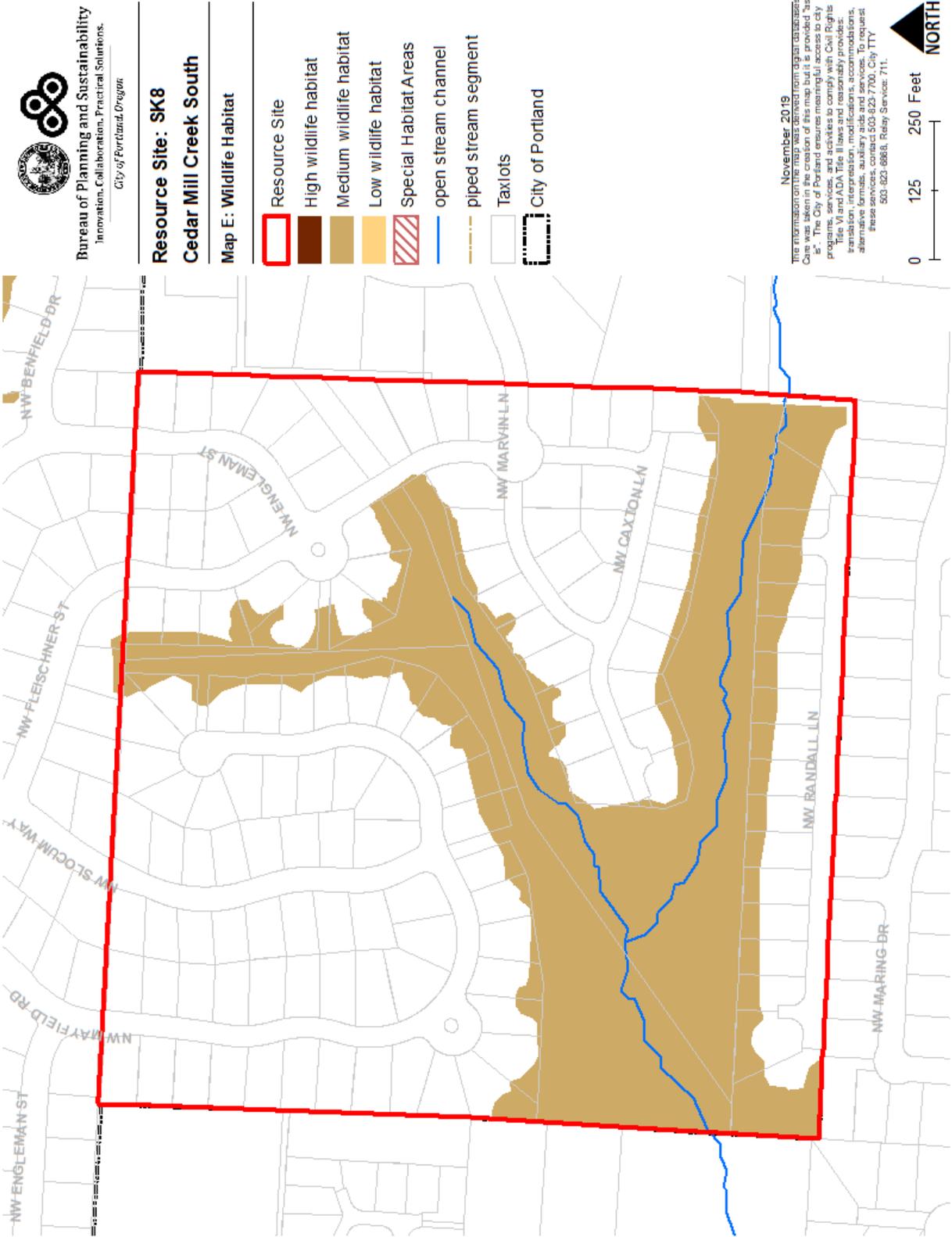
Resource Site: SK8
Cedar Mill Creek South
Map D: Riparian Corridors

- Resource Site
- High riparian function
- Medium riparian function
- Low riparian function
- open stream channel
- piped stream segment
- Taxlots
- City of Portland



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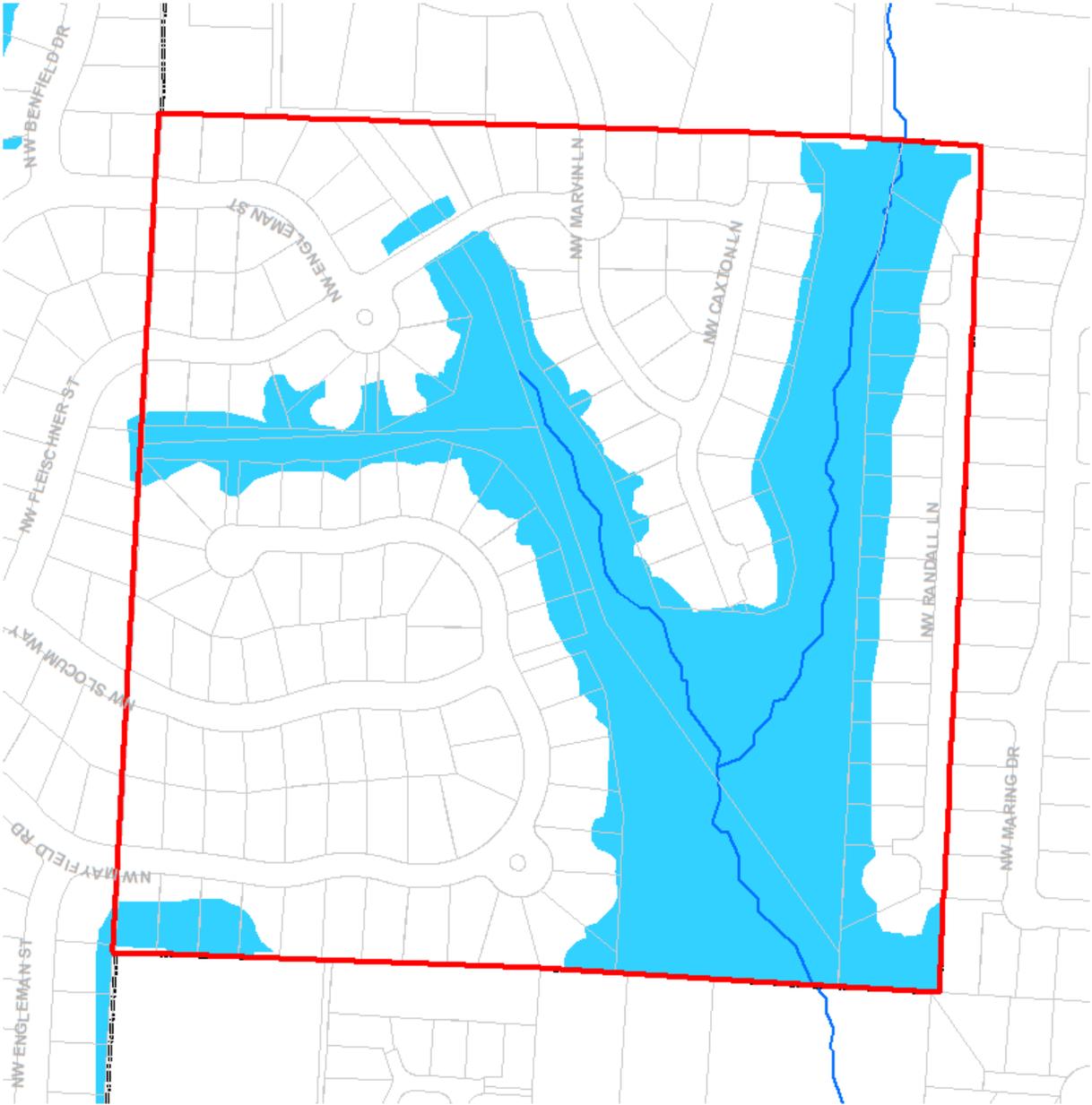




Resource Site: SK8
Cedar Mill Creek South

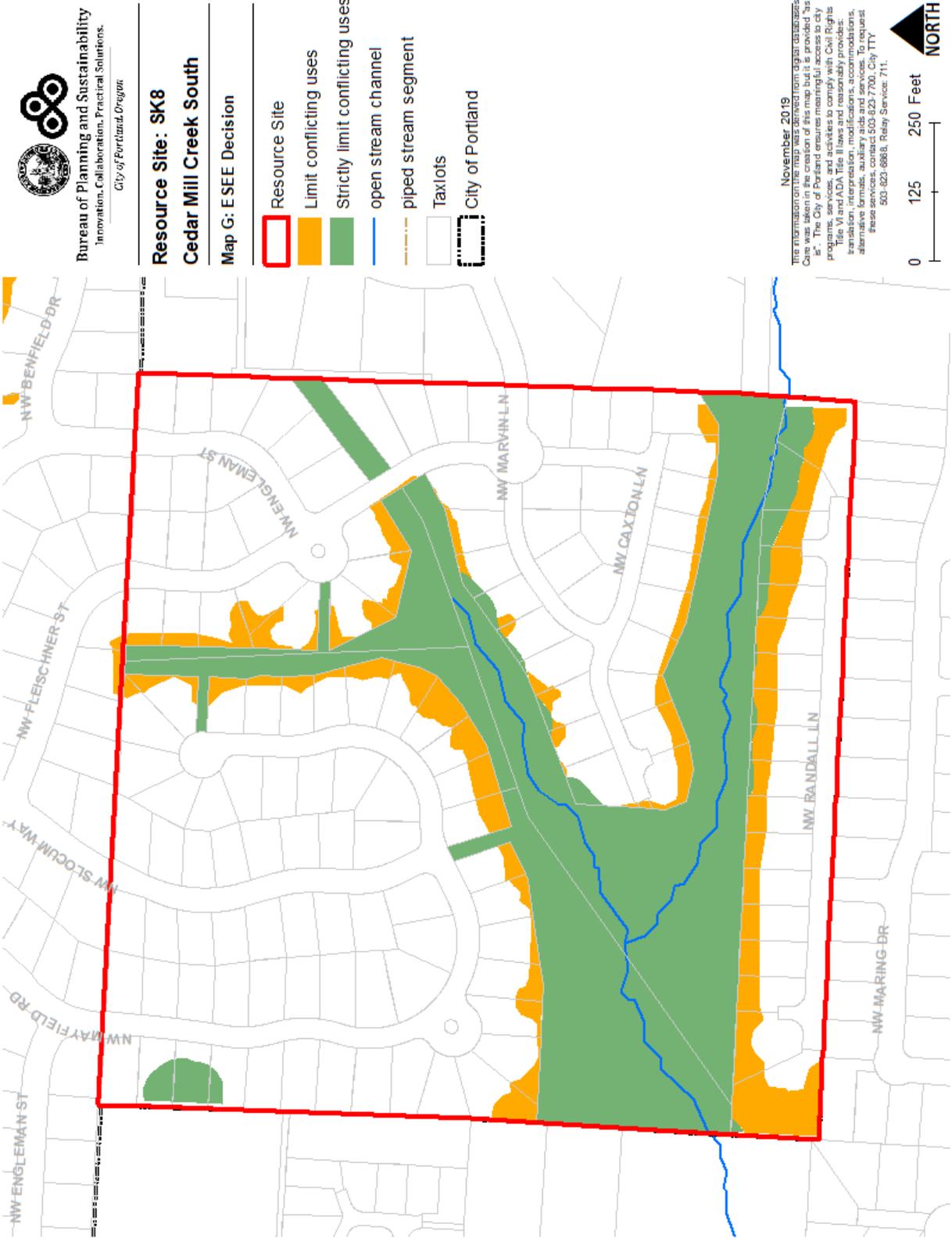
Map F: Determination of Significance

- Resource Site
- Significant natural resources
- open stream channel
- piped stream segment
- Taxlots
- City of Portland



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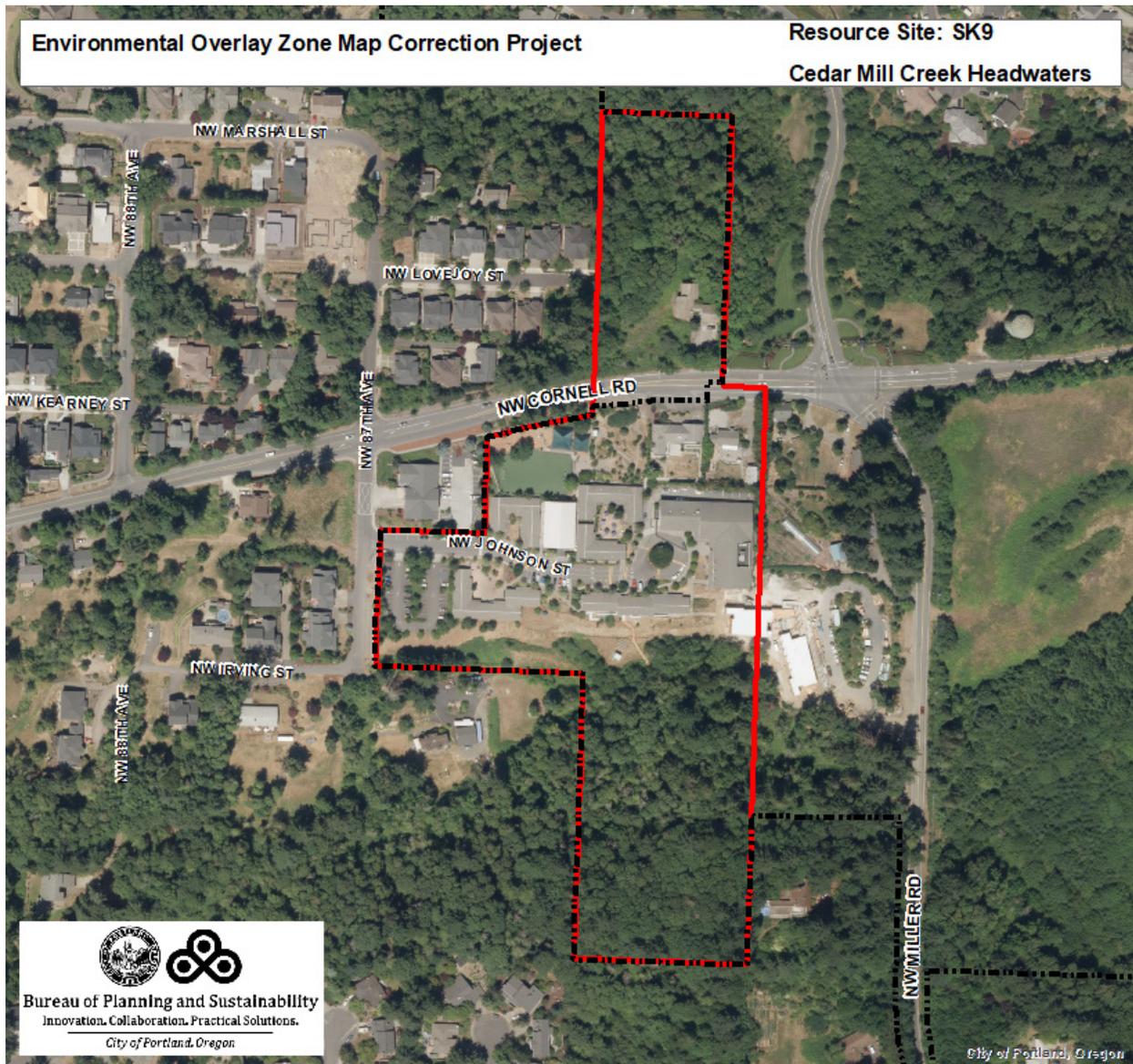
Resource Site: SK8
Cedar Mill Creek South
Map G: ESEE Decision

- Resource Site
- Limit conflicting uses
- Strictly limit conflicting uses
- open stream channel
- piped stream segment
- Taxlots
- City of Portland

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Resource Site No.: SK9 **Resource Site Name:** Cedar Mill Creek Headwaters
Previous Plan: Multnomah County Urban Lands **Previous Resource Site No.:** 111



Natural Resources Inventory

| Table A: Quantity of Natural Resource Features in Resource Site | | SK9 |
|---|--|------------|
| | | Study Area |
| Stream (Miles) | | 3.0 |
| Wetlands (acres) | | 0.0 |
| Vegetated Areas >= 1/2 acre (acres) | | 2.6 |
| Forest (acres) | | 2.0 |
| Woodland (acres) | | 0.0 |
| Shrubland (acres) | | 0.0 |
| Herbaceous (acres) | | 0.6 |
| Flood Area* | | 0.0 |
| Vegetated (acres) | | 0.0 |
| Non-vegetated (acres) | | 0.0 |
| Steep Slopes (acres)** | | 2.0 |
| Impervious Surface (acres) | | 0.5 |
| * The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area. | | |
| **Slopes are derived from LiDAR. Steep slopes are area with a slope greater than 25%. | | |

Slopes on the east side of the ridge are generally steeper, contributing to increased slide potential. West-side slopes are also subject to slides. Shallow rooting depth, a product of the fragipan, increases tree windfalls and slope instability. Where erosion or urban development exposes the fragipan, establishment of vegetation is difficult, compounding erosion problems.

Located on a forested ridge-top above the Willamette Valley, the plant community at this site is characteristic of the Western Hemlock vegetation zone (Franklin and Dymess 1988). The forest generally ranges in age from 50- to 120-year old second growth in a mid-seral stage of succession. With young shade-tolerant cedars well established in the understory, the older forest has entered the understory re-initiation stage (Oliver and Larson 1996).

The forest community is characterized by Douglas fir and bigleaf maple in the canopy layer, with mature western red cedar more common near Balch Creek and along Miller Road. Grand fir, red alder, bitter cherry and western hemlock are common overstory associates. Less common are Pacific dogwood and two invasive aliens, English holly and European hawthorn. In the understory, vine maple occurs in association with Indian plum, red elderberry, Oregon grape, western hazel, oceanspray, snowberry and cedar saplings. The ground layer is typically dominated by sword fern, though Pacific waterleaf and inside-out flower are occasional dominants. Several areas, most notably along Highway 26, are overrun by the exotic English ivy. Other common ground vegetation includes lady fern (on moist slopes and along streams), bracken fern, miner's lettuce, Hooker fairy-bell, false Solomon's seal, fringe-cup, western trillium and stream violet.

Large forest tracts within the site provide high quality habitat for a diverse wildlife assemblage. Abundant quantities of large woody debris and a thick organic layer on the forest floor provide habitat and foraging grounds for birds, reptiles, amphibians and small mammals. In most cases, the understory is a thick, diverse assemblage of berry and nut-bearing native shrubs that wildlife depend upon for

forage as well as cover, especially during winter months. Other valuable habitat features within these forests include snags, large boulders, ravines and seeps.

Many species of birds were encountered during field surveys of the site: those most frequently observed include downy woodpecker, northern flicker, winter wren, black-capped chickadee, common bushtit, rufous-sided towhee, Wilson's warbler, Swainson's thrush and song sparrow. Due to the abundance of songbirds, sharp-shinned hawks and other forest-dwelling birds of prey such as great-horned owls are likely to occur within the site as well. The area is also potential foraging ground for peregrine falcons, which rely on other birds for the bulk of their diet.

Amphibians and reptiles, including western red-backed salamander, Pacific chorus frog and garter snakes, inhabit the site. Tree cavities serve as roosting and nesting sites for bats, voles, squirrels, weasels, raccoons and cavity-nesting birds, including pileated woodpecker. The abundant cover is essential for black-tail deer, coyote and other large mammals.

Balch Creek runs through a portion of this site. Resident cutthroat trout inhabit the creek; historically, other species inhabited the drainage as well. Balch and other creeks within the site flow through steep forested ravines, providing wildlife with a protected travel corridor, refuge from high summer temperatures and a permanent source of water. Thick riparian forests protect the creeks and the integrity of their banks and influence the quality of stream habitat located downstream. Large quantities of silt are present in several of the streams, providing evidence of the consequences of vegetation removal associated with previous upstream development. Other sources of silt include upstream landslides and bank failures related to new construction.

Special Status Species found in the resource site include:

- Pacific western big-eared bat
- Long-eared myotis
- Fringed myotis
- Long-legged myotis
- Pileated woodpecker
- Little willow flycatcher
- American peregrine falcon
- Olive-sided flycatcher
- Coast cutthroat trout
- Northern red-legged frog

| Table B: Quality of Natural Resource Functions in Resource Site SK9 | | | | |
|---|-------------|---------------|------------|--------------|
| Resource Site (acres) = 3.892473 | | | | |
| | High | Medium | Low | Total |
| Riparian Corridors* | | | | |
| acres | 0.8 | 0.5 | 0.8 | 2.1 |
| percent total inventory site area | 21.8% | 11.6% | 20.6% | 54.0% |
| Wildlife Habitat* | | | | |
| acres | 0.0 | 2.0 | 0.0 | 2.0 |
| percent total inventory site area | 0.0% | 52.1% | 0.0% | 52.1% |
| Special Habitat Areas** | | | | |
| acres | | | | 0.0 |
| percent total inventory site area | | | | 0.0% |
| Combined Total⁺ | | | | |
| acres | 0.8 | 1.2 | 0.1 | 2.1 |
| percent total inventory site area | 21.8% | 30.3% | 1.9% | 54.0% |
| <p>* High-ranked riparian resources, Special Habitat Areas, and wildlife habitat include open water. ** Special Habitat Areas rank high for wildlife habitat. +Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.</p> | | | | |

Determination of Significance

Natural resource features mapped in the resource site that provide functions identified in the Natural Resources Inventory are determined to be significant (Map F). Within resource site SK9 the following significant features and functions are present:

Significant Natural Resource Features: open stream, forest vegetation within 300 feet of waterbodies; forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies; woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; developed land within 50 feet of waterbodies; forest patches and associated and contiguous woodland patches two acres in size or larger; and Special Habitat Areas.

Significant Riparian Corridor Functions: microclimate and shade; stream flow moderation and water storage; bank function and sediment, pollution and nutrient control; large wood and channel dynamics; organic inputs, food web and nutrient cycling; and riparian wildlife movement corridor.

Significant Wildlife Habitat Functions: interior area; food and water; resting, denning, nesting and rearing; movement and migration; reduction of noise, light and vibration; and habitat patches that support special status wildlife species.

Resource Site Specific ESEE

The General ESEE analysis, Volume 2, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

Conflicting Uses

The common impact of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; add impervious surface; modifying streams and floodplains; generating pollution; landscaping with non-native or invasive vegetation; building fences or other wildlife barriers; and other impacts such as noise, light, litter and pets.

Within the resource site residential uses are allowed outright or conditionally in the R10 base zones. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

ESEE Analysis

The analysis of economic, social, environmental and energy consequences provided in Volume 2 is confirmed for resource site SK9, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses generally would retain the riparian corridor and wildlife habitat functions of the significant natural resource features including maintaining habitat for at risk species, maintaining the flow moderation, water quality and flood control functions of streams and

wetlands, maintaining vegetation on steep slopes, and maintaining the stormwater management and air-cooling functions of the tree canopy. Mitigation for negative consequences of additional development in areas of high or medium ranked natural resources should be required. New or expanded development should be setback from a minimum distance streams and wetlands.

Steep slopes are susceptible to erosion and landslides. Development should be clustered away from steep slopes and trees and vegetation should be maintained to reduce the landslide risks. New or expanded development on steep slopes should be *limited*.

ESEE Decisions

Based on the ESEE general recommendations (Volume 2) and resource site-specific ESEE, the ESEE decisions for Resources Site SK9 are:

1. *Strictly limit* conflicting uses within stream channels from top-of-bank to top-of-bank and land within 50 feet of stream top-of-bank.
2. *Strictly limit* conflicting uses within areas of forest vegetation contiguous that are to but more than 50 feet from stream top-of-bank extending to 100 feet from top-of-bank.
3. *Limit* conflicting uses within areas of forest vegetation that are contiguous to but more than 100 feet from stream top-of-bank.
4. *Limit* conflicting uses within areas of forest vegetation on steep slopes that are contiguous to but more than 100 feet from stream top-of-bank.
5. *Allow* conflicting uses within all other areas containing significant natural resources.

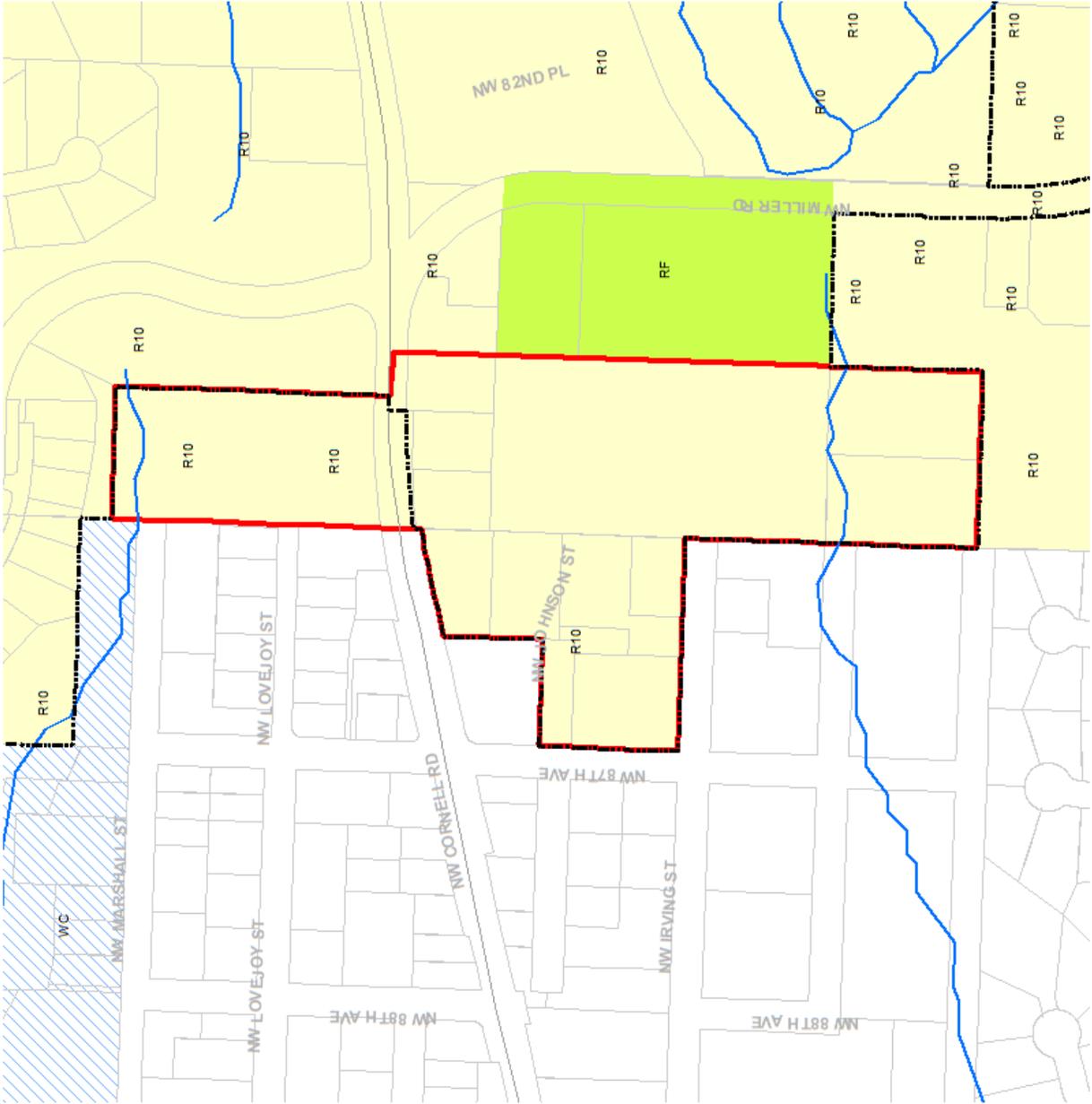
| Table C: ESEE Decision for Resource Site SK9 | |
|--|-------|
| ESEE Decision | Acres |
| Strictly Limit | 2.0 |
| Limit | 0.0 |
| Allow | 1.9 |



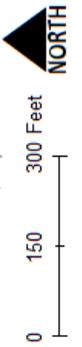
Resource Site: SK9
Cedar Mill Creek Headwaters

Map A: Base Zones

- Resource Site
- Streams
- Taxlots
- City of Portland



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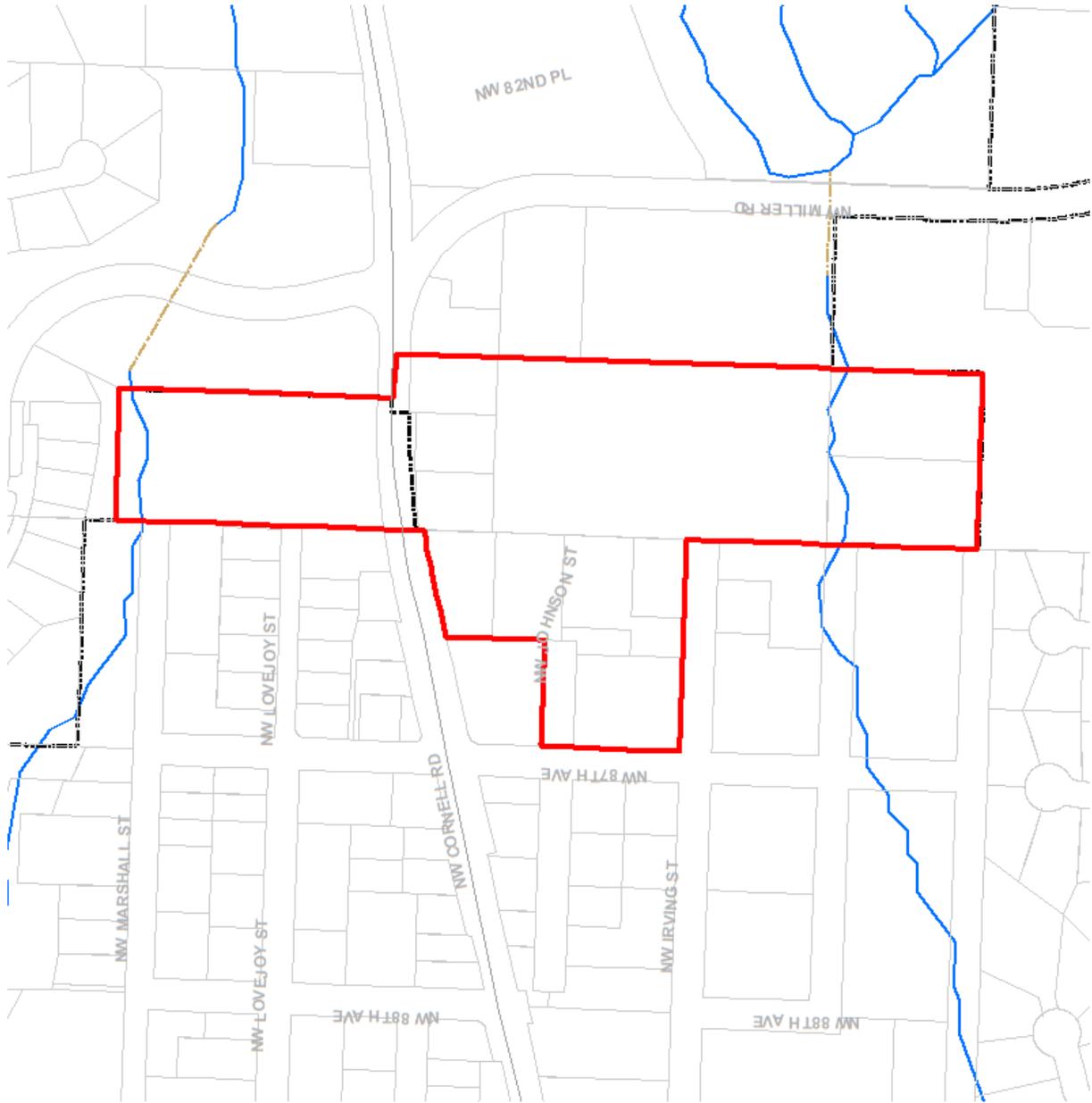




Resource Site: SK9
Cedar Mill Creek Headwaters

Map B: Water Related Features

-  Resource Site
-  Open stream channel
-  Piped stream segment
-  Wetlands
-  Floodplain
-  Taxlots
-  City of Portland



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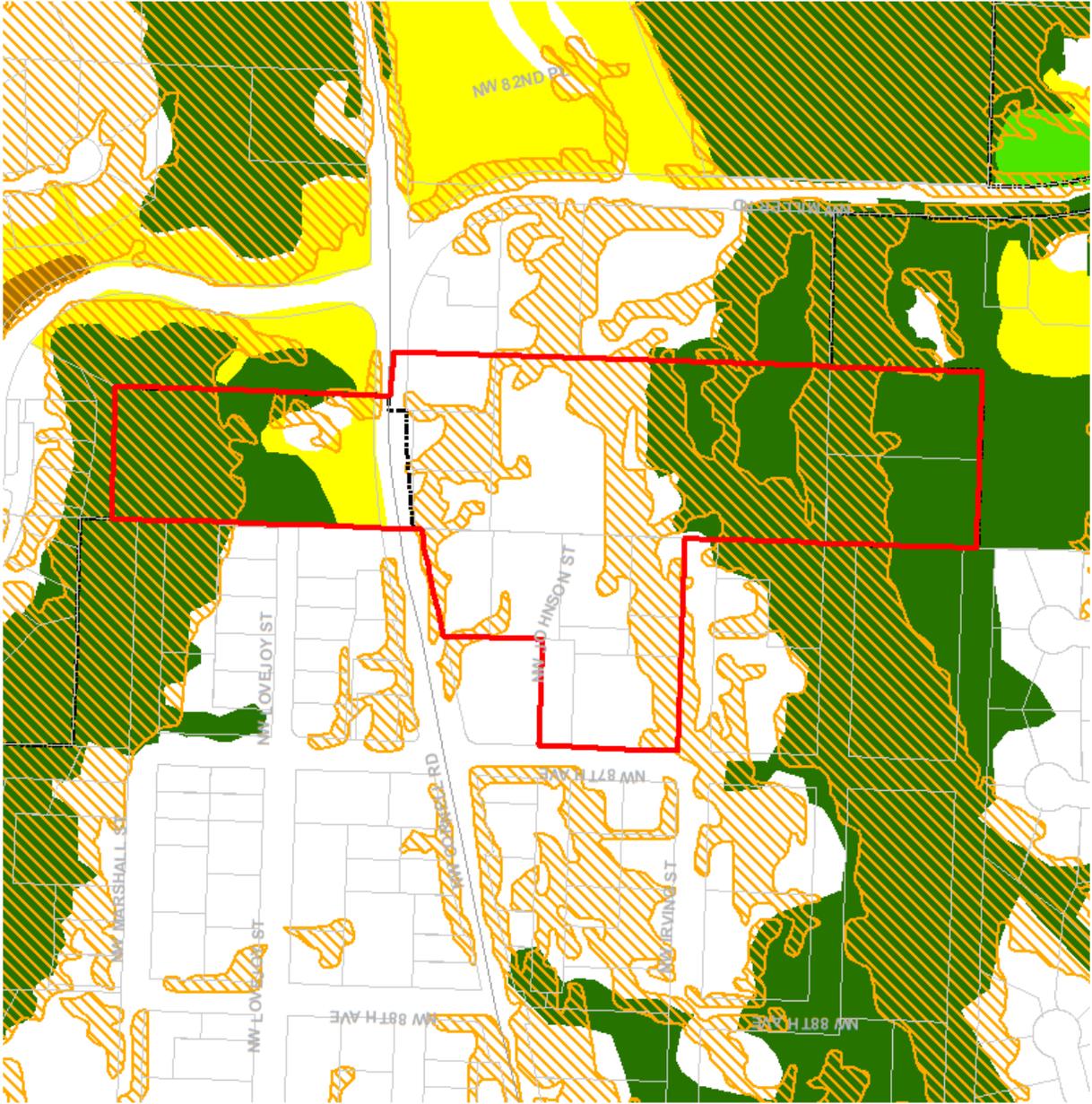
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Resource Site: SK9
Cedar Mill Creek Headwaters

Map C: Land Features

-  Resource Site
-  Steep Slopes (>25%)
-  Forest
-  Woodland
-  Shrubland
-  Herbaceous
-  Taxlots
-  City of Portland

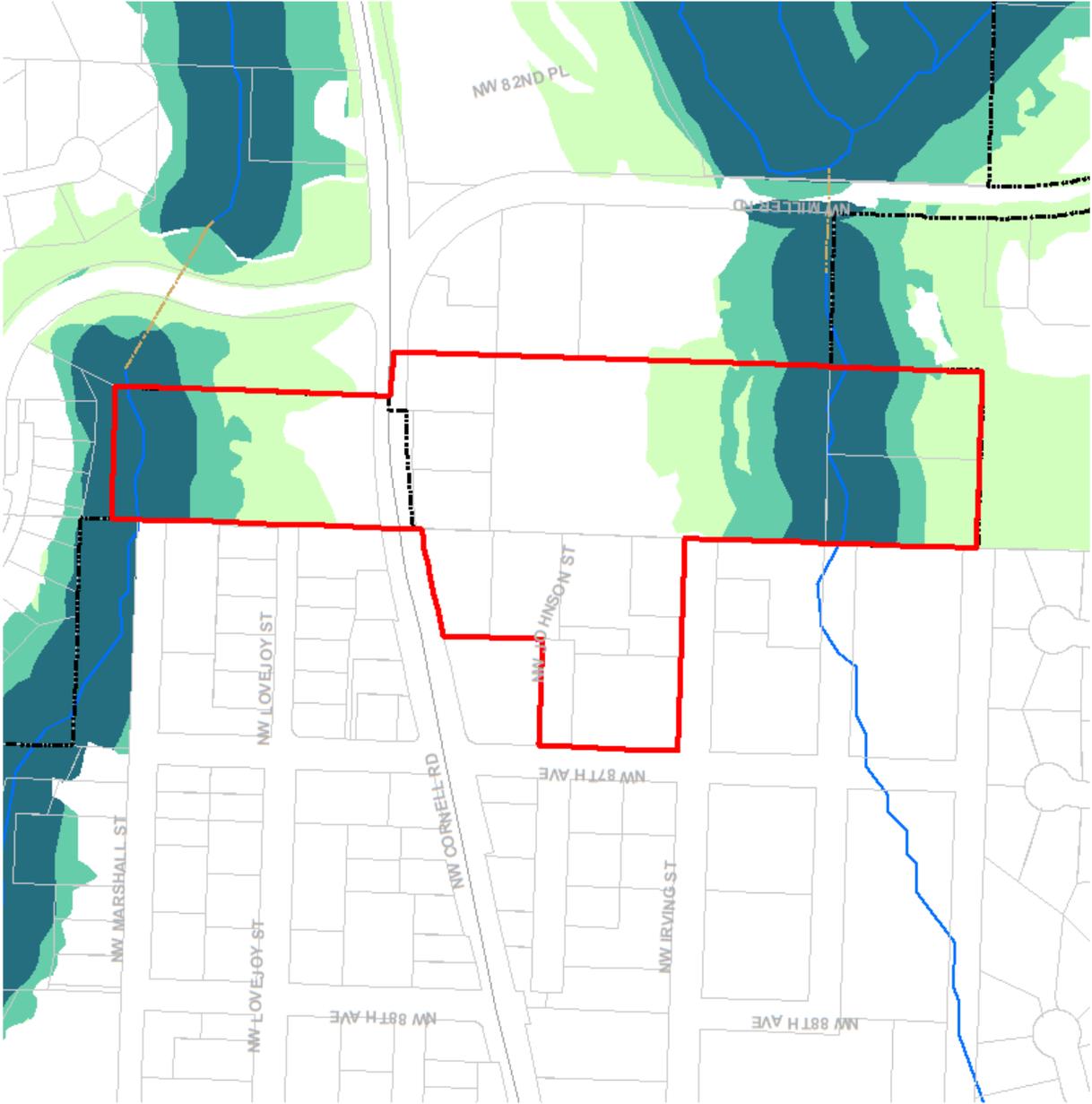
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Resource Site: SK9
Cedar Mill Creek Headwaters
Map D: Riparian Corridors

- Resource Site
- High riparian function
- Medium riparian function
- Low riparian function
- open stream channel
- piped stream segment
- Taxlots
- City of Portland



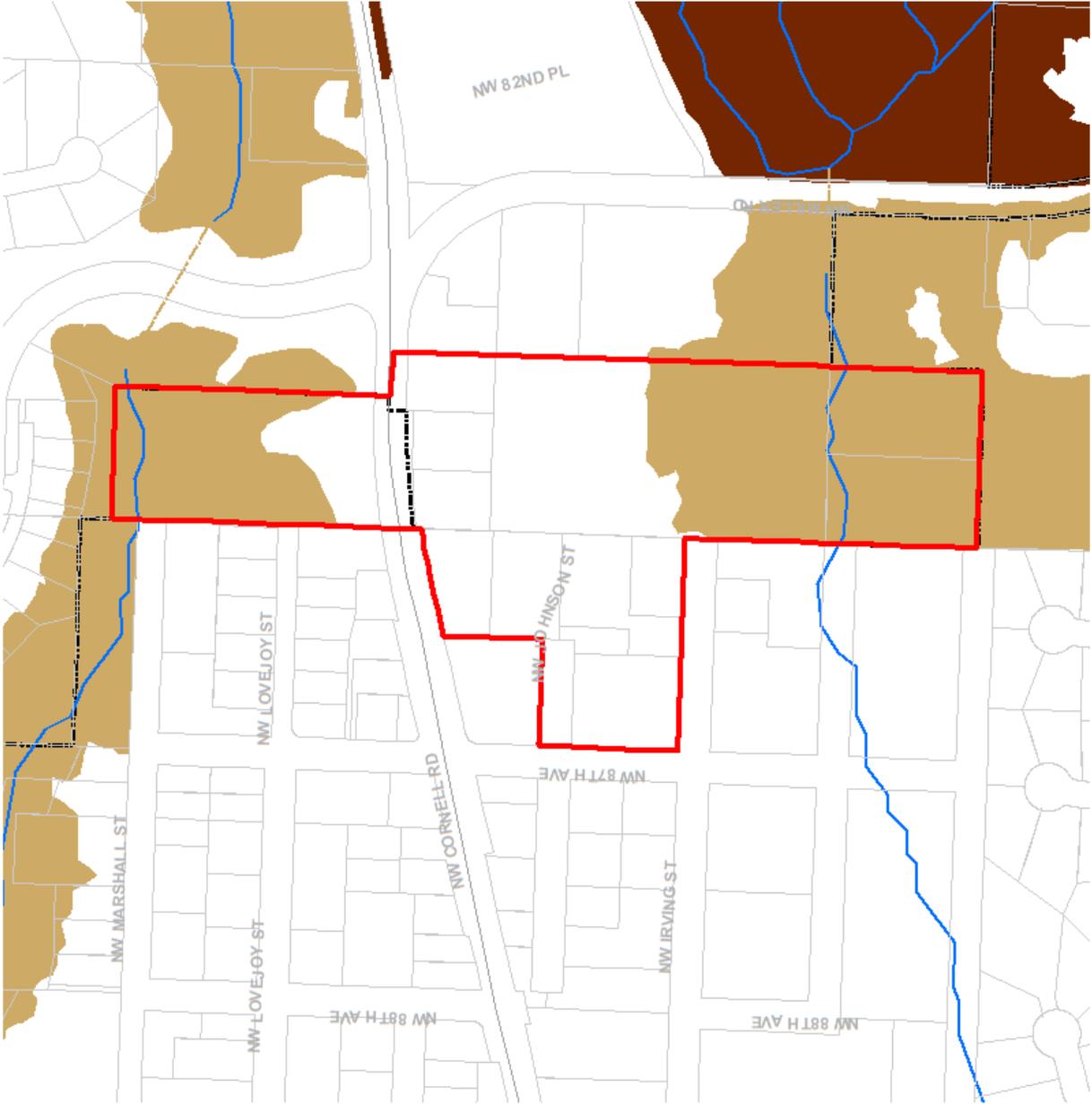
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Resource Site: SK9
Cedar Mill Creek Headwaters
Map E: Wildlife Habitat

- Resource Site
- High wildlife habitat
- Medium wildlife habitat
- Low wildlife habitat
- Special Habitat Areas
- open stream channel
- piped stream segment
- Taxlots
- City of Portland



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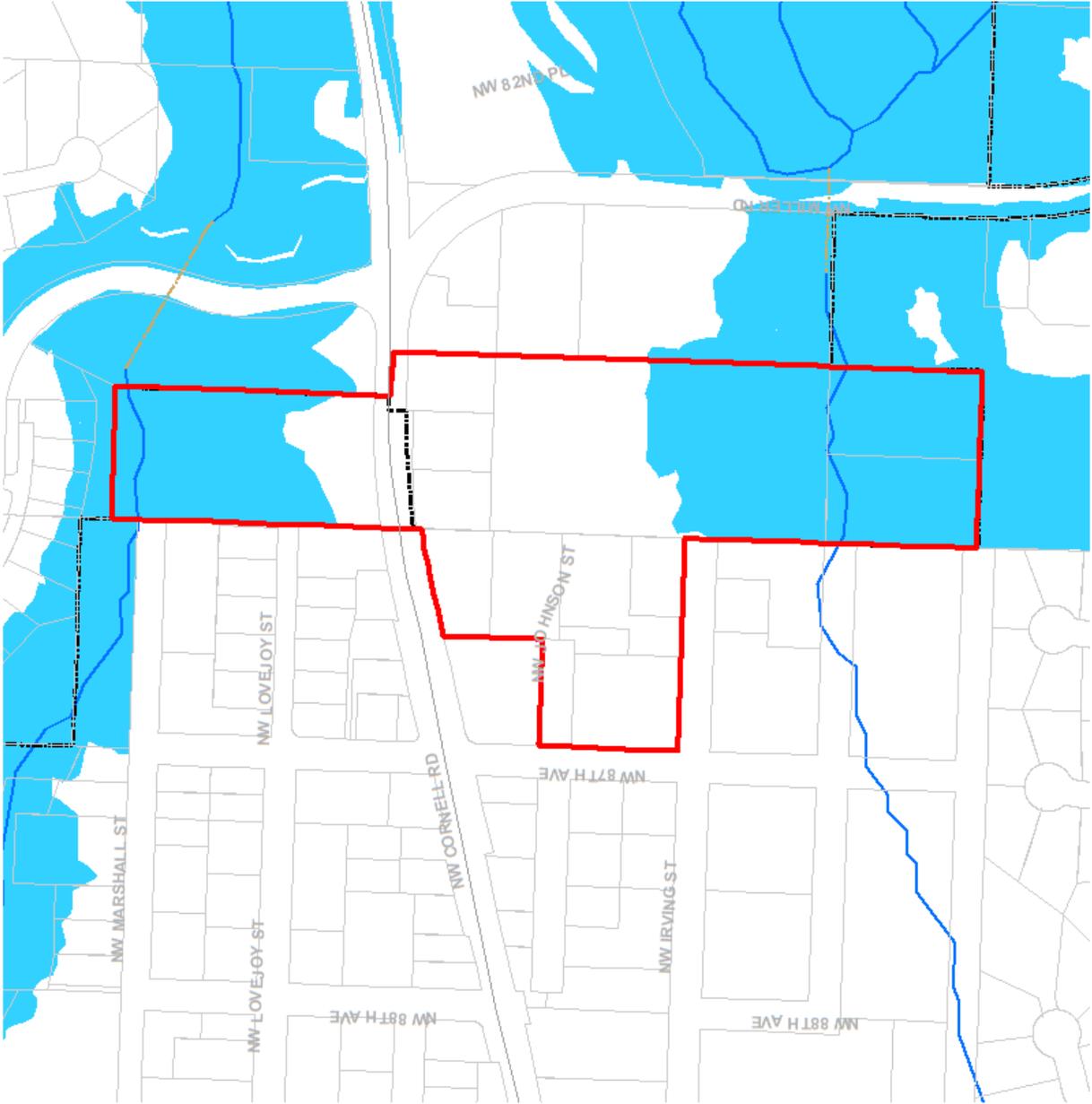




Resource Site: SK9
Cedar Mill Creek Headwaters

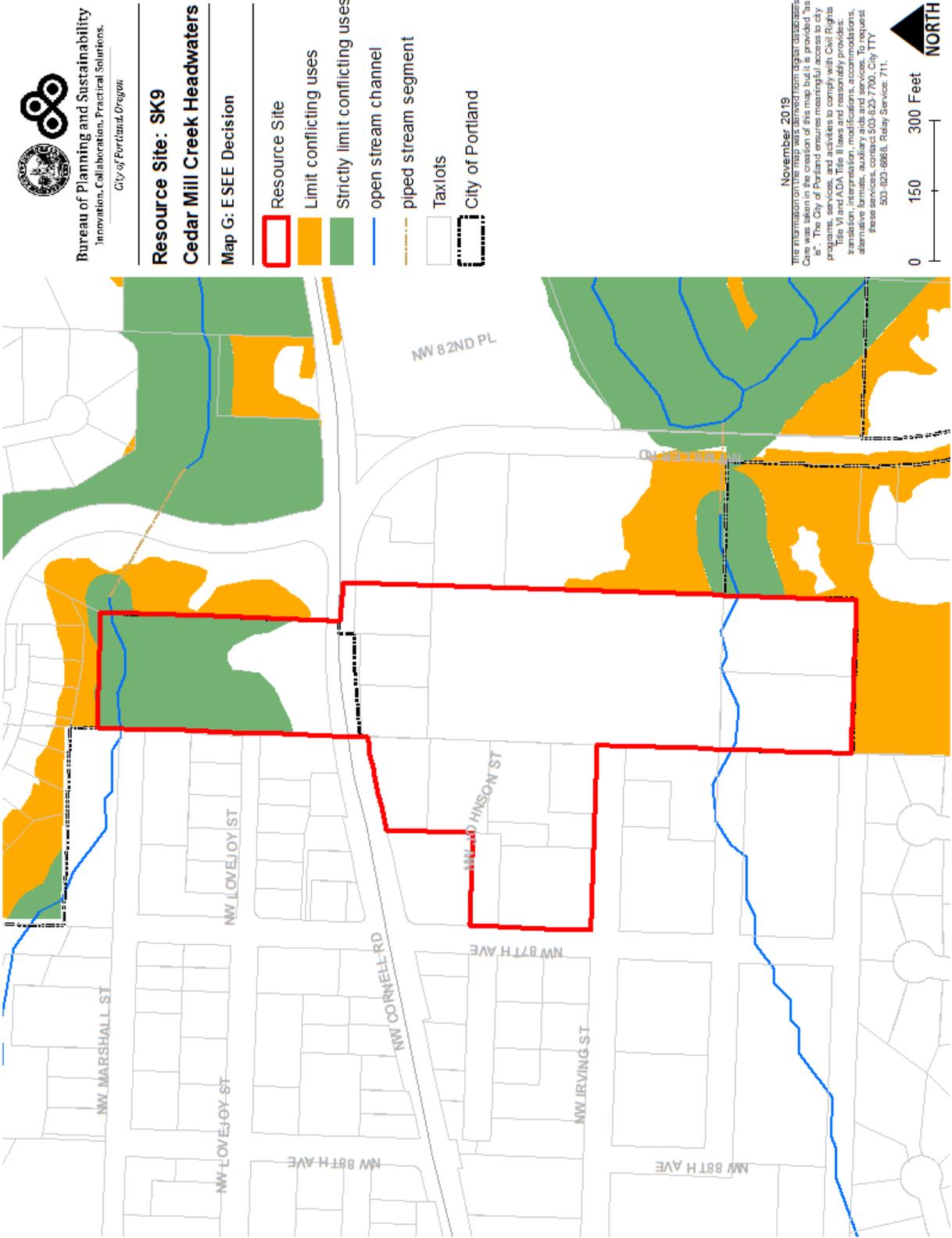
Map F: Determination of
Significance

- Resource Site
- Significant natural resources
- open stream channel
- piped stream segment
- Taxlots
- City of Portland



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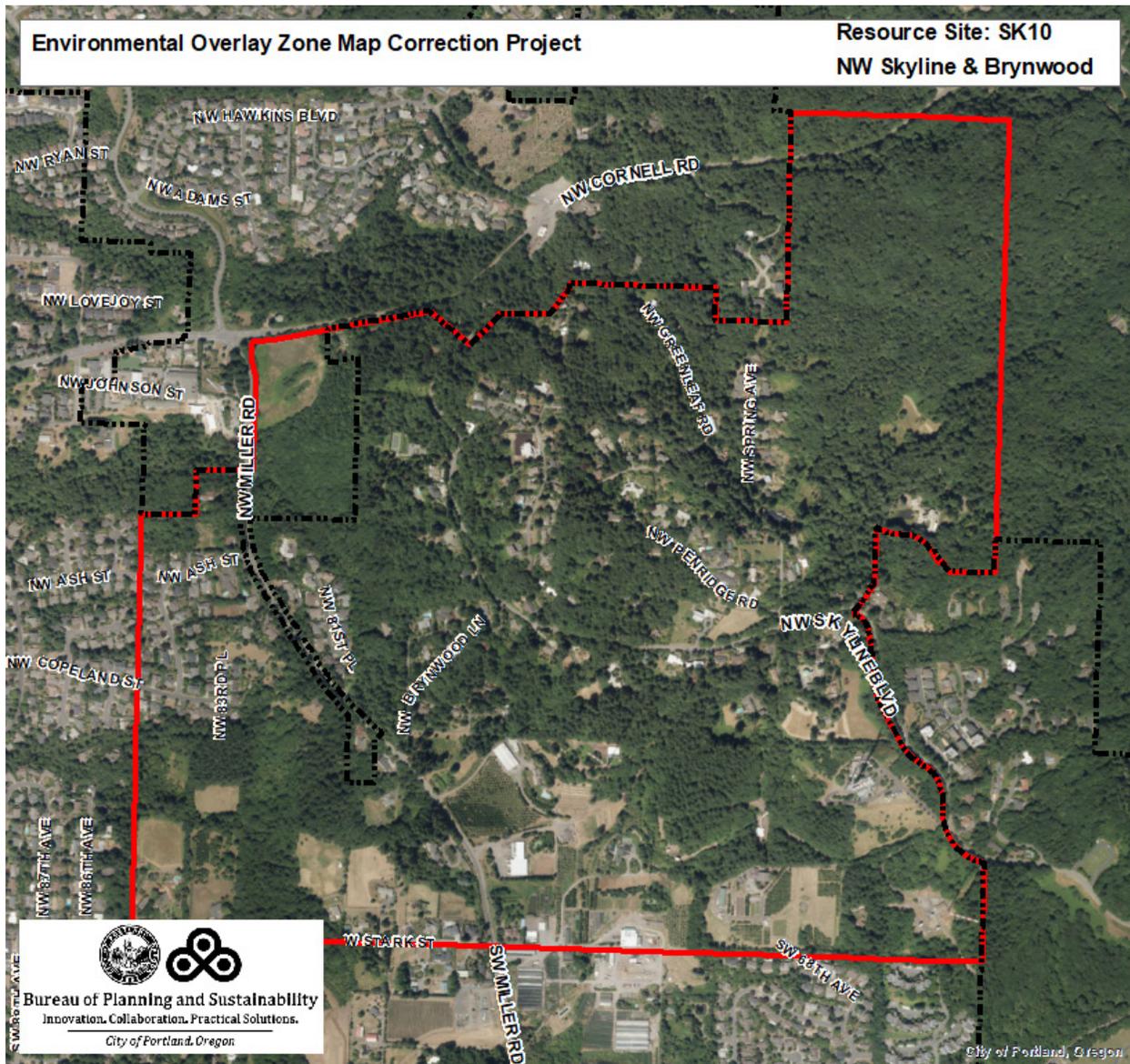
Resource Site: SK9
Cedar Mill Creek Headwaters
Map G: ESEE Decision

- Resource Site
- Limit conflicting uses
- Strictly limit conflicting uses
- open stream channel
- piped stream segment
- Taxlots
- City of Portland

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Resource Site No.: SK10 **Resource Site Name:** NW Skyline & Brynwood
Previous Plan: Multnomah County Urban Lands **Previous Resource Site No.:** 111



Natural Resources Inventory

| Table A: Quantity of Natural Resource Features in Resource Site | | SK10 |
|---|-----------------------|-------------------|
| | | Study Area |
| Stream (Miles) | | 5.4 |
| Wetlands (acres) | | 0.1 |
| Vegetated Areas >= ½ acre (acres) | | 388.3 |
| | Forest (acres) | 291.3 |
| | Woodland (acres) | 13.1 |
| | Shrubland (acres) | 27.9 |
| | Herbaceous (acres) | 56.0 |
| Flood Area* | | 0.0 |
| | Vegetated (acres) | 0.0 |
| | Non-vegetated (acres) | 0.0 |
| Steep Slopes (acres)** | | 346.4 |
| Impervious Surface (acres) | | 51.4 |
| * The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area. | | |
| **Slopes are derived from LiDAR. Steep slopes are area with a slope greater than 25%. | | |

Located on a forested ridge-top above the Willamette Valley, the plant community at this site is characteristic of the Western Hemlock vegetation zone (Franklin and Dymess 1988). The forest generally ranges in age from 50- to 120-year old second growth in a mid-seral stage of succession. With young shade-tolerant cedars well established in the understory, the older forest has entered the understory re-initiation stage (Oliver and Larson 1996).

The forest community is characterized by Douglas fir and bigleaf maple in the canopy layer, with mature western red cedar more common near Balch Creek and along Miller Road. Grand fir, red alder, bitter cherry and western hemlock are common overstory associates. Less common are Pacific dogwood and two invasive aliens, English holly and European hawthorn. In the understory, vine maple occurs in association with Indian plum, red elderberry, Oregon grape, western hazel, oceanspray, snowberry and cedar saplings. The ground layer is typically dominated by sword fern, though Pacific waterleaf and inside-out flower are occasional dominants. Several areas, most notably along Highway 26, are overrun by the exotic English ivy. Other common ground vegetation includes lady fern (on moist slopes and along streams), bracken fern, miner's lettuce, Hooker fairy-bell, false Solomon's seal, fringecup, western trillium and stream violet.

Large forest tracts within the site provide high quality habitat for a diverse wildlife assemblage. Abundant quantities of large woody debris and a thick organic layer on the forest floor provide habitat and foraging grounds for birds, reptiles, amphibians and small mammals. In most cases, the understory is a thick, diverse assemblage of berry and nut-bearing native shrubs that wildlife depend upon for forage as well as cover, especially during winter months. Other valuable habitat features within these forests include snags, large boulders, ravines and seeps.

Many species of birds were encountered during field surveys of the site: those most frequently observed include downy woodpecker, northern flicker, winter wren, black-capped chickadee, common bushtit,

rufous-sided towhee, Wilson's warbler, Swainson's thrush and song sparrow. Due to the abundance of songbirds, sharp-shinned hawks and other forest-dwelling birds of prey such as great-horned owls are likely to occur within the site as well. The area is also potential foraging ground for peregrine falcons, which rely on other birds for the bulk of their diet.

Amphibians and reptiles, including western red-backed salamander, Pacific chorus frog and garter snakes, inhabit the site. Tree cavities serve as roosting and nesting sites for bats, voles, squirrels, weasels, raccoons and cavity-nesting birds, including pileated woodpecker. The abundant cover is essential for black-tail deer, coyote and other large mammals.

Balch Creek runs through a portion of this site. Resident cutthroat trout inhabit the creek; historically, other species inhabited the drainage as well. Balch and other creeks within the site flow through steep forested ravines, providing wildlife with a protected travel corridor, refuge from high summer temperatures and a permanent source of water. Thick riparian forests protect the creeks and the integrity of their banks and influence the quality of stream habitat located downstream. Large quantities of silt are present in several of the streams, providing evidence of the consequences of vegetation removal associated with previous upstream development. Other sources of silt include upstream landslides and bank failures related to new construction.

Special Status Species found in the resource site include:

- Pacific western big-eared bat
- Long-eared myotis
- Fringed myotis
- Long-legged myotis
- Pileated woodpecker
- Little willow flycatcher
- American peregrine falcon
- Olive-sided flycatcher
- Coast cutthroat trout
- Northern red-legged frog

| Table B: Quality of Natural Resource Functions in Resource Site SK10 | | | | |
|---|-------------|---------------|------------|--------------|
| Resource Site (acres) = 475.371054 | | | | |
| | High | Medium | Low | Total |
| Riparian Corridors* | | | | |
| acres | 103.2 | 75.0 | 163.1 | 341.3 |
| percent total inventory site area | 21.7% | 15.8% | 34.3% | 71.8% |
| Wildlife Habitat* | | | | |
| acres | 194.3 | 105.2 | 0.0 | 299.5 |
| percent total inventory site area | 40.9% | 22.1% | 0.0% | 63.0% |
| Special Habitat Areas** | | | | |
| acres | | | | 126.1 |
| percent total inventory site area | | | | 26.5% |
| Combined Total⁺ | | | | |
| acres | 230.0 | 88.4 | 32.7 | 351.1 |
| percent total inventory site area | 48.4% | 18.6% | 6.9% | 73.9% |
| <p>* High-ranked riparian resources, Special Habitat Areas, and wildlife habitat include open water. ** Special Habitat Areas rank high for wildlife habitat. +Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.</p> | | | | |

Determination of Significance

Natural resource features mapped in the resource site that provide functions identified in the Natural Resources Inventory are determined to be significant (Map F). Within resource site SK10 the following significant features and functions are present:

Significant Natural Resource Features: open stream, wetlands, forest vegetation within 300 feet of waterbodies; forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies; woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; developed land within 50 feet of waterbodies; forest patches and associated and contiguous woodland patches two acres in size or larger; and Special Habitat Areas.

Significant Riparian Corridor Functions: microclimate and shade; stream flow moderation and water storage; bank function and sediment, pollution and nutrient control; large wood and channel dynamics; organic inputs, food web and nutrient cycling; and riparian wildlife movement corridor.

Significant Wildlife Habitat Functions: interior area; food and water; resting, denning, nesting and rearing; movement and migration; reduction of noise, light and vibration; and habitat patches that support special status wildlife species.

Resource Site Specific ESEE

The General ESEE analysis, Volume 2, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

Conflicting Uses

The common impact of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; add impervious surface; modifying streams and floodplains; generating pollution; landscaping with non-native or invasive vegetation; building fences or other wildlife barriers; and other impacts such as noise, light, litter and pets.

Within the resource site residential uses are allowed outright or conditionally in the RF, R20 and R10 base zones. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

ESEE Analysis

The analysis of economic, social, environmental and energy consequences provided in Volume 2 is confirmed for resource site SK10, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses generally would retain the riparian corridor and wildlife habitat functions of the significant natural resource features including maintaining habitat for at risk

species, maintaining the flow moderation, water quality and flood control functions of streams and wetlands, maintaining vegetation on steep slopes, and maintaining the stormwater management and air-cooling functions of the tree canopy. Mitigation for negative consequences of additional development in areas of high or medium ranked natural resources should be required. New or expanded development should be setback from a minimum distance streams and wetlands.

Steep slopes are susceptible to erosion and landslides. Development should be clustered away from steep slopes and trees and vegetation should be maintained to reduce the landslide risks. New or expanded development on steep slopes should be *limited*.

ESEE Decisions

Based on the ESEE general recommendations (Volume 2) and resource site-specific ESEE, the ESEE decisions for Resource Site SK10 are:

1. *Strictly limit* conflicting uses within stream channels from top-of-bank to top-of-bank, wetlands, land within 100 feet of stream top-of-bank and land within 100 feet of wetlands.
2. *Limit* conflicting uses within areas of forest vegetation that are contiguous to but more than 100 feet from stream top-of-bank.
3. *Limit* conflicting uses within the 46-acre patch of forest vegetation extending from the south-eastern corner of the resource site to the middle of the resource site and within the 5-acre patch of forest vegetation adjacent to NW Skyline Blvd.
4. *Limit* conflicting uses within areas of forest vegetation on steep slopes that are contiguous to streams but more than 100 feet from the stream top-of-bank.
5. *Allow* conflicting uses within all other areas containing significant natural resources.

| Table C: ESEE Decision for Resource Site SK10 | |
|--|--------------|
| ESEE Decision | Acres |
| Strictly Limit | 113.9 |
| Limit | 186.8 |
| Allow | 174.7 |



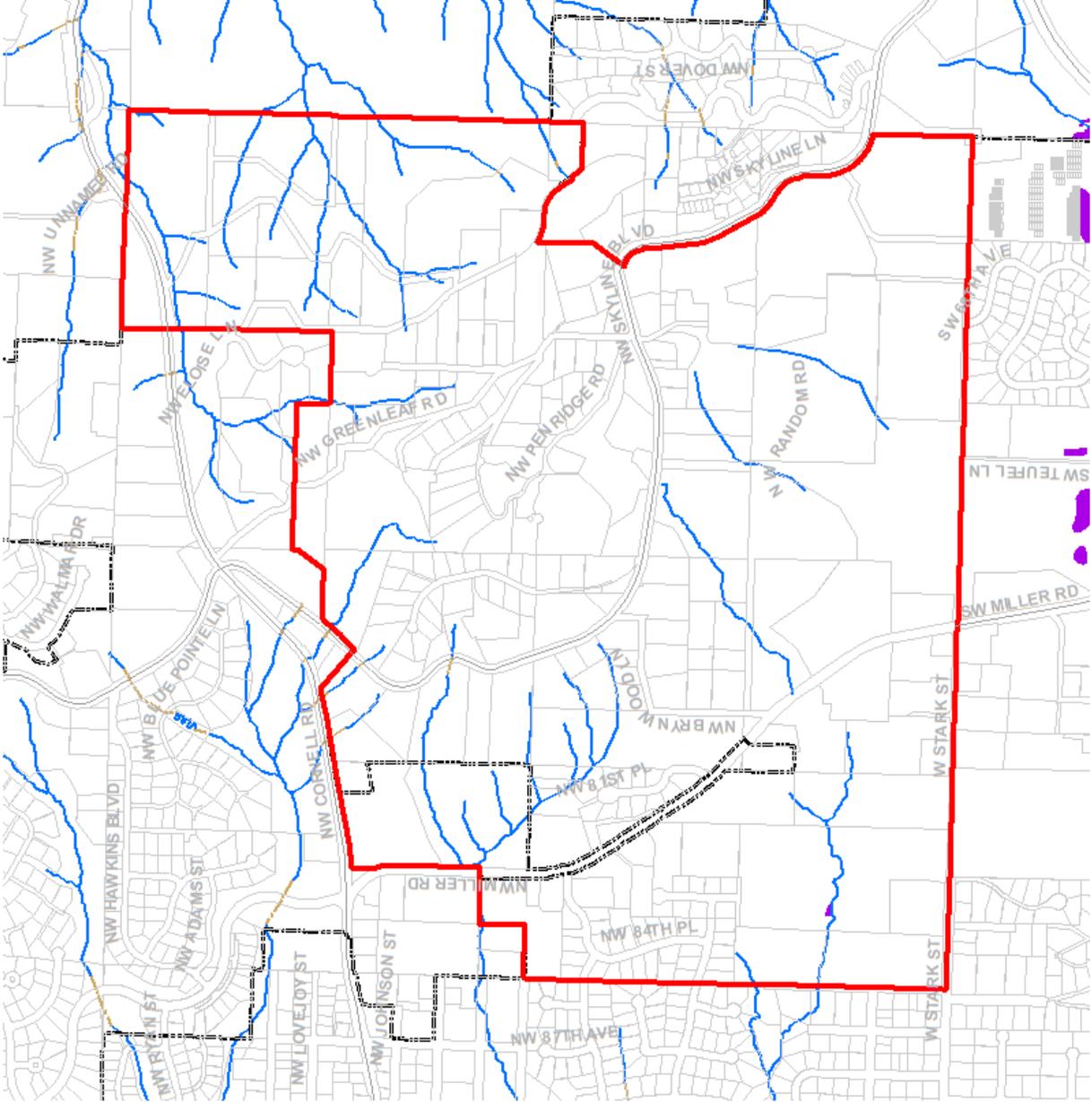
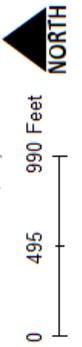
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Resource Site: SK10
NW Skyline & Brywood

Map B: Water Related Features

-  Resource Site
-  Open stream channel
-  Piped stream segment
-  Wetlands
-  Floodplain
-  Taxlots
-  City of Portland

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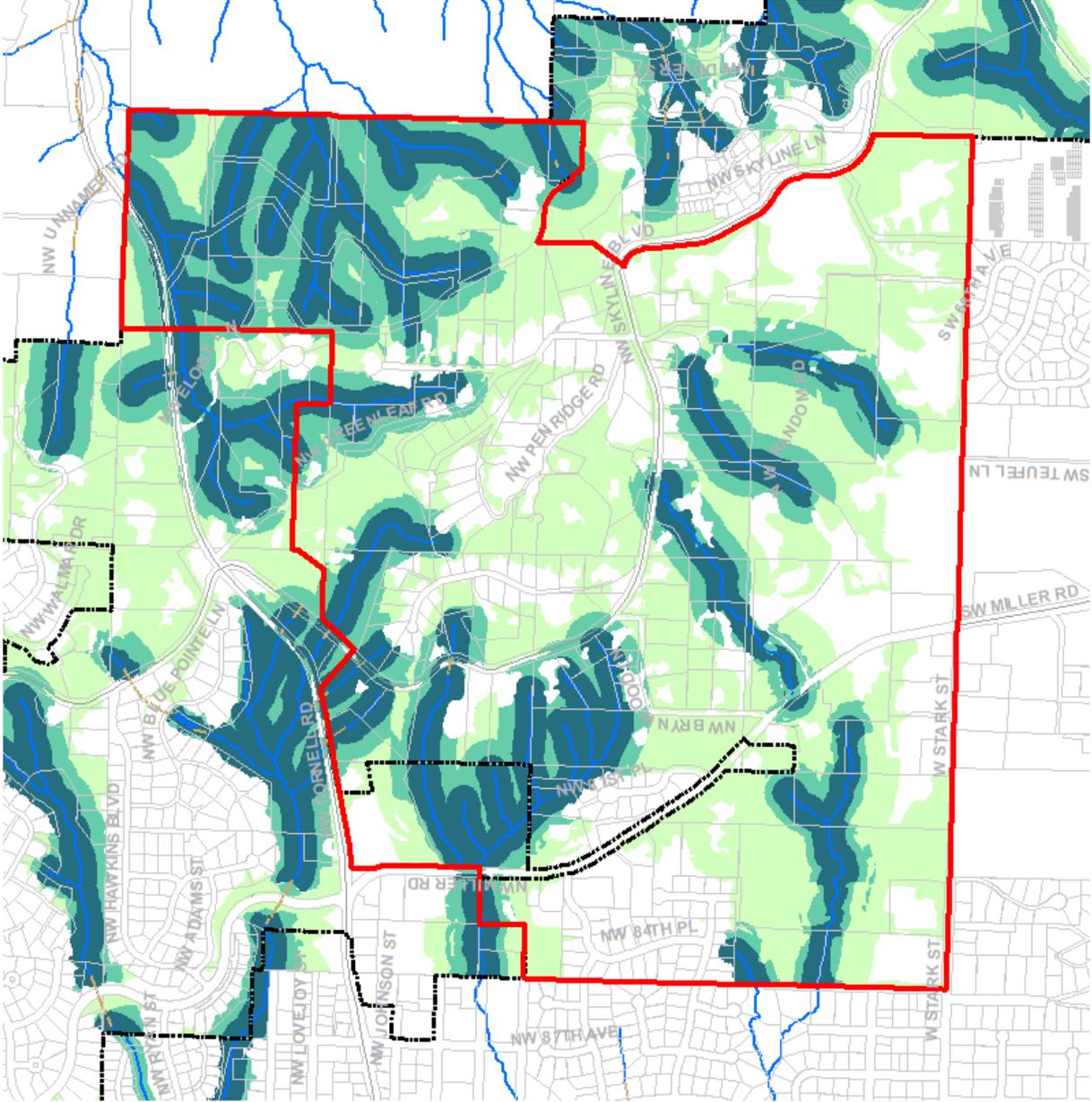
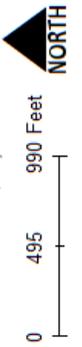




Resource Site: SK10
NW Skyline & Brynwood
Map D: Riparian Corridors

- Resource Site
- High riparian function
- Medium riparian function
- Low riparian function
- open stream channel
- piped stream segment
- Taxlots
- City of Portland

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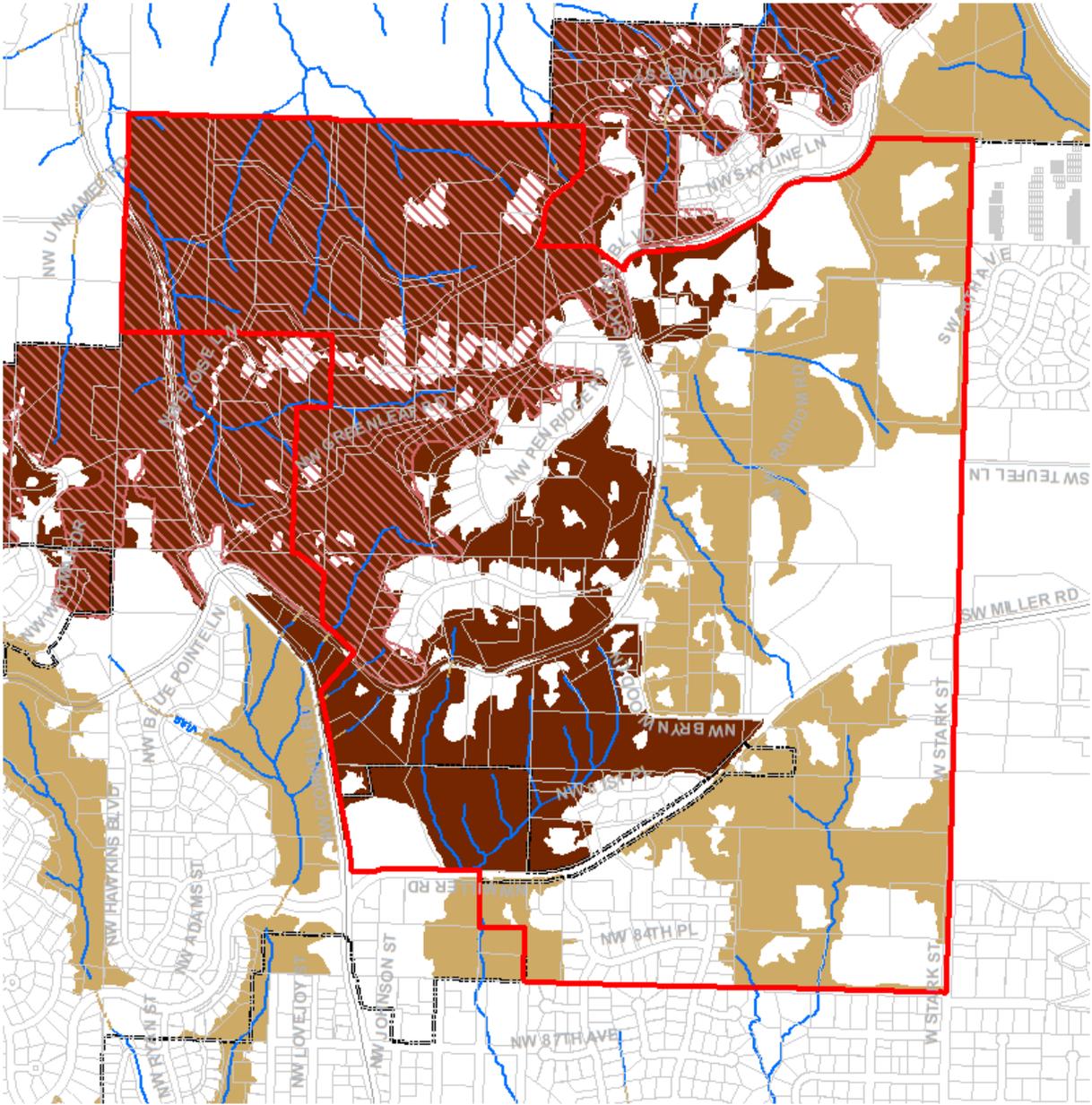
Resource Site: SK10

NW Skyline & Brynwood

Map E: Wildlife Habitat

- Resource Site
- High wildlife habitat
- Medium wildlife habitat
- Low wildlife habitat
- Special Habitat Areas
- open stream channel
- piped stream segment
- Taxlots
- City of Portland

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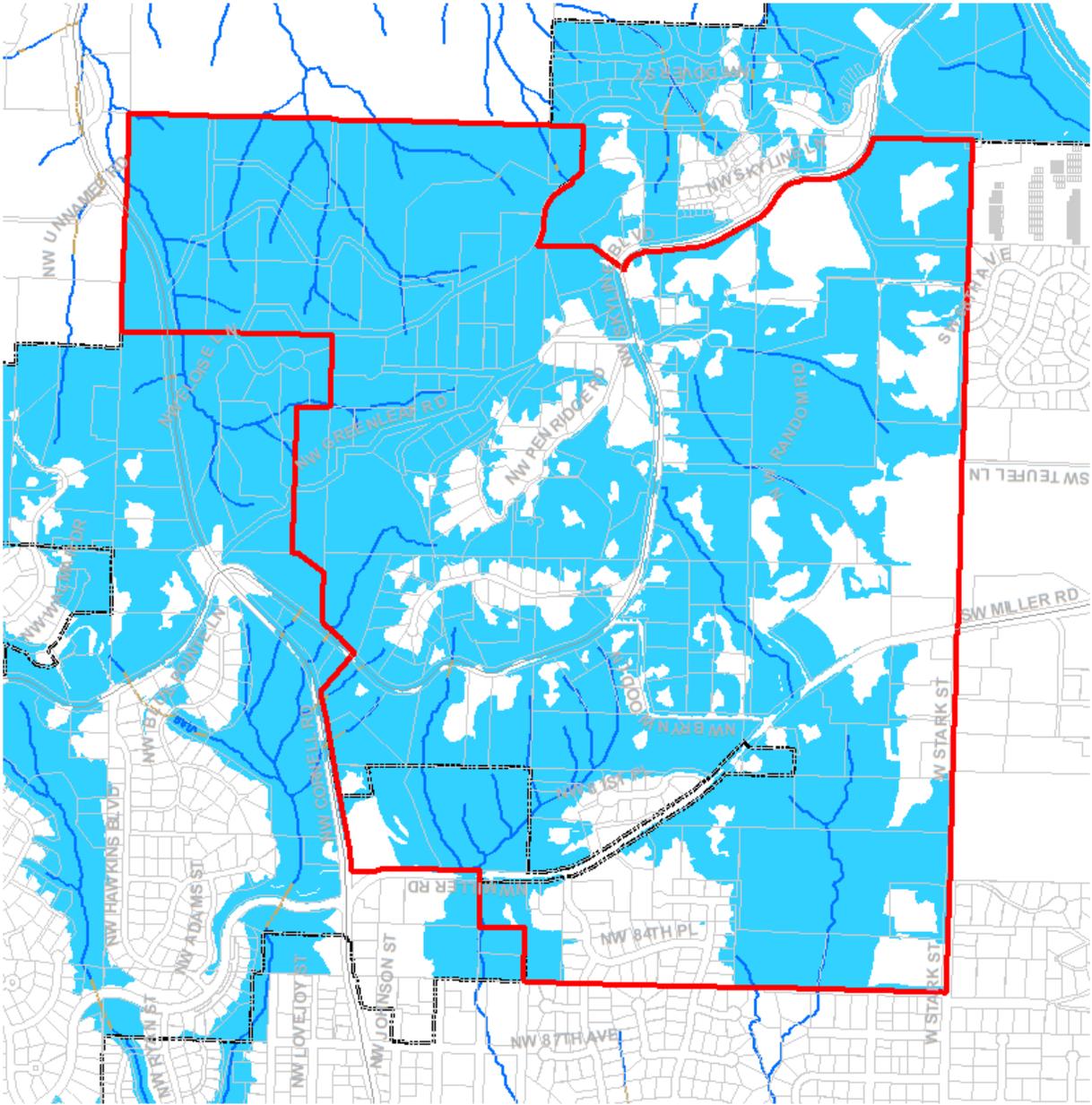
Resource Site: SK10

NW Skyline & Brynwood

Map F: Determination of Significance

- Resource Site
- Significant natural resources
- open stream channel
- piped stream segment
- Taxlots
- City of Portland

November 2019
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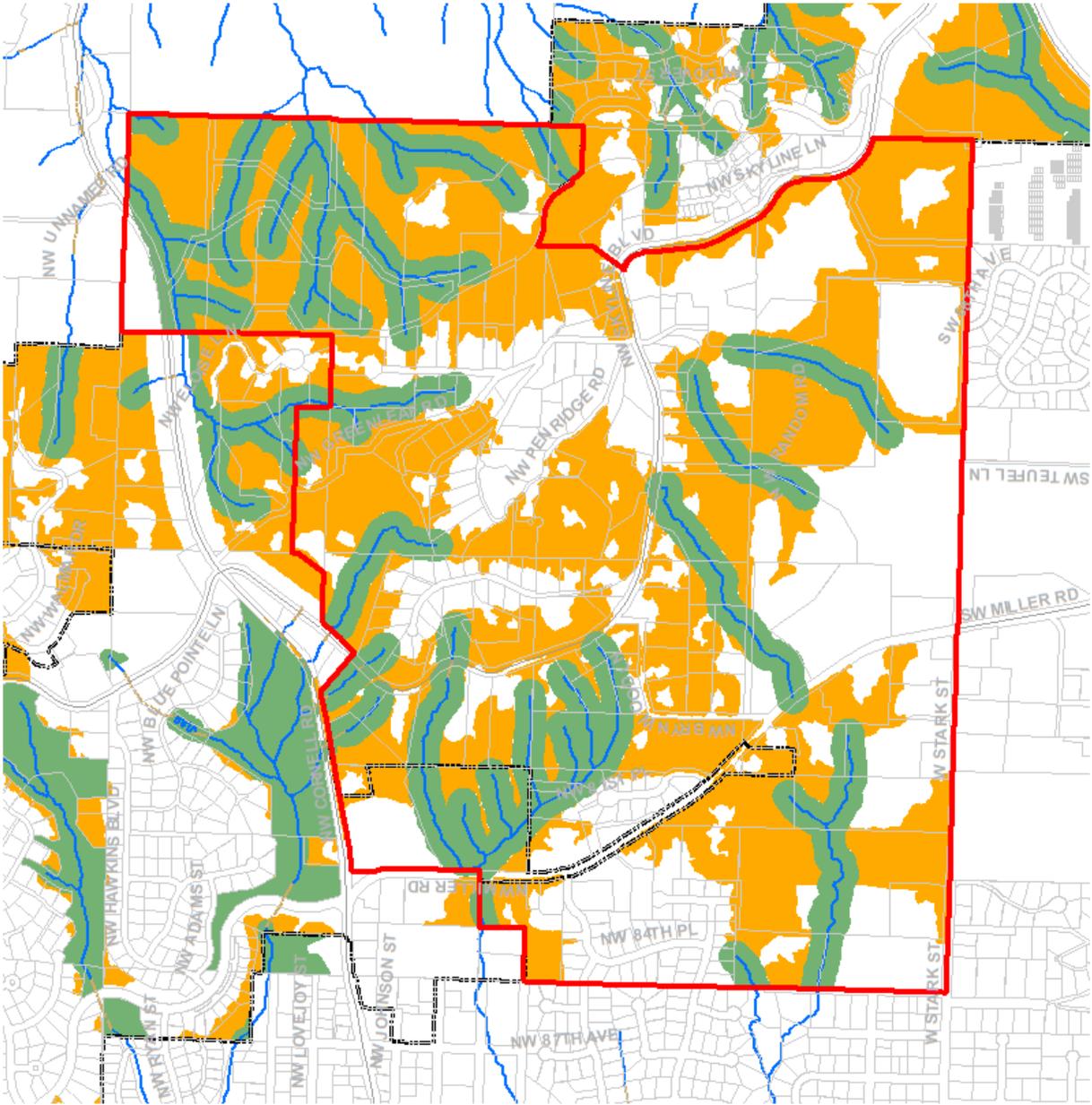




Resource Site: SK10
NW Skyline & Brynwood
Map G: ESEE Decision

- Resource Site
- Limit conflicting uses
- Strictly limit conflicting uses
- open stream channel
- piped stream segment
- Taxlots
- City of Portland

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The *Environmental Overlay Zone Map Correction Project* plan documents:

Volume 1 – Project Report, Summary of Results and Implementation

The purpose of the Project Report is to document the overall project approach and methodology, summarize public engagement, provide an at-a-glance summary of the results by resource site, and present the updated zoning code maps and refinements to zoning code chapter 33.430, Environmental Zones.

Volume 2 – General Economic, Social, Environmental and Energy Analysis

The General ESEE evaluates the tradeoffs between protecting natural resources and other city goals for economic development, housing, public health, etc. The General ESEE provides an overall recommendation regarding which natural resource features should be protected. The General ESEE recommendations are then affirmed, clarified or modified for each resource site based on resource site-specific circumstances. The resource site-specific ESEEs are presented in Volume 3, Part A-H.

Volume 3 – Resource Site Inventory and ESEE Decisions

For each of the geographies listed below, each document presents an inventory of natural resource features and functions, a site-specific Economic, Social, Environmental and Energy Analysis (ESEE), and the ESEE decisions regarding which natural resource should be protected for each resource site.

Part A1 – Forest Park and Northwest District, Resource Sites 1 – 20

Part A2 – Forest Park and Northwest District, Resource Sites 21 – 41

Part B – Skyline West

Part C – Tryon Creek and Southwest Hills East

Part D – Fanno Creek

Part E – East Buttes and Terraces

Part F – Johnson Creek

Part G – Boring Lava Domes

Volume 4 – Appendices

Appendices include the Regulatory Context; 2012 NRI Project Report; stream, vegetation and wetland mapping protocols; and the at-risk species list.