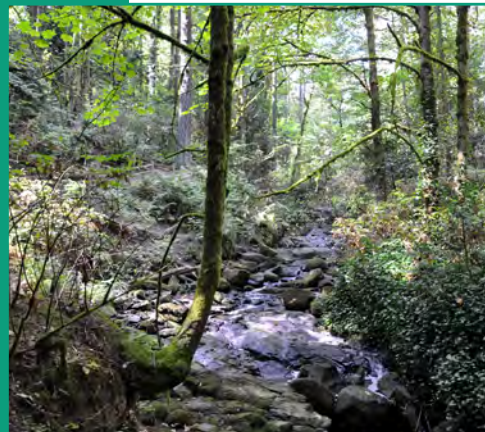


ENVIRONMENTAL OVERLAY ZONE MAP CORRECTION PROJECT

VOLUME 2, PART C:

Tryon Creek and Southwest
Hills East, Natural Resources
Inventory and Protection
Decisions



**Recommended Draft,
As Amended**

May 2022



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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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Table of Contents

A. Introduction	1
B. How To Use This Document	1
C. Natural Resources Definitions	4
D. Resource Site Boundaries	6
E. Results	7
E.1 Tryon Creek and Southwest Hills Natural Resources	8
E.2 Resource Sites	20
Resource Site SW1	21
Resource Site SW2	37
Resource Site SW3	52
Resource Site SW4	67
Resource Site SW5	82
Resource Site SW6	97
Resource Site SW7	112
Resource Site SW8	127
Resource Site SW9	143
Resource Site SW10	160
Resource Site SW11	177
Resource Site SW12	193
Resource Site SW13	208
Resource Site SW14	223
Resource Site SW15	238
Resource Site SW16	254
Resource Site SW17	271
Resource Site SW18	287
Resource Site SW19	303
Resource Site SW20	318
Resource Site SW21	334
Resource Site SW22	350
Resource Site SW23	366

Maps

1. Tryon Creek and Southwest Hills Geography 2
2. Tryon Creek and Southwest Hills Resource Sites 20

Resource Site Maps

- A. Water Features
- B. Land Features
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Habitat Conservation Areas/Goal 5 Significant Natural Resources
- H. Goal 5 Significant Natural Resources
- I. Recommended Natural Resource Protections

Tables

1. Tryon Creek Subwatershed Streams 11
 - A. Quantity of Natural Resource Features
 - B. Quality of Natural Resource Functions
 - C. Impervious Area

Figures

1. Stream Survey Results 15

A. INTRODUCTION

Volume 2, Part C, includes the results for Resource Sites in the Tryon Creek and Southwest hills geography (see Map 1). For each resource site the following is presented:

1. Verification riparian corridors and wildlife habitat features, functions and classifications pursuant to Metro Rule 3.07.1320 and Table 3.07-13d, and OAR 660-023-0110.
2. Confirmation of Habitat Conservation Areas, pursuant to Metro Rule 3.07.1320 and Table 3.07.13a.
3. Economic, Social, Environmental and Energy analysis pursuant to OAR 660-023-0110 for areas that are not Habitat Conservation Areas.
4. Program implementation recommendations pursuant to Metro Rule 3.07.1330 and 3.07.1340, and OAR 660-023-0110. Program implementation is presented in Volume 1, Part B.

B. HOW TO USE THIS DOCUMENT

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

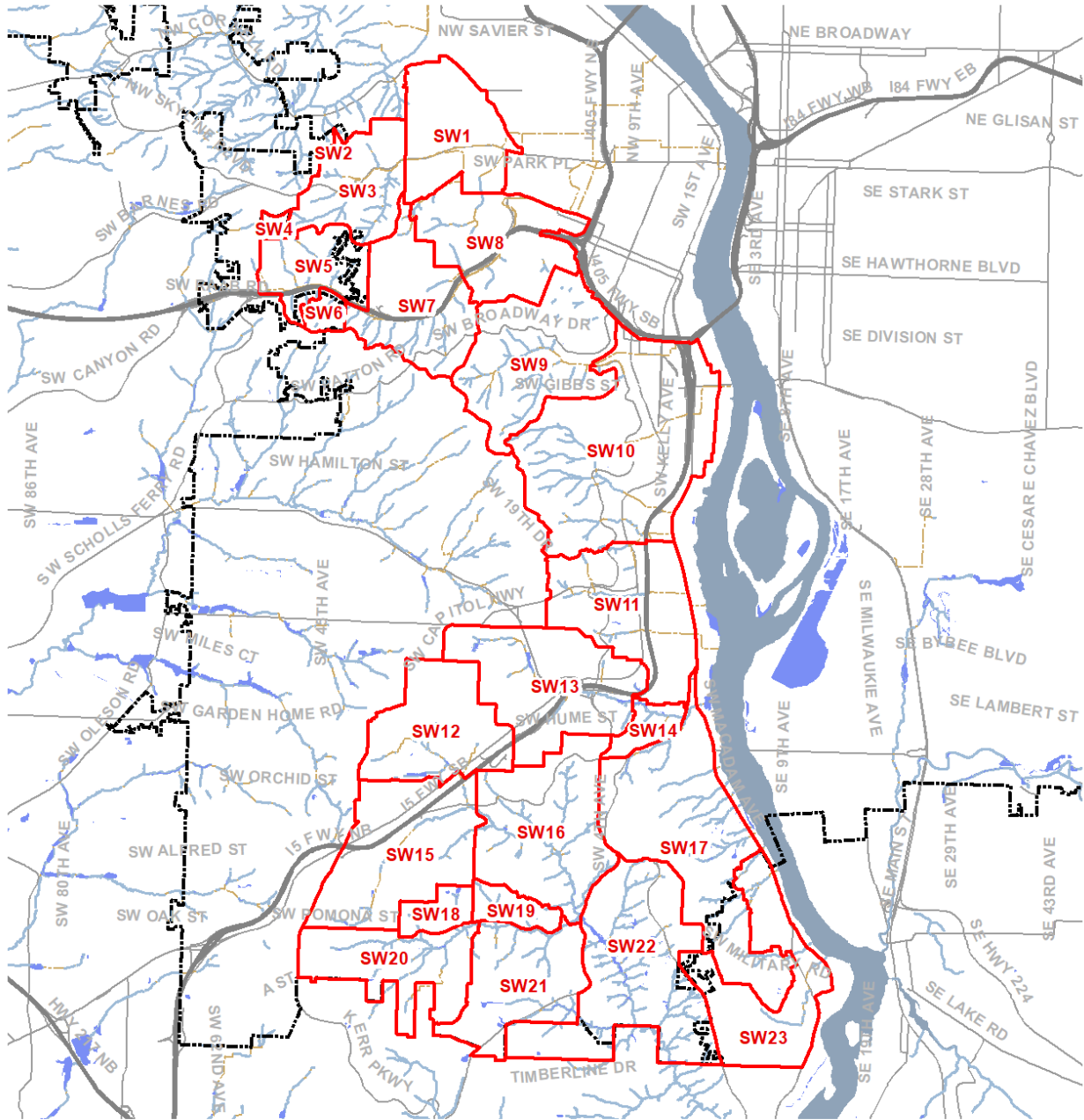
Area Descriptions

Volume 2, Part C, begins with an overview of the area's features, functions and conditions, including land use patterns. This information is provided for context but is also applicable to each resource site and should be used in conjunction with resource site-specific maps and descriptions during quasi-judicial reviews.

Natural Resource Features and Classification Maps

Metro Title 13 and Statewide Planning Goal 5, wildlife habitat, rules require verification of natural resource features and classifications. Natural resource features include rivers, streams, wetlands, flood area, vegetation (forest, woodland, shrubland and herbaceous), steep slopes and Special Habitat Areas. The methodology used to identify and map these features and the functions provided (also referred to in the zoning code as "functional values") is documented in Volume 3, Natural Resources Inventory. The methodology to verify the classifications is documented in Volume 3, Title 13 and Goal 5 Compliance.

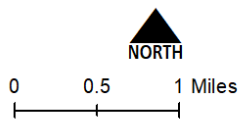
Each Resource Site begins with maps that document the location and extent of natural resource features, functions and classifications. The decisions regarding which natural resources to protect are based on the mapped features. The natural resource features maps can be updated at any time based on current conditions and additional factual data, such as a wetland delineation performed by a qualified professional. The environmental overlay zone boundaries may be 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.



**Tryon Creek and SW Hills
Resource Sites**

- Resource Sites
- open stream channel
- piped stream segment
- wetlands
- rivers
- freeways
- City of Portland

Updated: April 2020



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Map 1: Tryon Creek and Southwest hills East Resource Geography

Habitat Conservation Area and ESEE Decision Maps

Metro Title 13 requires confirmation of Habitat Conservation Areas. The methodology used to determine Habitat Conservation Areas is documented in Volume 3, Title 13 and Goal 5 Compliance. For natural resources that are not a Habitat Conservation Area, and for which Portland intends to protect the resources, Statewide Planning Goal 5 OAR 660-023-0110 must be followed to show the ESEE decisions. The methodology used to make the ESEE decisions is documented in Volume 3, Title 13 and Goal 5 Compliance. The Habitat Conservation Area determinations and ESEE decisions are the legislative intent regarding which resources should be protected and to what level of protection. The legislative intent should be consulted during quasi-judicial review.

Natural Resource Features and Functions Descriptions

Descriptions of the natural resource features and functions are not required by Metro Title 13 or Statewide Planning Goal 5; a map of the features is sufficient. However, Portland Zoning Code Title 33 requires that impacts to natural resources be fully mitigated to address both features and functions (also referred to as “functional values” in the zoning code). The functions provided by the resources are mapped based on the city’s Natural Resources Inventory methodology, see Volume 3. The area descriptions provided at the beginning of this document also provide information about functions that pertain to each resource site. Both the resource site descriptions and area description should be used to assess natural resource impacts and mitigation alternatives during quasi-judicial reviews. Additional factual information about the resource functions may also be provided by a qualified professional.

Metro Title 13 and Oregon Goal 5 Compliance

An explanation of compliance requirements for Metro Urban Growth Management Functional Plan Title 13, Nature in Neighborhoods, and Oregon Statewide Land Use Planning Goal 5, Open Spaces, Scenic and Historic Areas, and Natural Resources is found in Volume 3. The natural resource protection requirements are summarized, and recommendations are made for each resource site. For natural resources that are not a Title 13 Habitat Conservation Area, the general ESEE analysis and recommendations are affirmed, clarified or modified based on resource site-specific information. An ESEE decision is made and describes the significant natural resource features and functions to be protected from the impacts of conflicting uses.

Implementation

Results of Metro Title 13 and Oregon Goal 5 requirements are explained and presented in Map I for each resource site. The results are implemented by updates to the official zoning maps and zoning code, documented in Volume 1, Part B.

C. NATURAL RESOURCE DEFINITIONS

The natural resource definitions are part of the citywide Natural Resources Inventory (see Volume 3) and used to explain how resources are mapped and classified. These are not regulatory definitions.

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 that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions; although due to landscaping, seeding, mowing or grazing wet-adopted vegetation (hydrophytes) may not be present.

Flood area: The combination of the FEMA 100-year floodplain, the Special Flood Hazard Area (those areas with a 1% or greater chance of flooding in any given year), as well as areas that were inundated with water during the February 1996 floods.

Floodway: The floodway consists of the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood (100-year flood) without cumulatively increasing the water surface elevation more than one foot.

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.

Land: The ground itself and any features associated with or located on the ground including but not limited to flood area, vegetation, rip rap, paved areas, structures, buildings, trails, etc.

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

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

Wildlife Habitat: Waterbodies, flood areas, 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: Habitats designated by the City of Portland in accordance with Metro's Urban Growth Management Functional Plan Title 13, Nature in Neighborhoods, criteria for Habitat of Concern. These are areas that contain or support special status species, sensitive/unique plant populations, or other unique natural or manmade habitat features.

D. RESOURCE SITE BOUNDARIES

Portland established resource sites through previously adopted conservation and protection plans in accordance with Statewide Planning Goal 5. 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.”

Metro Title 13 does not require the designation of resource sites. However, because there is significant wildlife habitat throughout Portland that is not a Habitat Conservation Area, and therefore subject to Goal 5 OAR 660-023-0110, resource site will continue to be used.

This project is remapping resource site boundaries to be more consistent and easier to implement. The resource sites were remapped in the following way:

1. The previous resource site boundaries were used to the maximum extent practicable. The intent is to maintain consistency between the past plans and this plan.
2. Resource site boundaries were expanded to capture contiguous or similar and adjacent natural resource features that were not within a resource site.
3. Resource site boundaries were expanded to eliminate unnecessary gaps between resource sites.
4. Very small resource sites, with similar natural resource features and functions, were consolidated into one single larger resource site.
5. 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.
6. Centerlines of streets, bridges, railroad tracks or other transportation facilities are often used to delineate resource site boundaries.
7. 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 general description of Tryon Creek and Southwest hills East natural resources. The general description is applicable within each resource site. Following the general description are results for the resource sites. For each resource site the following information is provided:

1. Maps
 - A. Water Features – rivers, streams, wetlands and flood areas
 - B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
 - C. Special Habitat Areas
 - D. Riparian Corridor Classifications
 - E. Wildlife Habitat Classifications
 - F. Urban Development Value
 - G. Metro Title 13 Habitat Conservation Areas
 - H. Statewide Planning Goal 5 Areas
 - I. Natural Resource Protections
2. Natural Resource Descriptions – A narrative that provides additional site-specific information about the types, quantity, quality or functionality (aka resource functions or functional values) of the natural resource features present in the resource site.
3. Metro Title 13 and Oregon Goal 5 Compliance – The compliance requirements are documented in Volume 3 and summarized here. If there are natural resources that are not a Habitat Conservation Area present in the resource site, then the general ESEE recommendation (Volume 3) will be confirmed, modified or clarified based on resource site-specific conditions.
4. Natural Resource Protection Decisions – At the end of each resource site section are the final decisions regarding which riparian corridors and wildlife habitat should be protected. These decisions are repeated in Volume 1; if there is a discrepancy between sections, the decisions in Volume 2, Part A take precedence.

E.1. Tryon Creek and Southwest hills East Natural Resources

The Southwest hills forest protects and conserves important natural resources and watershed functions. Forest vegetation moderates the effects of wind 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 flows 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 wildlife. The forest canopy, as well as the shrubs and groundcover vegetation provide breeding, feeding and refuge areas for many species of insects, birds and mammals. The forest canopy helps moderate stream flows, filter out potential pollutants and moderate stream temperatures, thereby sustaining viable habitat for fish, amphibians and aquatic organisms in addition to providing an important upland water source for terrestrial wildlife. Intact forests also maintain good quality drinking water for local residents who rely on the use of wells. There are other benefits healthy forests provide to local residents such as a noise buffer from more urbanized areas, highways and nearby industrial activities. These forests also have the ability to moderate climate extremes by helping cool the air during the day and warming it at night. 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.

E.1.a. Geology

The Portland Hills (Tualatin Mountains) are a narrow, northwest-trending, complexly faulted range that rises about 1,000 feet on either side of the Tualatin and Lower Willamette basins. The major events leading to the formation of these hills began 16 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.

Geologic disturbances continued through the late Miocene period, when the present-day Cascade and Coast Ranges were formed. During the same period, a large upheaval of the Columbia River basalt base, under what is now Portland, created the Tualatin Mountain ridge and simultaneously formed the Willamette and Tualatin valleys. The same mountain-building disturbances caused the formation of numerous parallel and transverse high-angle faults, and

several southeast-dipping thrust faults along the ridge. 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.

The last major activity affecting the southwest hills area was the wind-blown deposition of up to 100 feet of loess, known as Portland Hills Silt. This silt was eroded from the Columbia River flood plain, carried down the gorge, and finally wind-deposited on the West Hills. Massive late Pleistocene flooding eroded this silt away from all areas below 300 feet and replaced it with Lacustrine deposits of silt and sand. In the more recent geologic past, silt and sand (alluvium) deposits were formed along the Columbia and Willamette River floodplains.

The presence of Portland Hills Silt along the Tualatin Mountains has important implications for land use and development. This 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 area over the last century.

E.1.b. Soils

The Natural Resources Conservation Service (NRCS) classifies soils in the Tryon Creek Watershed/ Southwest hills as belonging to the Cascade series. This soil group is comprised predominantly of silt loam high in aluminum-rich volcanic ash weathered from Columbia River Basalt. Approximately 90 percent of the study area is made up of Cascade and Cascade-Urban soils. Cascade soil is a somewhat poorly drained, dark-brown silt loam that is a depth of about eight inches. Below this layer is about 19 inches of dark-brown silt loam subsoil (PSU and Metro 1995) including a layer of low permeability to a depth of 60 inches called fragipan (City of Portland Bureau of Environmental Services 1997). This fragipan is a hard, brittle soil layer with low permeability (a.k.a. a hardpan) that impedes percolation of groundwater, causing a thin groundwater table to develop perched above the regional water table. The fragipan layer restricts rooting depth for plants to 30 to 48 inches and contributes to slope instability and erosion. As a result, the Cascade silt loams have severe limitations for building site development and sanitary facilities.

The hydrologic soil group classification for most of the soils in the Tryon Creek Watershed is Type C, a sandy clay loam, and soils with this classification have a slow infiltration rate and high runoff potential. Isolated pockets of Type D (clay loam) soils, which are even slower to drain, also exist in the watershed. The low permeability of these soils limits the function of onsite

stormwater and septic systems. Low soil permeability also affects watershed hydrology through limited soil absorption and interflow, resulting in higher runoff peaks and lower base flows.

Approximately five percent of the study area is made up of Cornelius soils. This soil is made up of moderately well-drained silt loams on remnants of terraces that have been dissected and are rolling. The surface layer is dark-brown silt loam about eight inches thick, below which is a substratum of a brown, mottled, silt loam fragipan to a depth of 60 inches or more. Permeability is slow and effective rooting depth is limited by the fragipan layer.

Approximately two percent of the study area is made up of Delena silt loam. This poorly drained soil occurs on broad, high terraces. The surface layer is mottled, very dark grayish brown silt loam about 13 inches thick, with a subsoil of mottled, dark grayish brown over grayish brown silty clay loam about 10 inches thick. The substratum is a mottled, grayish brown silty clay and variegated silty clay loam fragipan to a depth of 60 inches or more.

E.1.c. Topography and Slopes

The eastern face of the Tualatin Mountain range is dissected by creeks and creek channels flowing eastward to the Willamette River. In the study area, the terrain rises sharply from the lowlands near Willamette River to the crest of the hills (over 1,000 feet in elevation in certain places), with some slopes in excess of 50 percent. The western face of this range, by contrast, slopes more gently into the Tualatin Valley.

A physiographic inventory of Portland classified slopes in excess of 30 percent as generally having "severe landslide potential." Between 60 and 75 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 prevalent in mid-winter. Areas with "severe landslide potential" included slopes steeper than 30 percent which had a history of failures (e.g., major slumps and landslides).

E.1.d. Surface Water

The Tryon Creek Watershed, like the rest of Portland, enjoys mild, wet winters and cool, dry summers. Temperatures range from 25 to 45°F in the winter and from 70 to 90°F in the summer. The watershed gets about 39 inches of precipitation per year (98% rain and 2% snow) and almost all the rain falls between October and May, with half the annual total falling in November, December, and January.

The Bureau of Environmental Services maintains a system of rain gages as part of its Hydrologic Data Retrieval and Acquisition (HYDRA) system. Rain data from a HYDRA gage at the Portland Community College (PCC) Sylvania campus was used to develop rainfall characteristics in the

Tryon Creek Watershed, and design storms were defined for modeling future conditions and testing conveyance system capacity.

The Tryon Creek Watershed is characterized by steep slopes and stream gradients. The physiographic characteristics of the watershed and its soil types impact stream systems in terms of channel incision, undercutting of stream banks, landslides, and exposed sewer pipes.

In addition to open stream channels, stormwater is also conveyed through close to 30 miles of culverts and storm pipes (City of Portland Bureau of Environmental Services 1997). As the watershed undergoes further development, the ability of these conveyance systems to handle storm events designated as the City’s basic level of service (i.e., conveyance of the 10-year storm) will become increasingly difficult.

Under an intergovernmental agreement with Bureau of Environmental Services, the U.S. Geological Survey (USGS) installed a flow monitoring station on Tryon Creek mainstem in August 2001. BES and USGS will continue to fund operation of this station.

There are about 27 miles of open stream channel in the Tryon Creek Watershed, and an additional three miles of streams are in culverts or pipes. The mainstem of Tryon Creek is a perennial stream that originates in the West hills of Portland and flows southeast from Multnomah Village, through Tryon Creek State Natural Area, to its confluence with the Willamette River at the Highway 43 crossing in Lake Oswego. It is one of the few remaining free-flowing tributaries in Portland that flow into the Willamette River. Tryon Creek is primarily a high-gradient, open-stream system, with the exception of culverts at road crossings. Its major tributaries include Arnold Creek and Falling Creek.

Subwatershed	Open Channel	Pipe or Culvert	Other
Tryon Creek Mainstem	20.9	2.1	0.0
Arnold Creek	5.6	0.9	0.0
Falling Creek	1.0	0.5	1.5
Total	27.5	3.4	1.5

Source: City of Portland, OR, Bureau of Planning 1997. Note: numbers include creek tributaries.

E.1.e. Vegetation

The Tryon Creek watershed and southwest hills region contain many large patches of mixed deciduous-coniferous forest, including Hoyt Arboretum, Marquam Park, George Himes Park, Riverview Natural Area, and Tryon Creek State Park. These large forest patches create an important wildlife corridor that extends south from Forest Park. The region is on the very edge of the western hemlock vegetation zone, which occurs in maritime western Oregon, Washington,

and British Columbia. Vegetation in this zone is generally characterized by the climax species western hemlock (*Tsuga heterophylla*) and western red cedar (*Thuja plicata*), with Douglas fir (*Pseudotsuga menziesii*) as a prominent sub-climax species (Franklin and Dyrness 1988).

Vegetation in the Tryon Creek watershed and southwest hills reflects characteristics of typical western hemlock zone forests but is also heavily influenced by a history of surrounding urban development. Douglas fir is the most prominent coniferous species, with deciduous species bigleaf maple (*Acer macrophyllum*) and red alder (*Alnus rubra*) important in the canopy as well. These early-seral deciduous species are common throughout the western hemlock zone in riparian areas and other disturbance sites. The urban disturbance in the Tryon Creek watershed and southwest hills region, along with its proximity on the edge of the western hemlock zone, contributes to the increased prevalence of these species here. Pacific yew (*Taxus brevifolia*), which occurs in western coniferous forests throughout Oregon, Washington, and British Columbia, can be found in the Tryon Creek watershed. Oregon ash (*Fraxinus latifolia*) is also a common canopy species in riparian areas of this region. European hawthorn (*Crataegus monogyna*) and sweet cherry (*Prunus avium*) are common in urban areas and are present in this region.

The understory of Tryon Creek watershed and southwest hills region forests include species typical of western hemlock forests and forest edges, as well as species common to urban areas. Common shrubs include vine maple (*Acer circinatum*), oso berry (*Oemleria cerasiformis*), thimbleberry (*Rubus parviflorus*), salmonberry (*Rubus spectabilis*), Oregon grape (*Berberis nervosa* and *aquifolium*), and snowberry (*Symphoricarpos albus*), as well as Himalayan blackberry (*Rubus armeniacus* and *praecox*), English and Irish ivies (*Hedera helix* and *hibernica*), English holly (*Ilex aquifolium*), and English laurel (*Prunus laurocerasus*). Native forest herbaceous species, including sword fern (*Polystichum munitum*) and other ferns, Pacific trillium (*Trillium ovatum*), false Solomon's seal (*Maianthemum racemosum*), fringecup (*Tellima grandiflora*), and Pacific waterleaf (*Hydrophyllum tenuipes*) can be found in this region, along with common urban species such as bittersweet nightshade (*Solanum dulcamara*), herb Robert (*Geranium robertianum*), nipplewort (*Lapsana communis*), and prickly lettuce (*Lactuca serriola*).

E.1.f. Aquatic Species

Tryon Creek and its tributaries provided important habitat for various fish and other aquatic species before the turn of the century. Over the past decades, however, major modifications have been made in the watershed that have significantly affected aquatic habitat and fish passage (City of Portland Bureau of Environmental Services 1997; Pacific Habitat Services 1997; PSU and Metro 1995).

During the summers of 2019 and 2020, staff from the Oregon Department of Fish and Wildlife (ODFW) conducted stream habitat surveys in the Portland area using ODFW’s wadeable stream survey protocol.¹ As part of the surveys, ODFW staff walked each stream, measuring and characterizing each individual habitat unit (e.g. riffles, pools, glides, culverts) they observed. At each unit, staff measured the size (wetted length, width, and water depth), slope, streambank condition, large wood volume, canopy cover, and substrate composition. Along each stream reach, staff measured the bankfull width, terrace height, floodprone width, and valley width. The surveys also included a riparian assessment, where staff assessed a 30-meter (approx. 100 feet) transect perpendicular to the stream and characterized canopy closure, ground cover, and tree abundance.

The data was then analyzed by city staff to characterize the current quality of stream habitat in Portland’s streams. Stream condition is characterized by stream reach (segments of the stream that are approximately 0.5–1 mile long). The habitat quality of a stream reach represents how well the physical characteristics of the stream can support fish and other aquatic organisms by providing sources of food, refuge from predators, and areas to spawn. The metrics used to evaluate how well each stream reach provides these ecological functions are:

Grouping	Metric	Metric Description
Bank Condition	Percent artificial bank stabilization	Percent of the reach with artificial bank stabilization or riprap
Floodplain Condition	Floodplain connection	Vertical containment of the stream channel, calculated as floodprone width/bankfull width
	Floodplain development	Percentage of the current floodplain with vegetation
Habitat Connectivity	Percent Piped	Percentage of the stream flowing through pipes or culverts
	Road crossings	Number of road crossings per kilometer
Large Wood	Large wood volume	Volume of wood with diameter ≥ 15cm & length ≥ 3m, normalized by stream length
Pool Habitat	Pool frequency	The number of channel widths (active channel width) between pools in the reach
	Pool habitat cover	Cover includes a combination of residual pool depth, wood pieces per 100m, boulder count per 100m ² , undercut banks, debris jams
Riffle Habitat	Percent gravel	Percent of riffle area composed of gravel-sized substrate

¹ Kelly Moore, Kim Jones, Jeff Dambacher, Charlie Stein, et al. May 2021. Methods for Stream Habitat and Snorkel Surveys. Version 31.1. Oregon Department of Fish and Wildlife, Aquatic Inventories Project, Conservation and Recovery Program, Corvallis, OR.

<https://odfw.forestry.oregonstate.edu/freshwater/inventory/pdffiles/hmethd21.pdf>

https://odfw.forestry.oregonstate.edu/freshwater/inventory/basin_portland_reports.html

Grouping	Metric	Metric Description
	Percent fines	Percent of riffle area composed of fine substrate (silt, organic matter, sand)
	Riffle frequency	The number of channel widths (active channel width) between riffles in reaches where stream gradient is between 0.2 and 6%.
Riparian Condition	Shade	Current riparian shade as a proportion of the site potential
	Invasive cover	Invasive species cover in the riparian area (30 m)
	Natural Resource Inventory	Percentage of undeveloped high, medium and low quality riparian area as ranked by the NRI (50 ft)

The stream habitat metrics are computed for each stream reach and then converted to an index score that represents the ecological function provided by that metric. Index scores provide a consistent way of characterizing condition across a variety of habitat metrics and stream reaches. ODFW stream habitat benchmarks² and the City’s Watershed Health Index³ were used to establish the stream conditions that correspond to high quality habitat and which correspond to poor quality habitat for each metric.

Streams with ‘excellent’ stream habitat quality (dark blue lines on the map) are those where close to all of the habitat metrics meet or exceed the desired thresholds. These are areas with very high quality habitat that can support a variety of fish and aquatic organisms across their many different life stages. Conversely, stream reaches with ‘very poor’ stream habitat quality (red lines on the map) are those with little to no physical habitat that fish and other aquatic organisms require to survive.

Figure 1 shows the results of the streams survey within the Southwest Hills and Tryon Creek watershed.

² Scott Foster, Charles Stein, Kim Jones. 2001. A guide to interpreting stream survey reports. Edited by P.A. Bowers. Information Reports 2001-06. Oregon Department of Fish and Wildlife, Portland, OR.
<https://odfw.forestry.oregonstate.edu/freshwater/inventory/pdf/interpgd.pdf>

³ City of Portland Bureau of Environmental Services, Watershed Health Index and Report Cards.
<https://www.portlandoregon.gov/bes/reportcards>.

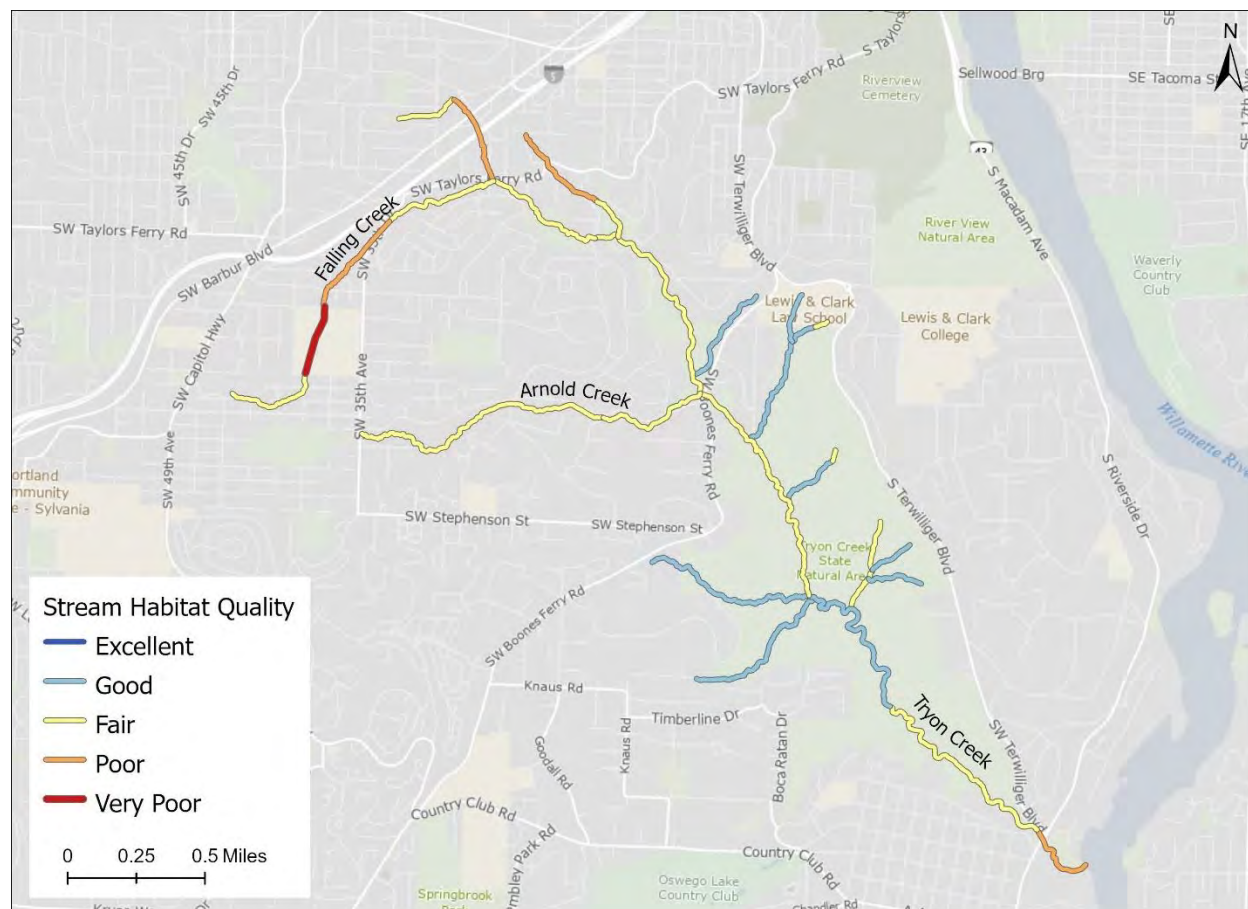


Figure 1: Stream Survey Results

E.1.f. Wildlife

Wildlife use different portions of the Southwest 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., downed logs, snags, herb, shrub and tree layers) is a key factor in determining the distribution and abundance of wildlife. Each stage of forest succession in the Southwest 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.

Terrestrial wildlife utilize different portions of the Tryon Creek Watershed and southwest 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., downed 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 southwest 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).

The Tryon Creek Watershed and southwest hills are used by about a hundred bird species and several small and medium sized mammals. Black bear, cougar, and Roosevelt elk were seen regularly before development, while today the area is still home to smaller, more adaptive mammals such as bats, beaver, black-tail deer, coyotes, raccoon, opossum, spotted skunk, Douglas Squirrel, red foxes, and Townsend's Chipmunk. Smaller creatures often go unnoticed, and many live in the streams and wetlands, in the humus of the forest floor, or high up in the canopy of Tryon Creek State Natural Area. The mild and damp conditions of the area are ideal for a number of amphibians and reptiles, including frogs, salamanders, snakes, toads, and turtles.

Birds are attracted to the variety of habitats found within the area's evergreen forests, deciduous woods, stream corridors, fringes of open fields, and numerous backyard birdhouses. Some of the birds found in the area include chickadees, Cooper's hawks, ducks, great horned owls, great blue herons, hummingbirds, jays, juncos, kingfishers, nuthatches, robins, sparrows, thrushes, towhees, warblers, waxwings, western screech owls, woodpeckers, and wrens (City of Portland Bureau of Environmental Services 1997; Pacific Habitat Services 1997; PSU and Metro 1995).

The pileated woodpecker (*Dryocopus pileatus*) is a species dependent on standing dead and dying trees in older forests. The bird is a cavity nester and is disappearing from rural areas because of timber harvest and the use of agricultural chemicals. The woodpecker is doing surprisingly well in some urban areas and can be observed in the Southwest Hills. Protection of older forests in urban areas is an important conservation strategy for the survival of this species.

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.

E.1.g. Special Habitat Areas

There are many areas in the Tryon Creek and southwest hills area that are designated Special Habitat Areas because of the presence of special status species (S criterion). Special Status species found in the study area 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, coastal cutthroat trout and northern red-legged frog.

Tryon Creek State Natural Area is designated a Special Habitat Area because it meets the following criteria:

- Special Status Species (S) – A habitat area or feature that supports an at-risk wildlife species on more than an incidental basis to complete one or more life history stages.

- Migratory Stopover Habitat (M) – An area or feature used by migratory birds for nesting, resting, feeding or cover on more than an incidental basis.
- Habitat Corridor (C) – An area that provides a wildlife movement corridor between larger habitat patches.

Tryon Creek is designated a Special Habitat Area because it meets the following criteria:

- Special Status Species (S) – A habitat area or feature that supports an at-risk wildlife species on more than an incidental basis to complete one or more life history stages.
- Habitat Corridor (C) – An area that provides a wildlife movement corridor between larger habitat patches.

Riverview Cemetery is designated a Special Habitat Area because it meets the following criteria:

- Migratory Stopover Habitat (M) – An area or feature used by migratory birds for nesting, resting, feeding or cover on more than an incidental basis.
- Habitat Corridor (C) – An area that provides a wildlife movement corridor between larger habitat patches.

Balch Creek Subwatershed is designated a Special Habitat Area because it meets the following criteria:

- Native Oak (O) – An area that contains Oregon white oaks; other tree species and vegetation may be present.
- Bottomland Hardwood Forest (B) – An area that contains remnant bottomland hardwood forest species; other tree species and vegetation may be present.
- Elk Migratory Corridor (E) – Areas that the Oregon Department of Fish and Wildlife has designated as elk migratory corridors.
- Migratory Stopover Habitat (M) – An area or feature used by migratory birds for nesting, resting, feeding or cover on more than an incidental basis.
- Habitat Corridor (C) – An area that provides a wildlife movement corridor between larger habitat patches.

Woods Memorial Park is designated a Special Habitat Area because it is an area used by migratory birds for nesting, resting, feeding or cover on more than an incidental basis (M).

Marquam Gulch Oak Stand is designated a Special Habitat Area because it contains Oregon white oaks (O). Note, other tree species and vegetation may be present.

Dunthorpe Oak is designated a Special Habitat Area because it meets the following criteria:

- Native Oak (O) – An area that contains Oregon white oaks; other tree species and vegetation may be present.

- Special Status Plants (P) – An area where rare or unique plant species have been documented. (Note – Because rare plants are often sought out for harvesting, the exact location of these species will not be documented in this report.)

E.1.h. Stormwater Management

Portland's stormwater system is a complex network of engineered and natural assets that provide conveyance, protect water quality, and provide and protect habitat and biological communities. In addition to hundreds of miles of pipes and ditches, and thousands of sumps and pollution reduction facilities; the city depends on the natural areas that intercept rainfall and the acres of wetlands and hundreds of miles of streams and drainageways that function as a critical part of the stormwater conveyance network.

Within the City of Portland there are three methods of conveying stormwater runoff from impervious areas. When soils allow infiltration, stormwater runoff may be directed to sumps or other stormwater facilities to be infiltrated into the ground, after being treated to protect groundwater. Some portions of the City direct stormwater to the combined sewer system, which sends stormwater along with sewage to the sanitary treatment plant for processing. In the remainder of the City, stormwater is directed to a natural stream system.

When natural areas are developed, the services provided by those natural areas are lost. Many of these services are critical to the healthy functioning of natural resources and are difficult or impossible to replace. For example, forest vegetation slows and takes up runoff from precipitation, thereby minimizing erosion and allowing the forest floor to filter out sediments and nutrients as the water soaks down into groundwater or passes into streams. By decreasing runoff and increasing groundwater infiltration, the forest protects downstream neighborhoods from flooding. The forest canopy helps to maintain stream flows, filter out potential pollutants, and moderate stream temperatures, thereby sustaining habitat for fish, amphibians and aquatic organisms as well terrestrial wildlife. Replacement of these functions through built stormwater management measures can only address a subset of the service provisions provided by natural systems.

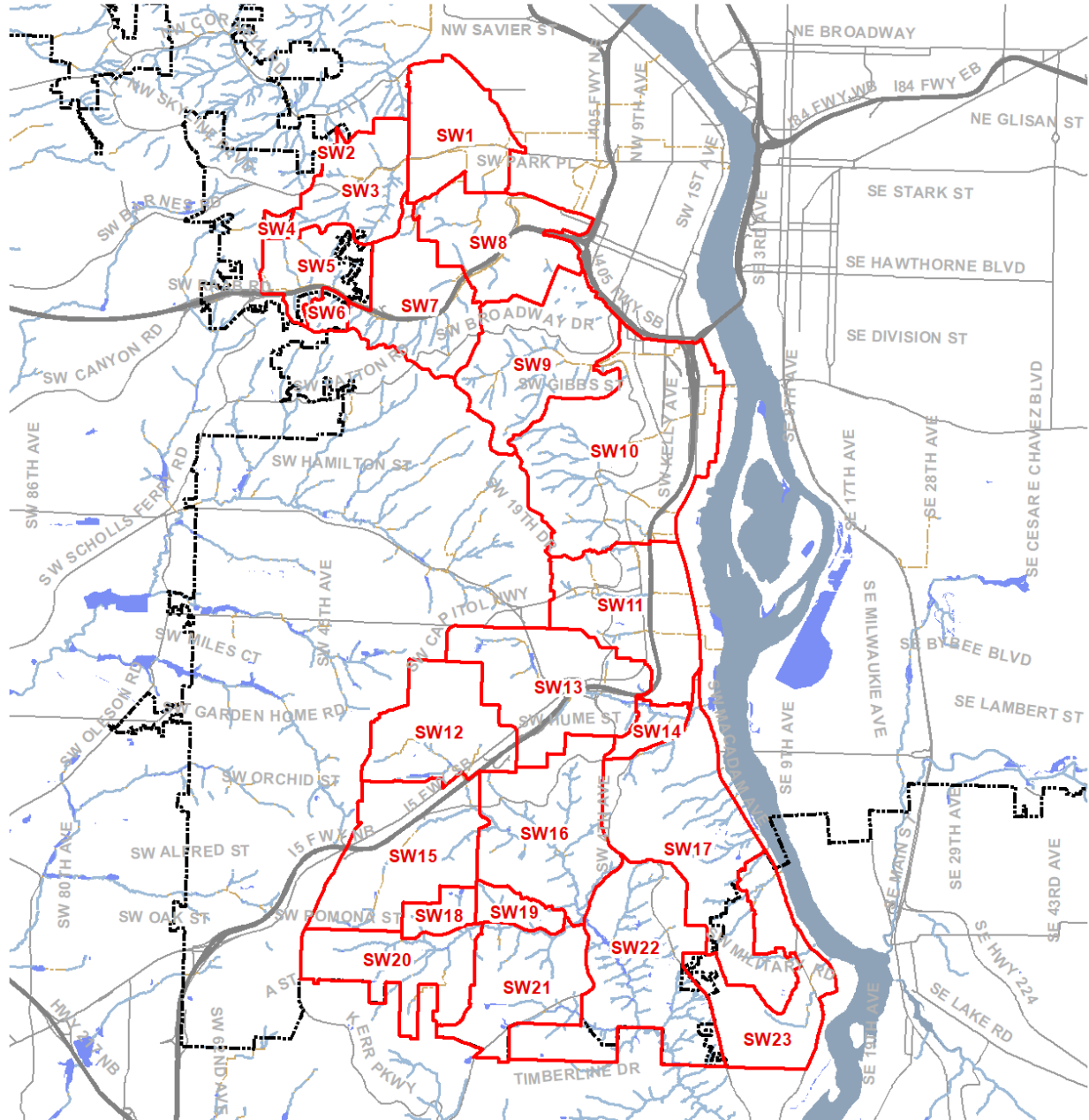
Natural resources found within urban boundaries are vulnerable to negative impacts from unmanaged or inadequately managed stormwater. Pavement, roofing, and other impervious surfaces prevent infiltration of stormwater into the ground and increase the amount of runoff during storm events. This can disrupt the natural hydrologic cycle and increase pollution levels of stormwater washing into rivers, streams, wetlands and groundwater resources. Significant problems can result from urbanization and inappropriately managed stormwater:

- Stormwater collects pollutants and sediment from impervious surfaces and carries those materials to streams, rivers and groundwater. Particulates and pollutants from streets,

autos, landscaping, roofs, animal waste and other sources can harm ESA-listed salmon, other native fish and aquatic species.

- Increased in-stream erosion and decreased groundwater recharge occurs due to changes in the timing, routing and amount of runoff. As a result, streambanks can be undercut, impacting stream health and potentially damaging buildings, roads and bridges. Streams become “flashy” – rising and falling very quickly – increasing flood risks during wet weather and resulting in very low stream flows in the summer.
- Landslide risks can be exacerbated by deficient or inadequate stormwater management.
- Problems with incomplete or ineffective stormwater system could be made worse with climate change due to increases in temperature and changes in precipitation patterns. This could further impact water temperatures in rivers and streams, a serious problem in Portland streams, which exceed temperature standards in the summer. More intense storm patterns can also increase the risks of erosion, landslides and flooding.
- Reduced groundwater and aquifer recharge due to impervious surfaces also negatively impacts water availability during dry periods, which are expected to increase with climate change.

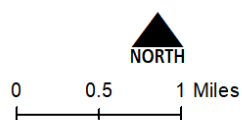
E.2. Resource Sites



**Tryon Creek and SW Hills
Resource Sites**

- Resource Sites
- open stream channel
- piped stream segment
- wetlands
- rivers
- freeways
- City of Portland

Updated: April 2020



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Map 2: Tryon Creek and Southwest Hills East Resource Sites

Resource Site No.: SW1 Site Name: Hillside Park

Previous Plan: Southwest hills Resource Protection

Previous Resource Site No.: 110

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

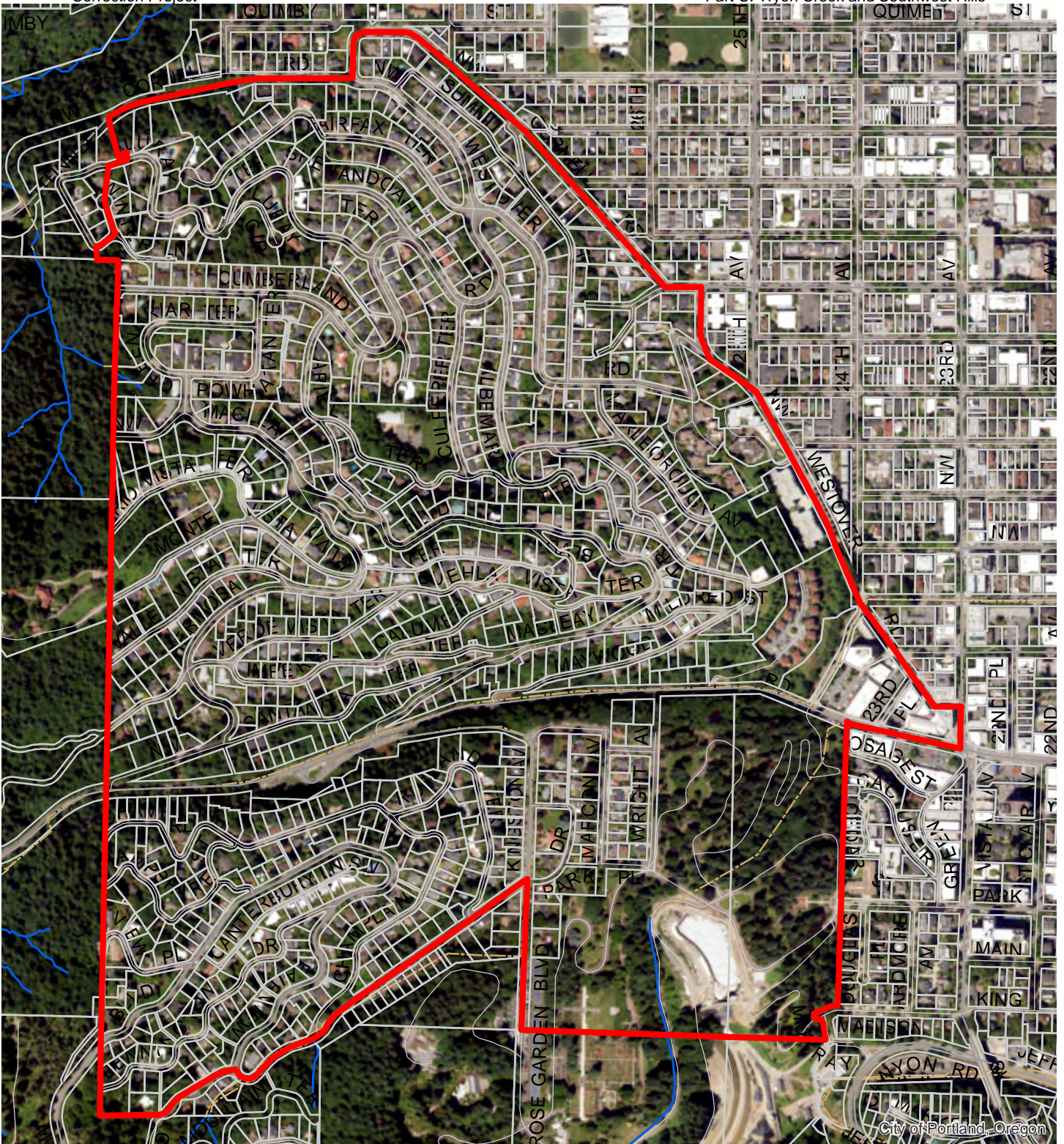
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW1 includes the following:

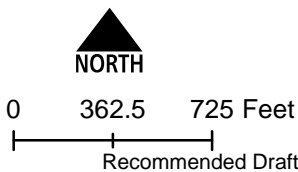
Site (acres)	359.2
Base zones (acres)	
CM2	0.0
CX	6.2
OS	54.6
R7	281.5
RM2	16.9



Map A: Water Features

Resource Site: SW1

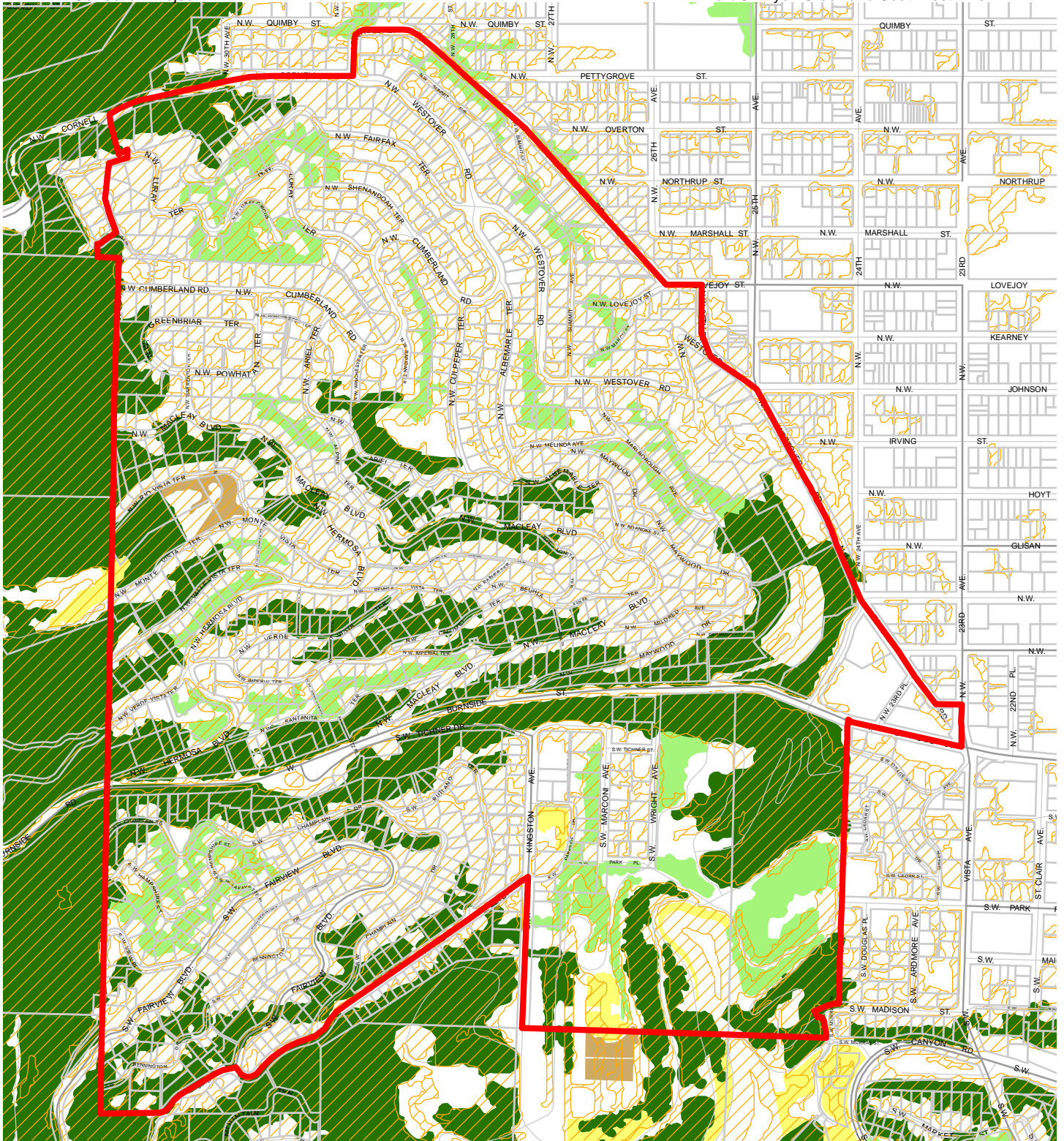
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



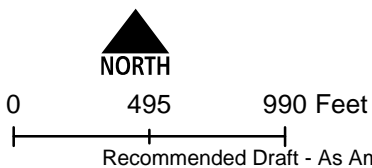
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Map B: Vegetation and Steep Slopes

Resource Site: SW1

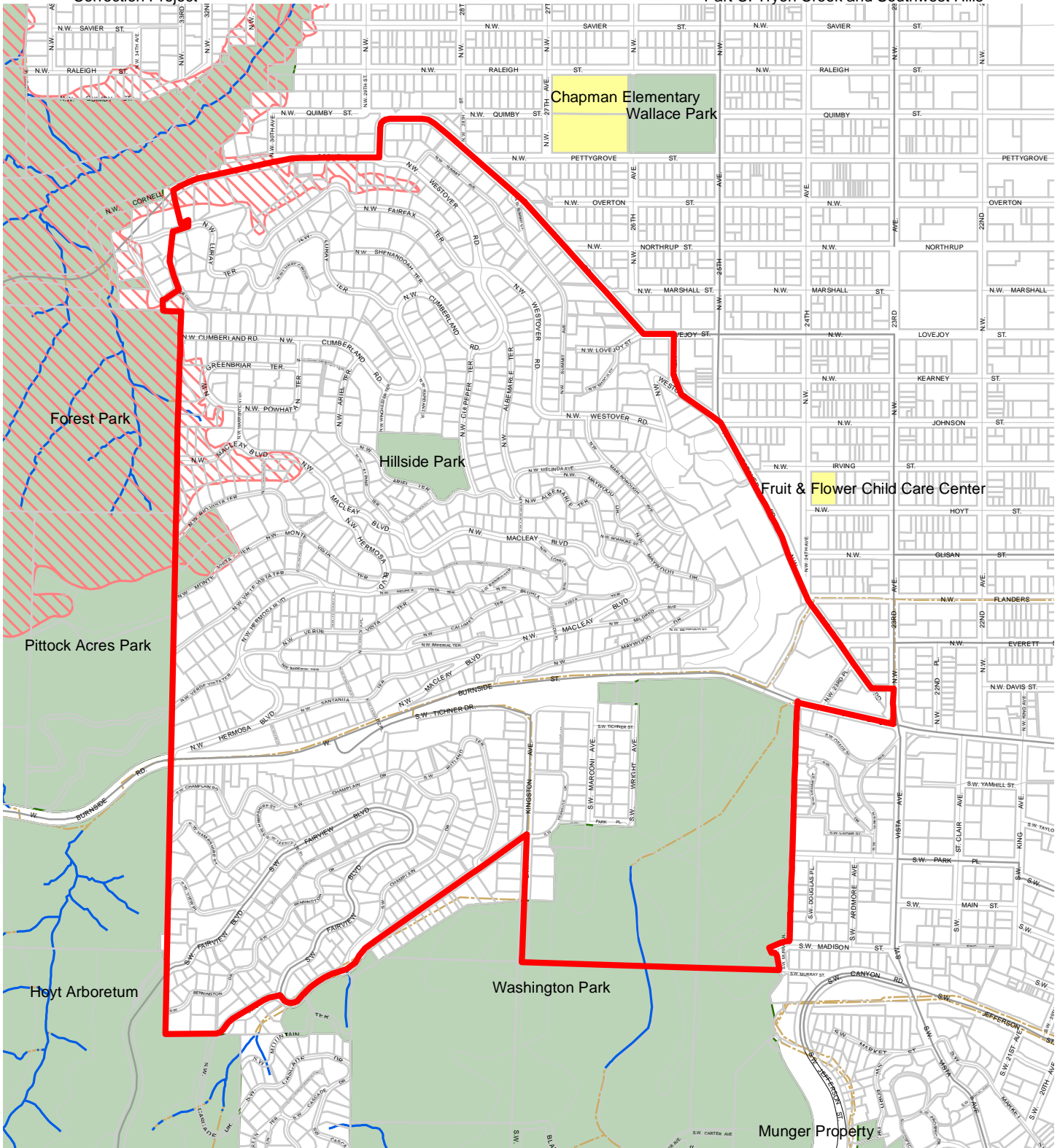
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous



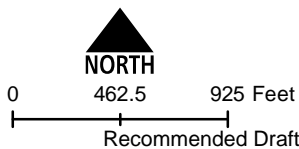
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022



**Map C: Special
Habitat Areas**

**Resource Site:
SW1**

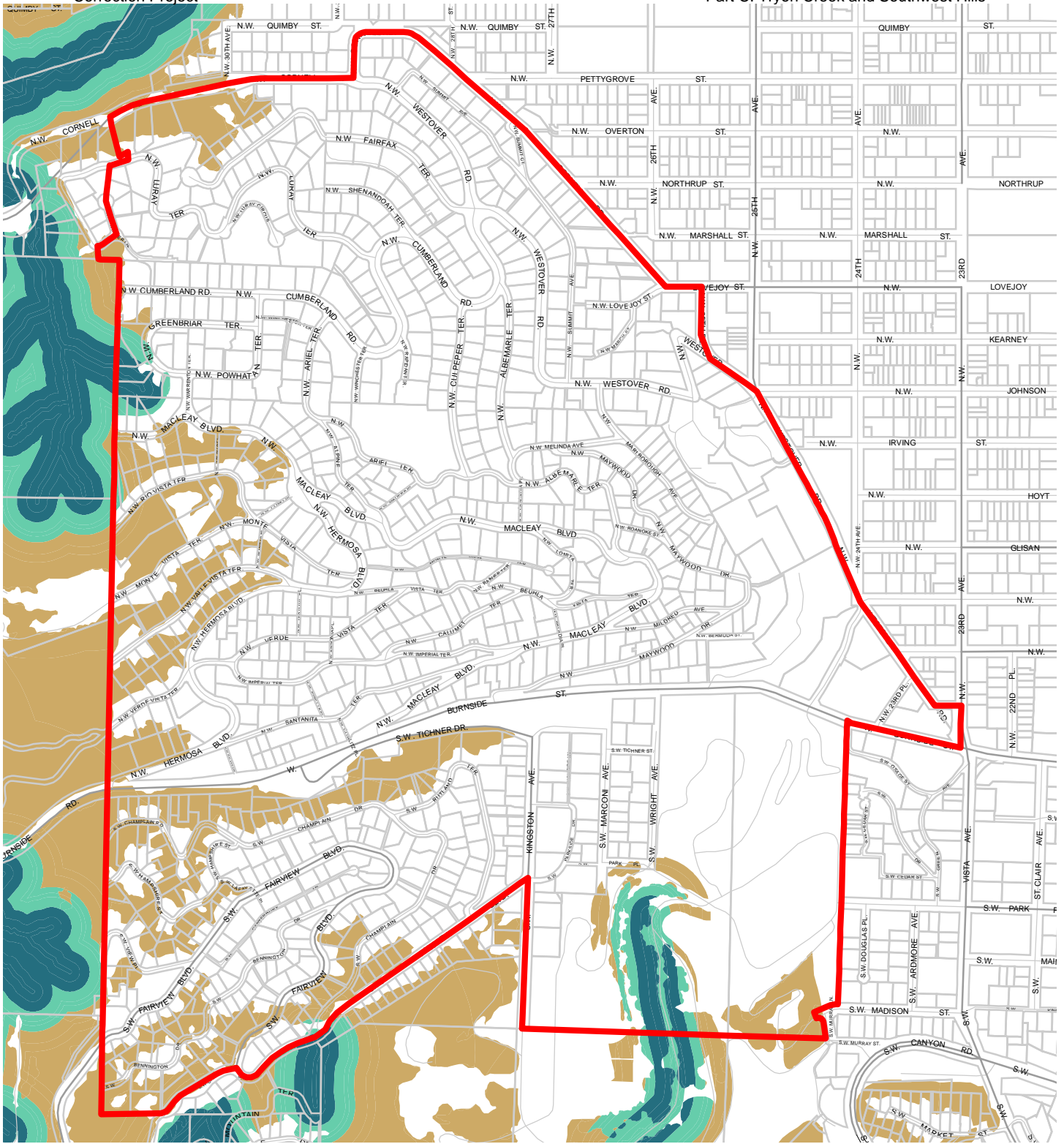
Updated: May 2022



- Resource Sites
- Special Habitat Areas (SHAs)
- Open Stream Channel
- Piped Stream Segment
- Parks
- Schools
- Urban Service Boundary
- Taxlots



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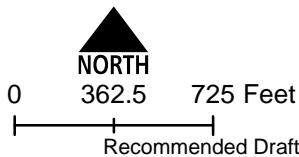


**Map D: Riparian
Corridors Habitat
Classification**

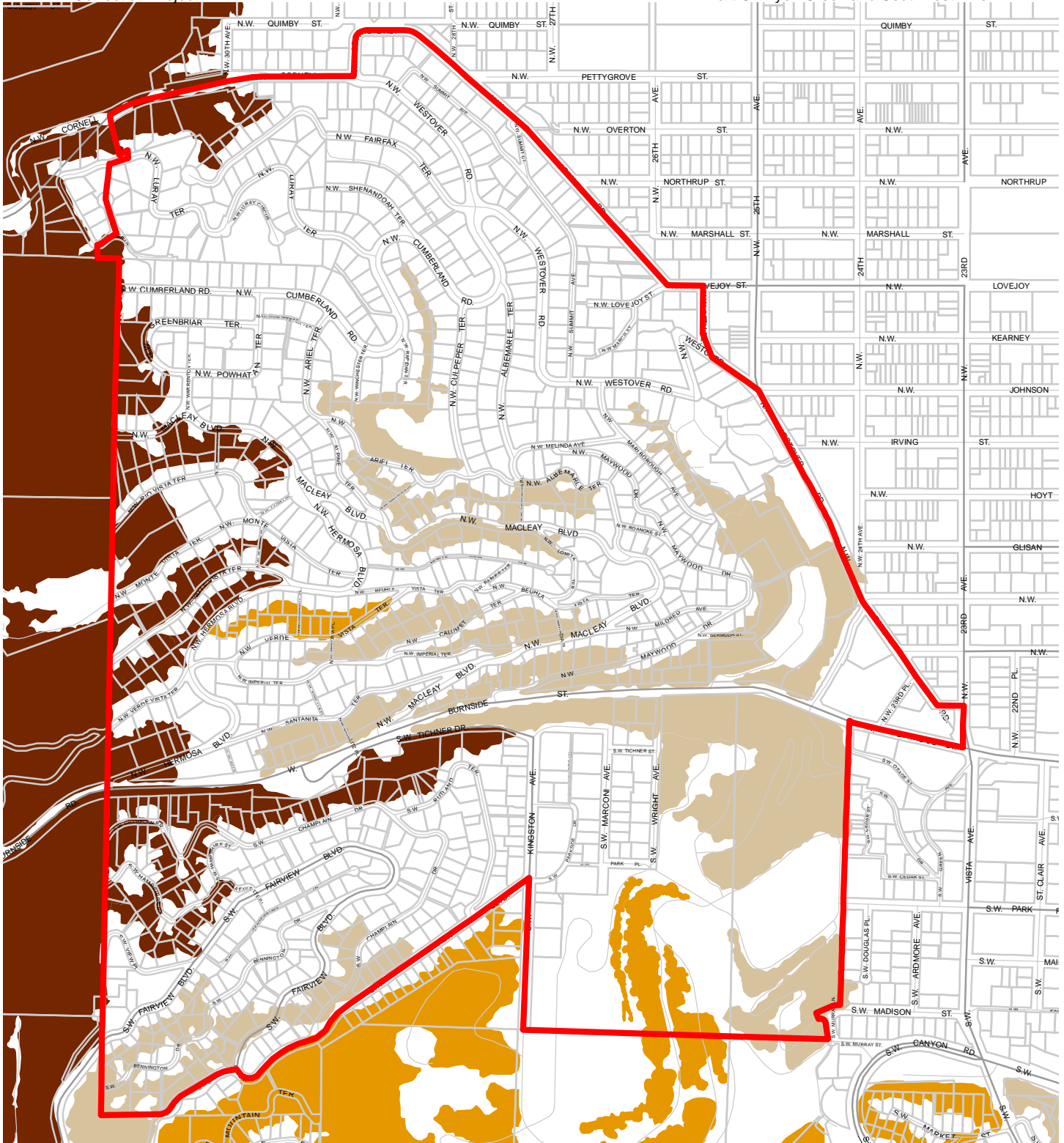
**Resource Site:
SW1**

Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots



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May 2022



**Map E: Wildlife
Habitat Classification**
Resource Site:
SW1

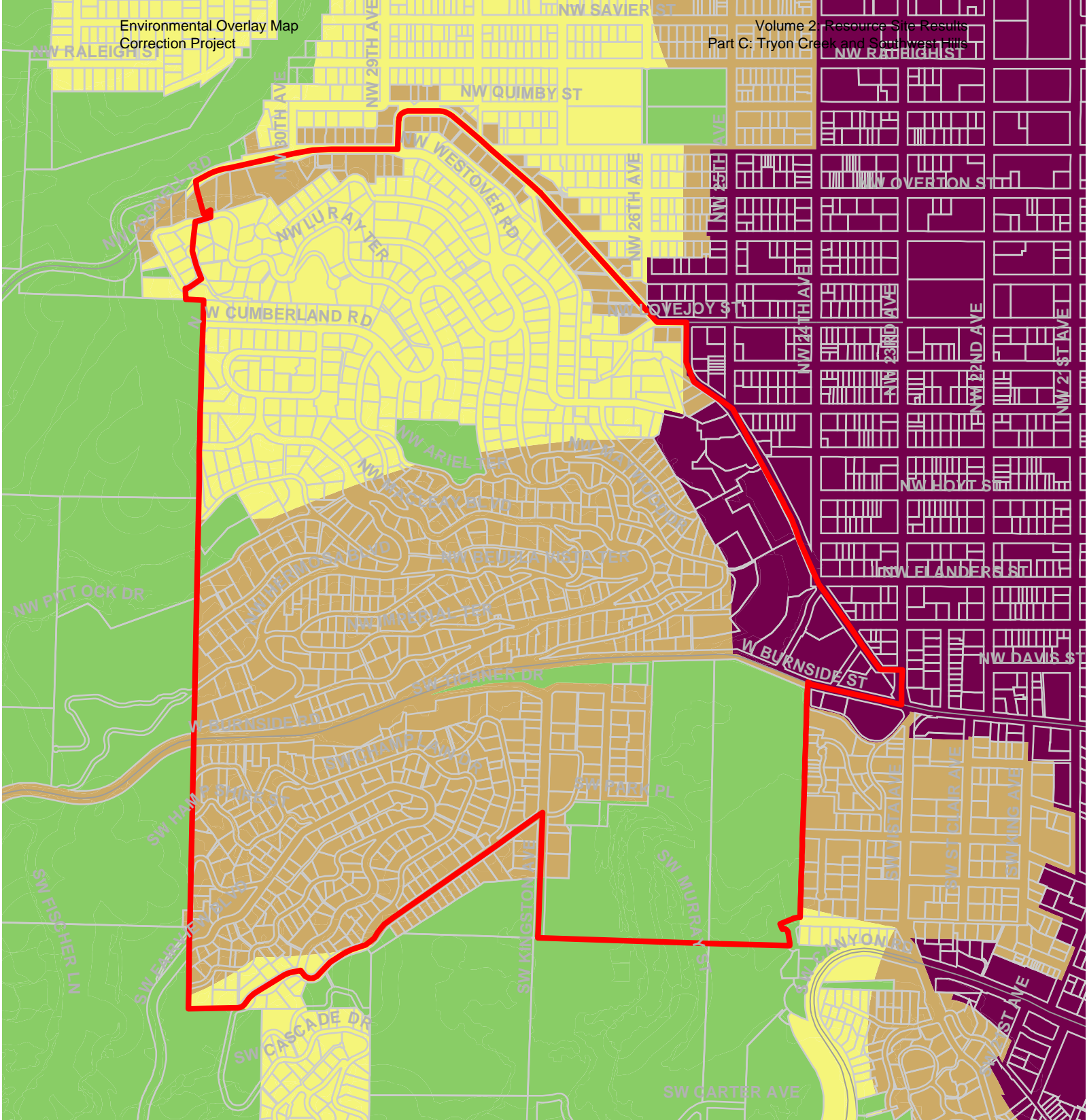
Updated: May 2022



- Resource Sites
- Class A (high rank)
- Class B (medium rank)
- Class C (low rank)
- Urban Service Boundary
- Taxlots



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May 2022

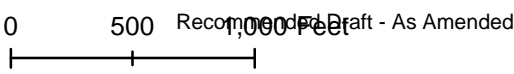


Map F: Urban Development Value (Title 13)
Resource Site: SW1

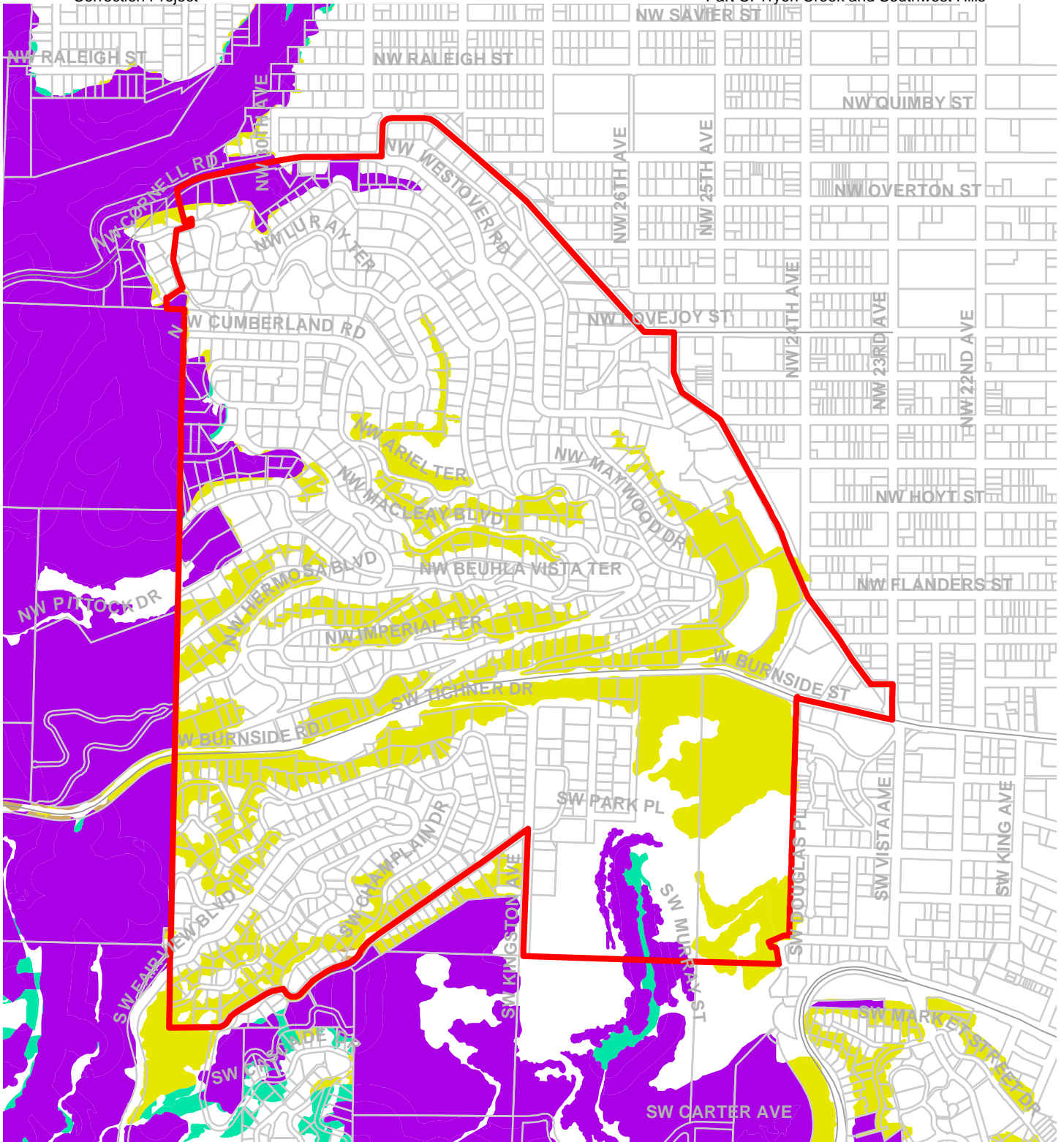
-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks



Updated: July 2021



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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW1

Updated: May 2022

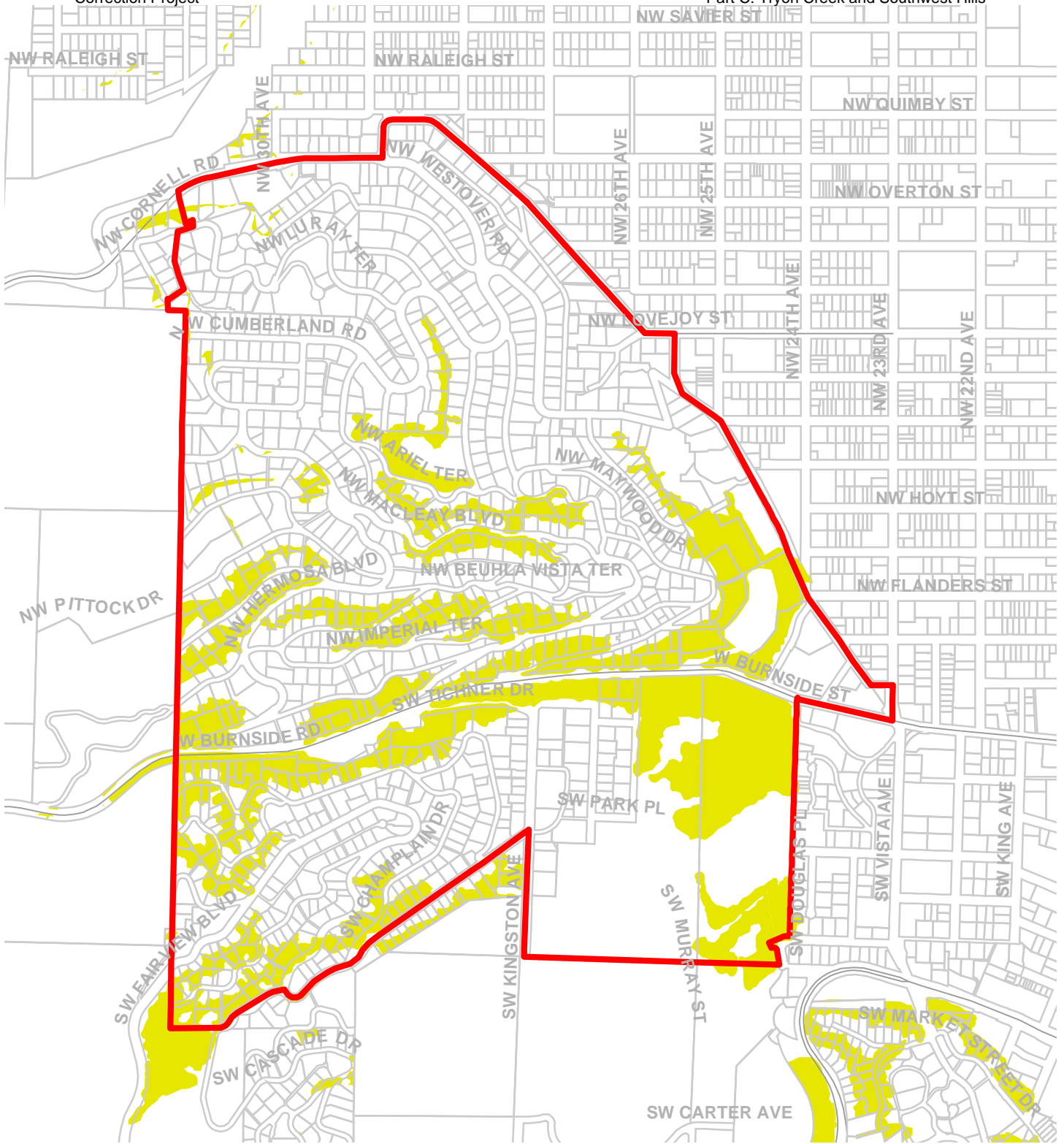


Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- HCA High Value
- HCA Moderate Value
- HCA Low Value
- Goal 5 Significant Natural Resources



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Map H: Goal 5 Resources

Resource Site: SW1

Updated: May 2022

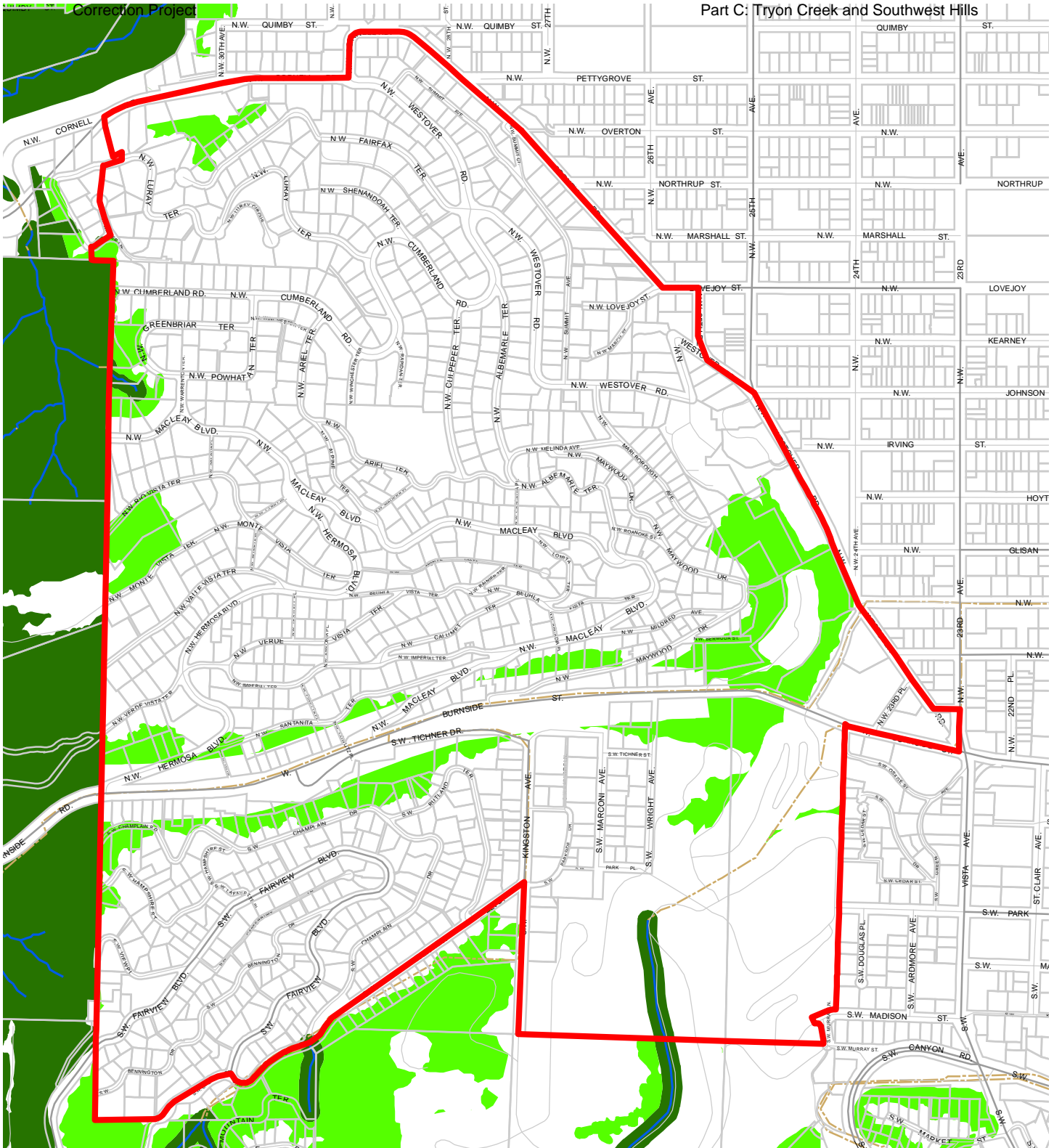


Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



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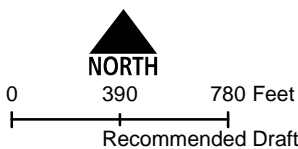


Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site: SW1

Updated: May 2022

- Resource Sites
- Open Stream Channel
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone
- Urban Service Boundary
- Taxlots



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Natural Resource Description

Within resource site SW1 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: Black Creek Watershed (O, B, M, C, E)

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW1	
	Study Area
Stream (Miles)	0.1
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	96.8
Woodland (acres)	35.3
Shrubland (acres)	1.2
Herbaceous (acres)	2.4
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	268.2
* 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 areas with a slope greater than 25%.	

The site is almost fully urbanized in the form of Kings Heights, Arlington Heights, and other residential neighborhoods. The homes are typically on steep, terraced lots that are 7,000 square feet or less in size. The neighborhoods are generally landscaped with non-native plants except for the areas which border Hoyt Arboretum and Washington Park. These areas tend to have a more natural character and greater amount of native vegetation including Douglas fir, bigleaf maple, and cottonwood along the drainageways.

About 85 percent of the site is classified as having "severe landslide potential" with the remaining 15 percent in the "moderate" potential classification. In 1987, about 25 percent of the residentially designated areas were undeveloped. Ninety percent of the remaining vacant areas designated for residential development is classified as having "severe landslide potential." The physical constraints include steep slopes and unstable geologic conditions.

The forest representative of the site has a tree zone with 80 percent closed canopy consisting of bigleaf maples that are typically 12 inches in diameter at breast height (dbh). The Douglas firs are 16-inches dbh on average. There are also mid-aged, climax forest species including western red cedar and grand fir. The shrub layer with 30 percent canopy closure consists of Oregon grape, oceanspray, thimbleberry, elderberry, red huckleberry, Indian plum and western hazel. English holly, English ivy and Himalayan blackberry are invasive, non-native species that inhibit forest health. This site area includes an abundance of fallen wood, an important resource that provides escape and nesting places plus habitat for insect populations that serve as a food source for other insects, birds and mammals (only because insects and birds are animals too).

A 93-year old forest is located in the western portion of the site near the east border of Hoyt Arboretum. The forest was last cut in 1898. The second growth is in its later seral mid-aged conifer stage. It has good to excellent habitat quality, is relatively undisturbed, and is composed of a 50/50 mix of deciduous and evergreen trees including Douglas fir, western red cedar, bigleaf maple and vine maple. The less common pacific yew tree is also present. The tree and herbaceous layers are well defined with 70 to 90 percent canopy closure. The shrub layer is also well defined with about a 40 percent closure. This area has an abundance of dead wood (e.g., downed trees) which enhances its habitat value. The area also contains a cave believed to have been used by Native Americans.

Wildlife movement is constrained by Burnside Street's four traffic lanes and adjacent steep canyon walls. Passage can best occur in the western portion of the site particularly over the tunnel. In addition, wildlife may be using the Barber Walker footbridge along the Wildwood Trail that was completed in 2020. Burnside Street's dramatic, wooded hillsides form a view corridor that contributes to the visual quality of the area and helps maintain slope stability.

Special status bird species found within the resource site include: bald eagle, band-tailed pigeon, brown creeper, bushtit, downy woodpecker, Pacific wren, pileated woodpecker, purple finch, varied thrush, and white-breasted nuthatch.

Table B: Quality of Natural Resource Functions in Resource Site SW1				
Resource Site (acres) = 359				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	3.2	3.5	43.6	50.4
percent total inventory site area	0.9%	1.0%	12.1%	14.0%
Wildlife Habitat*				
acres	32.7	6.4	61.8	101.0
percent total inventory site area	9.1%	1.8%	17.2%	28.1%
Special Habitat Areas**				
acres	13.2			
percent total inventory site area	3.7%			
Combined Total⁺				
acres	34.9	5.1	65.1	105.1
percent total inventory site area	9.7%	1.4%	18.1%	29.3%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water. ** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors. +Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called "effective impervious area." The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to

streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For Resource Area SW1, 28.1% of the total area is effectively impervious, indicating significant negative impacts are occurring due to the level of unmanaged impervious area and any additional impacts will cause further degradation.

Table C. Impervious Area within Resource Site SW1			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
359.2	106.3	100.9	28.1%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW1. Natural resources should be protected within HCA as follows:

1. *Strictly limit* or *limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit* or *limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit* or *limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.

5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or *limiting* conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting* or *limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW1 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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 R7 and R1 base zones. Commercial uses are allowed in the CX 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW1, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW1, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or 25 feet of wetlands.
2. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands and within areas of forest vegetation that are contiguous to W Burnside Road.
3. Apply a conservation overlay zone ('c' zone) to the Balch Creek Watershed Special Habitat Area.
4. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW2 Resource Site Name: Sylvan D

Previous Plan: Multnomah County Urban Lands

Previous Resource Site No.: 111

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

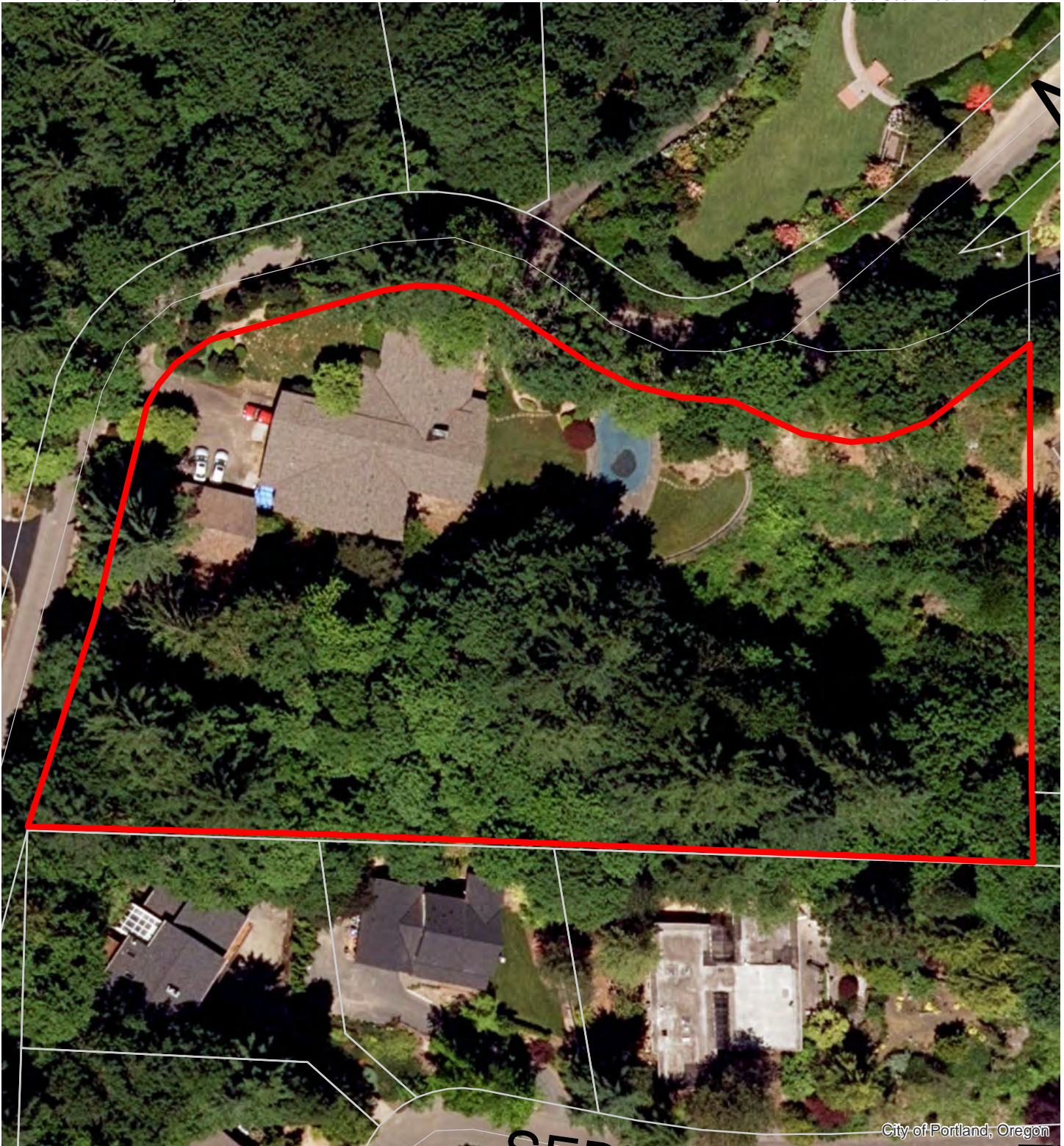
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

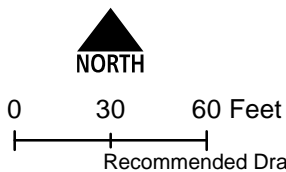
Resource site SW2 includes the following:

Site (acres)	1.9
Base zones (acres)	
R10	1.9



Map A: Water Features
Resource Site: SW2

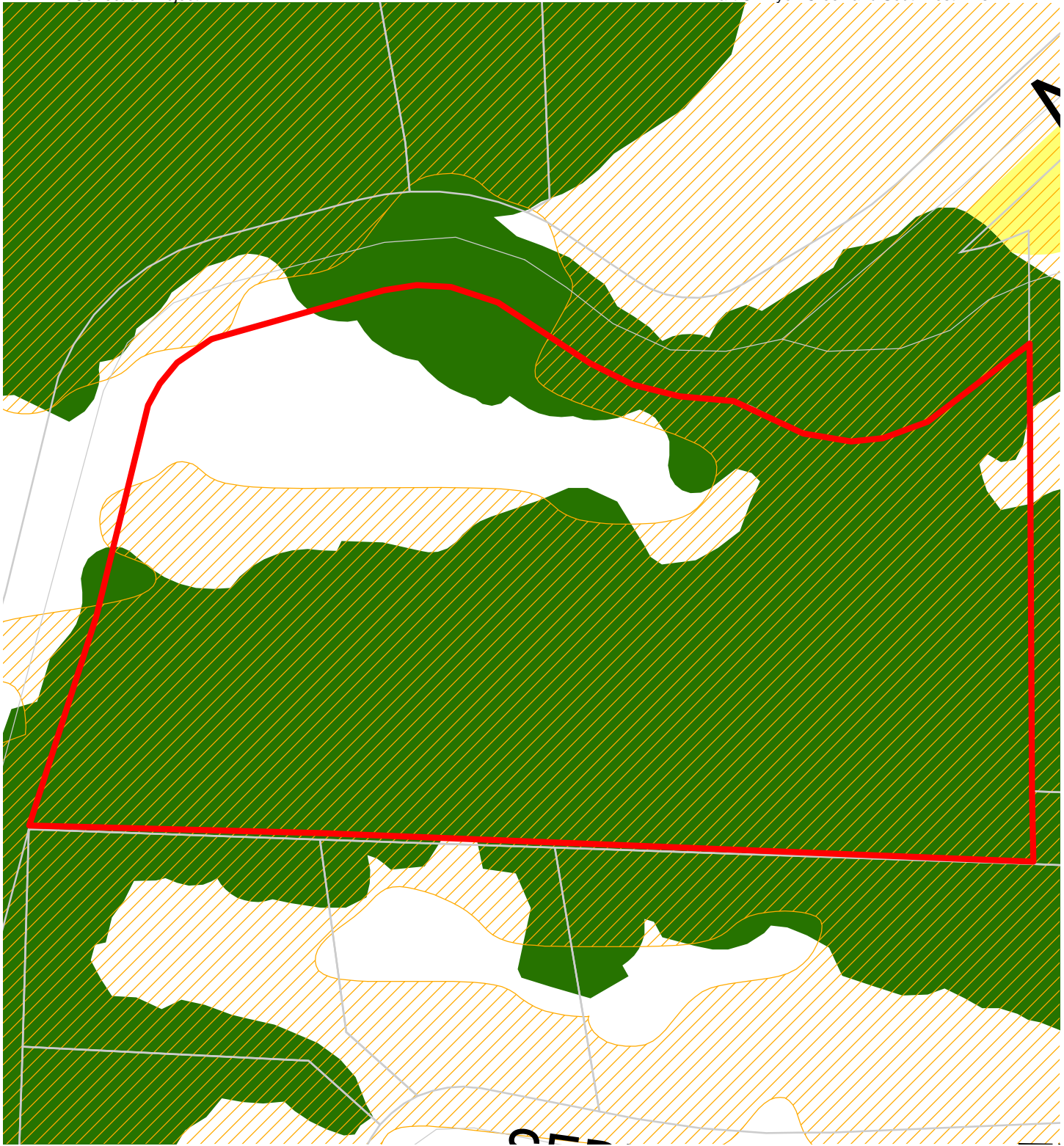
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



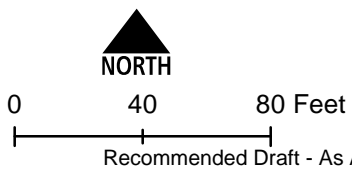
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.
May 2022










Map B: Vegetation and Steep Slopes

Resource Site: SW2

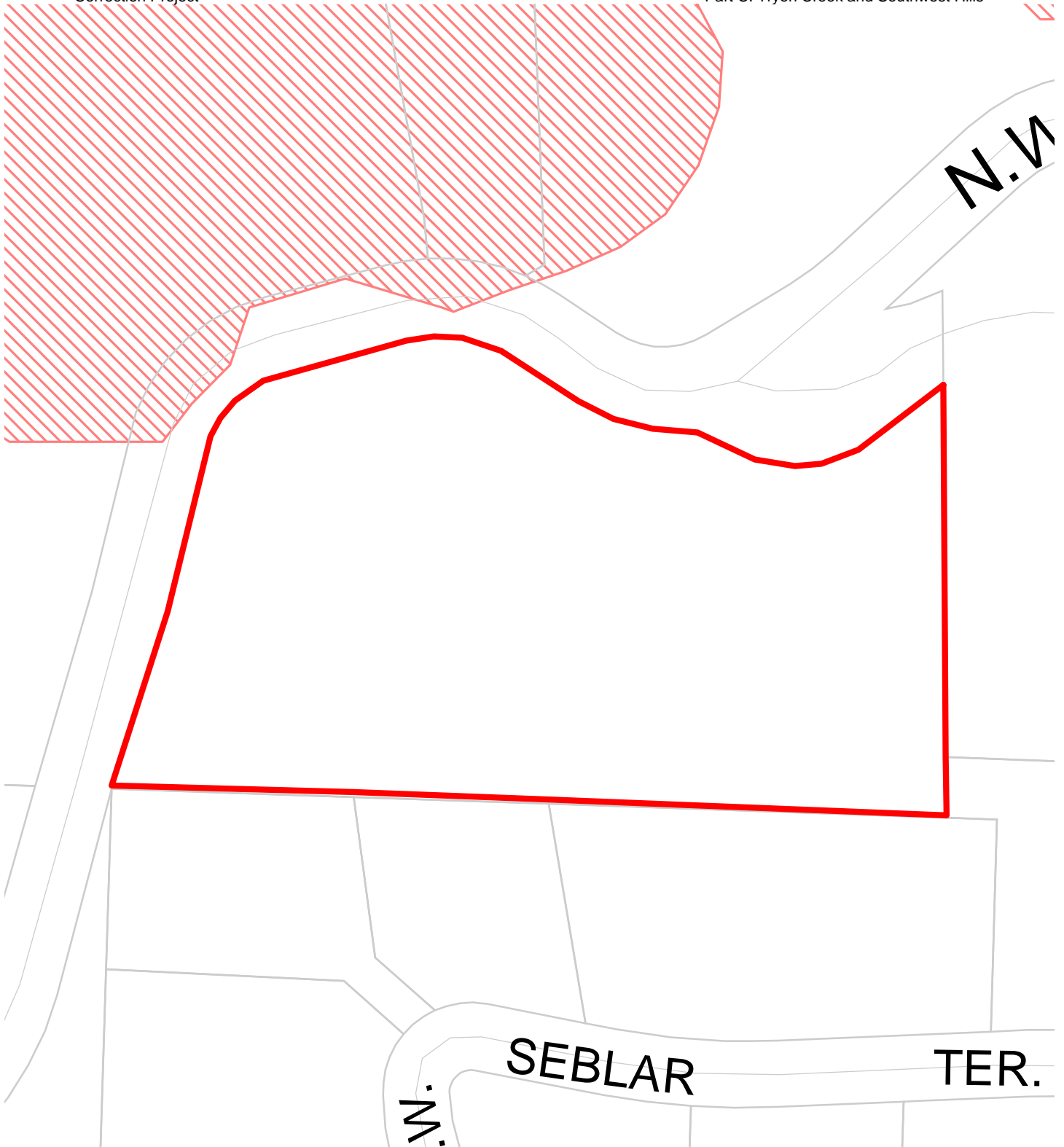
Updated: May 2022



-  Resource Sites
-  Urban Service Boundary
-  Taxlots
-  Forest
-  Woodland
-  Shrubland
-  Herbaceous



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**Map C: Special
Habitat Areas**
**Resource Site:
SW2**

Updated: May 2022

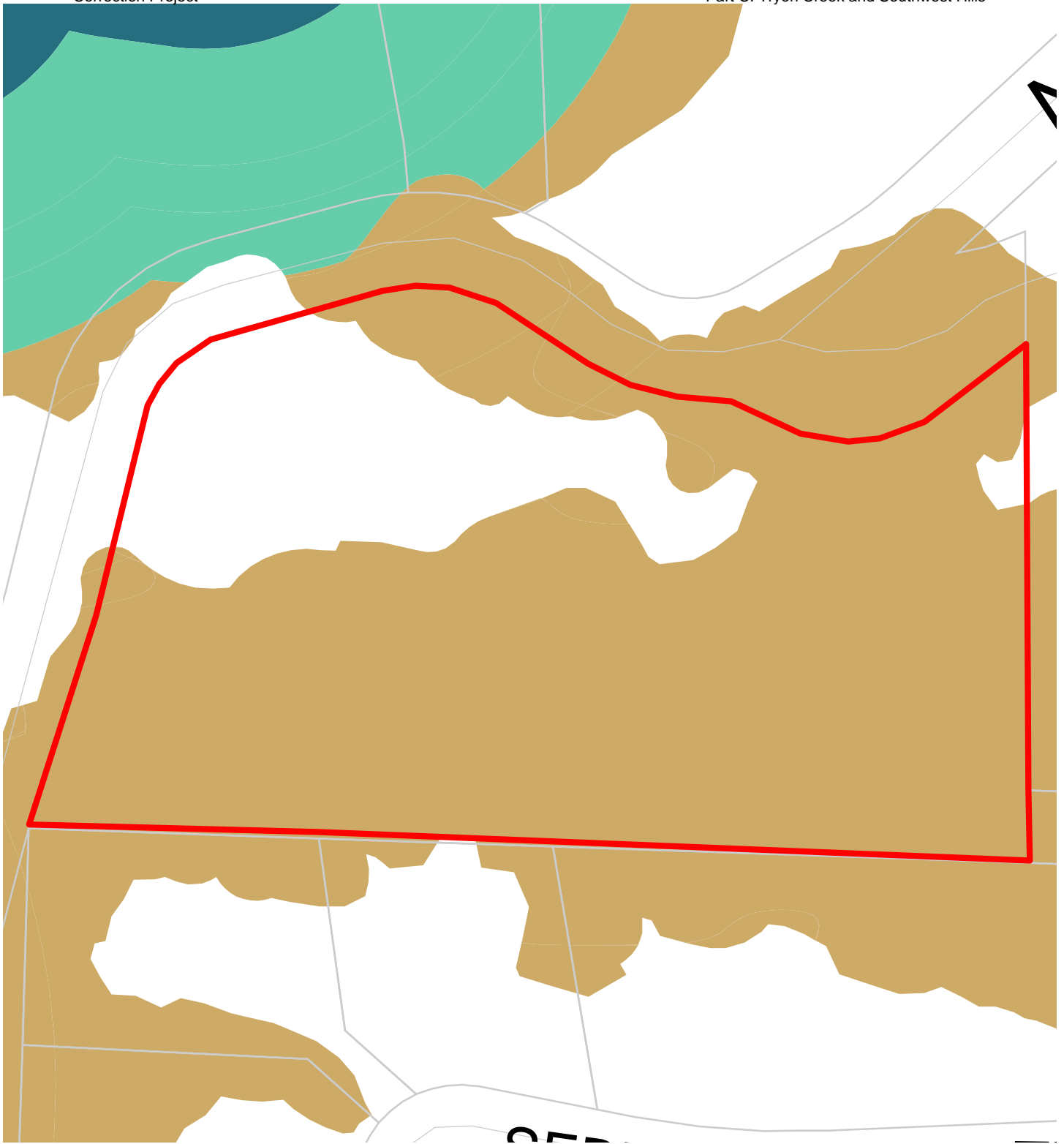


Recommended Draft - As Amended

- Resource Sites
- Special Habitat Areas (SHAs)
- Open Stream Channel
- Piped Stream Segment
- Parks
- Schools
- Urban Service Boundary
- Taxlots









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May 2022

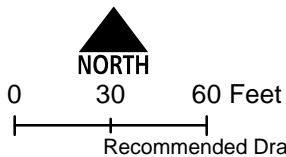


**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
SW2**

Updated: May 2022

-  Class I (high rank)
-  Class II (medium rank)
-  Class III (low rank)
-  Resource Sites
-  Urban Service Boundary
-  Taxlots



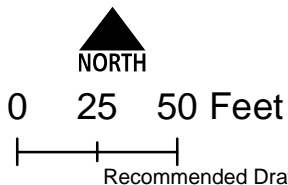
Recommended Draft - As Amended

The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.









**Map E: Wildlife
Habitat Classification**
Resource Site:
SW2

Updated: May 2022



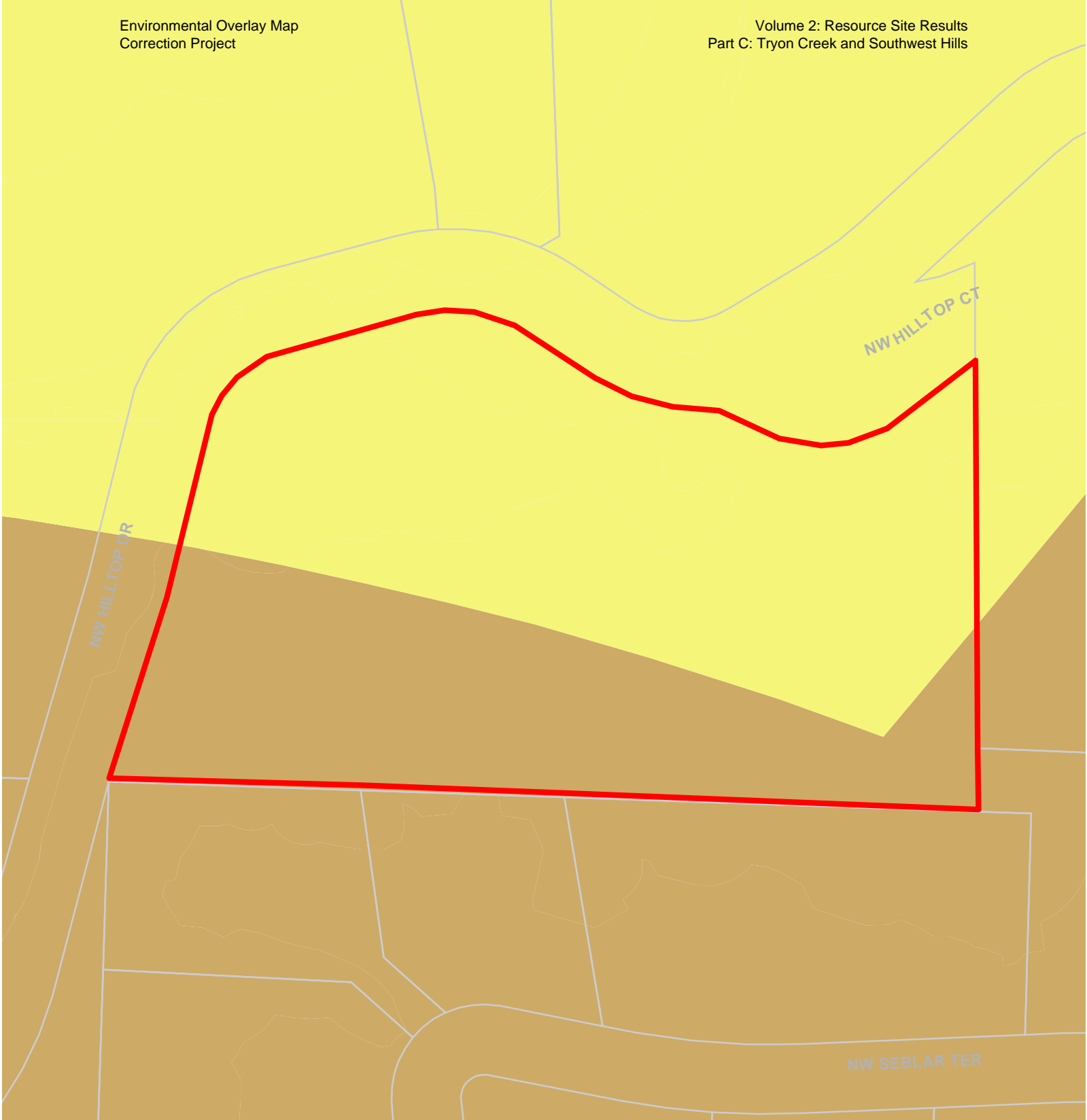
Recommended Draft - As Amended

-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.

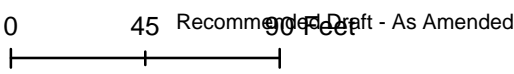
May 2022



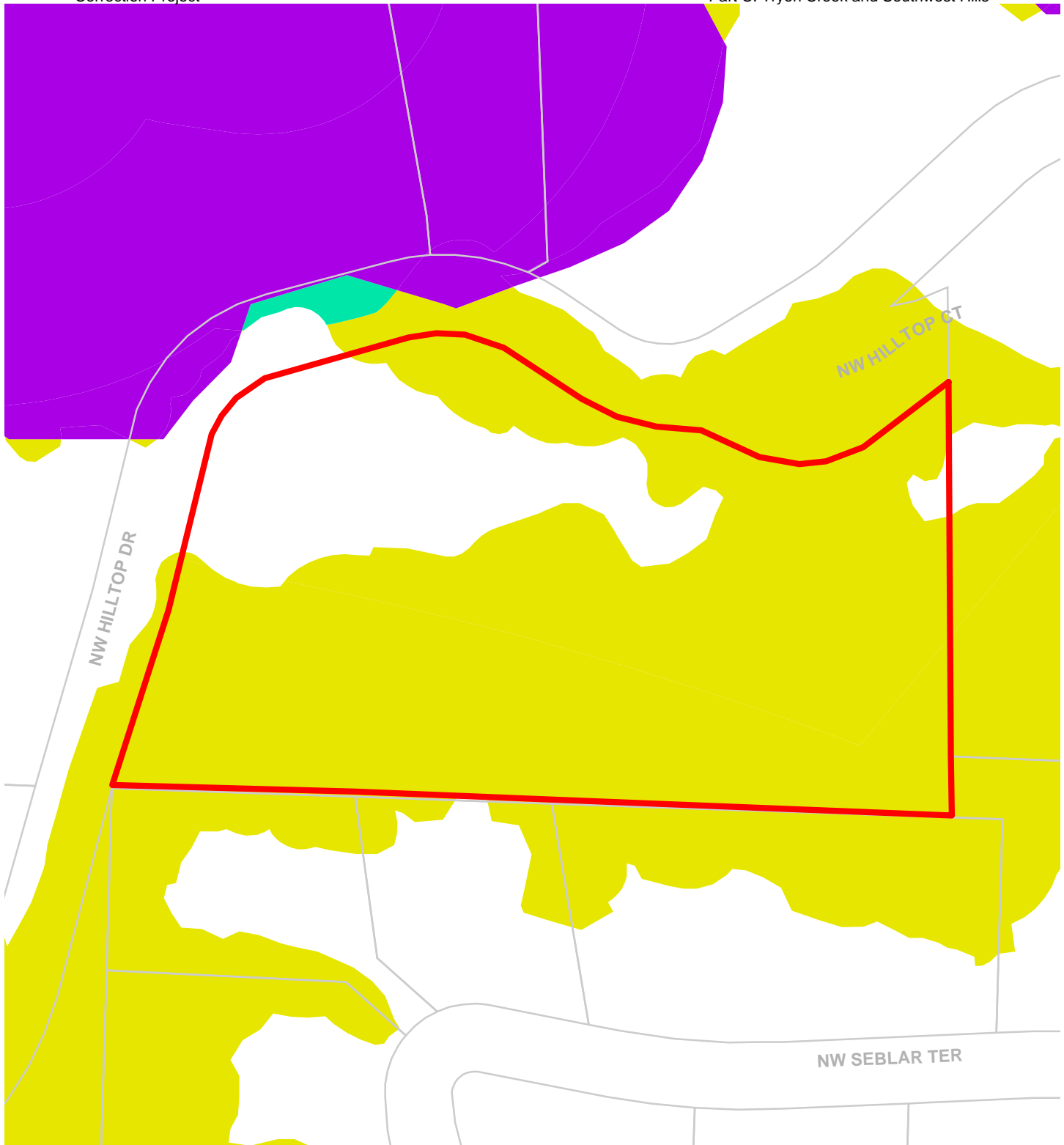
Map F: Urban Development Value (Title 13)
Resource Site: SW2

-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks

Updated: July 2021



The information on the map was derived from digital databases. 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 aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.




Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas


Resource Site: SW2

Updated: May 2022

--- Urban Service Boundary

 Resource Sites

 HCA High Value

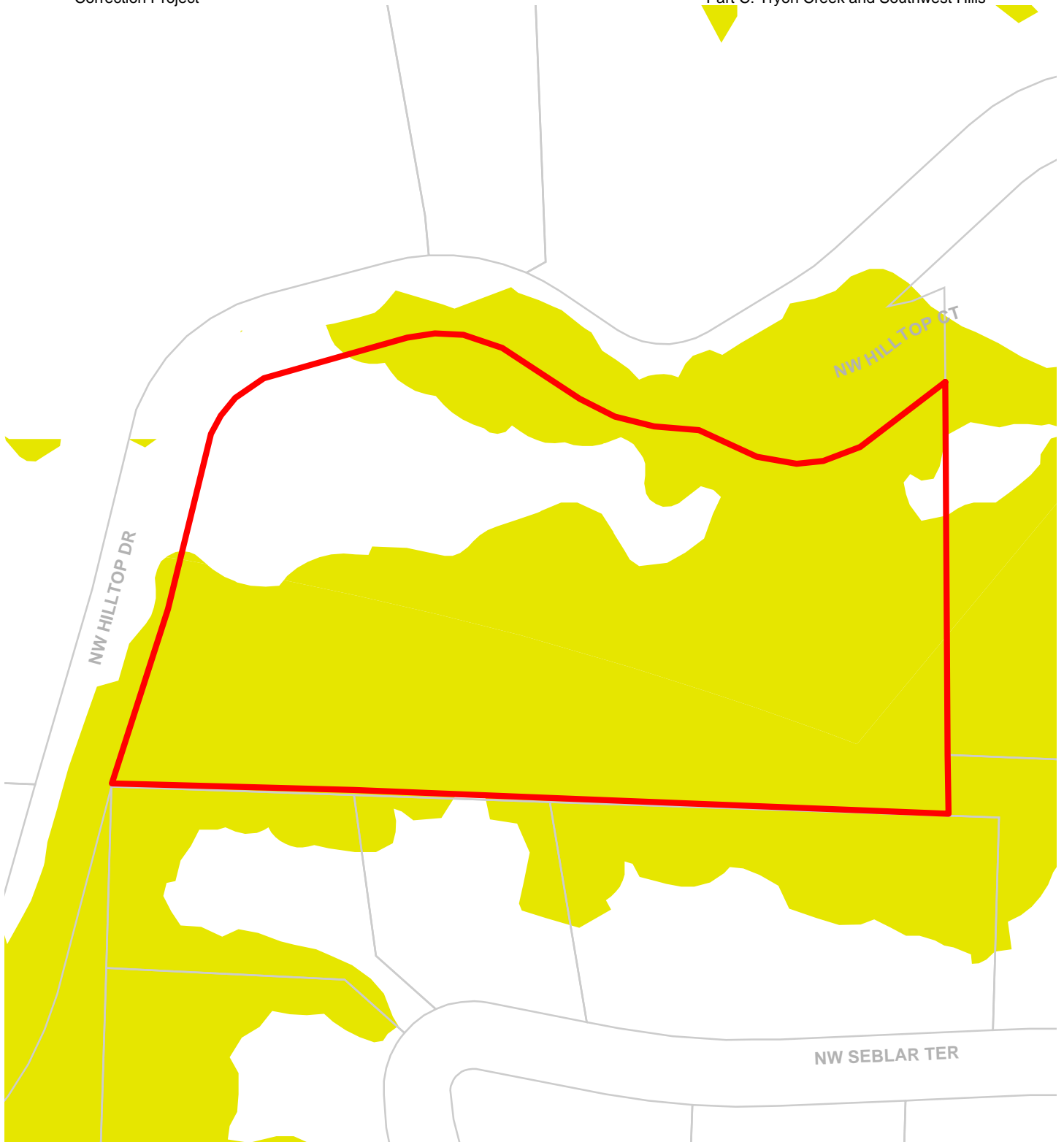
 HCA Moderate Value

 HCA Low Value

 Goal 5 Significant Natural Resources



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Map H: Goal 5 Resources

Resource Site: SW2

Updated: May 2022



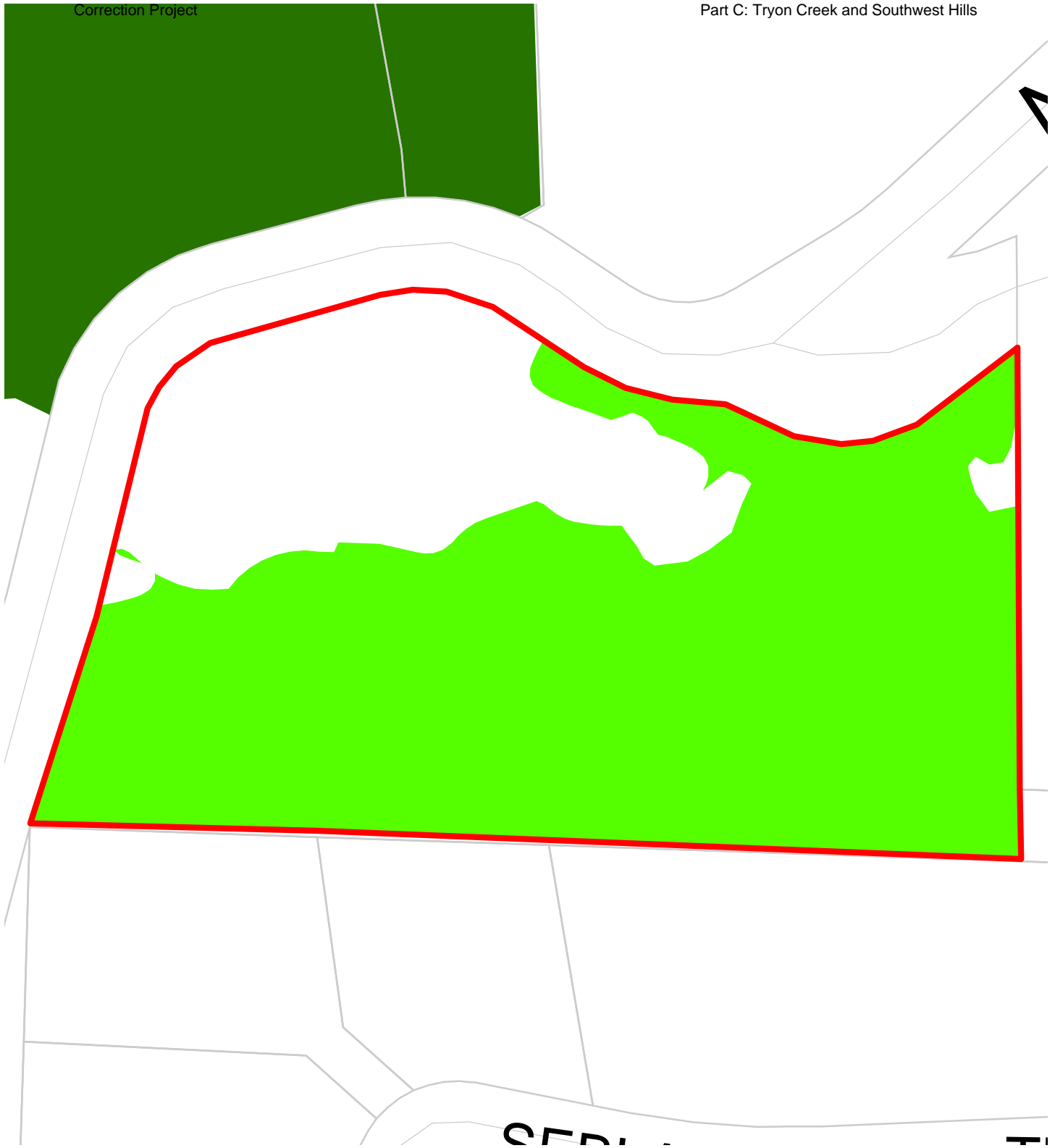
Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



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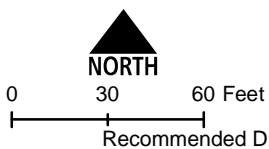
May 2022






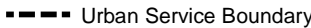



Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
SW2**

Updated: May 2022



-  Resource Sites
-  Open Stream Channel
-  Piped Stream Segment
-  Proposed Conservation Zone
-  Proposed Protection Zone
-  Urban Service Boundary
-  Taxlots



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.
May 2022

Natural Resource Description

Within resource site SW2 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: None

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: None

Riparian Corridor Functions: None

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.

Table A: Quantity of Natural Resource Features in Resource Site SW2	
	Study Area
Stream (Miles)	0.0
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	1.5
Woodland (acres)	0.0
Shrubland (acres)	0.0
Herbaceous (acres)	0.0
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	1.5
* 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 areas with a slope greater than 25%.	

Note – This resource site contains no site-specific resource description. Please refer to the section E.1 natural resource description.

Table B: Quality of Natural Resource Functions in Resource Site SW2				
Resource Site (acres) = 2				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	0.0	0.0	1.5	1.5
percent total inventory site area	0.0%	0.0%	78.0%	78.0%
Wildlife Habitat*				
acres	1.5	0.0	0.0	1.5
percent total inventory site area	78.0%	0.0%	0.0%	78.0%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total⁺				
acres	1.5	0.0	0.0	1.5
percent total inventory site area	78.0%	0.0%	0.0%	78.0%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water. ** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors. +Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called "effective impervious area." The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter

pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For resource site SW2, 8.7% of the total area is effectively impervious. This indicates a significant degree of stormwater management and/or existing natural resources that should be preserved. Areas with very low impervious cover and existing vegetation are more likely to be functioning properly to support biologic systems.

Table C. Impervious Area within Resource Site SW2			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
1.9	0.2	0.2	8.7%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW2. Natural resources should be protected within HCA as follows:

1. *Strictly limit or limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit or limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit or limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or limiting conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting or limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW2 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW2, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW2, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 25 feet of stream top-of-bank or wetlands
2. Apply a conservation overlay zone ('c' zone) to areas of forest vegetation on steep slopes.
3. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of the top-of-bank of streams or wetlands.
4. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW3 Site Name: Hoyt Arboretum

Previous Plan: Southwest hills Resource Protection Plan

Previous Resource Site No.: 110

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

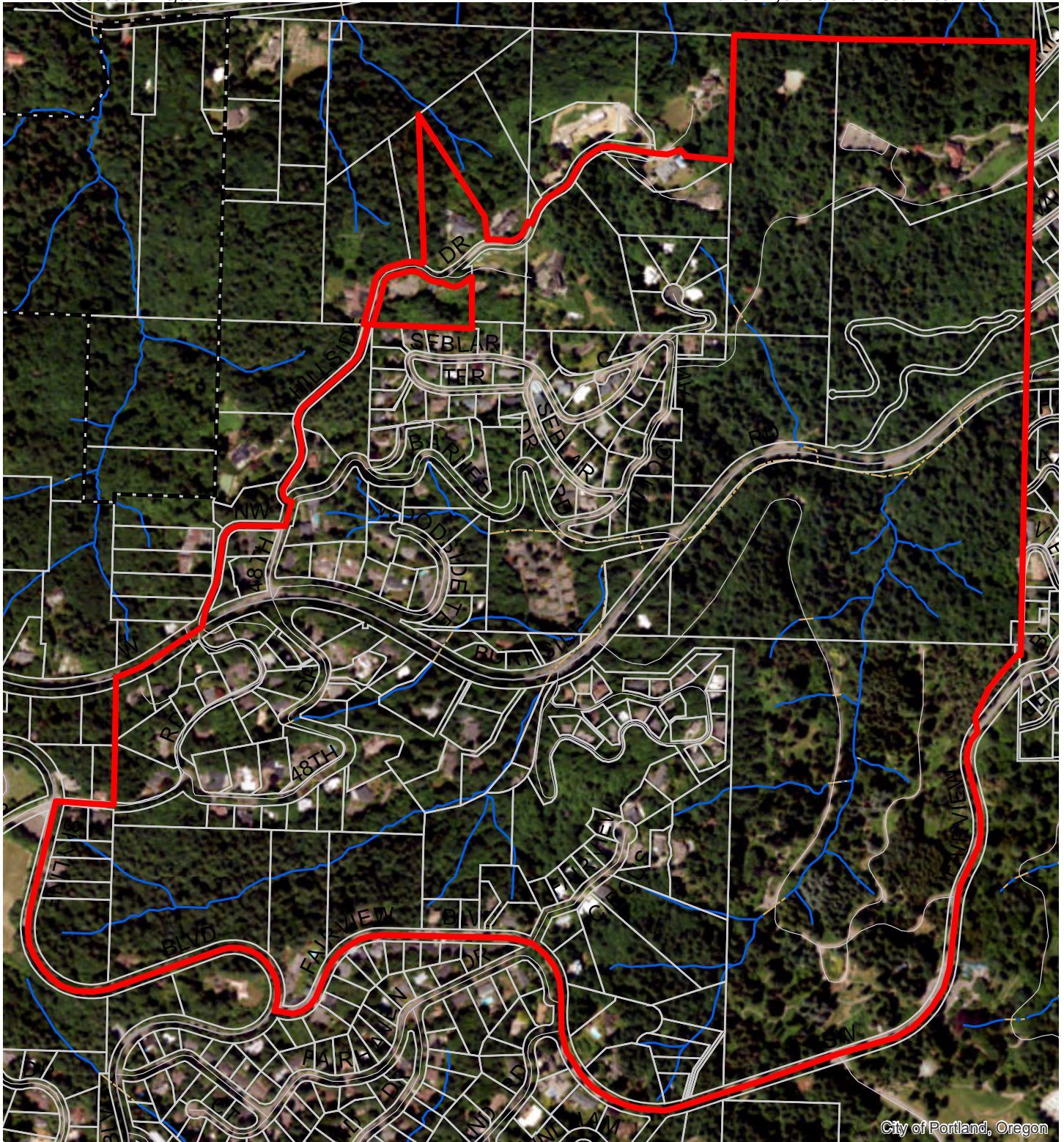
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW3 includes the following:

Site (acres)	292.4
Base zones (acres)	
OS	133.5
R10	74.6
R20	78.1
R7	6.1
RF	0.0



City of Portland, Oregon

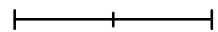
Map A: Water Features

Resource Site: SW3

Updated: May 2022



0 310 620 Feet

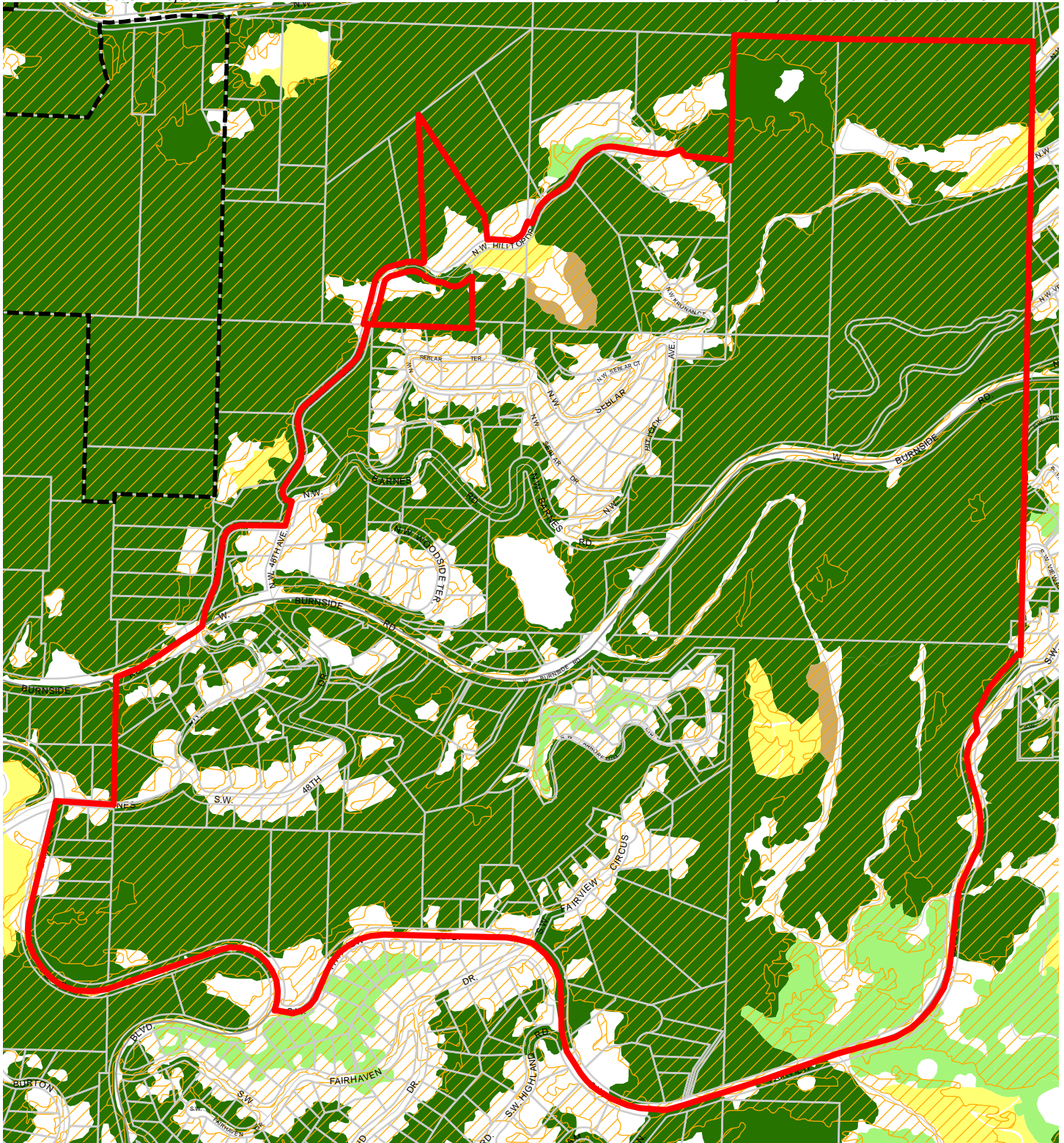


Recommended Draft - As Amended

- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



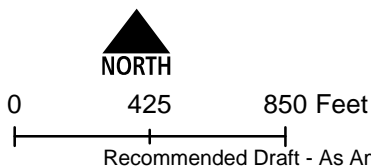
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Map B: Vegetation and Steep Slopes

Resource Site: SW3

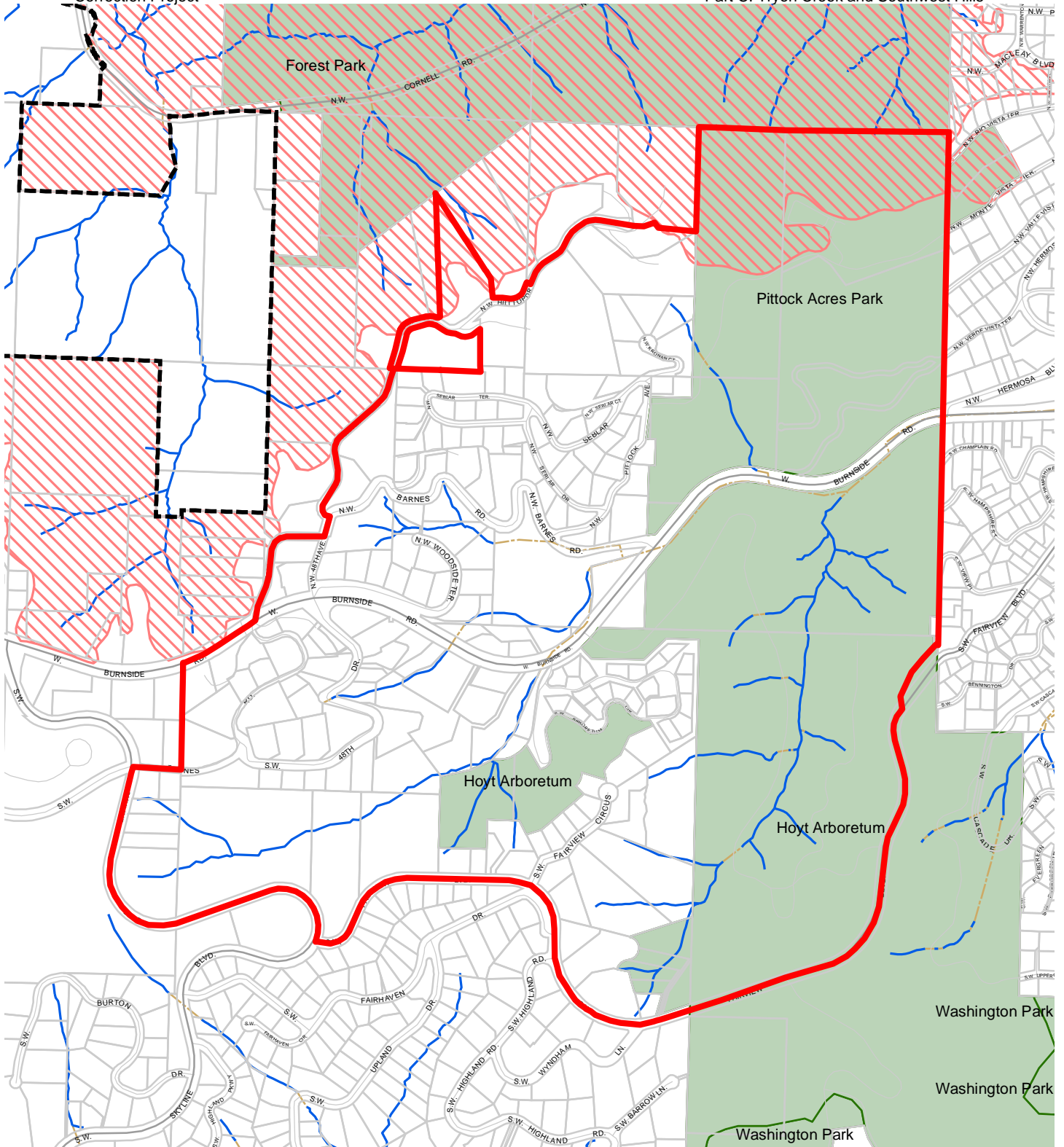
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous



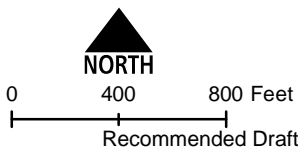
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May 2022



**Map C: Special
Habitat Areas**

**Resource Site:
SW3**

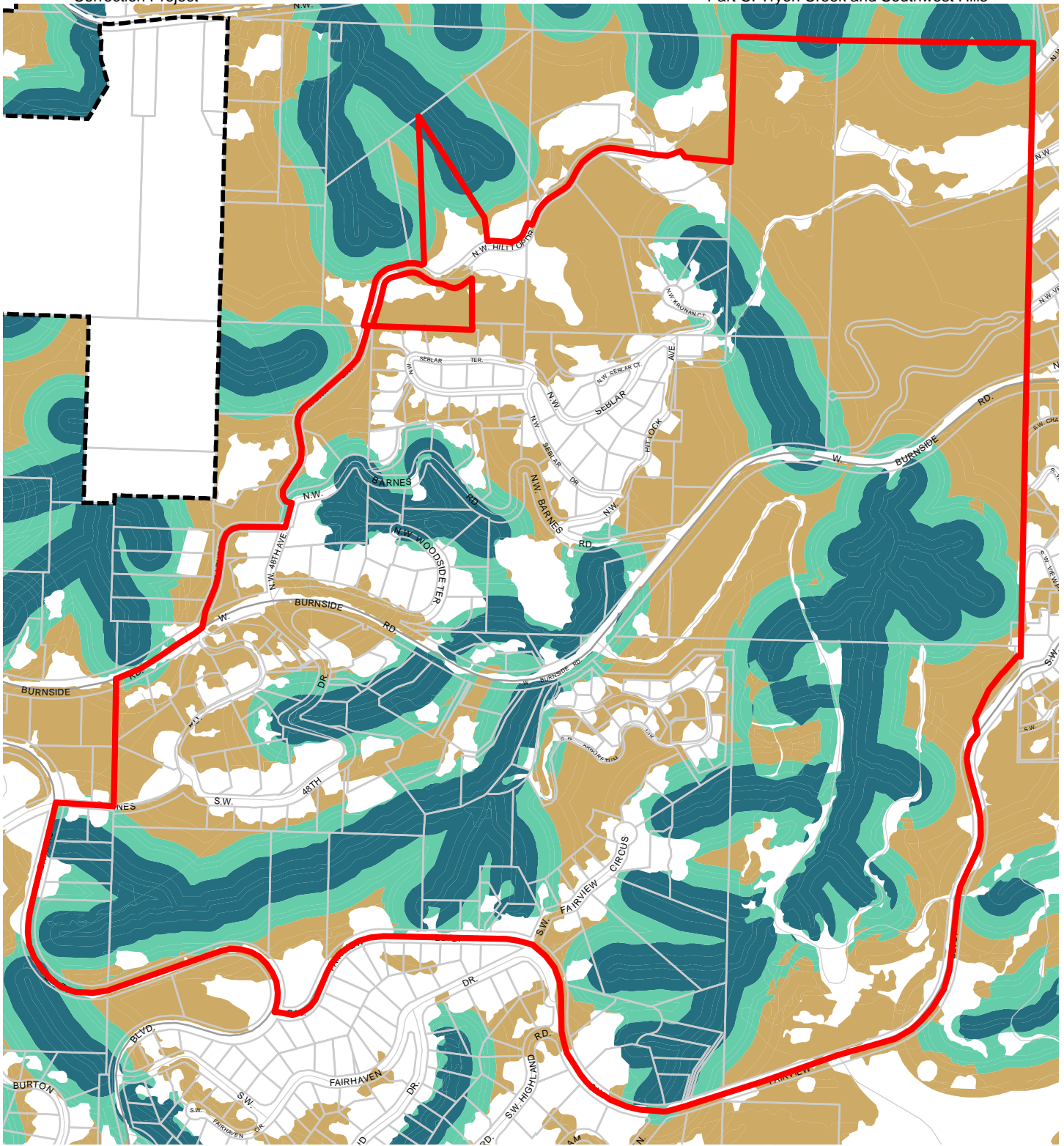
Updated: May 2022



- Resource Sites
- Special Habitat Areas (SHAs)
- Open Stream Channel
- Piped Stream Segment
- Parks
- Schools
- Urban Service Boundary
- Taxlots



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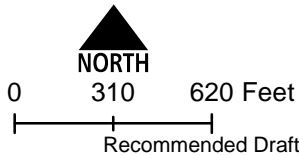


**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
SW3**

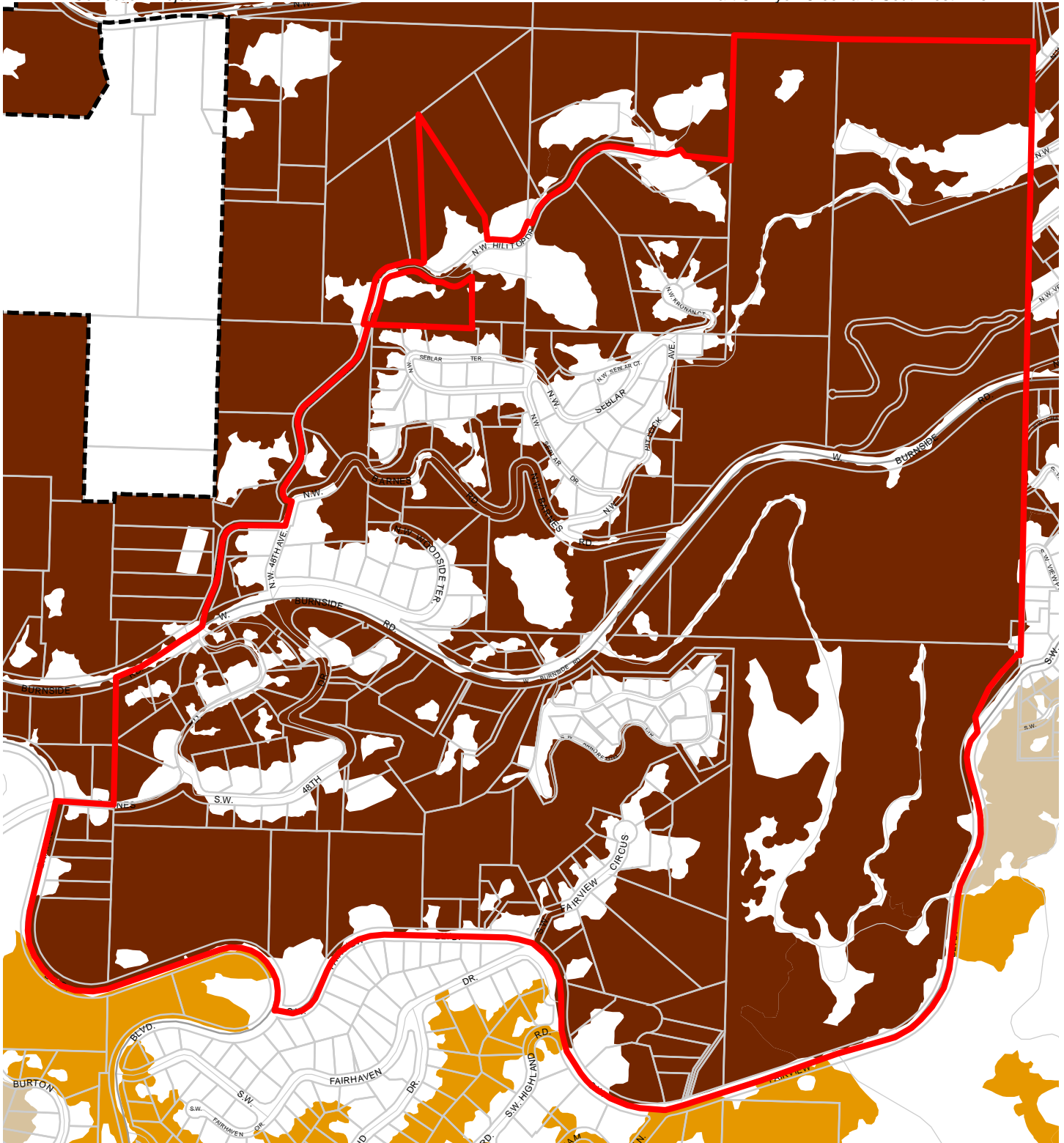
Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots



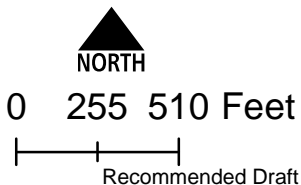
Recommended Draft - As Amended







The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.
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**Map E: Wildlife
Habitat Classification**
Resource Site:
SW3

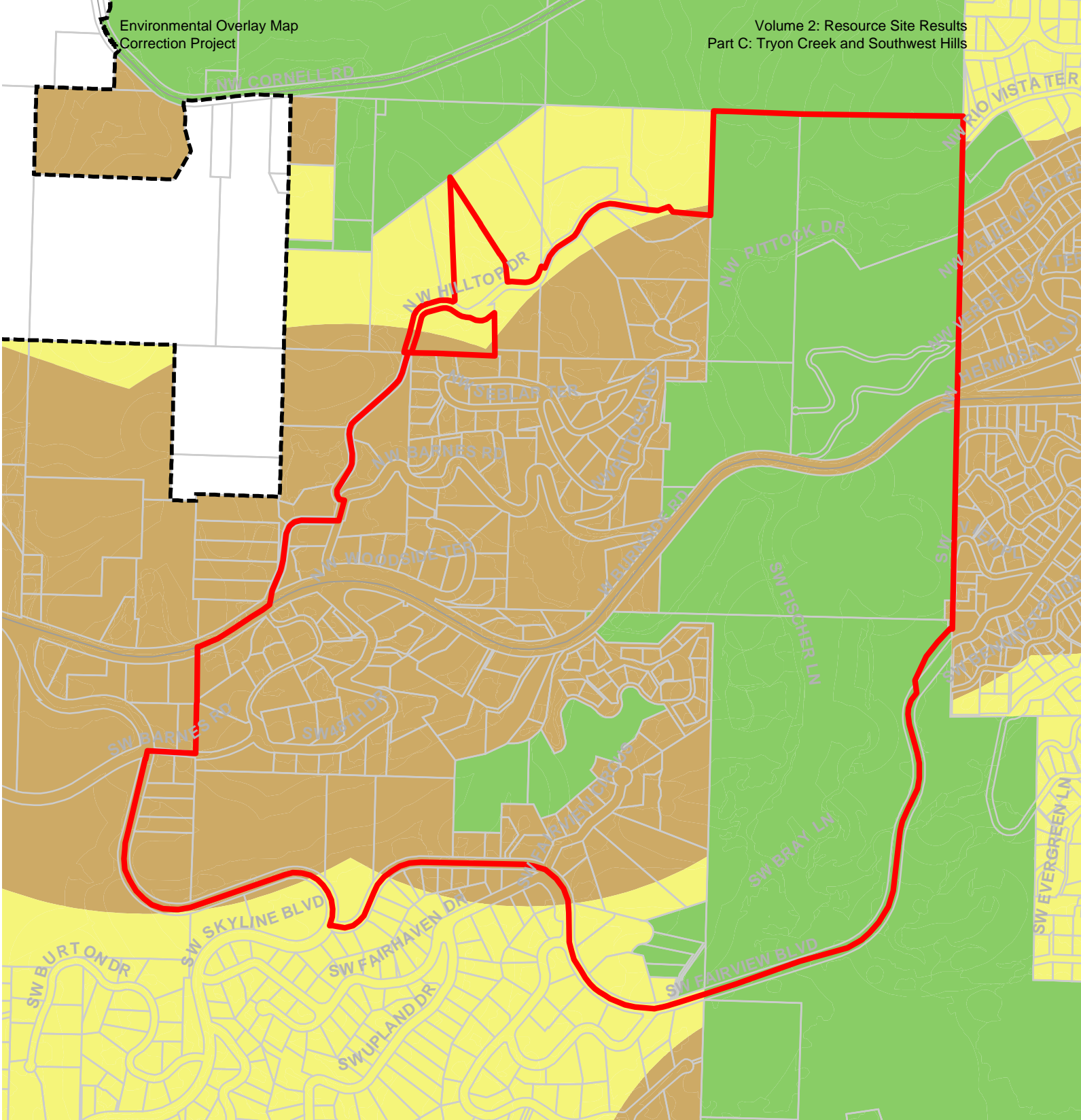
Updated: May 2022



-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots



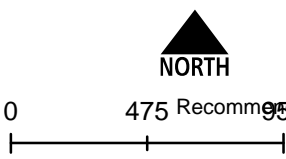
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May 2022



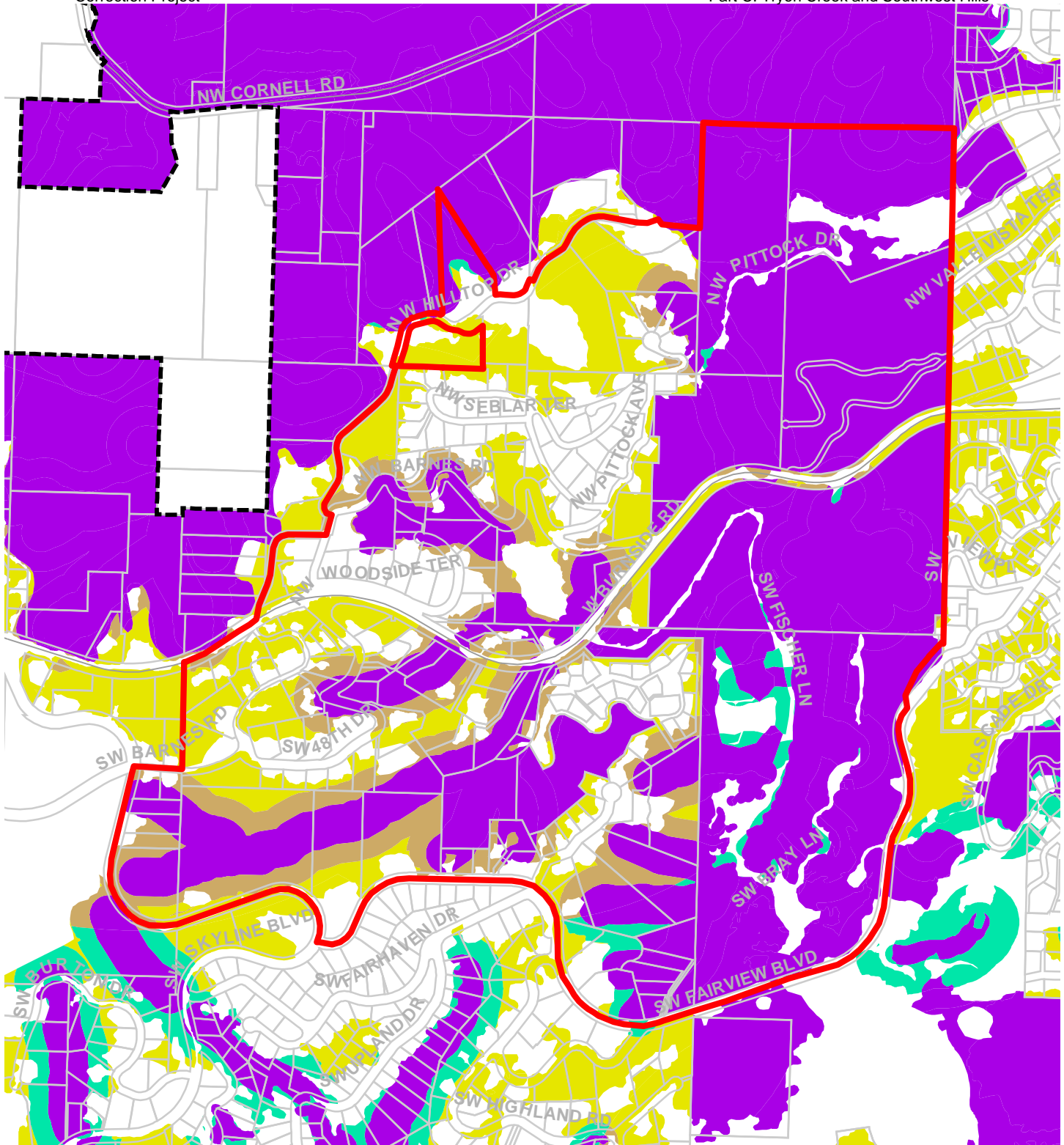
Map F: Urban Development Value (Title 13)
Resource Site: SW3

- Urban Service Boundary
- Resource Sites
- High Development Value
- Medium Development Value
- Low Development Value
- Parks

Updated: July 2021



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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW3

Updated: May 2022



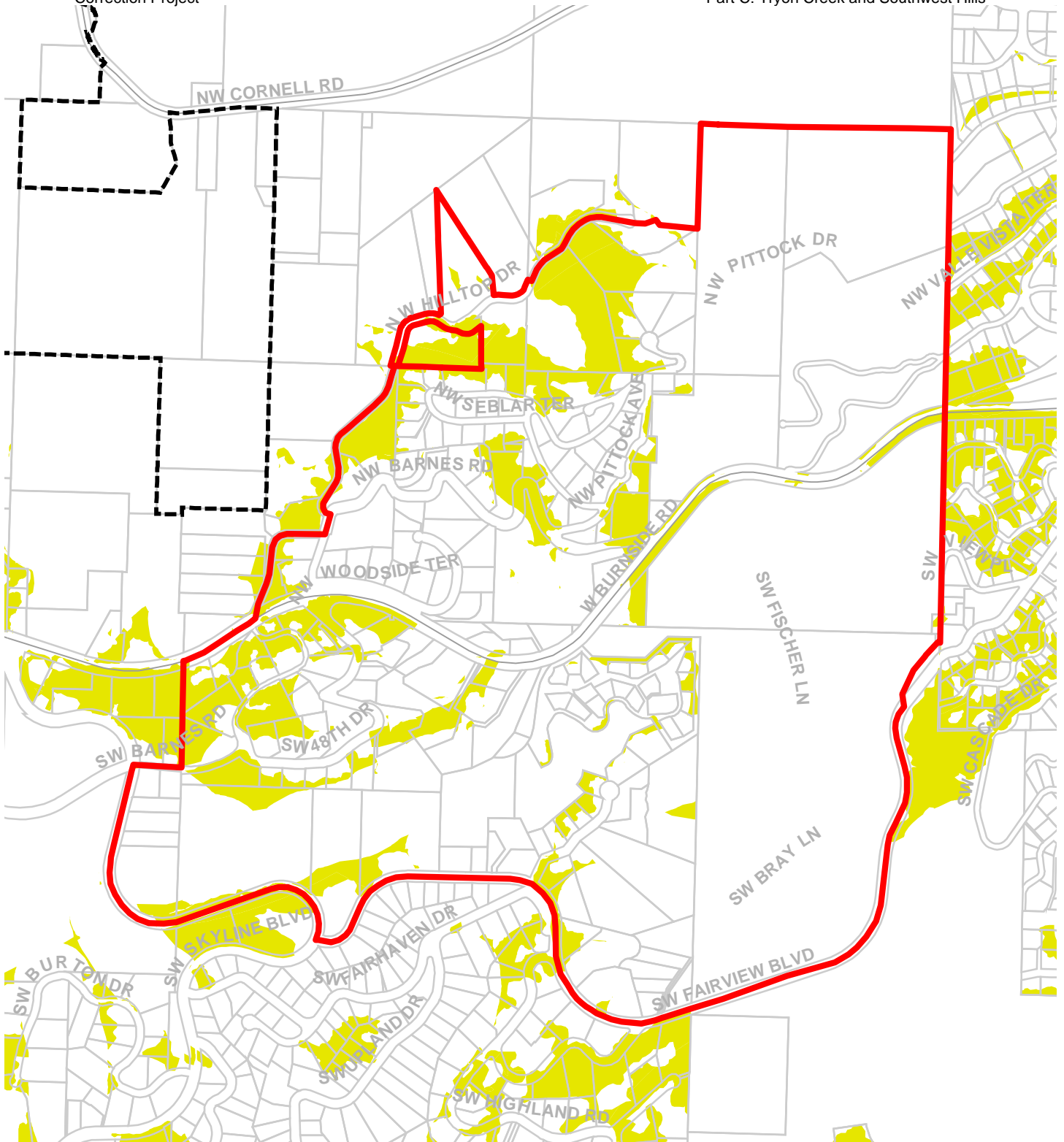
Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- HCA High Value
- HCA Moderate Value
- HCA Low Value
- Goal 5 Significant Natural Resources



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May 2022



Map H: Goal 5 Resources

Resource Site: SW3

Updated: May 2022

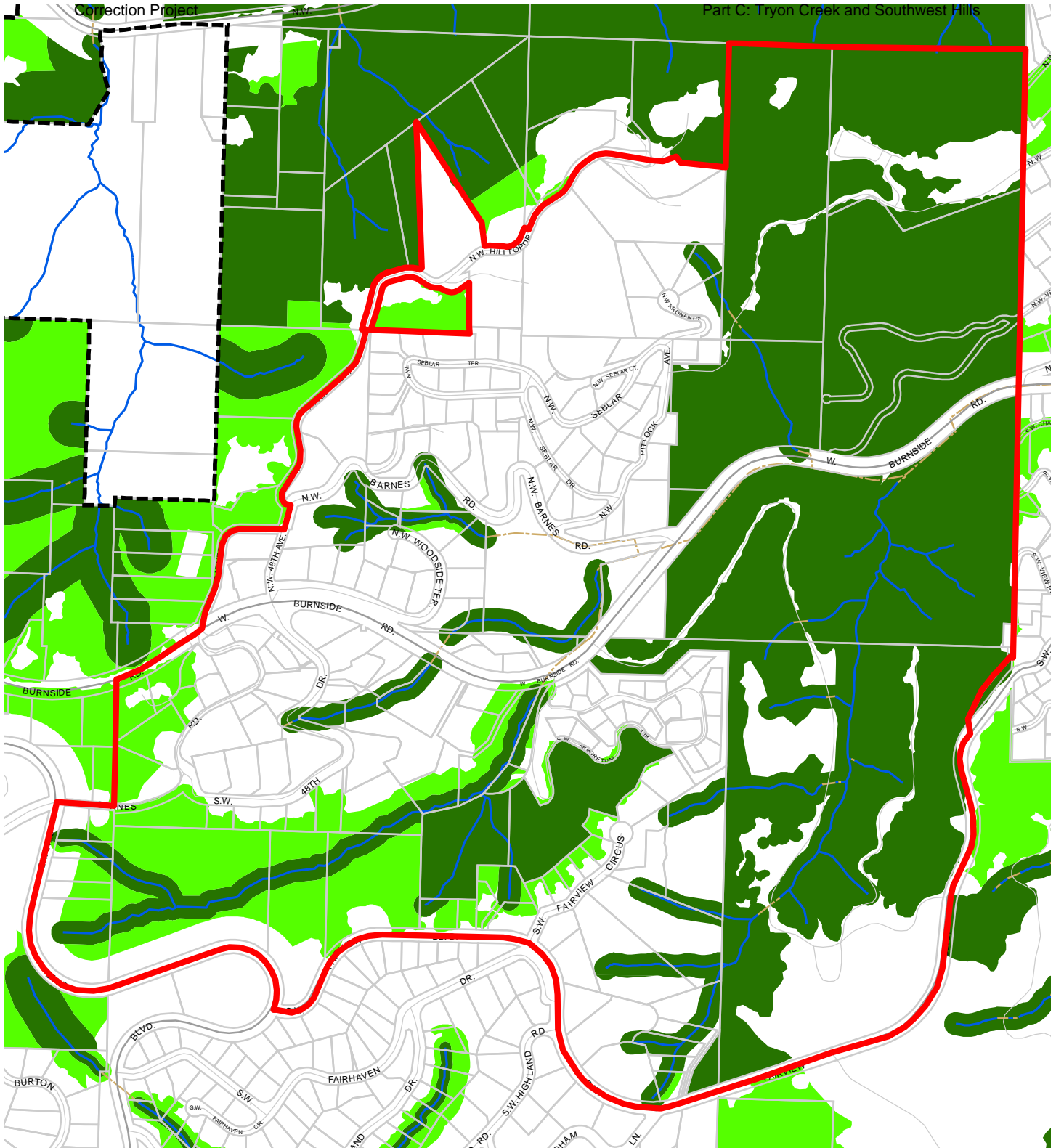


Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



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Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site: SW3

Updated: May 2022



Recommended Draft - As Amended

- Resource Sites
- Urban Service Boundary
- Open Stream Channel
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone
- Taxlots



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Natural Resource Description

Within resource site SW3 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: Balch Creek Watershed (O, B, M, C, E)

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW3	
	Study Area
Stream (Miles)	3.0
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	215.7
Woodland (acres)	7.8
Shrubland (acres)	1.5
Herbaceous (acres)	3.5
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	250.2
* 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 areas with a slope greater than 25%.	

Johnson Creek is a natural creek that flows north through the Hoyt Arboretum and then east along the south side of Burnside Street. A major tributary to Johnson Creek flows from near Skyline and Fairview Roads northeast to near Burnside Road where it joins Johnson Creek in the Hoyt Arboretum. Johnson Creek enters the combined sanitary and storm system west of the Burnside and Tichner Street intersection.

Portions of the 214-acre Hoyt Arboretum and 135-acre Pittock Mansion are located in the site. These sites form a wildlife corridor that connects habitat areas north and south of this site. Wildlife movement is constrained by Burnside Street’s four traffic lanes and adjacent steep canyon walls. Passage can best occur in the western portion of the site particularly over the tunnel. Burnside Street’s dramatic, wooded hillsides form a view corridor that contributes to the visual quality of the area and helps maintain slope stability.

Special status bird species found in this resource site include: bald eagle, band-tailed pigeon, brown creeper, bushtit, downy woodpecker, Pacific wren, pileated woodpecker, purple finch, varied thrush, and white-breasted nuthatch.

Table B: Quality of Natural Resource Functions in Resource Site SW3				
Resource Site (acres) = 292				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	66.9	53.0	108.0	228.0
percent total inventory site area	22.9%	18.1%	37.0%	78.0%
Wildlife Habitat*				
acres	219.3	0.1	0.0	219.4
percent total inventory site area	75.0%	0.0%	0.0%	75.0%
Special Habitat Areas**				
acres	17.5			
percent total inventory site area	6.0%			
Combined Total⁺				
acres	219.5	3.6	5.8	228.9
percent total inventory site area	75.1%	1.2%	2.0%	78.3%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water. ** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors. +Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called "effective impervious area." The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For resource site SW3, 6.1% of the total area is effectively impervious. This indicates a significant degree of stormwater management and/or existing natural resources that should be preserved. Areas with very low impervious cover and existing vegetation are more likely to be functioning properly to support biologic systems.

Table C. Impervious Area within Resource Site SW3			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
292.4	34.6	18.0	6.1%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW3. Natural resources should be protected within HCA as follows:

1. *Strictly limit* or *limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit* or *limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit* or *limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or *limiting* conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting* or *limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW3 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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. 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW3, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW3, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or 25 feet of wetlands.
2. Within Pittock Acres Park and Hoyt Arboretum, apply a protection overlay zone ('p' zone) to land between 25 and 50 feet of wetlands; and within areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
3. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands.
4. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW4 **Site Name:** Sylvan H

Previous Plan: Multnomah County Urban Lands

Previous Resource Site No.: 111

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

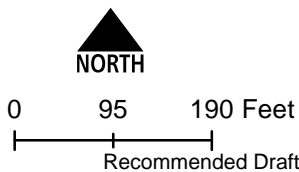
Resource site SW4 includes the following:

Site (acres)	22.6
Base zones (acres)	
OS	0.0
R20	22.6
R7	0.0



Map A: Water Features
Resource Site: SW4

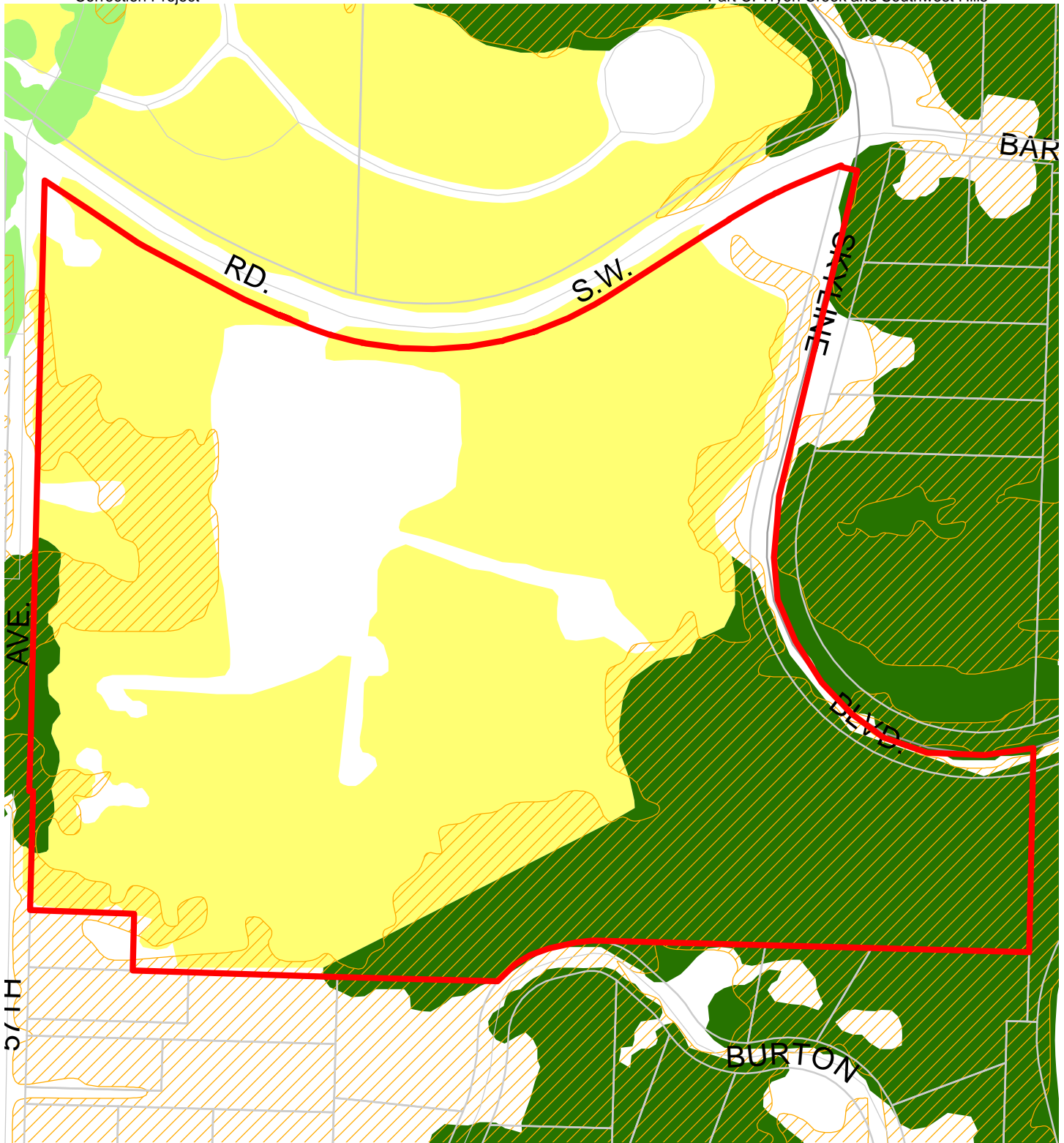
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



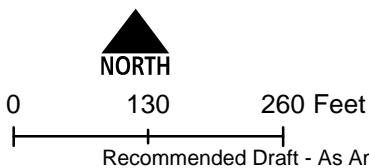
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Map B: Vegetation and Steep Slopes

Resource Site: SW4

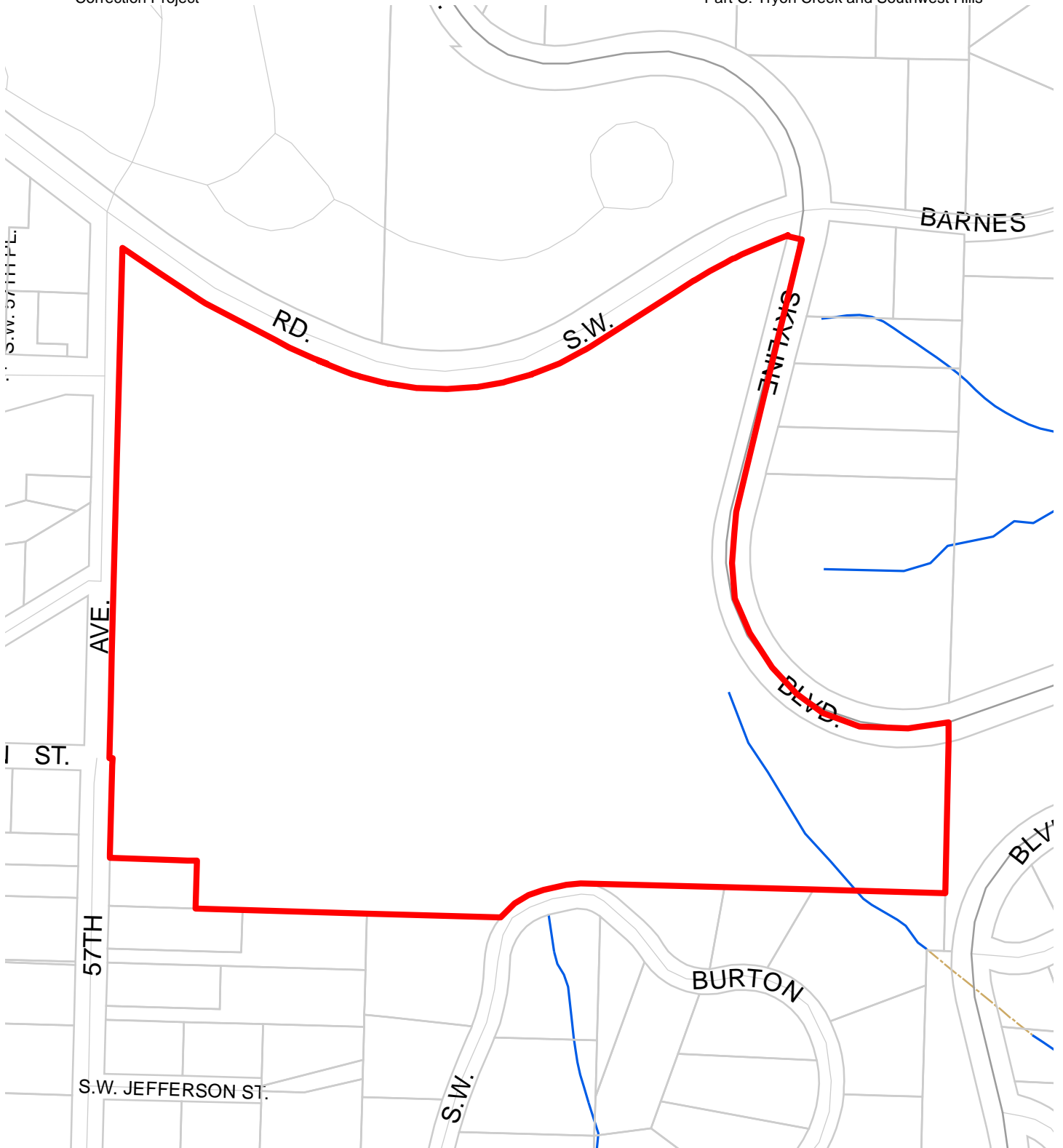
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous

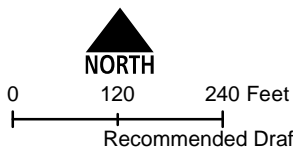










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**Map C: Special
Habitat Areas**
**Resource Site:
SW4**

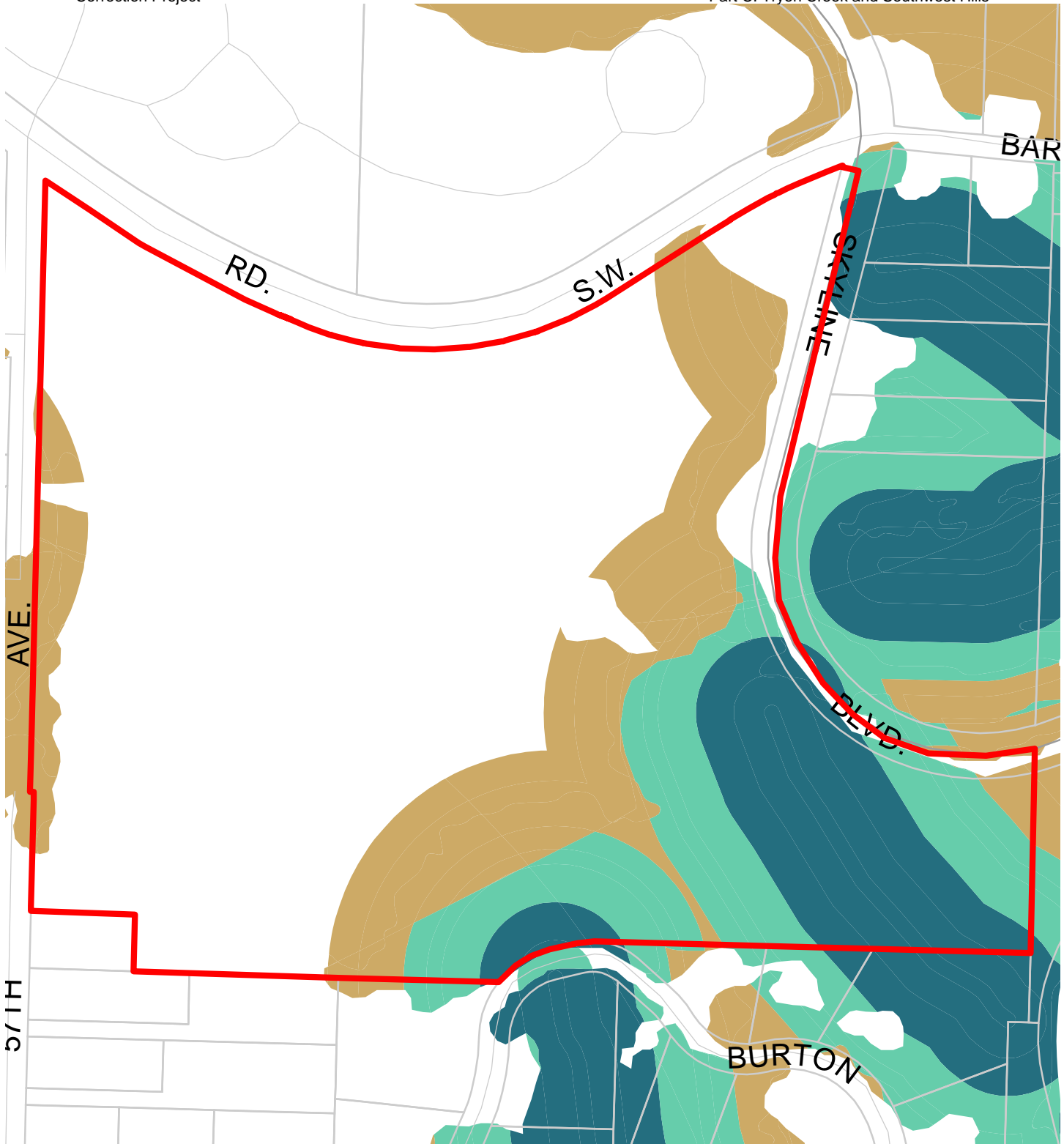
Updated: May 2022



-  Resource Sites
-  Special Habitat Areas (SHAs)
-  Open Stream Channel
-  Piped Stream Segment
-  Parks
-  Schools
-  Urban Service Boundary
-  Taxlots



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May 2022



**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
SW4**

Updated: May 2022

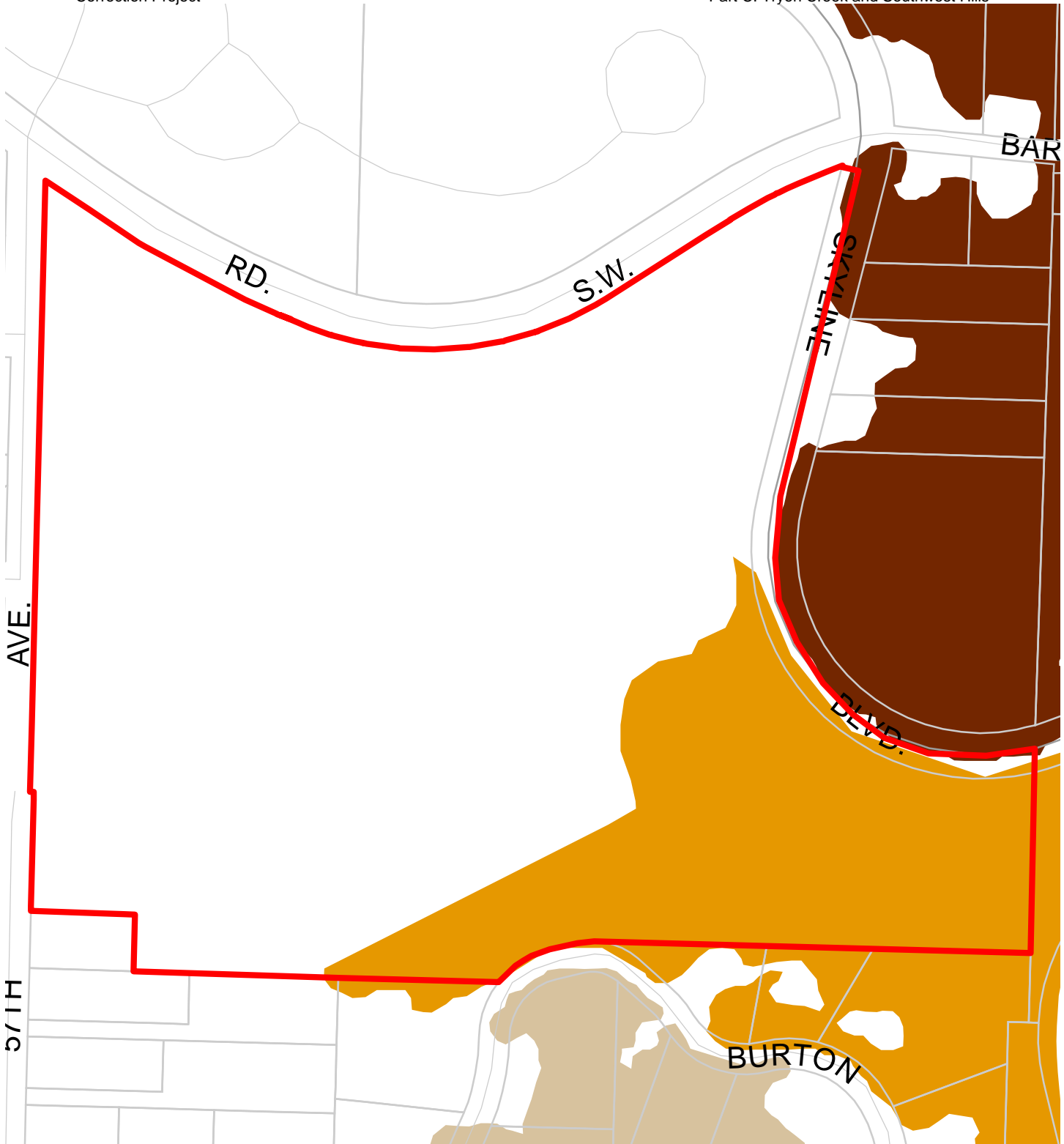
- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots



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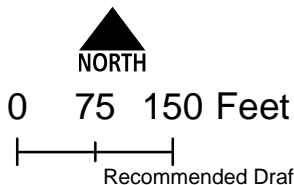
May 2022

NORTH
0 95 190 Feet
Recommended Draft - As Amended









**Map E: Wildlife
Habitat Classification**
Resource Site:
SW4

Updated: May 2022

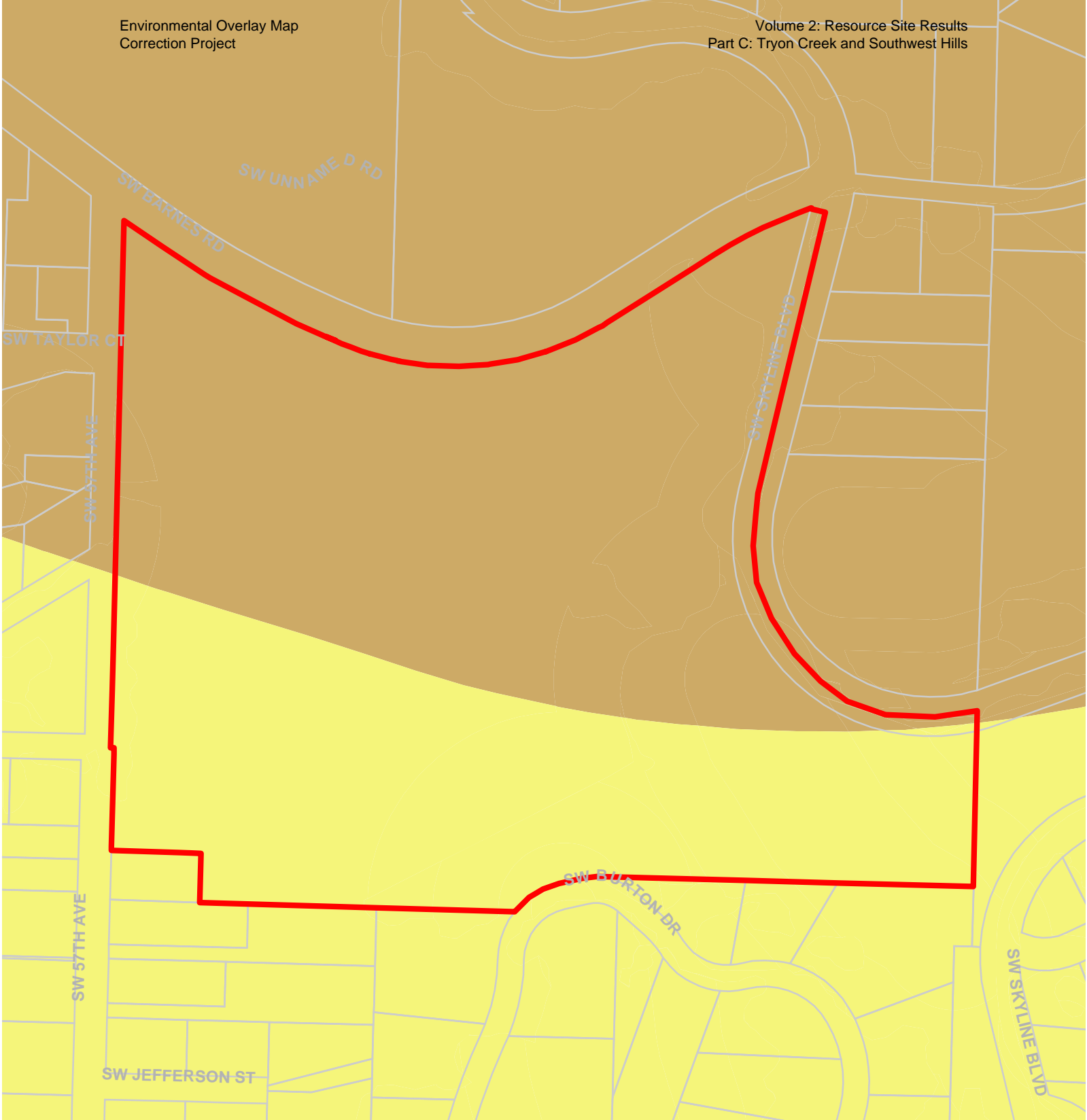


Recommended Draft - As Amended

-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots



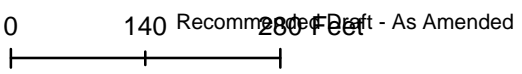
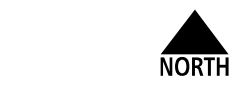
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May 2022



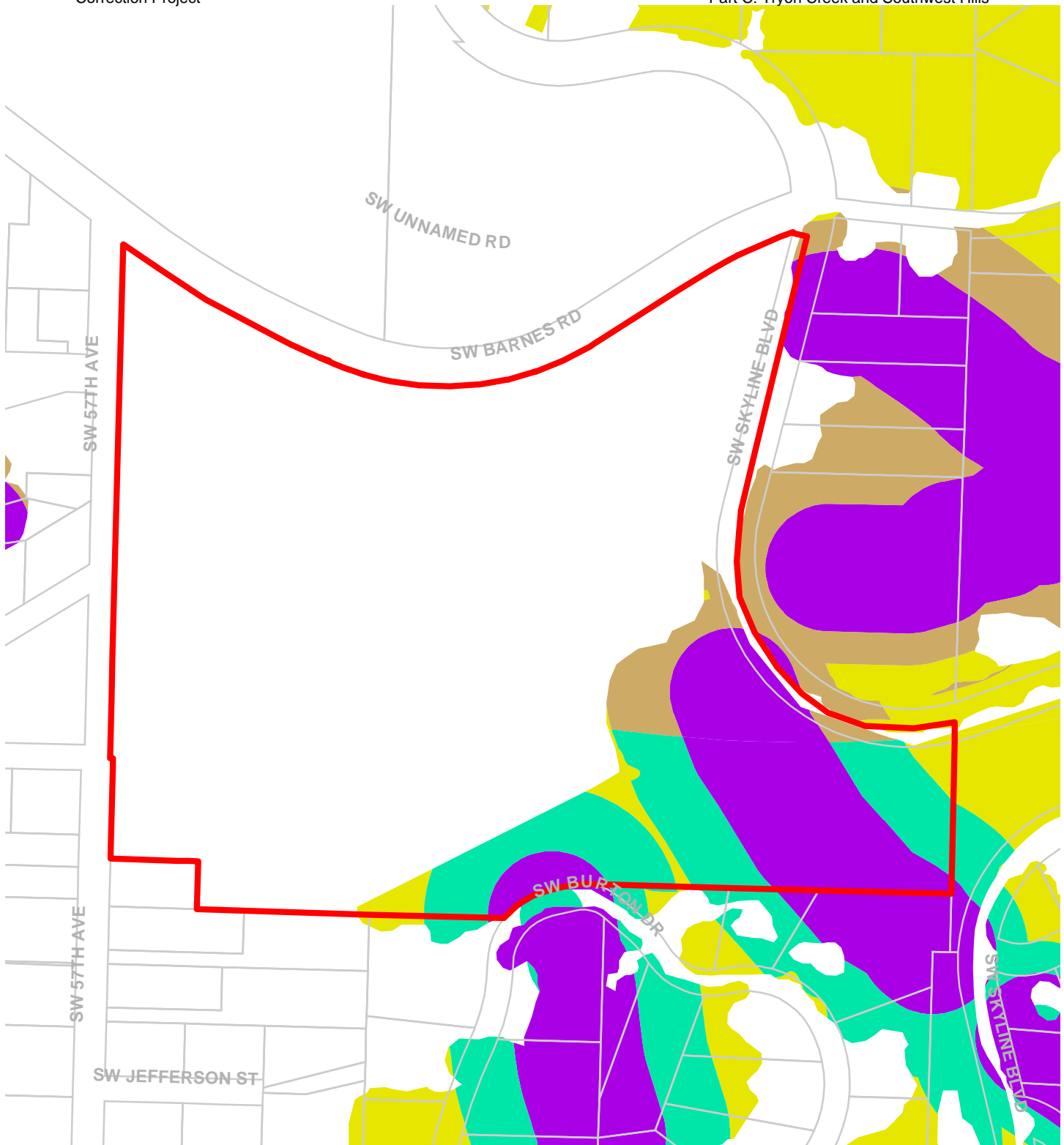
Map F: Urban Development Value (Title 13)
Resource Site: SW4

-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks

Updated: July 2021



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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW4

Updated: May 2022

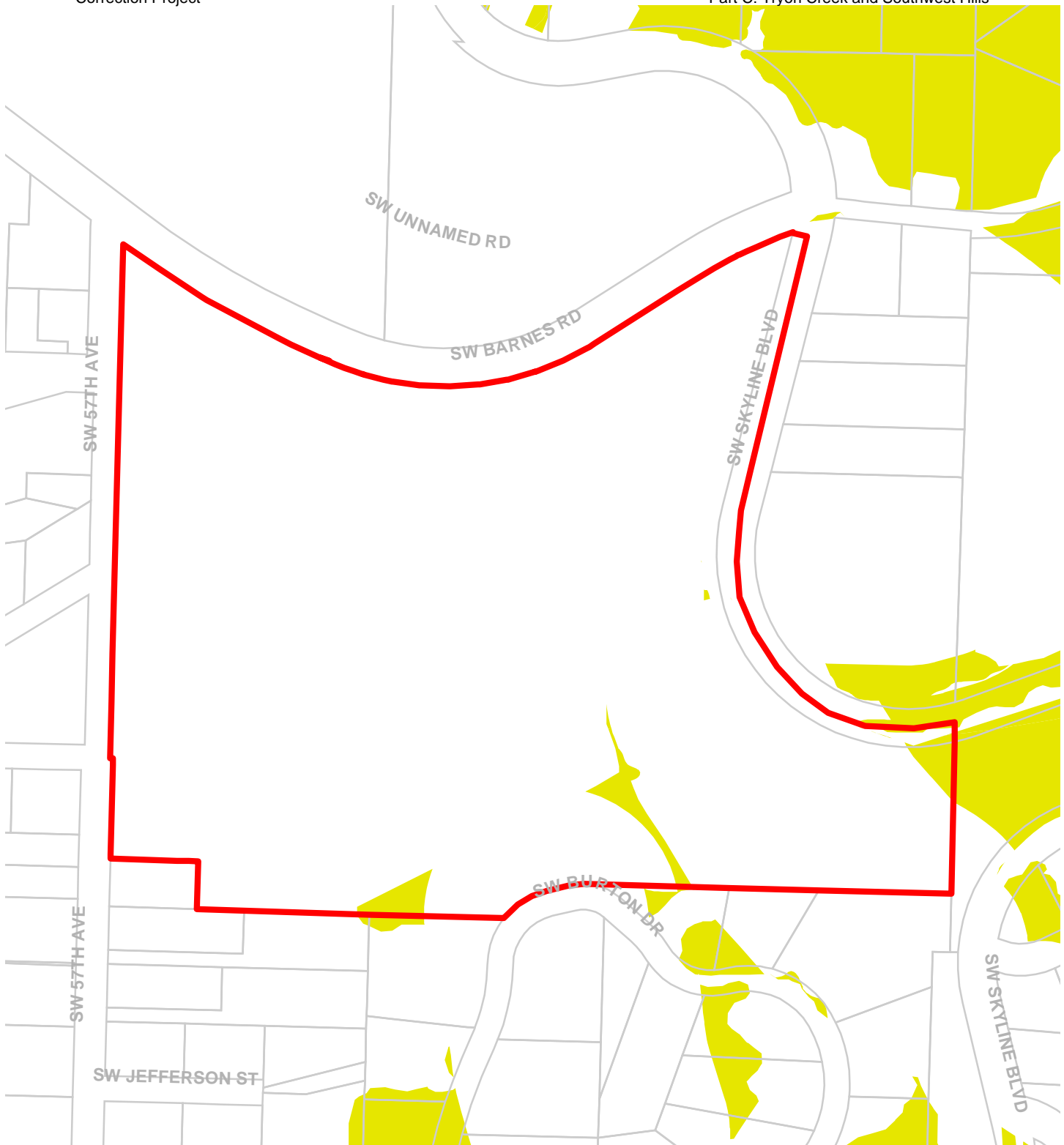


Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- HCA High Value
- HCA Moderate Value
- HCA Low Value
- Goal 5 Significant Natural Resources



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Map H: Goal 5 Resources

Resource Site: SW4

Updated: May 2022

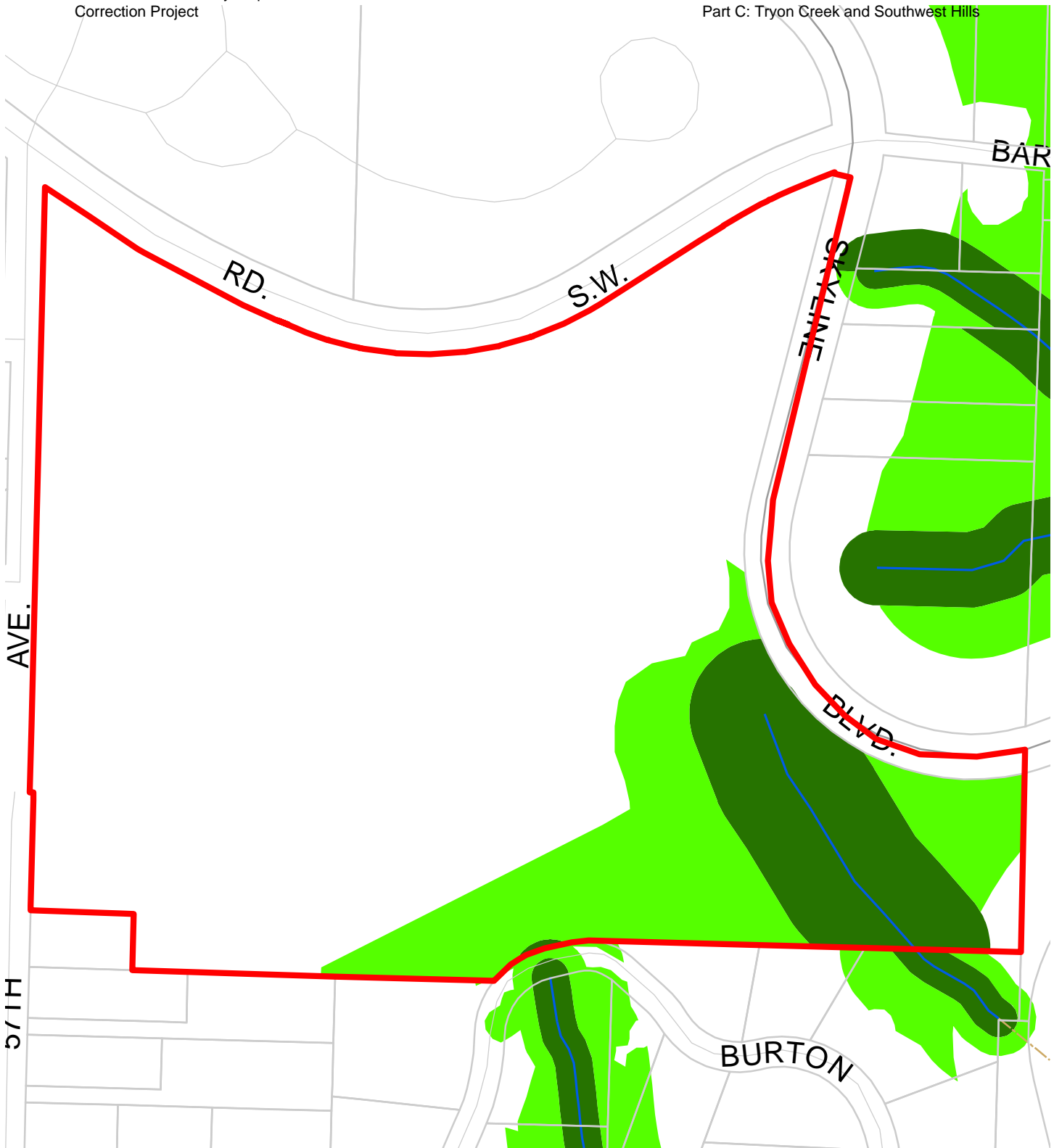


Recommended Draft - As Amended

-  Urban Service Boundary
-  Resource Sites
-  Goal 5 Significant Natural Resources



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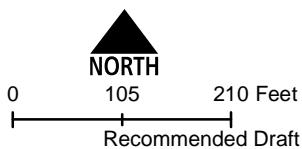


Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
SW4**

Updated: May 2022

- Resource Sites
- Open Stream Channel
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone
- Urban Service Boundary
- Taxlots



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May 2022

Natural Resource Description

Within resource site SW4 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: None

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW4	
	Study Area
Stream (Miles)	0.1
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	5.3
Woodland (acres)	0.0
Shrubland (acres)	0.0
Herbaceous (acres)	12.8
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	7.9
* 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 areas with a slope greater than 25%.	

Although much of this resource site is cleared ridgetop for television and radio transmission towers and facilities, the site does include one forested headwater stream that drains to critical habitat for ESA-listed salmon and trout species in the lower Willamette River.

Special status bird species found in this resource site include: bald eagle, black-throated gray warbler, bushtit, downy woodpecker, Pacific wren, purple finch, Swainson's thrush, Wilson's warbler.

Table B: Quality of Natural Resource Functions in Resource Site SW4				
Resource Site (acres) = 23				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	2.3	2.4	3.9	8.6
percent total inventory site area	10.0%	10.5%	17.5%	38.0%
Wildlife Habitat*				
acres	0.0	4.9	0.0	5.0
percent total inventory site area	0.2%	21.9%	0.0%	22.1%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total⁺				
acres	2.3	2.7	3.6	8.6
percent total inventory site area	10.1%	12.0%	15.9%	38.0%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.				
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.				
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called “effective impervious area.” The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For resource site SW4, 0.0% of the total area is effectively impervious. This indicates a significant degree of stormwater management and/or existing natural resources that should be preserved. Areas with very low impervious cover and existing vegetation are more likely to be functioning properly to support biologic systems.

Table C. Impervious Area within Resource Site SW4			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
21.9	1.9	0.01	0.0%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW4. Natural resources should be protected within HCA as follows:

1. *Strictly limit or limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit or limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit or limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or limiting conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting or limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW4 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW4, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW4, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or 25 feet of wetlands.
2. Apply a protection overlay zone ('p' zone) to 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. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands; and within areas of forest vegetation that are contiguous to but more than 100 feet from stream top-of-bank.
4. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW5 Site Name: Sylvan I

Previous Plan: Multnomah County Urban Lands

Previous Resource Site No.: 111

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

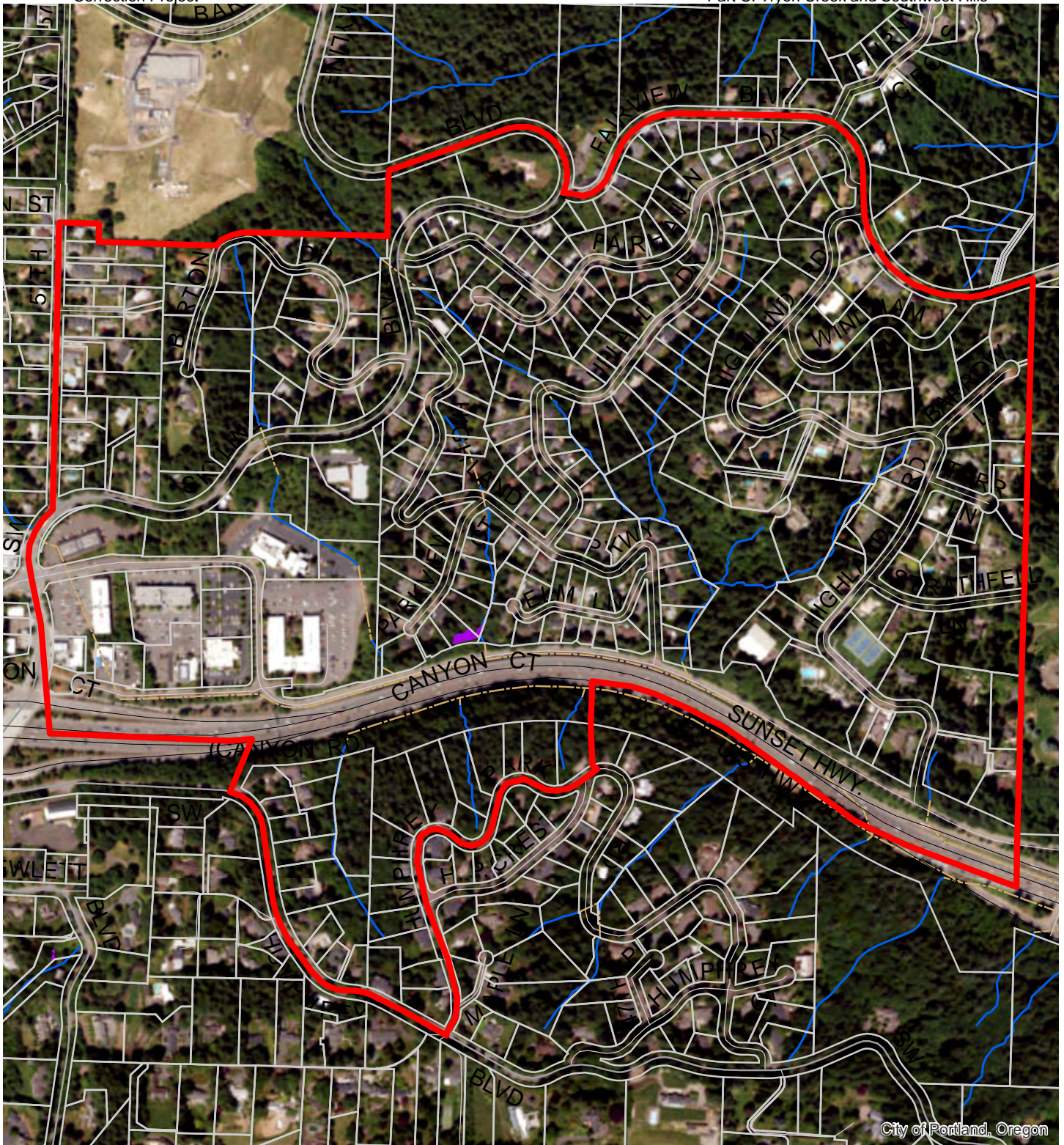
Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW5 includes the following:

Site (acres) 231.5

Base zones (acres)

CE	6.1
EG2	21.7
OS	0.0
R10	24.2
R20	100.2
R5	24.7
R7	49.1
RM1	5.4



City of Portland, Oregon

Map A: Water Features

Resource Site: SW5

Updated: May 2022



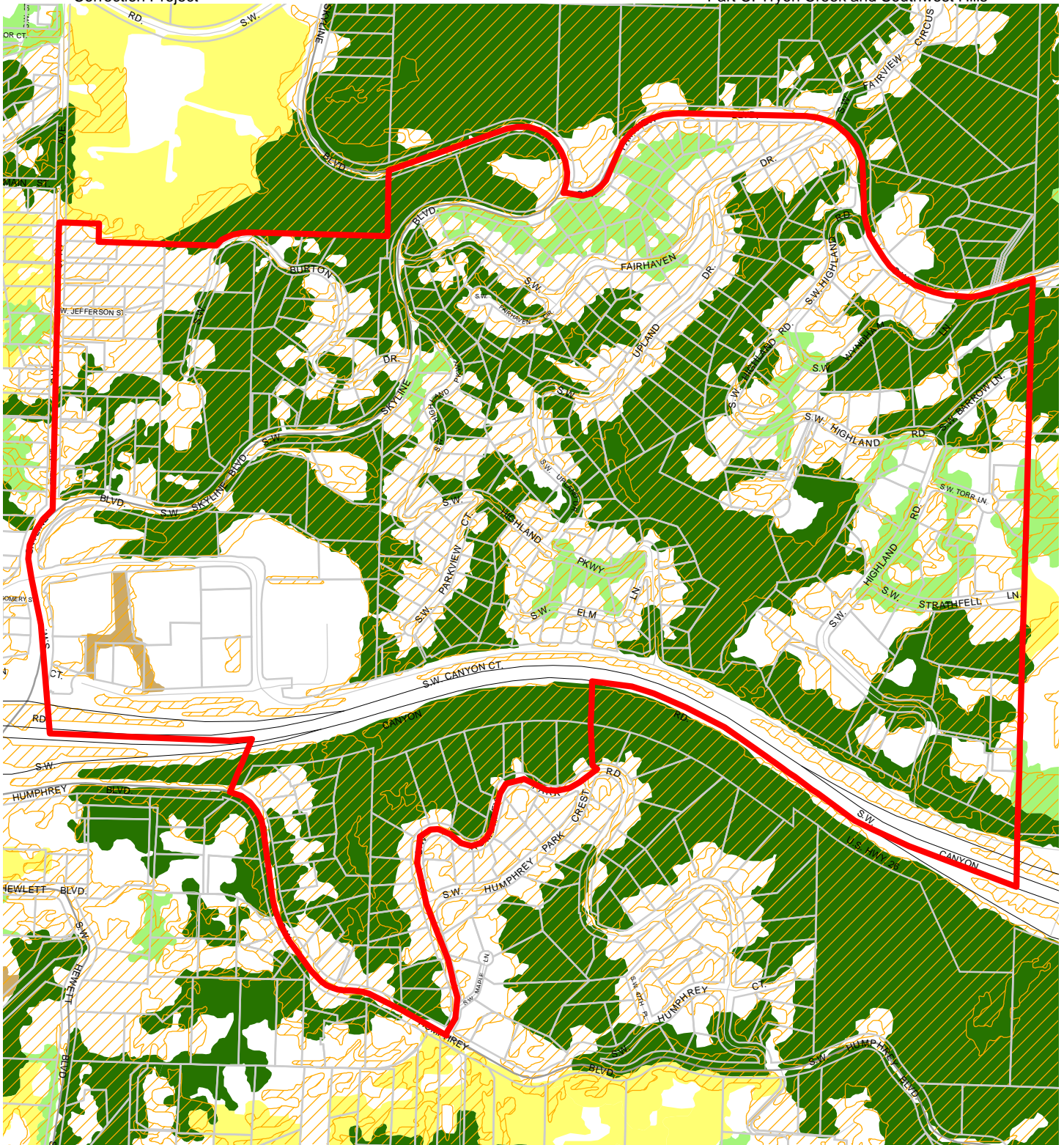
0 295 590 Feet

Recommended Draft - As Amended

- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



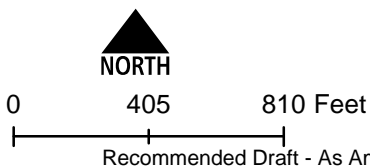
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Map B: Vegetation and Steep Slopes

Resource Site: SW5

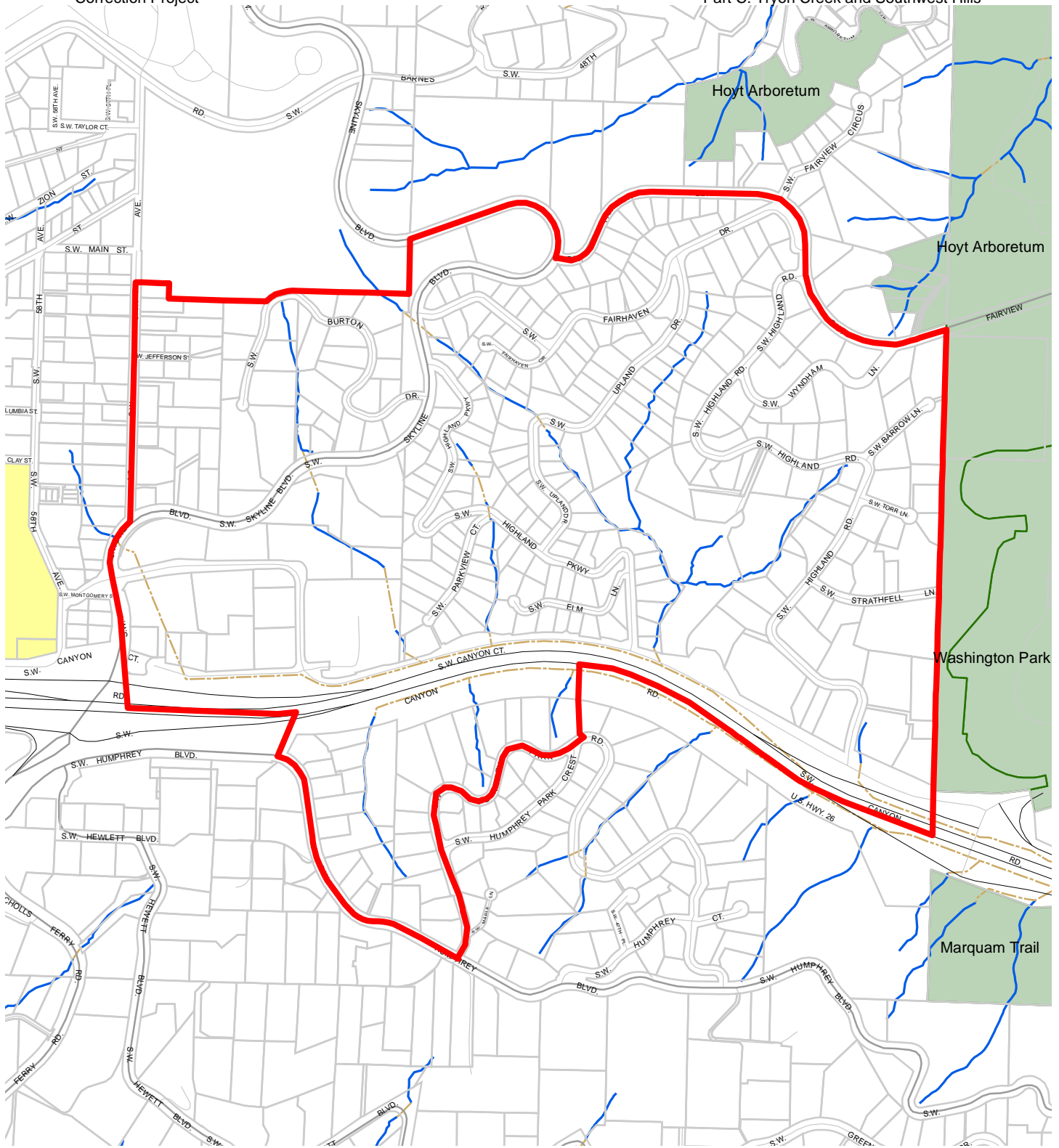
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous

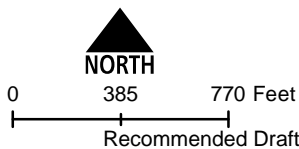










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**Map C: Special
Habitat Areas**
**Resource Site:
SW5**

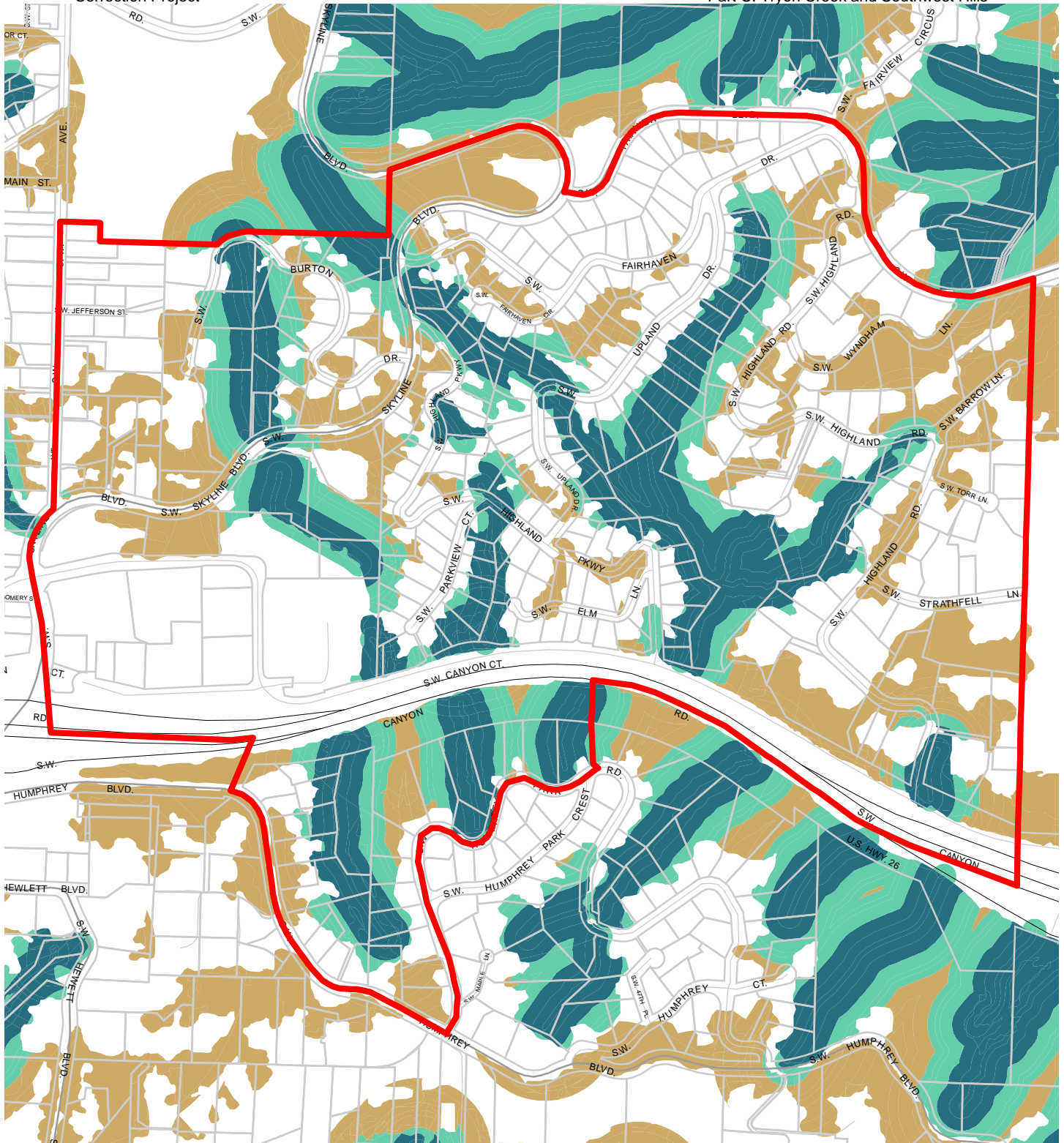
Updated: May 2022



-  Resource Sites
-  Special Habitat Areas (SHAs)
-  Open Stream Channel
-  Piped Stream Segment
-  Parks
-  Schools
-  Urban Service Boundary
-  Taxlots



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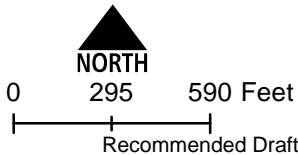


**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
SW5**

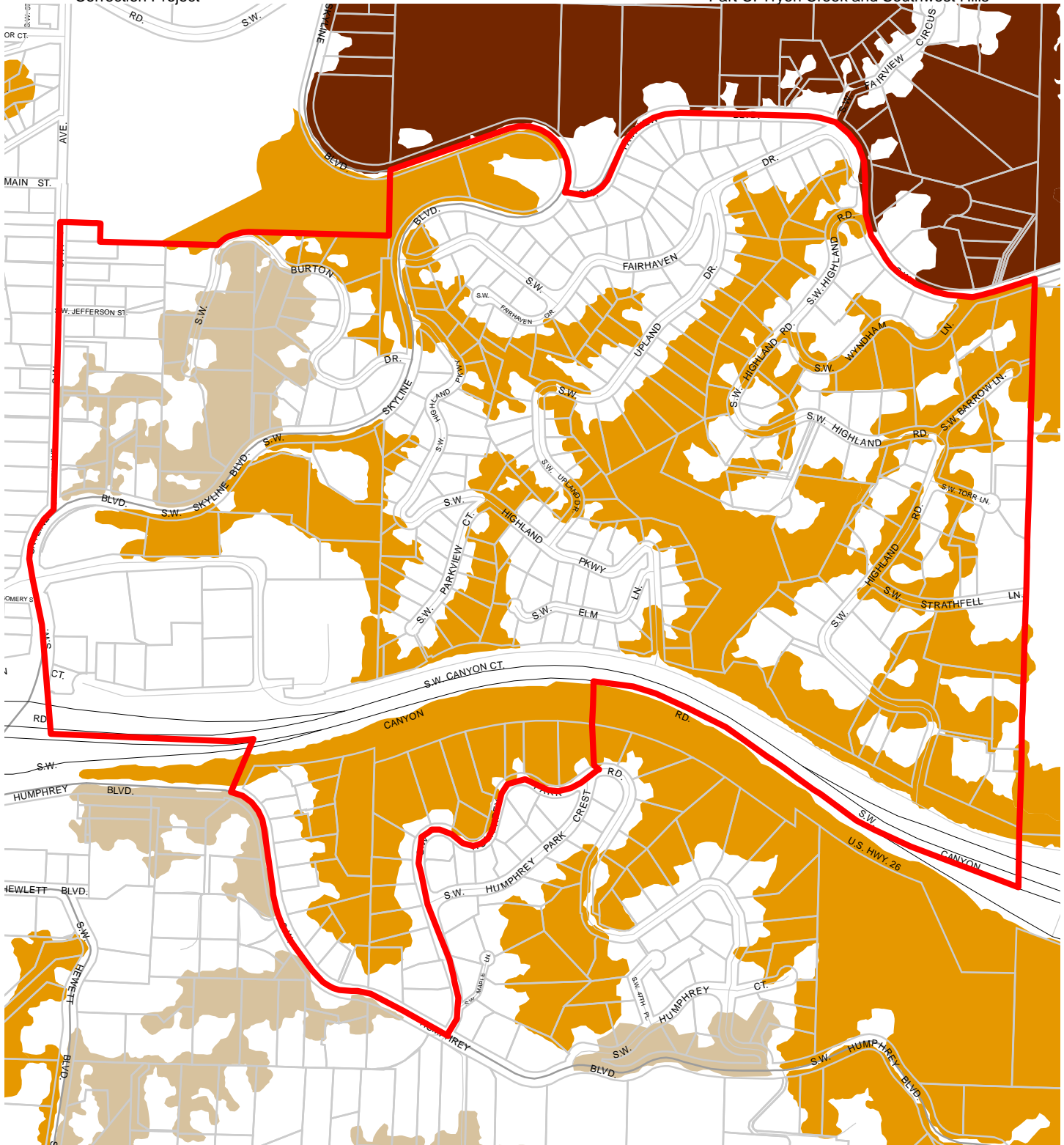
Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots



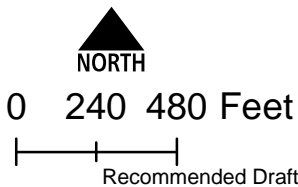
Recommended Draft - As Amended







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May 2022



**Map E: Wildlife
Habitat Classification
Resource Site:
SW5**

Updated: May 2022

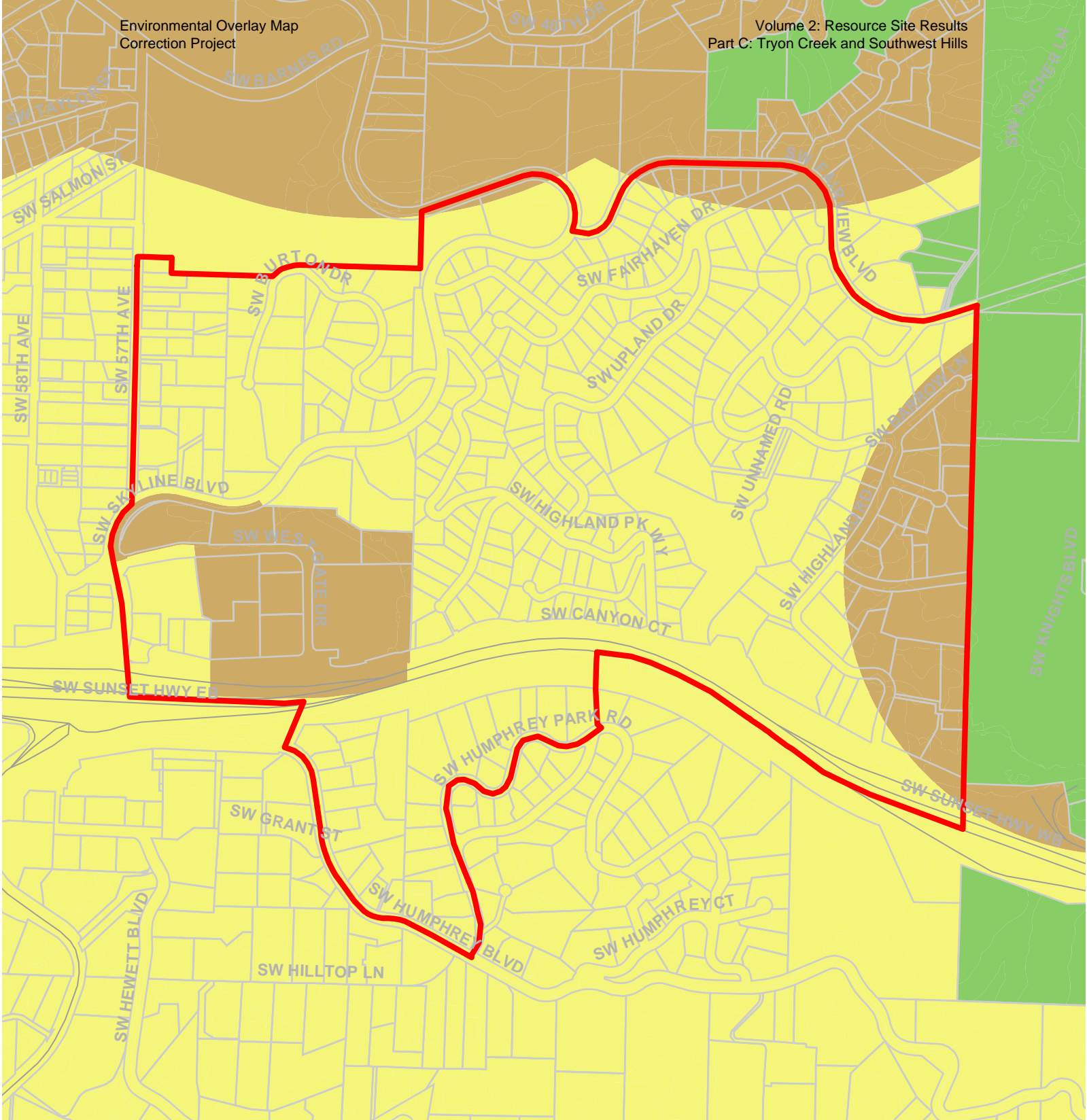


-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots

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May 2022



Map F: Urban Development Value (Title 13)
Resource Site: SW5

-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks

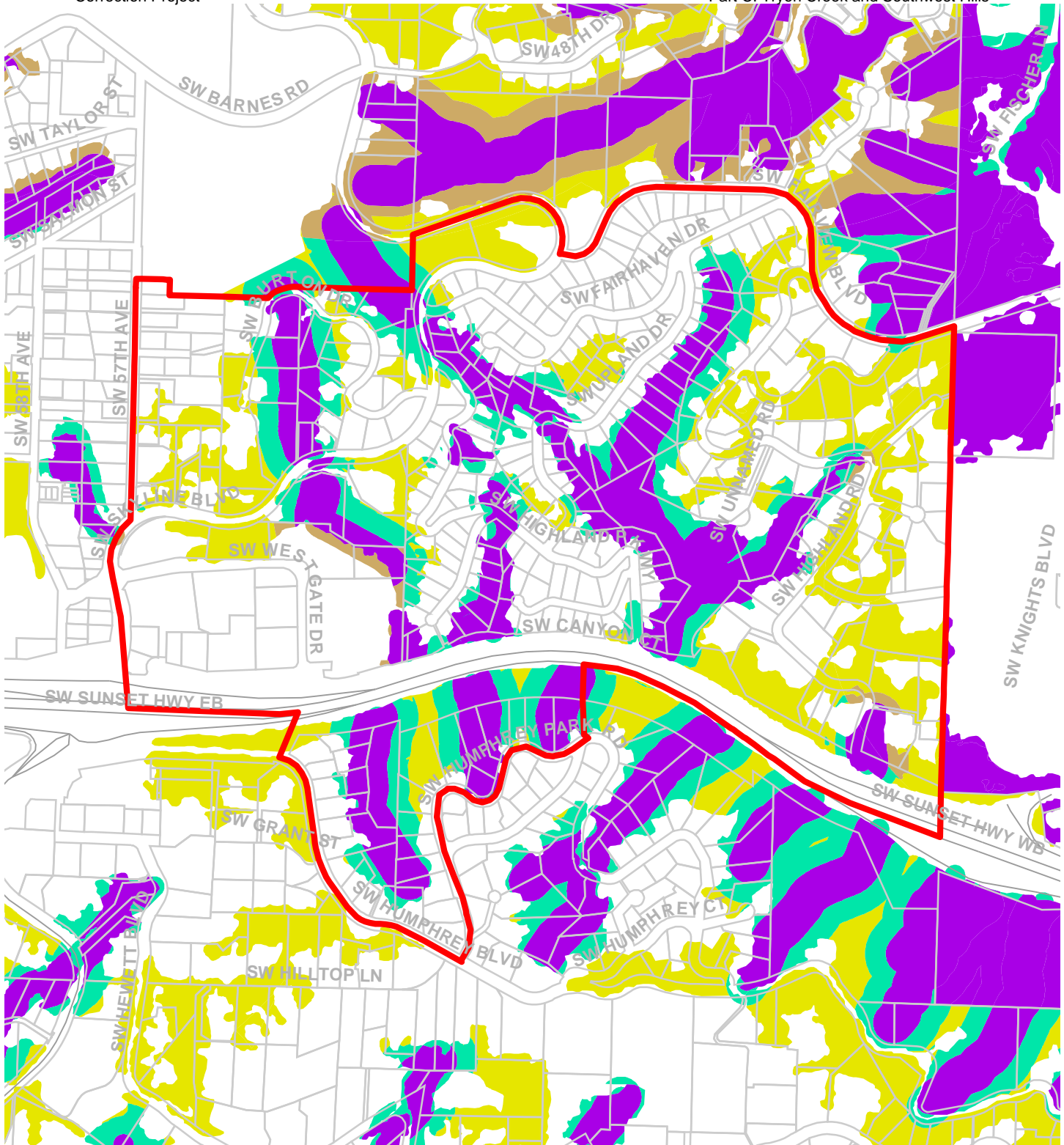


Updated: July 2021



0 437.5 875 Feet - As Amended

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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW5

Updated: May 2022



Recommended Draft - As Amended

--- Urban Service Boundary

Resource Sites

HCA High Value

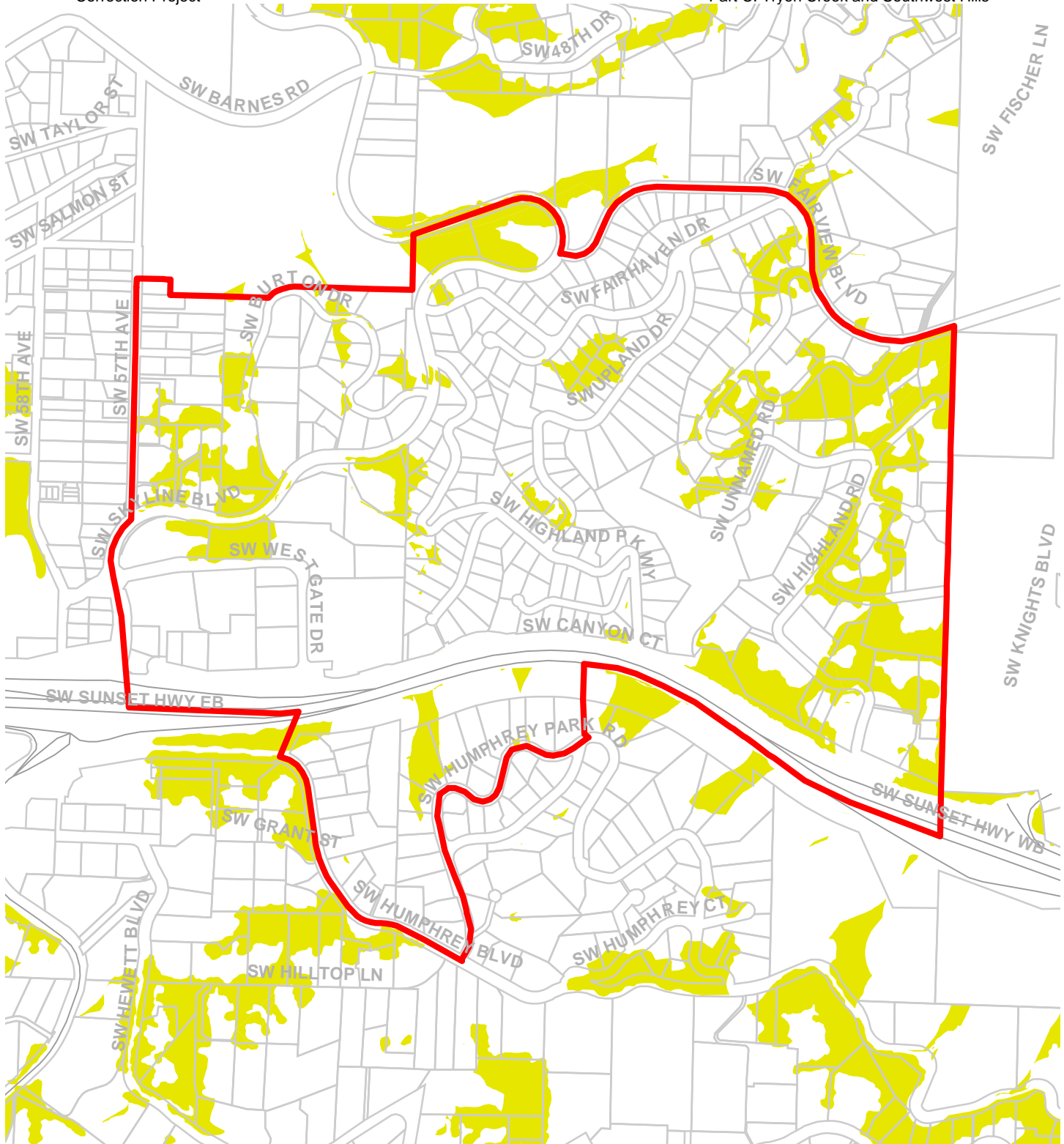
HCA Moderate Value

HCA Low Value

Goal 5 Significant Natural Resources



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Map H: Goal 5 Resources

Resource Site: SW5

Updated: May 2022

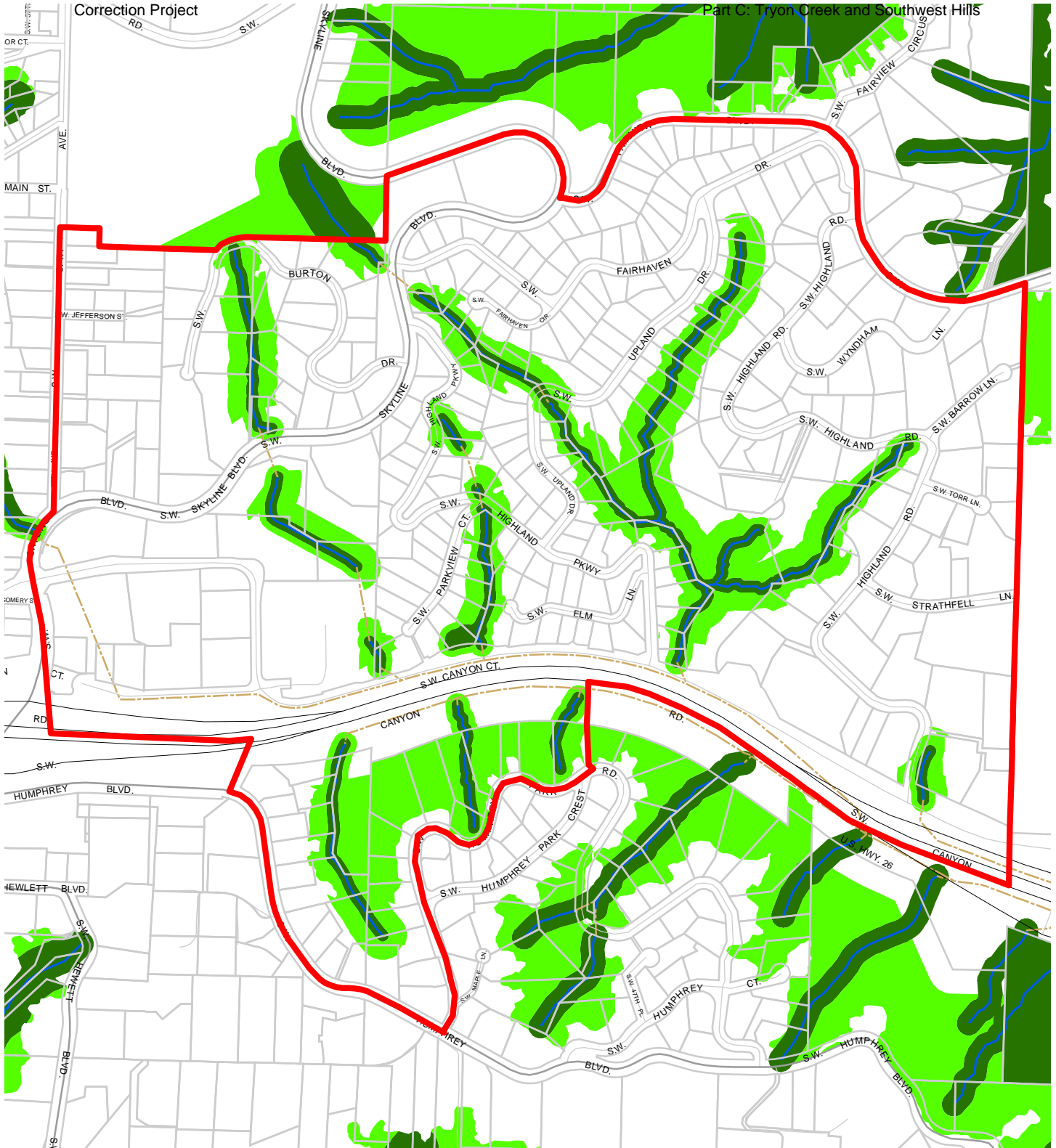


Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



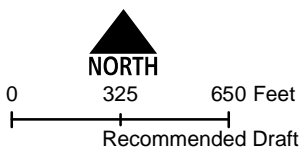
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Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
SW5**

Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Open Stream Channel
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone
- Taxlots



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022

Natural Resource Description

Within resource site SW5 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; wetland; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: None

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW5	
	Study Area
Stream (Miles)	1.8
Wetlands (acres)	0.1
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	99.6
Woodland (acres)	13.2
Shrubland (acres)	1.0
Herbaceous (acres)	0.1
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	157.5
* 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 areas with a slope greater than 25%.	

Various small streams form the headwaters of Tanner Creek across this resource site. These forested headwater streams drain to critical habitat for ESA-listed salmon and trout in the lower Willamette River. Habitat connectivity from north to south across this resource site is completely bisected by Highway 26.

Special status birds found in this resource site include: bald eagle, black-throated gray warbler, bushtit, downy woodpecker, Pacific wren, purple finch, Swainson’s thrush, and Wilson’s warbler.

Table B: Quality of Natural Resource Functions in Resource Site SW5				
Resource Site (acres) = 232				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	38.9	22.7	45.8	107.4
percent total inventory site area	16.8%	9.8%	19.8%	46.4%
Wildlife Habitat*				
acres	0.1	87.9	11.5	99.6
percent total inventory site area	0.0%	38.0%	5.0%	43.0%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total⁺				
acres	39.0	57.6	12.6	109.2
percent total inventory site area	16.9%	24.9%	5.4%	47.2%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water. ** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors. +Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called “effective impervious area.” The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For Resource Area SW5, 21.8% of the total area is effectively impervious, indicating a critical level of vulnerability, with negative impacts beginning to impact natural functions, but natural processes are still in place and providing support to biologic systems.

Table C. Impervious Area within Resource Site SW5			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
231.5	56.2	50.4	21.8%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW5. Natural resources should be protected within HCA as follows:

1. *Strictly limit* or *limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit* or *limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.

3. *Strictly limit* or *limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or *limiting* conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting* or *limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW5 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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, R10, R5 and R2 base zones. Commercial uses are allowed in the CE base zone. Employment uses are allowed in the EG2 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW5, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW5, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands, and land within 25 feet of stream top-of-bank or wetlands.
2. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of stream top-of-bank or wetlands; and within areas of forest vegetation that are contiguous to and between 50 and 100 feet from stream top-of-bank.
3. Apply a conservation overlay zone ('c' zone) to large forest patches contiguous to but greater than 100 feet from stream top-of-bank located to the south of highway 26.
4. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW6 Site Name: Sylvan K

Previous Plan: Multnomah County Urban Lands

Previous Resource Site No.: 111

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

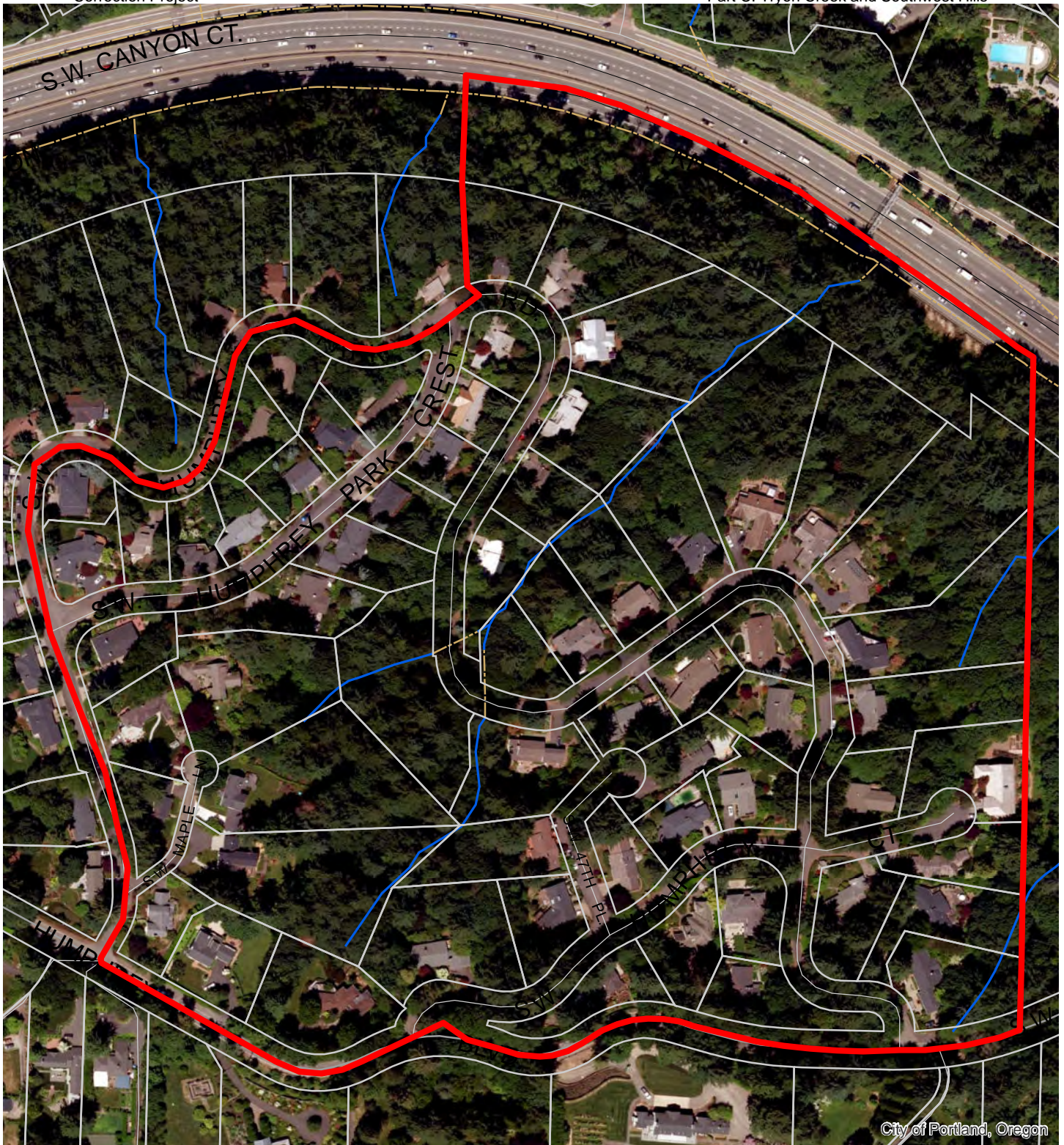
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW6 includes the following:

Site (acres)	44.8
Base zones (acres)	
R10	9.0
R20	35.8



City of Portland, Oregon

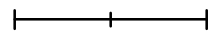
Map A: Water Features

Resource Site: SW6

Updated: May 2022



0 115 230 Feet

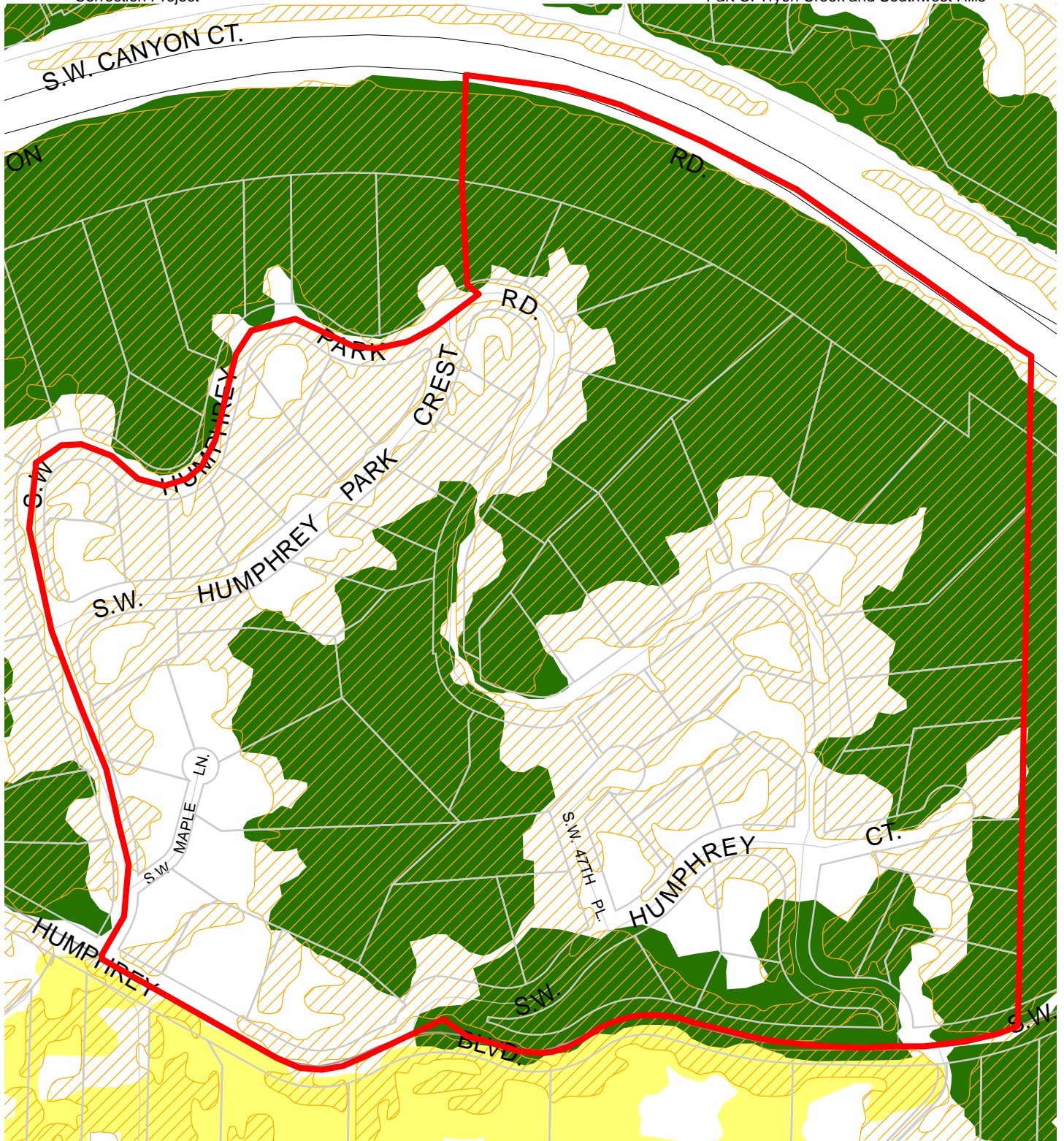


Recommended Draft - As Amended

- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



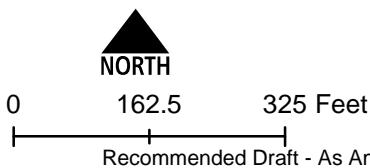
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.
May 2022



Map B: Vegetation and Steep Slopes

Resource Site: SW6

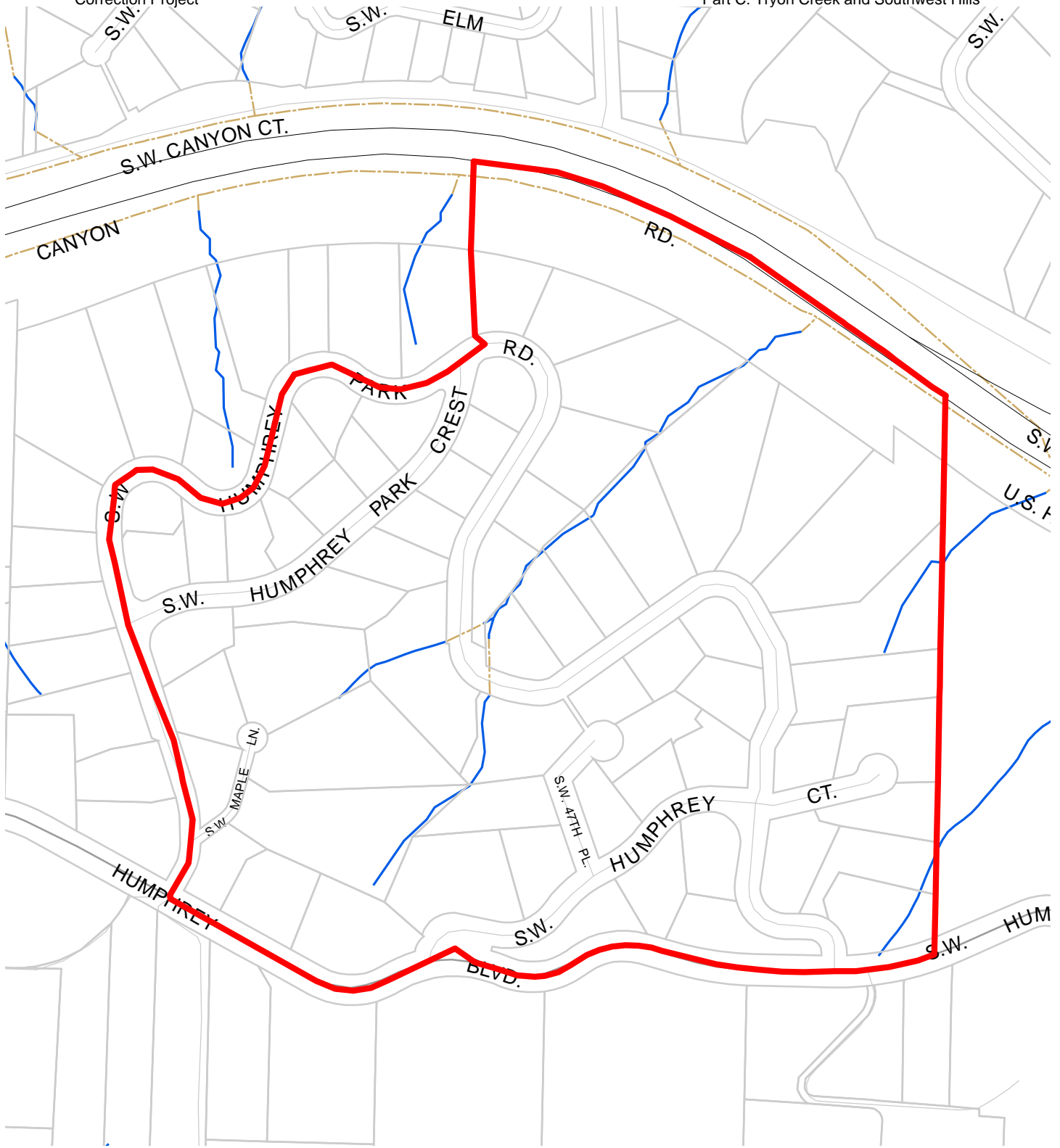
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous

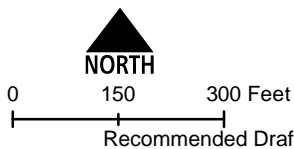


The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022











**Map C: Special
Habitat Areas**
**Resource Site:
SW6**

Updated: May 2022

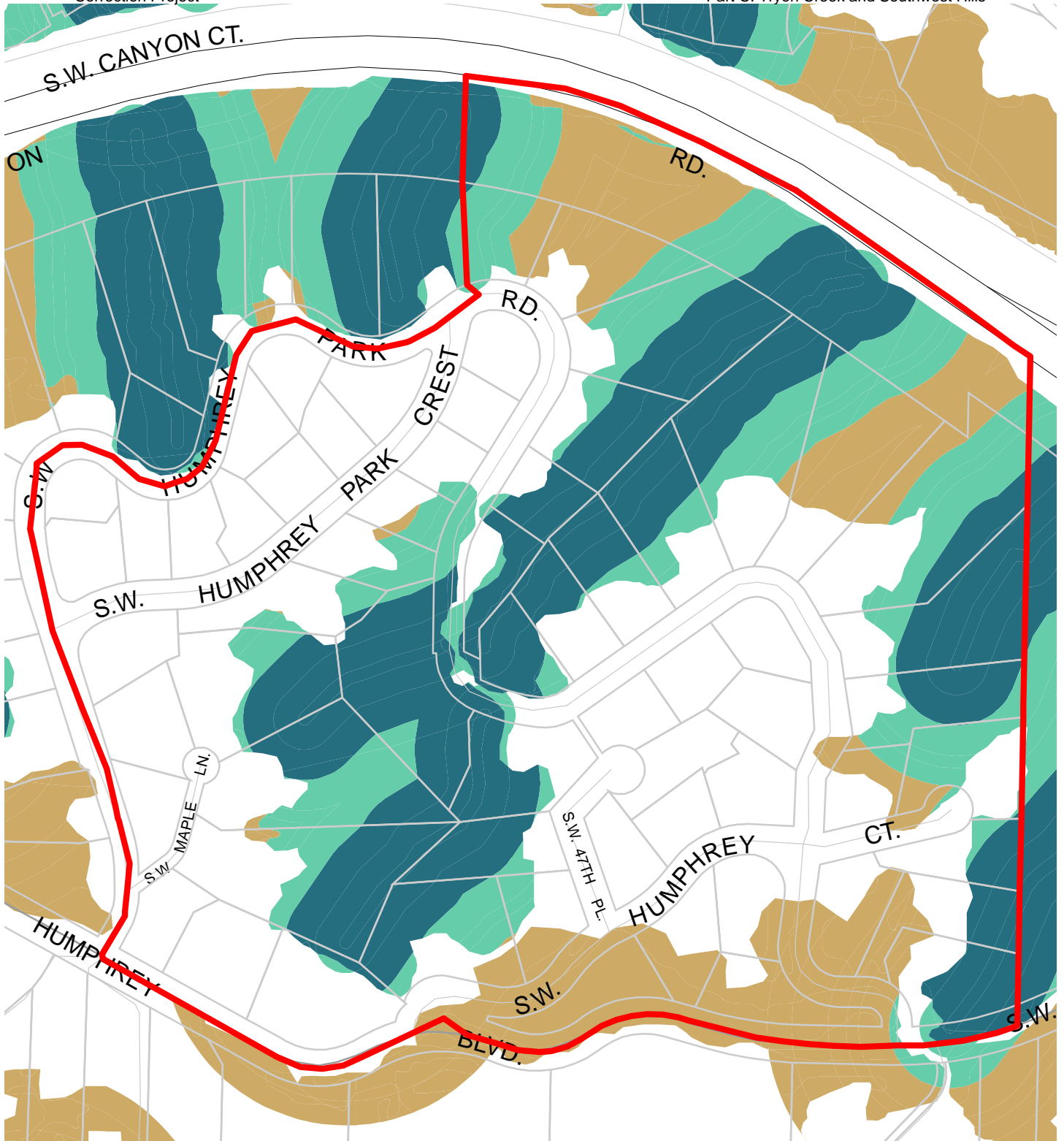


Recommended Draft - As Amended

-  Resource Sites
-  Special Habitat Areas (SHAs)
-  Open Stream Channel
-  Piped Stream Segment
-  Parks
-  Schools
-  Urban Service Boundary
-  Taxlots



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May 2022

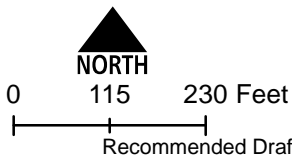


**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
SW6**

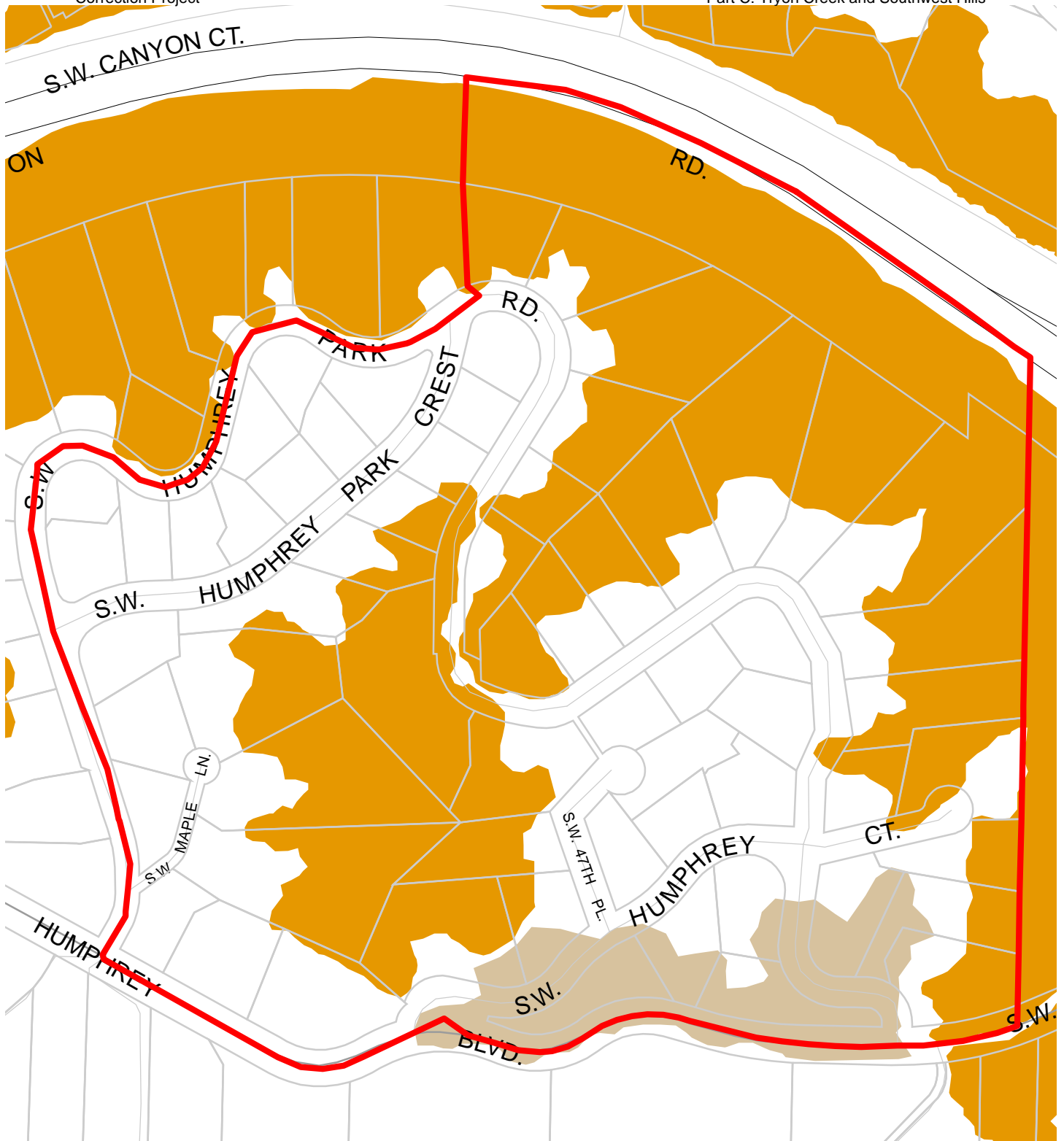
Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots



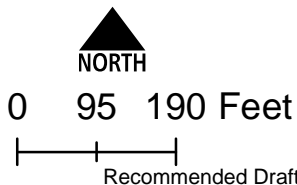
Recommended Draft - As Amended







The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.



**Map E: Wildlife
Habitat Classification**
Resource Site:
SW6

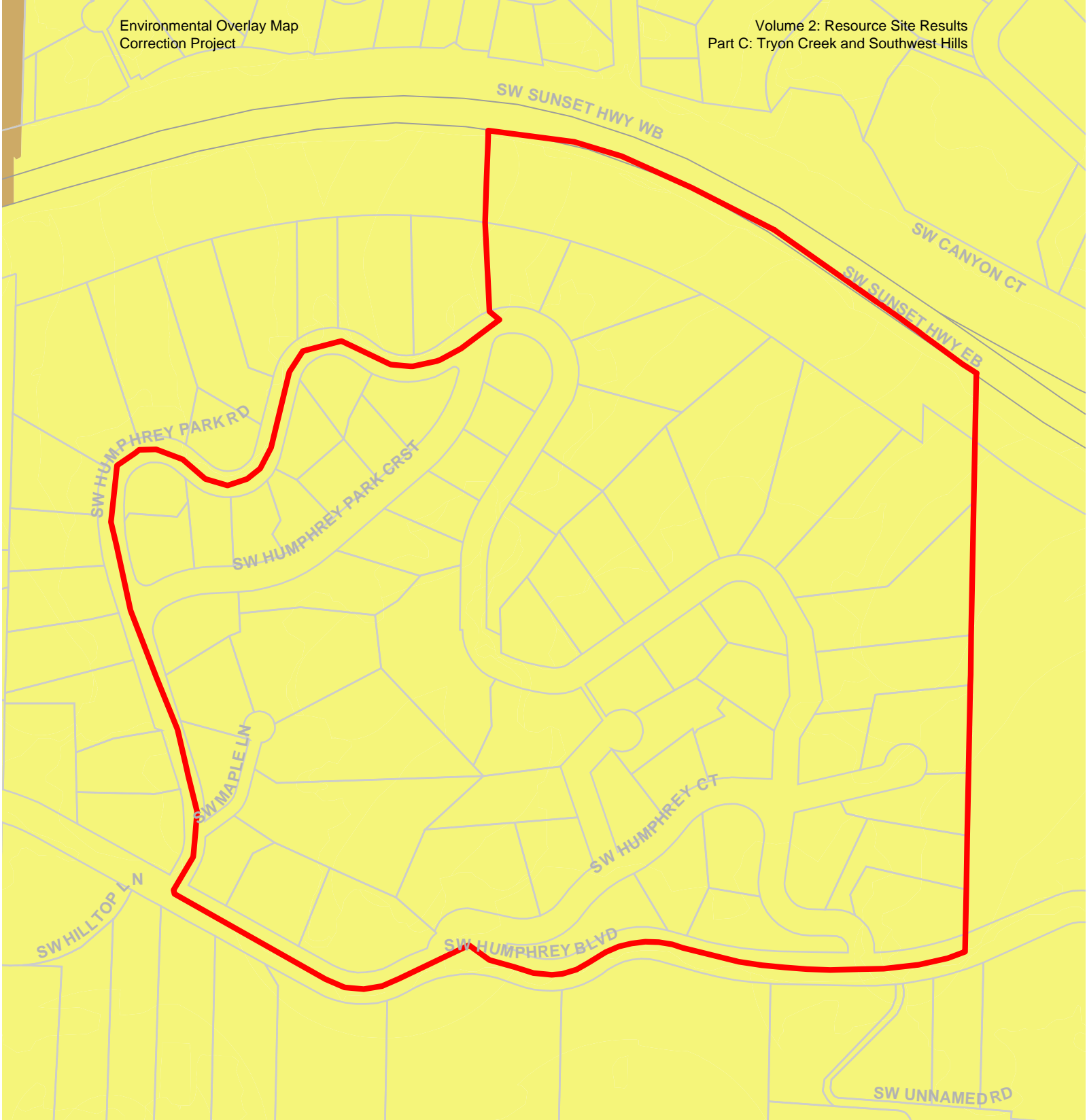
Updated: May 2022



-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots



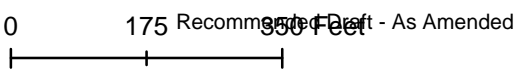
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.
May 2022



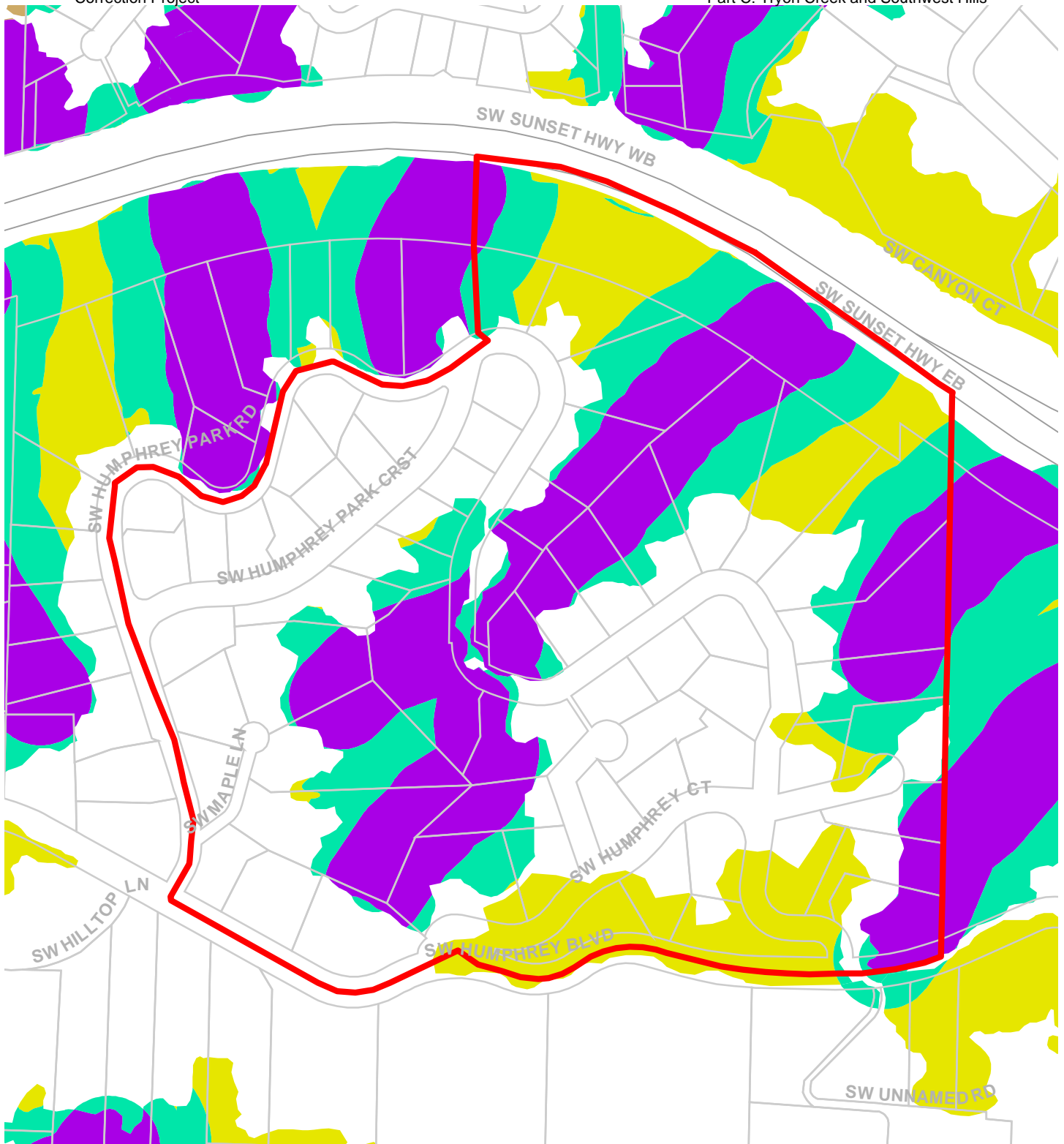
Map F: Urban Development Value (Title 13)
Resource Site: SW6

-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks

Updated: July 2021



The information on the map was derived from digital databases. 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 forms, and aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.



Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW6

Updated: May 2022



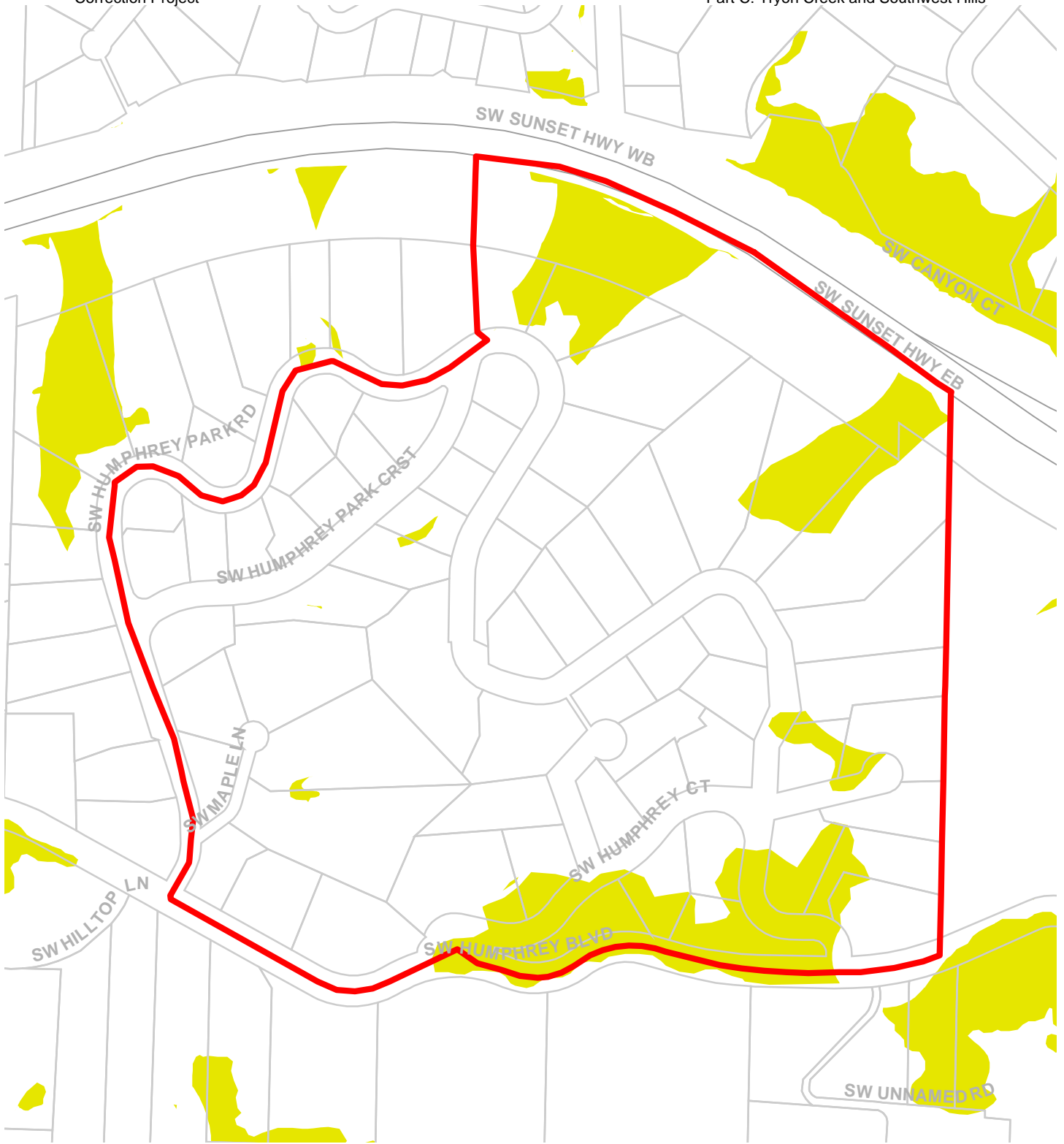
Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- HCA High Value
- HCA Moderate Value
- HCA Low Value
- Goal 5 Significant Natural Resources



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May 2022






Map H: Goal 5 Resources

Resource Site: SW6

Updated: May 2022



Recommended Draft - As Amended

-  Urban Service Boundary
 -  Resource Sites
 -  Goal 5 Significant Natural Resources
- Page 105



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.

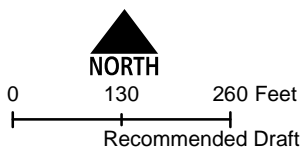
May 2022



Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
SW6**

Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Open Stream Channel
- Taxlots
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.
May 2022

Natural Resource Description

Within resource site SW6 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: None

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW6	
	Study Area
Stream (Miles)	0.4
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	22.6
Woodland (acres)	0.0
Shrubland (acres)	0.0
Herbaceous (acres)	0.0
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	34.8
* 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 areas with a slope greater than 25%.	

This resource site contains headwater streams that drain to critical habitat for ESA-listed salmon and trout in the lower Willamette River. Special status bird species found in this resource site include: bald eagle, black-throated gray warbler, bushtit, downy woodpecker, Pacific wren, purple finch, Swainson's thrush, and Wilson's warbler.

Table B: Quality of Natural Resource Functions in Resource Site SW6				
Resource Site (acres) = 45				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	10.3	6.4	6.1	22.8
percent total inventory site area	22.9%	14.4%	13.6%	50.9%
Wildlife Habitat*				
acres	0.0	19.6	3.0	22.6
percent total inventory site area	0.0%	43.8%	6.6%	50.4%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total⁺				
acres	10.3	9.6	2.9	22.8
percent total inventory site area	22.9%	21.4%	6.6%	50.9%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water. ** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors. +Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called "effective impervious area." The higher the percent of effective

impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For Resource Area SW6, almost the entire area is located outside current city boundaries and calculations on the impervious area managed are not currently available.

Table C. Impervious Area within Resource Site SW6			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
44.8	0.7	0.7	1.5%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW6. Natural resources should be protected within HCA as follows:

1. *Strictly limit or limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit or limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit or limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.

5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or *limiting* conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting* or *limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW6 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW6, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW6, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or 25 feet of wetlands.
2. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands; and within areas of forest vegetation contiguous to but more than 50 feet from stream top-of-bank.
3. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW7 Site Name: Sylvan J

Previous Plan: Multnomah County Urban Lands

Previous Resource Site No.: 111

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

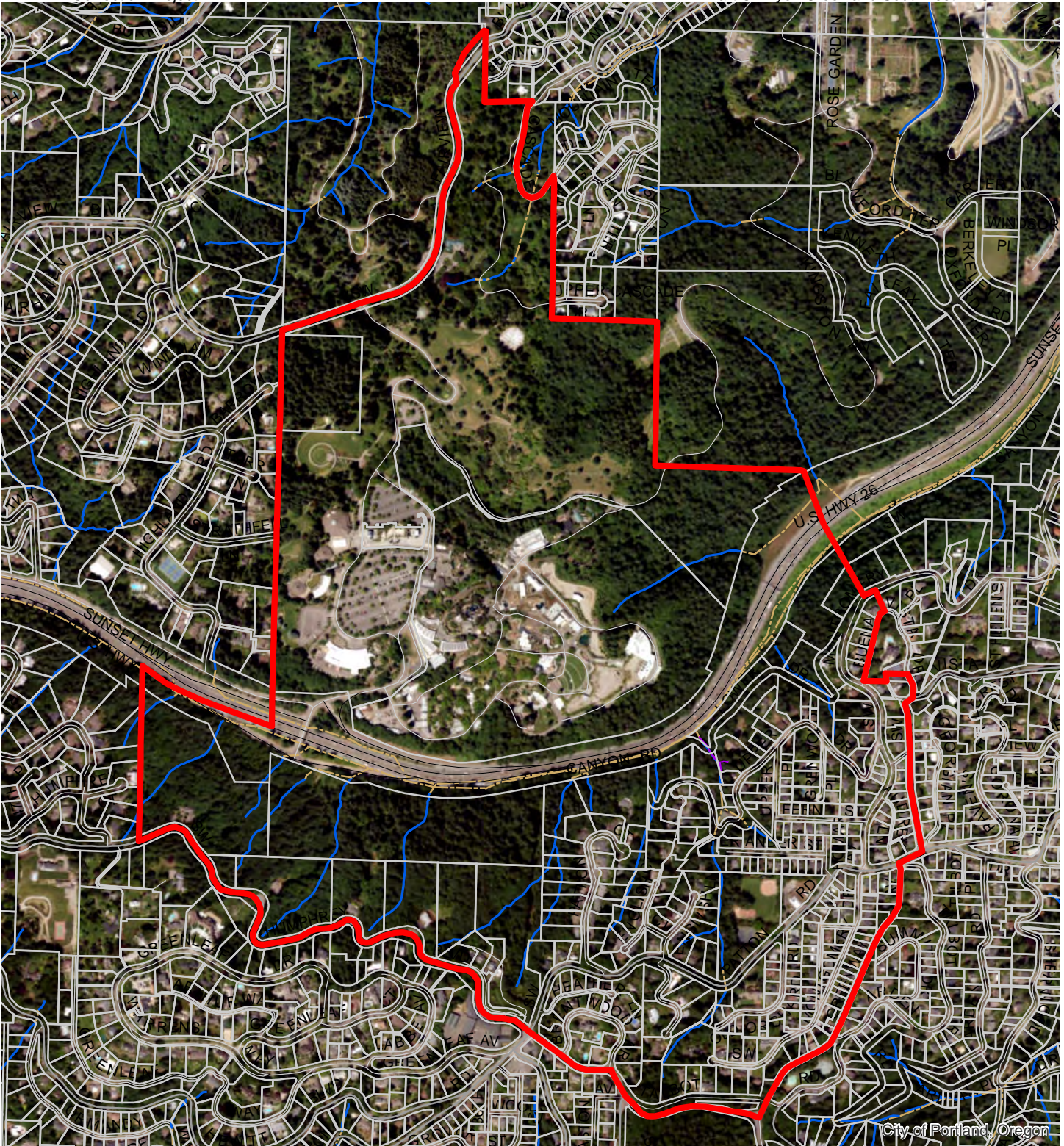
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW7 includes the following:

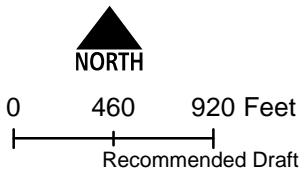
Site (acres)	396.7
Base zones (acres)	
CM1	1.4
OS	242.9
R10	69.6
R20	53.6
R5	27.7
R7	1.6



Map A: Water Features

Resource Site: SW7

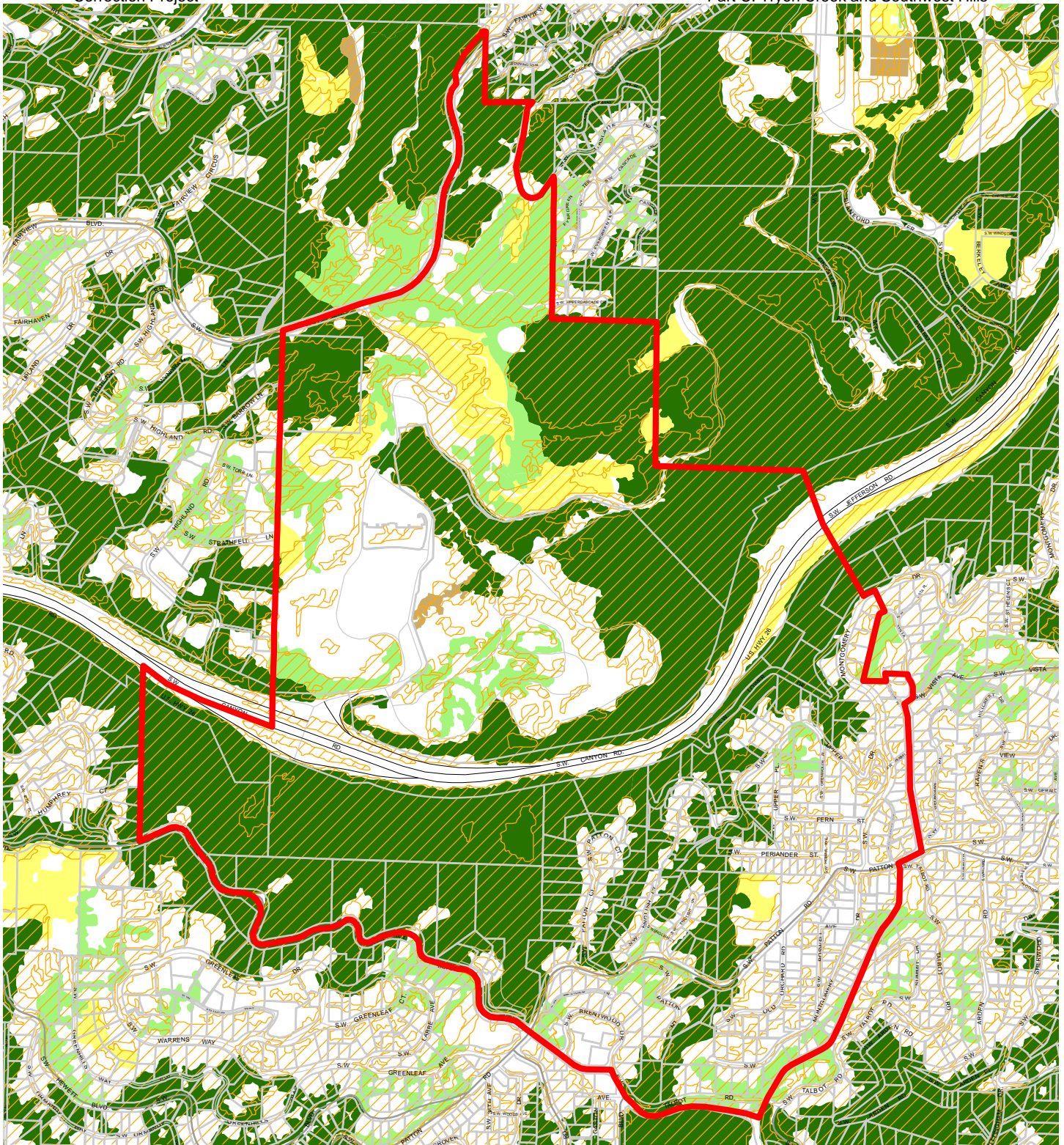
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



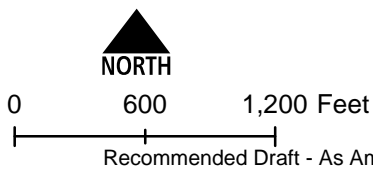
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Map B: Vegetation and Steep Slopes

Resource Site: SW7

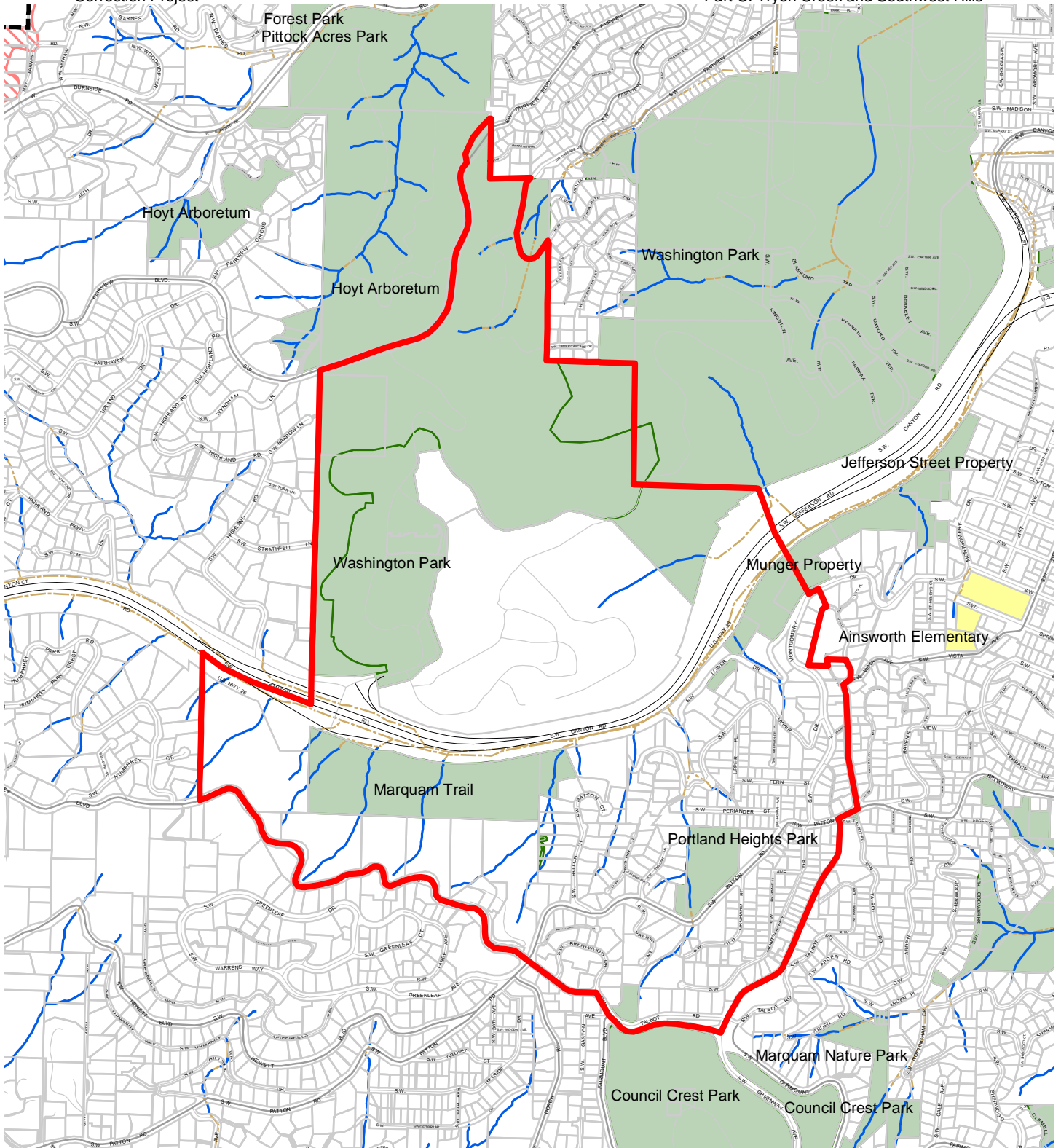
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous



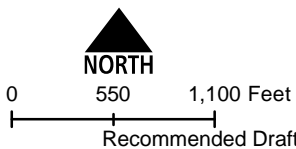
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**Map C: Special
Habitat Areas**

**Resource Site:
SW7**

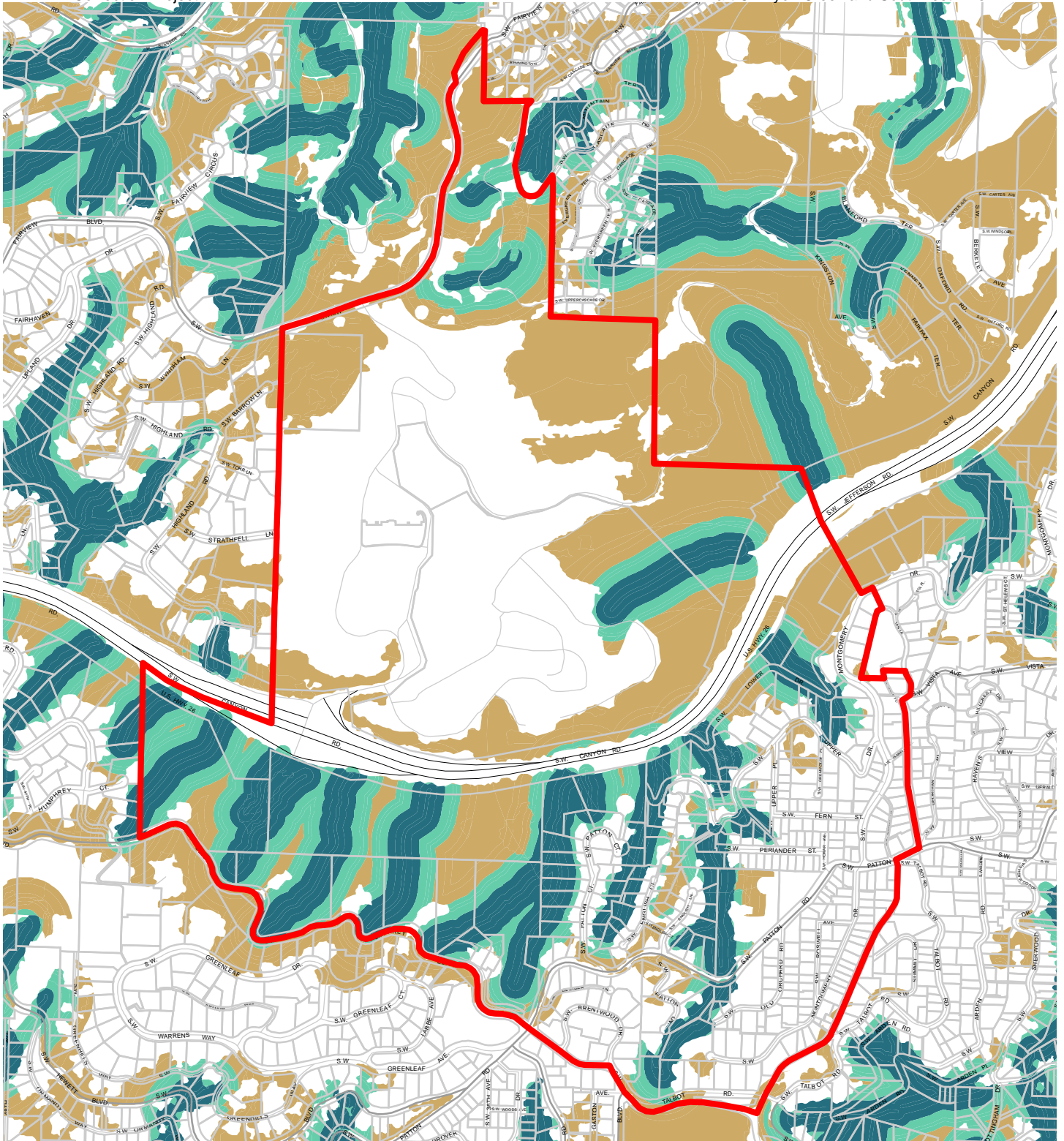
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Special Habitat Areas (SHAs)
- Taxlots
- Open Stream Channel
- Piped Stream Segment
- Parks
- Schools



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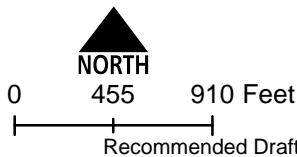


**Map D: Riparian
Corridors Habitat
Classification**

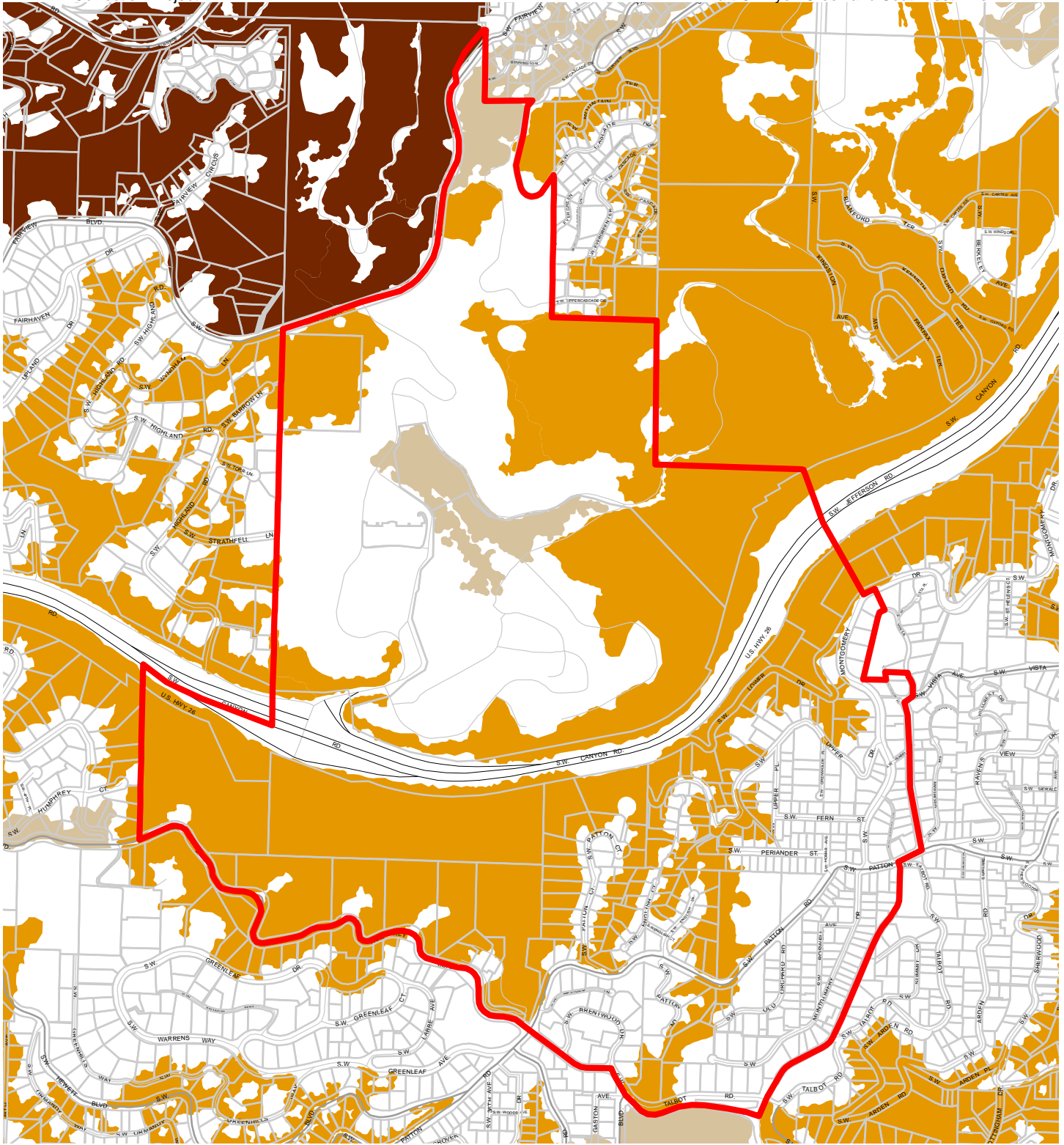
**Resource Site:
SW7**

Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots

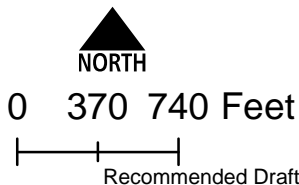








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May 2022



**Map E: Wildlife
Habitat Classification
Resource Site:
SW7**

Updated: May 2022

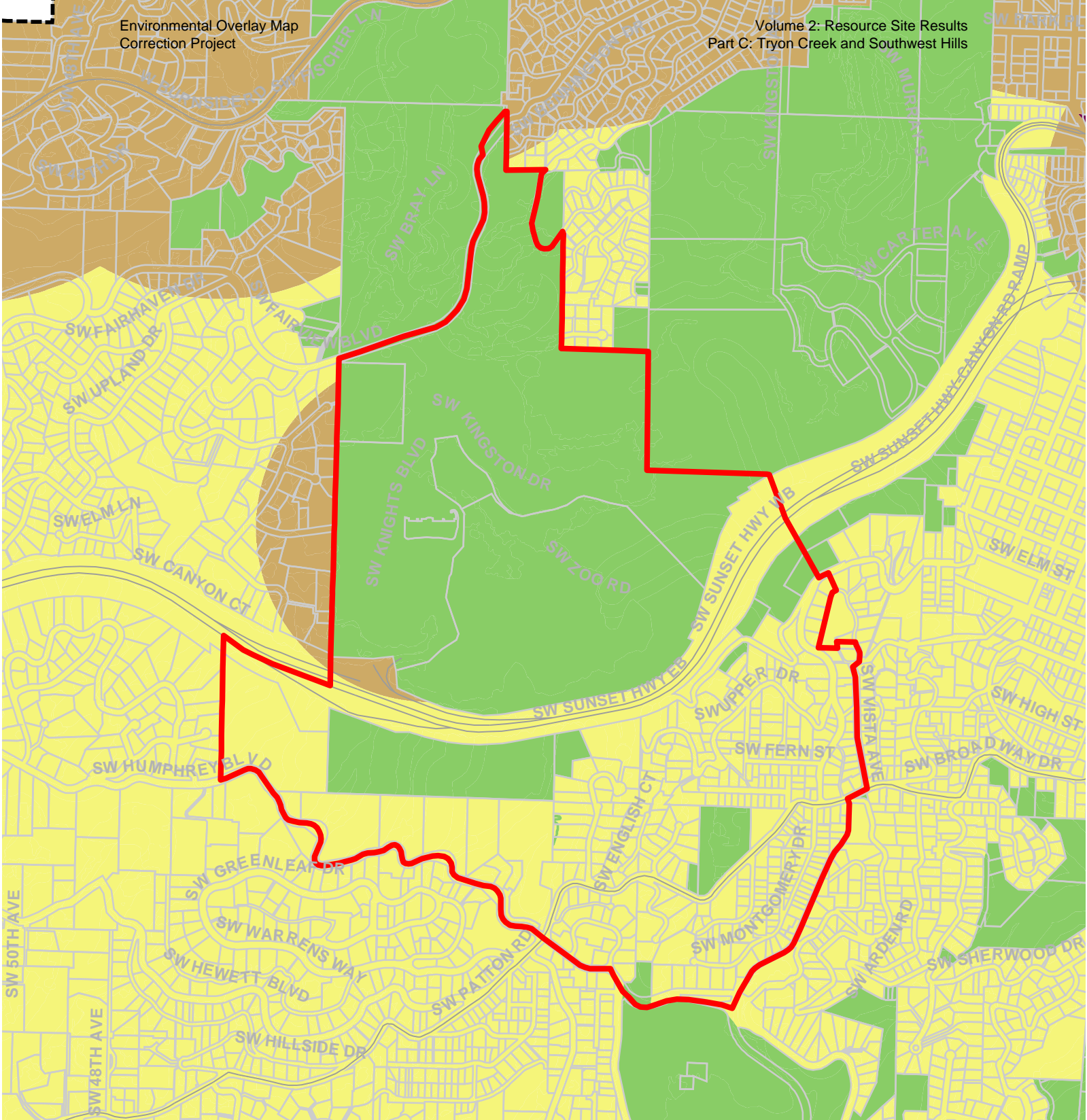


-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots

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Map F: Urban Development Value (Title 13)
Resource Site: SW7

-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks

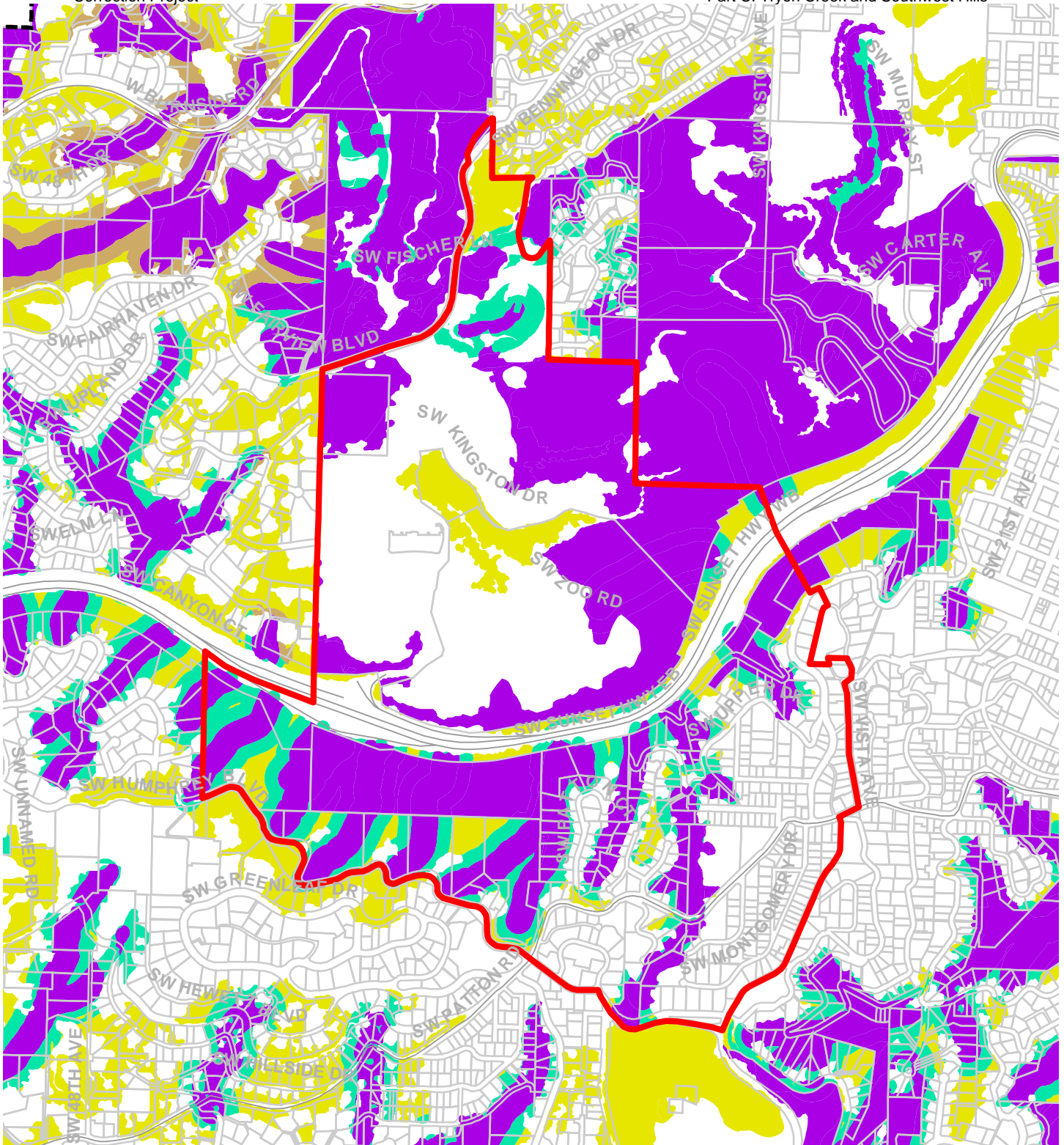


Updated: July 2021



0 650 1,300 Feet
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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW7

Updated: May 2022



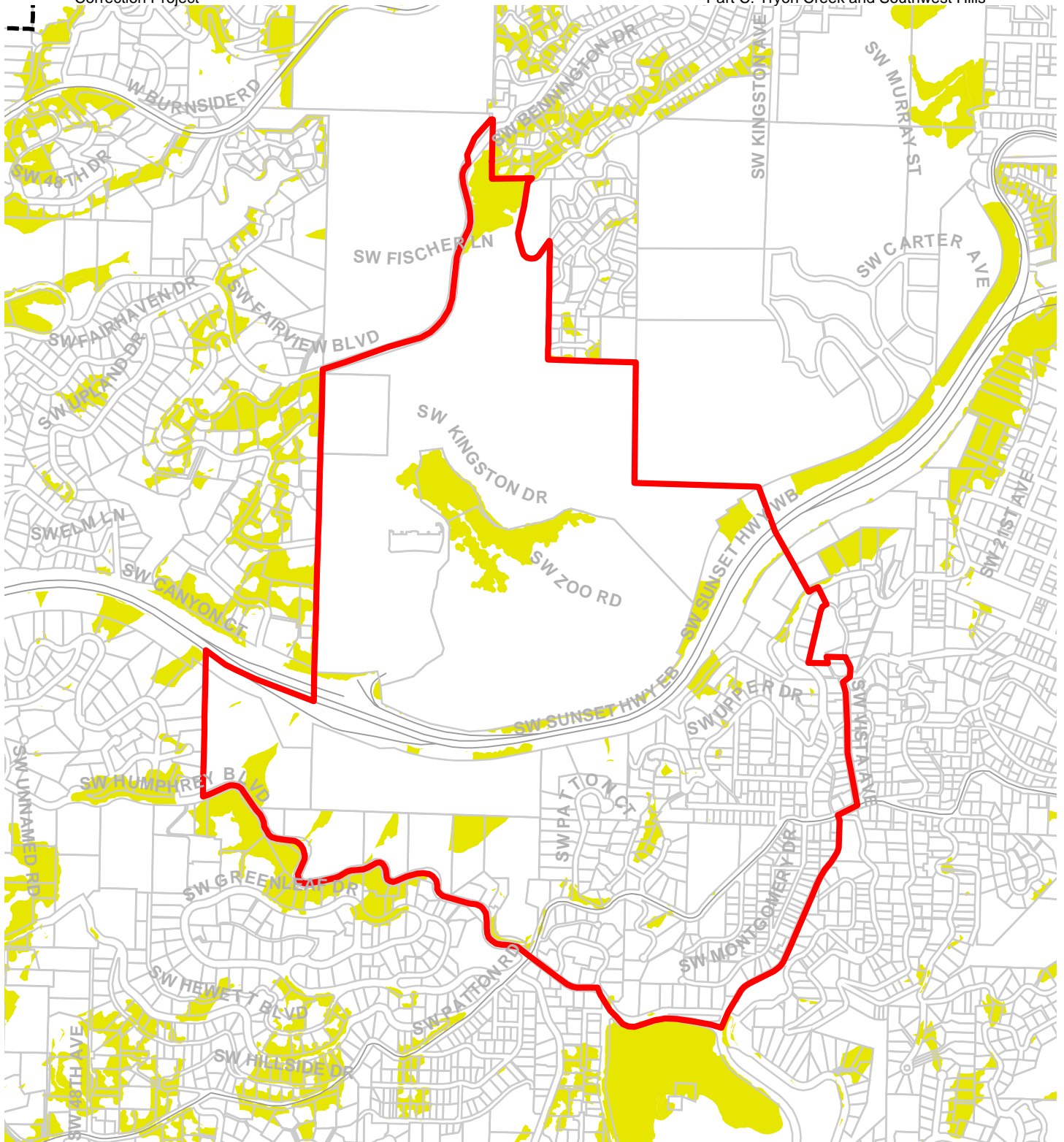
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- Urban Service Boundary
- ▭ Resource Sites
- ▭ HCA High Value
- ▭ HCA Moderate Value
- ▭ HCA Low Value
- ▭ Goal 5 Significant Natural Resources



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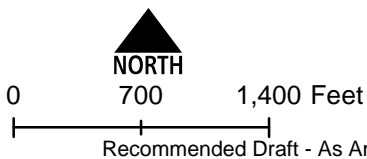
May 2022



Map H: Goal 5 Resources

Resource Site: SW7

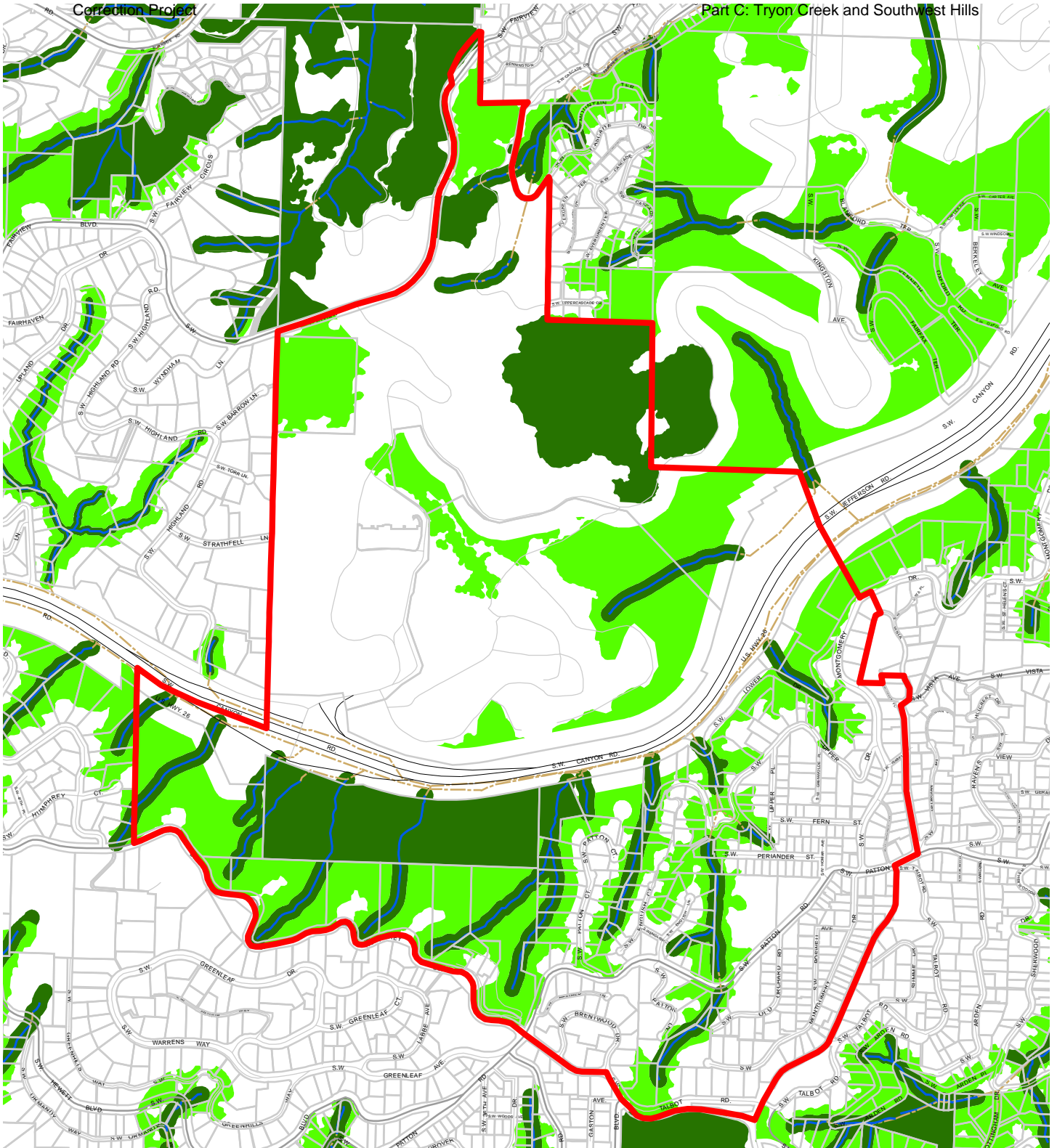
Updated: May 2022



- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



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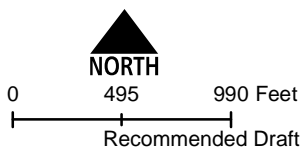


Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
SW7**

Updated: May 2022

- Resource Sites
- Urban Service Boundary
- Open Stream Channel
- Taxlots
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone



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Natural Resource Description

Within resource site SW7 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: None

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW7	
	Study Area
Stream (Miles)	2.5
Wetlands (acres)	0.1
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	186.7
Woodland (acres)	36.4
Shrubland (acres)	0.7
Herbaceous (acres)	16.6
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	277.4
* 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 areas with a slope greater than 25%.	

This site is part of the Westside Wildlife Corridor-River View Natural Area Management Plan (2015); please refer to Appendix A, Corridor Analysis, for additional information.

This resource site includes forested headwater streams that drain to critical habitat of ESA-listed salmon and trout species in the lower Willamette River. Special status bird species found in this resource site include: bald eagle, brown creeper, bushtit, downy woodpecker, Hutton's vireo, Pacific wren, pileated woodpecker, and varied thrush. Rare plants documented in this resource site include Hooded lady's tresses (*Spiranthes romanzoffiana*) and Oregon White Oak.

Table B: Quality of Natural Resource Functions in Resource Site SW7				
Resource Site (acres) = 397				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	60.3	45.6	89.7	195.5
percent total inventory site area	15.2%	11.5%	22.6%	49.3%
Wildlife Habitat*				
acres	0.3	177.9	14.3	192.6
percent total inventory site area	0.1%	44.9%	3.6%	48.5%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total⁺				
acres	60.6	125.5	24.1	210.1
percent total inventory site area	15.3%	31.6%	6.1%	53.0%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.				
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.				
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in

the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called “effective impervious area.” The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For resource site SW7, 8.9% of the total area is effectively impervious. This indicates a significant degree of stormwater management and/or existing natural resources that should be preserved. Areas with very low impervious cover and existing vegetation are more likely to be functioning properly to support biologic systems.

Table C. Impervious Area within Resource Site SW7			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
396.7	80.7	35.3	8.9%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW7. Natural resources should be protected within HCA as follows:

1. *Strictly limit* or *limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit* or *limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit* or *limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or *limiting* conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting* or *limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW7 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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, R10 and R5 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW7, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW7, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or 25 feet of wetlands.
2. Apply a protection overlay zone ('p' zone) to areas of forest vegetation in Hoyt Arboretum.
3. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands; and within areas of forest vegetation contiguous to but more than 50 feet from stream top-of-bank.
4. Apply a conservation overlay zone ('c' zone) to the forest canopy in the northwest corner of the Vietnam Veterans of Oregon Memorial, contiguous to SW Fairway Blvd.
5. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW8 **Site Name:** Canyon Road East

Previous Plan: Southwest hills Resource Protection Plan

Previous Resource Site No.: 112

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW8 includes the following:

Site (acres)	424.0
Base zones (acres)	
CE	1.7
CM1	0.7
CM3	0.2
CX	13.2
OS	192.8
R10	73.7
R5	48.6
R7	48.0
RM1	9.4
RM2	27.1
RM3	8.6



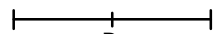
Map A: Water Features

Resource Site: SW8

Updated: May 2022



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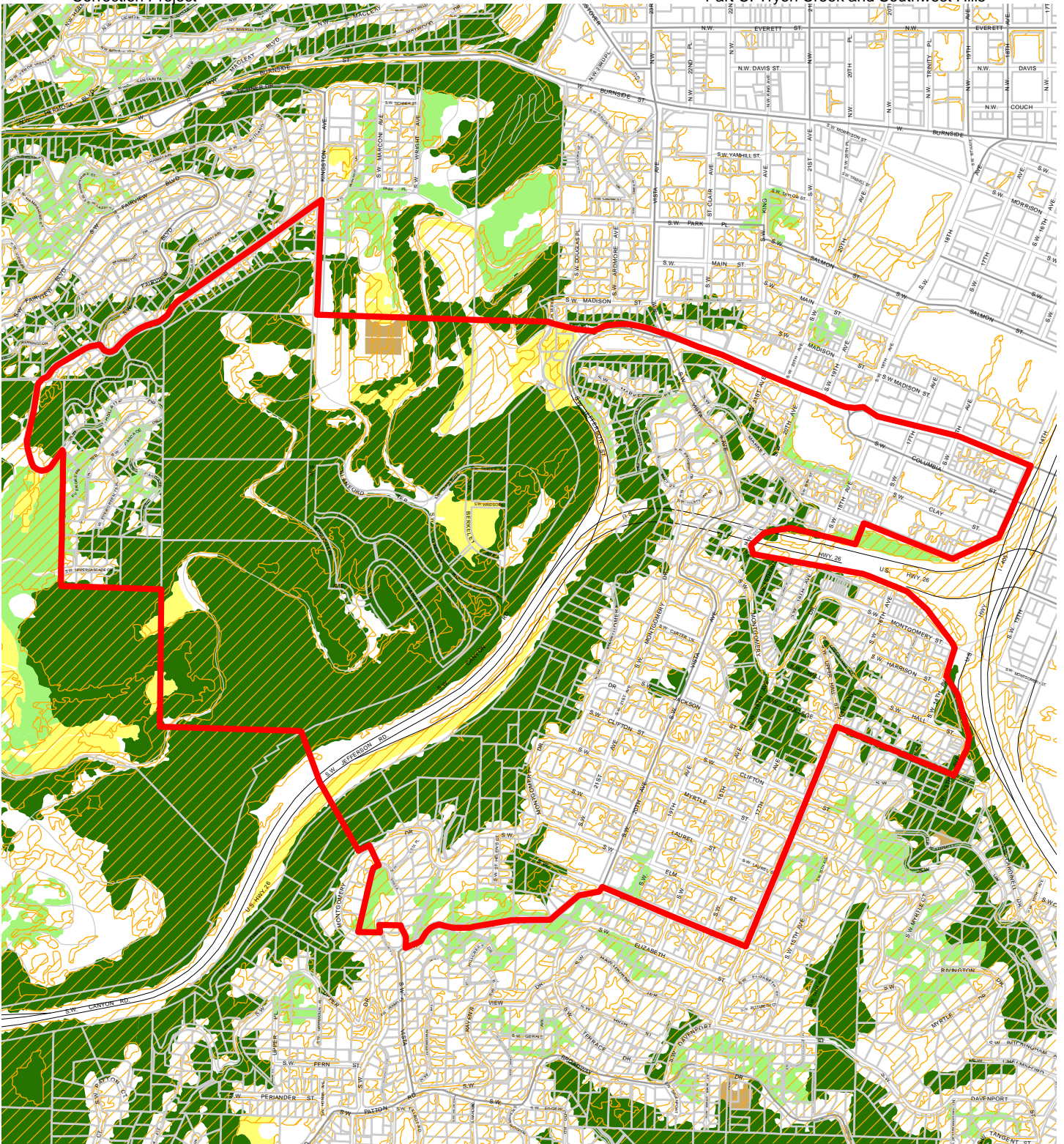


Recommended Draft - As Amended

- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



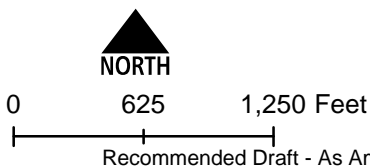
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Map B: Vegetation and Steep Slopes

Resource Site: SW8

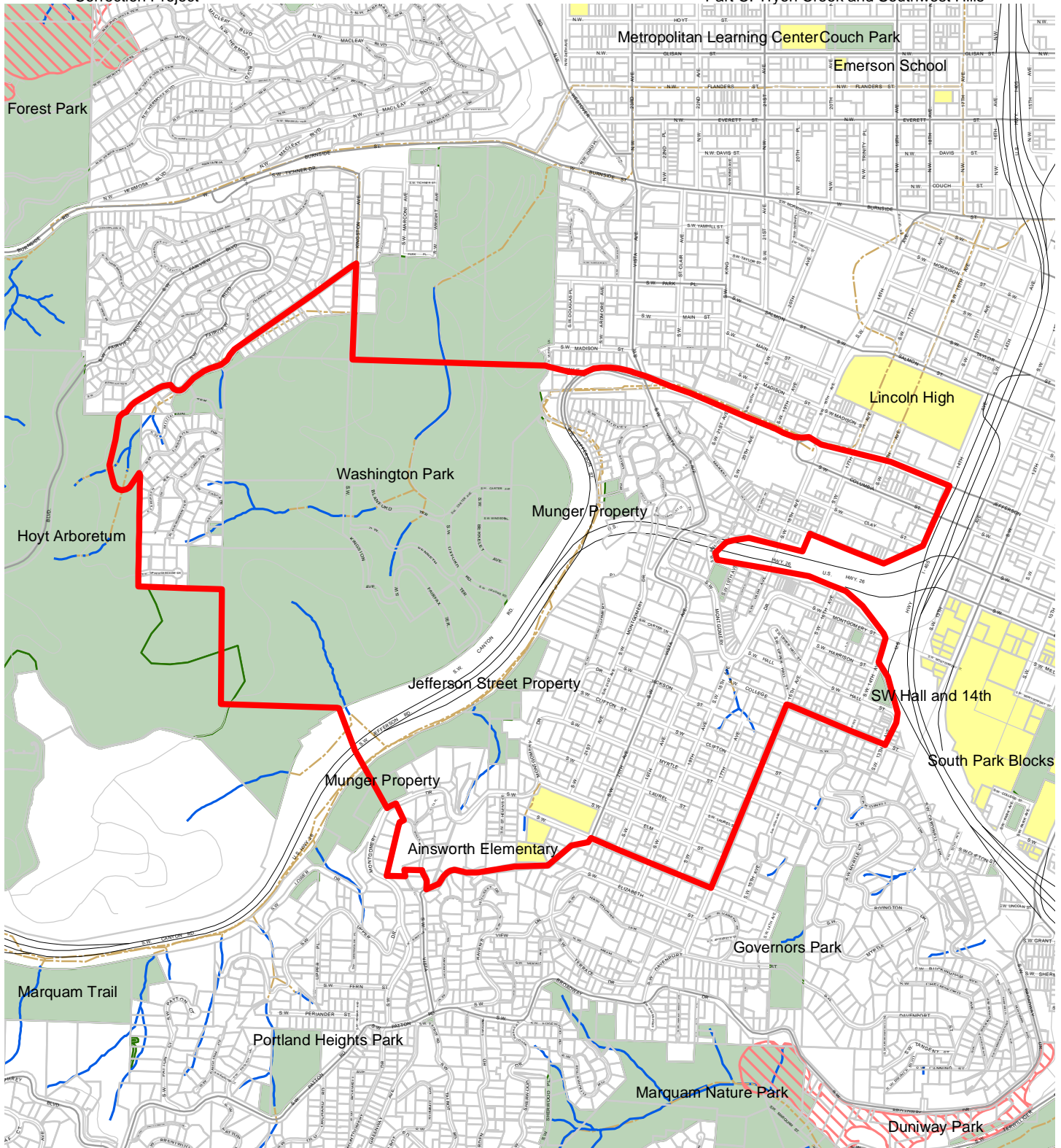
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous



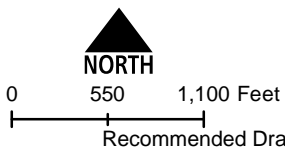
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**Map C: Special
Habitat Areas**

**Resource Site:
SW8**

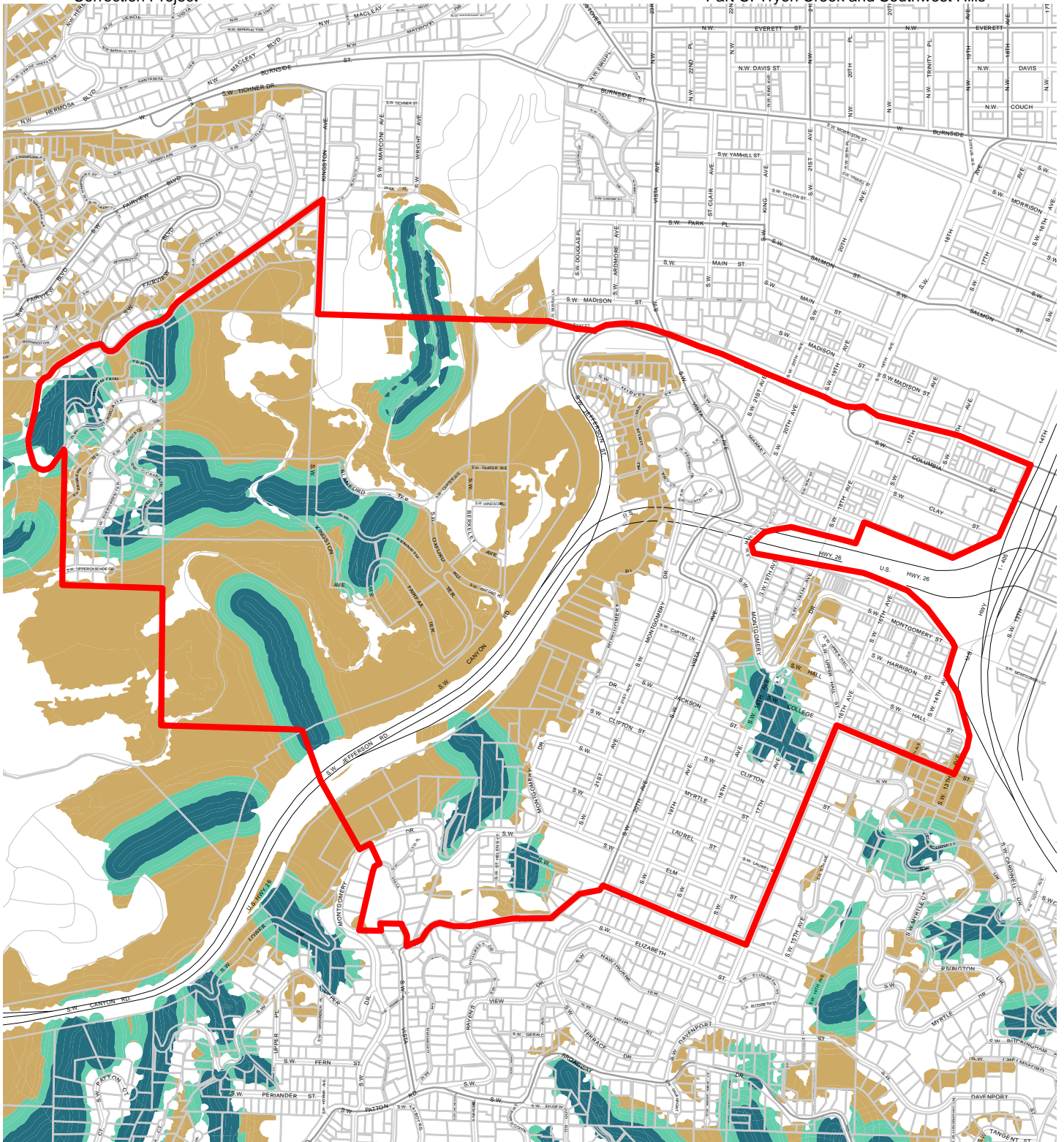
Updated: May 2022



- Resource Sites
- Special Habitat Areas (SHAs)
- Open Stream Channel
- Piped Stream Segment
- Parks
- Schools
- Urban Service Boundary
- Taxlots



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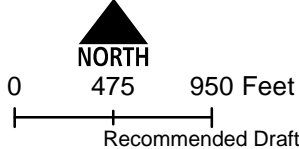


**Map D: Riparian
Corridors Habitat
Classification**

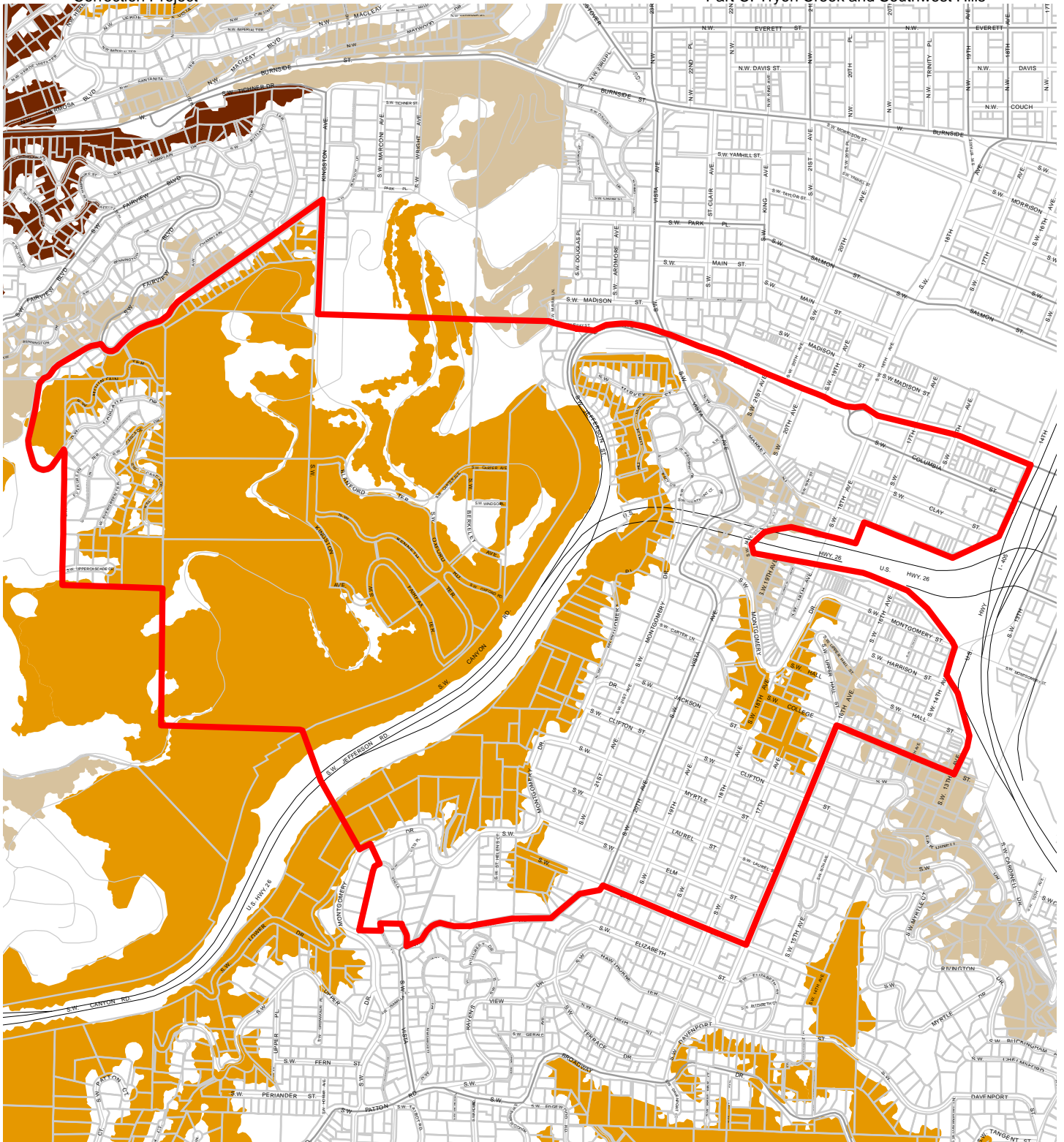
**Resource Site:
SW8**

Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots



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


**Map E: Wildlife
Habitat Classification**
Resource Site:
SW8

Updated: May 2022

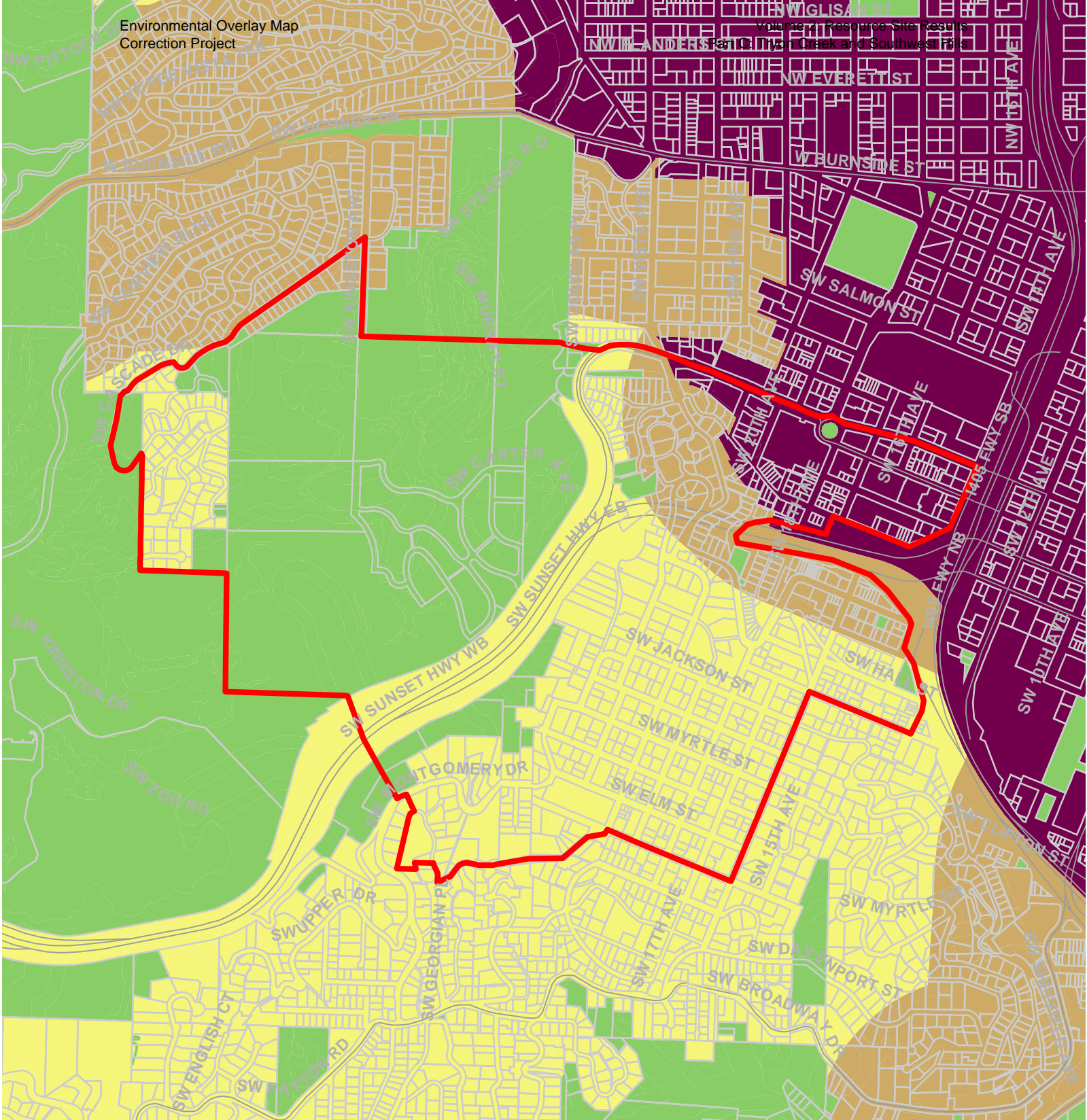
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-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots



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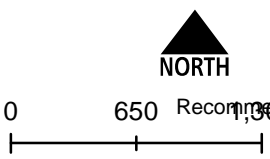


Map F: Urban Development Value (Title 13)
Resource Site: SW8

-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks

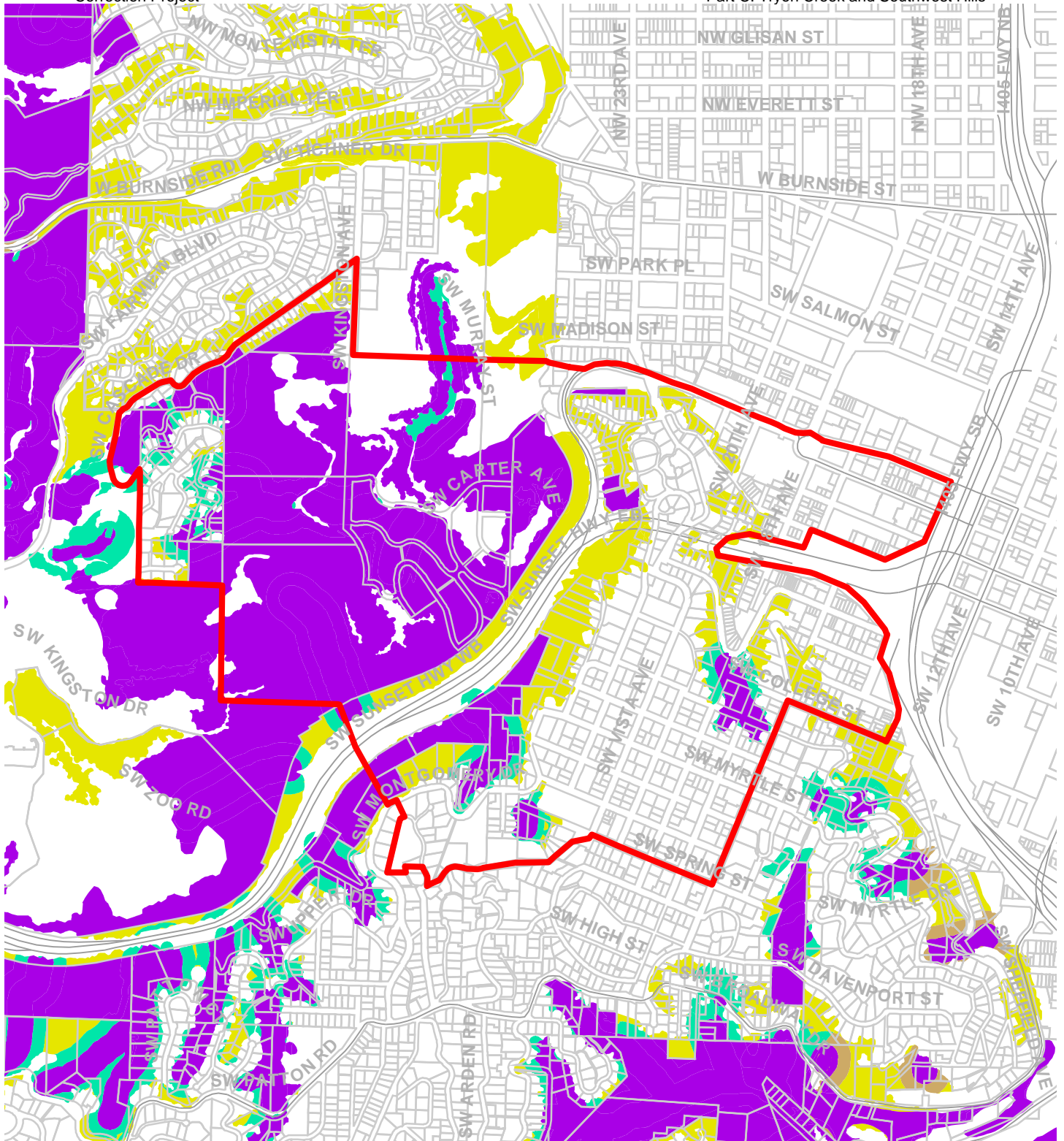


Updated: July 2021



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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW8

Updated: May 2022

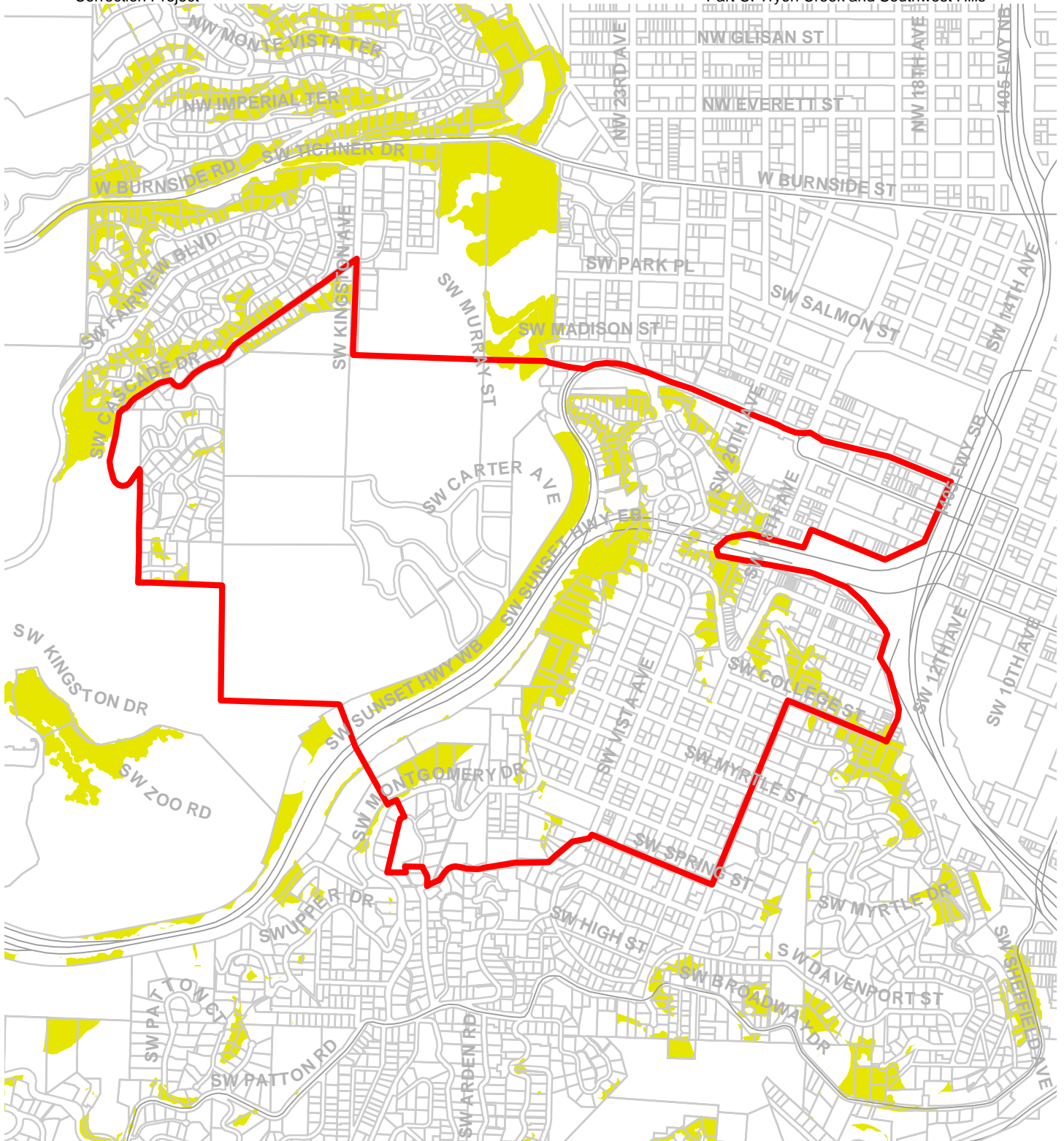


Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- HCA High Value
- HCA Moderate Value
- HCA Low Value
- Goal 5 Significant Natural Resources



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Map H: Goal 5 Resources

Resource Site: SW8

Updated: May 2022



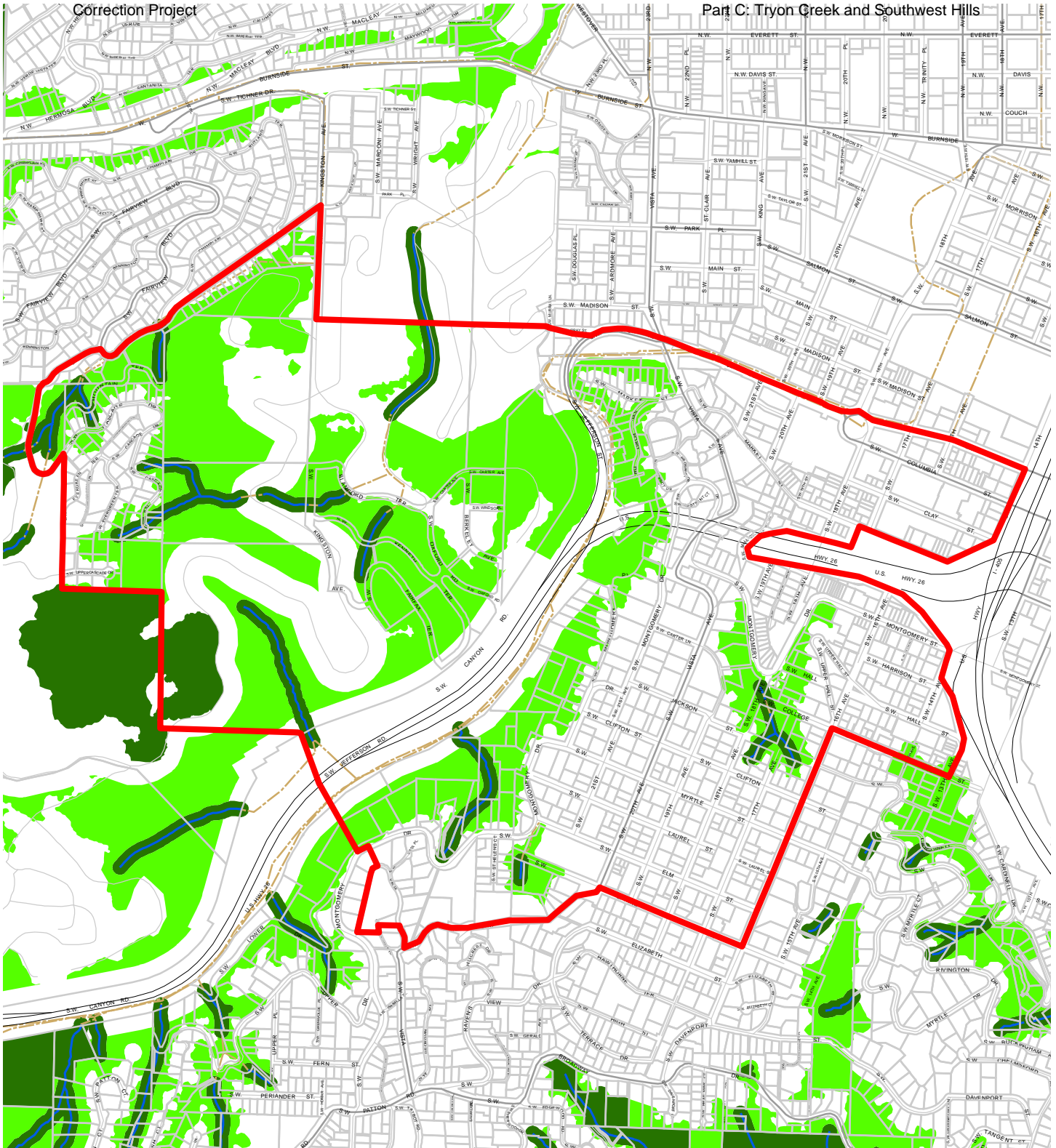
- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources

Recommended Draft - As Amended



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May 2022

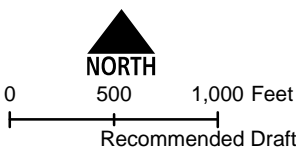


Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
SW8**

Updated: May 2022

- Resource Sites
- Urban Service Boundary
- Open Stream Channel
- Taxlots
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone



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Natural Resource Description

Within resource site SW8 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: None

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW8	
	Study Area
Stream (Miles)	1.4
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	202.9
Woodland (acres)	10.3
Shrubland (acres)	1.2
Herbaceous (acres)	11.1
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	299.5
* 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 areas with a slope greater than 25%.	

This site is part of the Westside Wildlife Corridor-River View Natural Area Management Plan (2015), Appendix A, Corridor Analysis. The site resources include forest uplands and ravines that have perennial and intermittent creeks. These natural features provide habitat for local wildlife. The predominant trees are Douglas fir and bigleaf maple plus the uncommon climax species, grand fir. The forest ranges from early to later seral stages, 40 to 80 years old with hardwood with young conifer and conifer topping hardwood. The representative forest has an 80 percent tree canopy closure, 20 percent shrub closure and 90 percent herbaceous closure. Approximately one snag per acre exists providing important nesting and food resources. Exotic plant species are invading and threatening the health of the habitat.

The two large tracts of contiguous forest that occur on this site increase the habitat quality. One is formed by two ridges located south of Highway 26 that cover approximately nine acres. The other area is the undeveloped portion of Washington Park that abuts the north side of Highway 26. It is about 200 acres in size (including the area that extends beyond the site boundary).

Special status bird species found in this resource site include: bald eagle, band-tailed pigeon, black-throated gray warbler, brown creeper, bushtit, downy woodpecker, orange-crowned warbler, Pacific-slope flycatcher, Pacific wren, pileated woodpecker, purple finch, Swainson's thrush, varied thrush, white-breasted nuthatch, and Wilson's warbler.

Table B: Quality of Natural Resource Functions in Resource Site SW8				
Resource Site (acres) = 424				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	33.5	32.5	131.2	197.3
percent total inventory site area	7.9%	7.7%	31.0%	46.5%
Wildlife Habitat*				
acres	0.0	188.4	10.4	198.8
percent total inventory site area	0.0%	44.4%	2.5%	46.9%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total⁺				
acres	33.5	158.1	17.1	208.7
percent total inventory site area	7.9%	37.3%	4.0%	49.2%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.				
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.				
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called "effective impervious area." The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter

pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For Resource Area SW8, 20.5% of the total area is effectively impervious, indicating a critical level of vulnerability, with negative impacts beginning to impact natural functions, but natural processes still in place and providing support to biologic systems.

Table C. Impervious Area within Resource Site SW8			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
424.0	103.4	86.9	20.5%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW8. Natural resources should be protected within HCA as follows:

1. *Strictly limit or limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit or limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit or limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, expect parks and open space.

Strictly limiting or limiting conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting or limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW8 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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, R7, R5, R2, R1, and RH base zones. Commercial uses are allowed in the CX, CE and 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW8, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW8, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or 25 feet of wetlands.
2. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands; and within areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
3. Apply a conservation overlay zone ('c' zone) to forest vegetation along SW College St.
4. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW9 Site Name: Marquam Hill Ravine

Previous Plan: Southwest hills Resource Protection Plan

Previous Resource Site No.: 113

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

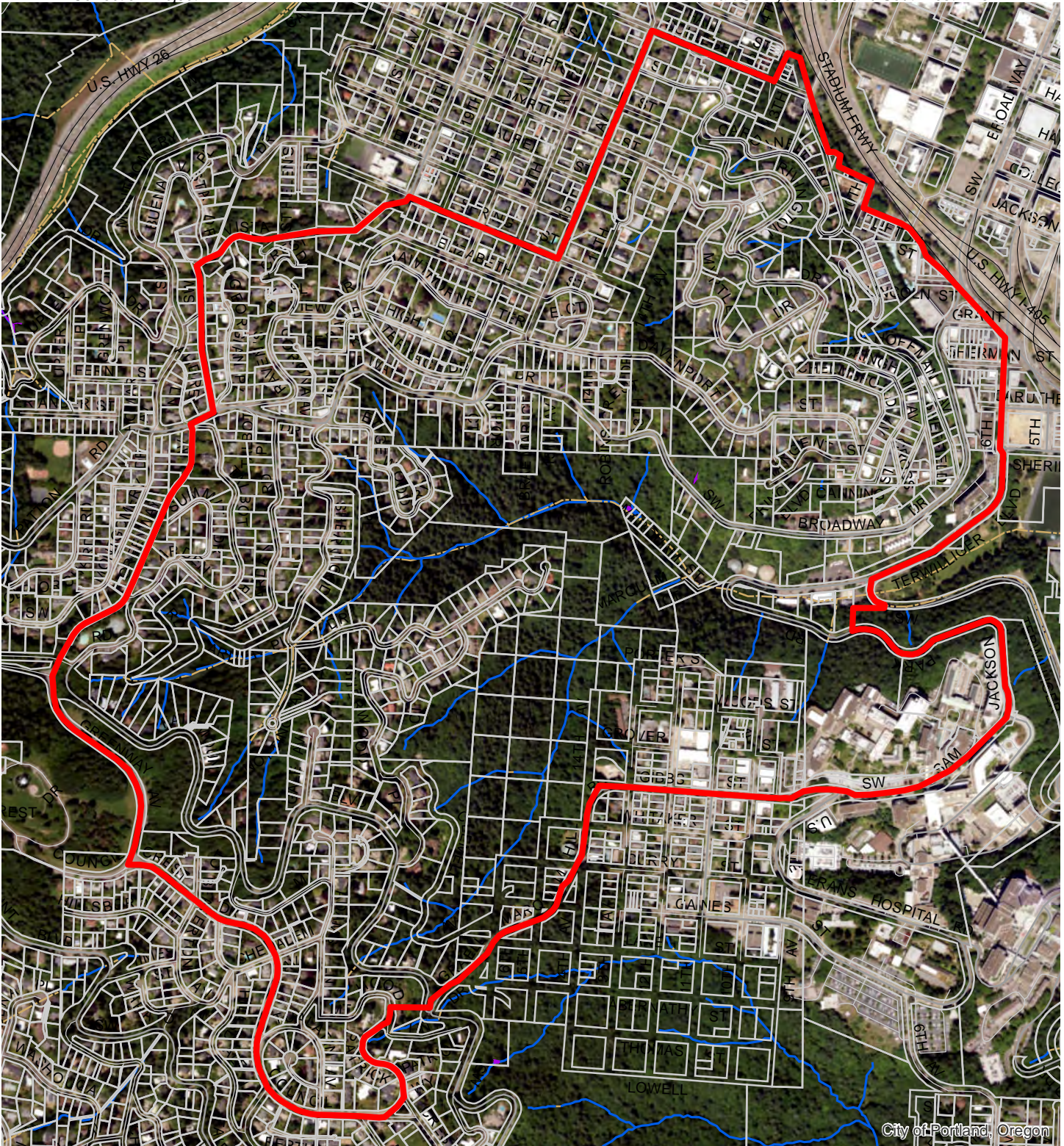
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW9 includes the following:

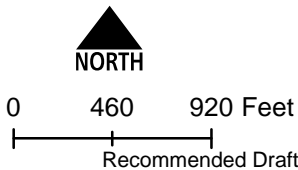
Site (acres)	536.2
Base zones (acres)	
CE	5.5
CM1	0.0
CM2	4.4
CM3	1.7
EX	28.2
OS	106.0
R10	200.2
R5	52.9
R7	79.6
RM1	8.6
RM2	34.3
RM3	0.8
RM4	14.0



Map A: Water Features

Resource Site: SW9

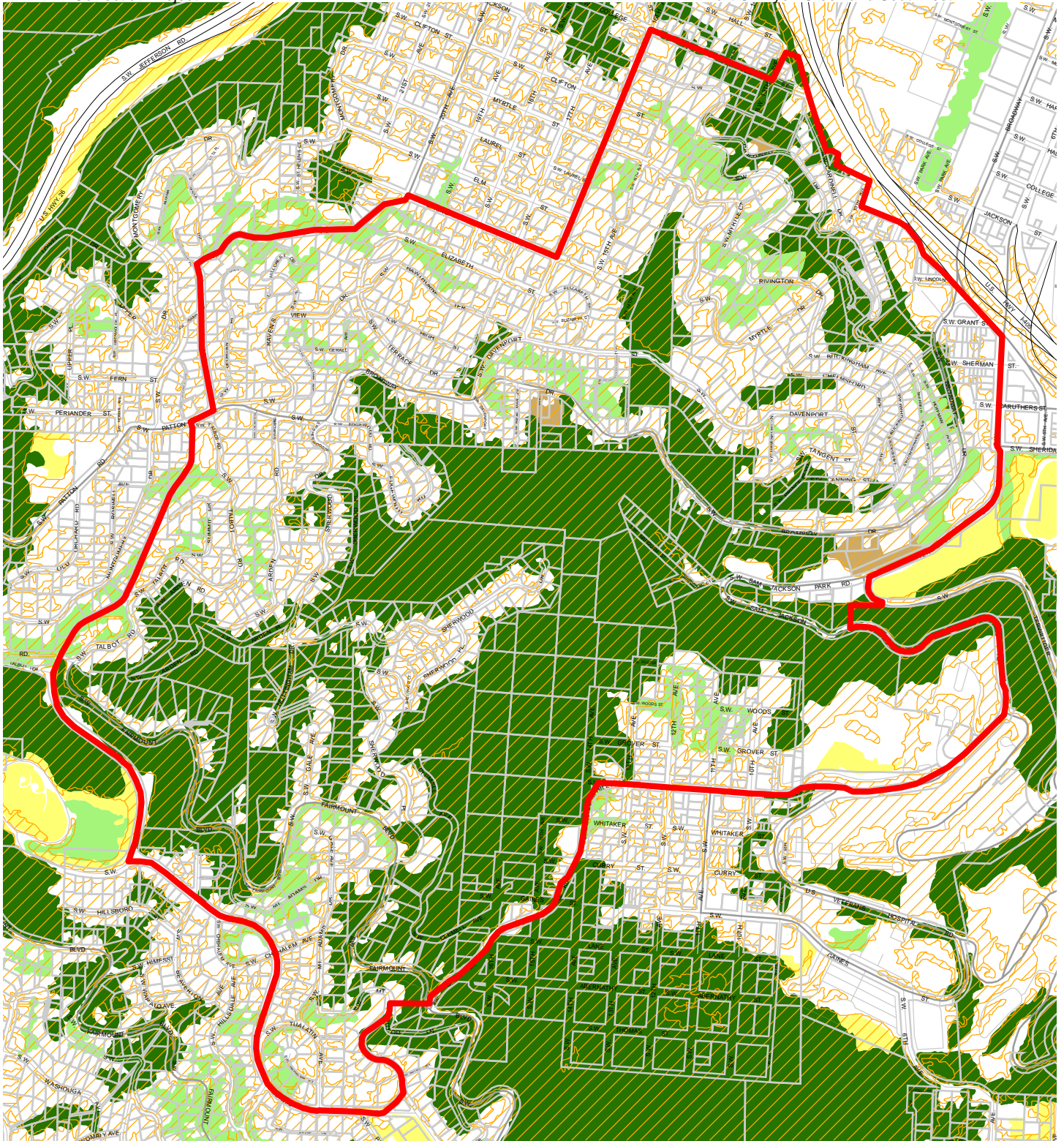
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



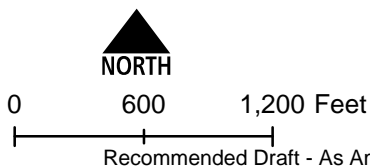
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May 2022



Map B: Vegetation and Steep Slopes

Resource Site: SW9

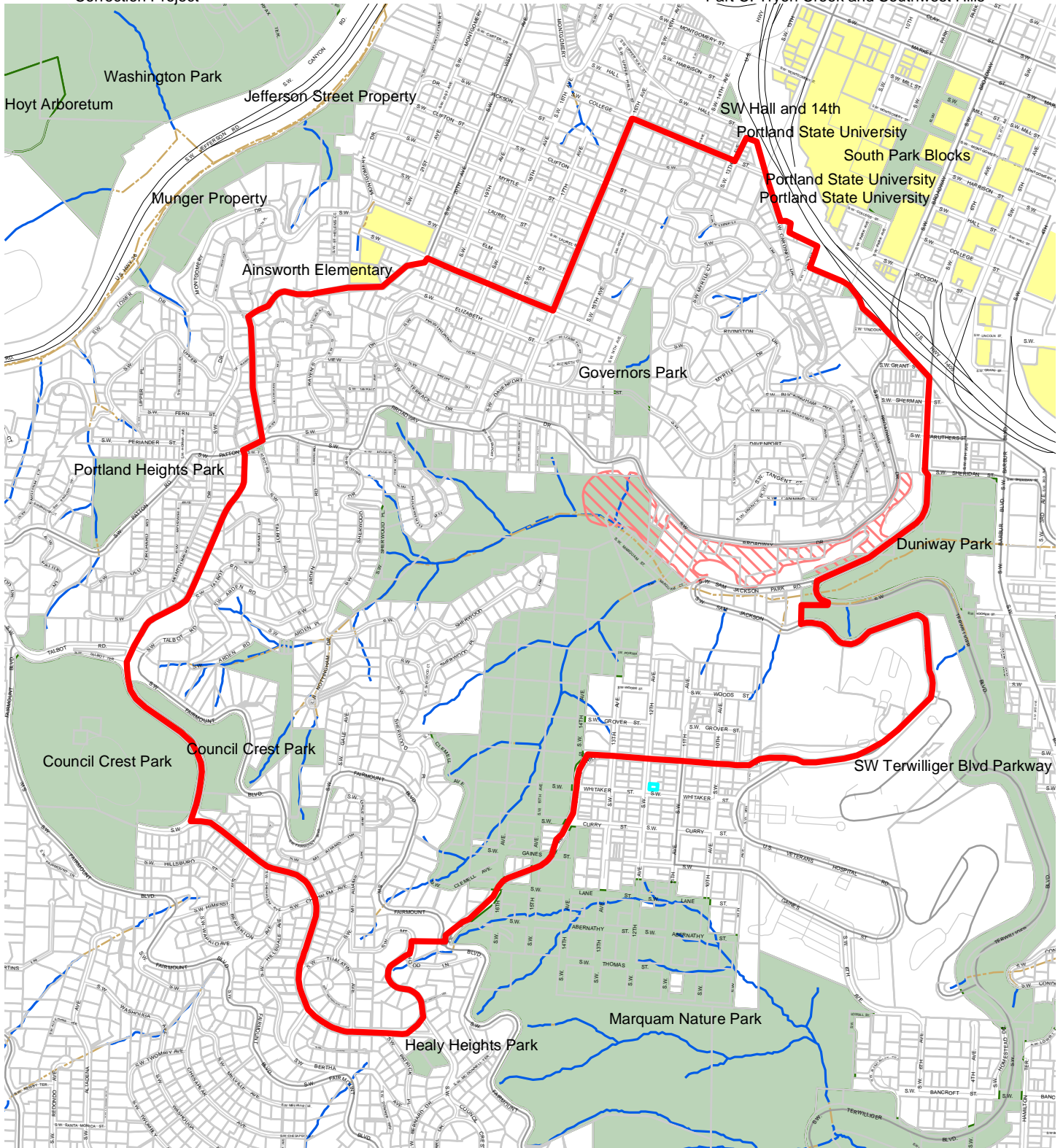
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous



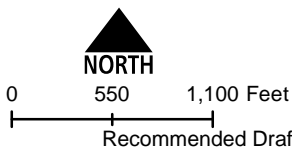
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**Map C: Special
Habitat Areas**

**Resource Site:
SW9**

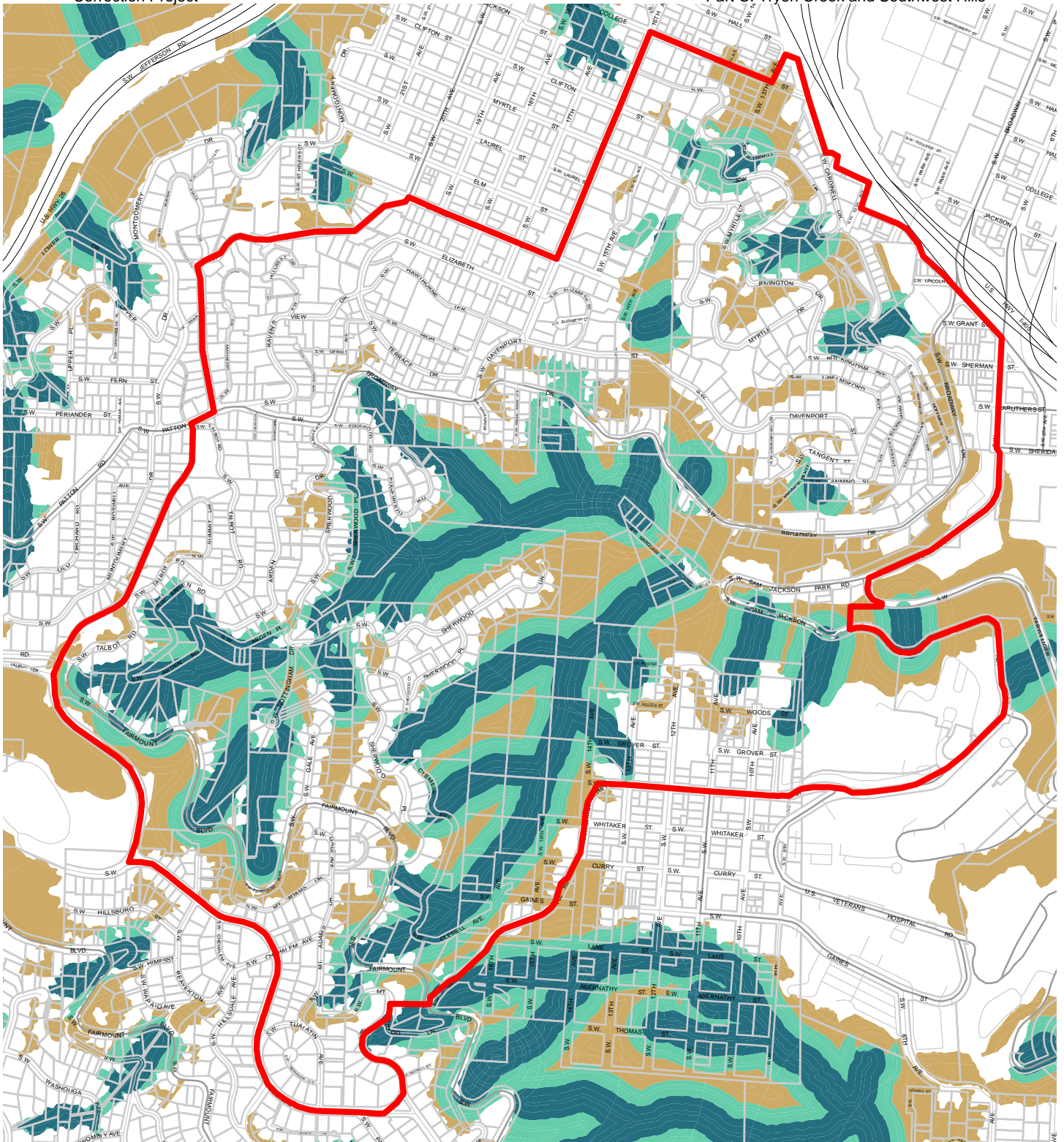
Updated: May 2022



- Resource Sites
- Special Habitat Areas (SHAs)
- Open Stream Channel
- Piped Stream Segment
- Parks
- Schools
- Urban Service Boundary
- Taxlots



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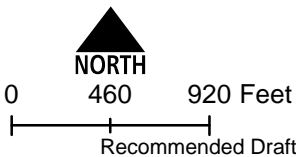


**Map D: Riparian
Corridors Habitat
Classification**

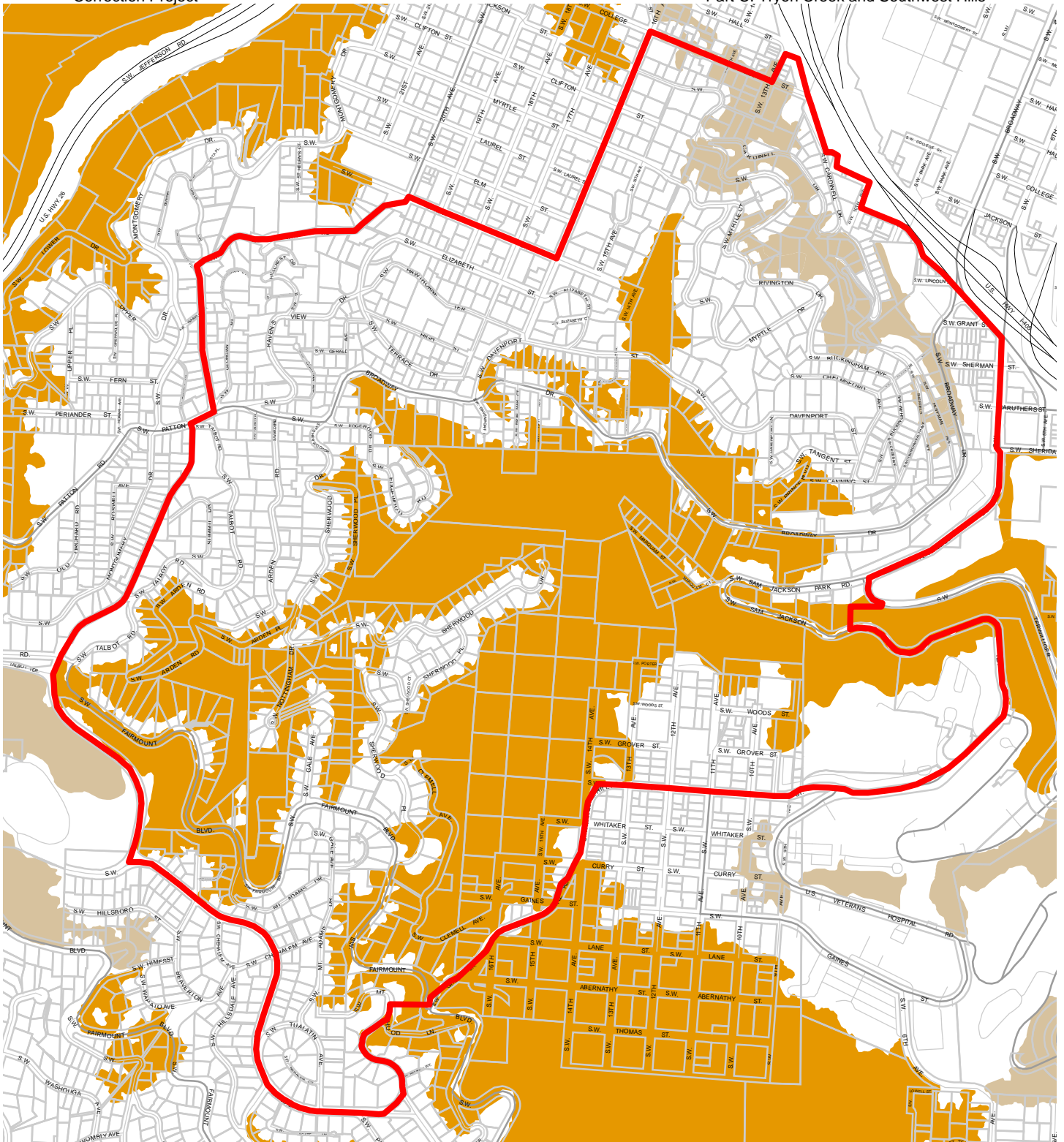
**Resource Site:
SW9**

Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots









The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.



**Map E: Wildlife
Habitat Classification
Resource Site:
SW9**

Updated: May 2022

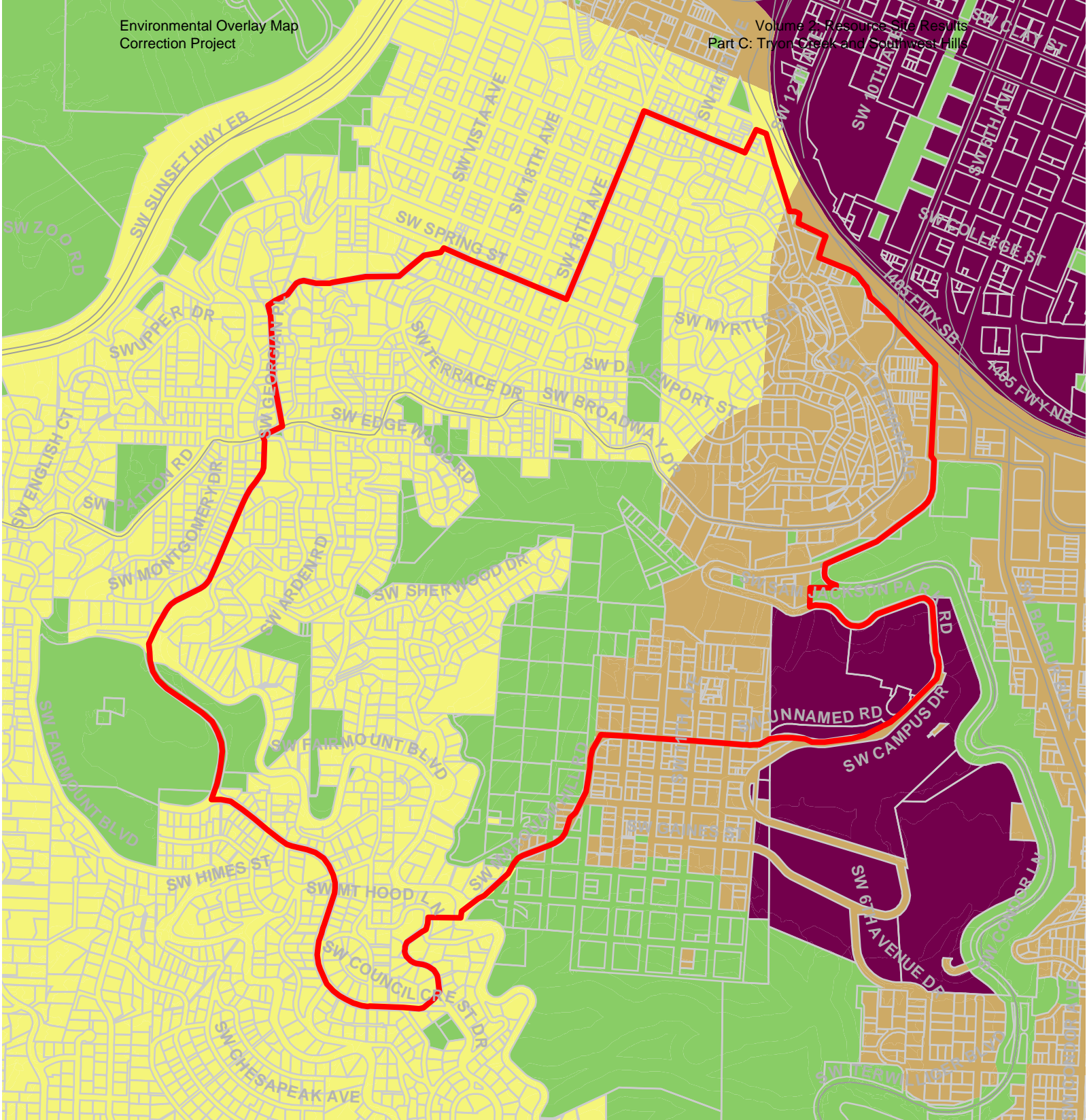


-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots

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Map F: Urban Development Value (Title 13)
Resource Site: SW9

-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks

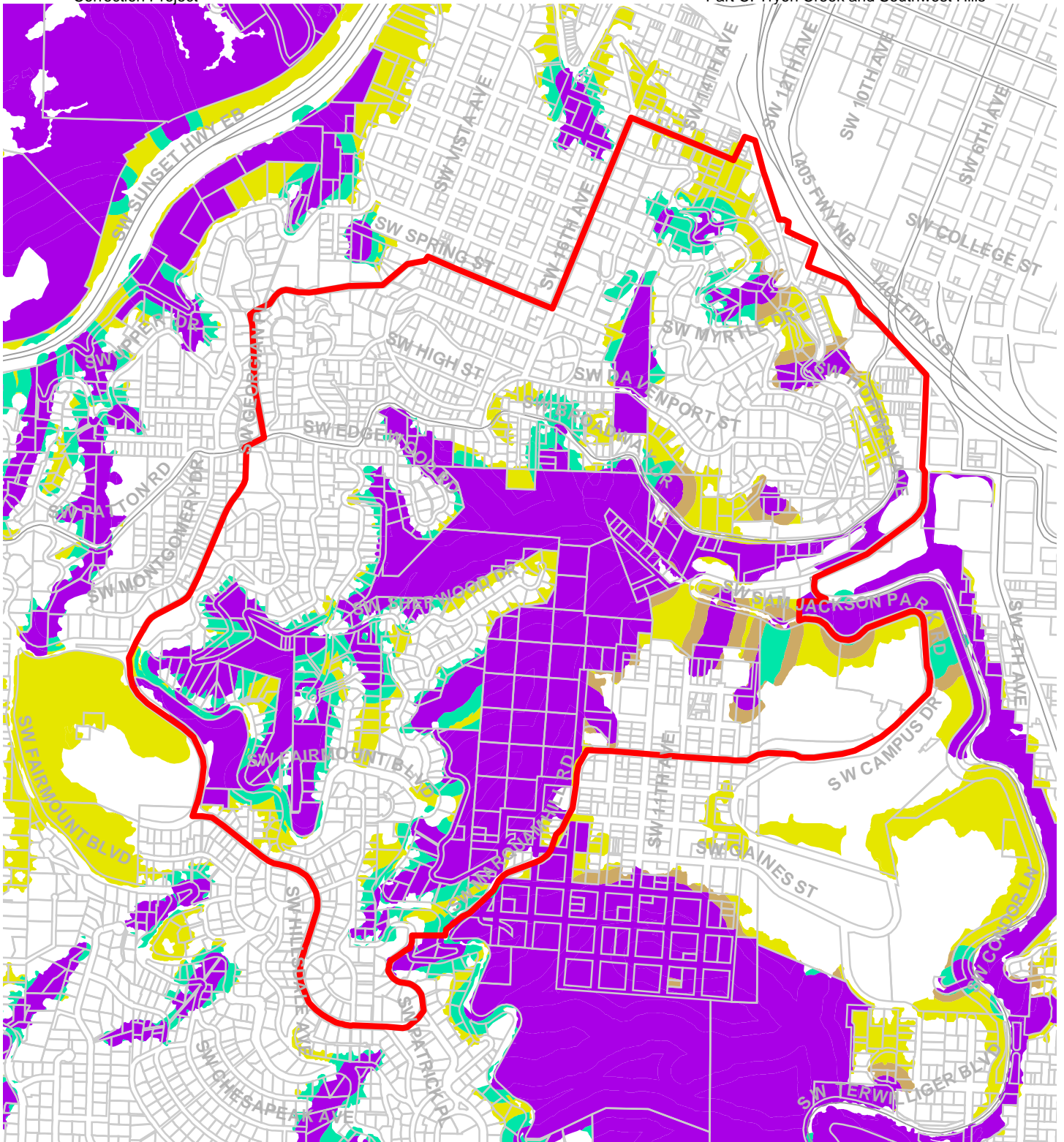


Updated: July 2021



0 650 1,300 Feet
Recommended Draft - As Amended

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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW9

Updated: May 2022

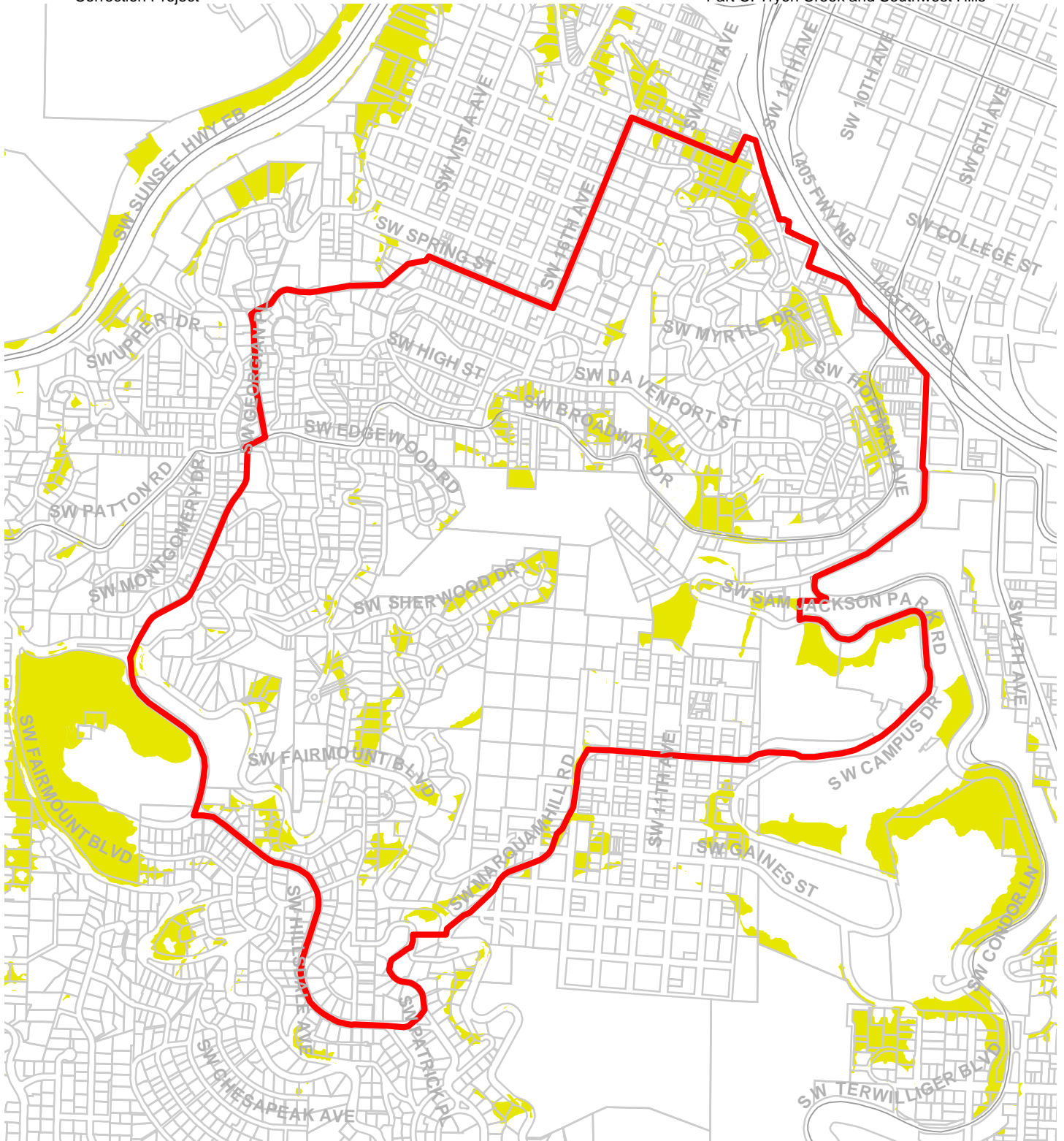


- Urban Service Boundary
- Resource Sites
- HCA High Value
- HCA Moderate Value
- HCA Low Value
- Goal 5 Significant Natural Resources



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May 2022






Map H: Goal 5 Resources

Resource Site: SW9

Updated: May 2022

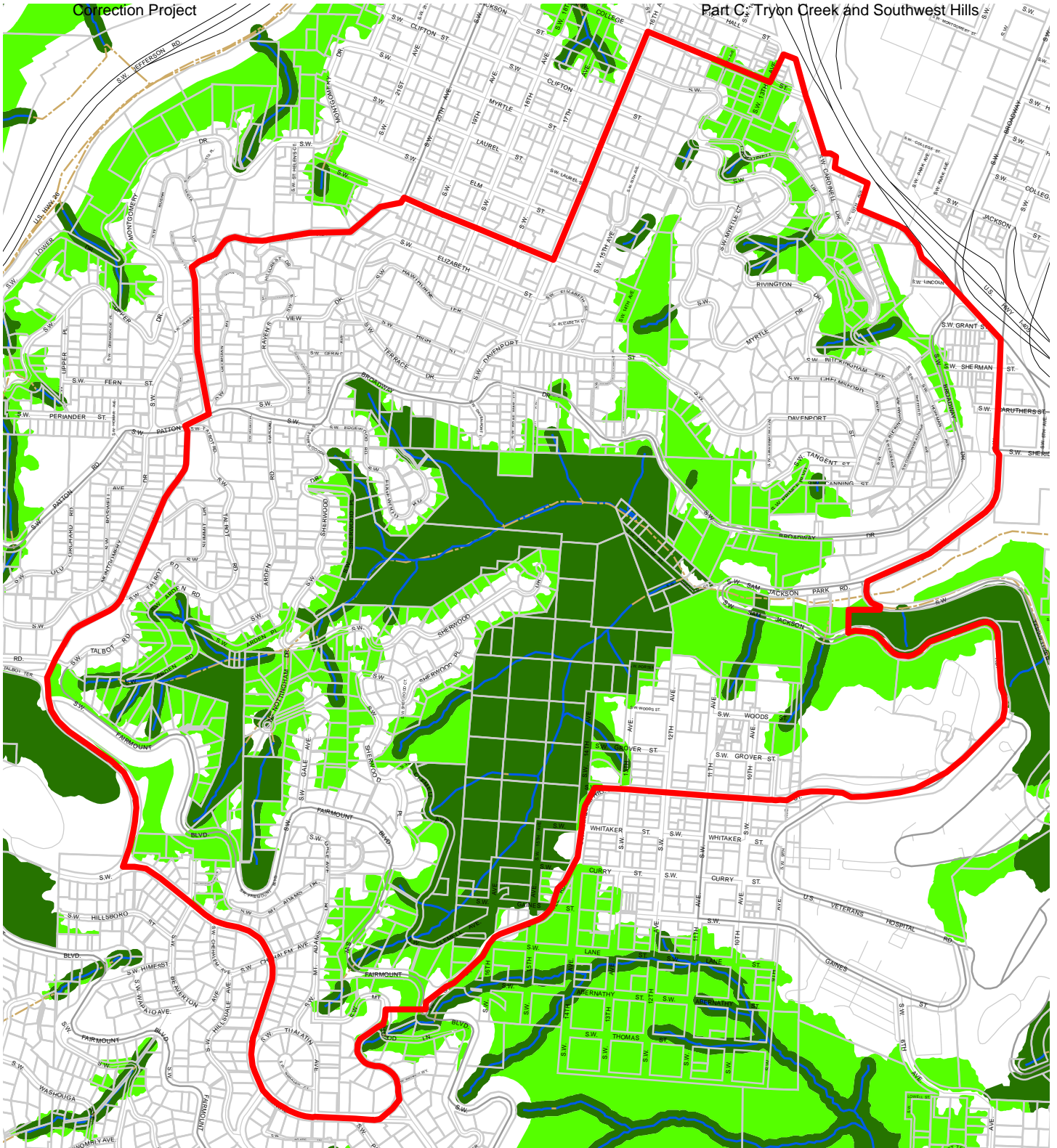


Recommended Draft - As Amended

-  Urban Service Boundary
-  Resource Sites
-  Goal 5 Significant Natural Resources



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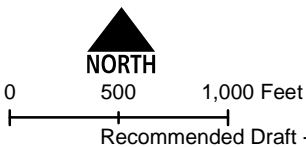


Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
SW9**

Updated: May 2022

- Resource Sites
- Urban Service Boundary
- Open Stream Channel
- Taxlots
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022

Natural Resource Description

Within resource site SW9 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: Marquam Gulch Oak Stand (O)

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW9	
	Study Area
Stream (Miles)	3.8
Wetlands (acres)	0.1
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	232.1
Woodland (acres)	37.5
Shrubland (acres)	3.0
Herbaceous (acres)	1.3
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	441.0
* 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 areas with a slope greater than 25%.	

Most of Site SW9 consists of the north, east and west slopes of Marquam Hill, a prominent feature of the Portland Hills. The lower east slope of Council Crest is also part of Site SW9. The total site acreage is 499 acres and characterized by steep, unstable slopes. Marquam Nature Park forms the centerpiece for the site natural habitat and serves to protect its unstable hillsides from development. It is a 71-acre forested upland area bisected by multiple ravines. It is designated as open space. Other open space includes Duniway Park, an 11.14-acre developed park located at the bottom of the Marquam Ravine near Barbur Boulevard and Governors Park, a six-acre forest near SW 13th and Davenport.

The natural areas including Marquam Nature Park are located in the middle and west portions of the site. The northern third of the site is primarily a north facing slope that is developed with single-family homes. It is in this area that Governors Park is located. The northern part of the Oregon Health Science University (OHSU) campus is located within this site.

Approximately 60 percent or 273 acres of Site SW9 has a mixed conifer and deciduous forested cover. Marquam Nature Park, a 71-acre designated open space area serves as a significant center piece to the surrounding natural areas within the site and connecting to adjacent sites. Marquam Creek which is the main drainage is in an open, natural condition until it reaches the Sam Jackson Road and Terwilliger Boulevard intersection where it joins a major tributary flowing from the south. The southern tributary is a one-mile long perennial creek that extends from Fairmont Street near Marquam Hill Rd.

The forest is a mid-aged coniferous forest (60 to 100 years old) with climax species present and intermittent creeks flowing through it. This site has about two dozen seasonal creeks that are tributaries of three watersheds. The creeks are associated with ravines that have 40 to 60 percent side-slopes. The ravines and waterways provide an important source of water for the plants and animals of the area. Generally, the highest plant diversity is found near the creek.

The forested areas are well represented throughout the site ranging from 80 percent canopy closure in the vicinity of Marquam Gulch to 60 percent closure near SW Fairmont and Mt. Adams Streets. Climax species of hemlock, cedar and grand fir are well established in the east side of the site. Non-indigenous plants such as ivy and blackberries have invaded the area. The Marquam Gulch Oak Woodlands are located north of OHSU and are comprised of 13.2 acres dominated by Oregon white oaks (*Quercus garryana*) and are identified as a Significant Habitat Area by the City. "Many different wildlife species utilize these valuable plant communities making their preservation and management important on a local and regional scale. Oak habitats in Portland provide important nesting and foraging sites for species of concern such as neo-tropical migrant birds and Western gray squirrels" (City of Portland Bureau of Environmental Services, Marquam-Hill 2009).

The forest provides open space, recreational, scenic and educational resources. The Marquam Hill Nature Trail provides pedestrian access through the park in the form of an unpaved path that is a part of the 40-Mile Loop regional bike and trail system. In addition to the path system, there is a shelter and interpretive information. Signs of erosion are present along the Marquam Trail. Other signs of erosion are found throughout the site in the form of slumping and bowed trees.

There are about four miles of unimproved right-of-way in Site SW9. The majority of these rights-of-way are undisturbed natural areas that contribute to the habitat quality of the area and in some cases provide pedestrian and wildlife passage. A portion of the unimproved rights-of-way is part of the Portland Homestead Addition that is designated open space.

Marquam Nature Park located in the Marquam Gulch is located north of Barbur Boulevard and south of Broadway Drive. Two creeks in the Marquam Gulch are designated wetlands on the 1989 National Wetland Inventory. The most northerly creek which runs in a northeast direction is defined as a riverine, intermittent streambed with cobble-gravel. The southerly wetland which runs in a northern direction into the above-mentioned creek/wetland is defined as a palustrine, forested wetland with an aquatic bed.

In total there are two dozen tributary creeks associated with the three watersheds in Marquam Gulch. The creeks provide storm drainage, habitat and groundwater recharge.

Other resources include the scenic value of the natural vegetation that covers over 60 percent of the site. Visual resources also include views into the wooded ravines and hilltops as well as views out to the city. Included are views of Mt. Hood and Mt. St. Helens, the eastern buttes, the Columbia and Willamette Rivers and the cityscape. As mentioned above, Marquam Hill is a prominent hill within the West Hills. The area open space contributes to the image of the West hills as a whole. The visual impact of the greenery of the West hills when viewed from the east, north and south sides of the city or when flying over the city, contributes to the image of Portland as a "City of Roses" and a livable city.

Governors Park, located in the northern part of the site, is six acres in size and has a stand of mature Douglas fir. This park provides wildlife habitat, marks the top of the hill and creates a gateway into the neighborhoods on each side of it. All of these elements contribute to the urban design and quality of the area.

Retention of natural vegetation helps maintain soil and slope stability. Gross removal of vegetation has been noted as a major contributing cause of land instability on the slope of the Portland Hills. The geology and landslide potential of Marquam Hill has been well documented in the Environmental Geology for Planning of the Marquam Hill Area, prepared by Roger Redfern and Dr. Leonard Palmer for the Bureau of Planning in 1973. Extensive areas on

Marquam Hill are in the extreme hazard classification. Many of these areas were either purchased or given to the city in the late 1970's in order to remain undeveloped. These areas now exist as designated open space. Significant investment has been made by Portland Parks and Recreation since 2012 to restore parks within this resource site by removing invasive vegetation and revegetating with native plants.

The observed bird species found in this resource site include: Downy Woodpecker, Rufous-Sided Towhee, Orange-Crowned Warbler, Black-Throated Grey Warbler, Varied Thrush and kinglets as well as more commonly seen birds.

Table B: Quality of Natural Resource Functions in Resource Site SW9				
Resource Site (acres) = 536				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	91.0	78.4	87.4	256.8
percent total inventory site area	17.0%	14.6%	16.3%	47.9%
Wildlife Habitat*				
acres	0.0	211.8	22.8	234.6
percent total inventory site area	0.0%	39.5%	4.3%	43.8%
Special Habitat Areas**				
acres	13.4			
percent total inventory site area	2.5%			
Combined Total⁺				
acres	91.0	136.9	29.4	257.3
percent total inventory site area	17.0%	25.5%	5.5%	48.0%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.				
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.				
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in

the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called “effective impervious area.” The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For Resource Area SW9, 17.6% of the total area is effectively impervious, indicating a critical level of vulnerability, with negative impacts beginning to impact natural functions, but natural processes still in place and providing support to biologic systems.

Table C. Impervious Area within Resource Site SW9			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
536.2	130.8	94.4	17.6%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW9. Natural resources should be protected within HCA as follows:

1. *Strictly limit* or *limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.

2. *Strictly limit* or *limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit* or *limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or *limiting* conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting* or *limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW9 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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, R7, R5, R2, R1, and RH base zones. Commercial uses are allowed in the CE, CM3 and CM2 base zone. Employment is allowed in the EX 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW9, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW9, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or 25 feet of wetlands.
2. Inside Marquam Nature Park, apply a protection overlay zone ('p' zone) to land between 25 and 50 feet of wetlands; and within areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
3. Outside Marquam Nature Park, apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands; and within areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
4. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW10 **Site Name:** Central Terwilliger Parkway

Previous Plan: Southwest hills Resource Protection Plan

Previous Resource site No.: 114

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented. Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW10 includes the following:

Site (acres) 958.8

Base zones (acres)

CE	0.5
CI2	7.9
CM1	7.6
CM2	66.9
CM3	20.5
CX	100.7
EX	84.9
OS	272.2
R10	48.4
R2.5	0.8
R20	67.8
R5	41.8
R7	28.2
RM1	113.6
RM2	50.8
RM3	42.7
RM4	3.6



City of Portland, Oregon

Map A: Water Features

Resource Site: SW10

Updated: May 2022



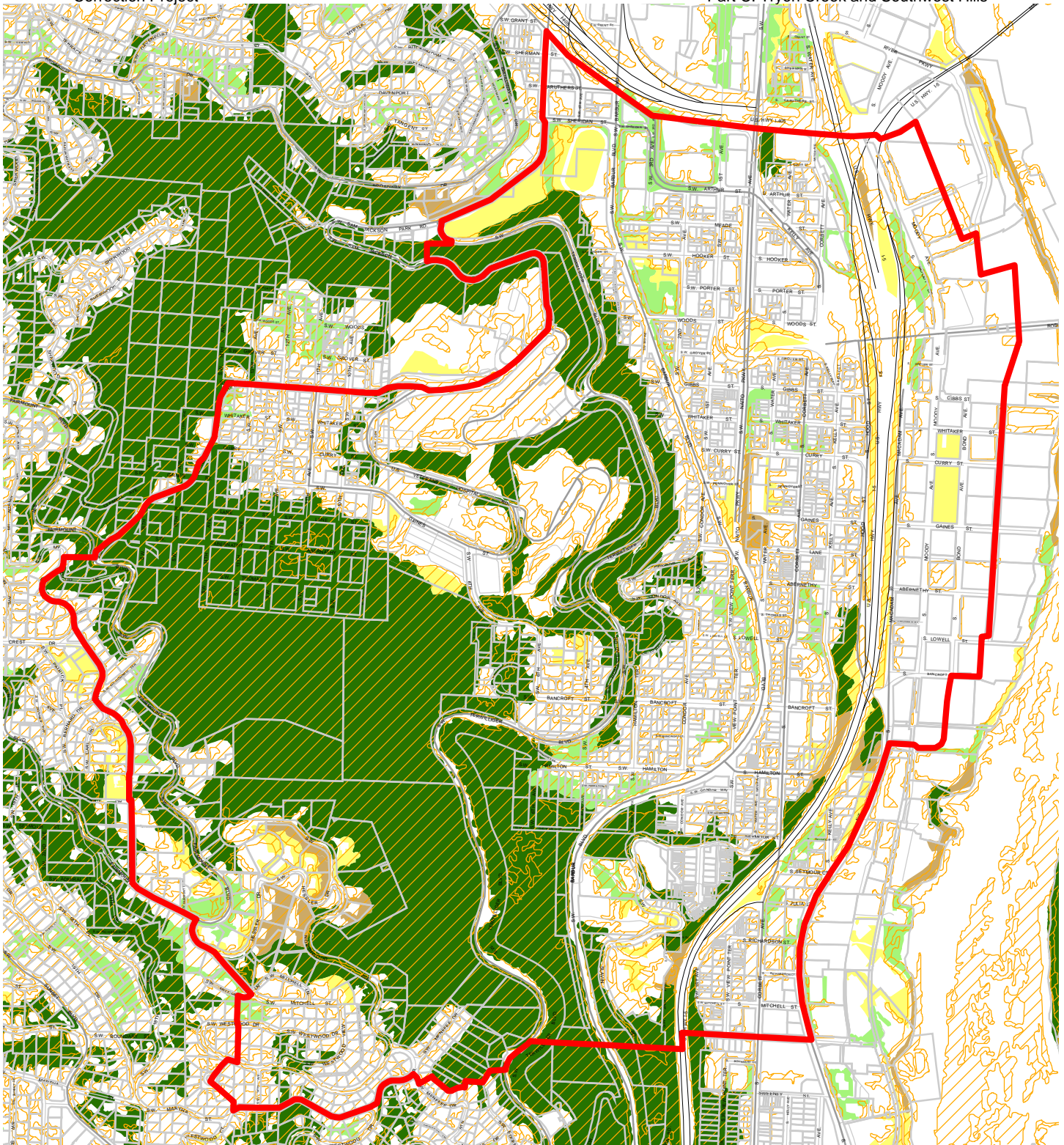
0 550 1,100 Feet

Recommended Draft - As Amended

- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



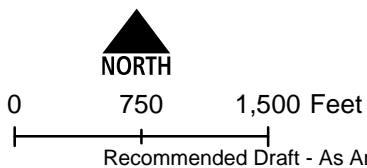
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.
May 2022



Map B: Vegetation and Steep Slopes

Resource Site: SW10

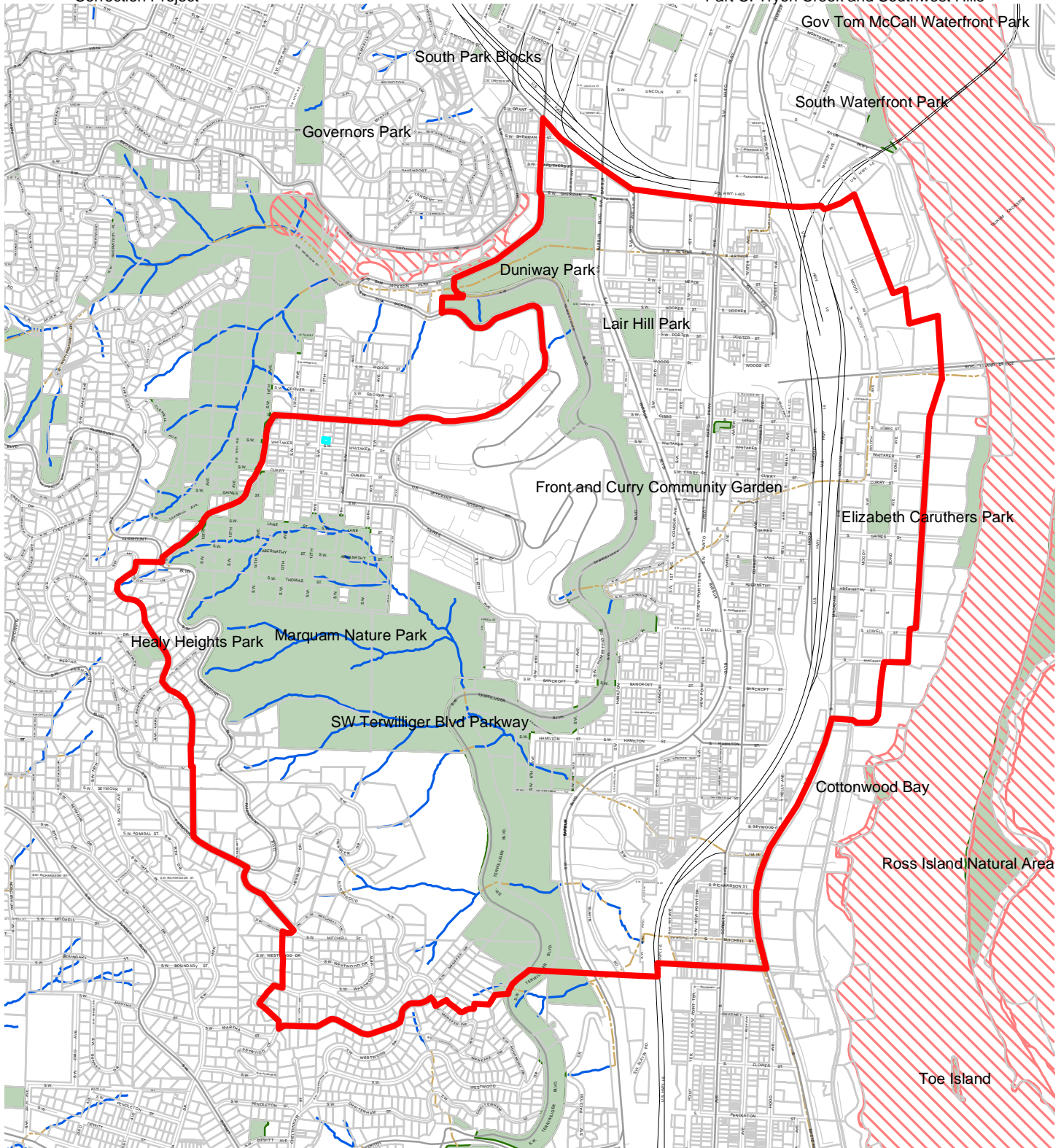
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous



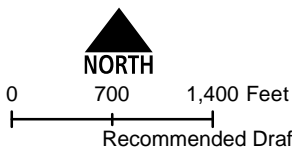
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022










**Map C: Special
Habitat Areas**

**Resource Site:
SW10**

Updated: May 2022

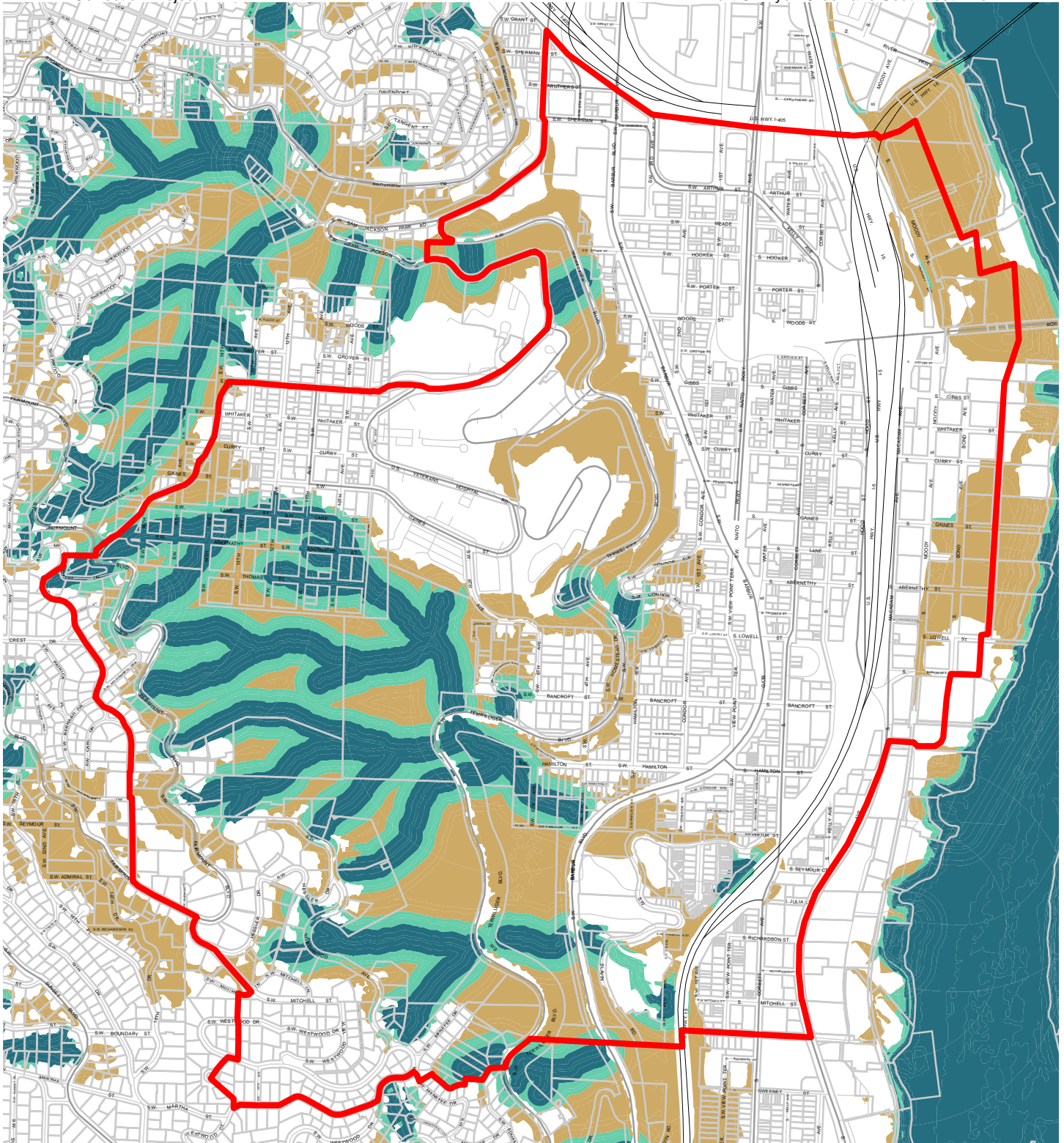


-  Resource Sites
-  Special Habitat Areas (SHAs)
-  Open Stream Channel
-  Piped Stream Segment
-  Parks

-  Urban Service Boundary
-  Taxlots



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May 2022



**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
SW10**

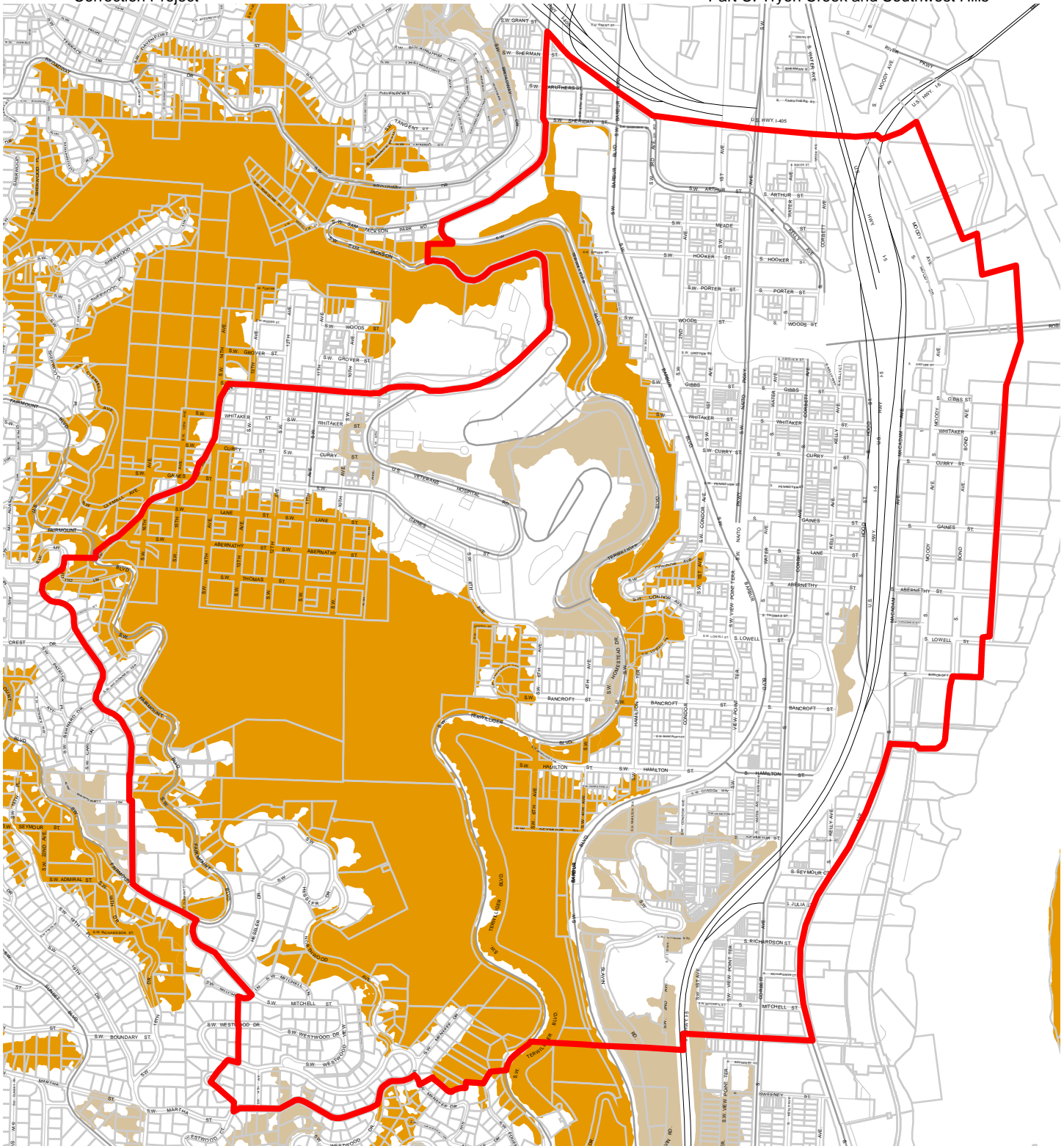
Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots



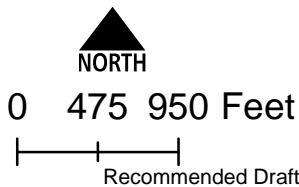
Recommended Draft - As Amended







The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.
May 2022



**Map E: Wildlife
Habitat Classification
Resource Site:
SW10**

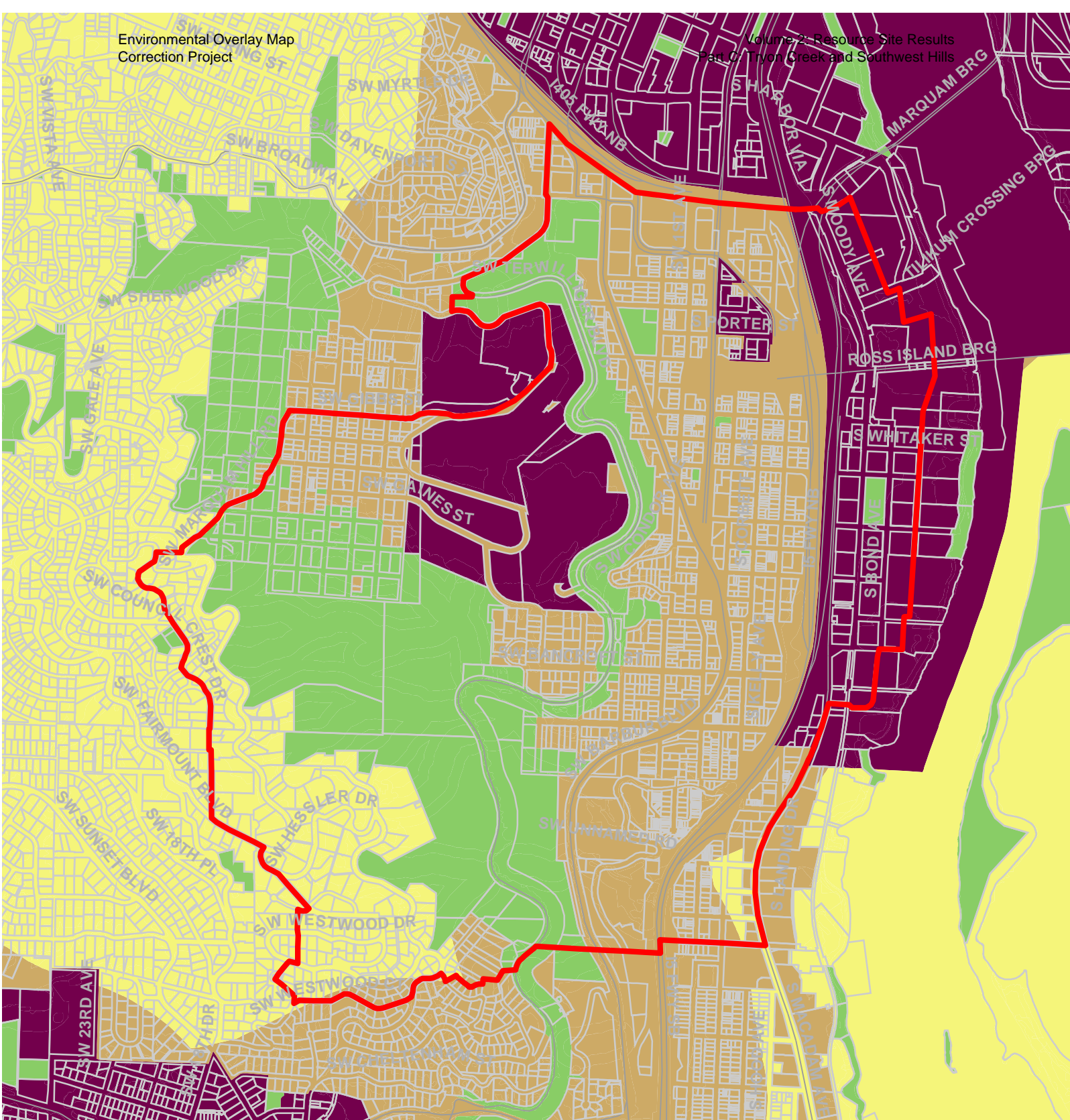
Updated: May 2022



-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots



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May 2022

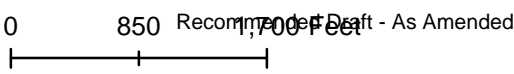


Map F: Urban Development Value (Title 13)
Resource Site: SW10

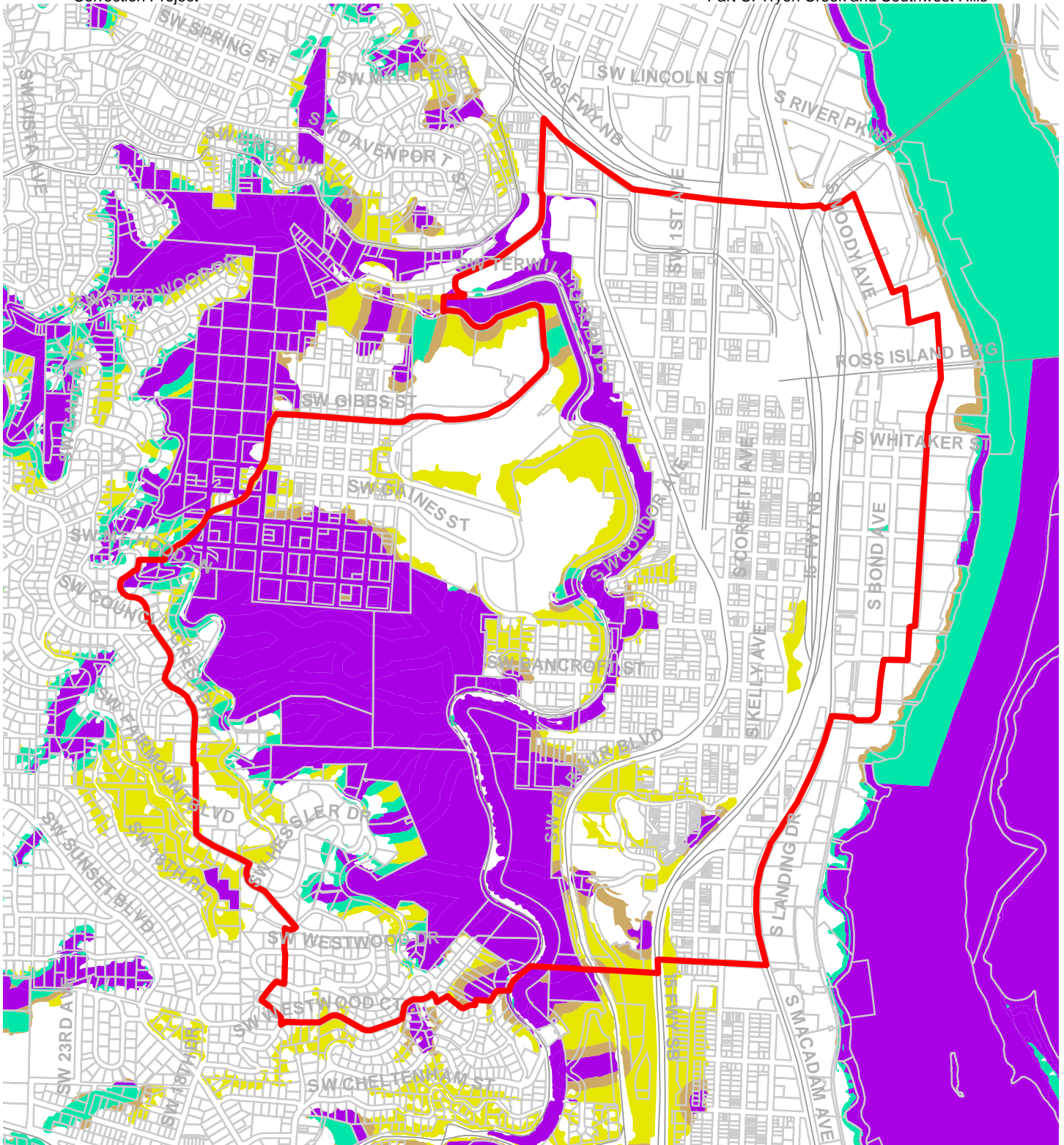
-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks



Updated: July 2021



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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW10

Updated: May 2022



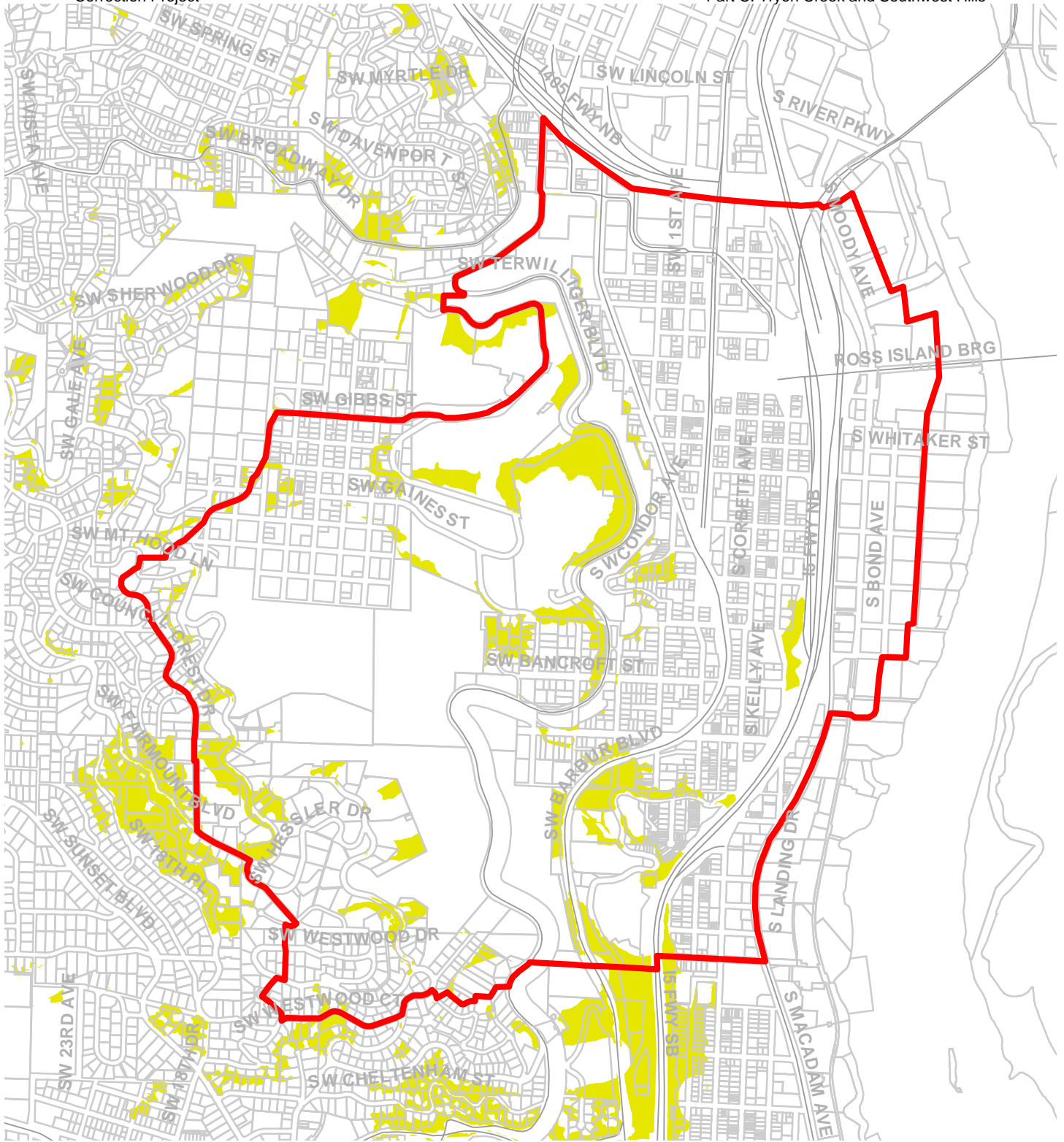
Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- HCA High Value
- HCA Moderate Value
- HCA Low Value
- Goal 5 Significant Natural Resources



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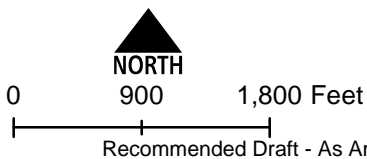
May 2022



Map H: Goal 5 Resources

Resource Site: SW10

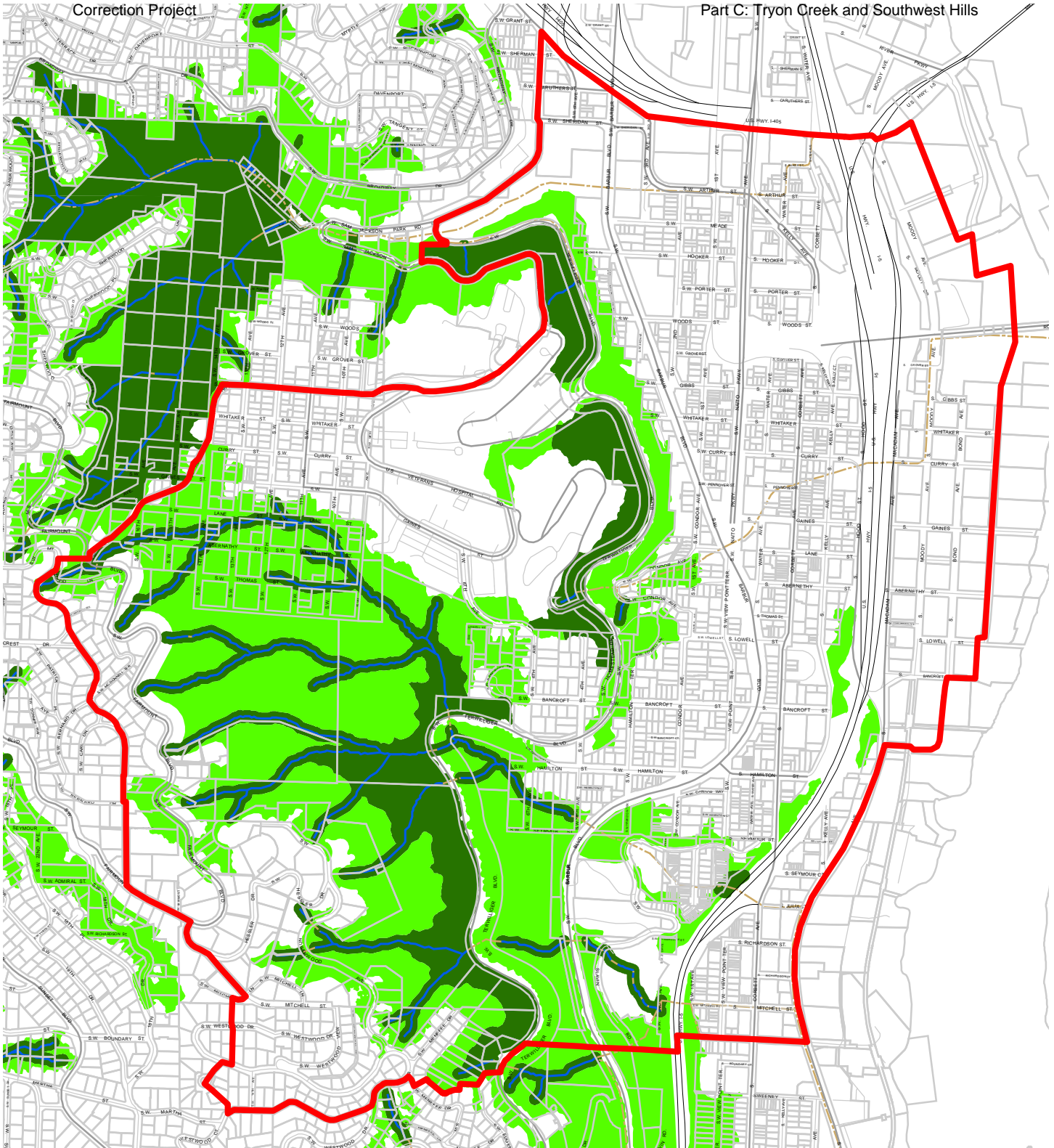
Updated: May 2022



- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.

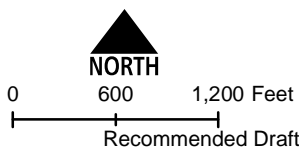


Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
SW10**

Updated: May 2022

- Resource Sites
- Urban Service Boundary
- Open Stream Channel
- Taxlots
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.
May 2022

Natural Resource Description

Within resource site SW10 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: None

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW10	
	Study Area
Stream (Miles)	4.6
Wetlands (acres)	0.2
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	353.7
Woodland (acres)	36.3
Shrubland (acres)	10.9
Herbaceous (acres)	35.1
Flood Area*	
Vegetated (acres)	0.2
Non-vegetated (acres)	17.8
Steep Slopes (acres)**	567.4
* 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 areas with a slope greater than 25%.	

This 455-acre site contains the greatest amount of potentially developable land in the study area. The western half or about 200 acres of Site SW10 is unsewered, representing the largest unsewered area in the study area and a constraint to development. These undeveloped hillsides have primarily a mixed coniferous/deciduous forest cover. This site has three additional unique features: portions of the Terwilliger Parkway, the Oregon Health Sciences University (OHSU), and the 40-Mile Loop Trail. The middle section or about 1.2 miles of the three-mile long Terwilliger Parkway is located in Site SW10. The Terwilliger Parkway is a 77-acre parkway envisioned in 1903 by John Olmsted and presently part of a design overlay zone. The parkway is primarily tree covered, has lookout points, a bike path and a two-lane roadway. Terwilliger Parkway is the most popular and well-used jogging/walking corridor in the city. The middle portion of the parkway has little development with the exception to the new OHSU eye clinic at the Campus Drive entrance.

Oregon Health Sciences University is a multi-institutional center located on SW13 acres (Sites SW9 & SW10) containing over 26 buildings. According to the Framework Master Plan (May, 1991) there is one site identified as having development potential that is in a natural resource area. It is referred to as Site L and is about a 50-acre undeveloped, wooded site on the southeast slope of Marquam Hill south of OHSU.

This site has a series of ten ridges that form three watersheds. The elevations vary between 150 and 850 feet. Site SW10 has documented shallow and unstable soils as well as fault lines³⁰ (also see Site SW10, Resource Areas Map). The shallow soils in Site SW10 are located on both sides of Terwilliger Boulevard and in conjunction with rock outcroppings. These features occur on the eastern slope of OHSU for about 2,800 feet in Site SW10 (see Geomorphology Map, Redfern 1972). Slopes with moderate to extreme landslide hazard conditions exist throughout the site and are mapped in a Planning Bureau atlas. The rock outcroppings are a scenic resource as well as a constraint to development due to the increased labor cost necessary for blasting or building into bedrock.

The representative forest is second growth conifer topping hardwood. The forest is 30 to 50 years old and is generally half conifer and half deciduous. A layer of downed woody debris provides food and cover and increases habitat quality. Canopy closure in the herb zone is 90%, in the shrub zone, 15%, and in the tree zone, 60%. Pileated woodpeckers and evening grosbeaks have been observed in the area.

Today the Terwilliger Parkway is recognized as an important open space system and recreation corridor. The parkway includes a heavily used walking/jogging path and is a bicycle commuter route. In 1983, the City Council adopted the Terwilliger Parkway Corridor Plan which specifies design treatment anticipated for the private and public land along the parkway within the adopted design overlay zone. While the corridor plan was adopted as policy and intended to be

enforceable, the inherent flexibility of the guidelines and allowance for exceptions has resulted in recent developments which do not fully meet the guidelines. Notwithstanding, the parkway provides great civic pride and is a visual and wildlife corridor. The Terwilliger Parkway links two miles of the six-mile length of the Southwest Hills. This forested corridor provides a great deal of civic pride and contributes to a sense of place and to Portland's identity as forested city.

The Marquam section of the 40-Mile Loop runs through Site SW10. The trail system is mapped on the official zoning maps. It connects the Zoo and a 20-acre designated open space parcel located on the south side of Highway 26 with Patton Road, Council Crest and Marquam Nature Park. It passes through unbuilt portions of SW 14th, SW Lane and SW 10th streets, and through undeveloped portions of the OHSU property (i.e., tax lots 55 and 35) to Terwilliger Boulevard. The trail continues south to George Himes Park (Site SW11) where it cuts east to Willamette Park and the Sellwood Bridge. The trail system is in place in its entirety. In Site SW10, large portions of the trail exist on private property in the form of easements. This trail system forms a habitat, scenic and recreation corridor. It is a portion of a regional asset and trail system that is over 140 miles long.

A particularly visually prominent knoll is "Eagle Point" located east of the Terwilliger and Homestead intersection where Lowell Terrace and Lowell Lane are today. It was a major element of Olmsted's 1903 plan and is identified in the Terwilliger Parkway Corridor Plan. Unfortunately, the northern loop of the "Eagle Point" was vacated in 1963. The knoll is 380 feet in elevation, 90 percent forested with a conifer topping hardwood forest, and is the most easterly extending portion of the Southwest hills (with the exception of the River View Cemetery area). These characteristics make it significant.

Another site resource exists in the form of natural access points to and from properties adjacent to Terwilliger Boulevard formed by the natural topography. "Natural Future Access Points" and "Existing or Approved Private Access" points have been mapped as a part of the Terwilliger Parkway Corridor Study. This is important inventory and parkway development guideline information which if followed will help increase development opportunities in a rational way while protecting the more difficult to develop and fragile locations.

Significant investment has been made by Portland Parks and Recreation since 2012 to restore parks within this resource site by removing invasive vegetation and revegetating with native plants.

Table B: Quality of Natural Resource Functions in Resource Site SW10				
Resource Site (acres) = 959				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	110.3	91.6	189.1	391.0
percent total inventory site area	11.5%	9.6%	19.7%	40.8%
Wildlife Habitat*				
acres	0.0	300.3	49.3	349.6
percent total inventory site area	0.0%	31.3%	5.1%	36.5%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total⁺				
acres	110.3	203.5	89.9	403.6
percent total inventory site area	11.5%	21.2%	9.4%	42.1%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.				
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.				
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called "effective impervious area." The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter

pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For Resource Area SW10, 26.4% of the total area is effectively impervious, indicating significant negative impacts are occurring due to the level of unmanaged impervious area and any additional impacts will cause further degradation.

Table C. Impervious Area within Resource Site SW10			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
958.8	334.0	253.3	26.4%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW10. Natural resources should be protected within HCA as follows:

1. *Strictly limit or limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit or limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit or limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or limiting conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting or limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW10 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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, R10, R7, R5, R2, R1, and RH base zones. Commercial uses are allowed in the CI2, CM3, CM2 and CM1 base zone. Employment is allowed in the EX 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW10, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW10, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or wetlands.
2. Apply a protection overlay zone ('p' zone) to areas of forest vegetation on steep slopes adjacent to and west of SW Terwilliger Blvd right-of-way.
3. Apply a conservation overlay zone ('c' zone) within areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
4. Apply a conservation overlay zone ('c' zone) to area of forest vegetation on steep slopes adjacent to and east of SW Terwilliger Blvd right-of-way, forest vegetation on steep slopes adjacent to SW Barbur Blvd or Interstate 5 right-of-way (both sides) and forest vegetation on steep slope in the EX base zone.
5. Allow conflicting uses within all other areas containing significant natural resources.

On the Oregon Health and Sciences University campus, the delineation between the 'p' zone along SW Terwilliger Blvd and the 'c' zone along SW Campus Dr is an old, abandoned road closest to SW Terwilliger Blvd. This is a location where the slope flattens at the old road. The 'c' zone continues from the old road west to apply to the contiguous forest continuing until it reaches the Children's Hospital. There is also area of 'c' zone applied to the edge of the forest at the intersection of SW Terwilliger Blvd and SW Campus Dr to support continued development of the intersection for access to the campus while requiring mitigation for impacts to the natural resources.

Resource Site No.: SW11 **Site Name:** George Himes Park

Previous Plan: Southwest hills Resource Protection Plan

Previous Resource Site No.: 115

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

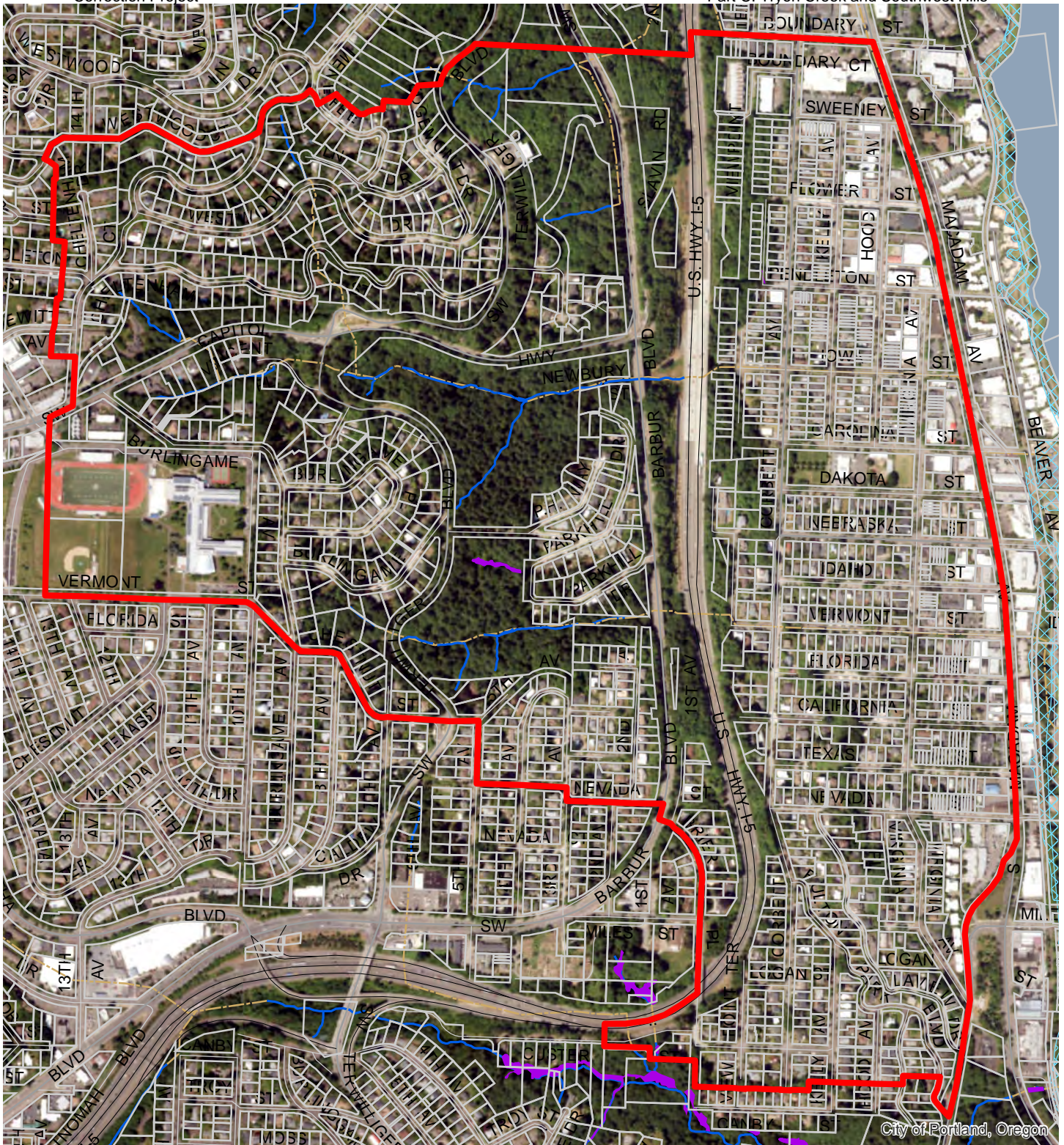
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW11 includes the following:

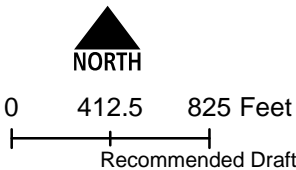
Site (acres)	502.3
Base zones (acres)	
CM1	1.3
CM2	40.6
IR	24.1
OS	51.4
R10	35.4
R2.5	1.4
R5	179.6
R7	122.5
RM1	37.6
RM2	8.3



Map A: Water Features

Resource Site: SW11

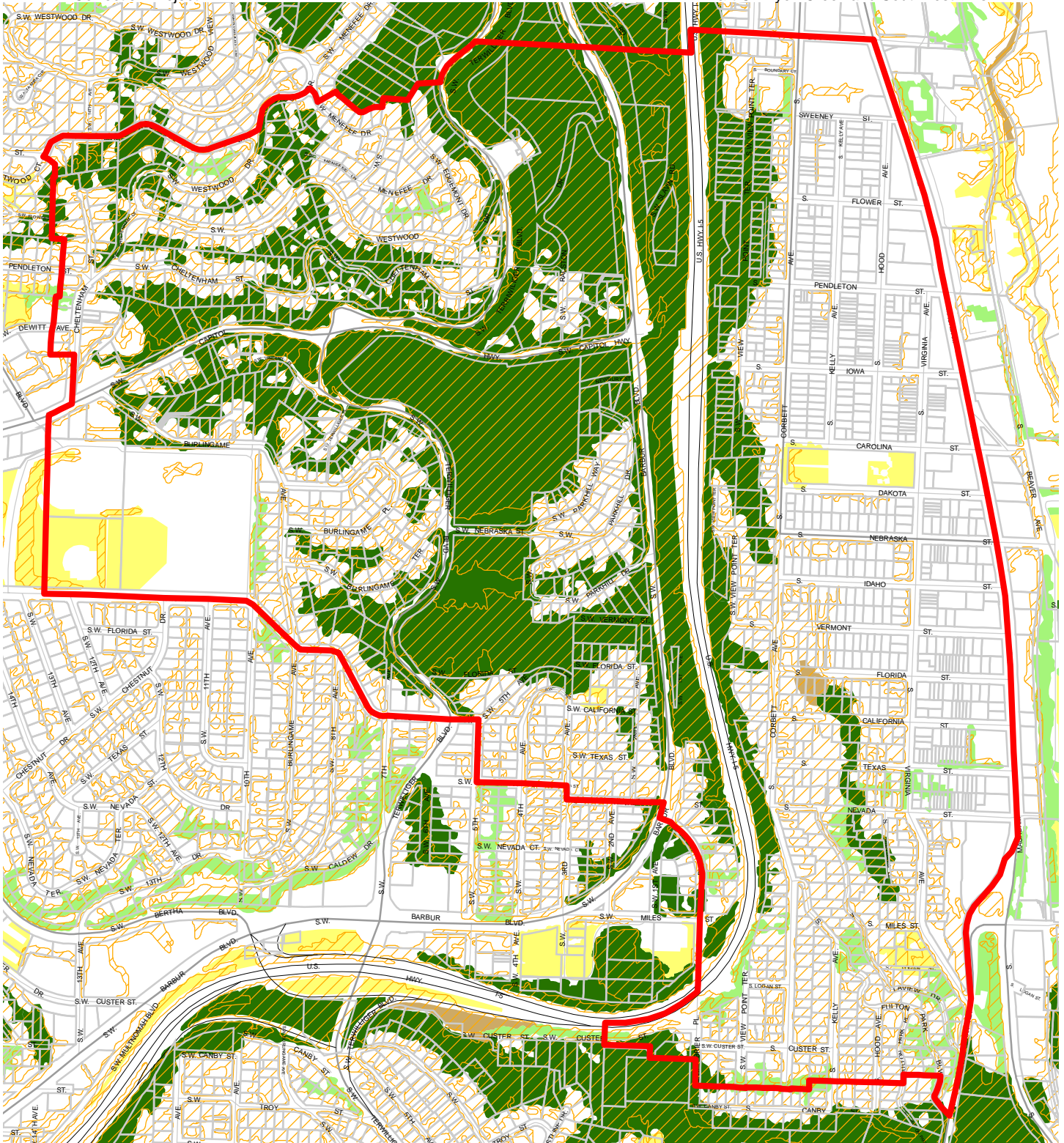
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



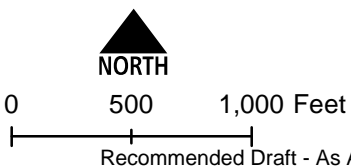
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022



Map B: Vegetation and Steep Slopes

Resource Site: SW11

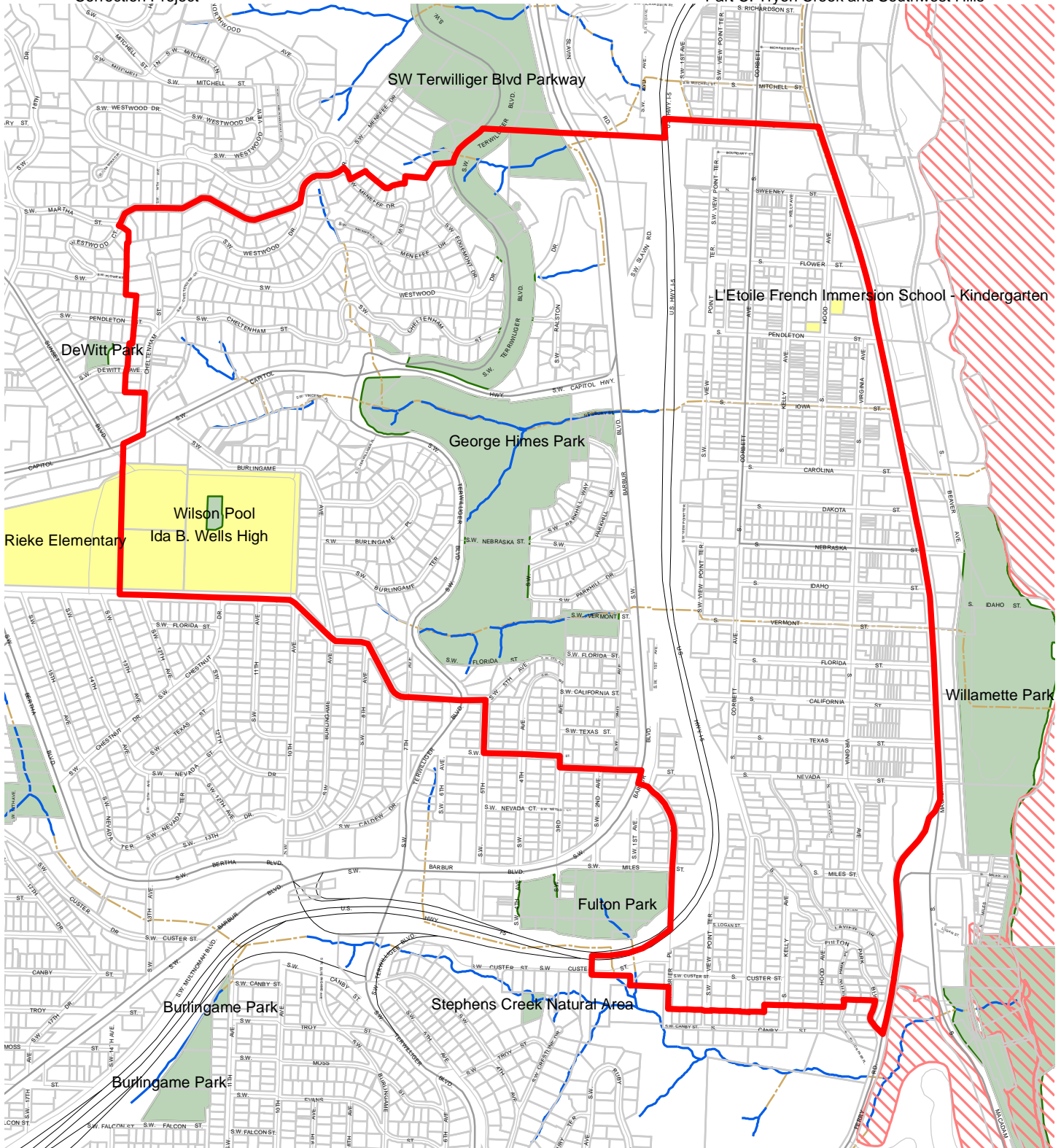
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous



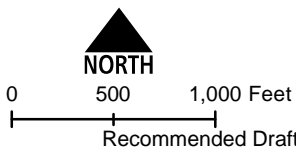
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022



**Map C: Special
Habitat Areas**

**Resource Site:
SW11**

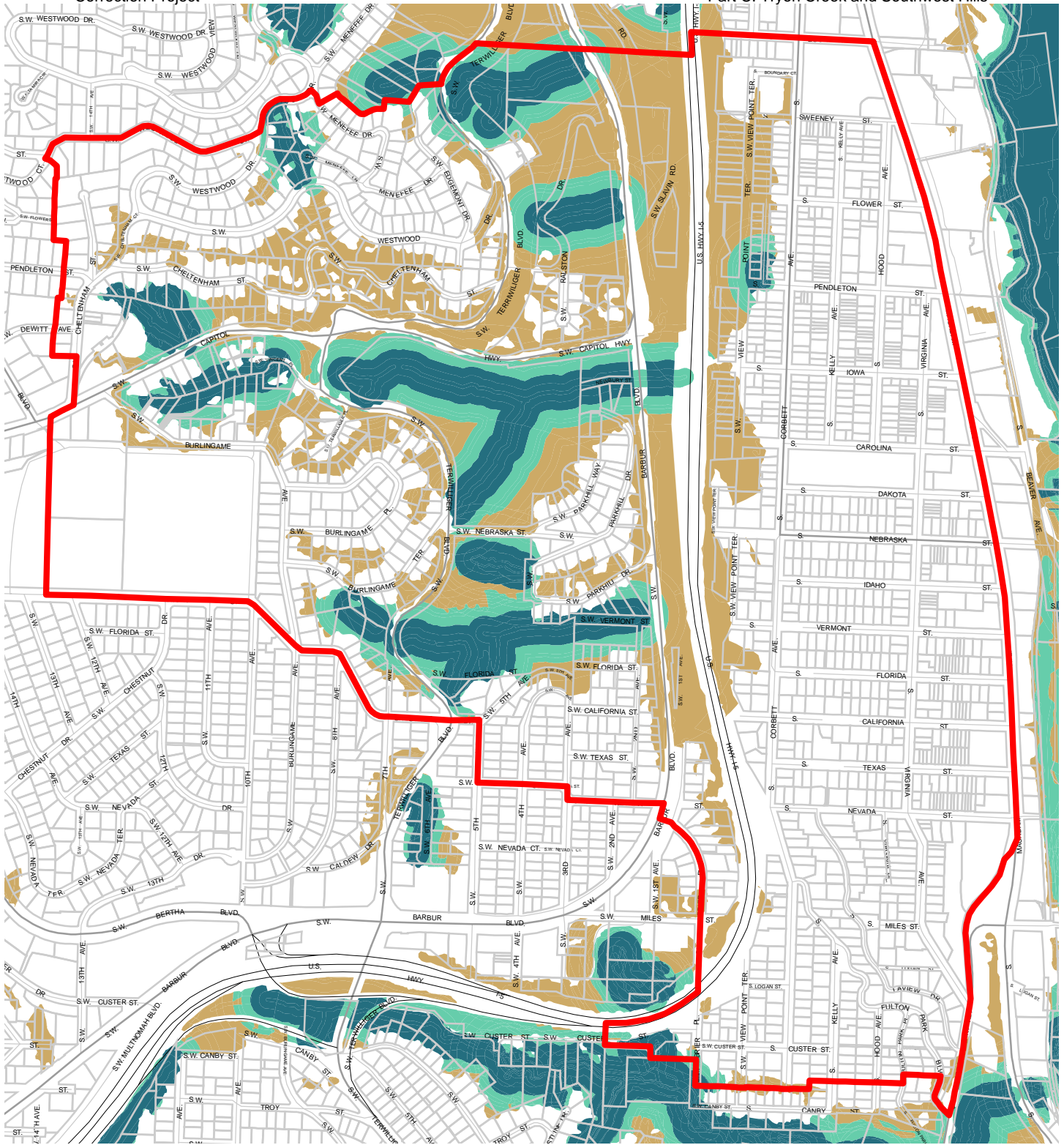
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Special Habitat Areas (SHAs)
- Taxlots
- Open Stream Channel
- Piped Stream Segment
- Parks
- Schools



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022

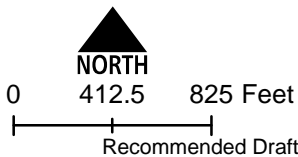


**Map D: Riparian
Corridors Habitat
Classification**

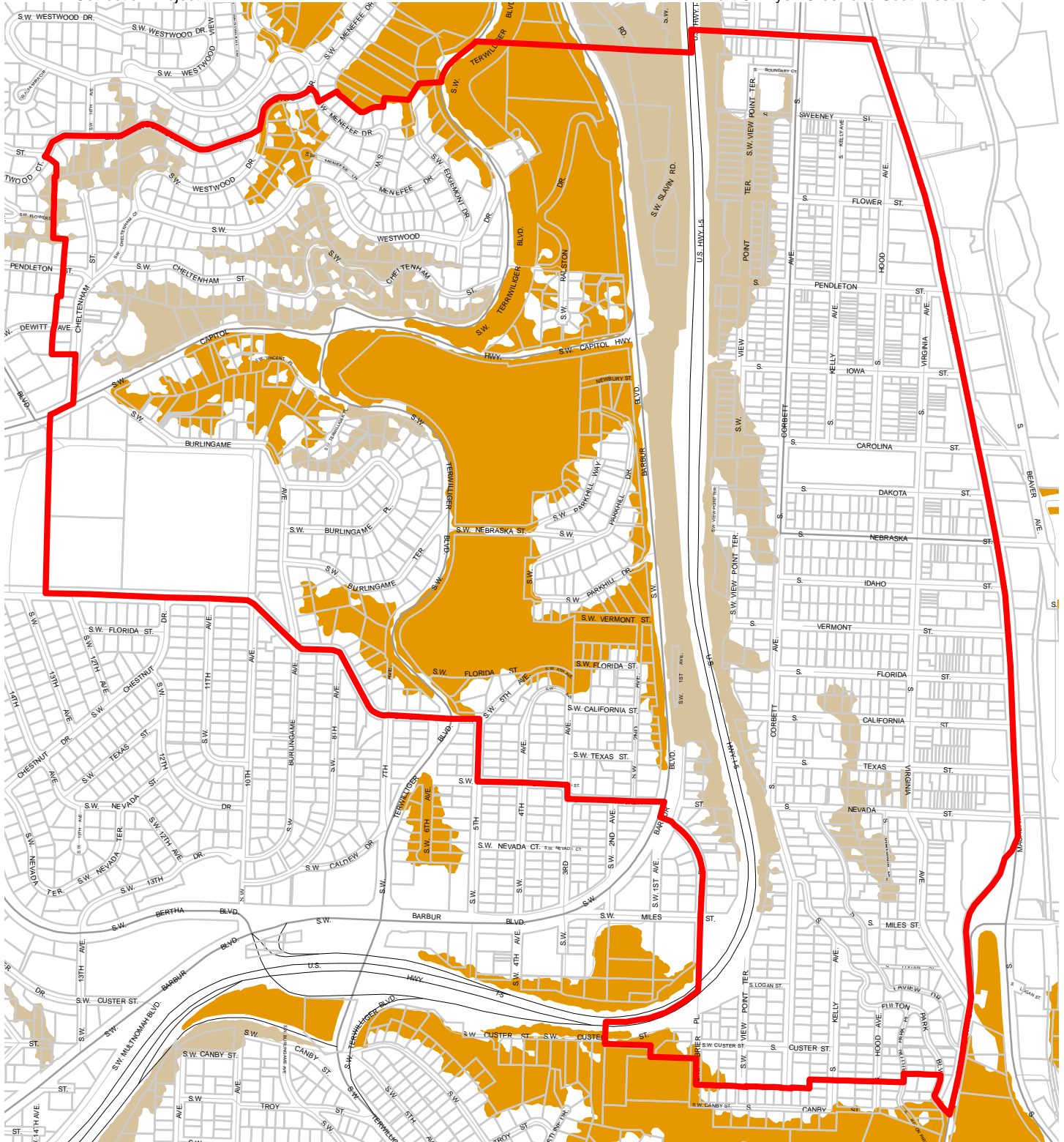
**Resource Site:
SW11**

Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots

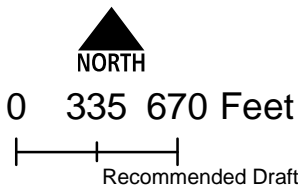








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**Map E: Wildlife
Habitat Classification**
Resource Site:
SW11

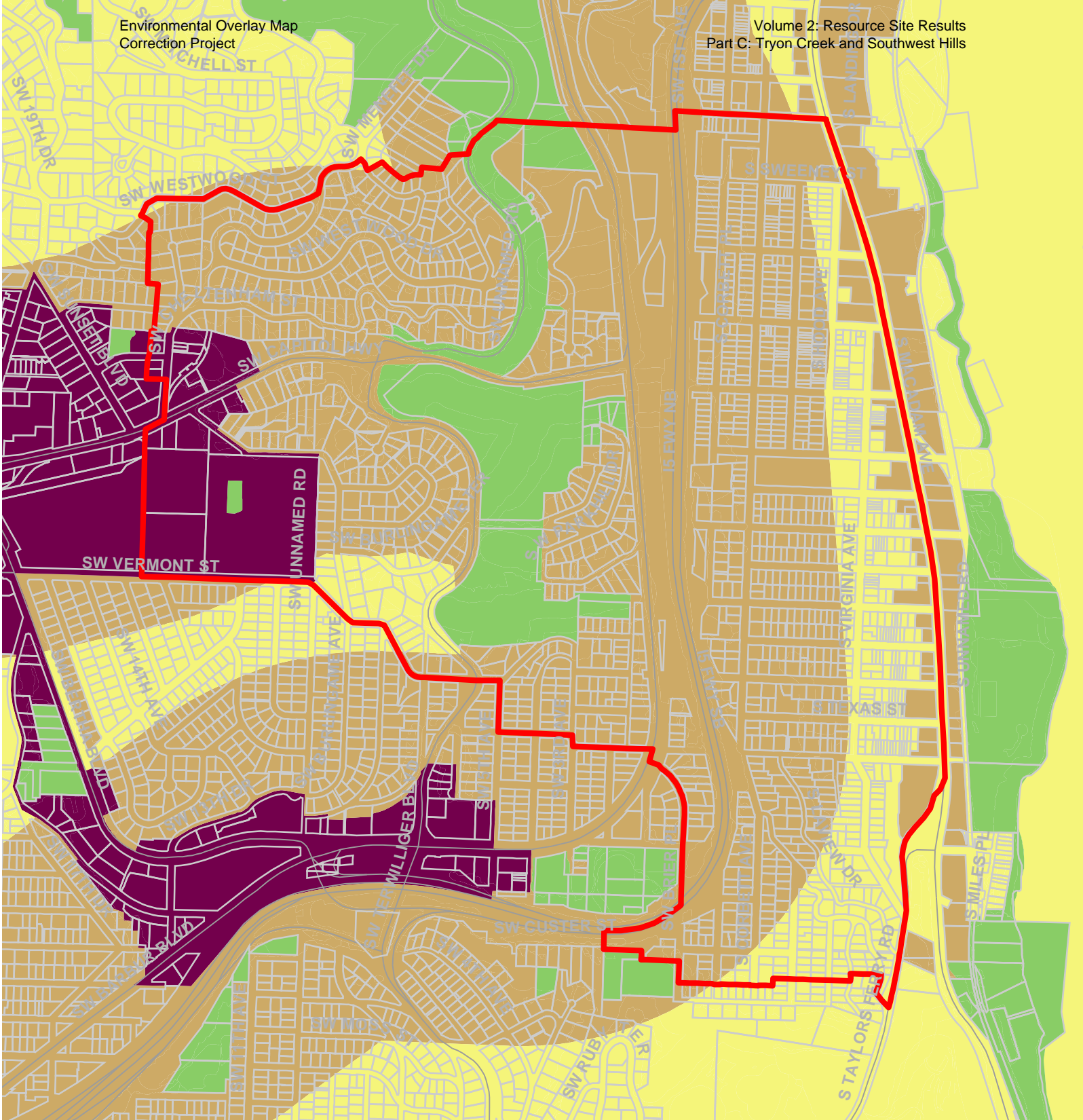
Updated: May 2022



-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots



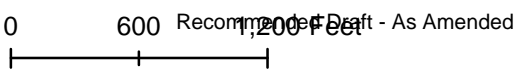
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.
May 2022



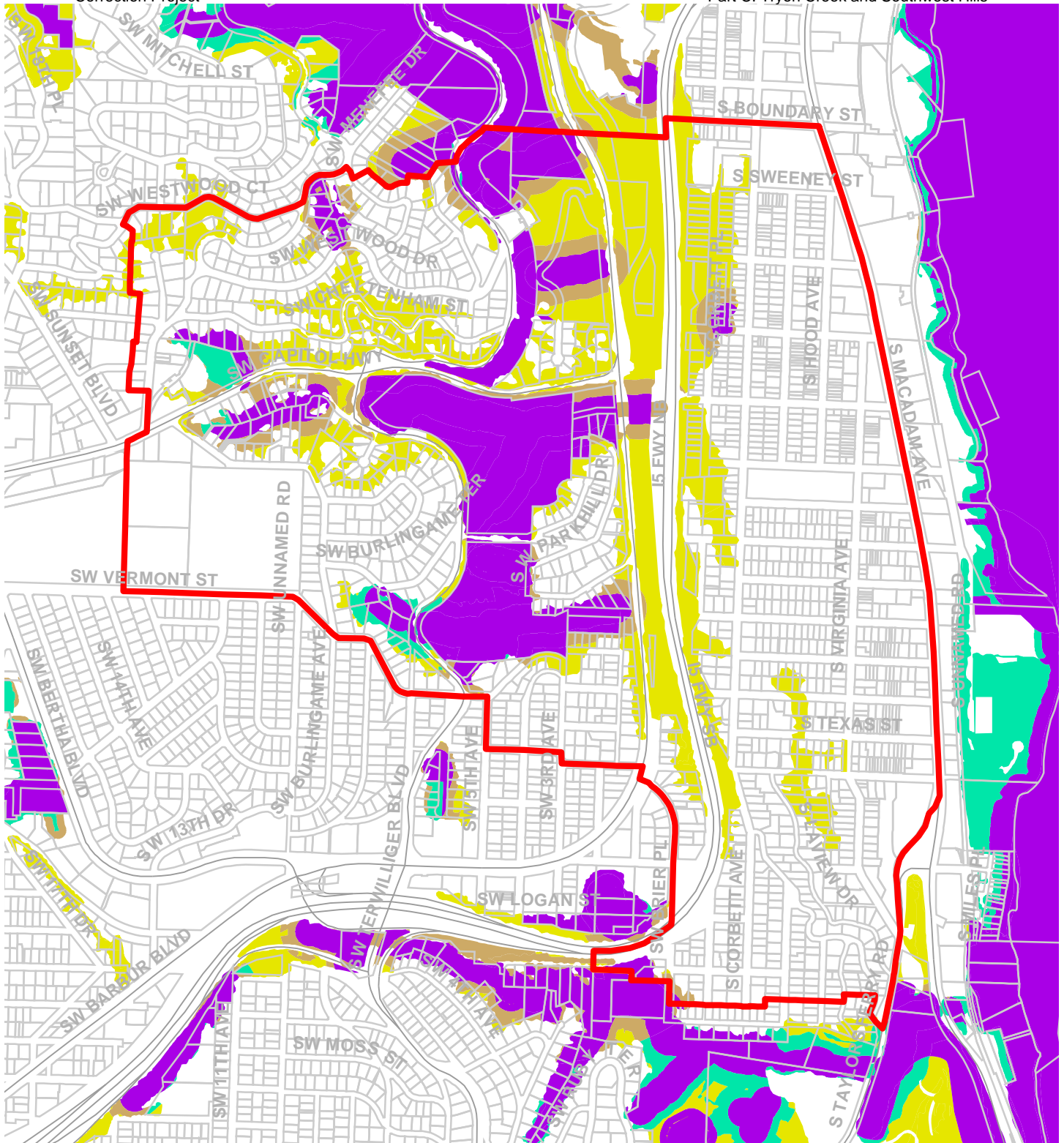
Map F: Urban Development Value (Title 13)
Resource Site: SW11

-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks

Updated: July 2021



The information on the map was derived from digital databases. 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 aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.



Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW11
Updated: May 2022



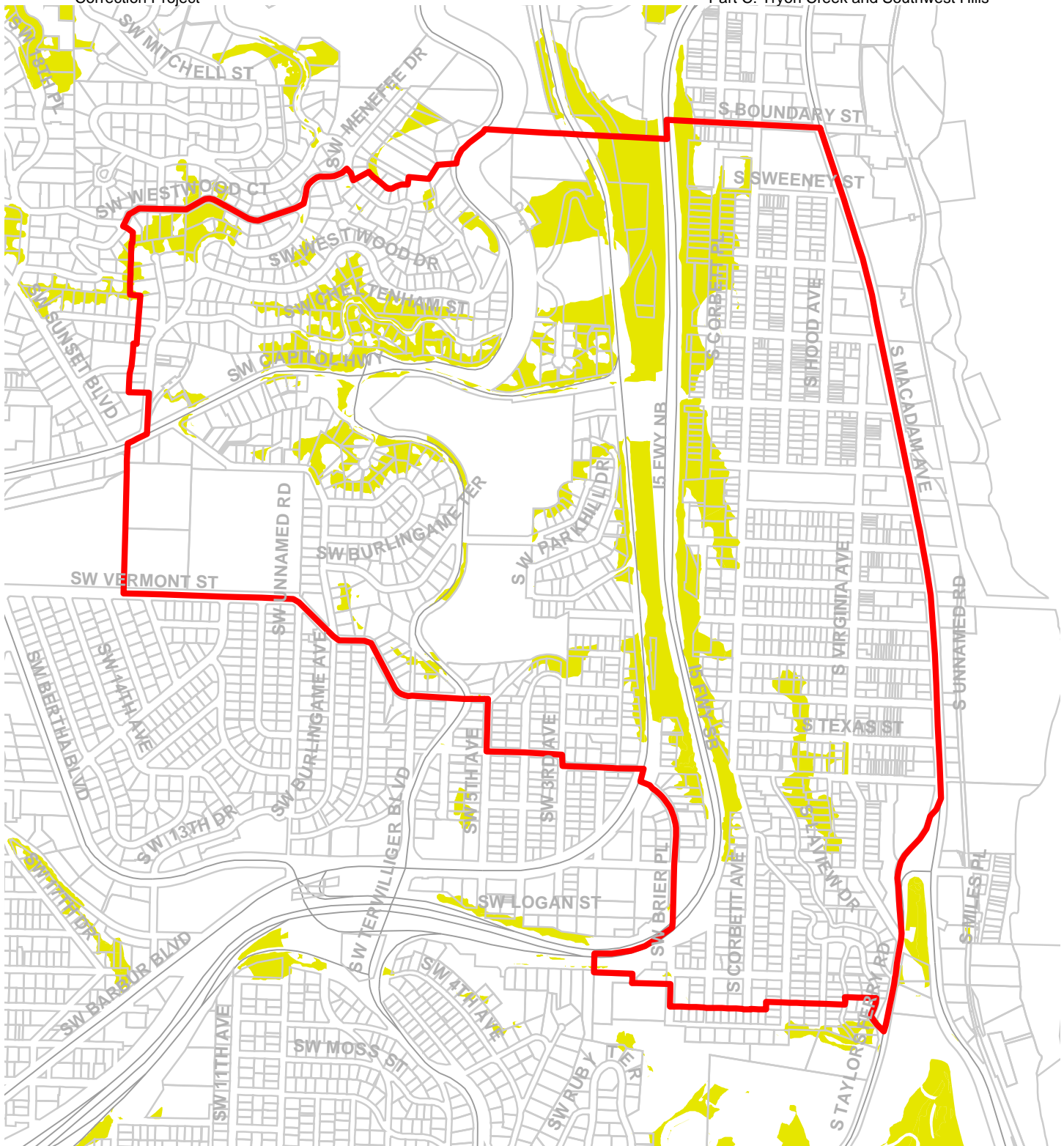
Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- HCA High Value
- HCA Moderate Value
- HCA Low Value
- Goal 5 Significant Natural Resources



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.

May 2022



Map H: Goal 5 Resources

Resource Site: SW11

Updated: May 2022

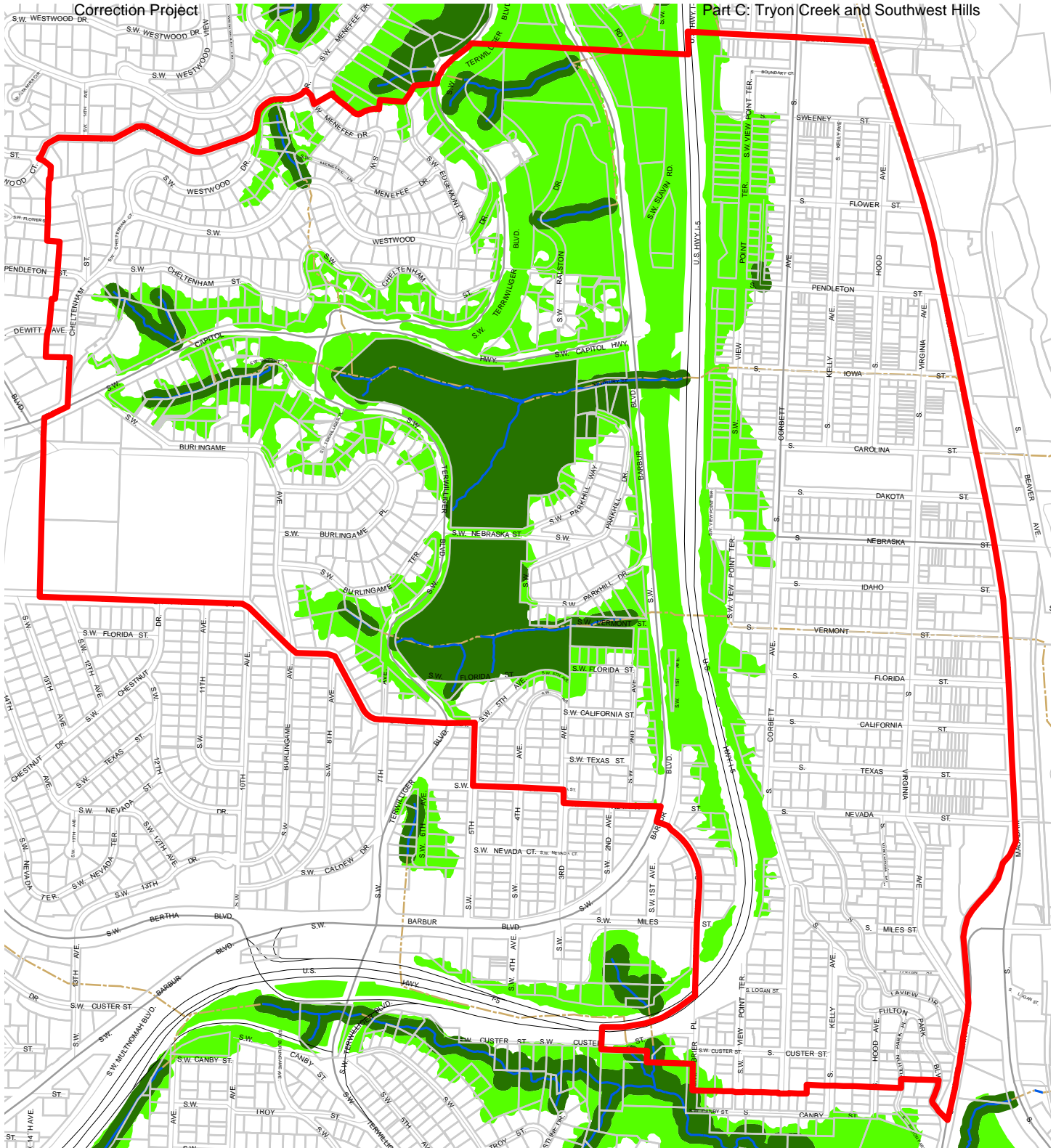


Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.

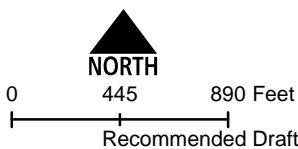


Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
SW11**

Updated: May 2022

- Resource Sites
- Urban Service Boundary
- Open Stream Channel
- Taxlots
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022

Natural Resource Description

Within resource site SW11 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; wetland; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: Wetlands (W)

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW11	
	Study Area
Stream (Miles)	1.6
Wetlands (acres)	0.2
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	176.8
Woodland (acres)	10.9
Shrubland (acres)	0.7
Herbaceous (acres)	9.7
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	290.1
* 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 areas with a slope greater than 25%.	

This site is directly adjacent to the Willamette River as well as uplands. The site is bisected east and west by Interstate 5 and Barbur Boulevard. The elevations are about 35 feet along the river, 450 feet in the middle of the site (around George Himes Park), extending to 650 feet near Westwood Drive. A major break in the west hills occurs in this site where Capitol Hwy. and George Himes Park are located. This natural draw is a part of the Sentinel Hill Fulton drainage where a perennial creek is located. This site has the greatest diversity of land uses. The resources are typically intermingled with developed residential areas or open space designated areas. There is, however, an approximately 20-acre resource area located west of Barbur. The western half of the site is generally developed with residential neighborhoods on hillsides made up with single-family homes built in the 1950's. Wilson High School is located on the southwest corner of the site.

This site includes 6,000 feet of the Willamette River shoreline (from Boundary St. to south of Miles St.) and the river terrace (shoreline to Corbett St.). Thirteen seasonal creeks and one perennial creek occur on this site with associated springs and riparian and upland forests. The creeks are dispersed across the site and intermingle with established neighborhoods except for the 20-acre site west of Barbur that is undeveloped. This site is primarily forested, has three seasonal streams and has a 40 percent slope. Ralston, an unbuilt street, runs through the site between Barbur and Terwilliger Boulevards.

The upland area is a western hemlock forest. The forest canopy is 80 to 90 percent closed and the dominant trees are bigleaf maple and Douglas fir. Generally, the forest is 10 percent coniferous with greater amounts of Douglas fir located higher in the basin and along NW Nebraska Street in George Himes Park. The forest includes old Douglas fir (over 36" dbh). The shrub layer is 30 percent closed and the herbaceous layer is 90 percent closed.

George Himes Park is 35 acres in size and is located in the middle of the 472-acre site. Four of the seasonal creeks are located in the park. The longest of the creeks extends east through the park, under Barbur Boulevard and Interstate 5 (I-5), and into the Corbett neighborhood near Iowa and Corbett Streets. Both a wildlife and a pedestrian link exists. The park commemorates George Himes, an early pioneer, with a monument located in the park.

There is little habitat connection for terrestrial animals between the Willamette River and elsewhere in the study area due to obstacles such as I-5 and Barbur Boulevard. A wooded ravine that connects George Himes Park to the Corbett neighborhood provides the only wildlife connectivity across Interstate-5 and Barbur Boulevard in southwest Portland (City of Portland Bureau of Environmental Services, Carolina-Terwilliger 2009). The bridges over I-5 and Barbur Boulevard provide a pedestrian link to the Corbett neighborhood. Between Corbett Street and the river, there are no habitat connections. There is, however, a strong avian link between the upland areas of the site (plus points farther west) and the river. Birds such as great blue heron,

kingfisher and osprey travel west from the river via this site through the natural break in the West Hills.

In addition to George Himes Park, the southern section of the Terwilliger Parkway is located in Site SW11. It serves as a significant wildlife, scenic and recreation corridor that contributes to the livability of the city, as well as the immediate area. (See Site SW10 for more resource information on Terwilliger.)

Significant investment has been made by Portland Parks and Recreation since 20120 to restore parks within this resource site by removing invasive vegetation and revegetating with native plants.

Table B: Quality of Natural Resource Functions in Resource Site SW11				
Resource Site (acres) = 502				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	41.5	32.6	92.6	166.7
percent total inventory site area	8.3%	6.5%	18.4%	33.2%
Wildlife Habitat*				
acres	0.0	95.1	72.4	167.6
percent total inventory site area	0.0%	18.9%	14.4%	33.4%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total*				
acres	41.5	62.8	74.9	179.2
percent total inventory site area	8.3%	12.5%	14.9%	35.7%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water. ** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors. +Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called “effective impervious area.” The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For Resource Area SW11, 27.7% of the total area is effectively impervious, indicating significant negative impacts are occurring due to the level of unmanaged impervious area and any additional impacts will cause further degradation.

Table C. Impervious Area within Resource Site SW11			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
502.3	161.0	139.1	27.7%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW11. Natural resources should be protected within HCA as follows:

1. *Strictly limit* or *limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit* or *limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit* or *limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or *limiting* conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting* or *limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW11 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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, R7, R5, R2 and R1 base zones. Commercial uses are allowed in the CM2 and CM1 base zone. Institutional uses are allowed in the IR 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW11, with the following additional information that clarifies the analysis.

Strictly limiting or *limiting* conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW11, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or wetlands.
2. Inside George Himes park, apply a protection overlay zone ('p' zone) to areas of forest vegetation contiguous to but more than 50 feet from stream top-of-bank.
3. Outside of George Himes Park, apply a conservation overlay zone ('c' zone) to areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank extending to 100 feet from top-of-bank.
4. Apply a conservation overlay zone ('c' zone) to areas of forest vegetation on steep slopes that is adjacent to SW Terwilliger Blvd right-of-way, SW Barbur Blvd or Interstate 5 right-of-way (both sides).
5. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW12 **Site Name:** Multnomah

Previous Plan: Southwest hills Resource Protection Plan

Previous Resource Site No.: 118

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

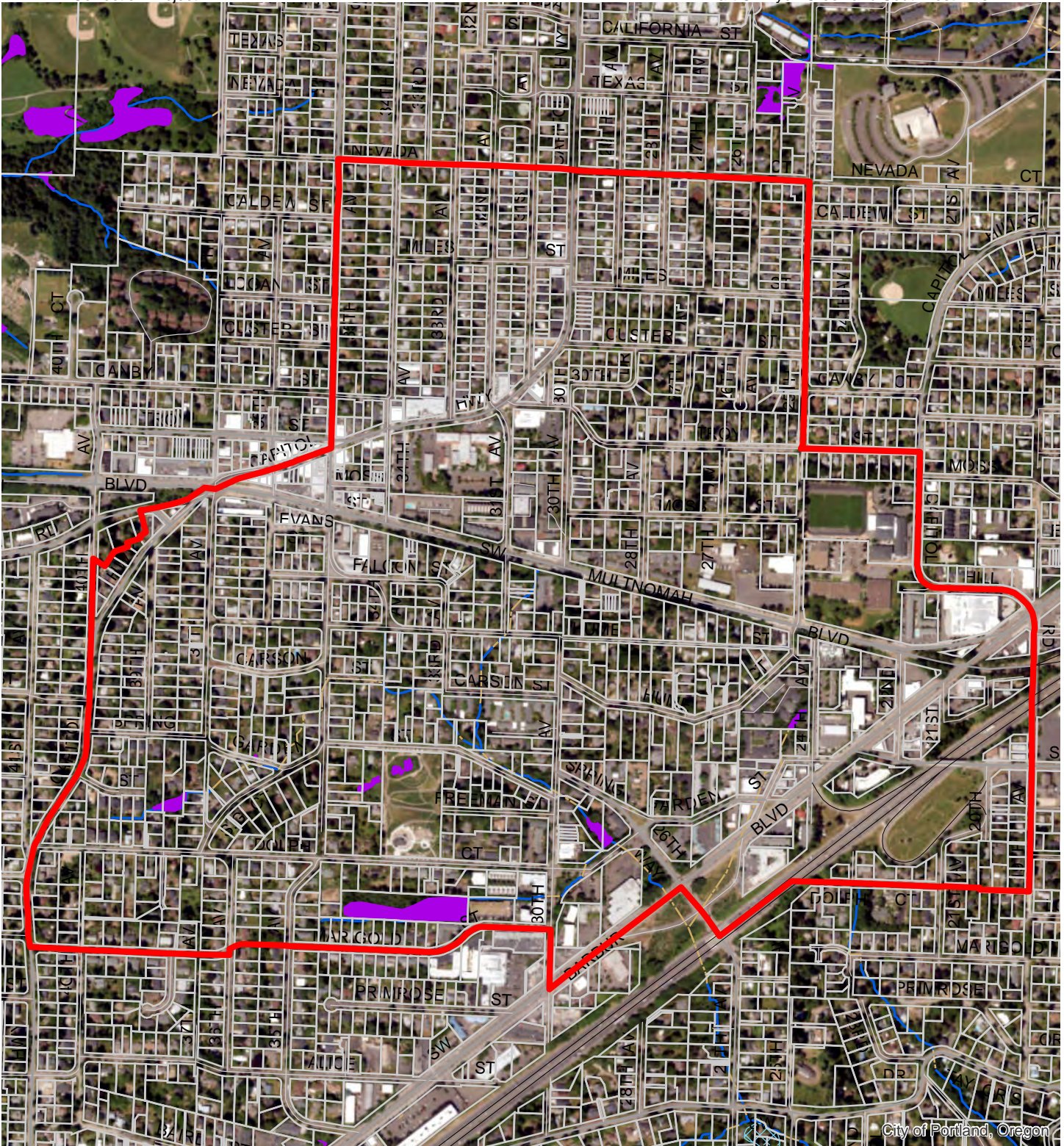
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW12 includes the following:

Site (acres)	407.1
Base zones (acres)	
CE	42.5
CM1	8.6
CM2	25.6
EG2	4.7
OS	7.5
R2.5	4.4
R5	67.1
R7	179.3
RM1	43.7
RM2	23.6

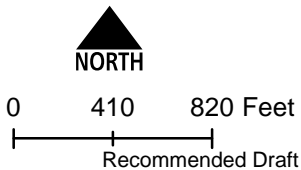


City of Portland, Oregon

Map A: Water Features

Resource Site: SW12

Updated: May 2022

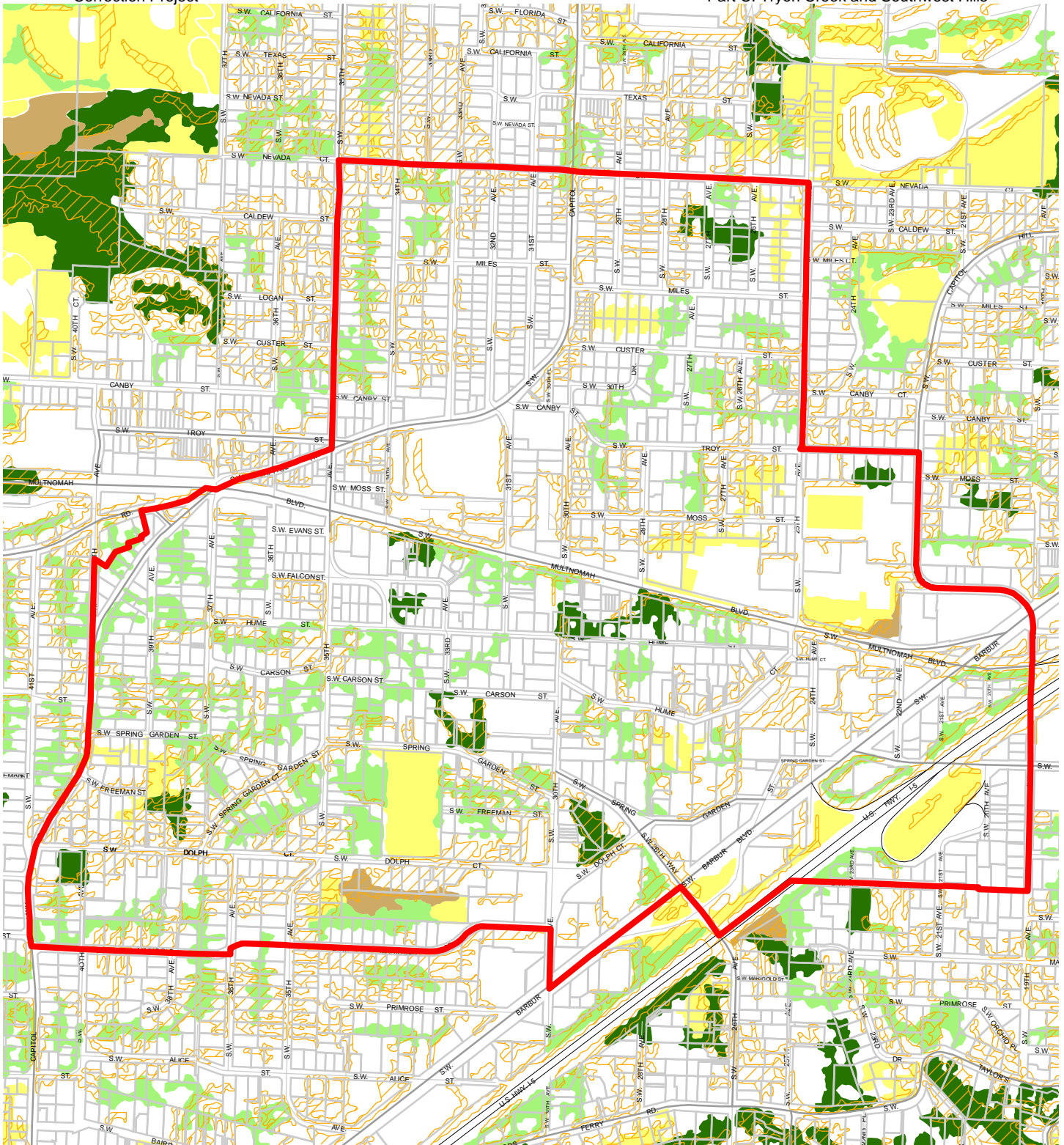


Recommended Draft - As Amended

- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



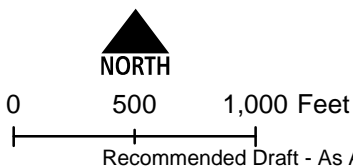
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022



Map B: Vegetation and Steep Slopes

Resource Site: SW12

Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous



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Atlas Immersion Academy - Gabriel Park

Portland Jewish Academy

Neighborhood House

Maimonides Jewish Day School

Gabriel Park

Crossroads Community Garden

West Hills Schools

A Park

Multnomah Arts Center

West Hills Christian

Spring Garden Park

Capitol Hill Elementary

Tryon Creek Headwaters

Woods Memorial Natural Area

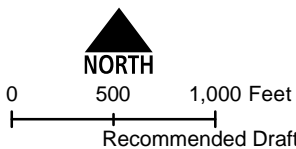
Marshall Park

Foley-Balmer Natural Area

**Map C: Special
Habitat Areas**

**Resource Site:
SW12**

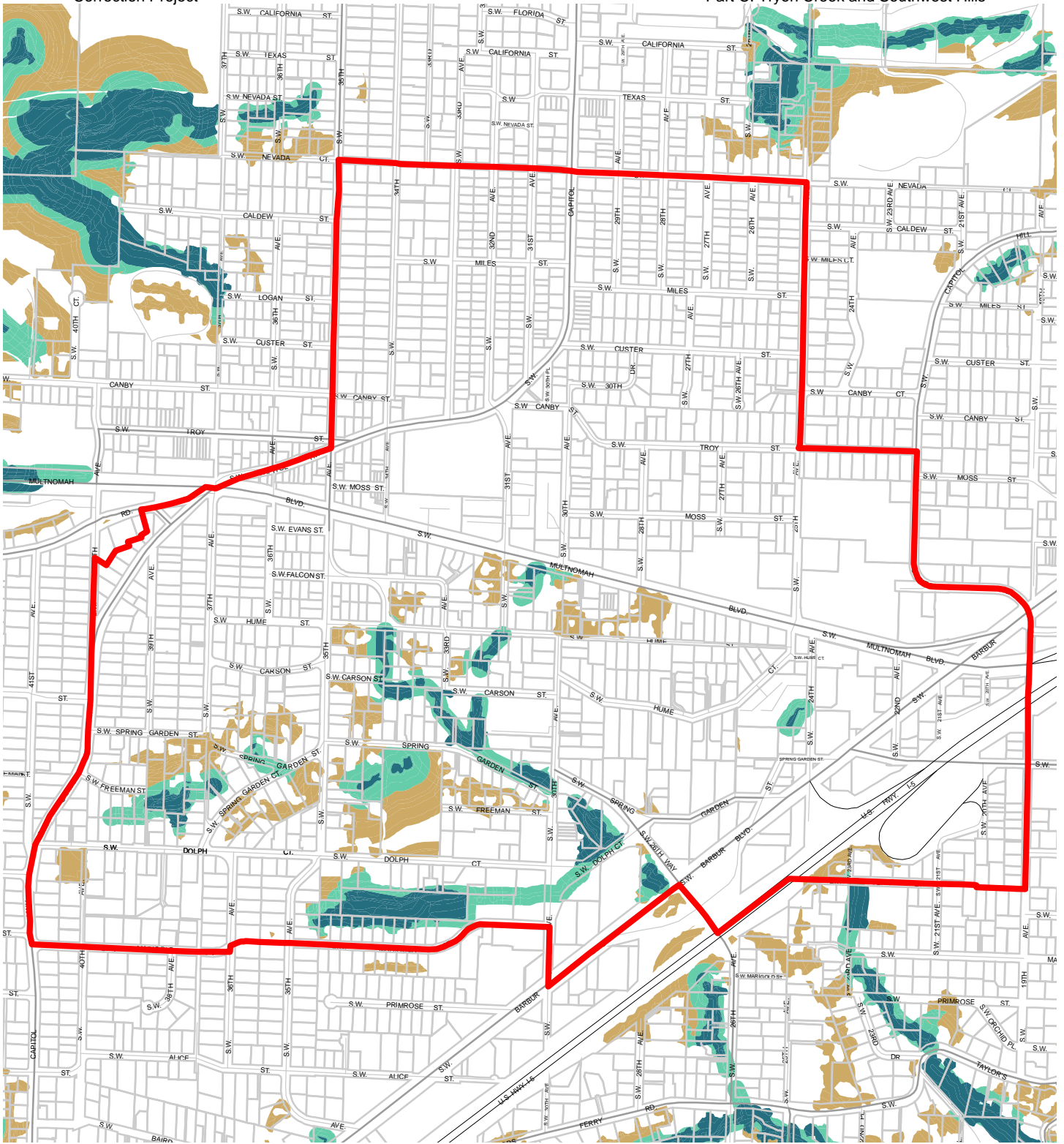
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Special Habitat Areas (SHAs)
- Taxlots
- Open Stream Channel
- Piped Stream Segment
- Parks
- Schools



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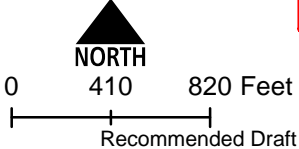


**Map D: Riparian
Corridors Habitat
Classification**

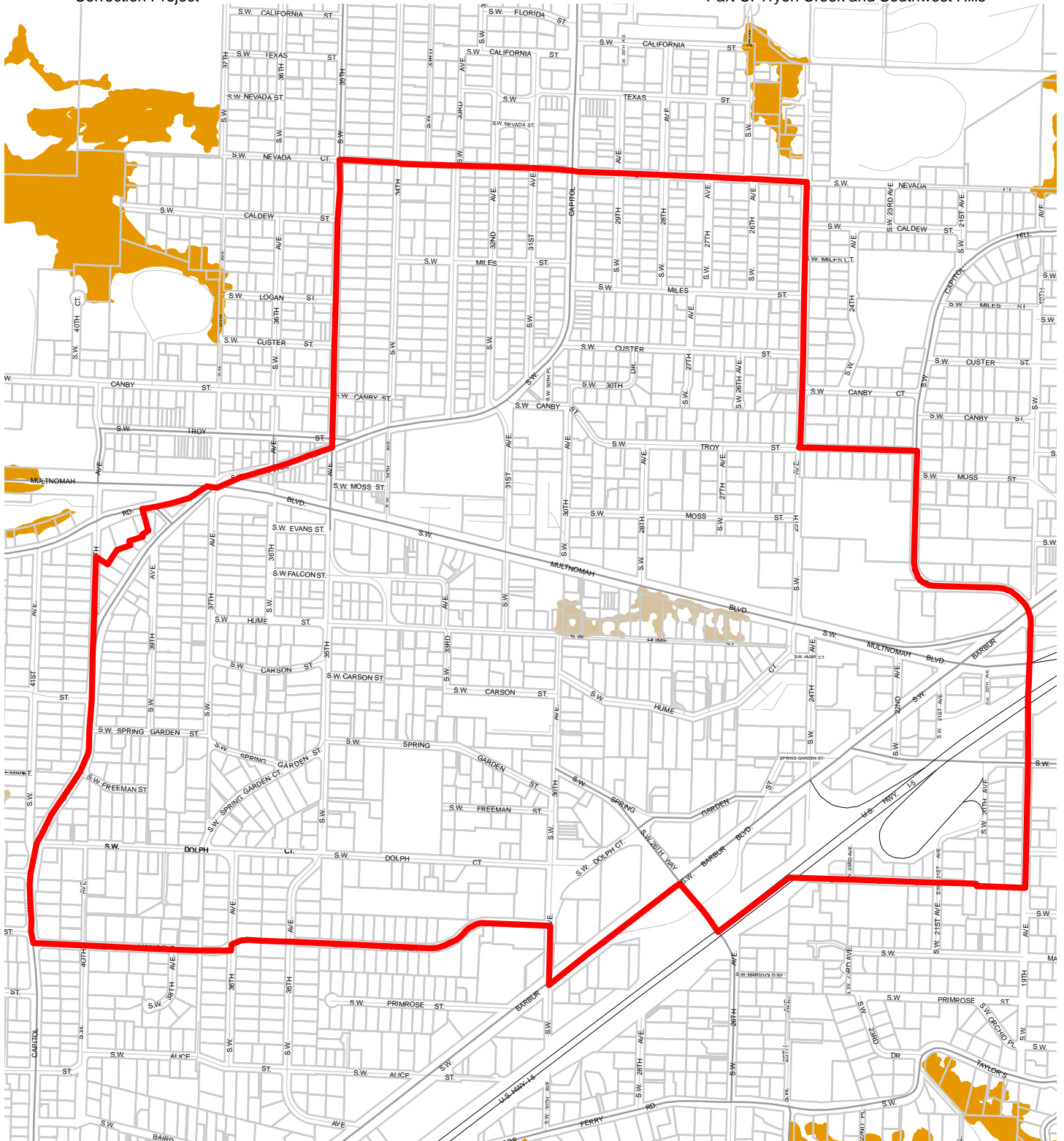
**Resource Site:
SW12**

Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots

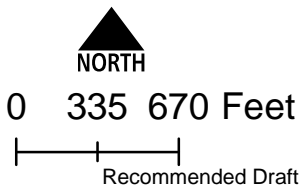








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May 2022



**Map E: Wildlife
Habitat Classification
Resource Site:
SW12**

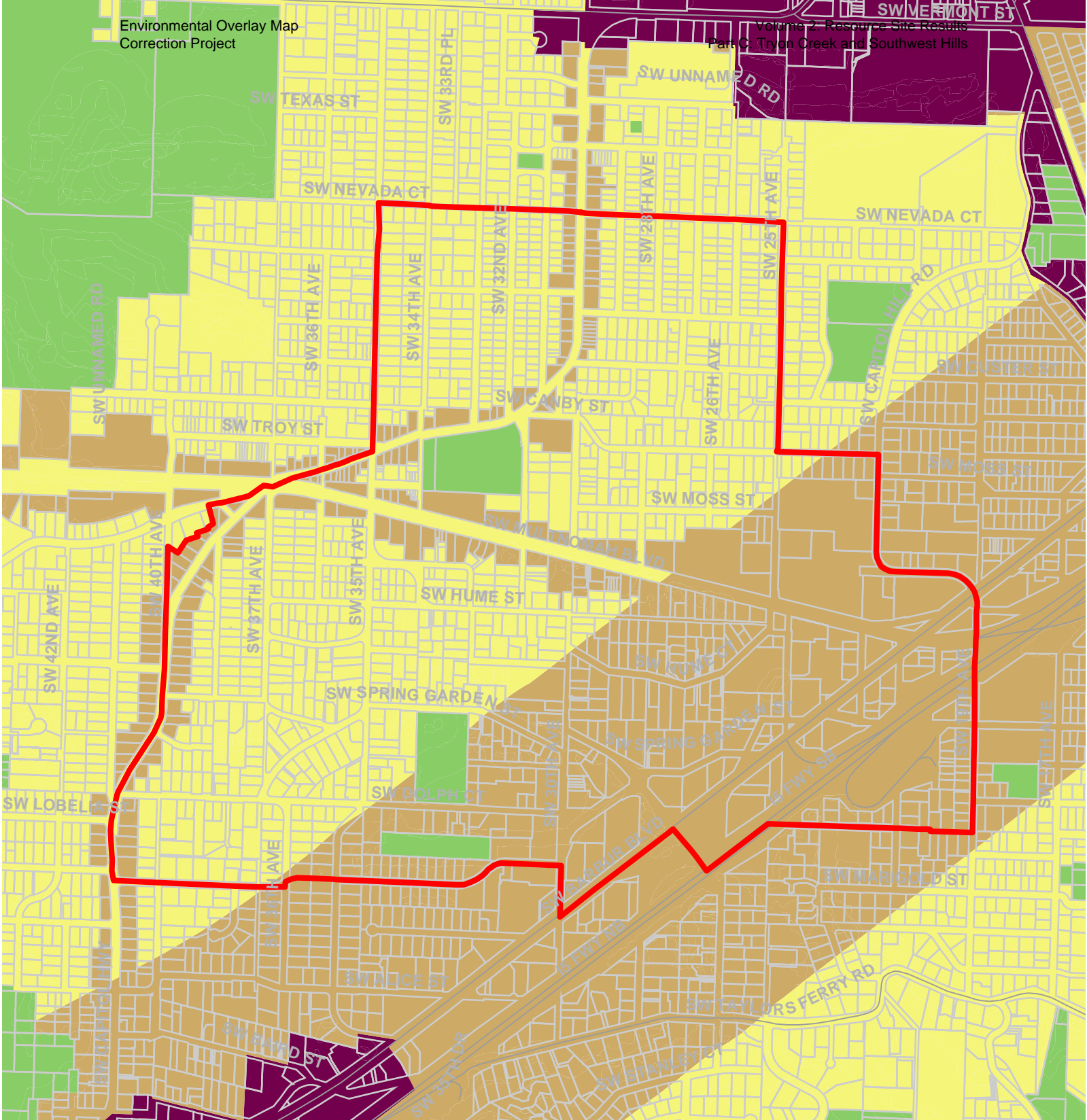
Updated: May 2022



-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots



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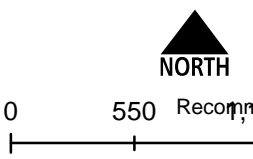


Map F: Urban Development Value (Title 13)
Resource Site: SW12

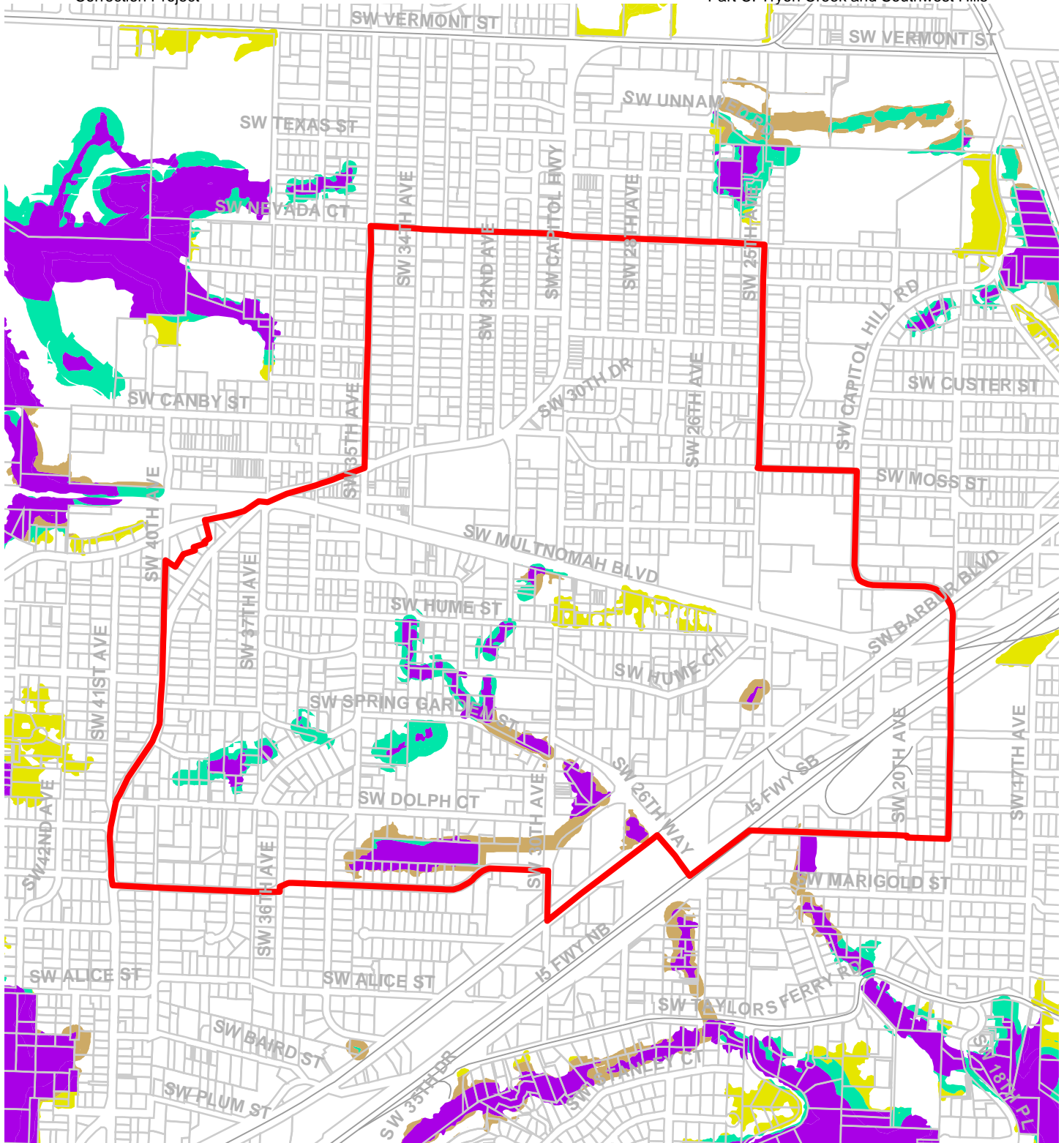
- Urban Service Boundary
- Resource Sites
- High Development Value
- Medium Development Value
- Low Development Value
- Parks



Updated: July 2021



The information on the map was derived from digital databases. 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 aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.



Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW12

Updated: May 2022



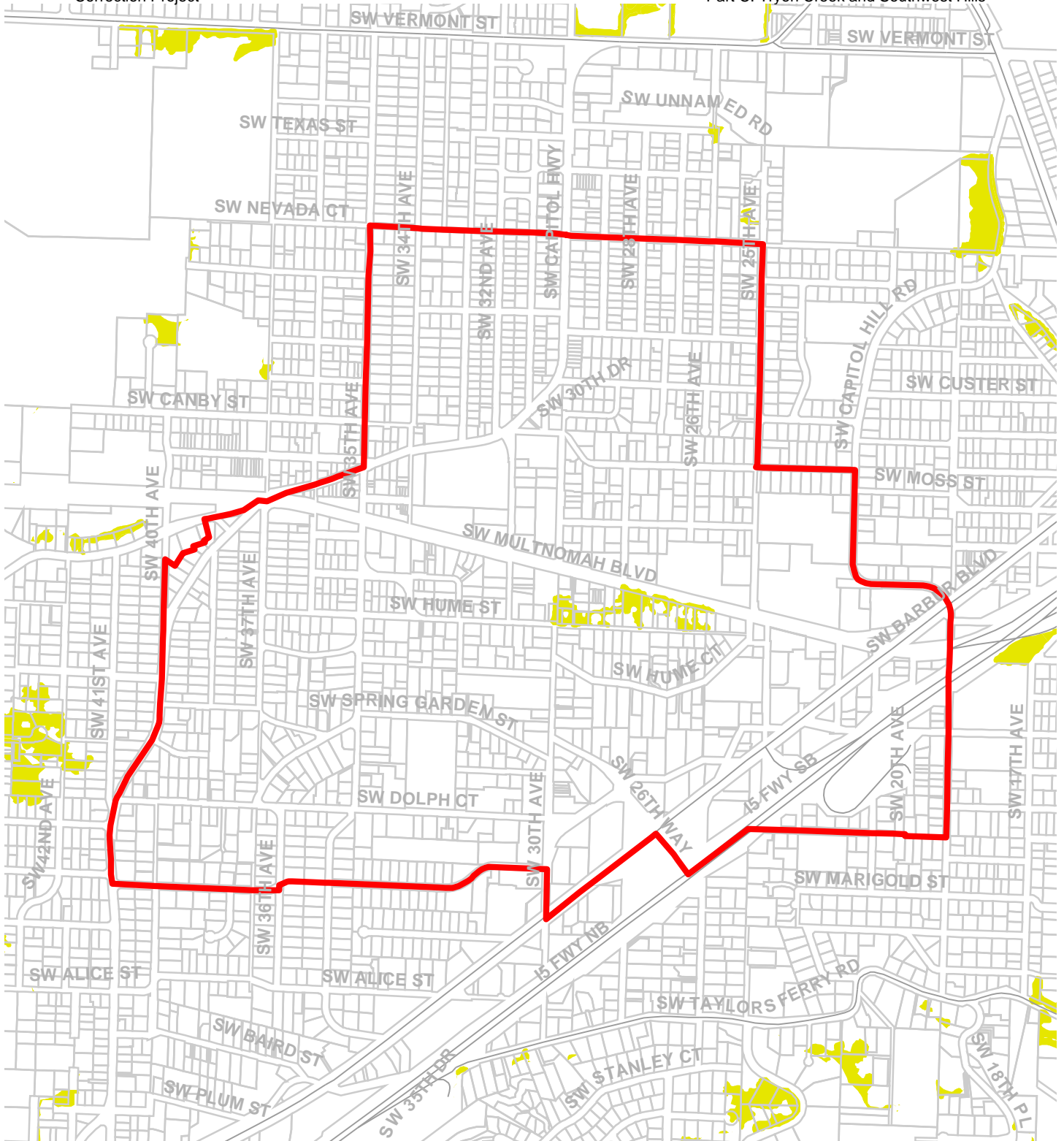
Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- HCA High Value
- HCA Moderate Value
- HCA Low Value
- Goal 5 Significant Natural Resources



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May 2022



Map H: Goal 5 Resources

Resource Site: SW12

Updated: May 2022

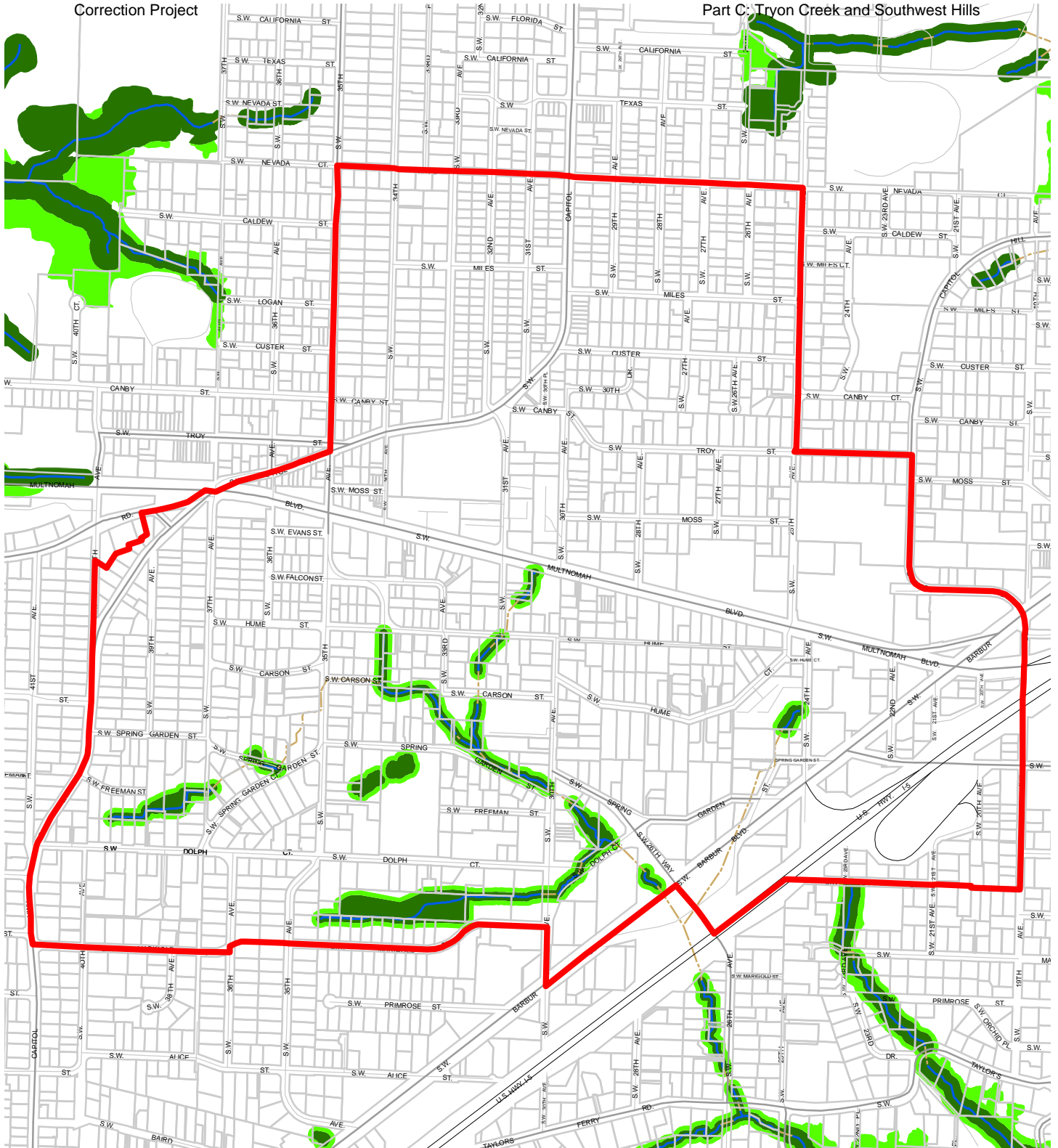


Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.

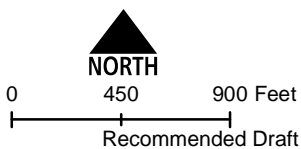


Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
SW12**

Updated: May 2022

- Resource Sites
- Urban Service Boundary
- Open Stream Channel
- Taxlots
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022

Natural Resource Description

Within resource site SW12 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; wetland; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: Wetlands (W)

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW12	
	Study Area
Stream (Miles)	0.9
Wetlands (acres)	2.5
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	9.6
Woodland (acres)	51.3
Shrubland (acres)	2.3
Herbaceous (acres)	22.7
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	72.3
* 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 areas with a slope greater than 25%.	

There are two significant natural areas within Site SW12. They are between two and four acres in area and form part of a 320-acre drainage basin. The remainder of the creek has been piped until it passes under Interstate 5. From I-5, the creek re-emerges as an open system again and joins with Falling Creek which is the drainage off of the hills north of Mt. Sylvania. Site SW12 creek and Falling Creek are part of Tryon Creek's 4,477-acre drainage basin.

This relatively small creek, wetlands and pond system provides storm drainage, sediment trapping and forms an enclave for resident wildlife. Typha willow and salamanders live here. The creek banks have native ash and non-native willow trees. Blackberry, willow and grass species form the understory. The riparian vegetation along the waterway forms an urban edge and gives a sense of place. The water provides potential recreation for the children of the area. These environmental qualities contribute to the neighborhood's identity. This site received a wildlife habitat score of 50, the lowest score in the study area. The low score reflects how the habitat has been compromised as a result of development. The scarcity of remaining habitat in this part of the city should be a considered in the ESEE analysis.

Table B: Quality of Natural Resource Functions in Resource Site SW12				
Resource Site (acres) = 407				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	9.4	13.1	17.6	40.0
percent total inventory site area	2.3%	3.2%	4.3%	9.8%
Wildlife Habitat*				
acres	0.0	0.0	3.0	3.0
percent total inventory site area	0.0%	0.0%	0.7%	0.7%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total⁺				
acres	9.4	13.1	18.6	41.1
percent total inventory site area	2.3%	3.2%	4.6%	10.1%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.				
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.				
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and

increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called “effective impervious area.” The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For Resource Area SW12, 27.9% of the total area is effectively impervious, indicating significant negative impacts are occurring due to the level of unmanaged impervious area and any additional impacts will cause further degradation.

Table C. Impervious Area within Resource Site SW12			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
407.1	150.6	113.6	27.9%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW12. Natural resources should be protected within HCA as follows:

1. *Strictly limit or limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit or limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit or limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or limiting conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting or limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW12 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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 R7, R5, R2.5, R2 and R1 base zones. Commercial uses are allowed in the CE, CM2 and CM1 base zone. Employment uses are allowed in the EG2 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW12, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW12, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands, land within 25 feet of stream top-of-bank or wetlands.
2. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of stream top-of-bank or between 25 and 50 feet of wetlands.
3. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW13 **Site Name:** Capitol Hill/Burlingame

Previous Plan: Southwest hills Resource Protection Plan

Previous Resource Site No.: 116

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

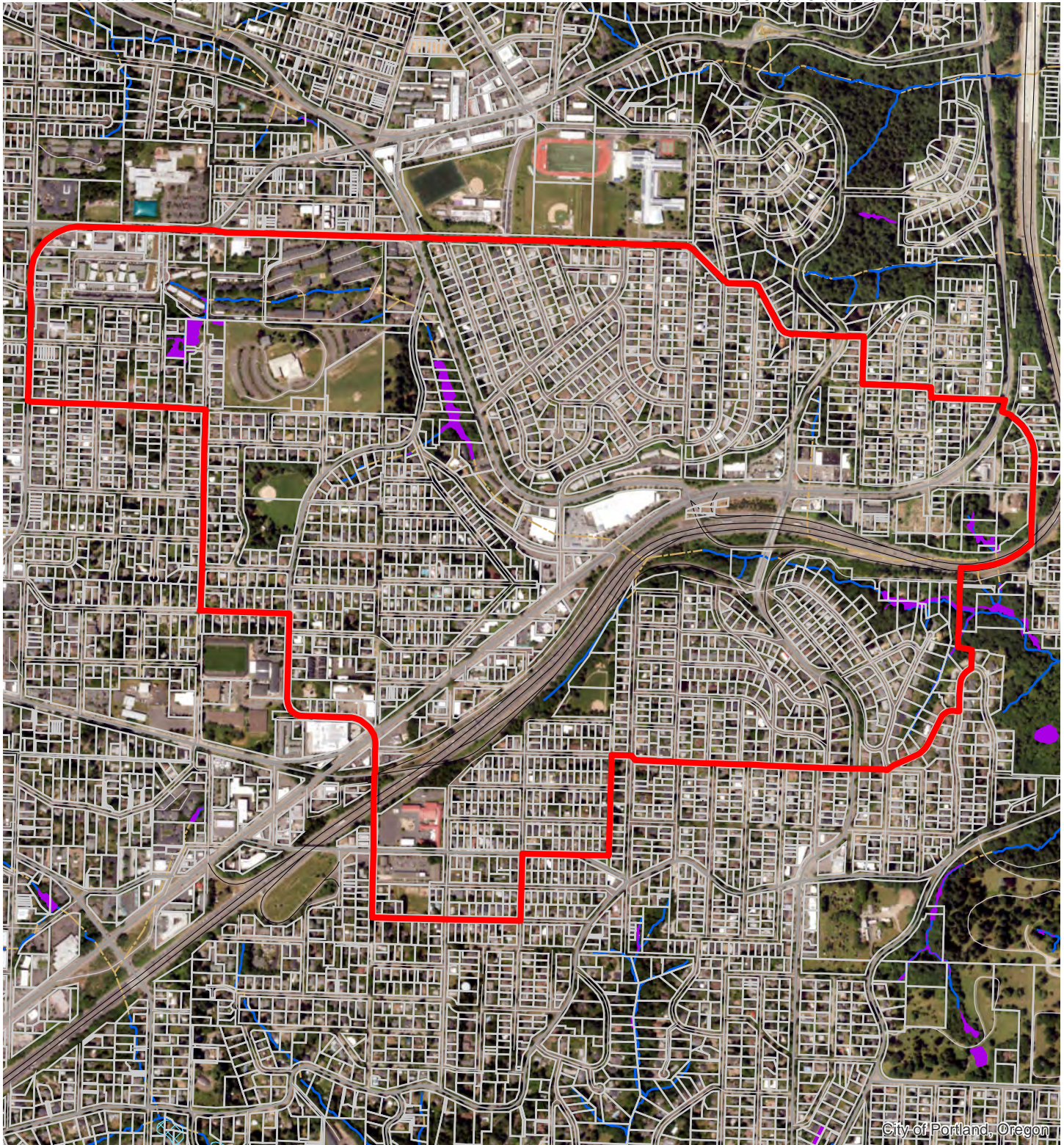
- A. Water Features – rivers, streams, wetlands and flood areas
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- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW13 includes the following:

Site (acres)	542.5
Base zones (acres)	
CE	13.4
CM1	2.7
CM2	40.4
IR	0.0
OS	43.2
R10	21.7
R2.5	13.8
R5	166.8
R7	150.8
RM1	60.4
RM2	29.3



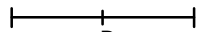
City of Portland, Oregon

Map A: Water Features
Resource Site: SW13

Updated: May 2022



0 500 1,000 Feet

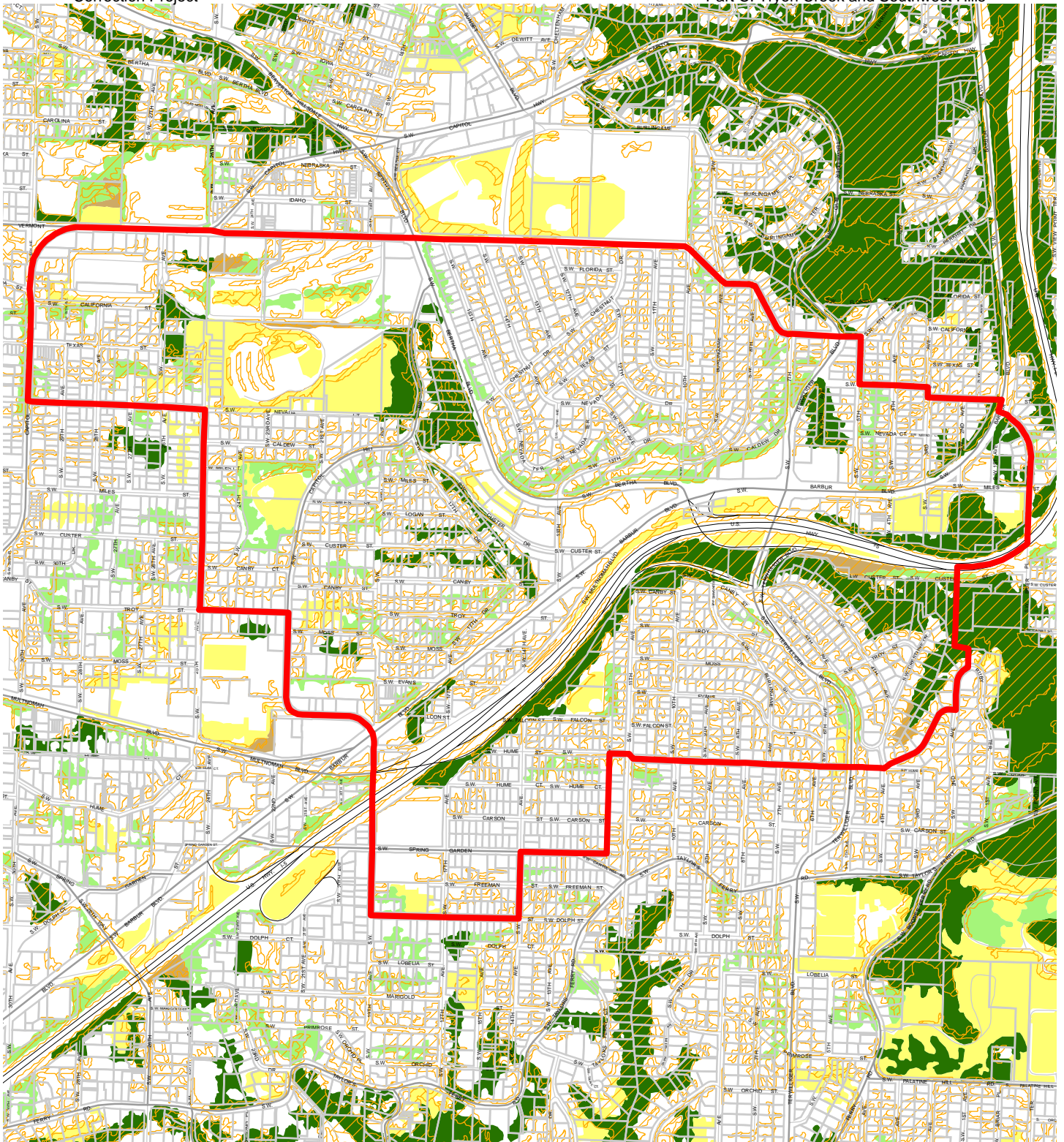


Recommended Draft - As Amended

- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



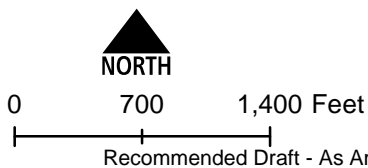
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May 2022



Map B: Vegetation and Steep Slopes

Resource Site: SW13

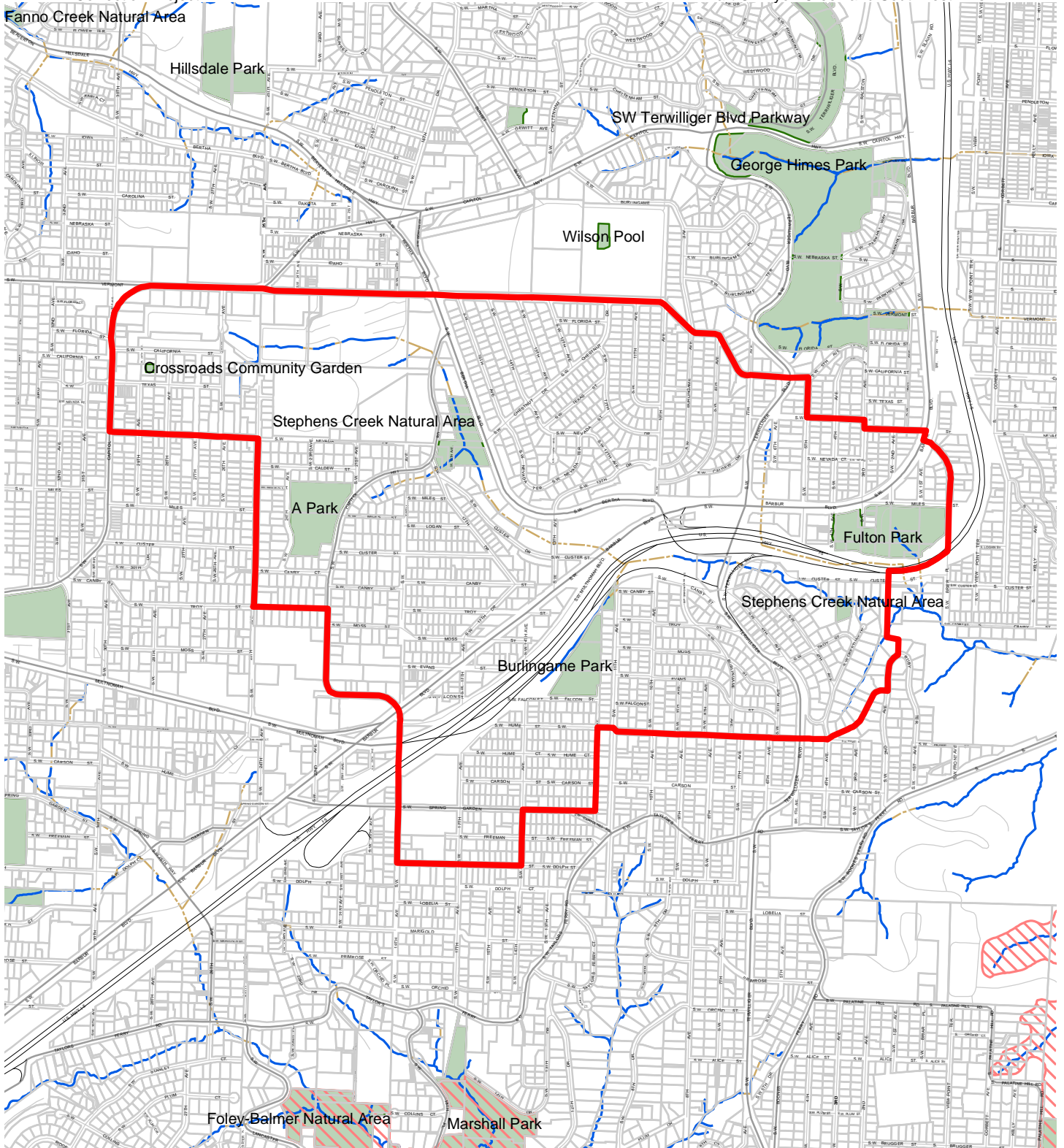
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous



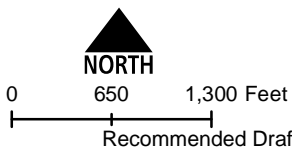
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**Map C: Special
Habitat Areas**

**Resource Site:
SW13**

Updated: May 2022

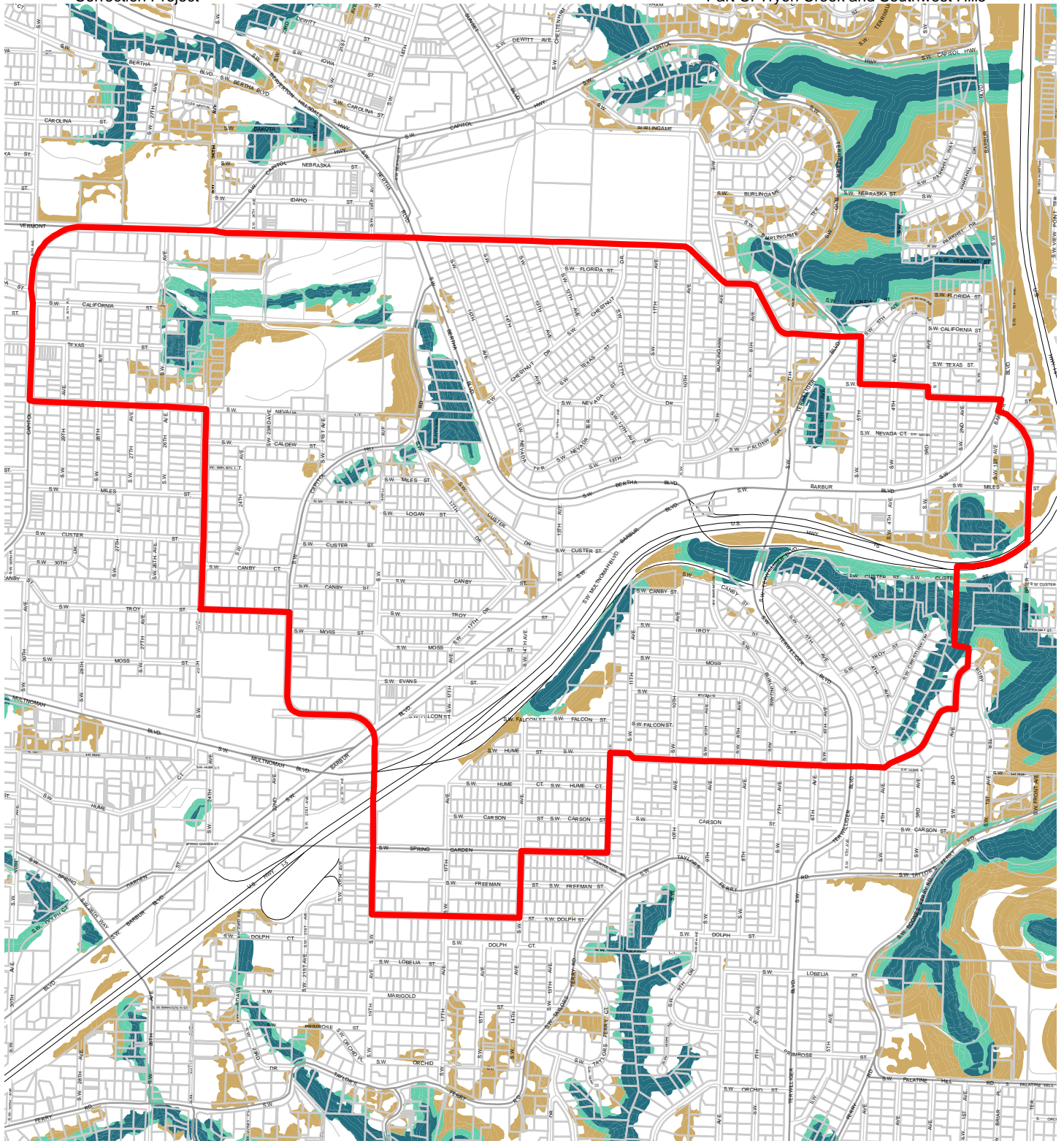


- Resource Sites
- Special Habitat Areas (SHAs)
- Open Stream Channel
- Piped Stream Segment
- Parks

- Urban Service Boundary
- Taxlots




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**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
SW13**

Updated: May 2022

 Class I (high rank)

 Class II (medium rank)

 Class III (low rank)

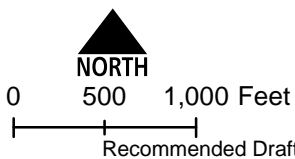
 Resource Sites

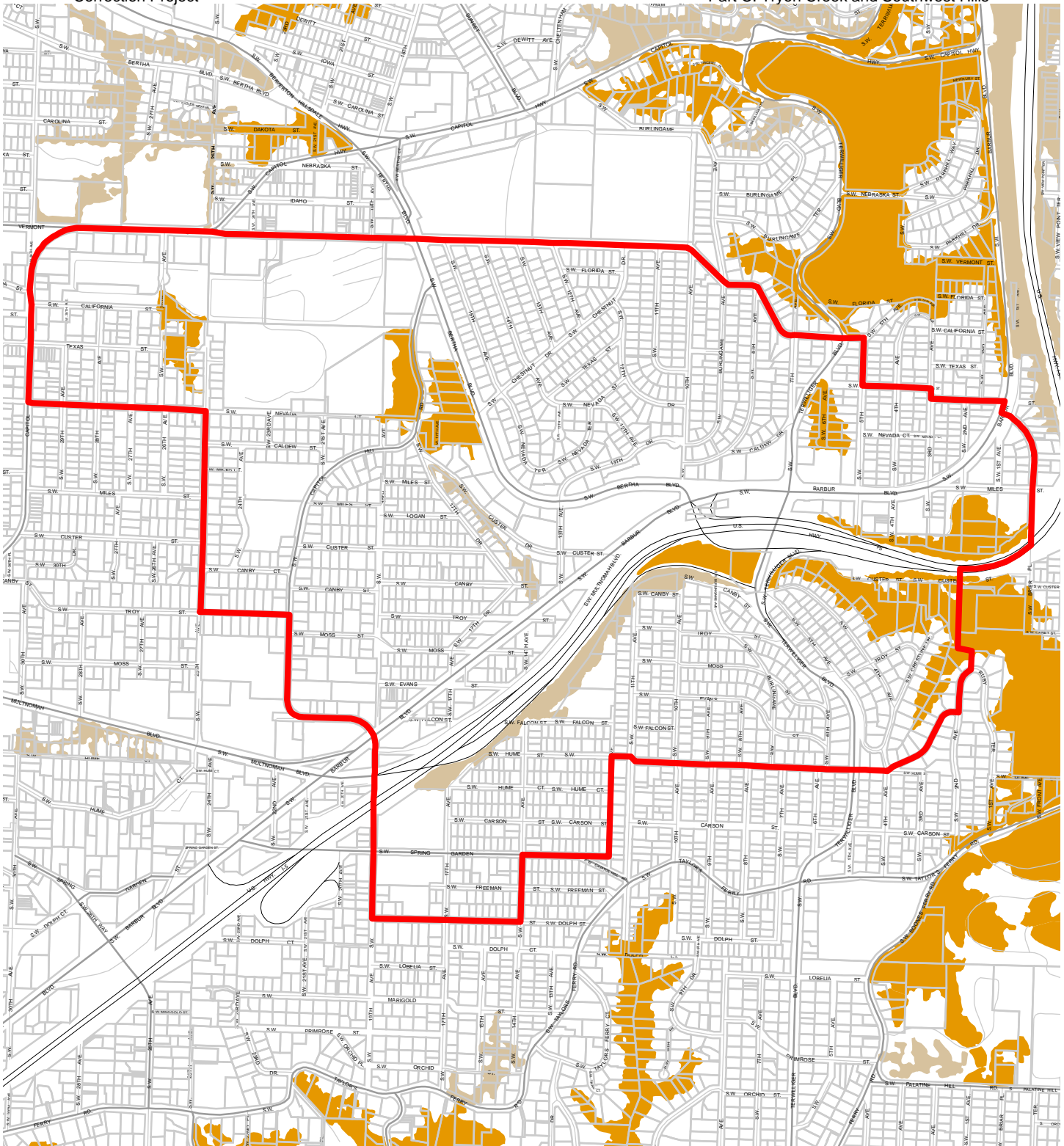
 Urban Service Boundary

 Taxlots



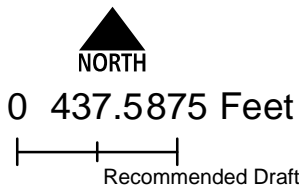
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.
May 2022











**Map E: Wildlife
Habitat Classification**
Resource Site:
SW13

Updated: May 2022

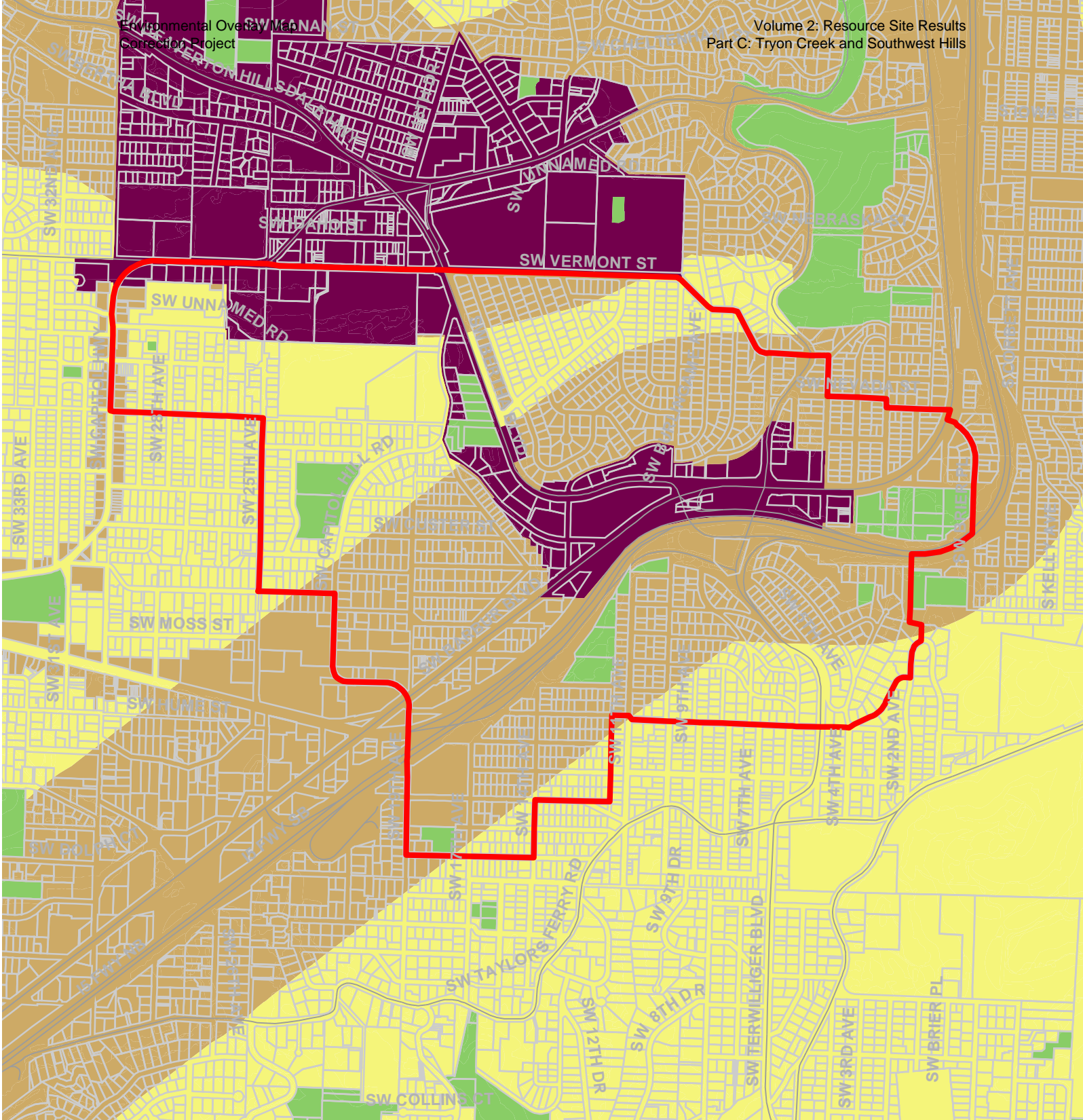


-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots



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May 2022



Map F: Urban Development Value (Title 13)
Resource Site: SW13

-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks

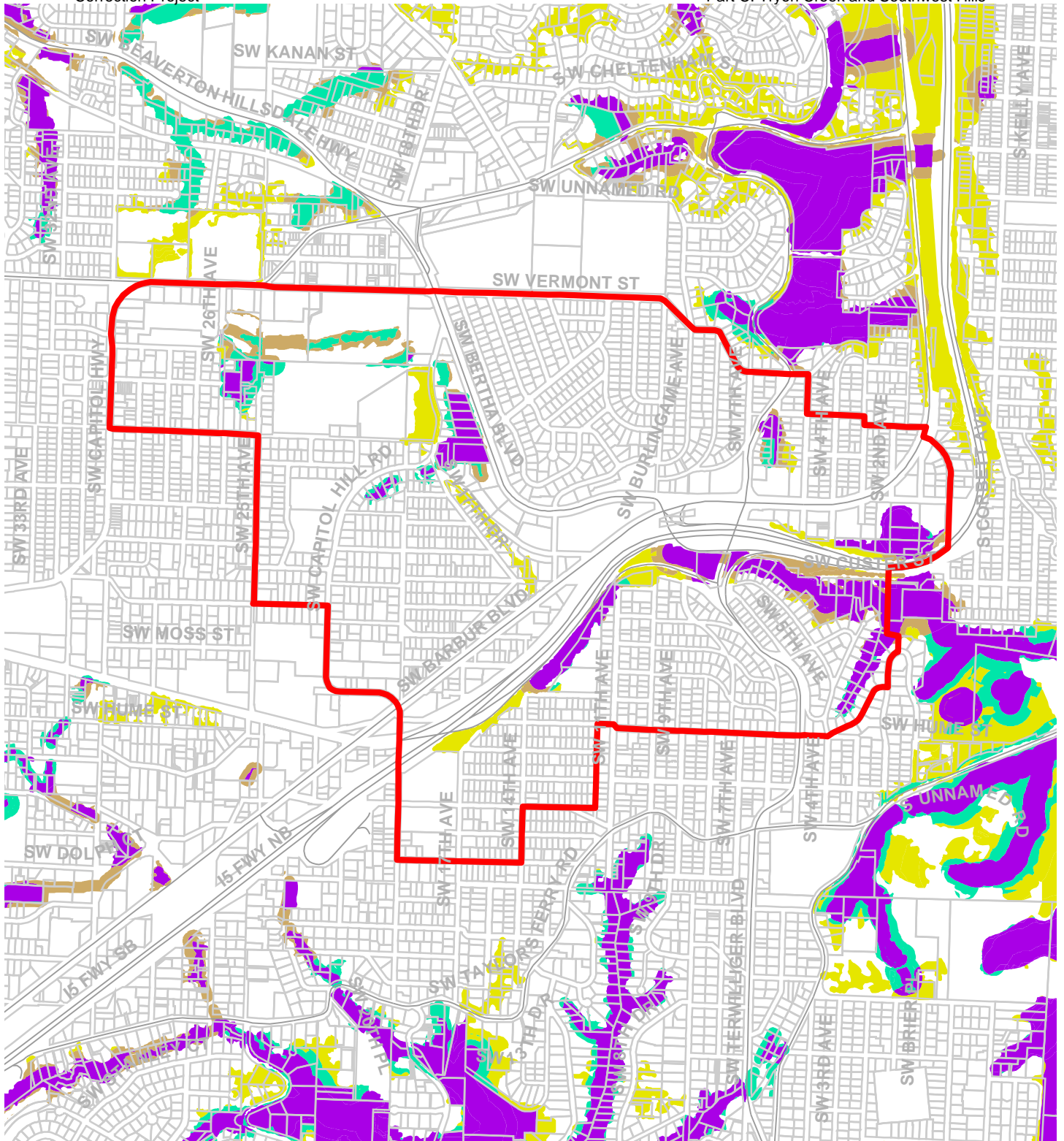


Updated: July 2021



0 750 1,500 Feet
Recommended Draft - As Amended

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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW13

Updated: May 2022



Recommended Draft - As Amended

--- Urban Service Boundary

Resource Sites

HCA High Value

HCA Moderate Value

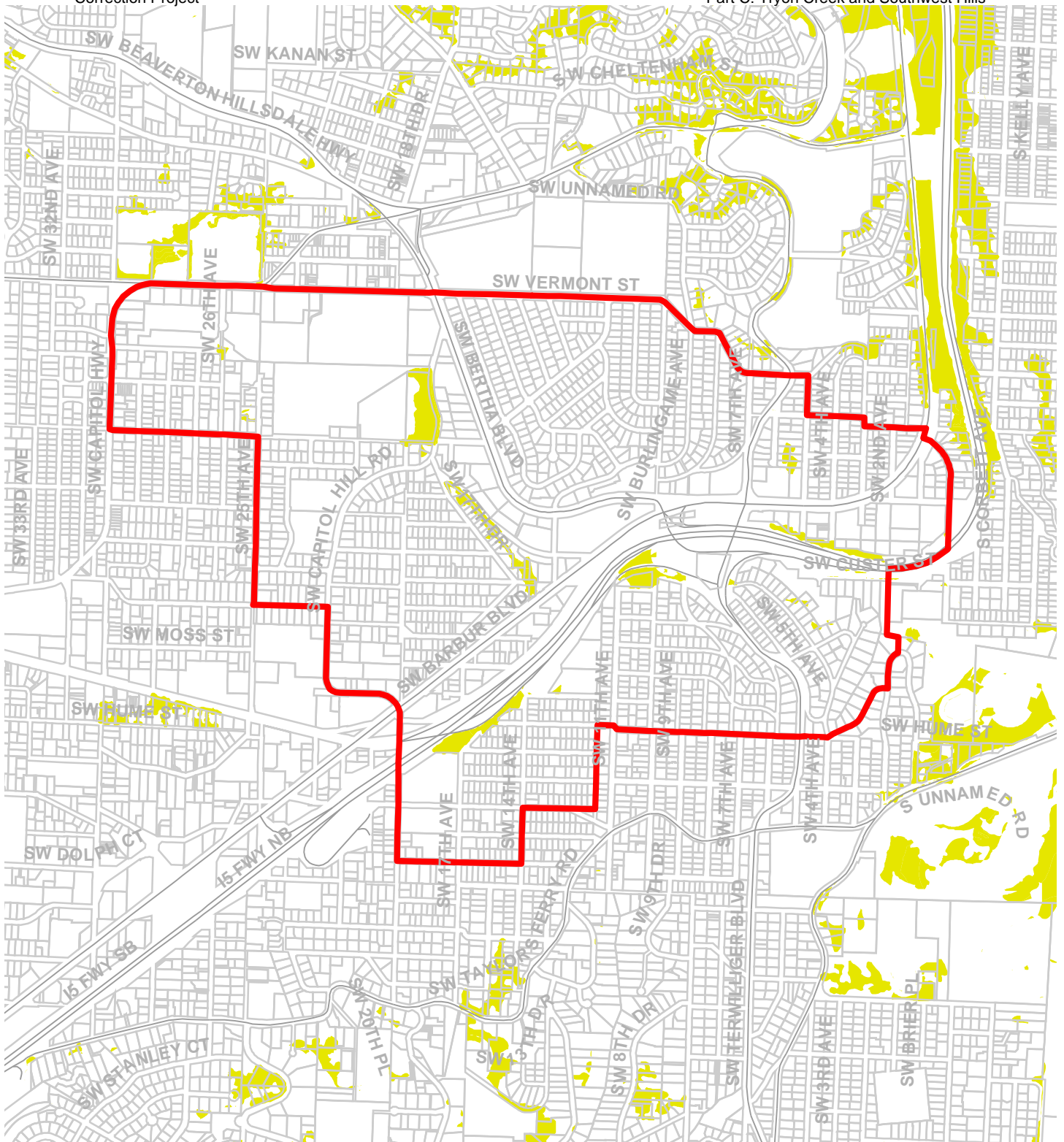
HCA Low Value

Goal 5 Significant Natural Resources



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May 2022



Map H: Goal 5 Resources

Resource Site: SW13

Updated: May 2022

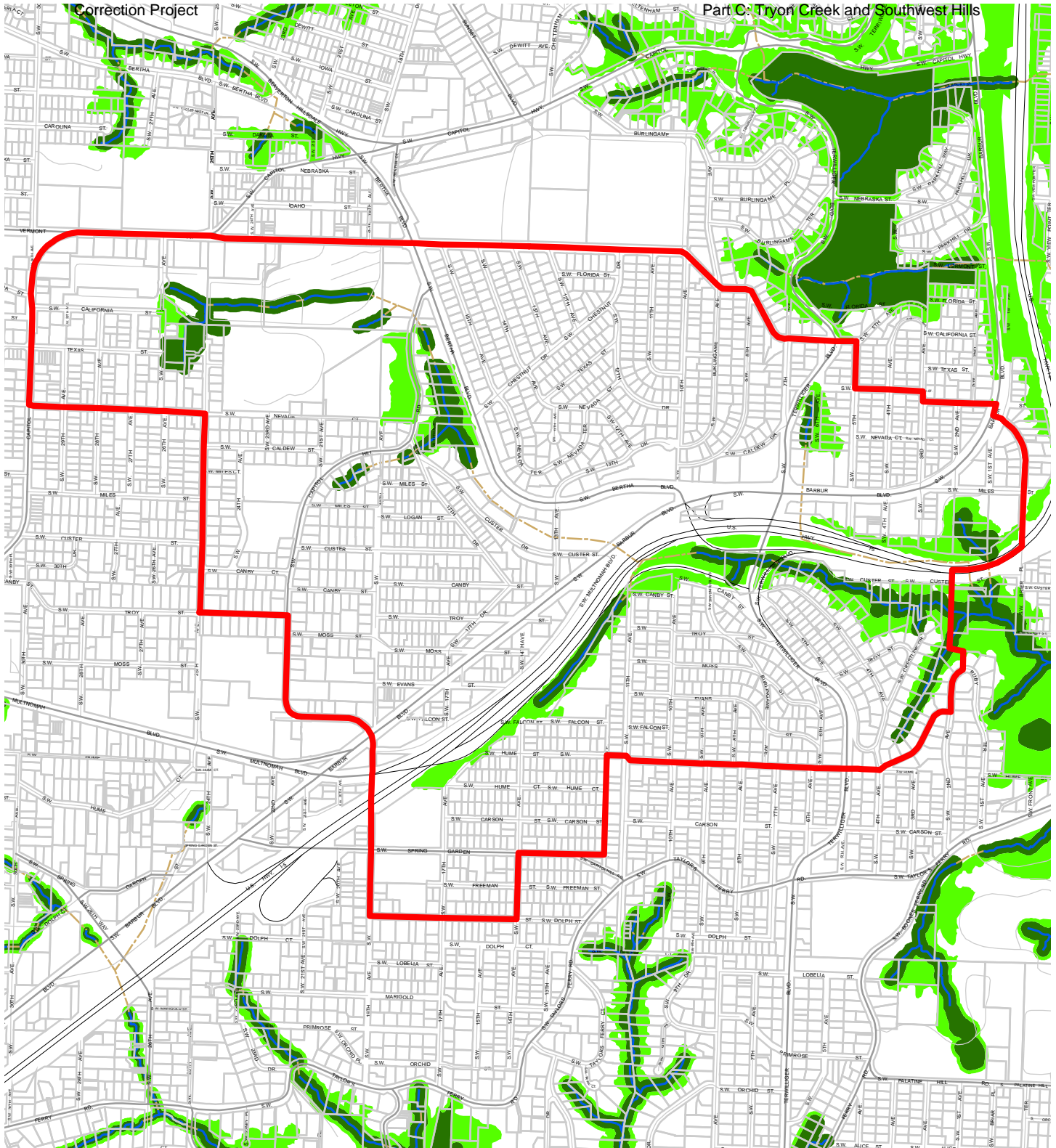


Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



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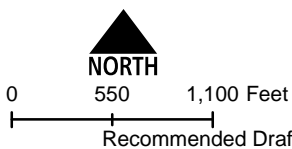


Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
SW13**

Updated: May 2022

- Resource Sites
- Urban Service Boundary
- Open Stream Channel
- Taxlots
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022

Natural Resource Description

Within resource site SW13 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; wetland; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: Wetlands (W)

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW13	
	Study Area
Stream (Miles)	1.6
Wetlands (acres)	3.2
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	54.0
Woodland (acres)	35.7
Shrubland (acres)	3.1
Herbaceous (acres)	33.9
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	199.1
* 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 areas with a slope greater than 25%.	

This site has a diversity of natural relief defined by four knolls. Three of the knolls are north of Interstate 5 (I-5); the fourth is south. The gulch that is formed by the knolls contains Stephens Creek, a perennial creek that flows on the south side of I-5, north of the River View Mausoleum, and then into the Willamette River. South of Miles Street (Site SW11), there is a National Wetland Inventory (PFO1W) designated wetland. The site elevations range from 500 feet on the west to 200 feet on the east. Five remaining natural areas ranging from two to 11 acres have been identified. Three of these areas are located in drainageways and two are hillsides above Interstate 5 that are either right-of-way areas or undeveloped parkland.

Eighty percent of Site SW13 has been developed, leaving only about 30 acres in a natural condition. Three of the sites have water courses of which Stephens Creek is the most significant. All five areas have groves of native trees including Douglas fir, cottonwood, bigleaf maple and alder. These areas provide cover and food for animals such as raccoon, mice, amphibians, and birds. The presence of water in the three drainage courses increases the area’s habitat quality since water is essential for wildlife survival. West of SW Bertha Boulevard is a half-acre wetland. Wetlands are rare and valued resources because of the high plant, animal and insect species to land area ratio. Wetlands also improve water quality by trapping sediment. This site includes the southern 1,000 feet of the Terwilliger Parkway. Terwilliger is a significant scenic and recreation corridor that also provides habitat (see Site SW10 & SW11 for more discussion).

Table B: Quality of Natural Resource Functions in Resource Site SW13				
Resource Site (acres) = 542				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	30.8	15.9	28.9	75.6
percent total inventory site area	5.7%	2.9%	5.3%	13.9%
Wildlife Habitat*				
acres	0.0	35.5	10.5	45.9
percent total inventory site area	0.0%	6.5%	1.9%	8.5%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total⁺				
acres	30.8	23.4	22.7	76.9
percent total inventory site area	5.7%	4.3%	4.2%	14.2%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.				
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.				
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called “effective impervious area.” The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For Resource Area SW13, 33.6% of the total area is effectively impervious, indicating significant negative impacts are occurring due to the level of unmanaged impervious area and any additional impacts will cause further degradation.

Table C. Impervious Area within Resource Site SW13			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
542.5	200.2	182.3	33.6%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW13. Natural resources should be protected within HCA as follows:

1. *Strictly limit or limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit or limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit or limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or limiting conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting or limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW13 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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, R7, R5, R2.5, R2 and R1 base zones. Commercial uses are allowed in the CE, CM2 and 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW13, with the following additional information that clarifies the analysis.

Strictly limiting or *limiting* conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW13, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands, land within 50 feet of stream top-of-bank or wetlands.
2. Apply a conservation overlay zone ('c' zone) to areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
3. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW14 **Site Name:** Stephens Creek

Previous Plan: Southwest hills Resource Protection Plan

Previous Resource Site No.: 117

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

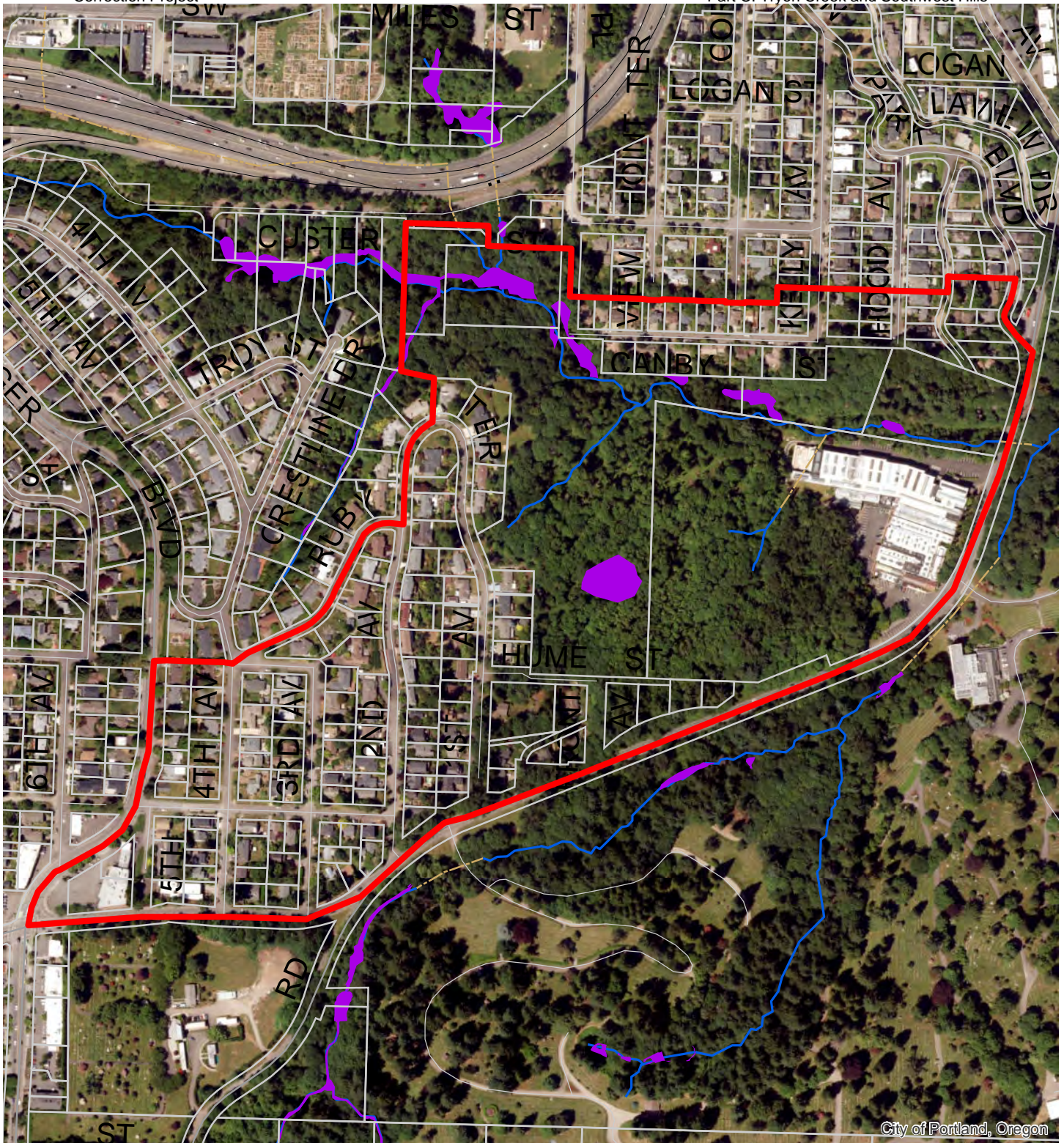
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW14 includes the following:

Site (acres)	78.0
Base zones (acres)	
CM1	1.7
OS	20.9
R10	31.5
R5	23.0
RM1	0.3
RM2	0.7



City of Portland, Oregon

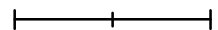
Map A: Water Features

Resource Site: SW14

Updated: May 2022



0 225 450 Feet

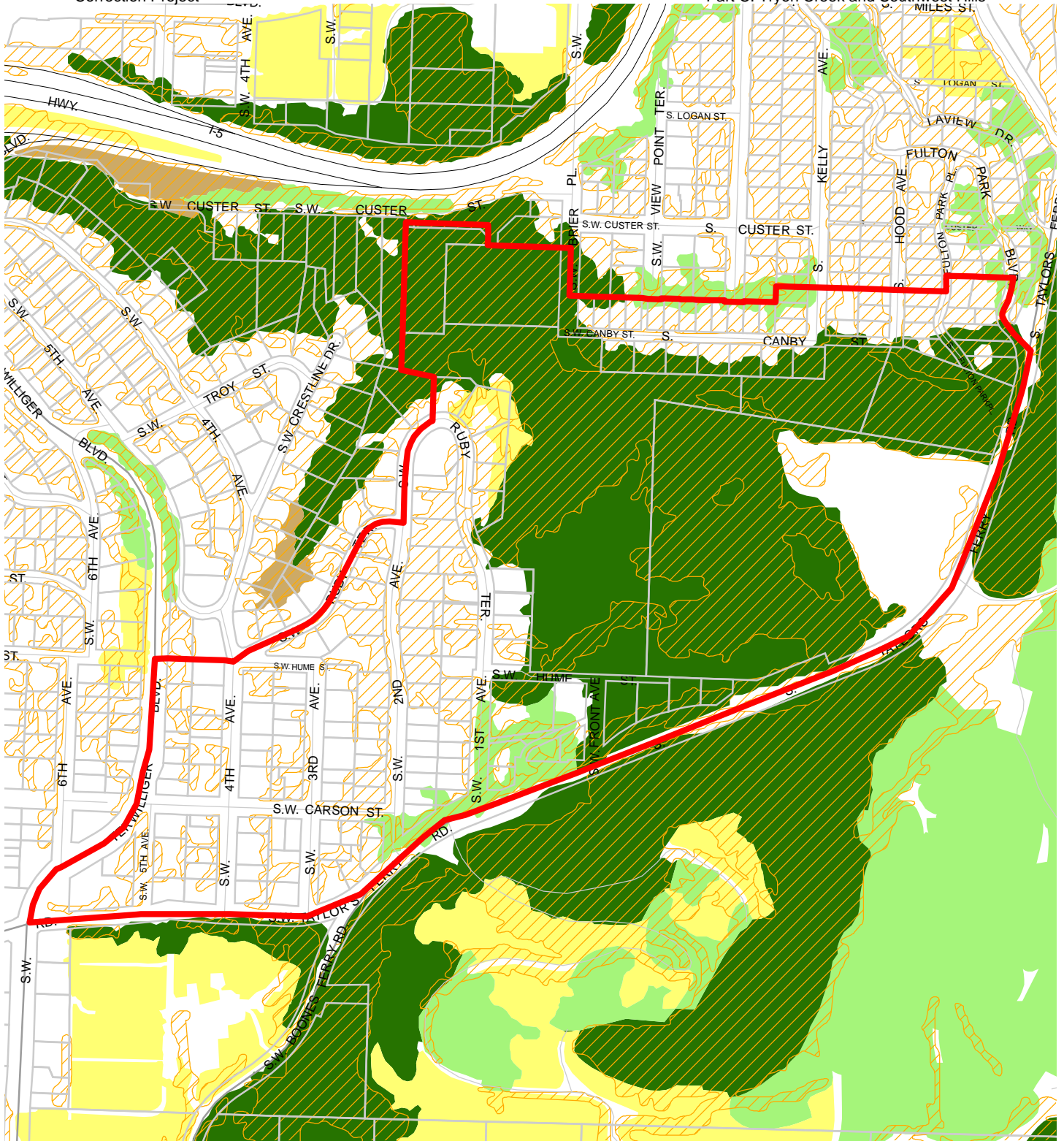


Recommended Draft - As Amended

- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



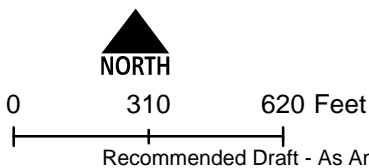
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May 2022










Map B: Vegetation and Steep Slopes

**Resource Site:
SW14**

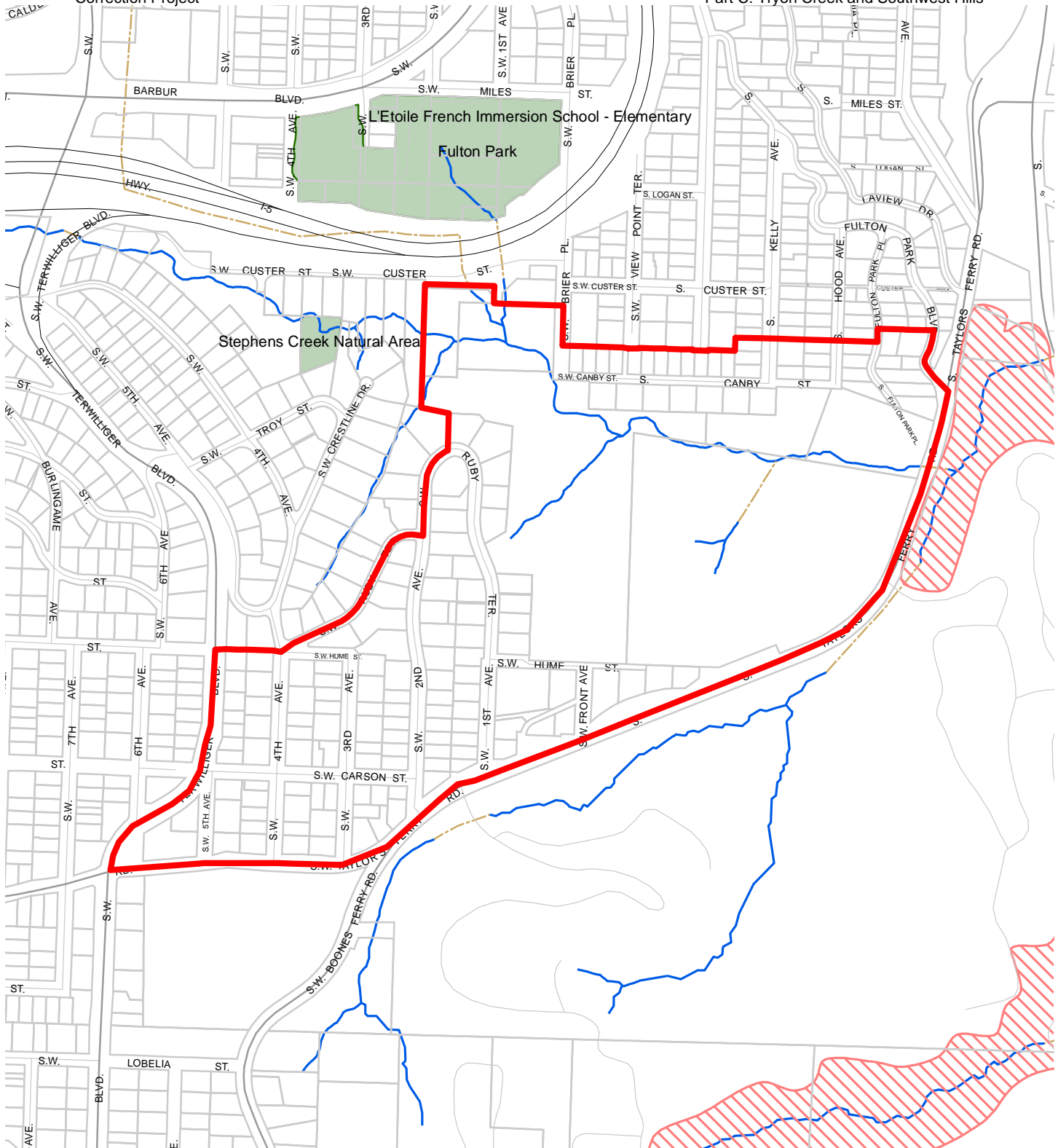
Updated: May 2022



-  Resource Sites
-  Urban Service Boundary
-  Taxlots
-  Forest
-  Woodland
-  Shrubland
-  Herbaceous



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May 2022



Map C: Special Habitat Areas

Resource Site: SW14

Updated: May 2022

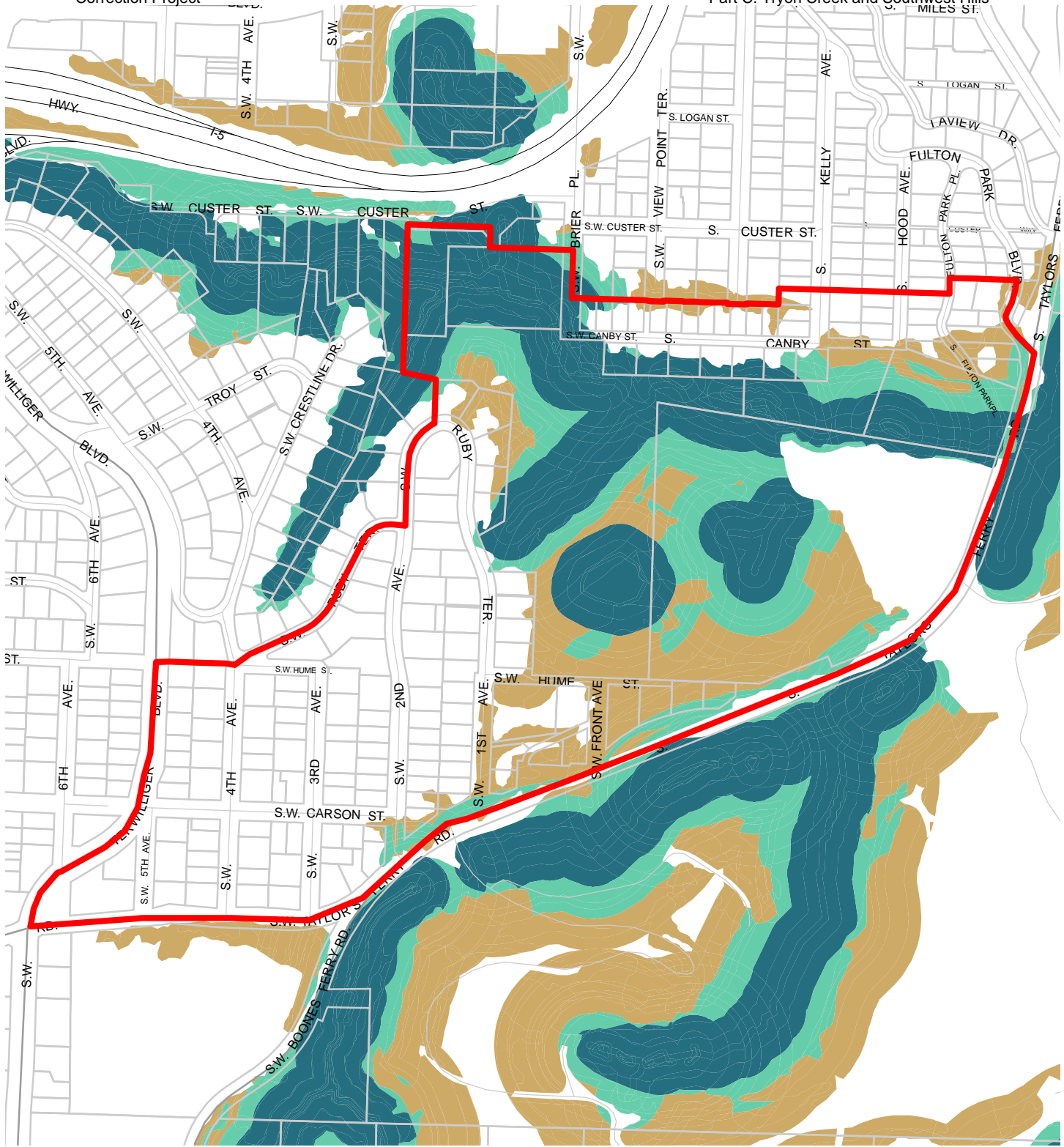


Recommended Draft - As Amended

- Resource Sites
- Urban Service Boundary
- Special Habitat Areas (SHAs)
- Taxlots
- Open Stream Channel
- Piped Stream Segment
- Parks
- Schools



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May 2022

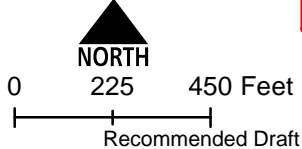


**Map D: Riparian
Corridors Habitat
Classification**

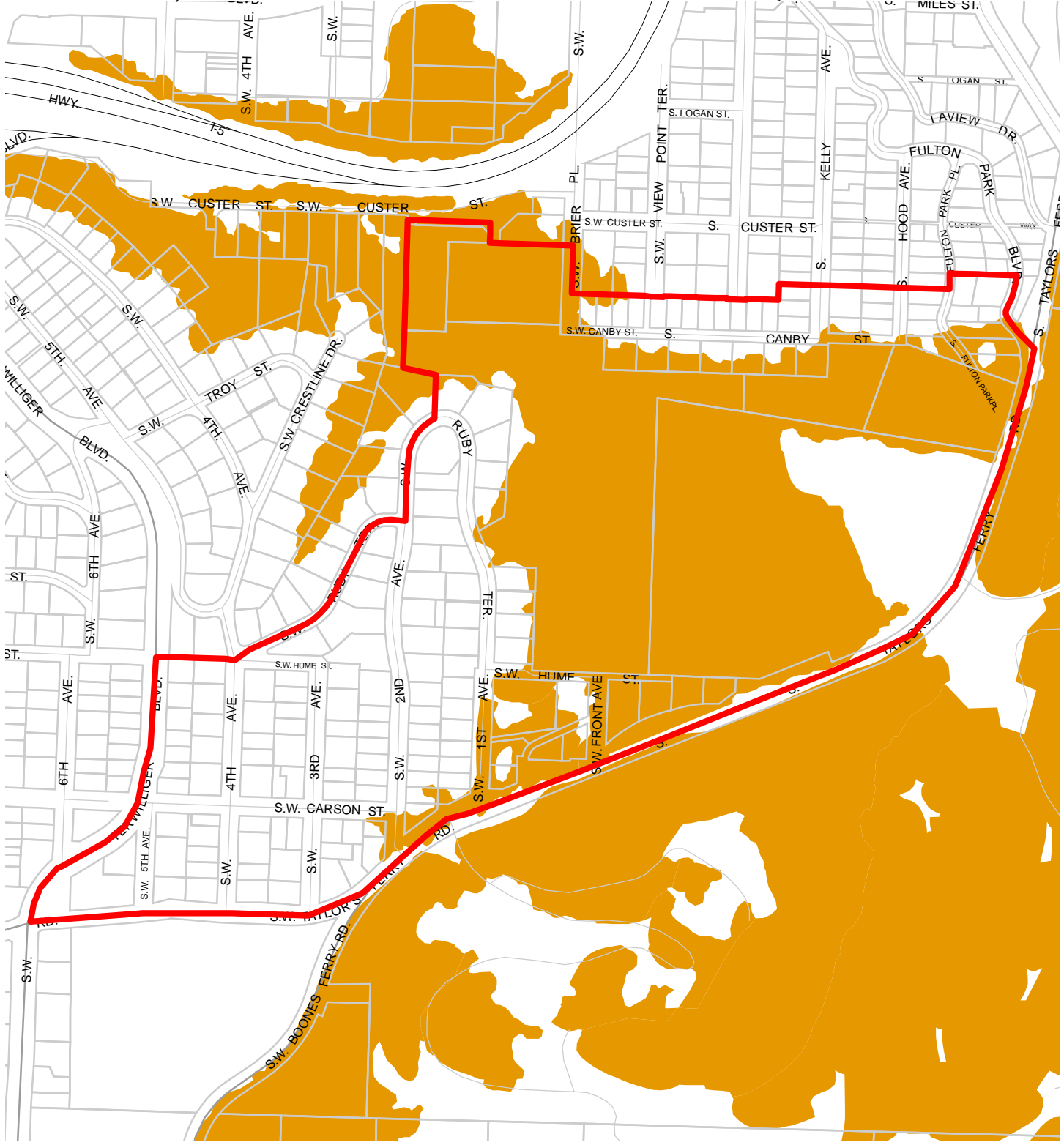
**Resource Site:
SW14**

Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots

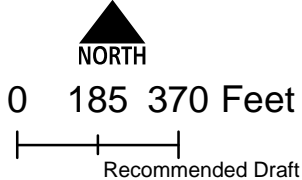


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May 2022



**Map E: Wildlife
Habitat Classification**
Resource Site:
SW14

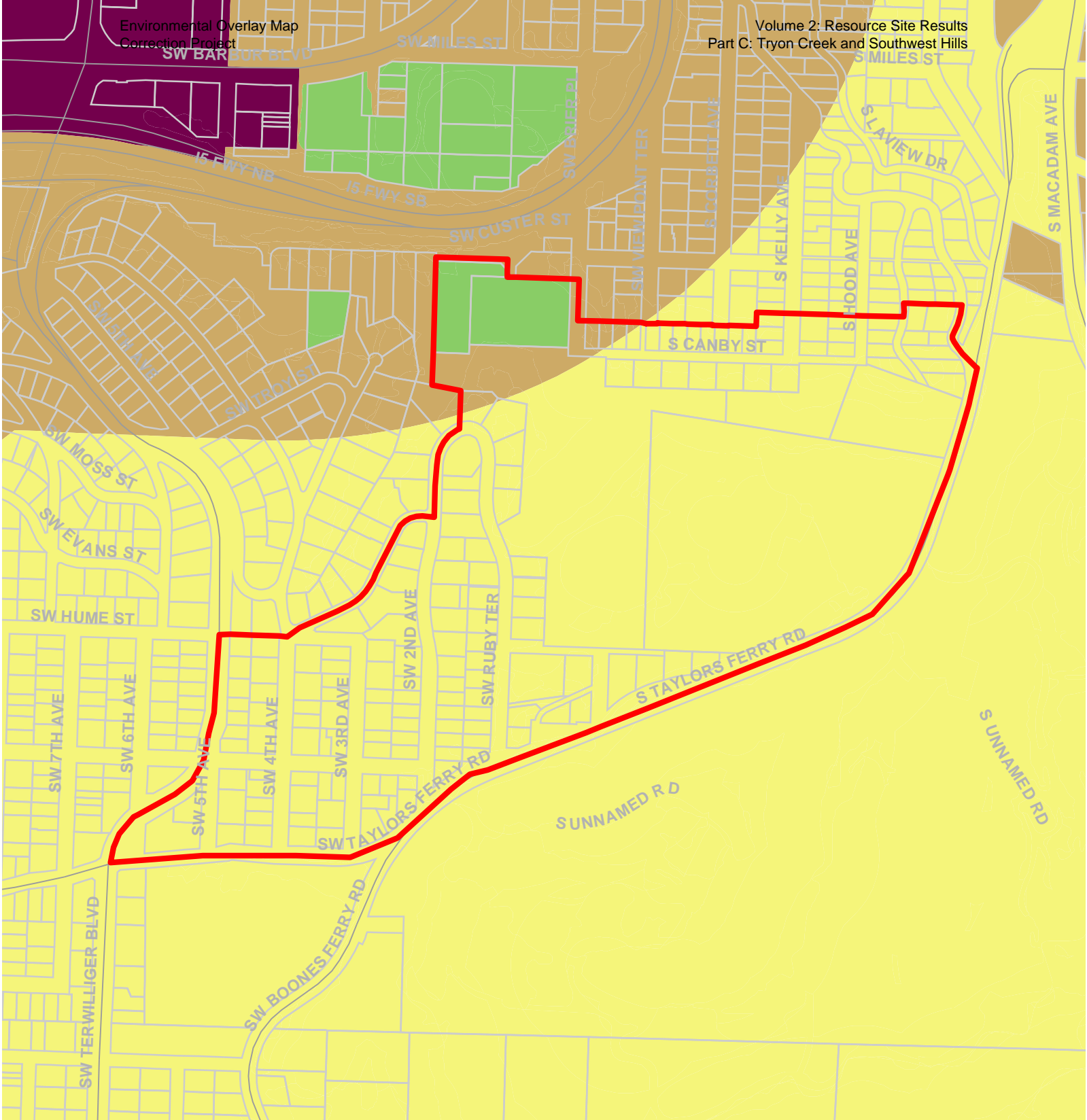
Updated: May 2022



- Resource Sites
- Class A (high rank)
- Class B (medium rank)
- Class C (low rank)
- Urban Service Boundary
- Taxlots



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May 2022



Map F: Urban Development Value (Title 13)
Resource Site: SW14

-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks

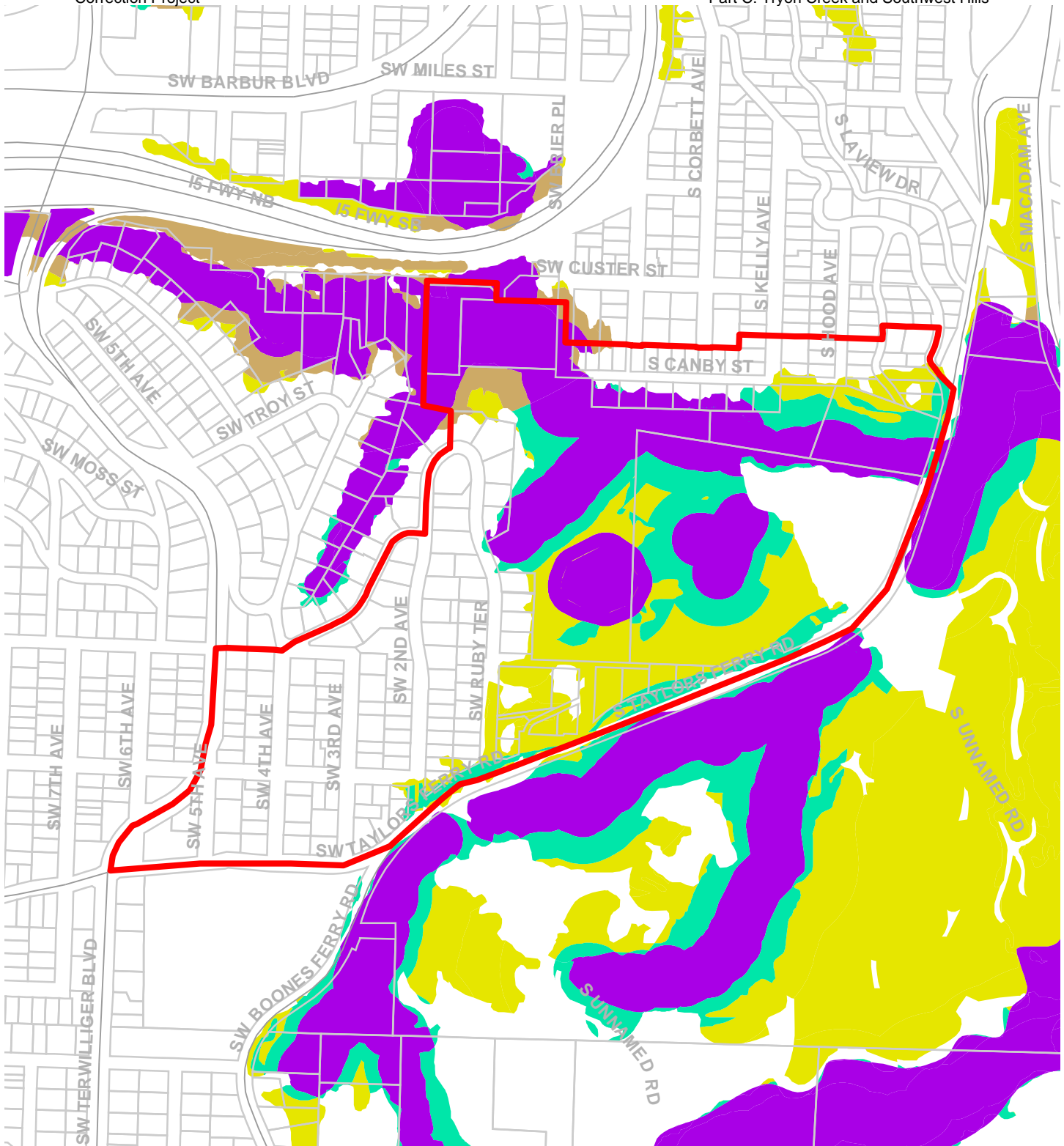


Updated: July 2021



0 335 670 Feet
Recommended Draft - As Amended

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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW14

Updated: May 2022

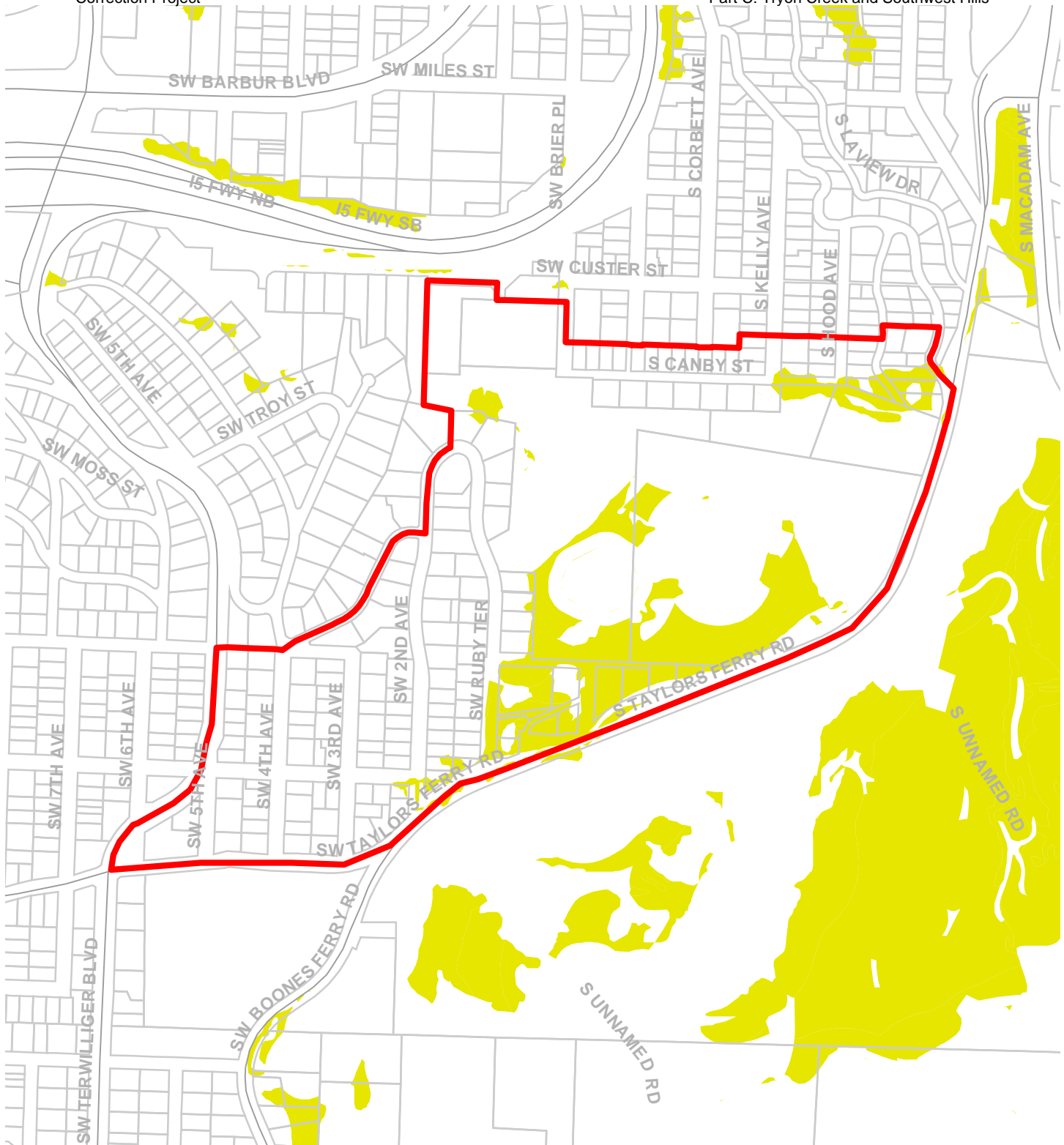


Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- HCA High Value
- HCA Moderate Value
- HCA Low Value
- Goal 5 Significant Natural Resources



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.



Map H: Goal 5 Resources

Resource Site: SW14

Updated: May 2022

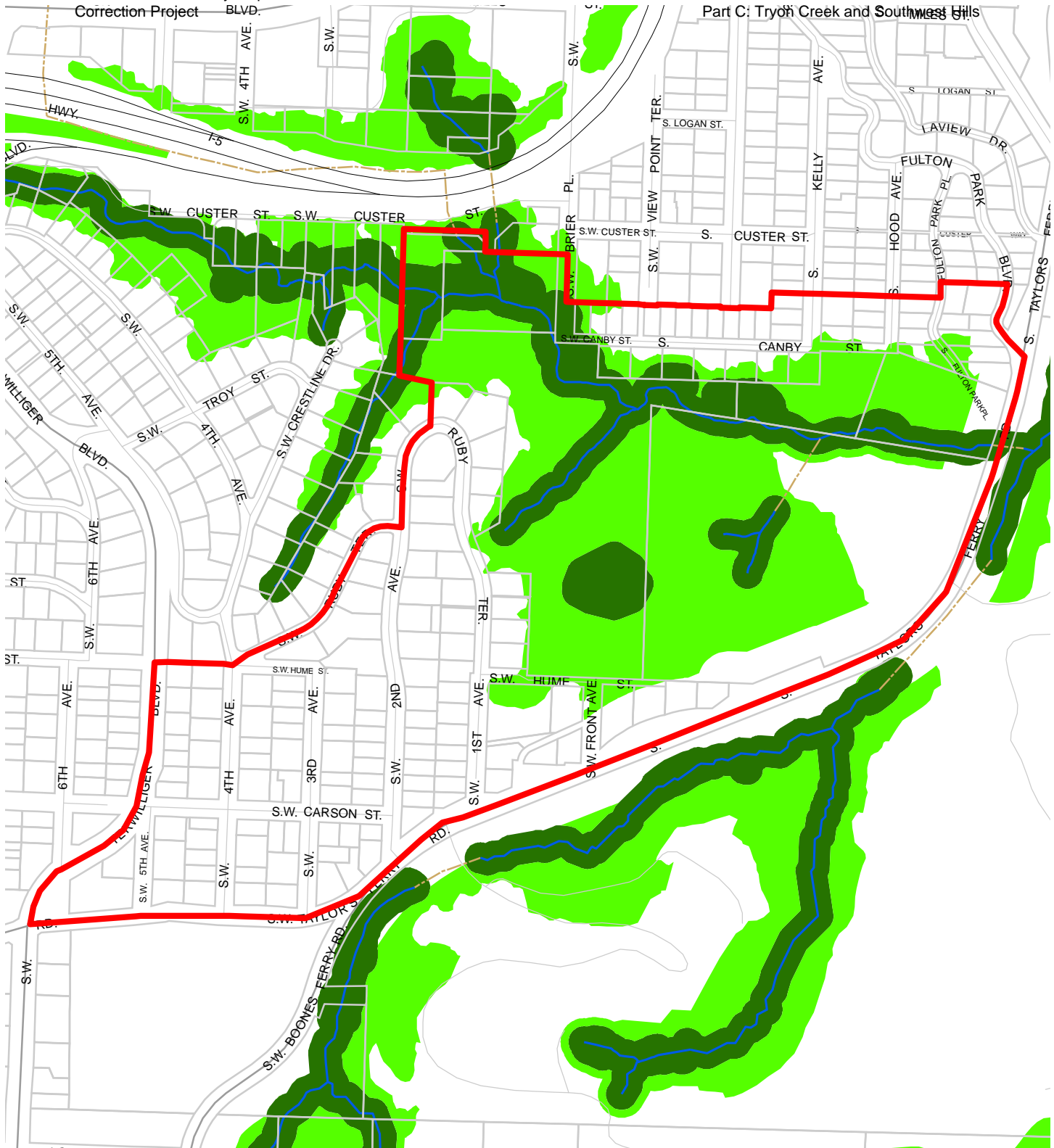


Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



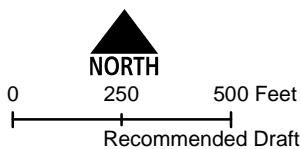
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Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
SW14**

Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Open Stream Channel
- Taxlots
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone



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May 2022

Natural Resource Description

Within resource site SW14 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; wetland; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: Wetlands (W)

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW14	
	Study Area
Stream (Miles)	0.7
Wetlands (acres)	1.3
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	36.8
Woodland (acres)	3.0
Shrubland (acres)	0.0
Herbaceous (acres)	0.8
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	43.9
* 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 areas with a slope greater than 25%.	

The Bureau of Environmental Services has invested heavily in the Stephens Creek subwatershed, particularly in the mainstem of Stephens Creek that flows through this resource area. In 2008, BES completed the *Burlingame Sewer Repair and Streambank Enhancement Project* to repair and protect a sewer trunk that runs along Stephens Creek, to control leaks from the pipe, to restore and stabilize eroded stream banks, and to remove invasive vegetation and restore native vegetation along the stream. This reach of Stephens Creek was found to have relatively high quality habitat for fish (Stephens Creek Stormwater System Plan Characterization Memorandum, 2011). Wetlands are present along much of this stretch of Stephens Creek. A Hydrogeomorphic (HGM) wetland assessment showed that wetlands in the Stephens Creek subwatershed “are providing a range of functions that support biological and physical processes in the watershed” (City of Portland Bureau of Environmental Services, Stephens Creek Stormwater System Plan, 2013).

Riparian and upland forest habitat (deciduous and mixed deciduous/coniferous forest) provides essential bird habitat. Observed special status species in the resource site include: bald eagle, brown creeper, bushtit, and pileated woodpecker.

Table B: Quality of Natural Resource Functions in Resource Site SW14				
Resource Site (acres) = 78				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	18.1	10.0	12.4	40.4
percent total inventory site area	23.1%	12.8%	15.9%	51.8%
Wildlife Habitat*				
acres	0.0	39.2	0.0	39.2
percent total inventory site area	0.0%	50.2%	0.0%	50.2%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total⁺				
acres	18.1	21.4	1.3	40.7
percent total inventory site area	23.1%	27.4%	1.7%	52.2%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.				
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.				
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called “effective impervious area.” The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For Resource Area SW14, 20.2% of the total area is effectively impervious, indicating a critical level of vulnerability, with negative impacts beginning to impact natural functions, but natural processes are still in place and providing support to biologic systems.

Table C. Impervious Area within Resource Site SW14			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
78.0	17.9	15.7	20.2%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW14. Natural resources should be protected within HCA as follows:

1. *Strictly limit or limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit or limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit or limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or limiting conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting or limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW14 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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, R5, R2 and R1 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW14, with the following additional information that clarifies the analysis.

Strictly limiting or *limiting* conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW14, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands, and land within 50 feet of stream top-of-bank or wetlands.
2. Apply a conservation overlay zone ('c' zone) to land between 50 and 75 feet of stream top-of-bank and land between 50 and 75 feet of wetlands; and within areas of forest vegetation that are contiguous to but more than 75 feet from stream top-of-bank.
3. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW15 **Site Name:** Falling Creek Headwaters

Previous Plan: Southwest hills Resource Protection Plan

Previous Resource Site No.: 119

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

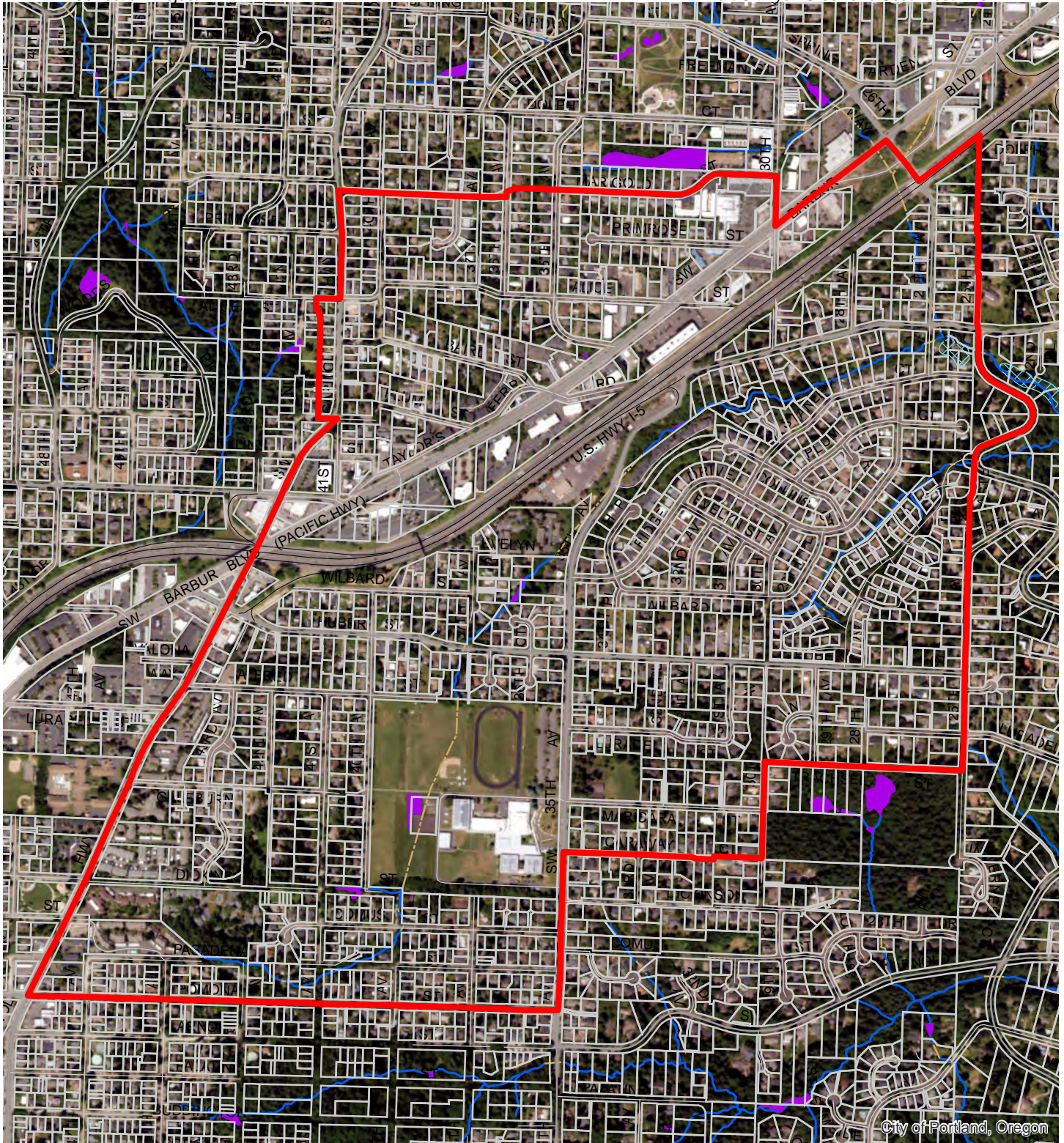
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW15 includes the following:

Site (acres)	555.7
Base zones (acres)	
CE	20.6
CM1	1.5
CM2	43.9
OS	39.6
R10	82.6
R2.5	1.0
R20	3.4
R5	31.6
R7	280.7
RM1	45.1
RM2	5.7



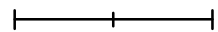
Map A: Water Features

Resource Site: SW15

Updated: May 2022



0 485 970 Feet

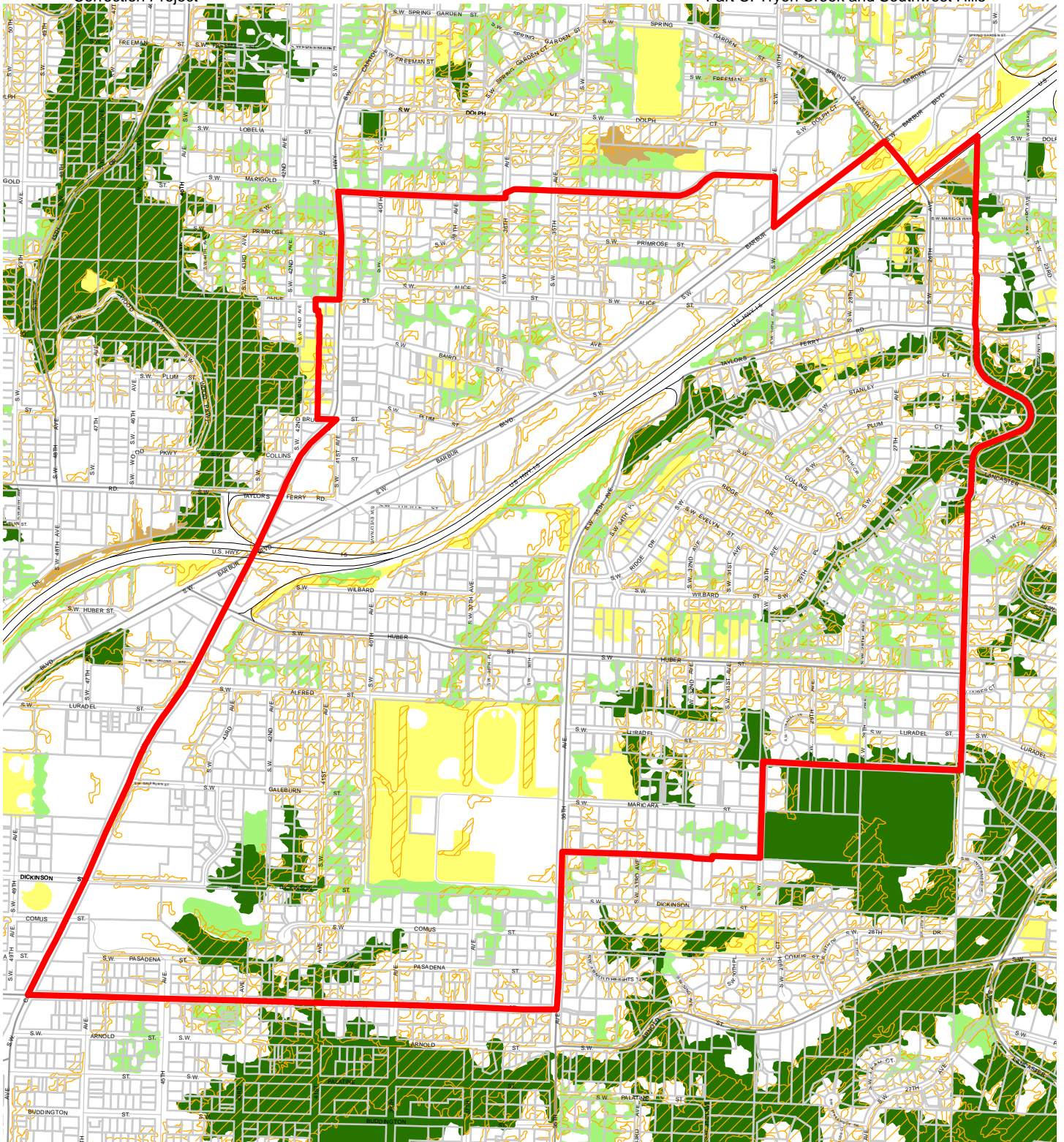


Recommended Draft - As Amended

- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



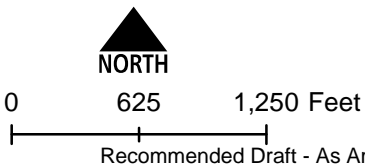
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Map B: Vegetation and Steep Slopes

Resource Site: SW15

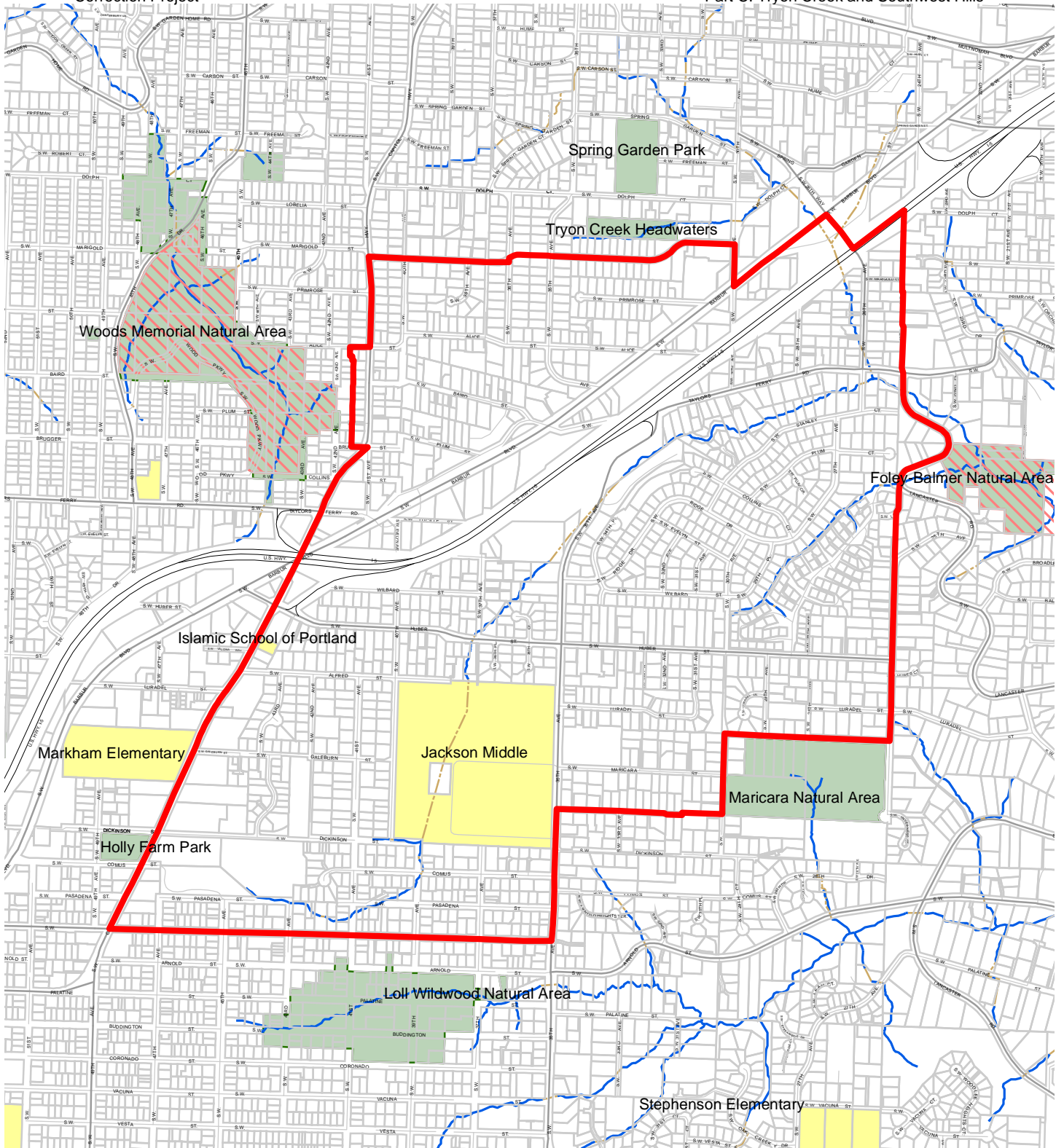
Updated: May 2022



-  Resource Sites
-  Urban Service Boundary
-  Taxlots
-  Forest
-  Woodland
-  Shrubland
-  Herbaceous



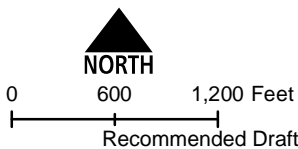
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**Map C: Special
Habitat Areas**

**Resource Site:
SW15**

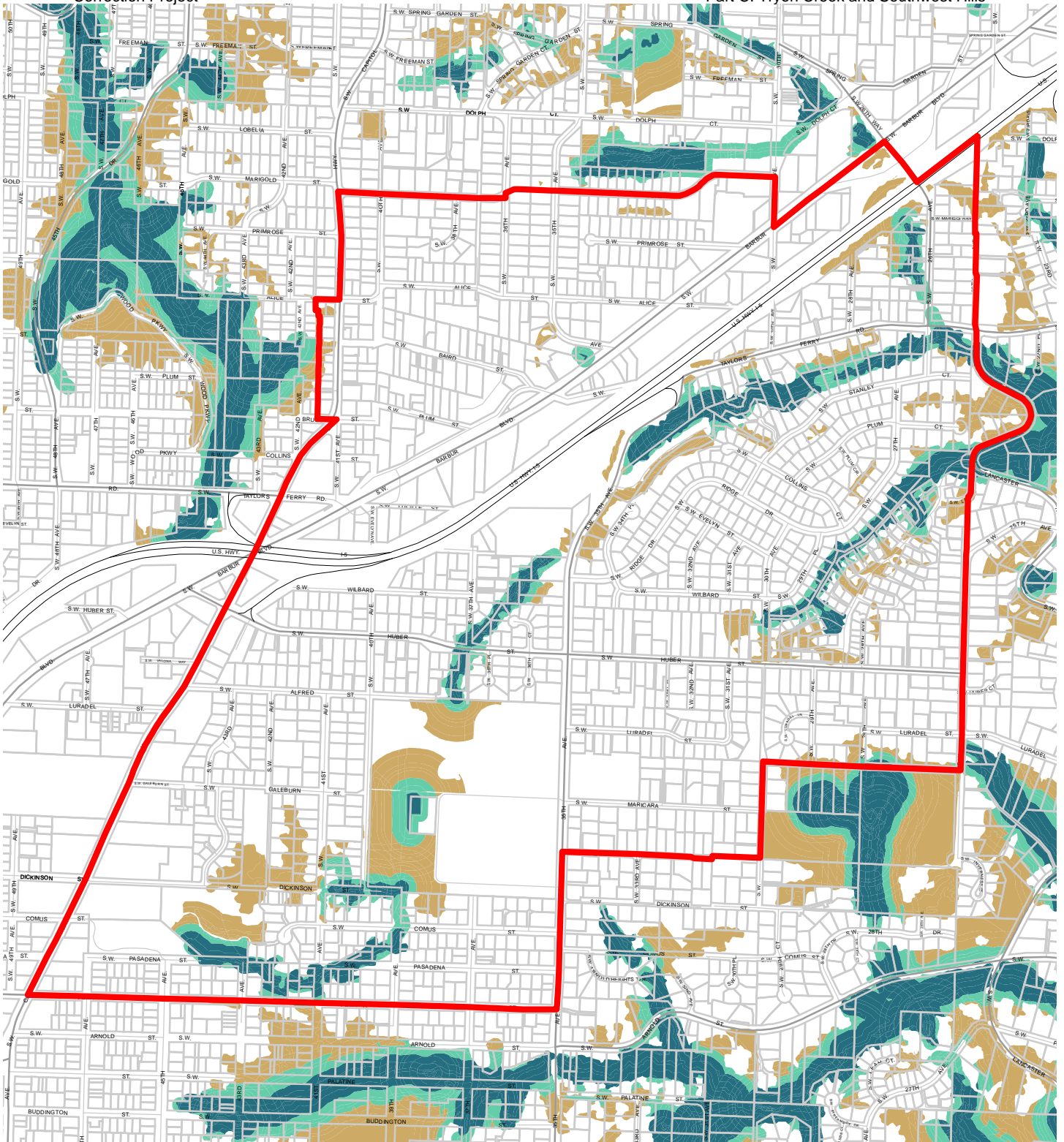
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Special Habitat Areas (SHAs)
- Taxlots
- Open Stream Channel
- Piped Stream Segment
- Parks
- Schools



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**Map D: Riparian
Corridors Habitat
Classification**

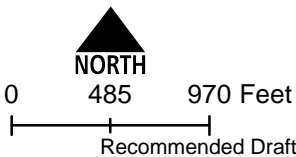
**Resource Site:
SW15**

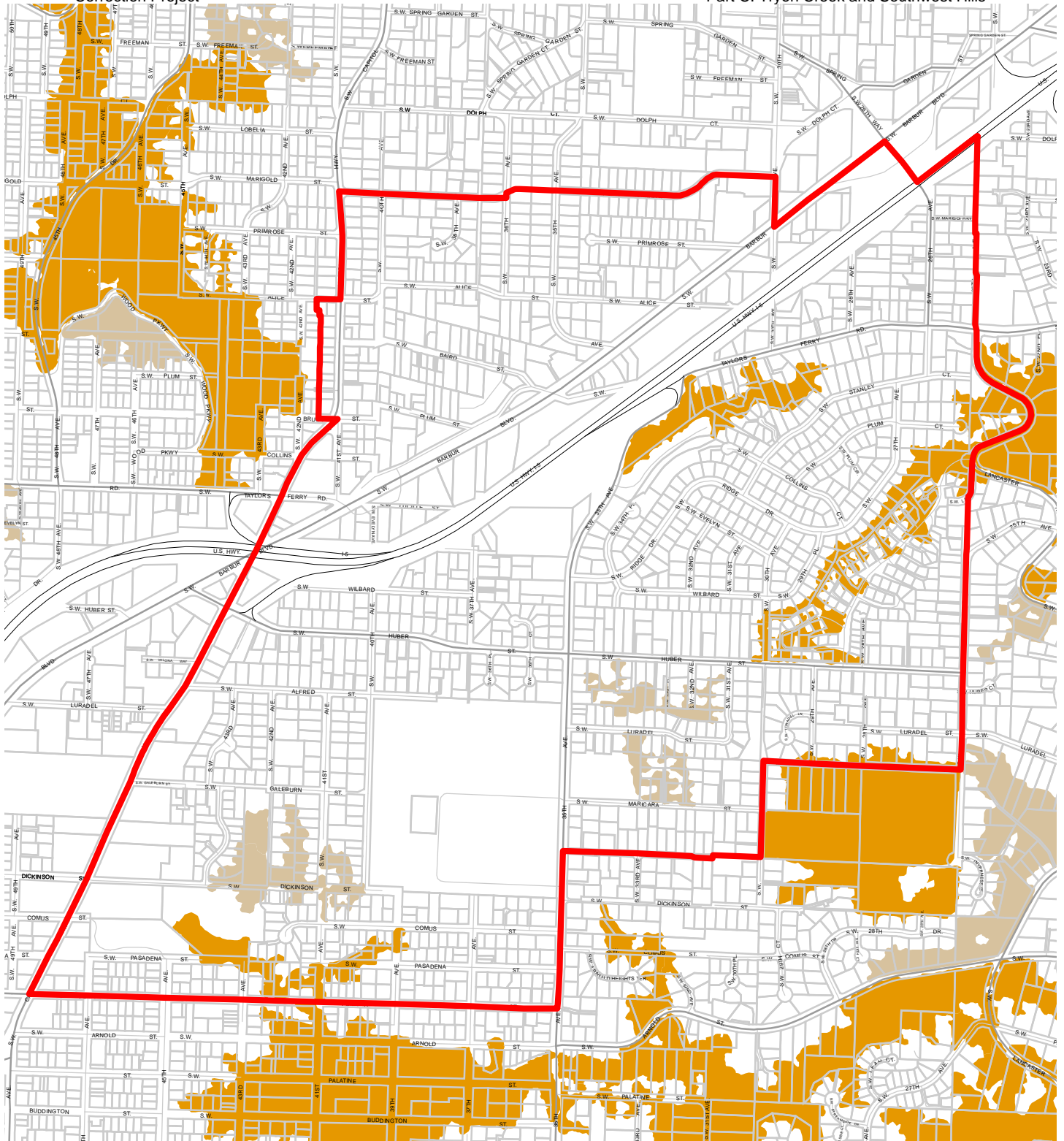
Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots



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


**Map E: Wildlife
Habitat Classification**
Resource Site:
SW15

Updated: May 2022

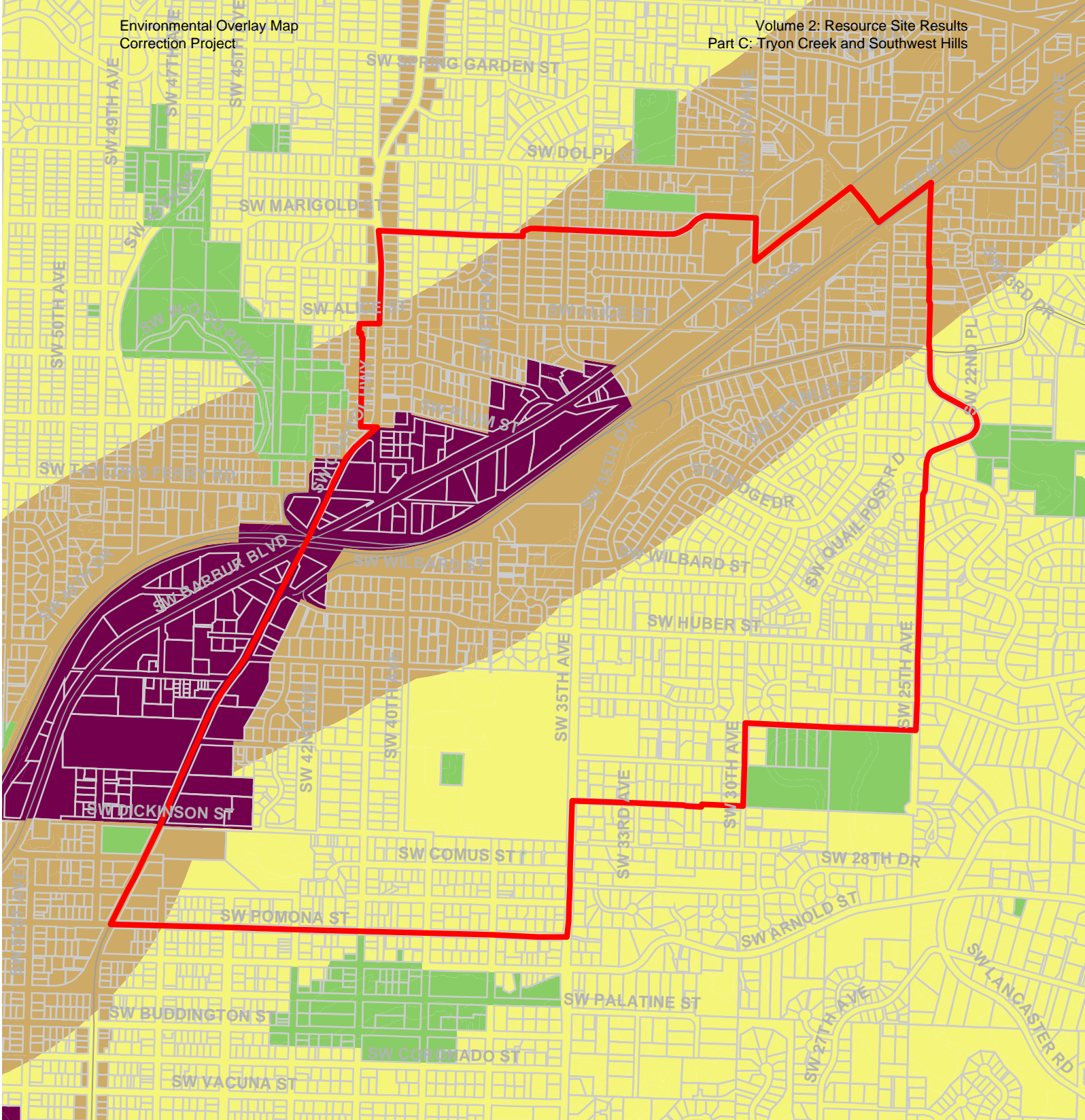


Recommended Draft - As Amended

-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots



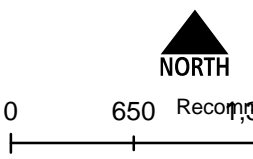
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May 2022



Map F: Urban Development Value (Title 13)
Resource Site: SW15

-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks

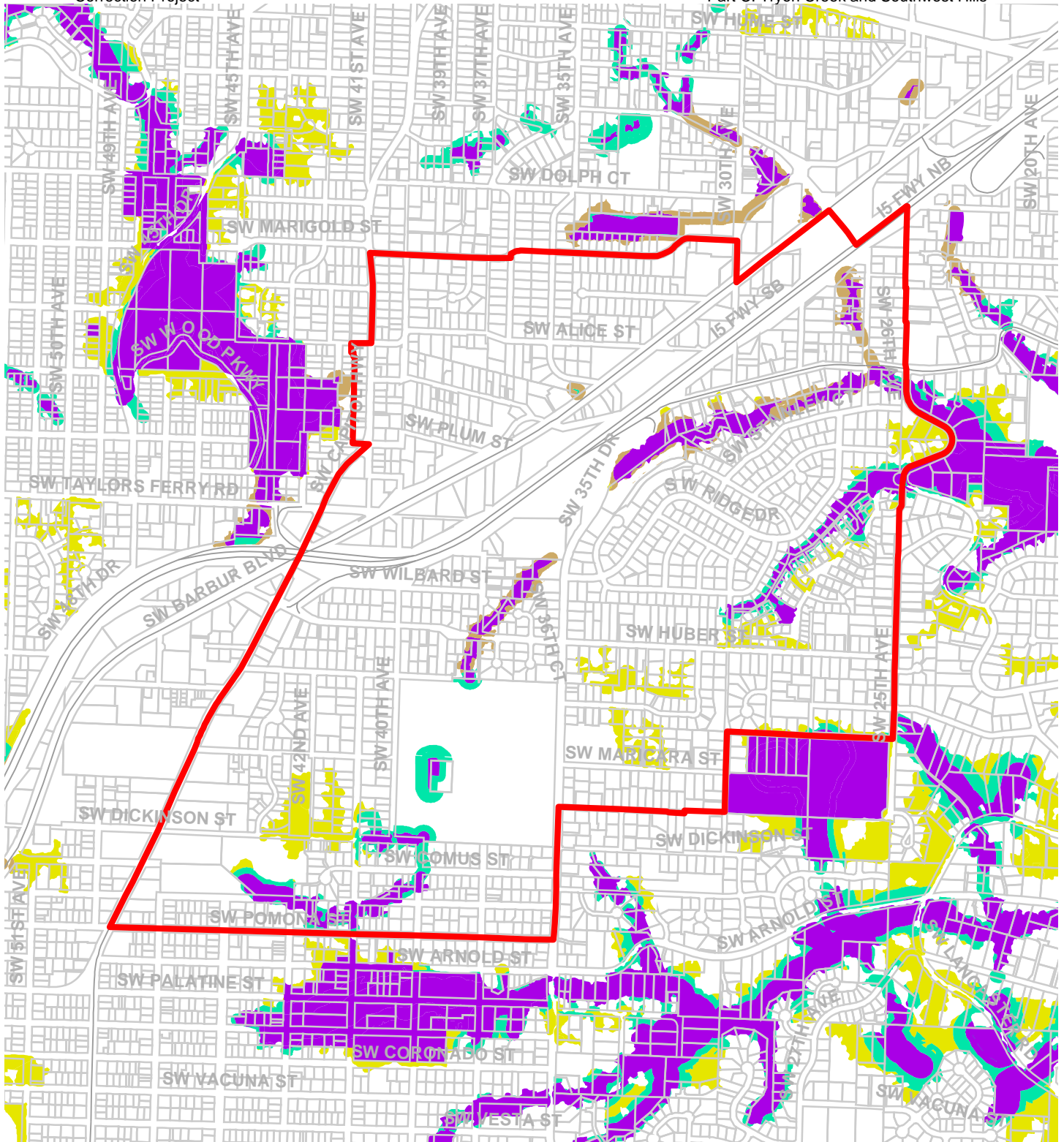
Updated: July 2021



Recomm. Draft - As Amended



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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW15

Updated: May 2022

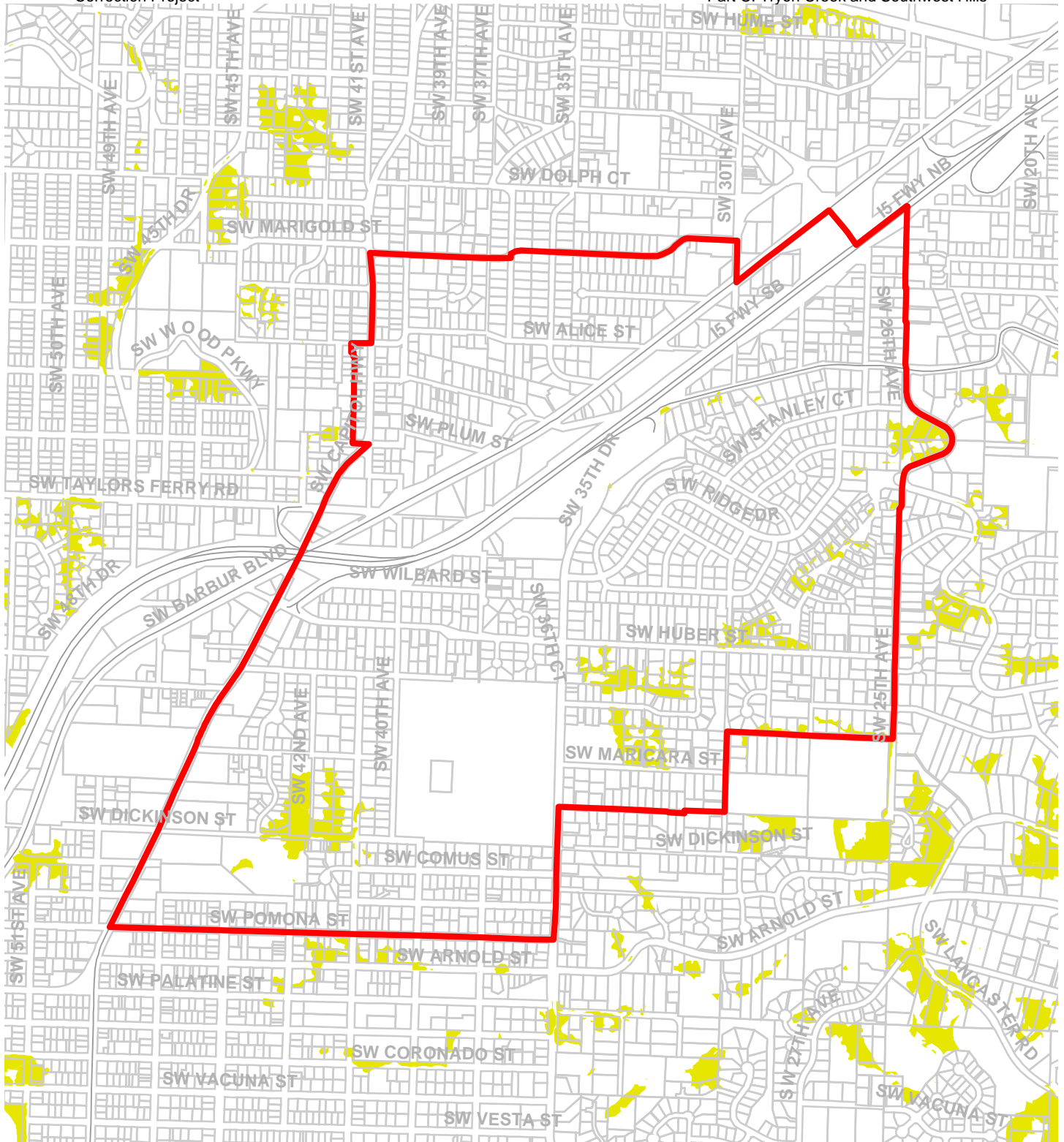


Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- HCA High Value
- HCA Moderate Value
- HCA Low Value
- Goal 5 Significant Natural Resources



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Map H: Goal 5 Resources

Resource Site: SW15

Updated: May 2022



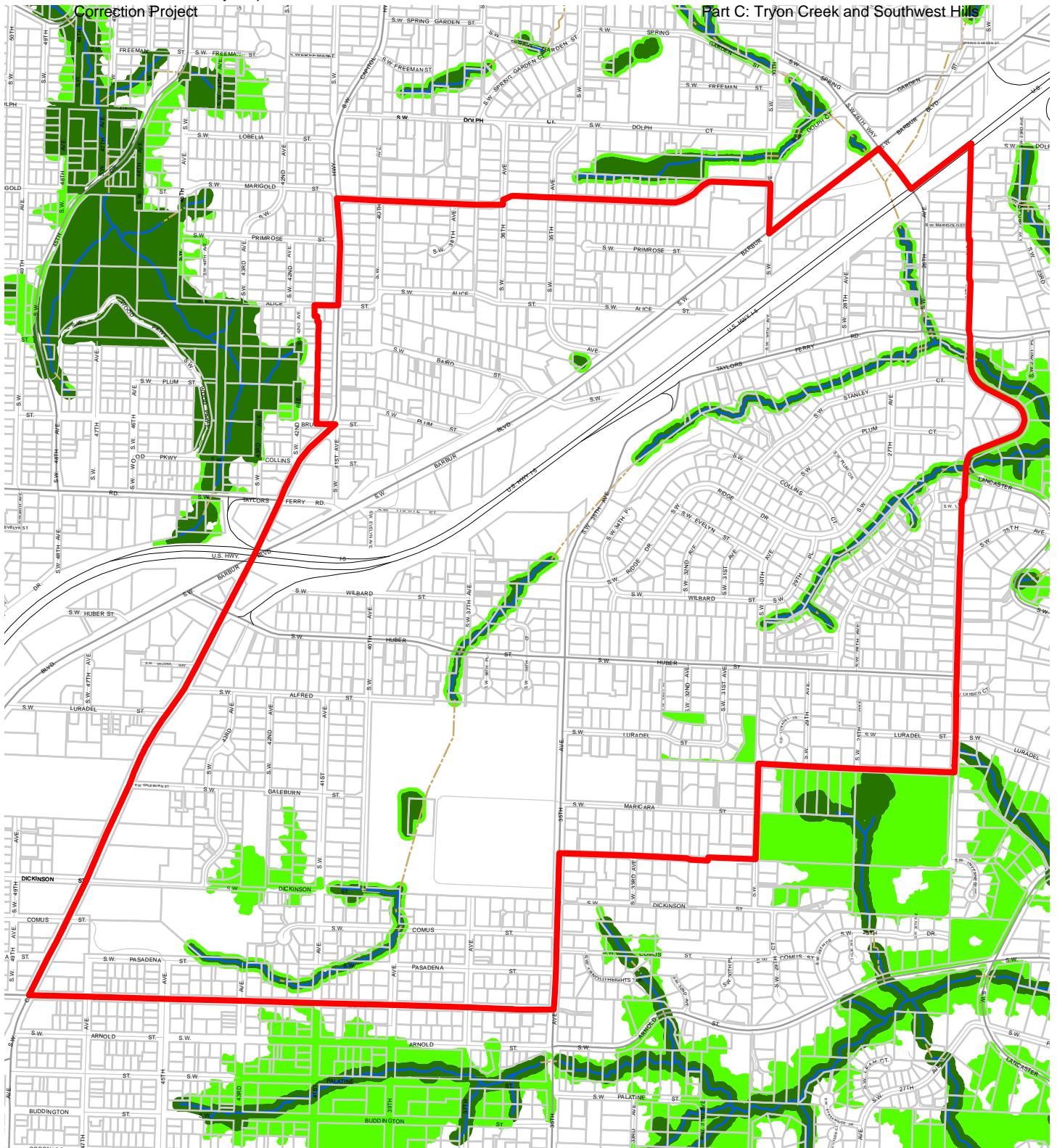
-  Urban Service Boundary
-  Resource Sites
-  Goal 5 Significant Natural Resources

Recommended Draft - As Amended



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May 2022

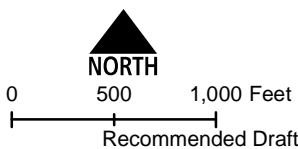


Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
SW15**

Updated: May 2022

- Resource Sites
- Open Stream Channel
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone
- Urban Service Boundary
- Taxlots



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022

Natural Resource Description

Within resource site SW15 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; wetland; flood area; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: Wetlands (W)

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW15	
	Study Area
Stream (Miles)	1.7
Wetlands (acres)	0.6
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	41.6
Woodland (acres)	53.6
Shrubland (acres)	0.7
Herbaceous (acres)	37.6
Flood Area*	
Vegetated (acres)	0.3
Non-vegetated (acres)	0.2
Steep Slopes (acres)**	149.3
* 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 areas with a slope greater than 25%.	

This site includes portions of two small hills located north of Mt. Sylvania. The elevations are 725 feet for the most westerly hill (near SW Galeburn and 42nd); and 550 feet for the other hill (located near SW Luradel and 32nd Place). Marquam Middle School (previously Jackson High School) is located between the two hills. The site elevation drops to 350 feet near Interstate 5 where the drainage from Site SW12 feeds into Falling Creek near SW 26th and Taylors Ferry. The confluence of these two creeks forms the headwaters of Tryon Creek and flows through Marshall Park.

Falling Creek and its tributary are the two primary creeks on this site. Both flow through forested, relatively narrow (50-100 feet), parallel canyons. These shallow canyons were inventoried as having hydric soils and mapped on the National Wetlands Inventory. The associated forest is 80 percent deciduous with a 70 percent canopy closure. The tree species include bigleaf maple, alder, cottonwood, red cedar, Douglas fir and pacific dogwood (the latter of which is less common). The creek corridors have an estimated two snags per acre that are two feet in diameter. Mammals in the area include a small herd of mule deer. Bird species include woodpeckers, hawks and owls. In combination, the vegetation, snags and perennial creeks provide good wildlife habitat.

While Falling Creek only provides marginal fish habitat, amphibians, reptiles, mammals, birds, and crustaceans likely use the stream, particularly during summer when the creek retains some water (Fanno and Tryon Creek Watershed Management Plan, 2005). The canyons in which the creeks are located create edges to the surrounding neighborhoods and contribute to the urban design of the area.

Low density urban development, particularly in the lower portions of the subwatershed along Arnold Creek, retains a relatively high degree of vegetation cover and minimizes impervious cover, both of which help to retain some natural watershed functions (Fanno and Tryon Creek Watershed Management Plan, 2005).

Table B: Quality of Natural Resource Functions in Resource Site SW15				
Resource Site (acres) = 556				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	23.1	15.6	36.7	75.4
percent total inventory site area	4.2%	2.8%	6.6%	13.6%
Wildlife Habitat*				
acres	0.0	27.6	13.9	41.5
percent total inventory site area	0.0%	5.0%	2.5%	7.5%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total⁺				
acres	23.1	23.1	36.4	82.6
percent total inventory site area	4.2%	4.2%	6.6%	14.9%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.				
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.				
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called "effective impervious area." The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter

pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For Resource Area SW15, 26.3% of the total area is effectively impervious, indicating significant negative impacts are occurring due to the level of unmanaged impervious area and any additional impacts will cause further degradation.

Table C. Impervious Area within Resource Site SW15			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
555.7	190.9	146.1	26.3%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW15. Natural resources should be protected within HCA as follows:

1. *Strictly limit or limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit or limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit or limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or limiting conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting or limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW15 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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, R7, R5, R2.5, R2 and R1 base zones. Commercial uses are allowed in the CE, CM2 and 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW15, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

There is a roughly 5-acre patch of forest vegetation located along SW Dickinson St and another roughly 5-acre patch of forest vegetation located along SW Pasadena St. These forest patches extend across multiple properties. The forest patches are located immediately uphill from the headwaters of streams and wetlands that feed into Falling Creek. The forests provide multiple functions including storage of water and reduction of overland flows, which that manages and mitigates flow within the streams and wetlands. This reduces the risk of flooding and erosion in lower Falling Creek. Impacts to the forest should be limited.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW15, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 25 feet of stream top-of-bank or wetlands.
2. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of stream top-of-bank or wetlands.
3. Apply a conservation overlay zone ('c' zone) to the area of forest vegetation located in the two conservation tracts on the west and east side of SW 31st Ave; and between SW 41st Ave and SW 43rd Ave.
4. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW16 **Site Name:** Marshall Park/Capitol Hill

Previous Plan: Southwest hills Resource Protection Plan

Previous Resource Site No.: 120

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

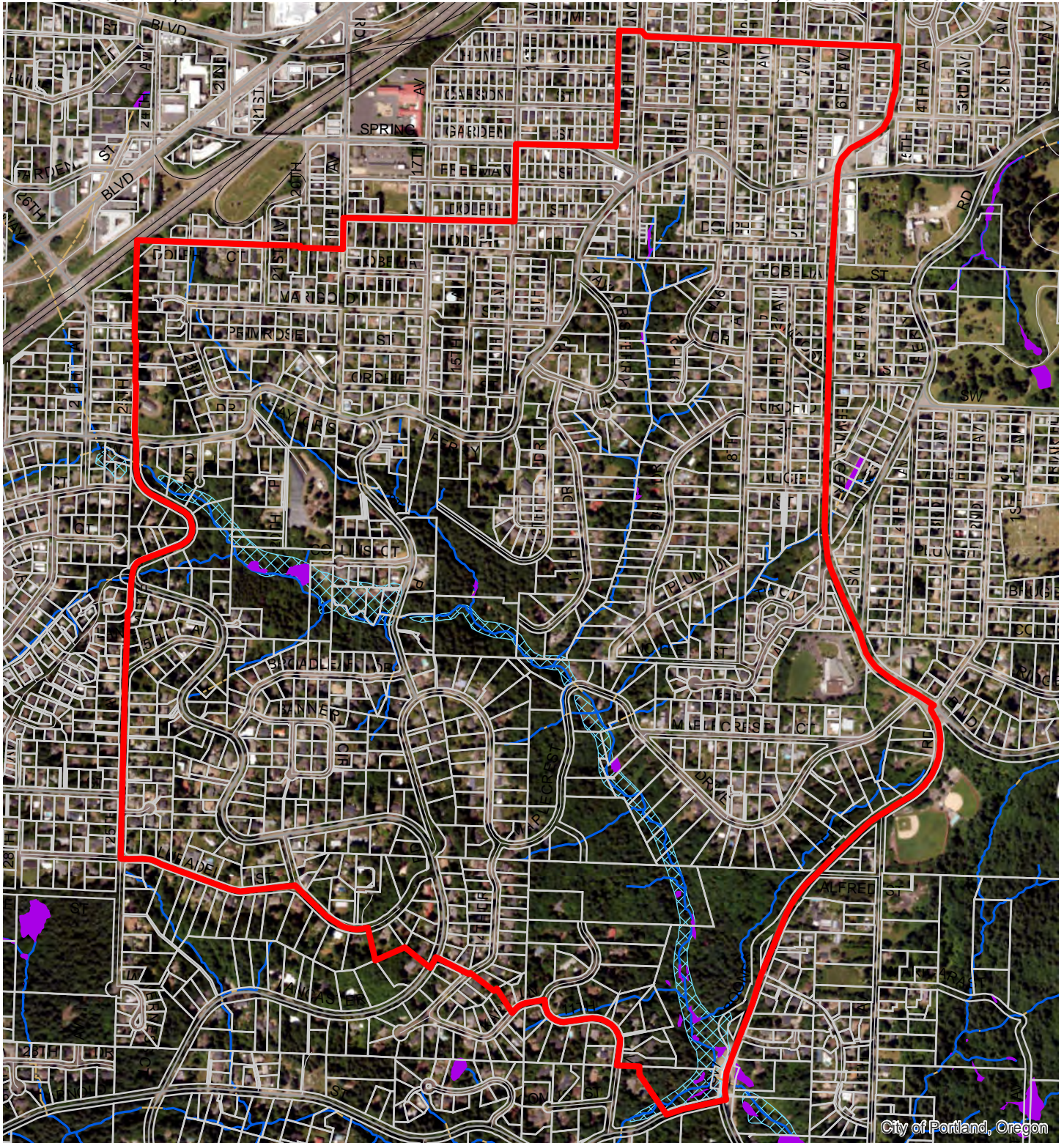
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW16 includes the following:

Site (acres)	561
Base zones (acres)	
CE	0.7
CI1	0.0
CM1	2.9
CR	0.4
OS	71.7
R10	146.2
R2.5	7.3
R20	157.6
R5	79.5
R7	90.2
RM1	4.5



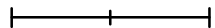
Map A: Water Features

Resource Site: SW16

Updated: May 2022



0 470 940 Feet

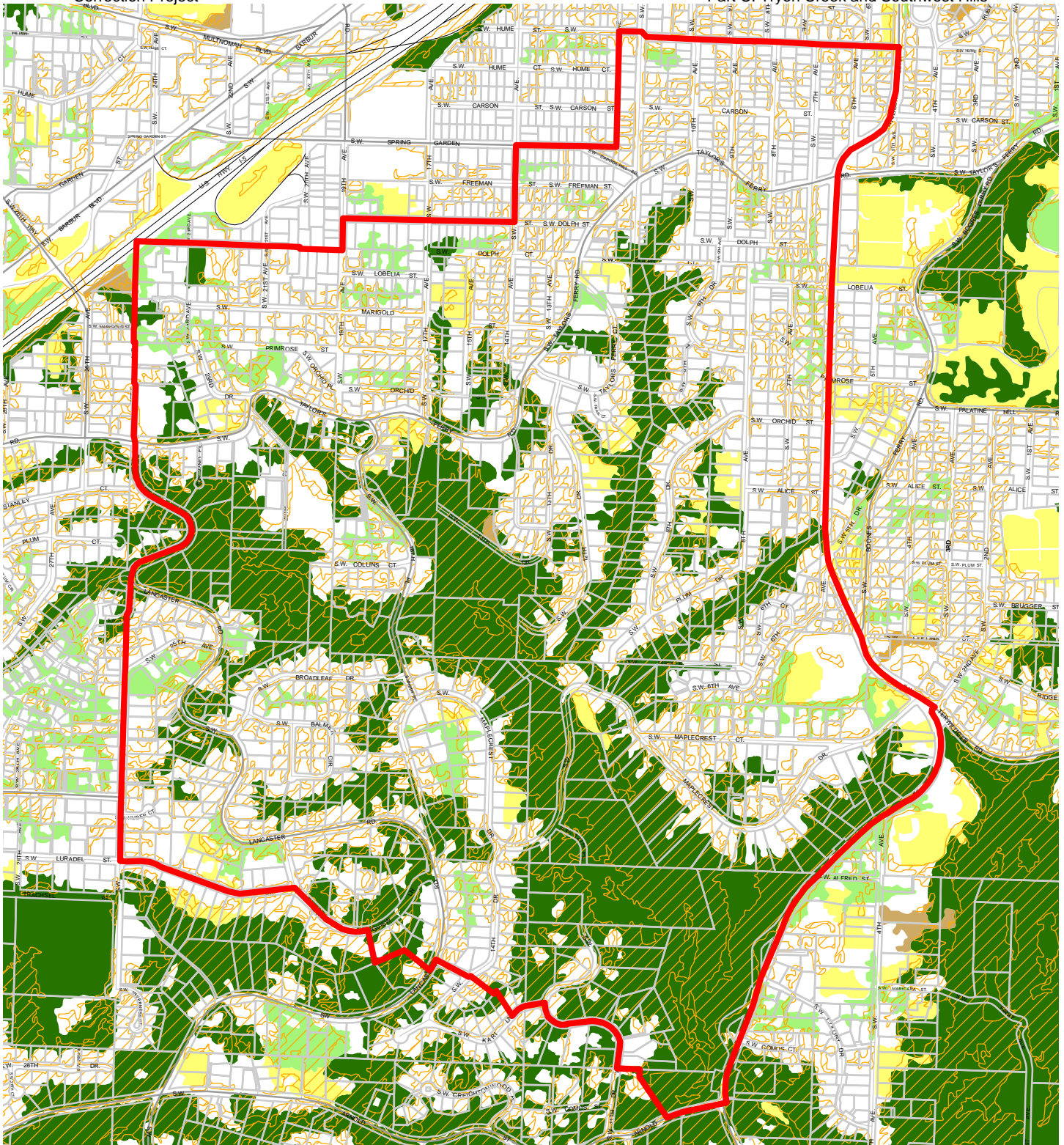


Recommended Draft - As Amended

- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



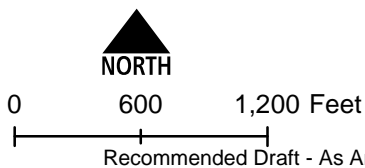
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022










Map B: Vegetation and Steep Slopes

Resource Site: SW16

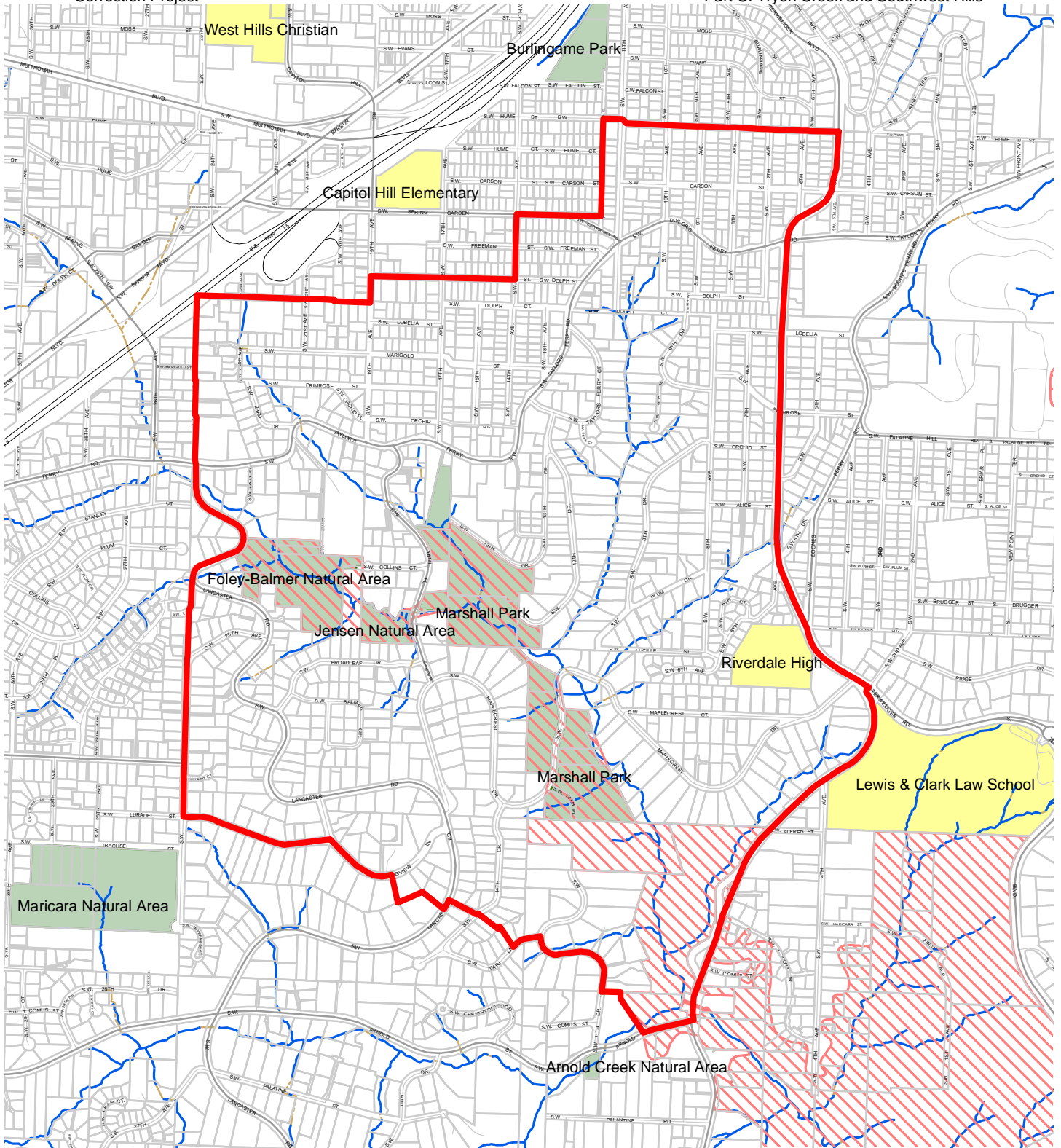
Updated: May 2022



-  Resource Sites
-  Urban Service Boundary
-  Taxlots
-  Forest
-  Woodland
-  Shrubland
-  Herbaceous



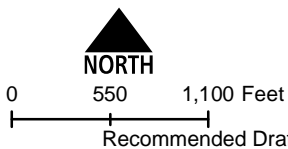
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022



**Map C: Special
Habitat Areas**

**Resource Site:
SW16**

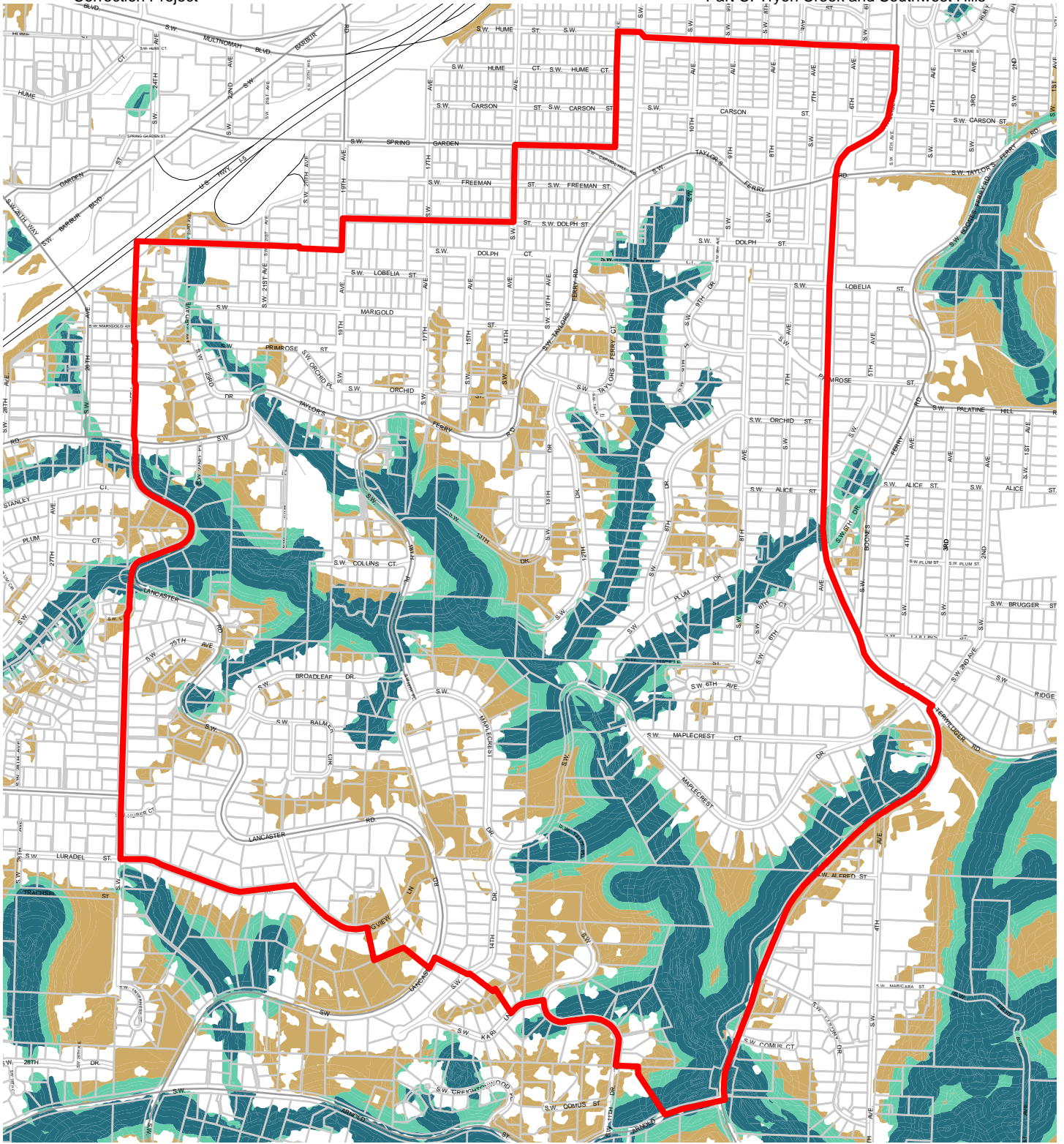
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Special Habitat Areas (SHAs)
- Taxlots
- Open Stream Channel
- Piped Stream Segment
- Parks
- Schools



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022



**Map D: Riparian
Corridors Habitat
Classification**

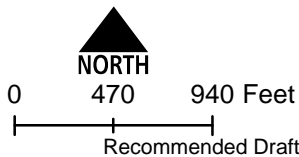
**Resource Site:
SW16**

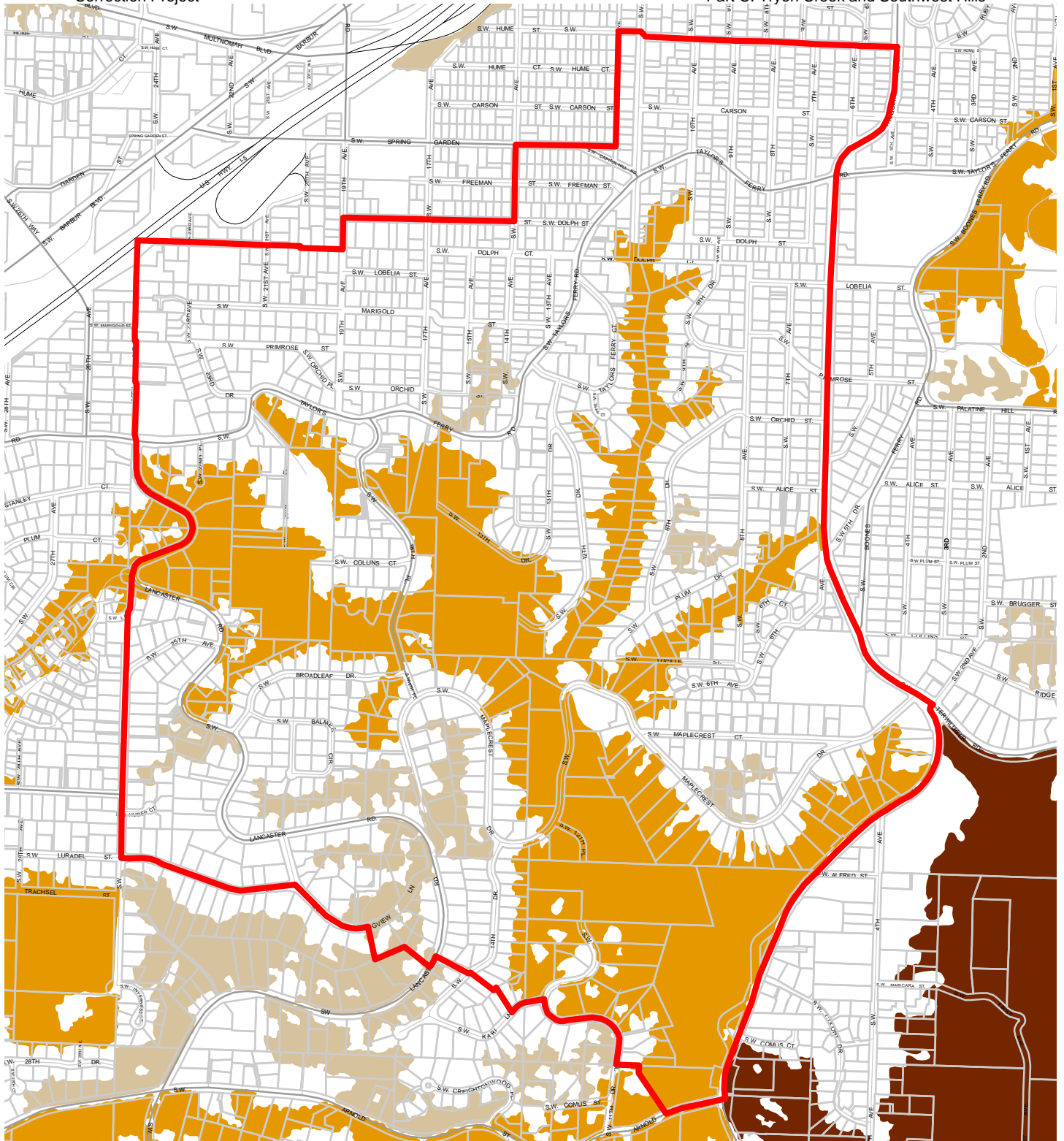
Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots



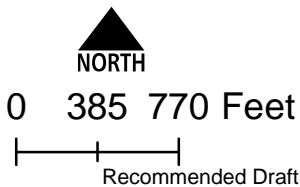
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.
May 2022











**Map E: Wildlife
Habitat Classification
Resource Site:
SW16**

Updated: May 2022

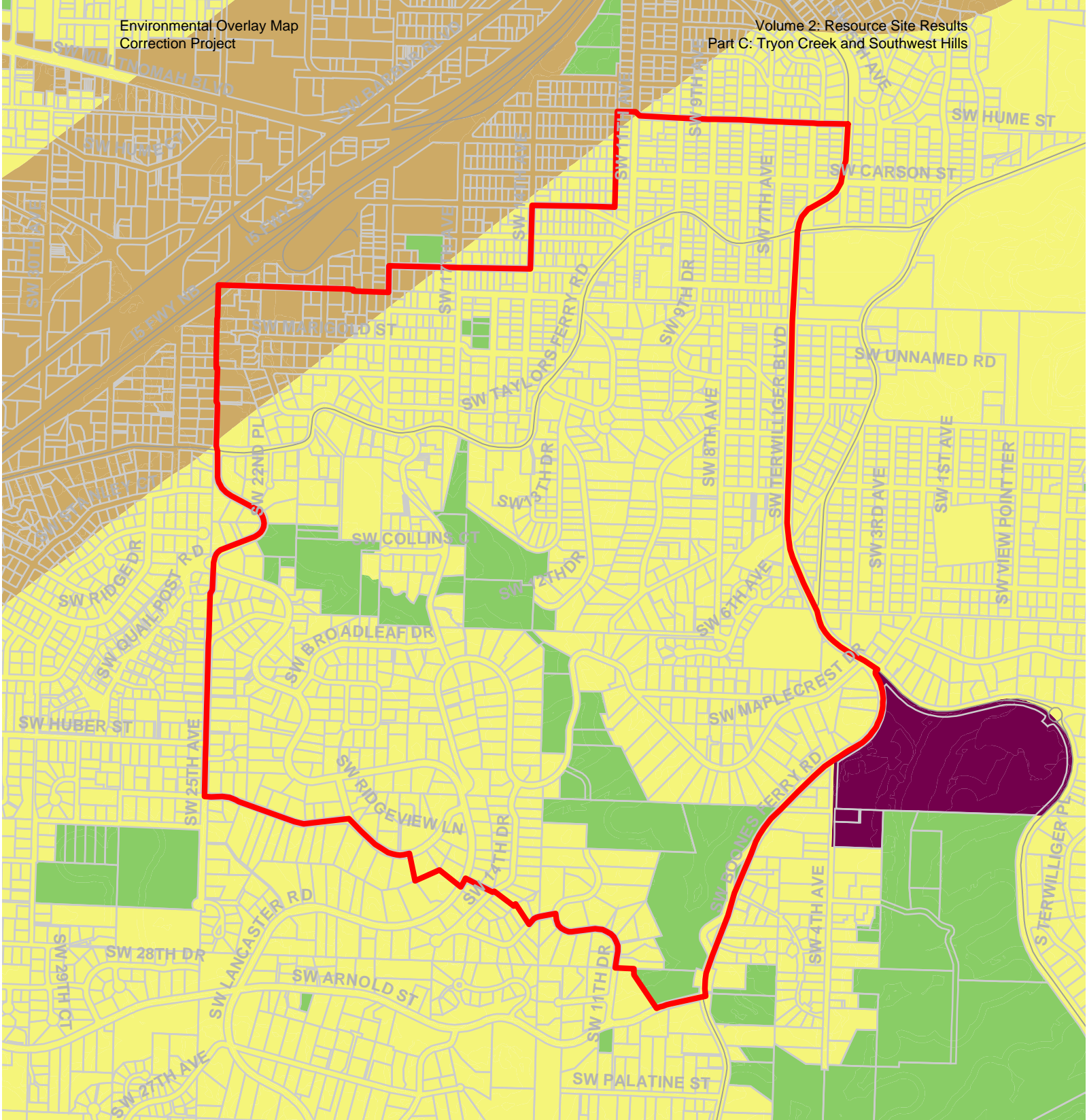


-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.

May 2022



Map F: Urban Development Value (Title 13)
Resource Site: SW16

-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks

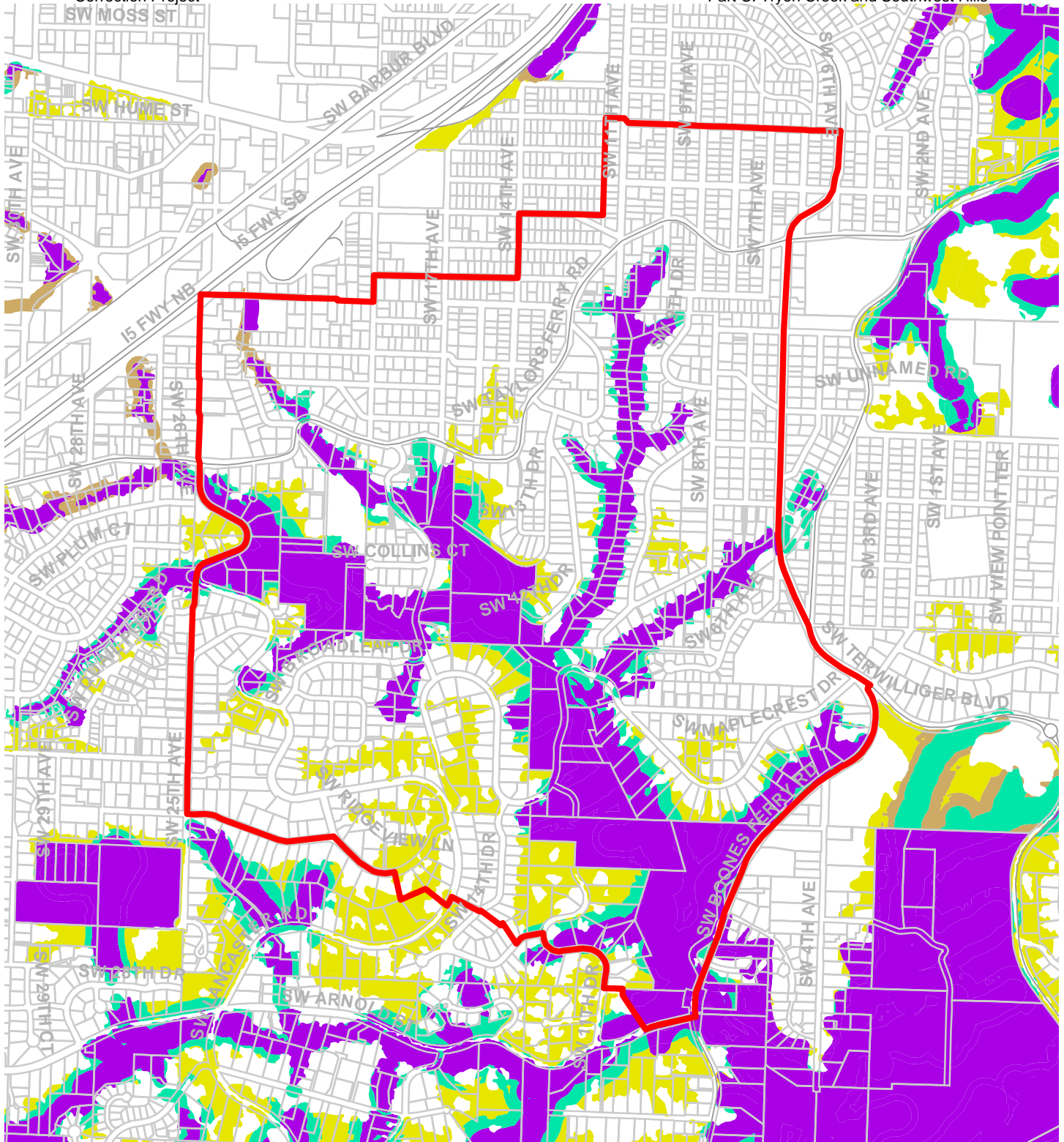


Updated: July 2021



0 650 1300 Feet

The information on the map was derived from digital databases. 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 aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.



Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW16
Updated: May 2022

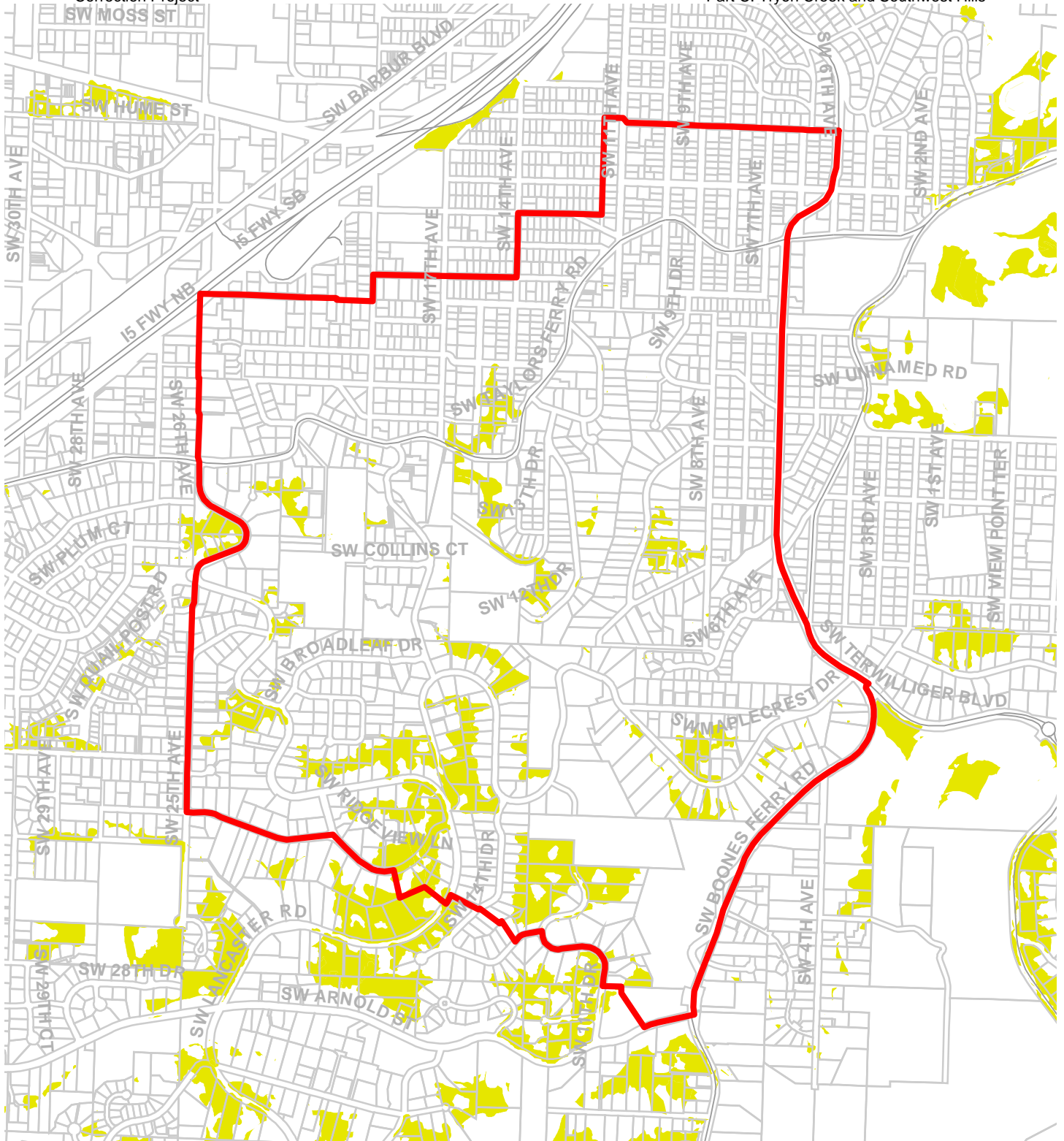


Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- HCA High Value
- HCA Moderate Value
- HCA Low Value
- Goal 5 Significant Natural Resources



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.






Map H: Goal 5 Resources

Resource Site: SW16

Updated: May 2022

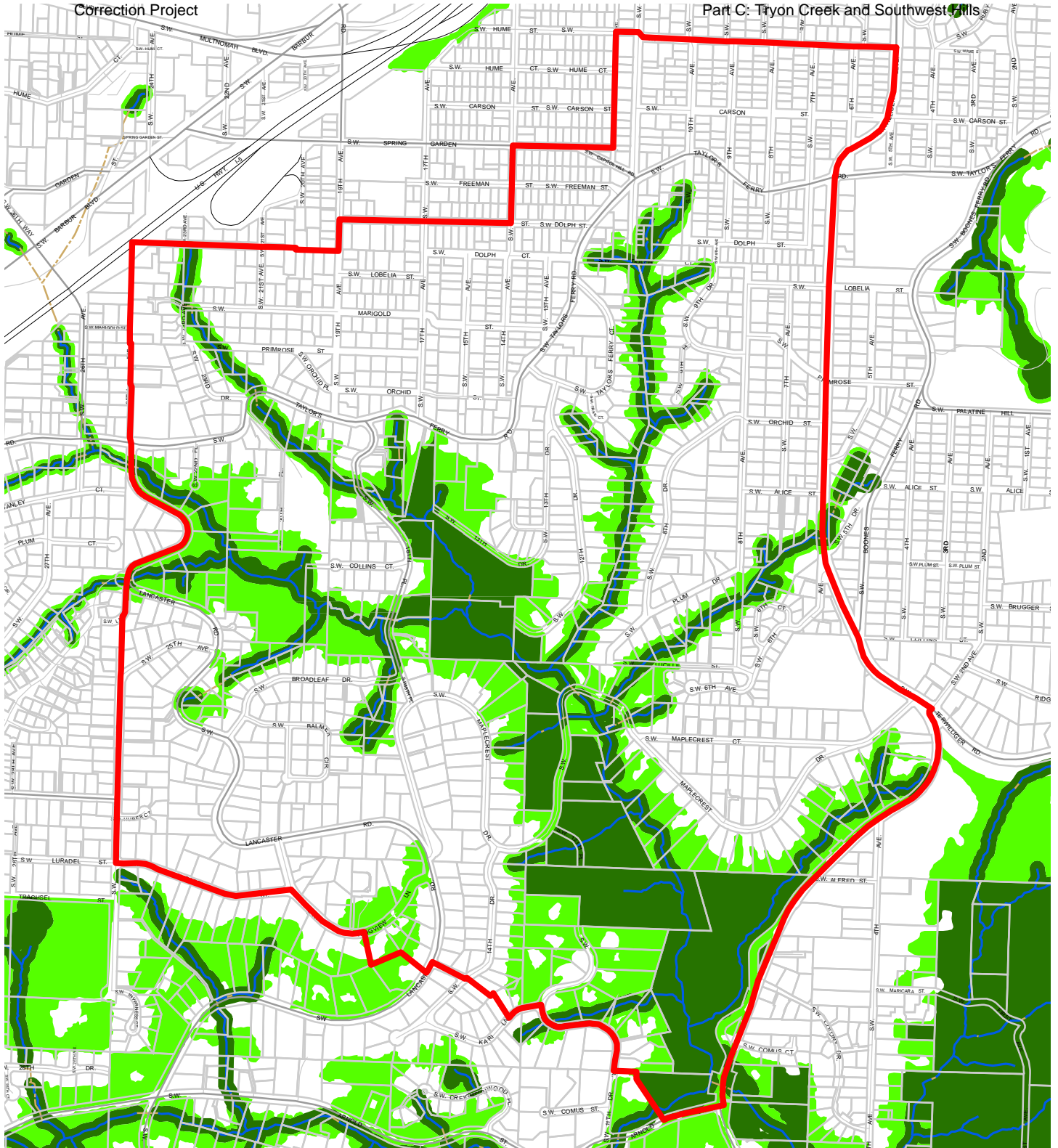


Recommended Draft - As Amended

-  Urban Service Boundary
-  Resource Sites
-  Goal 5 Significant Natural Resources



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.

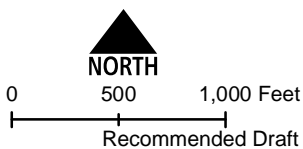


Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
SW16**

Updated: May 2022

- Resource Sites
- Urban Service Boundary
- Open Stream Channel
- Taxlots
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022

Natural Resource Description

Within resource site SW16 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; wetland; flood area; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: Marshall Park/Jensen Property/Foley Balmer Property (C), Tryon Creek State Natural Area (S, M, C) Wetlands (W)

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW16	
	Study Area
Stream (Miles)	5.3
Wetlands (acres)	1.3
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	204.5
Woodland (acres)	26.8
Shrubland (acres)	0.3
Herbaceous (acres)	14.0
Flood Area*	
Vegetated (acres)	14.7
Non-vegetated (acres)	1.7
Steep Slopes (acres)**	269.8
* 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 areas with a slope greater than 25%.	

Marshall Park forms the backbone of this part of the city's natural area. The canyon is a natural drainage basin formed by the west slope of the Palatine Hill, the hills northwest of Mt. Sylvania and by Tryon Creek that runs through it. The surrounding area has a mixture of low-density residential development and areas with no development. The street system appears incomplete in the south half of the site where the creek canyon leaves the site.

About half of Site SW16 is undeveloped and has a forested cover. Thirty-seven acres are designated open space. Marshall Park is 23.25 acres in size and 14 acres of Tryon State Creek Park are in the southeast corner of this site. Marshall Park has a waterfall that has white water flowing year-round and is framed by rock boulders and fallen trees. This stretch of Tryon Creek has several species of fish including coho salmon and spawning steelhead.

Marshall Park Natural Areas – Marshall Park, Foley-Balmer Natural Area, and Jensen Natural Area make up 37.7 acres of wooded open space (mainly evergreen and deciduous forest habitat). The southern boundary of Marshall Park is adjacent to open space land purchased by Metro and managed by Oregon Parks and Recreation Department (ORPD) as part of Tryon Creek State Natural Area (Appendix A, Watershed Map). Otherwise, the park and natural areas are bordered by residential streets and houses. Tryon Creek flows through the three sites.

Marshall Park provides a diverse habitat for wildlife. The perennial stream provides year-round water. The multi-layered, dense forest composed mainly of native vegetation contains most of the habitat elements, food sources, and cover for wildlife. There is a one-acre meadow habitat at Foley-Balmer and riparian forest runs along Tryon Creek. The tree canopy is dominated by Douglas fir, big leaf maple, western hemlock, western red cedar, grand fir, red alder, and black cottonwood. Understory plants include vine maple, sword fern, Indian-plum, Oregon grape, and salmonberry. Other species that can be found at Marshall Park are beaked hazelnut, lady fern, skunk cabbage, inside-out flower, Indian pipe, stinging nettle, and western wahoo. The ecological health for Marshall Park (completed in October 2004) ranges from poor in the northern portion to fair/good south of the stone bridge (Appendix E, Vegetation Mapping & Summaries of management plan).

The ecological health for Foley-Balmer was rated fair in 2004 and Jensen Natural Area was rated fair to poor. Invasive species occur throughout most of the habitat and pose a serious threat to native plants in the understory. These include horse chestnut, Norway maple, English holly, English ivy, garlic mustard, Japanese knotweed, English laurel, and Himalayan blackberry. Portland Parks and Recreation staff are working to eliminate garlic mustard while volunteers have been removing holly and ivy. Riparian plantings have been installed along the mainstem of Tryon Creek and a one-acre restoration was completed south of the picnic area. The meadow area in Foley-Balmer was weeded and seeded with native plants.

Bird surveys (point counts) conducted during the spring of 1999 (Hennings 2003) recorded 21 species, including both resident and migrating songbirds. The Marshall Park bird checklist compiled by neighbors over many years of casual observation includes over 50 species. Local residents include black-capped chickadees, Bewick’s wren, downy woodpecker, and great horned owls. Migrating birds include a suite of warblers, cedar waxwings, and kinglets (Appendix F). Twenty bird species are designated as special status species (CoP/BES 2007). Black-tailed deer, raccoons, and coyotes have been seen in the natural areas. Recent bat surveys have recorded bat use in the deciduous trees along the creek. Presently there are barriers below Marshall Park that prevent coho from moving upstream, including a private dam below Marshall Park and Marshall Cascades. Bureau of Environmental Services is removing the culvert at SW Boones Ferry Road that previously impeded fish passage.

Table B: Quality of Natural Resource Functions in Resource Site SW16				
Resource Site (acres) = 561				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	102.9	42.7	72.7	218.3
percent total inventory site area	18.3%	7.6%	13.0%	38.9%
Wildlife Habitat*				
acres	0.0	166.3	26.3	192.6
percent total inventory site area	0.0%	29.6%	4.7%	34.3%
Special Habitat Areas**				
acres	65.7			
percent total inventory site area	11.7%			
Combined Total⁺				
acres	102.9	74.2	48.5	225.6
percent total inventory site area	18.3%	13.2%	8.7%	40.2%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.				
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.				
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called “effective impervious area.” The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For Resource Area SW16, 14.6% of the total area is effectively impervious, indicating a critical level of vulnerability, with negative impacts beginning to impact natural functions, but natural processes still in place and providing support to biologic systems.

Table C. Impervious Area within Resource Site SW16			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
561.0	110.1	82.0	14.6%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW16. Natural resources should be protected within HCA as follows:

1. *Strictly limit or limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit or limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit or limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or limiting conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting or limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW16 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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, R10, R7, R5, R2.5, and R2 base zones. Commercial uses are allowed in the CE and 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW16, with the following additional information that clarifies the analysis.

Strictly limiting or *limiting* conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

There is development located in the floodplain. The structures and impervious surface limit the flood capacity and infiltration functions of the land and increase the flood risk to the property as well as properties up and down stream. New or expanded development in the flood area should be *limited*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW16, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands, land within 50 feet of stream top-of-bank or wetlands.
2. Inside Marshall Park, apply a protection overlay zone ('p' zone) to areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
3. Outside Marshall Park, apply a conservation overlay zone ('c' zone) to land between 50 and 75 feet of stream top-of-bank; and within areas of forest vegetation that are contiguous to but more than 75 feet from stream top-of-bank.
4. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW17 Site Name: Riverview Natural Area

Previous Plan: Southwest hills Resource Protection Plan

Previous Resource Site No.: 117

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

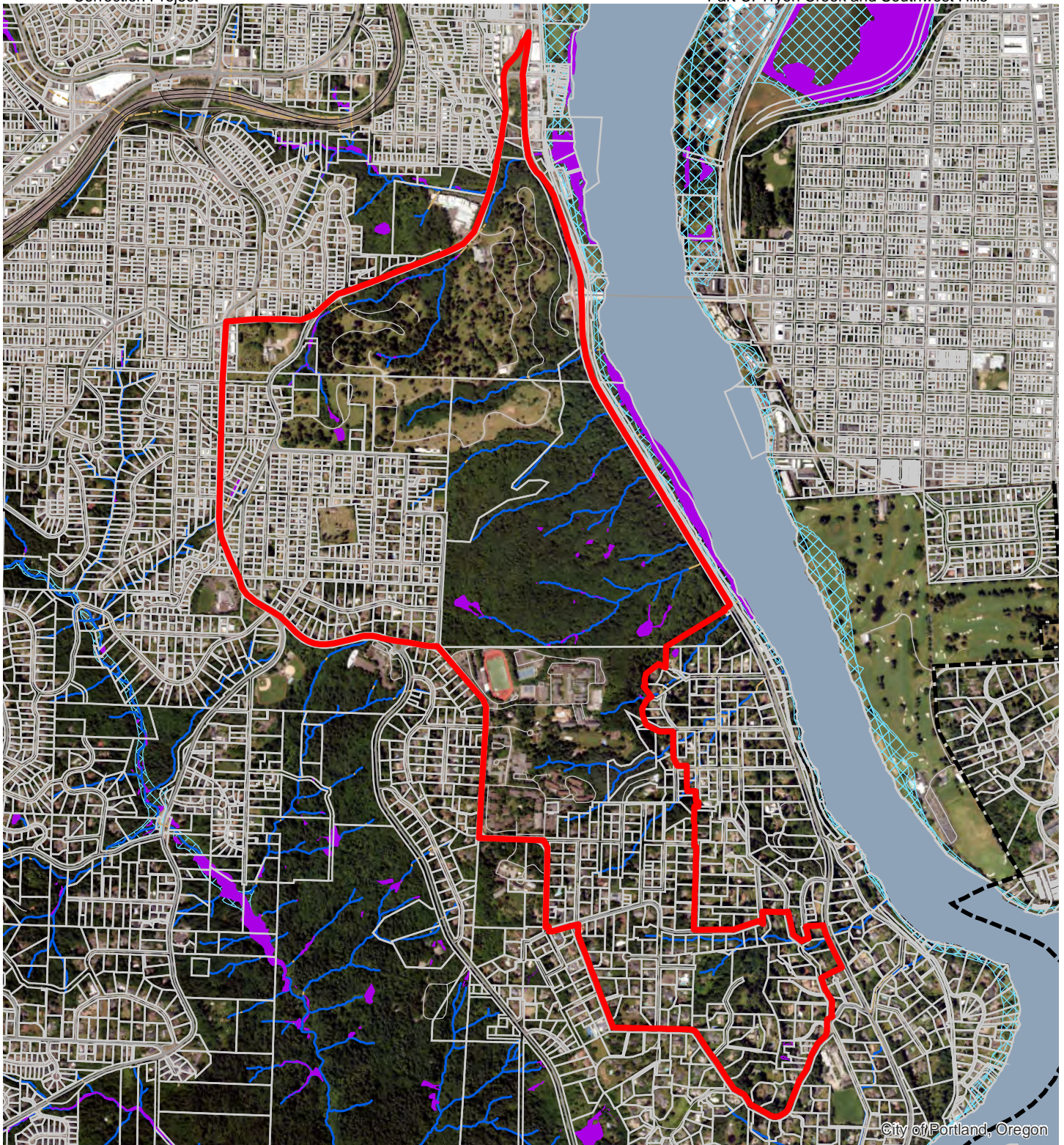
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW17 includes the following:

Site (acres)	754.9
Base zones (acres)	
CE	0.0
CI1	88.5
CM1	1.8
CM2	4.1
OS	358.9
R10	33.1
R2.5	2.0
R20	163.2
R5	0.2
R7	102.9
RM1	0.1



City of Portland, Oregon

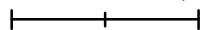
Map A: Water Features

Resource Site: SW17

Updated: May 2022



0 800 1,600 Feet

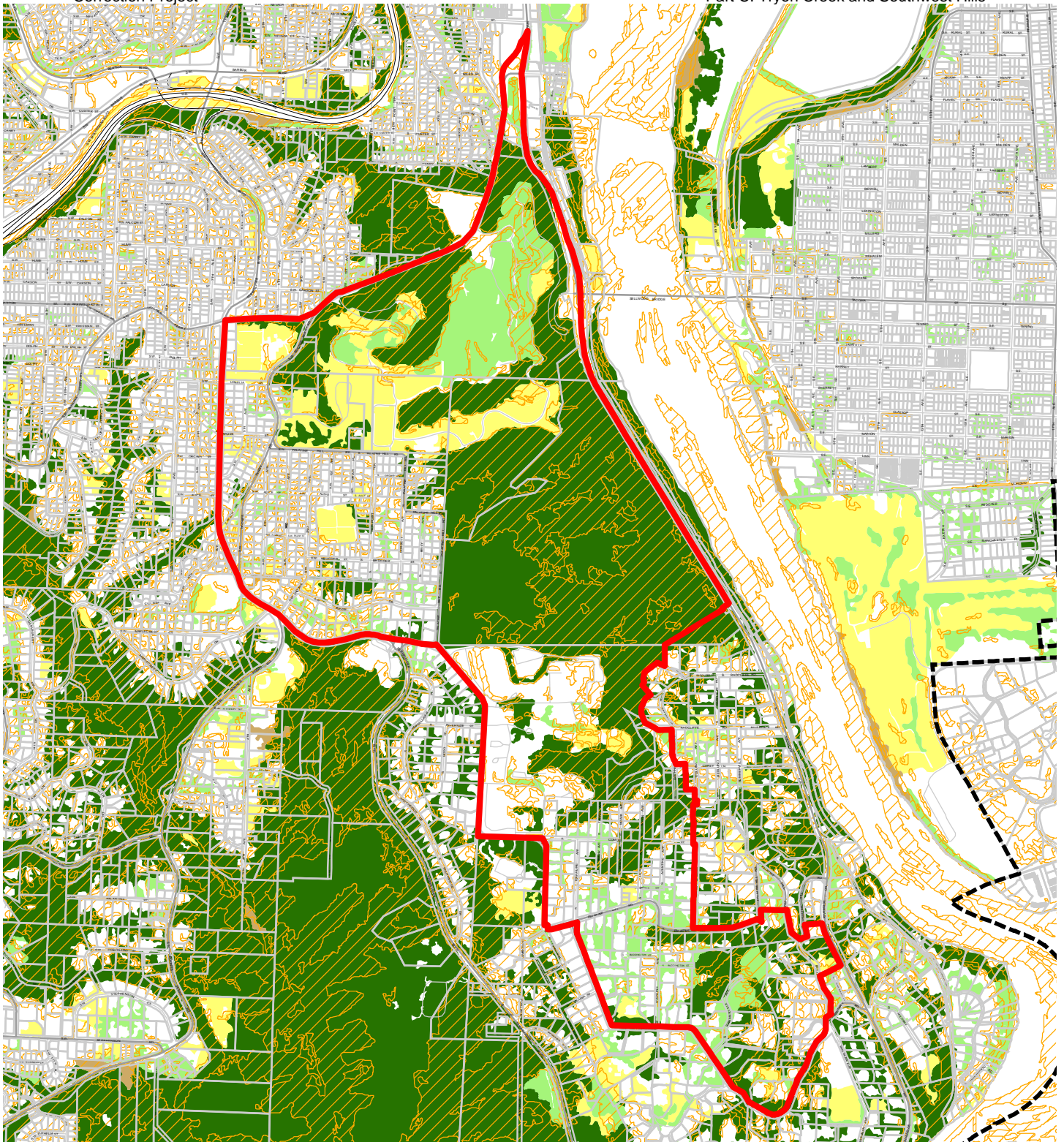


Recommended Draft - As Amended

- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



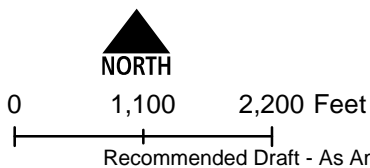
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May 2022



Map B: Vegetation and Steep Slopes

Resource Site: SW17

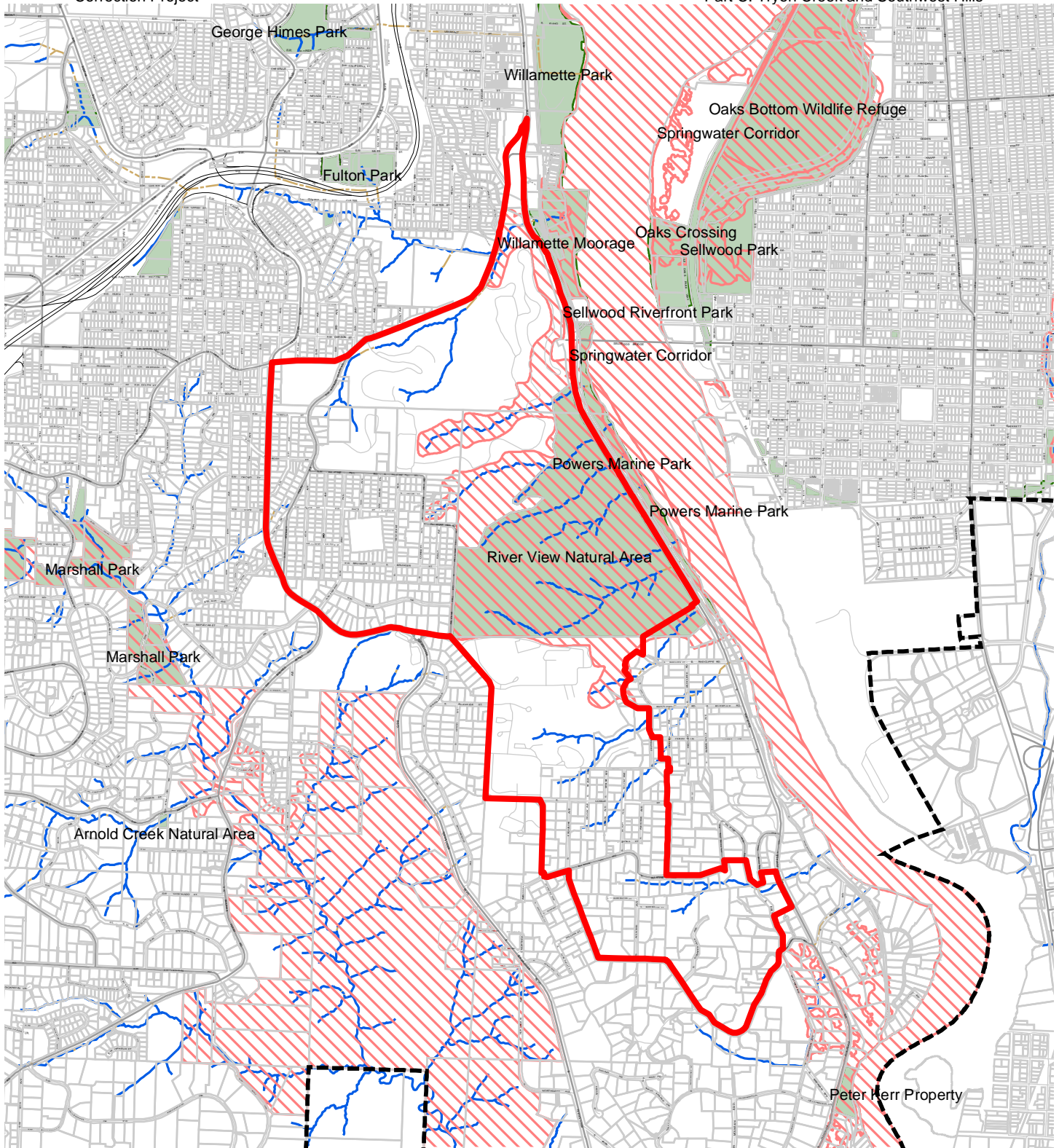
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous



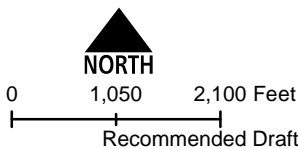
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**Map C: Special
Habitat Areas**

**Resource Site:
SW17**

Updated: May 2022

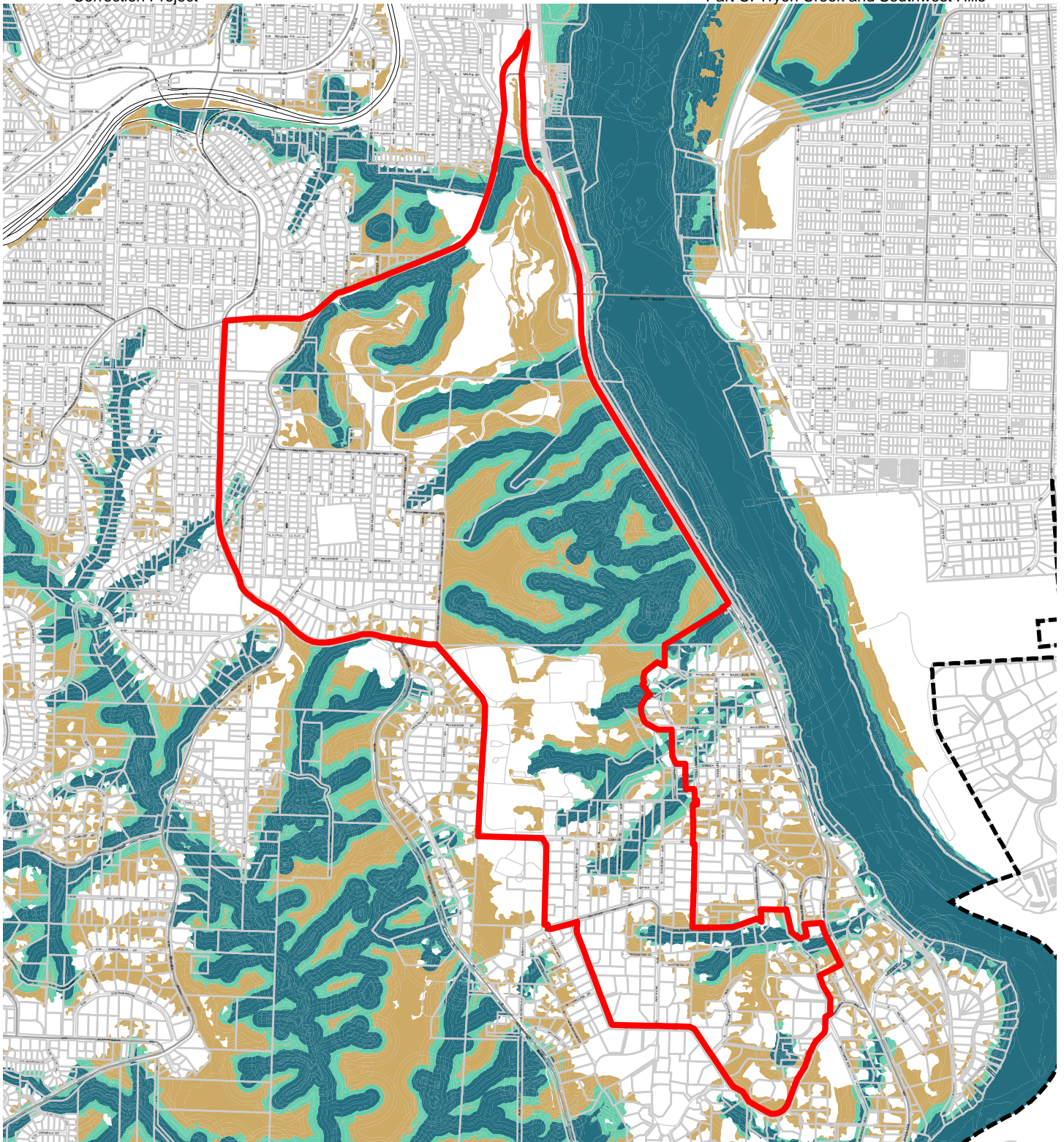


-  Resource Sites
-  Special Habitat Areas (SHAs)
-  Open Stream Channel
-  Piped Stream Segment
-  Parks

-  Urban Service Boundary
-  Taxlots



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May 2022

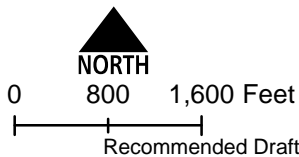


**Map D: Riparian
Corridors Habitat
Classification**

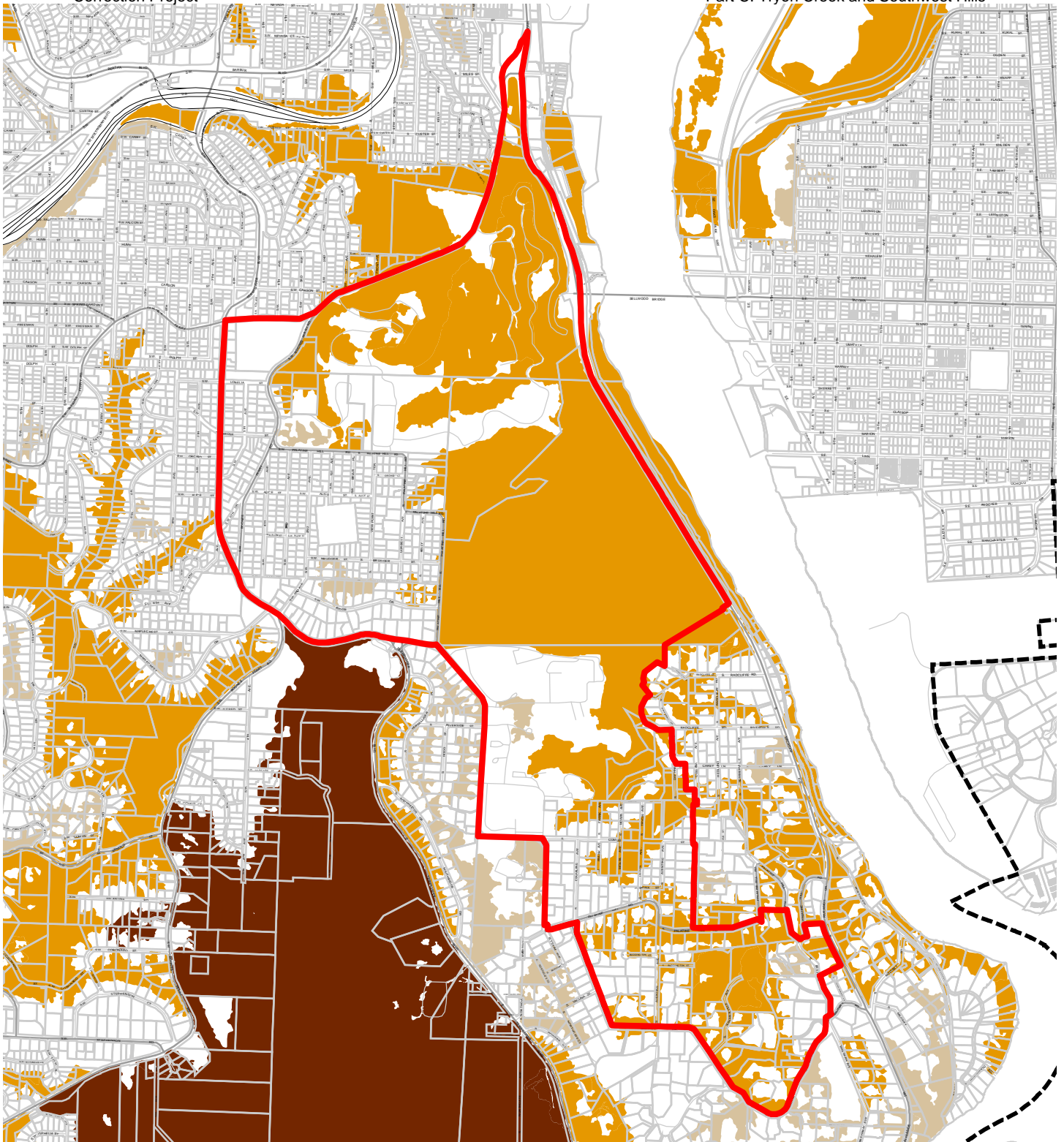
**Resource Site:
SW17**

Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots

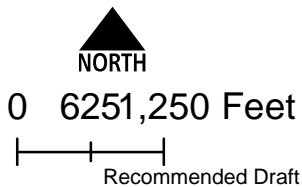








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May 2022



**Map E: Wildlife
Habitat Classification
Resource Site:
SW17**

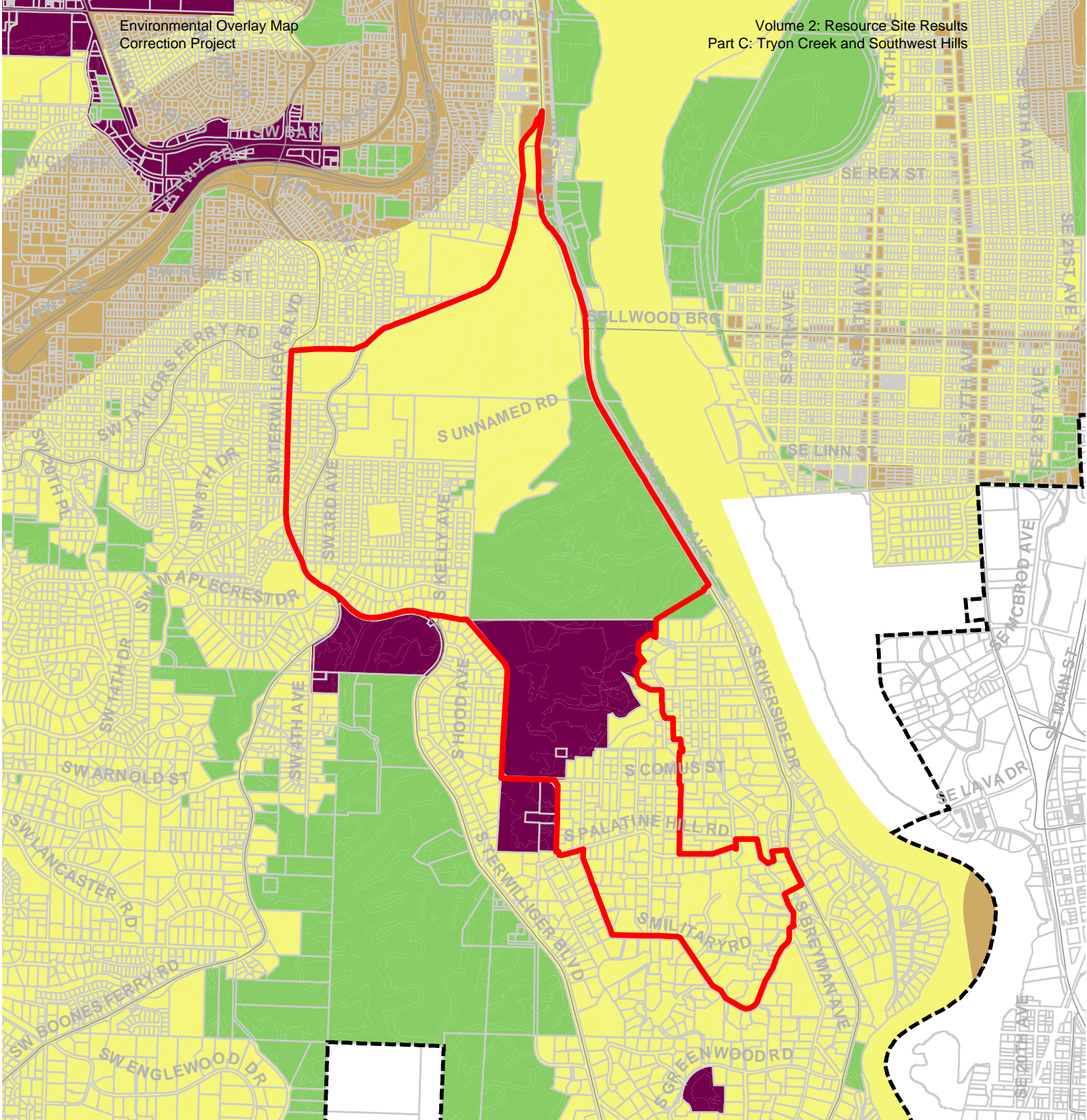
Updated: May 2022



-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots



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May 2022

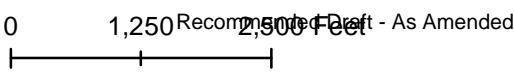


Map F: Urban Development Value (Title 13)
Resource Site: SW17

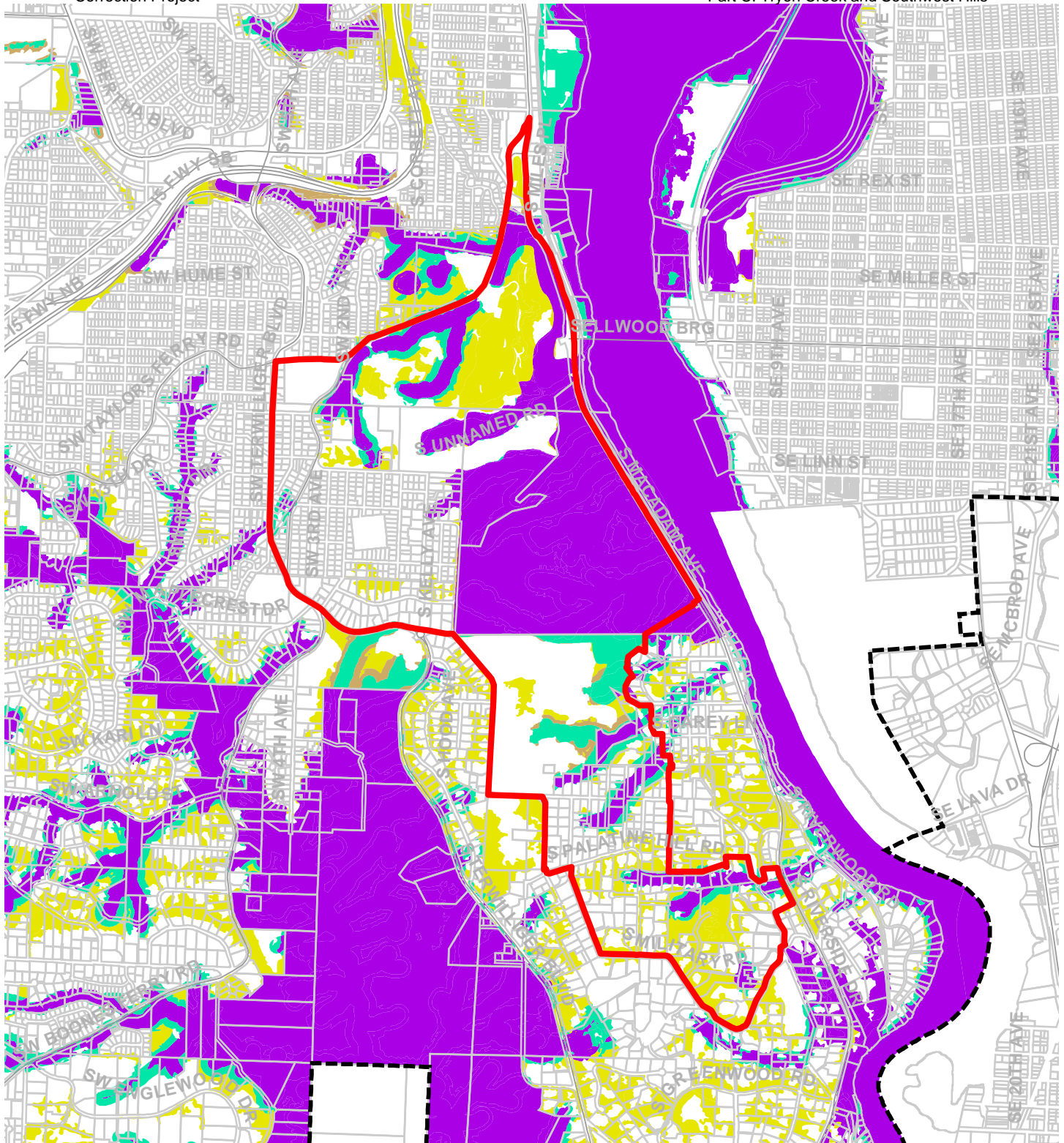
-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks



Updated: July 2021



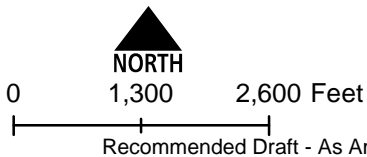
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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW17

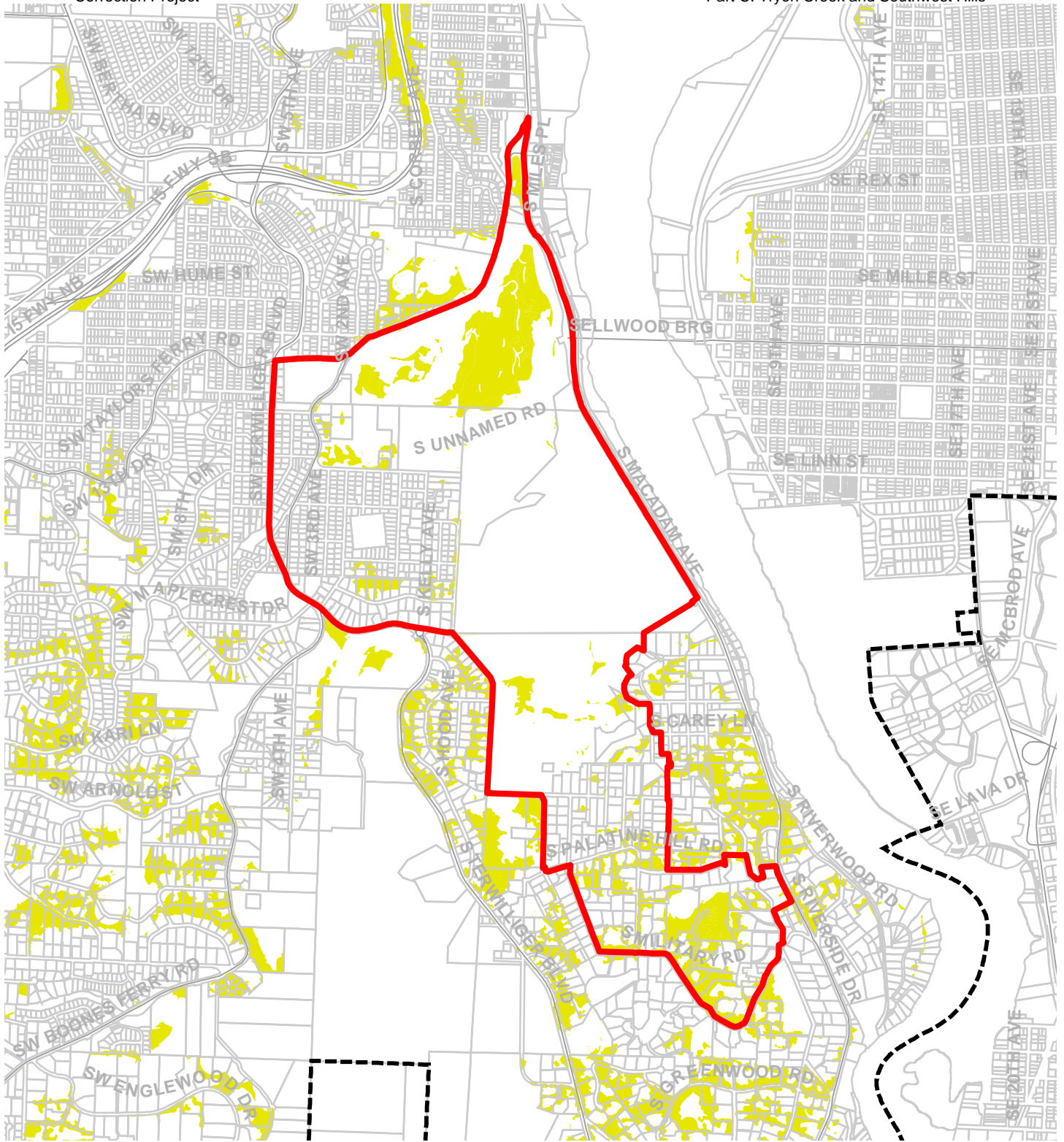
Updated: May 2022



- Urban Service Boundary
- Resource Sites
- HCA High Value
- HCA Moderate Value
- HCA Low Value
- Goal 5 Significant Natural Resources



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Map H: Goal 5 Resources

Resource Site: SW17

Updated: May 2022



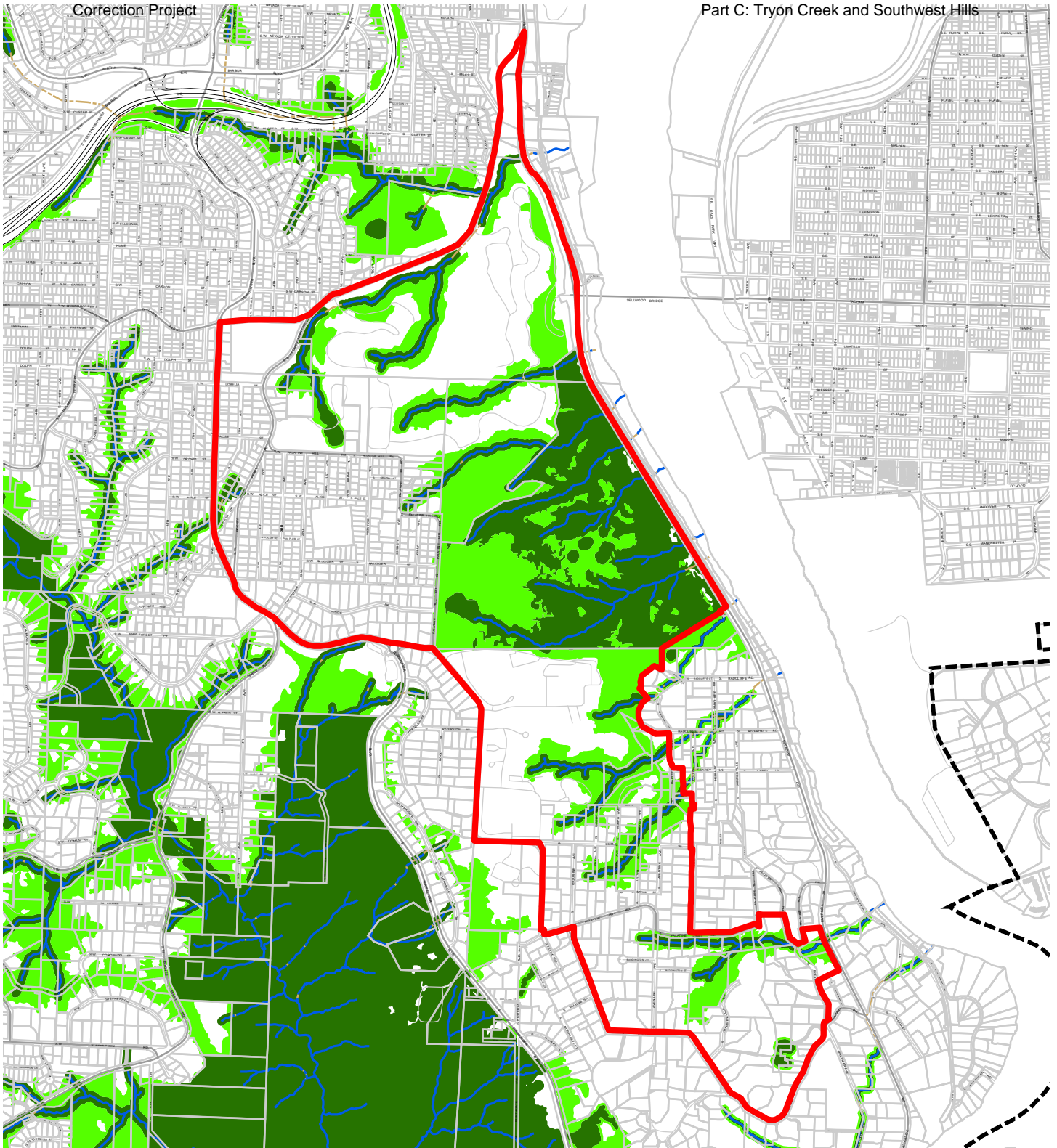
-  Urban Service Boundary
-  Resource Sites
-  Goal 5 Significant Natural Resources

Recommended Draft - As Amended



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.

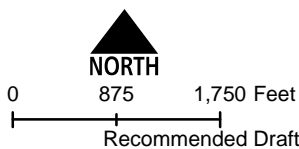
May 2022



Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
SW17**

Updated: May 2022



- Resource Sites
- Open Stream Channel
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone
- Urban Service Boundary
- Taxlots



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May 2022

Natural Resource Description

Within resource site SW17 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; wetland; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: Riverview Cemetery (M, C); Wetlands (W)

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW17	
	Study Area
Stream (Miles)	6.0
Wetlands (acres)	4.1
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	344.0
Woodland (acres)	97.0
Shrubland (acres)	0.6
Herbaceous (acres)	70.9
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	360.0
* 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 areas with a slope greater than 25%.	

This site is the northern portion of a broad, massive ridge that is about two miles long, includes Palatine Hill and extends south to Lake Oswego. The ridge is about 1,500 feet wide, 550 feet high and consists of a series of ravines. About half of the site is in a natural condition. The west slope forms the east face of the Tryon Creek Canyon and the east side drops vertically to the Willamette River and Macadam Avenue. Stephens Creek flows through the northern part of this site in a deep ravine that separates Fulton Park and Burlingame neighborhoods. The major land uses include Riverview Natural Area, River View Cemetery, Lewis and Clark College and low density residential.

The representative forest cover is in its mid-seral second growth stage, with a 70 percent deciduous and 30 percent coniferous composition. Red alder and bitter cherry are common associates of the dominant bigleaf maple. Several unusually large specimens of pacific dogwood and cascara are present. Understory shrub species include serviceberry, thimbleberry, Indian plum, wild rose and snowberry that provide wildlife food and cover. Blackberry plus English ivy, clematis, morning glory, English laurel, English holly and English hawthorn are present in places. Within Riverview Natural Area, the invasive species are minimal, and a native understory is starting to establish. The site soils are prone to slides and slumps when saturated. At particular risk are the steep, sloped ravines. Erosion caused by the failure of these slopes would negatively impact the habitat and water quality.

Aquatic resources at this site include wetlands, four perennial streams and three intermittent streams. All seven of these streams flow to the Willamette River. Crawfish and a variety of macroinvertebrates and amphibians inhabit the site's stream and wetland resources. Bird species observed include great blue heron, cedar wax wing, pileated and downy woodpeckers, Oregon junco, bald eagle, redtail hawks, flickers, owls and ducks. Mammals in the area include mule deer. Over 40 plant species are present at the site and 15 wildlife species were observed during a one-hour visit. Over 60 bird and 30 mammal species have known proclivities for the vegetation type found at the site, both in terms of breeding and feeding activities.

The site contains areas of high value natural resources and includes unique and special habitats associated with Powers Marine Park, the Willamette Moorage Natural Area, and the open space within the 222-acre River View Cemetery. In 2011, the City of Portland acquired the 146-acre River View Natural Area from the River View Cemetery to protect and preserve water quality and wildlife habitat. This was a high priority acquisition for an area designated by the City's Natural Resource Inventory as a high value resource for sensitive and threatened wildlife and their habitats. The site's forested areas and aquatic resources provide an important link between the West Hills, the Ross Island-Oaks Bottom ecosystem complex, and Tryon Creek State Natural Area.

This site has important visual resources. The tree-covered condition of the site contributes to the neighborhood character. Because of the relatively high ridge elevation, broadness and tree

cover, this ridge is an important feature of the West hills and to the surrounding region. Palatine Hill provides a foreground to the Cascades Mountains when viewed from areas near Council Crest.

Please refer to the River View Natural Area Management Plan, 2015, for additional information.

<https://www.portlandoregon.gov/parks/69279>

Table B: Quality of Natural Resource Functions in Resource Site SW17				
Resource Site (acres) = 755				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	157.3	87.4	175.0	419.7
percent total inventory site area	20.8%	11.6%	23.2%	55.6%
Wildlife Habitat*				
acres	0.0	397.6	11.3	408.8
percent total inventory site area	0.0%	52.7%	1.5%	54.2%
Special Habitat Areas**				
acres	222.0			
percent total inventory site area	29.4%			
Combined Total⁺				
acres	157.3	247.9	58.4	463.6
percent total inventory site area	20.8%	32.8%	7.7%	61.4%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.				
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.				
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called “effective impervious area.” The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For resource site SW17, 4.3% of the total area is effectively impervious. This indicates a significant degree of stormwater management and/or existing natural resources that should be preserved. Areas with very low impervious cover and existing vegetation are more likely to be functioning properly to support biologic systems.

Table C. Impervious Area within Resource Site SW17			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
754.8	82.0	32.5	4.3%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW17. Natural resources should be protected within HCA as follows:

1. *Strictly limit* or *limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.

2. *Strictly limit* or *limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit* or *limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or *limiting* conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting* or *limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW17 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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, R10, R7 and R2.5 base zones. Commercial uses are allowed in the C11 and 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW17, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW17, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or wetlands.
2. Inside the River View Natural Area, apply a protection overlay zone ('p' zone) to areas of forest vegetation on steep slopes that is contiguous to but more than 50 feet from stream top-of-bank.
3. Inside the River View Natural Area, apply a conservation overlay zone ('c' zone) to areas of forest vegetation on non-steep slopes that is contiguous to but more than 50 feet from stream top-of-bank.
4. Outside of River View Natural Area, apply a conservation overlay zone ('c' zone) to land that is between 50 and 75 feet of stream top-of-bank or wetlands; and within areas of forest vegetation that are contiguous to but more than 75 feet of stream top-of-bank.
5. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW18 **Site Name:** Maricara Natural Area

Previous Plan: Southwest hills Resource Protection Plan

Previous Resource Site No.: 121

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

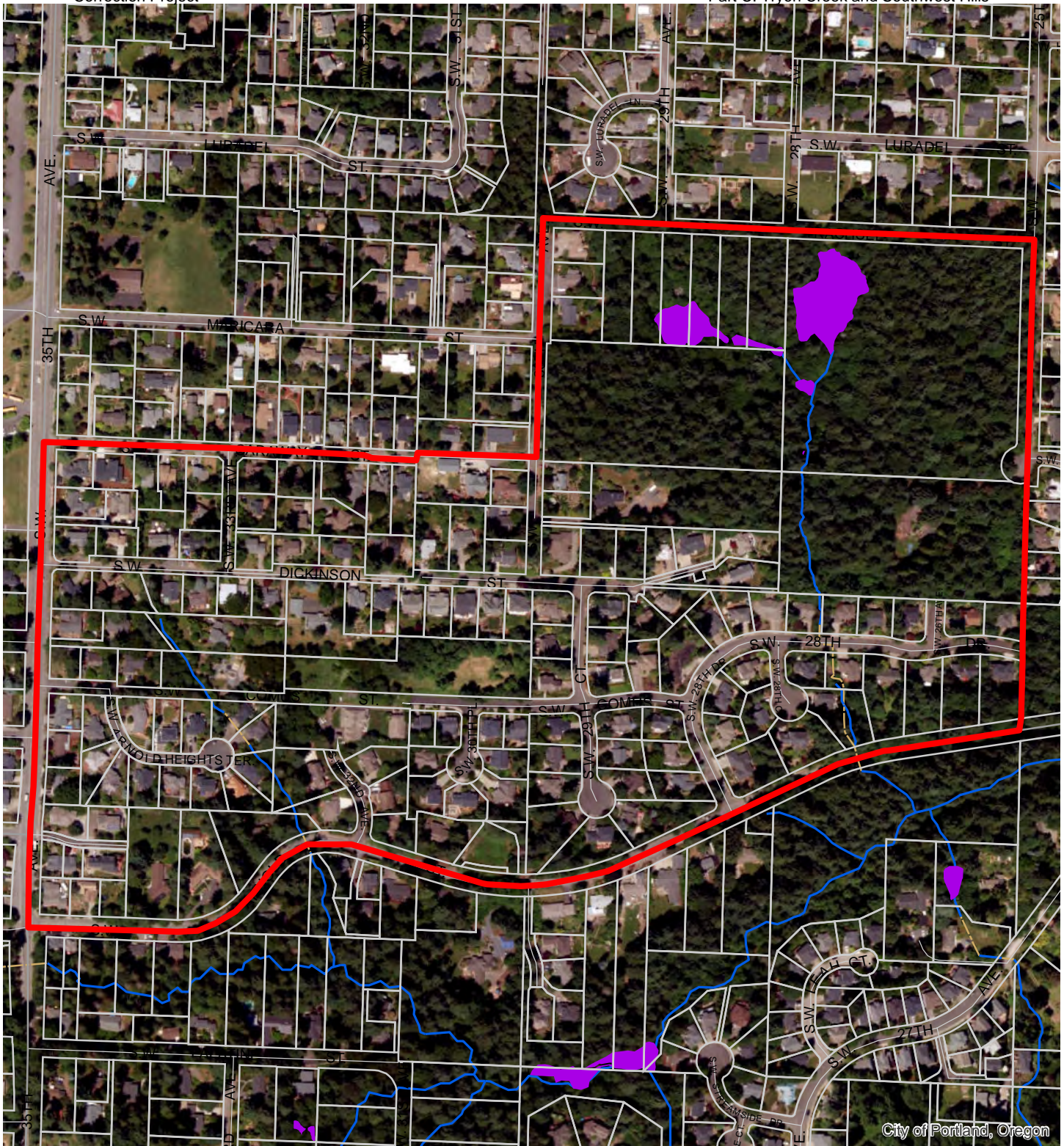
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW18 includes the following:

Site (acres)	83.0
Base zones (acres)	
OS	18.5
R10	58.0
R20	4.8
R7	1.7

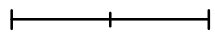


Map A: Water Features
Resource Site: SW18

Updated: May 2022



0 195 390 Feet

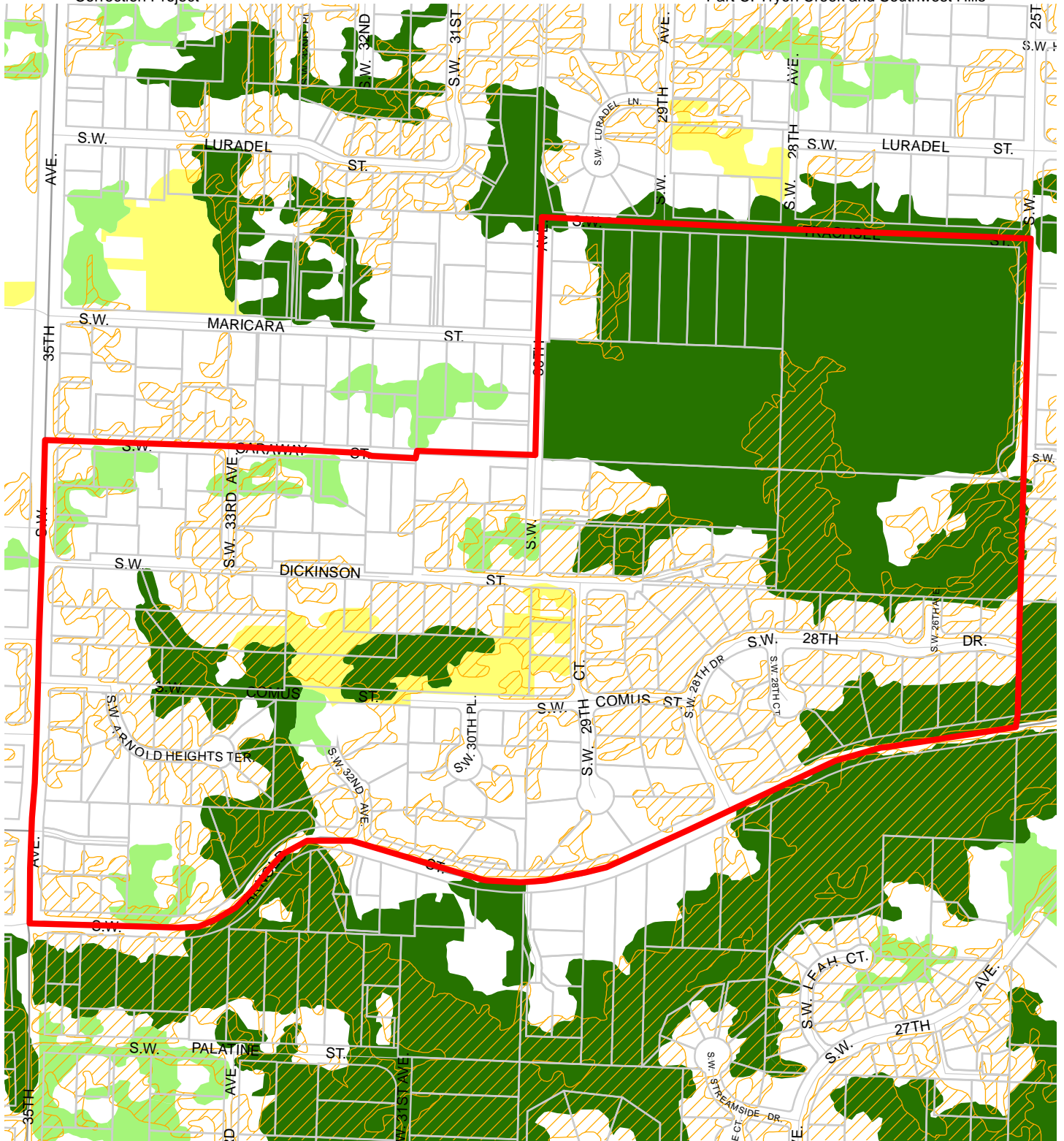


Recommended Draft - As Amended

- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



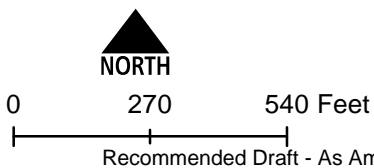
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Map B: Vegetation and Steep Slopes

Resource Site: SW18

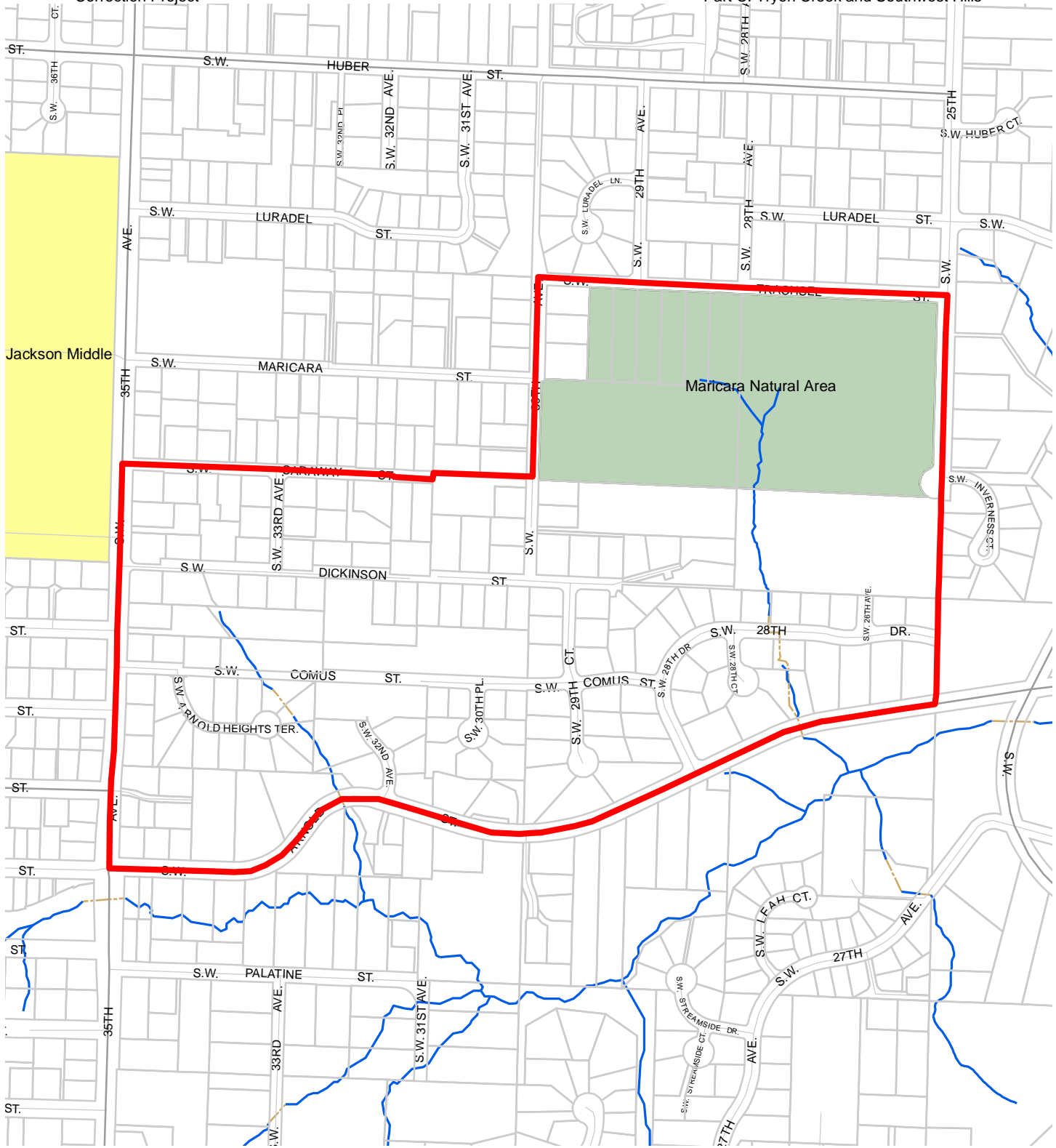
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous

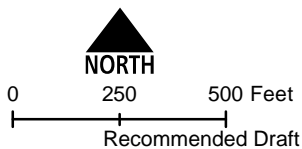


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**Map C: Special
Habitat Areas**
**Resource Site:
SW18**

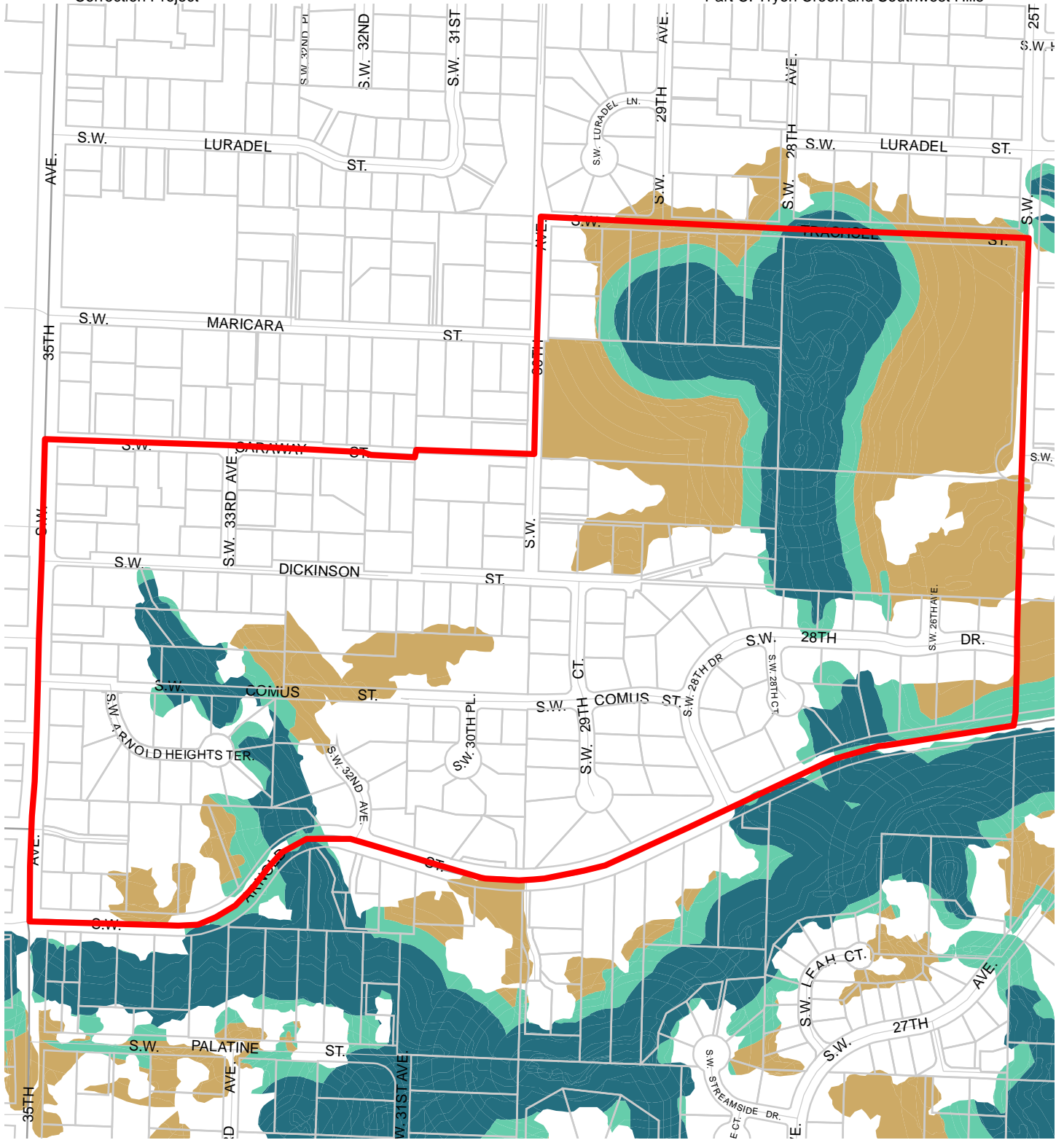
Updated: May 2022



- Resource Sites
- Special Habitat Areas (SHAs)
- Open Stream Channel
- Piped Stream Segment
- Parks
- Schools
- Urban Service Boundary
- Taxlots



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May 2022

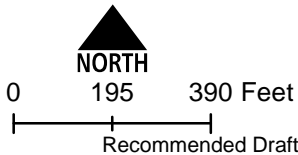


**Map D: Riparian
Corridors Habitat
Classification**

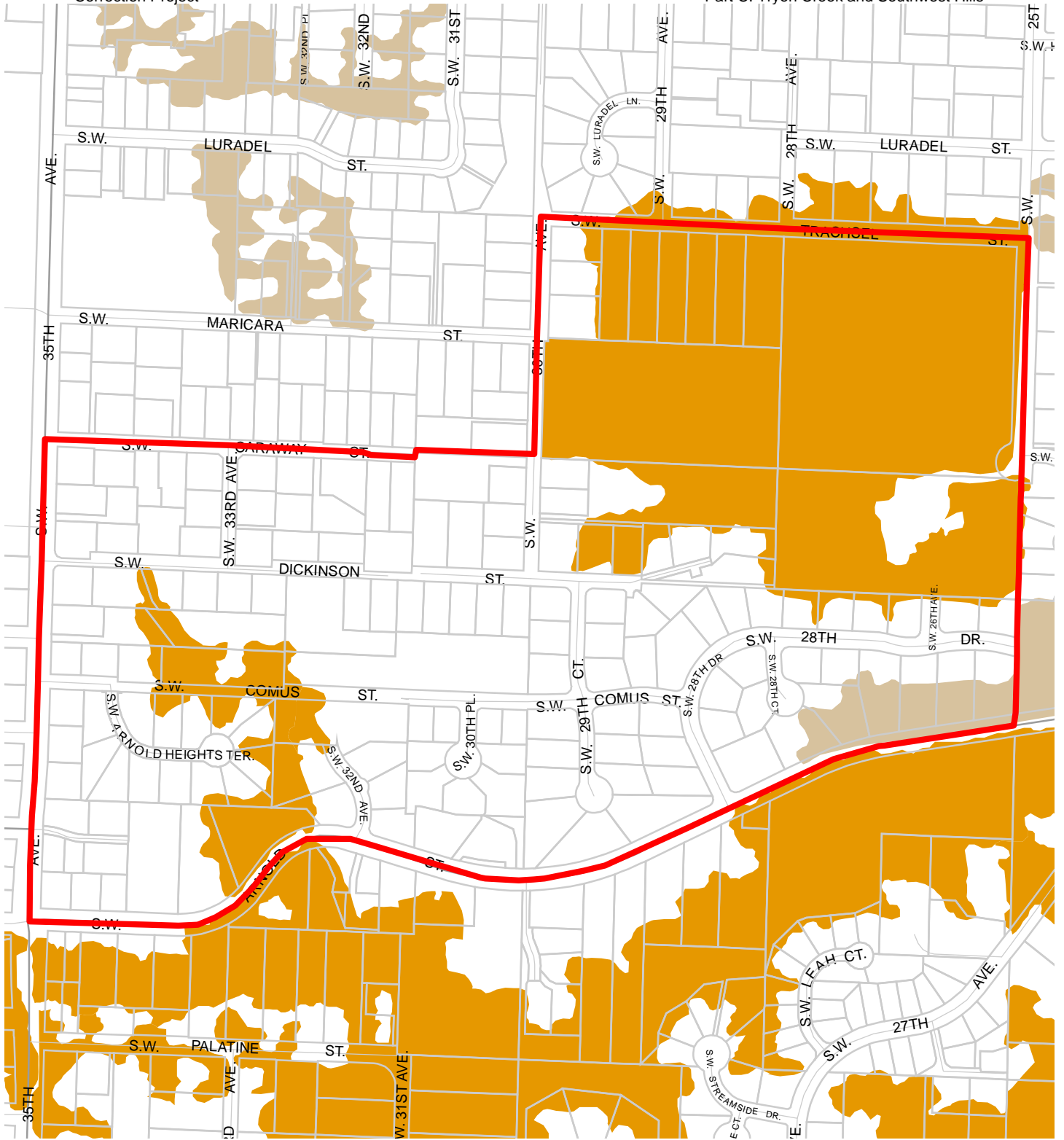
**Resource Site:
SW18**

Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots

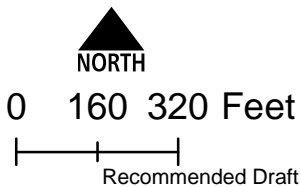


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**Map E: Wildlife
Habitat Classification**
Resource Site:
SW18

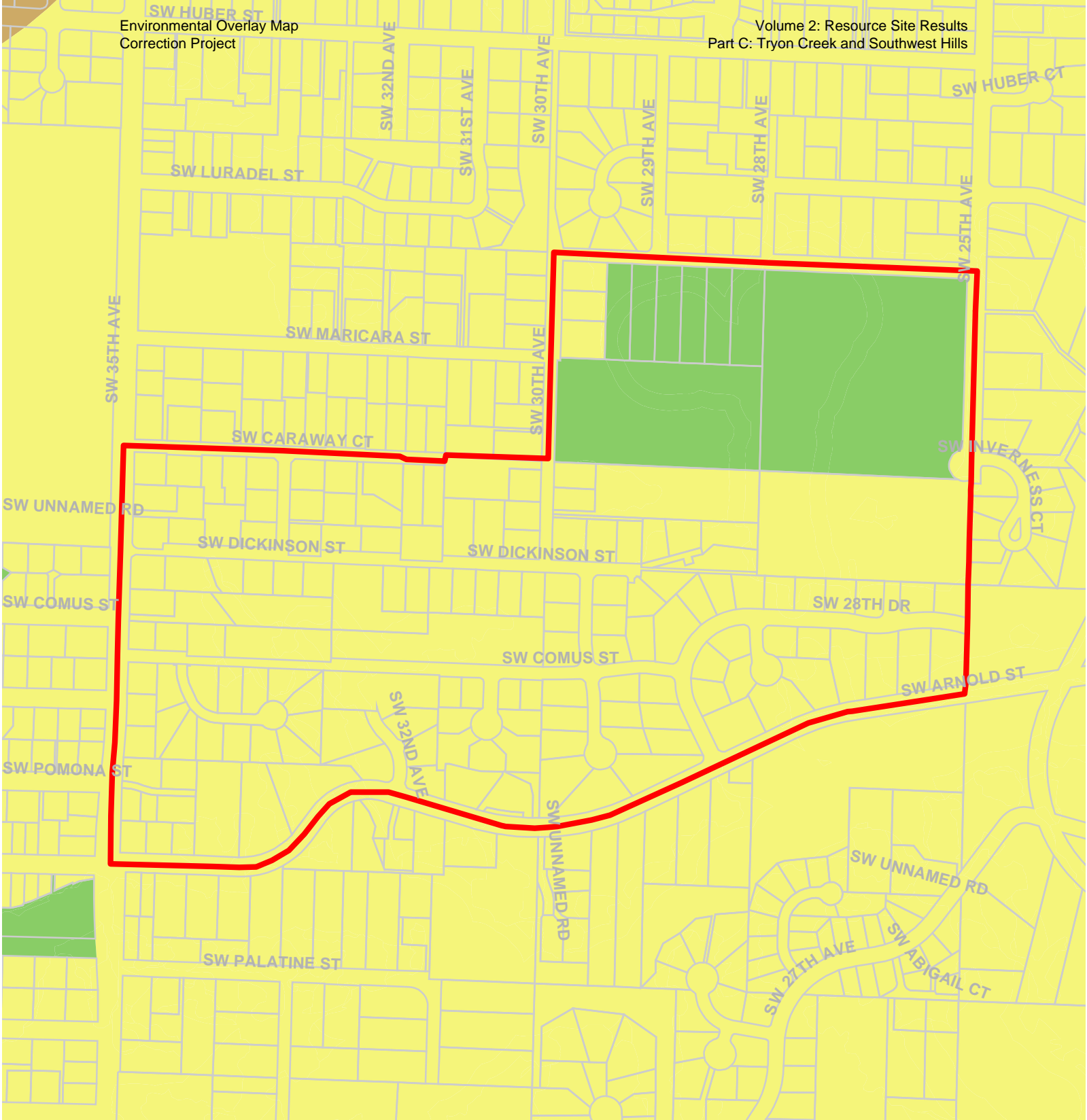
Updated: May 2022



- Resource Sites
- Class A (high rank)
- Class B (medium rank)
- Class C (low rank)
- Urban Service Boundary
- Taxlots



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Map F: Urban Development Value (Title 13)
Resource Site: SW18

-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks

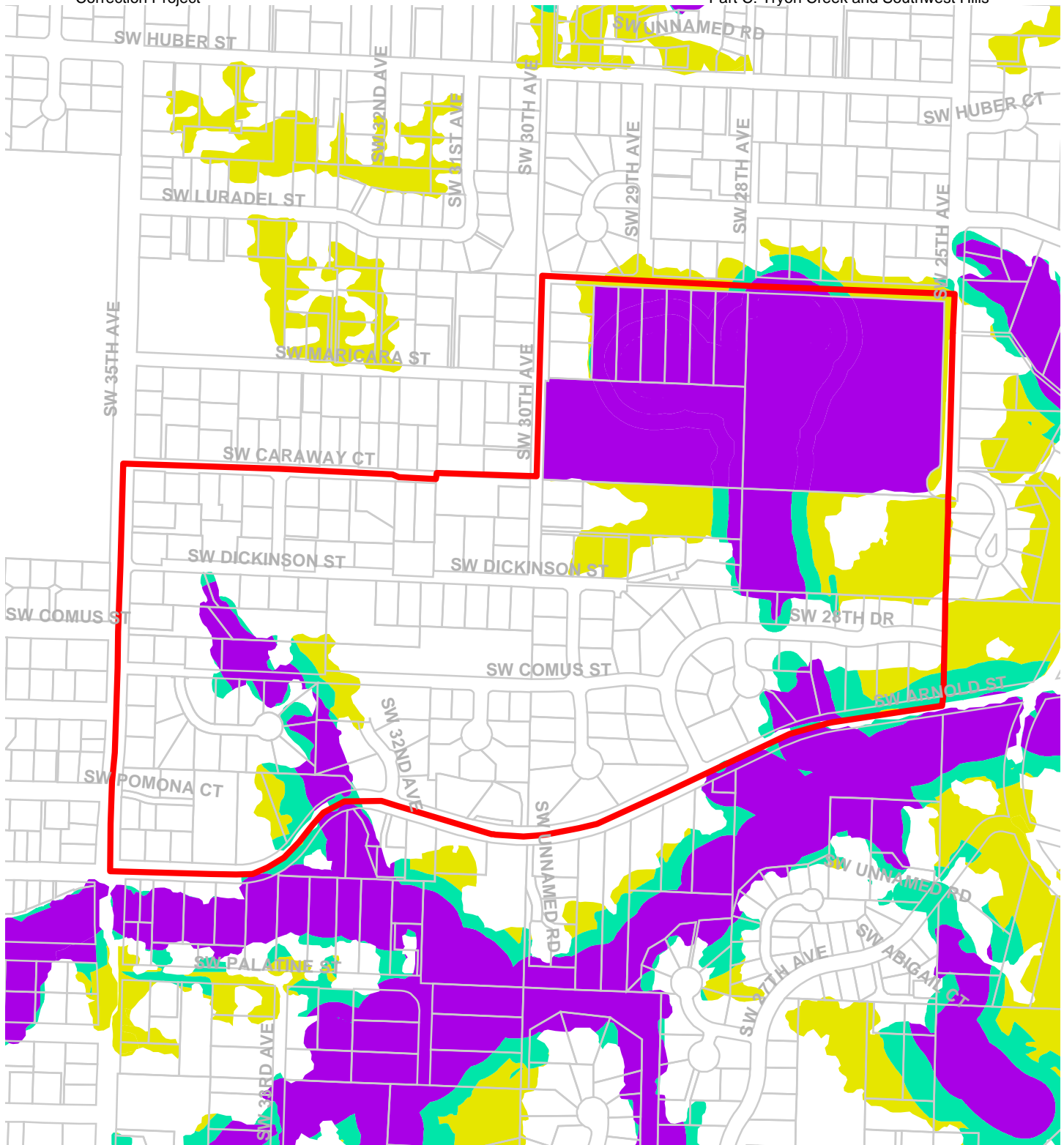


Updated: July 2021



0 287.5 Feet
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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW18

Updated: May 2022



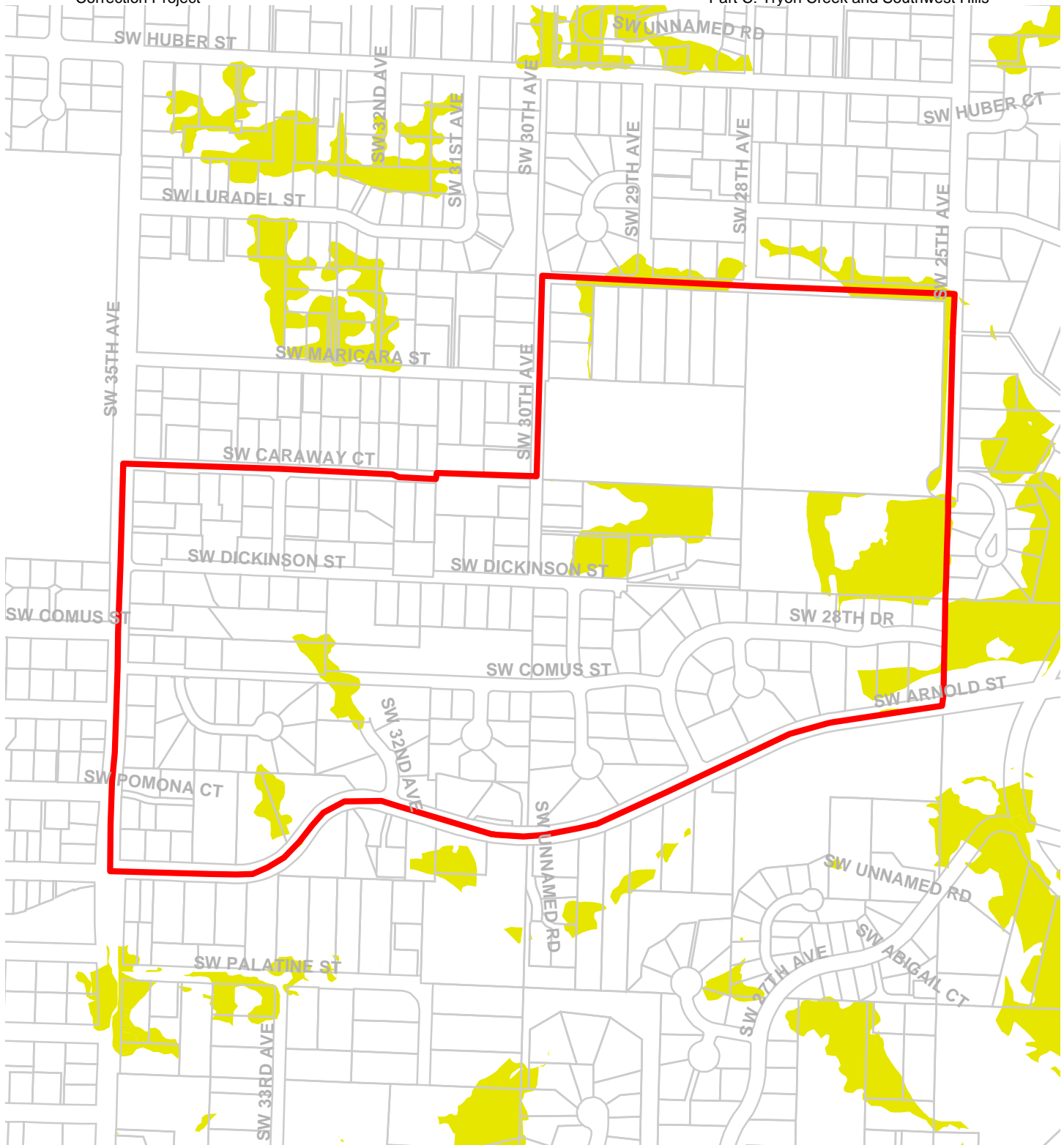
Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- HCA High Value
- HCA Moderate Value
- HCA Low Value
- Goal 5 Significant Natural Resources



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May 2022



Map H: Goal 5 Resources

Resource Site: SW18

Updated: May 2022

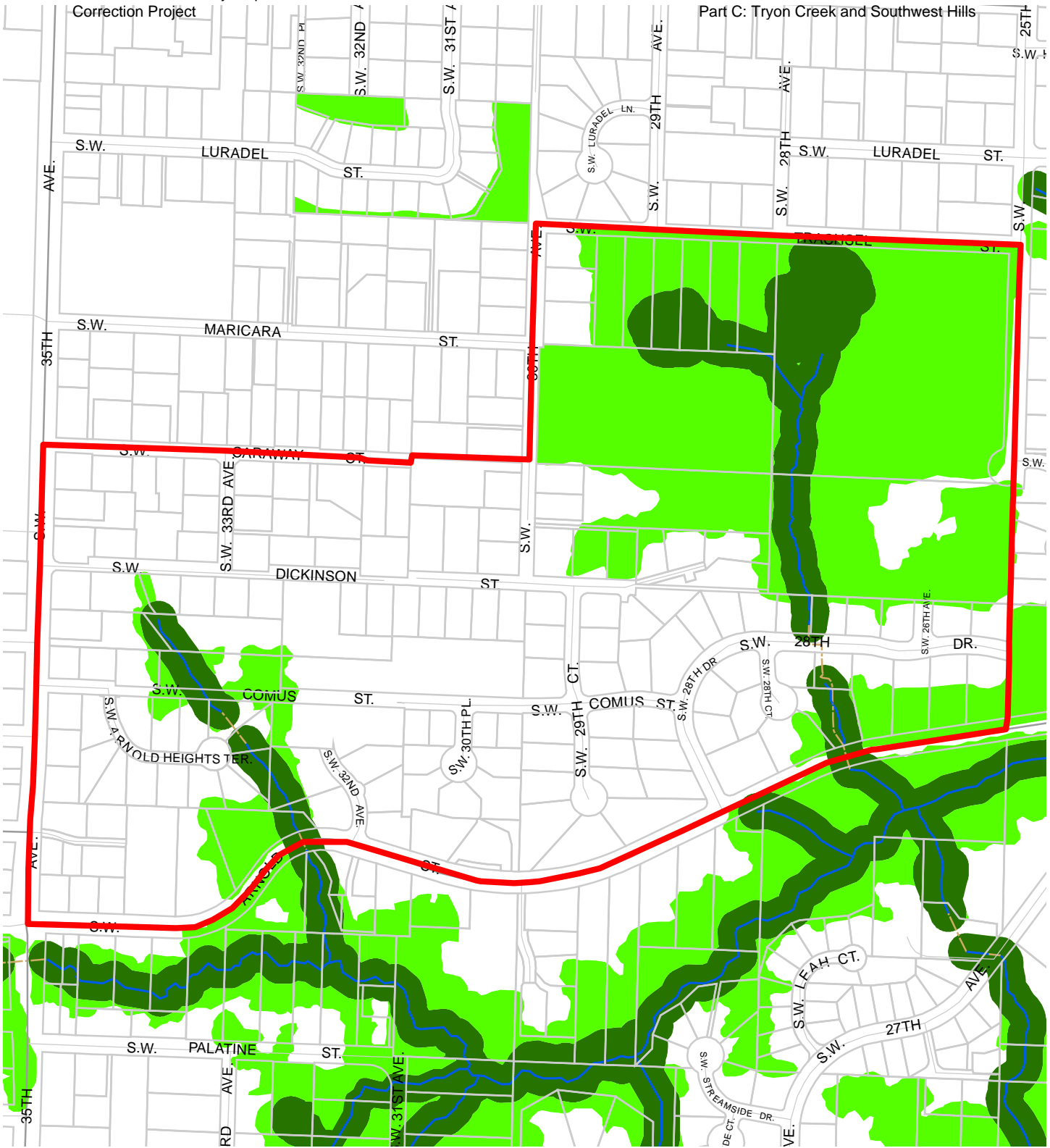


Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



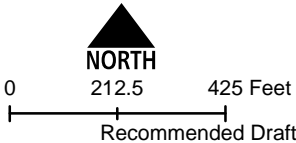
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Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site: SW18

Updated: May 2022



-  Resource Sites
-  Open Stream Channel
-  Piped Stream Segment
-  Proposed Conservation Zone
-  Proposed Protection Zone
-  Urban Service Boundary
-  Taxlots



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Natural Resource Description

Within resource site SW18 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; wetland; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: None

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW18	
	Study Area
Stream (Miles)	0.3
Wetlands (acres)	1.2
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	31.8
Woodland (acres)	2.9
Shrubland (acres)	0.0
Herbaceous (acres)	2.5
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	31.8
* 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 areas with a slope greater than 25%.	

This resource area includes Maricara Nature Park, a 17-acre natural area that contains open stream channels and wetlands that drain to Arnold Creek, the largest tributary to Tryon Creek. The streams likely have good riparian vegetation cover and floodplain interaction. Arnold Creek and its tributaries are important to Tryon Creek because they provide habitat continuity and augment low summer base flows. In-stream habitat such as pools and gravel and riffle substrates are adequate in many of the upper reaches of Arnold Creek. Vegetated areas, such as wide and intact riparian habitat, provide habitat for many small and adaptive mammal species. Up to 60 species of birds, and a number of amphibian and reptile species may inhabit some of these areas. Rainbow and cutthroat are present in Arnold Creek. Portions of Arnold Creek may provide important spawning and rearing habitat to resident fish species (City of Portland Bureau of Environmental Services (BES), Fanno and Tryon Creeks Watershed Management Plan, 2005).

Maricara Natural Area supports deciduous and evergreen needle-leaf forest communities. The tree canopy is dominated by Douglas fir, big leaf maple, and red alder. Western red cedar and grand fir occur infrequently. Riparian and wetland vegetation growing in seasonally flooded habitat include red alder, Oregon ash, Scouler's willow, red elderberry, oceanspray, soft Pacific rush, sedges, western false hellebore, and lady fern. Other species found at the site are vine maple, western yew, beaked hazelnut, salal, Indian plum, and cascara. Indian plum is widespread, particularly on the western half of the site. Oregon grape and sword fern are abundant on the eastern half of the site. There is also a small population of Columbia lily, a native lily that grows in forests, thickets, and meadows within the natural area. The overall ecological health for the natural area is fair to good. Invasive species are found throughout the natural area though still in manageable patches. They include English holly, English laurel, English ivy, traveler's joy, Siberian iris, Japanese knotweed, Himalayan blackberry, horse chestnut, and common hawthorn.

Low density urban development, characteristic of the Arnold Creek subwatershed, retains a relatively high degree of vegetation cover and minimized impervious cover, both of which help to retain some natural watershed functions (City of Portland (BES), Fanno and Tryon Creeks Watershed Management Plan, 2005).

Table B: Quality of Natural Resource Functions in Resource Site SW18				
Resource Site (acres) = 83				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	11.3	5.7	17.0	33.9
percent total inventory site area	13.6%	6.8%	20.5%	40.9%
Wildlife Habitat*				
acres	0.0	28.9	2.0	30.9
percent total inventory site area	0.0%	34.8%	2.4%	37.2%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total⁺				
acres	11.3	20.0	2.7	33.9
percent total inventory site area	13.6%	24.1%	3.2%	40.9%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.				
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.				
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called "effective impervious area." The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter

pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For Resource Area SW18, 14.1% of the total area is effectively impervious, indicating a critical level of vulnerability, with negative impacts beginning to impact natural functions, but natural processes still in place and providing support to biologic systems.

Table C. Impervious Area within Resource Site SW18			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
83.0	14.1	11.7	14.1%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW18. Natural resources should be protected within HCA as follows:

1. *Strictly limit or limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit or limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit or limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or limiting conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting or limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW18 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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. 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW18, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW18, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or wetlands.
2. Apply a conservation overlay zone ('c' zone) to areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
3. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW19 **Site Name:** Mt Sylvania

Previous Plan: Southwest hills Resource Protection Plan

Previous Resource Site No.: 122

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

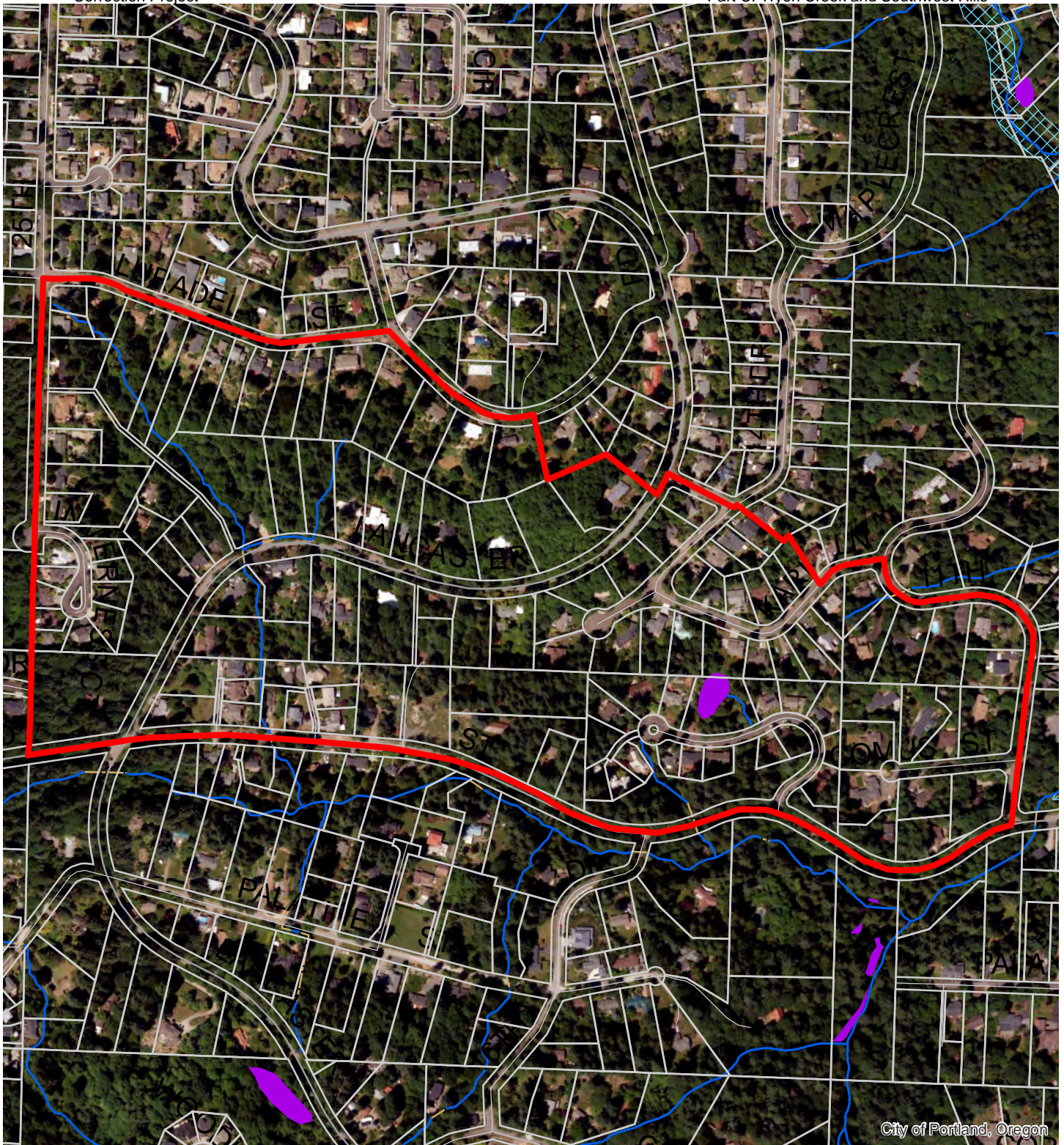
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW19 includes the following:

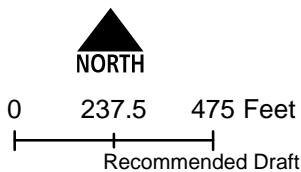
Site (acres)	86.2
Base zones (acres)	
OS	0.0
R10	13.3
R20	72.9



Map A: Water Features

Resource Site: SW19

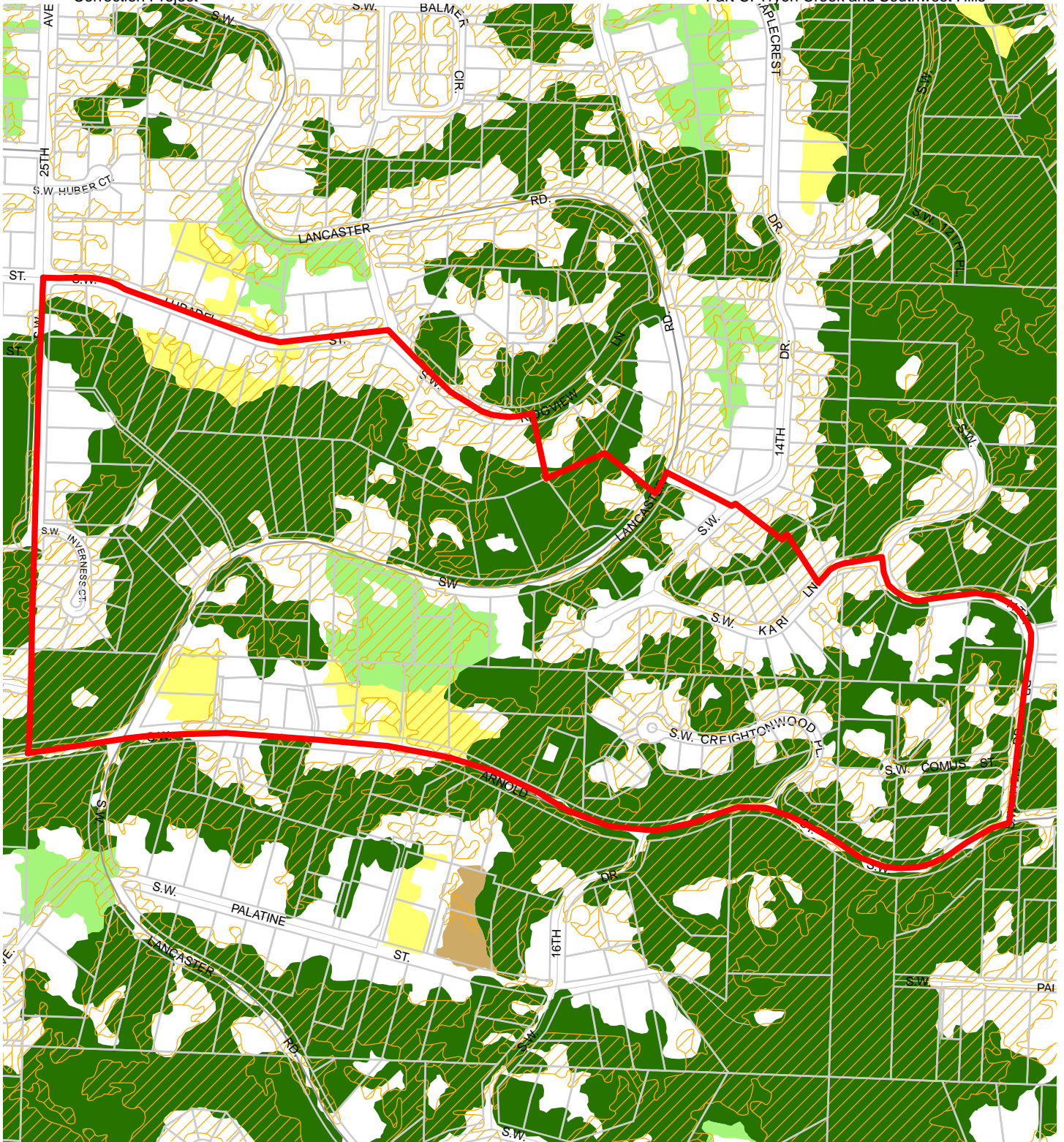
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



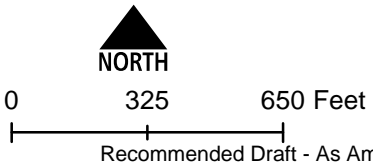
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Map B: Vegetation and Steep Slopes

Resource Site: SW19

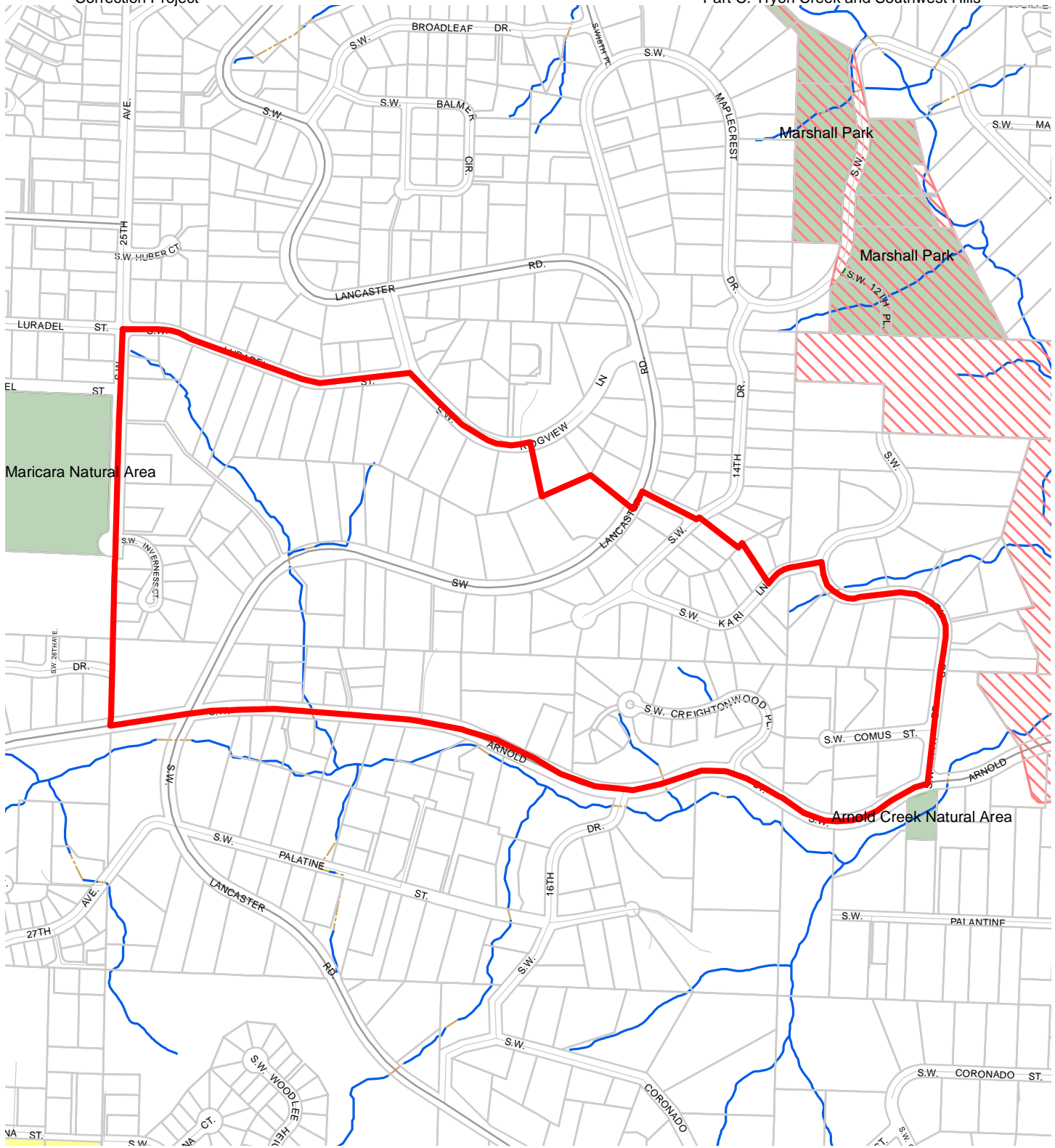
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous

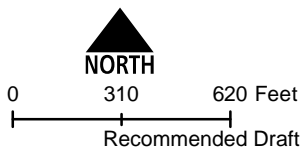









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**Map C: Special
Habitat Areas**
**Resource Site:
SW19**

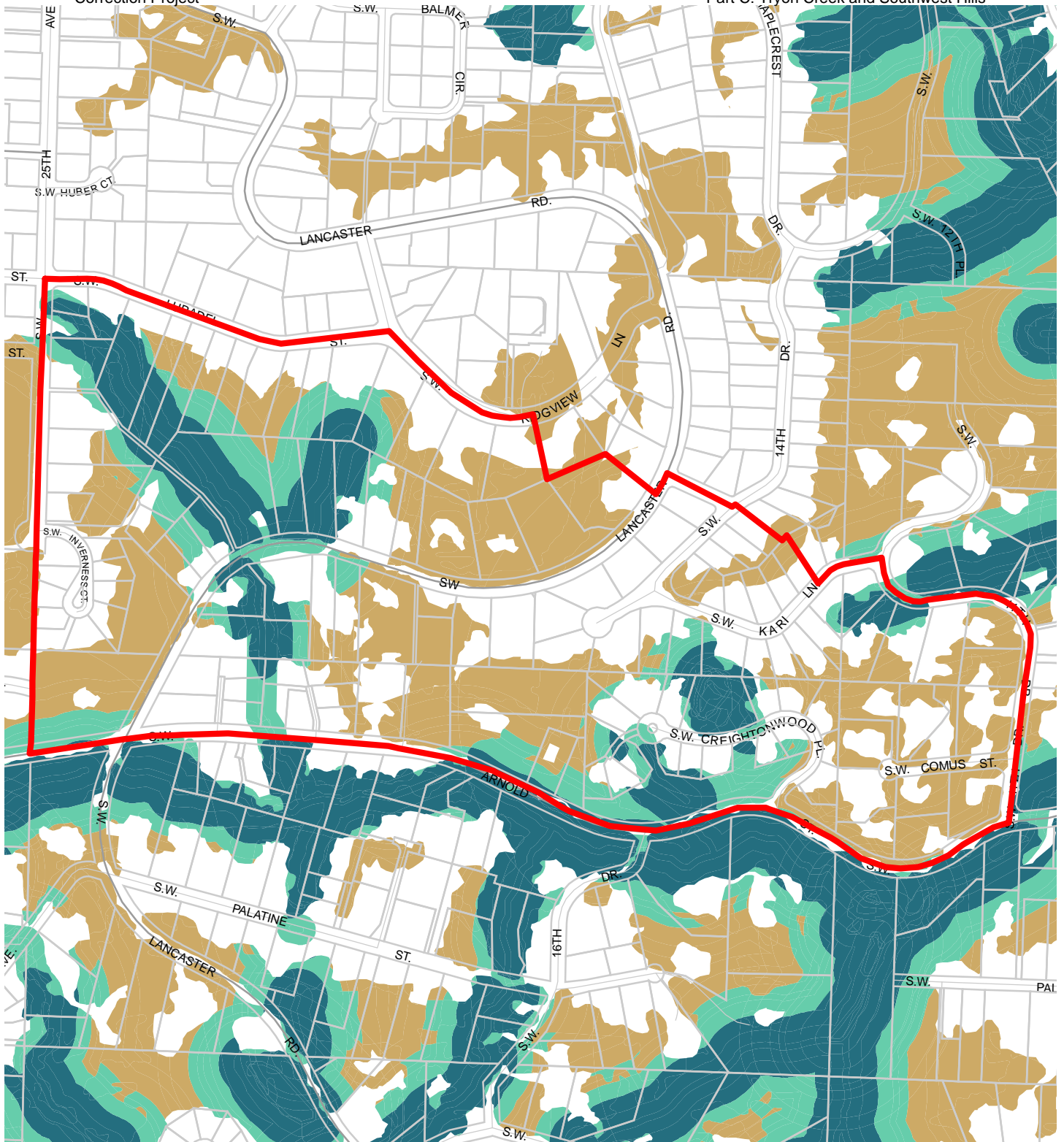
Updated: May 2022



-  Resource Sites
-  Special Habitat Areas (SHAs)
-  Open Stream Channel
-  Piped Stream Segment
-  Parks
-  Schools
-  Urban Service Boundary
-  Taxlots



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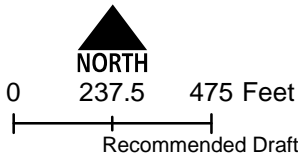


**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
SW19**

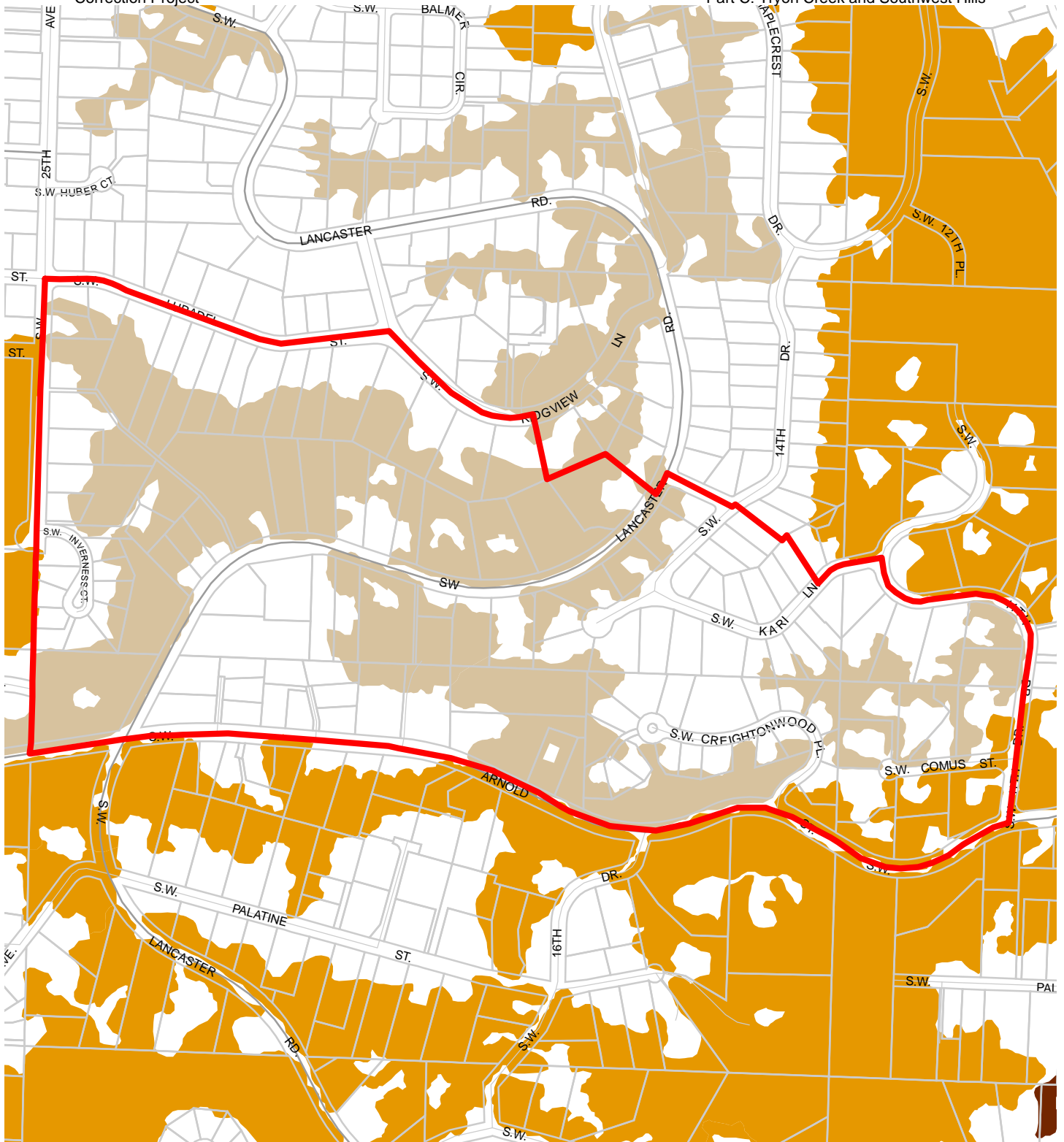
Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots



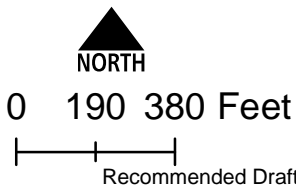
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May 2022



**Map E: Wildlife
Habitat Classification
Resource Site:
SW19**

Updated: May 2022

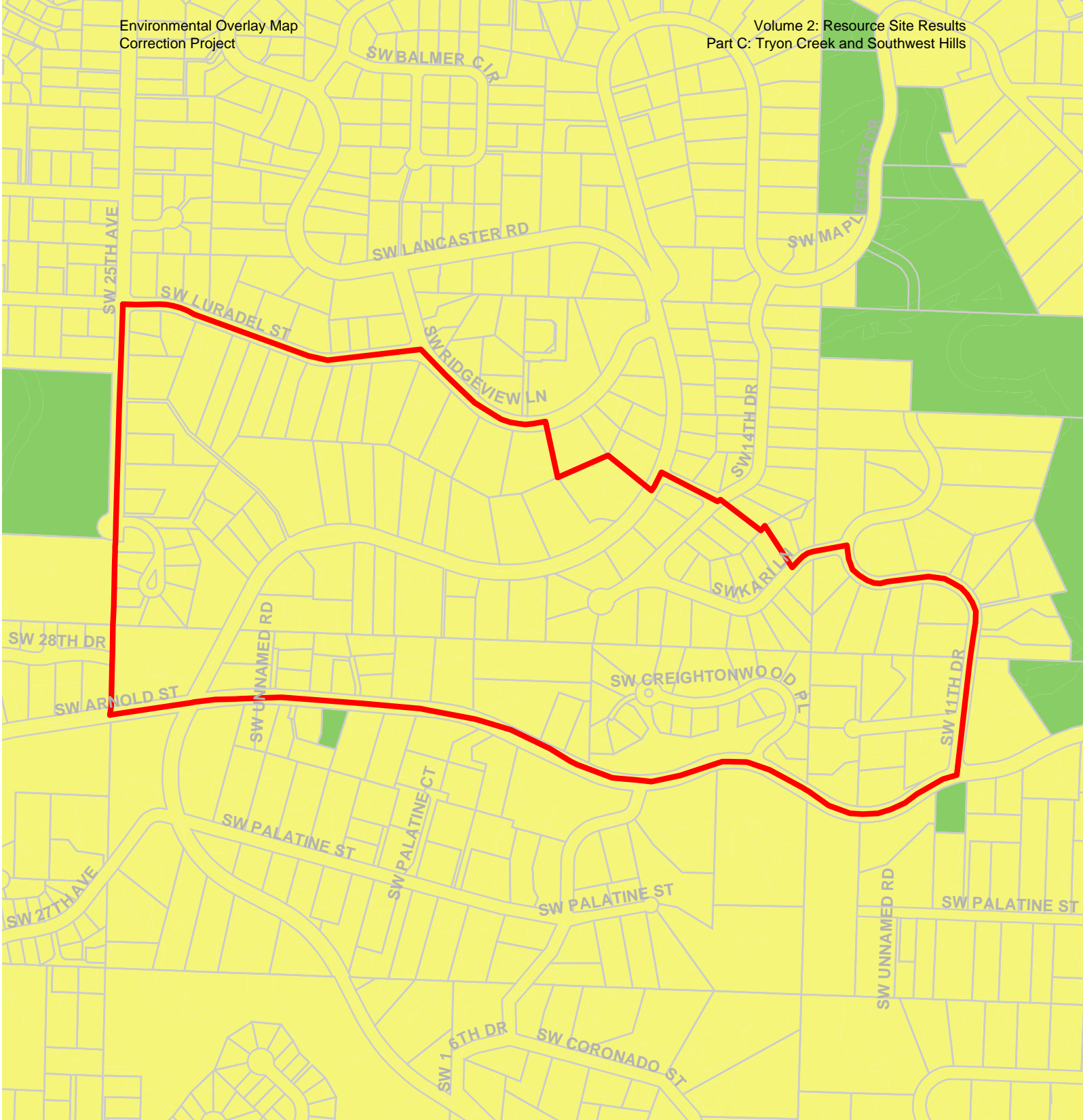


- Resource Sites
- Class A (high rank)
- Class B (medium rank)
- Class C (low rank)
- Urban Service Boundary
- Taxlots



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May 2022



Map F: Urban Development Value (Title 13)
Resource Site: SW19

-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks

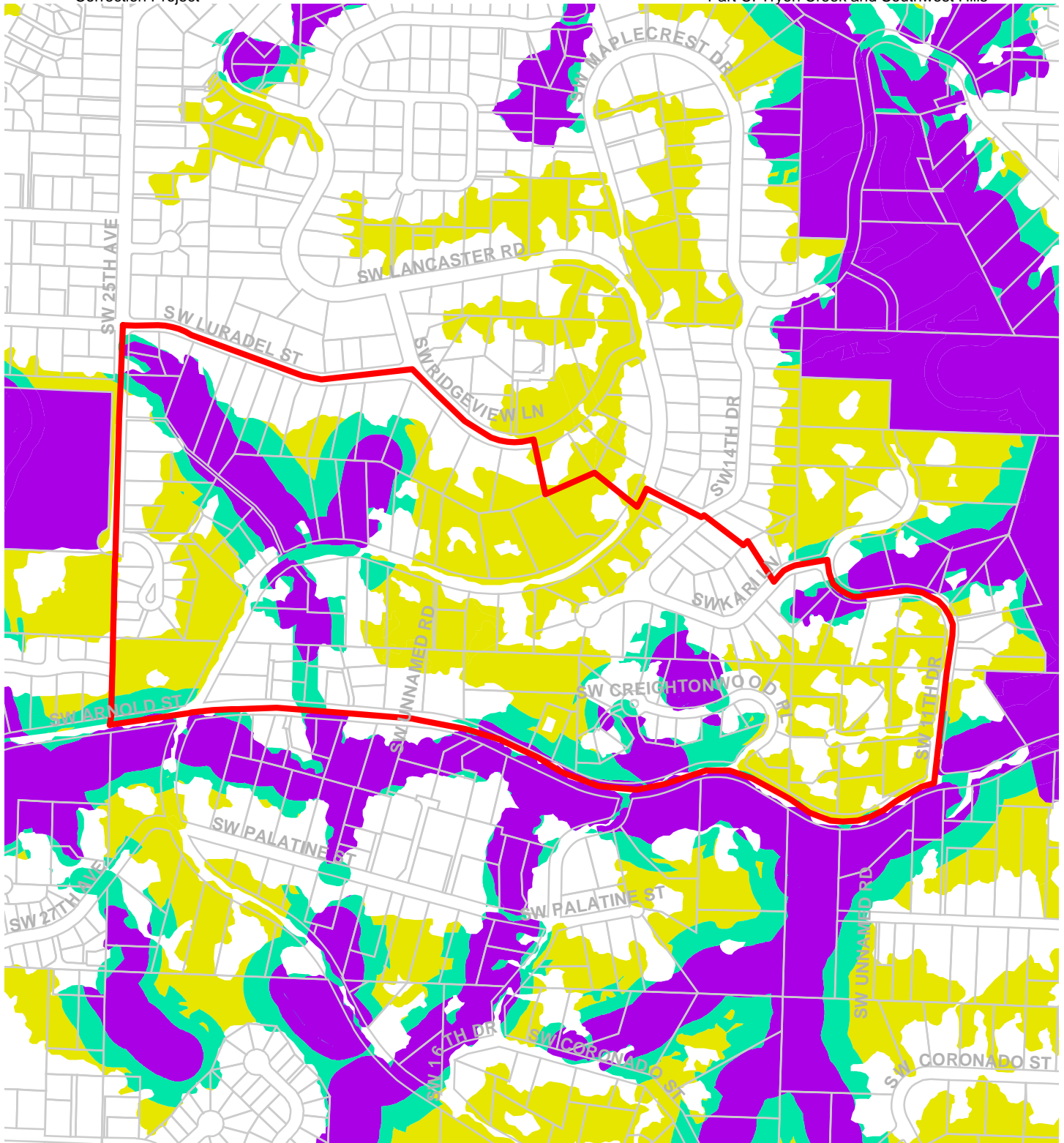
Updated: July 2021



0 350 700 Feet
Recommended Draft - As Amended



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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW19

Updated: May 2022



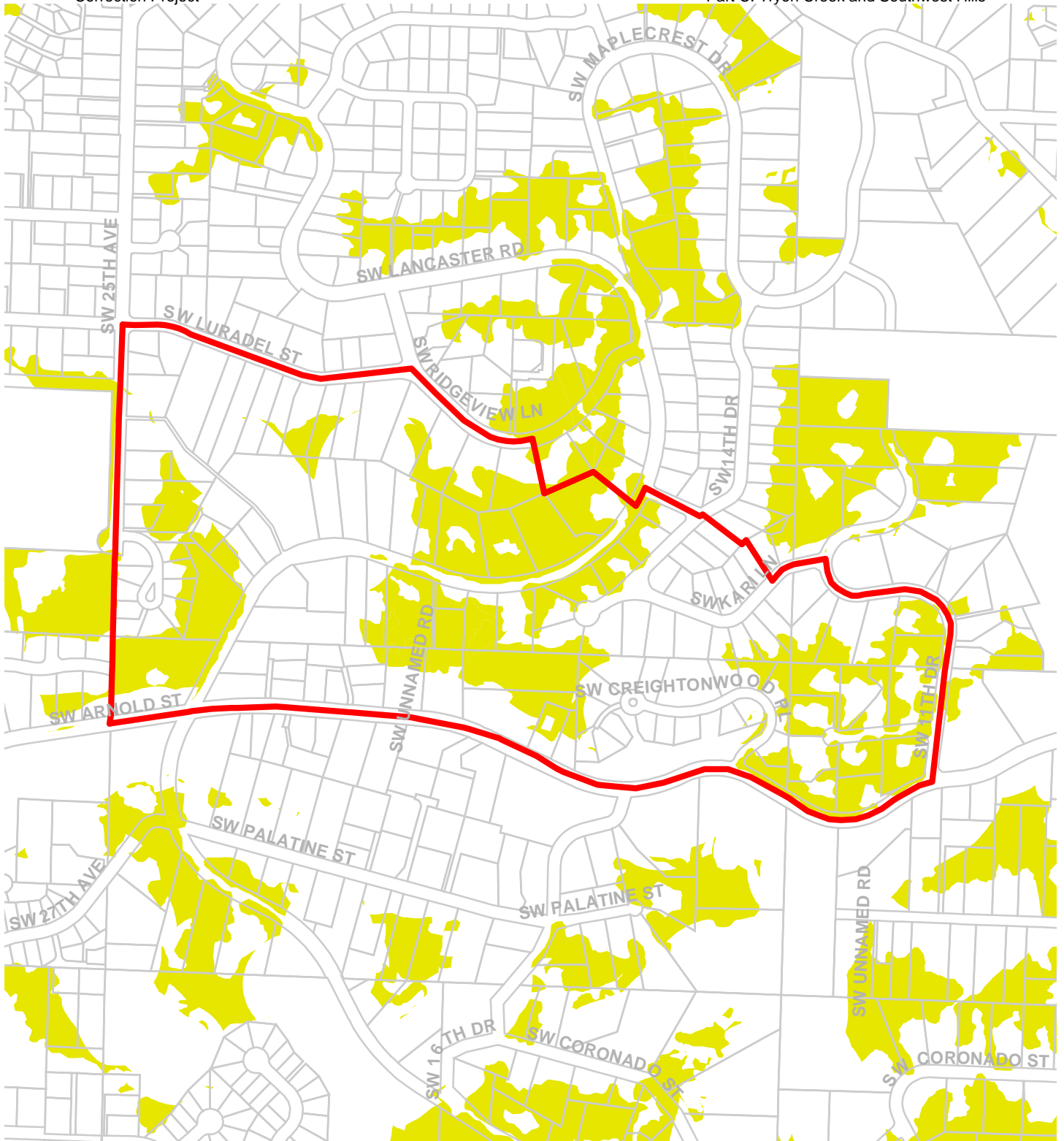
Recommended Draft - As Amended

- Urban Service Boundary
- Resource Sites
- HCA High Value
- HCA Moderate Value
- HCA Low Value
- Goal 5 Significant Natural Resources



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May 2022






Map H: Goal 5 Resources

Resource Site: SW19

Updated: May 2022

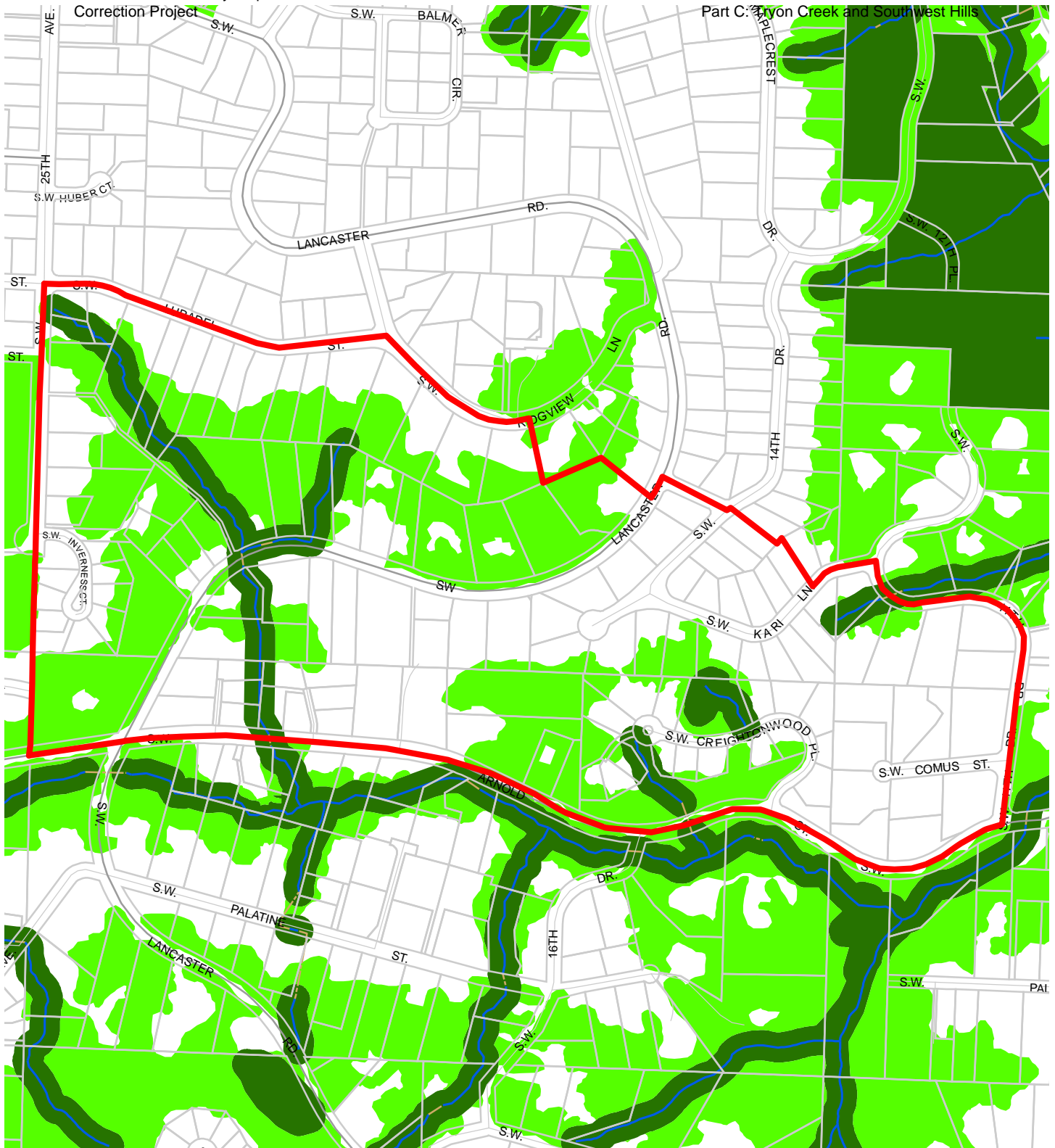


Recommended Draft - As Amended

-  Urban Service Boundary
-  Resource Sites
-  Goal 5 Significant Natural Resources



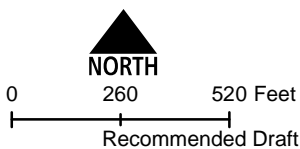
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Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
SW19**

Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Open Stream Channel
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone
- Taxlots



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022

Natural Resource Description

Within resource site SW19 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: None

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW19	
	Study Area
Stream (Miles)	0.6
Wetlands (acres)	0.2
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	44.6
Woodland (acres)	3.7
Shrubland (acres)	0.0
Herbaceous (acres)	3.8
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	50.2
* 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 areas with a slope greater than 25%.	

This resource area includes open stream channels that drain to Arnold Creek, the largest tributary to Tryon Creek. The streams likely have good riparian vegetation cover and floodplain interaction. Arnold Creek and its tributaries are important to Tryon Creek because they provide habitat continuity and augment low summer base flows. "In-stream habitat such as pools and gravel and riffle substrates are adequate in many of the upper reaches of Arnold Creek... Vegetated areas, such as wide and intact riparian habitat, provide habitat for many small and adaptive mammal species. Up to 60 species of birds, and a number of amphibian and reptile species may inhabit some of these areas. Rainbow and cutthroat are present in Arnold Creek. Portions of Arnold Creek may provide important spawning and rearing habitat to resident fish species" (City of Portland (BES), Fanno and Tryon Creeks Watershed Management Plan, 2005).

Low density urban development, characteristic of the Arnold Creek subwatershed, retains a relatively high degree of vegetation cover and minimized impervious cover, both of which help to retain some natural watershed functions (City of Portland (BES), Fanno and Tryon Creeks Watershed Management Plan, 2005).

Table B: Quality of Natural Resource Functions in Resource Site SW19				
Resource Site (acres) = 86				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	11.2	10.1	28.6	49.9
percent total inventory site area	13.0%	11.7%	33.2%	57.9%
Wildlife Habitat*				
acres	0.0	3.3	39.5	42.8
percent total inventory site area	0.0%	3.8%	45.9%	49.7%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total⁺				
acres	11.2	13.2	28.3	52.7
percent total inventory site area	13.0%	15.4%	32.8%	61.1%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.				
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.				
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities),

stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called “effective impervious area.” The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For resource site SW19, 8.5% of the total area is effectively impervious. This indicates a significant degree of stormwater management and/or existing natural resources that should be preserved. Areas with very low impervious cover and existing vegetation are more likely to be functioning properly to support biologic systems.

Table C. Impervious Area within Resource Site SW19			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
86.2	13.8	7.3	8.5%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW19. Natural resources should be protected within HCA as follows:

1. *Strictly limit* or *limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit* or *limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit* or *limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or *limiting* conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting* or *limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW19 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW19, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW19, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or 25 feet of wetlands.
2. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands; and within areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
3. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW20 **Site Name:** Arnold Creek Headwaters

Previous Plan: Southwest hills Resource Protection Plan

Previous Resource Site No.: 121

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

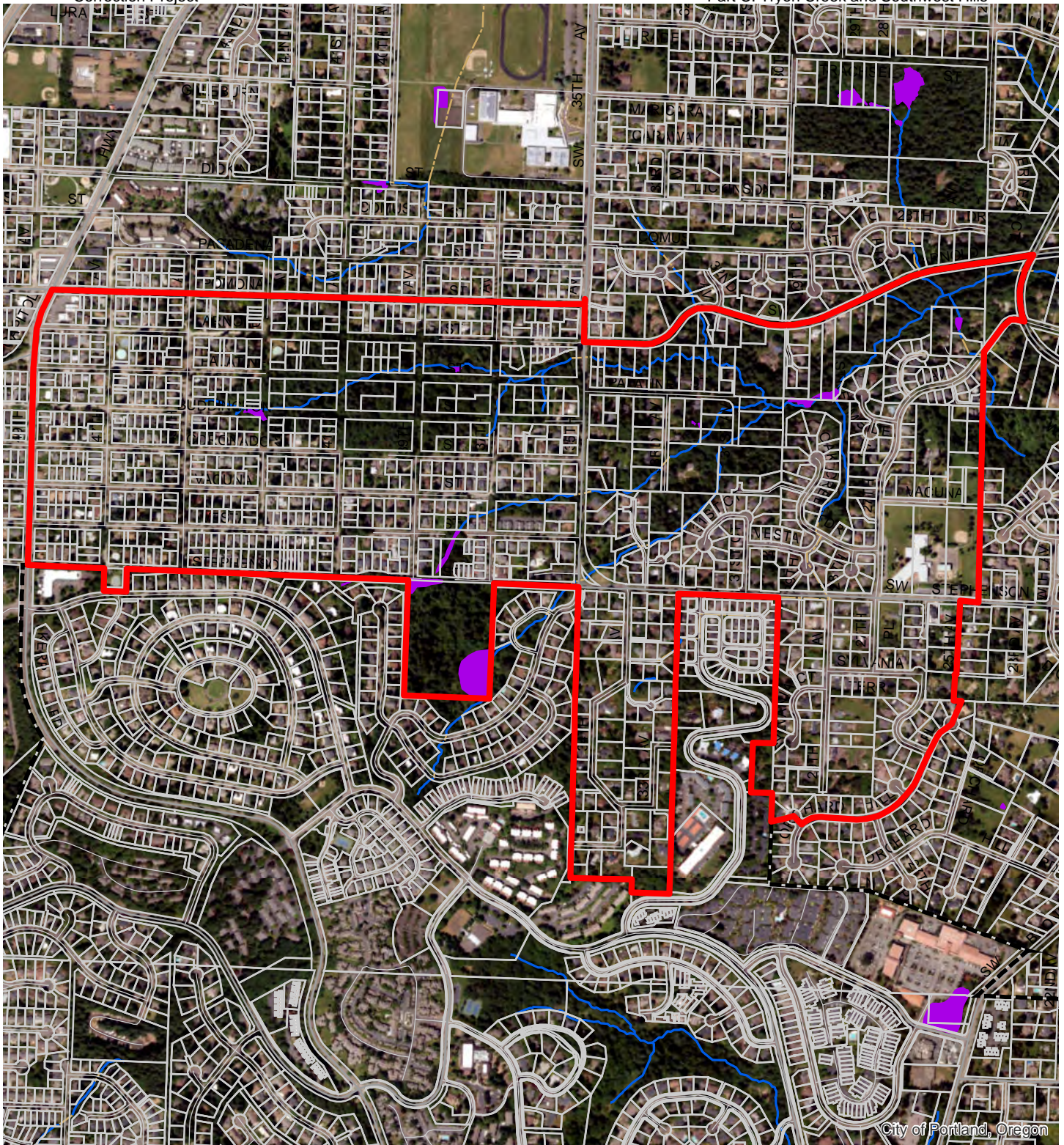
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW20 includes the following:

Site (acres)	352.3
Base zones (acres)	
CM2	1.4
OS	35.4
R10	138.2
R2.5	7.5
R20	48.2
R5	35.1
R7	86.5



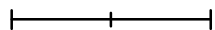
Map A: Water Features

Resource Site: SW20

Updated: May 2022



0 485 970 Feet

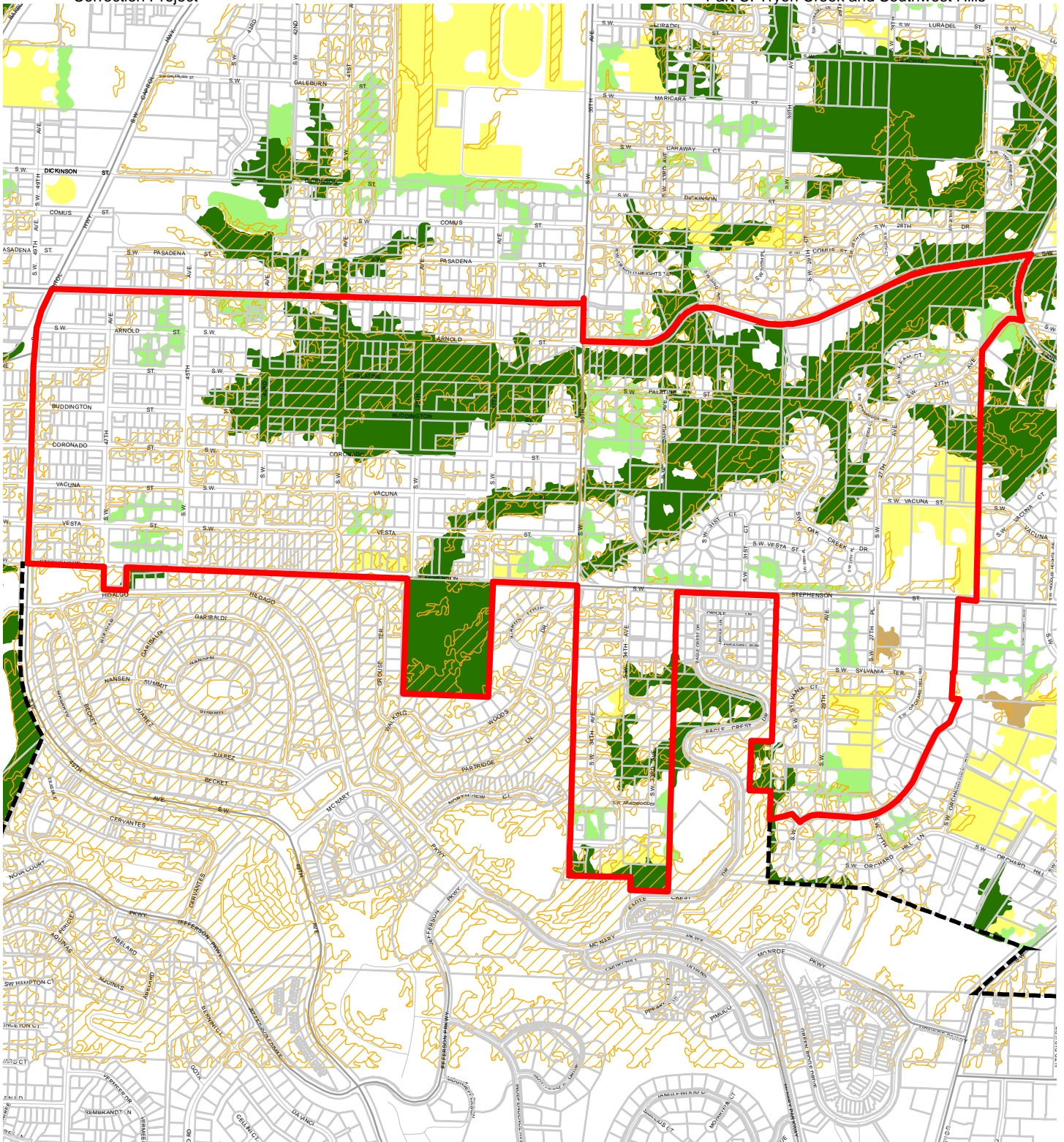


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- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



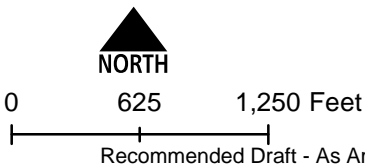
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Map B: Vegetation and Steep Slopes

Resource Site: SW20

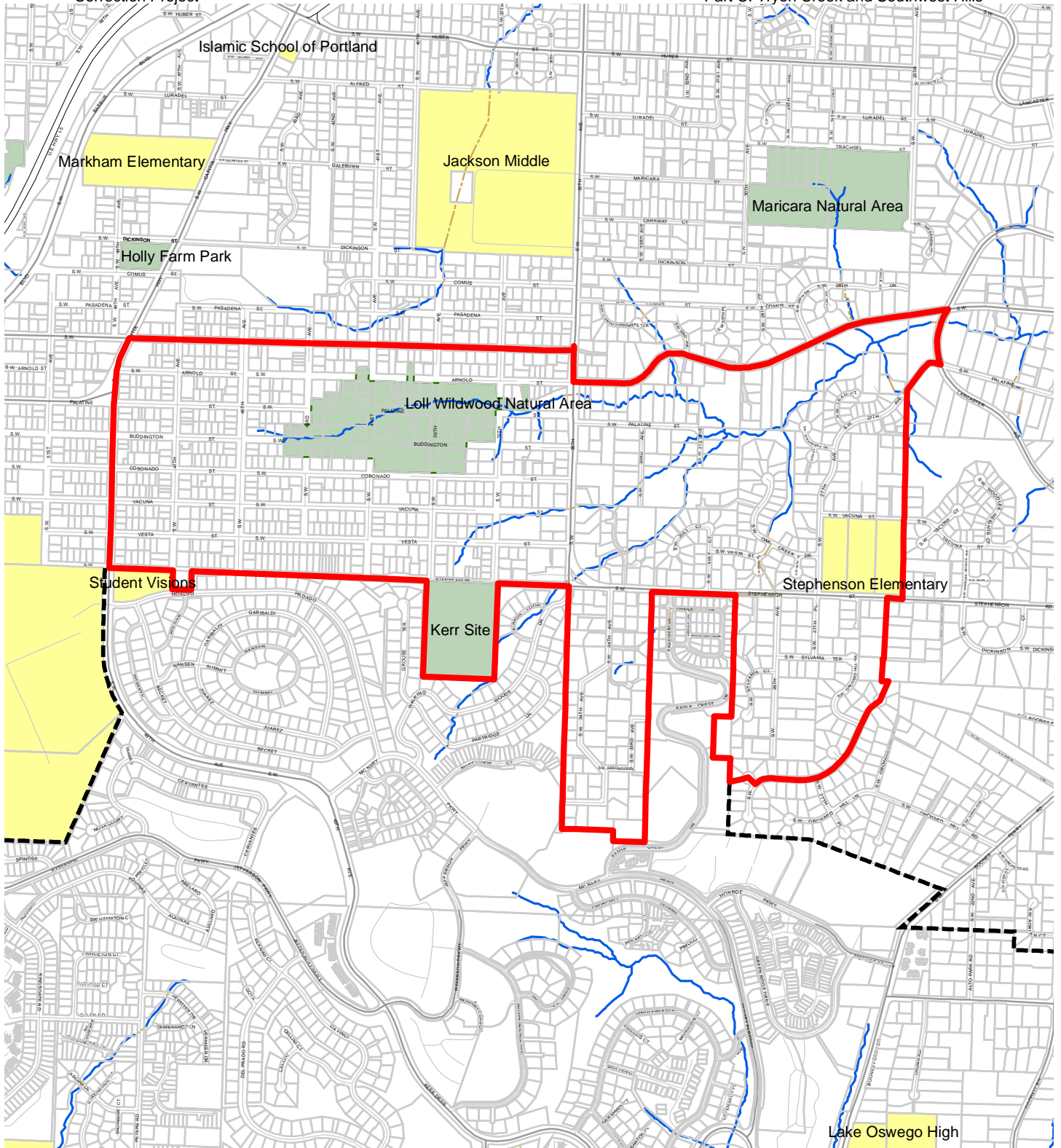
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous



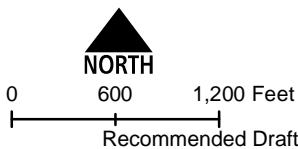
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**Map C: Special
Habitat Areas**

**Resource Site:
SW20**

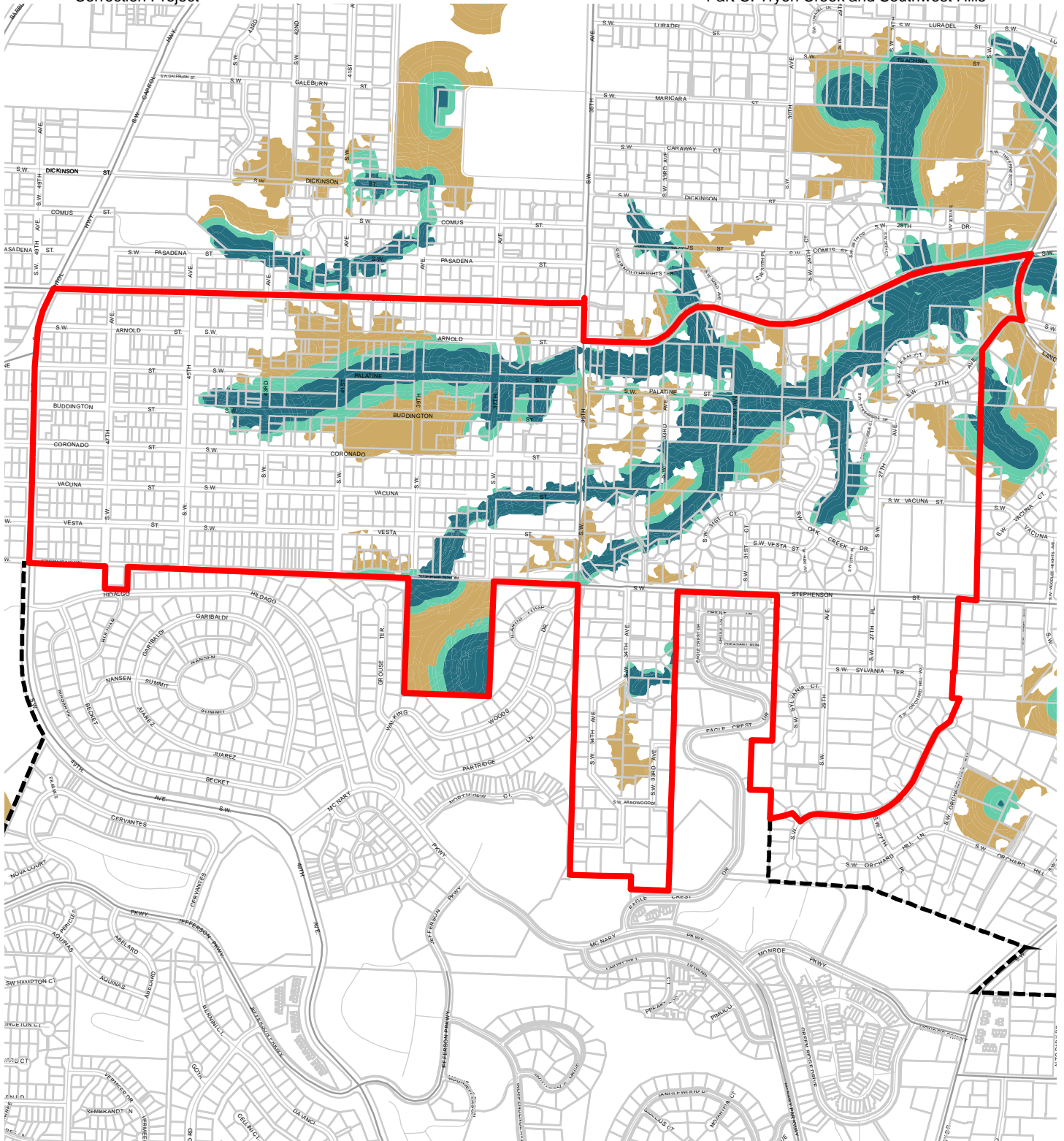
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Special Habitat Areas (SHAs)
- Taxlots
- Open Stream Channel
- Piped Stream Segment
- Parks
- Schools




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**Map D: Riparian
Corridors Habitat
Classification**


**Resource Site:
SW20**


Updated: May 2022

 Class I (high rank)

 Class II (medium rank)

 Class III (low rank)

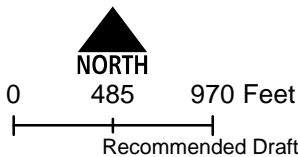
 Resource Sites

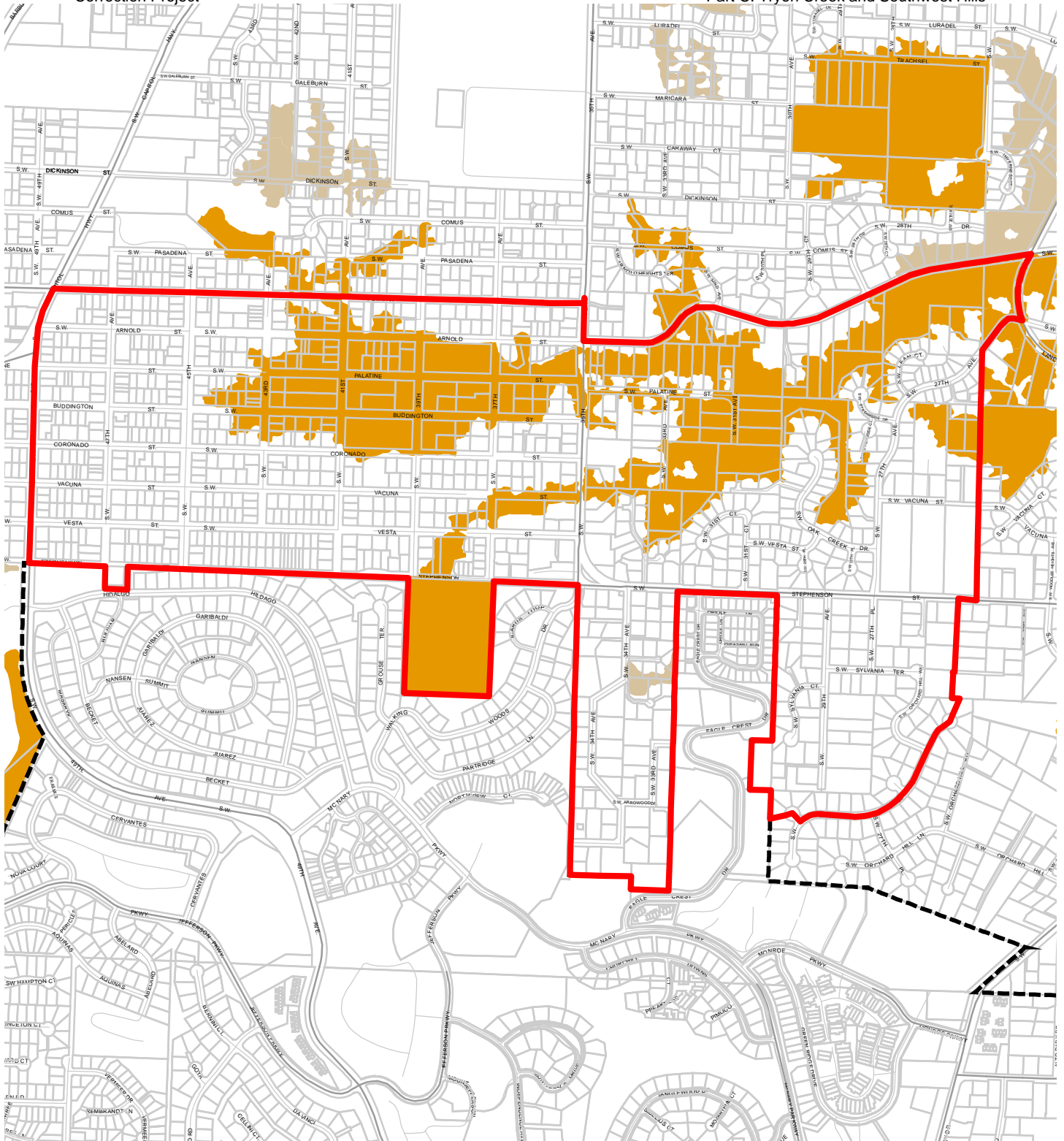
 Urban Service Boundary

 Taxlots



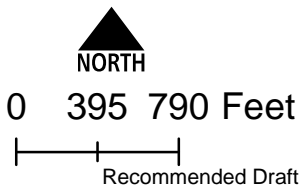
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.
May 2022











**Map E: Wildlife
Habitat Classification
Resource Site:
SW20**

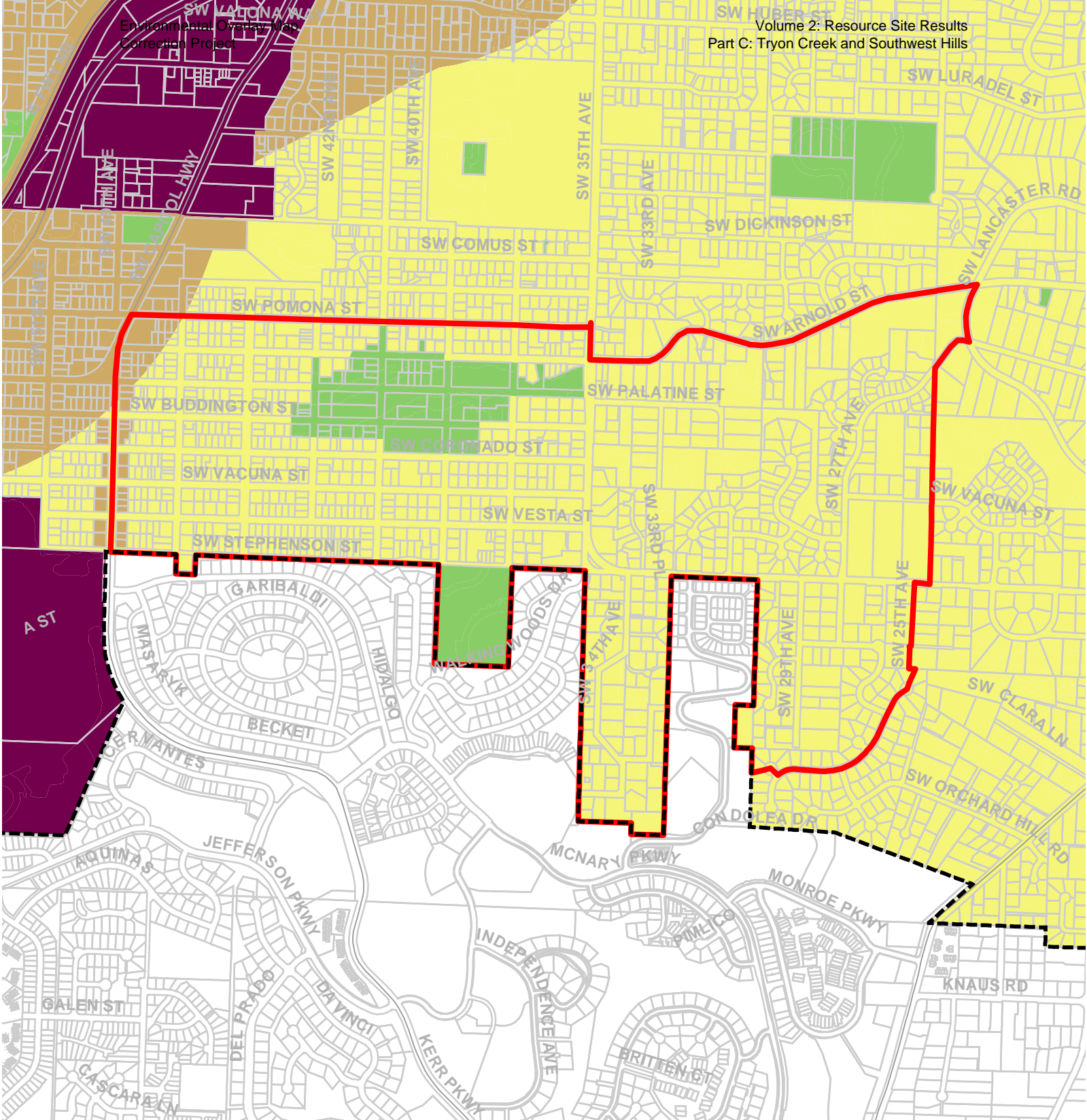
Updated: May 2022



-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots



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May 2022

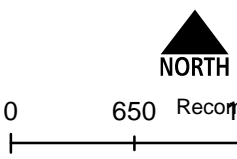


Map F: Urban Development Value (Title 13)
Resource Site: SW20

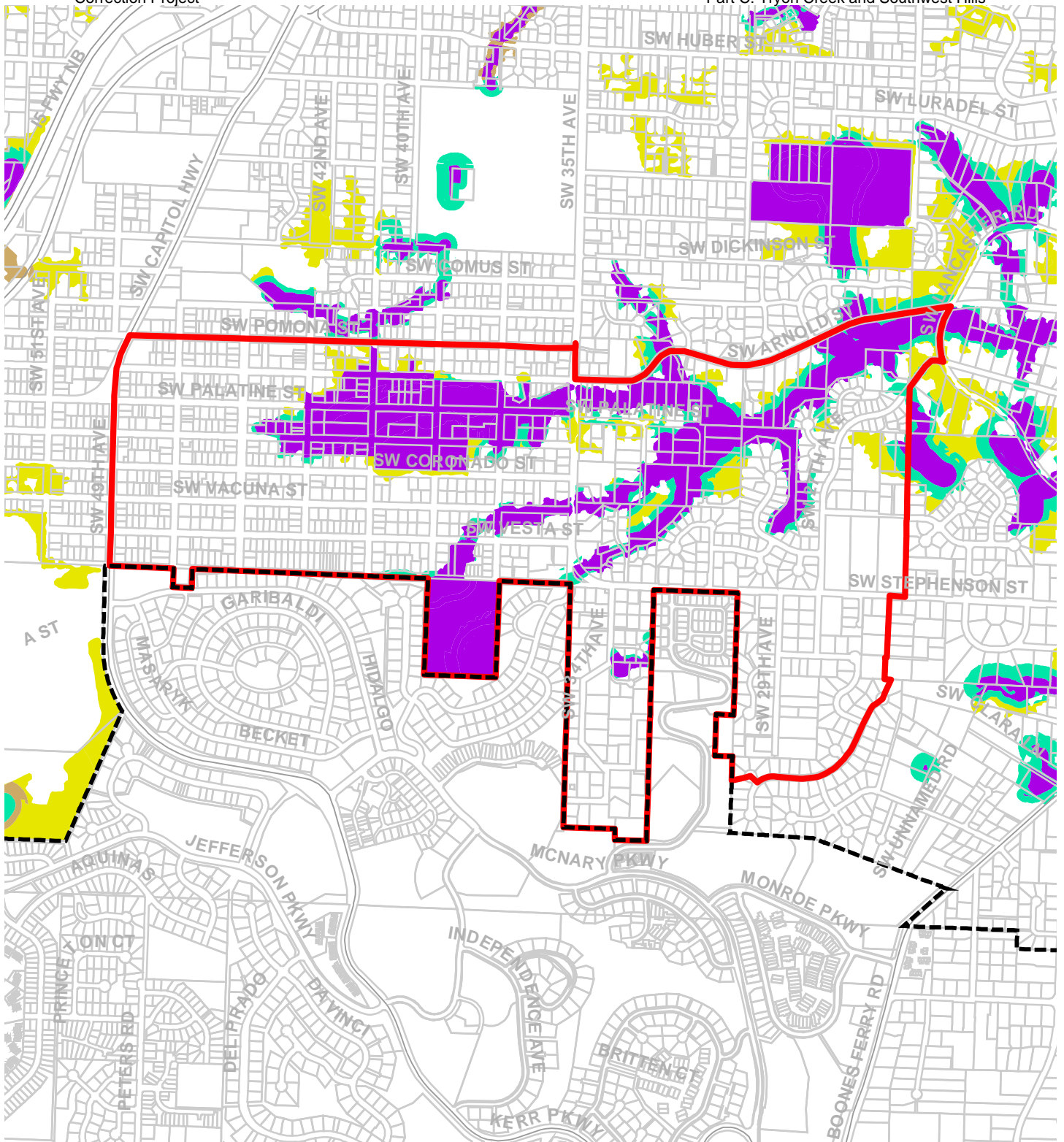
-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks



Updated: July 2021



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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW20

Updated: May 2022



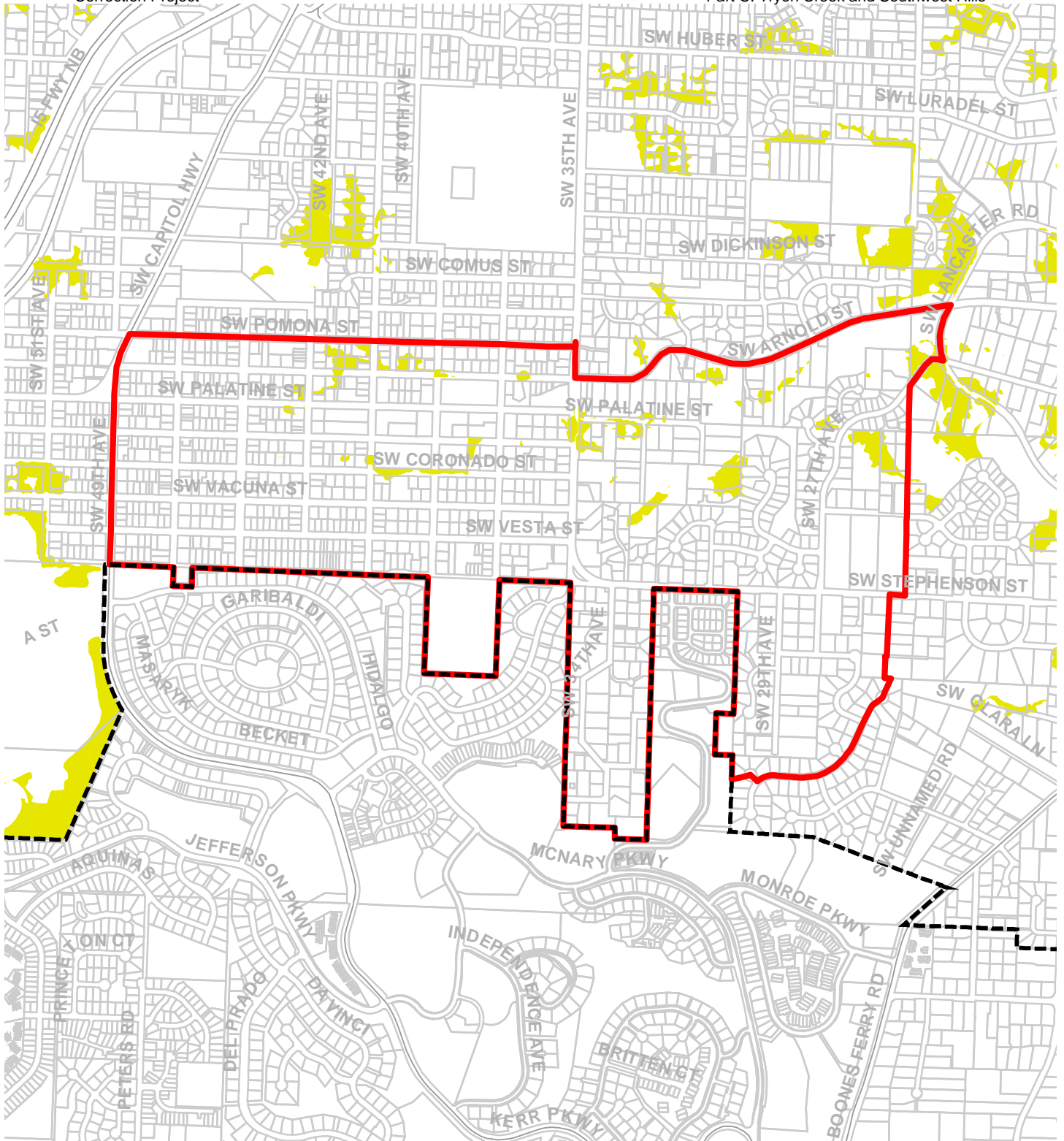
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-  Urban Service Boundary
-  Resource Sites
-  HCA High Value
-  HCA Moderate Value
-  HCA Low Value
-  Goal 5 Significant Natural Resources



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May 2022






Map H: Goal 5 Resources

Resource Site: SW20

Updated: May 2022



-  Urban Service Boundary
-  Resource Sites
-  Goal 5 Significant Natural Resources

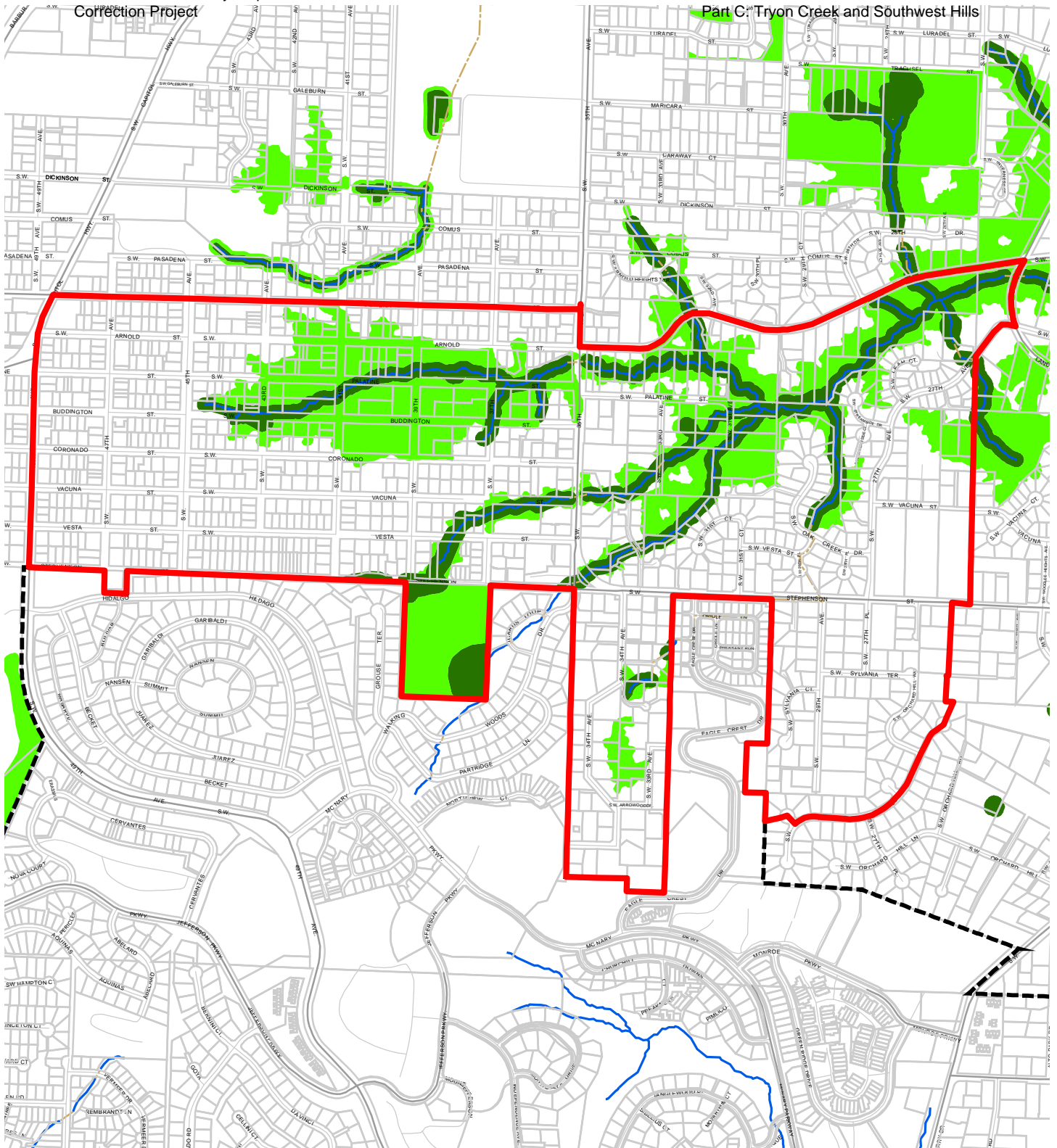
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Page 326



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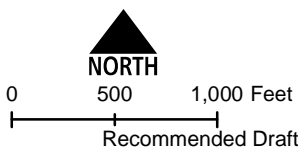
May 2022



Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
SW20**

Updated: May 2022



- Resource Sites
- Open Stream Channel
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone
- Urban Service Boundary
- Taxlots



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022

Natural Resource Description

Within resource site SW20 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; wetland; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: Wetlands (W)

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW20	
	Study Area
Stream (Miles)	2.6
Wetlands (acres)	2.4
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	102.3
Woodland (acres)	18.3
Shrubland (acres)	0.7
Herbaceous (acres)	13.7
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	137.0
* 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 areas with a slope greater than 25%.	

This area contains the headwaters of Arnold Creek and is a part of Tryon Creek's 4,447- acre drainage basin. Arnold Creek travels from near SW 45th Avenue east for about two miles to the Arnold Street and Boones Ferry Road intersection (Site SW16) where it empties into Tryon Creek. This site drains the northeast slope of Mt. Sylvania, the west slope of a small knoll and the south slope of the hill north of Pomona Street. These surrounding hills are 1/2 mile within the headwaters of Arnold Creek and are 660, 670 and 970 feet in elevation from north to south, respectively.

This site is sparsely populated and largely undeveloped. West of SW 35th Ave. the area is platted as West Portland Park into 25-foot by 100-foot lots in 250-foot by 450-foot blocks with 40-foot wide public rights-of-way. West Portland Park was platted in 1889 without regard for the topography, which resulted in a street and lot pattern that conflicts with development and protection of the natural topography. Developing according to the grid will result in environmental damage to the area and increased development costs due to cut and fill requirements necessitated by the steep slopes and creek.

With the exception of a few new developments along Stephenson Street, the site has a wooded character. The area forest is mature, second growth conifer topping hardwood forest, 80-100 years old, with a 60 percent deciduous/40 percent coniferous composition. Three areas within the site have forests that are contiguous. These forest areas are 35, 10 and 18 acres in size (west to east, respectively).

Hydric soils are extensive throughout this site indicating possible wetlands. No wetlands in this area are inventoried on the National Wetlands Inventory. However, the City of Portland wetland data show one wetland to the south of a stream on taxlot R291400410. The area around Palatine between 35th and 37th forms a natural drainage basin which is part of Arnold Creek. Arnold Creek's drainage basin is 743.3 acres in size and extends outside of the city limits. A storm drainage storage reservoir exists on the west side of Arnold St., at SW 34th Ave.³⁴ The rare flora includes old western hemlock and grand fir trees, as well as Indian pipe plants.

The vegetation includes mature second growth Douglas fir, mature western red cedar, western hemlock, bigleaf maple, red alder and pacific yew. The forest is structurally diverse with a diverse understory. Bird species include: Bushtit, Pacific-slope flycatcher, Pacific wren, Wilson's warbler. Deer have been observed in this area.

Arnold Creek and its tributaries are important to Tryon Creek because they provide habitat continuity and augment low summer base flows. "In-stream habitat such as pools and gravel and riffle substrates are adequate in many of the upper reaches of Arnold Creek... Vegetated areas, such as wide and intact riparian habitat, provide habitat for many small and adaptive mammal species. Up to 60 species of birds, and a number of amphibian and reptile species may

inhabit some of these areas. Rainbow and cutthroat are present in Arnold Creek. Portions of Arnold Creek may provide important spawning and rearing habitat to resident fish species” (City of Portland (BES), Fanno and Tryon Creeks Watershed Management Plan, 2005).

“Low density urban development, characteristic of the Arnold Creek subwatershed, retains a relatively high degree of vegetation cover and minimized impervious cover, both of which help to retain some natural watershed functions” (City of Portland (BES), Fanno and Tryon Creeks Watershed Management Plan, 2005).

Table B: Quality of Natural Resource Functions in Resource Site SW20				
Resource Site (acres) = 352				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	54.7	21.2	33.6	109.5
percent total inventory site area	15.5%	6.0%	9.5%	31.1%
Wildlife Habitat*				
acres	0.0	95.7	1.1	96.8
percent total inventory site area	0.0%	27.2%	0.3%	27.5%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total⁺				
acres	54.7	47.0	8.1	109.7
percent total inventory site area	15.5%	13.3%	2.3%	31.1%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.				
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.				
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in

the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called “effective impervious area.” The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For Resource Area SW20, 18.9% of the total area is effectively impervious, indicating a critical level of vulnerability, with negative impacts beginning to impact natural functions, but natural processes still in place and providing support to biologic systems.

Table C. Impervious Area within Resource Site SW20			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
352.3	90.7	66.7	18.9%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW20. Natural resources should be protected within HCA as follows:

1. *Strictly limit* or *limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit* or *limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit* or *limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or *limiting* conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting* or *limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW20 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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, R10, R7, R5, and R2.5 base zones. Commercial uses are allowed in the CM2 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW20, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW20, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or wetlands.
2. Apply a conservation overlay zone ('c' zone) to areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank or wetlands.
3. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW21 **Site Name:** Arnold Creek

Previous Plan: Southwest hills Resource Protection Plan

Previous Resource Site No.: 122

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

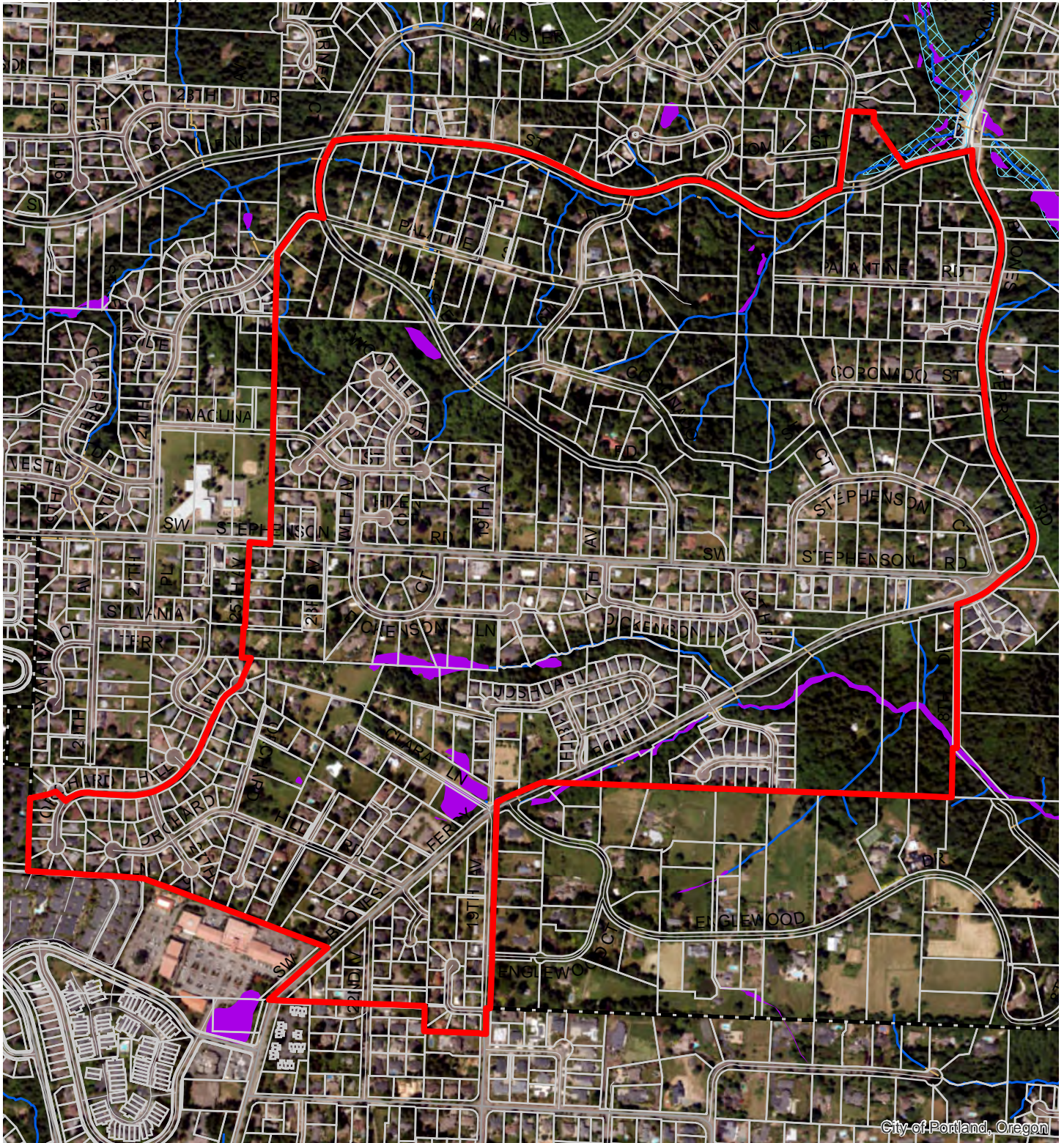
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW21 includes the following:

Site (acres)	393.9
Base zones (acres)	
OS	20.3
R10	230.4
R20	142.6
RF	0.7



City of Portland, Oregon

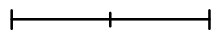
Map A: Water Features

Resource Site: SW21

Updated: May 2022



0 415 830 Feet

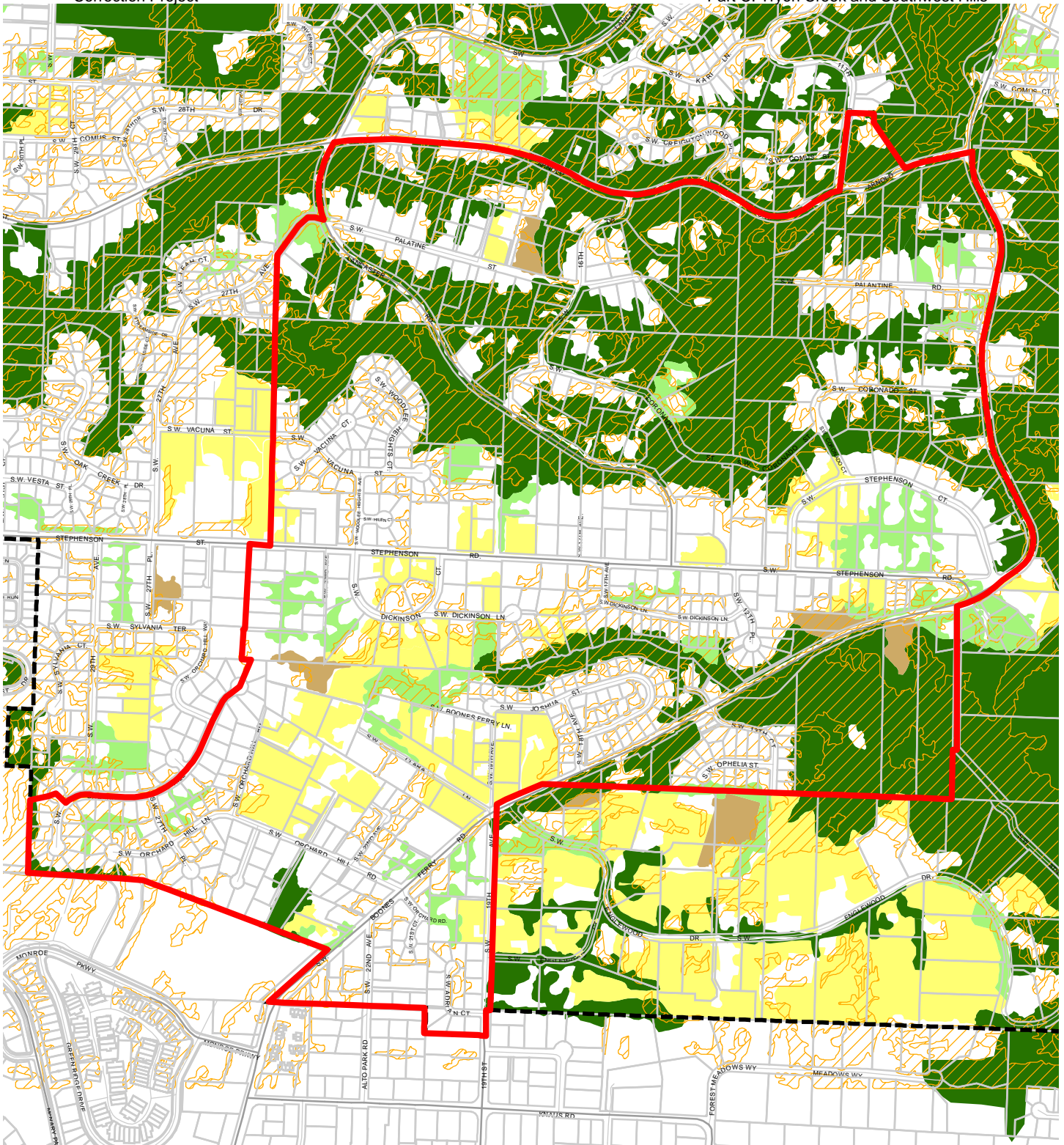


Recommended Draft - As Amended

- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



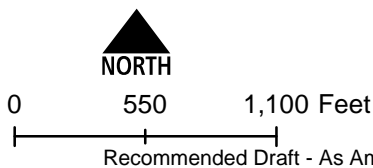
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022



Map B: Vegetation and Steep Slopes

Resource Site: SW21

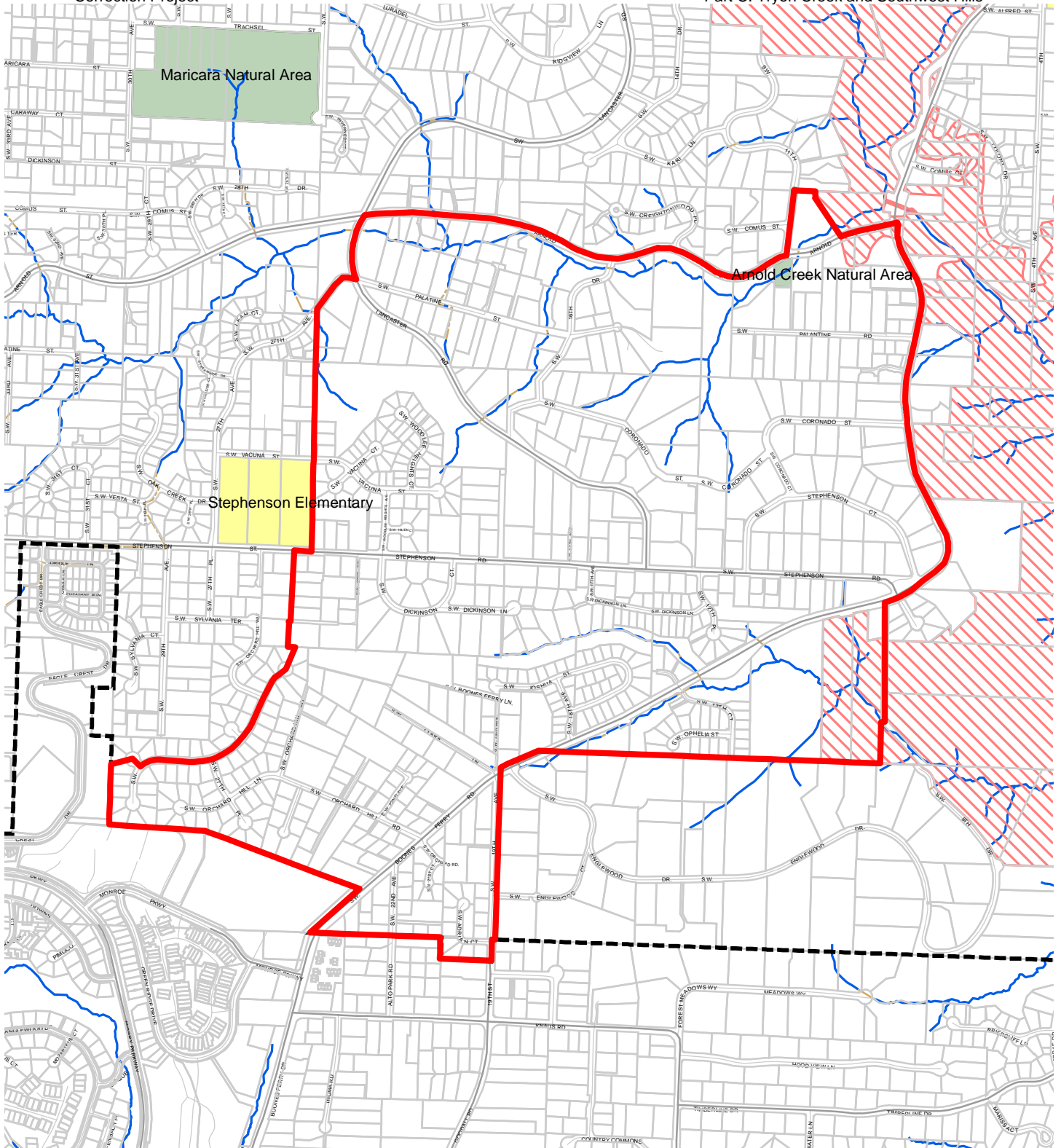
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous

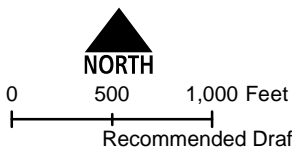


The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022



**Map C: Special
Habitat Areas**
**Resource Site:
SW21**

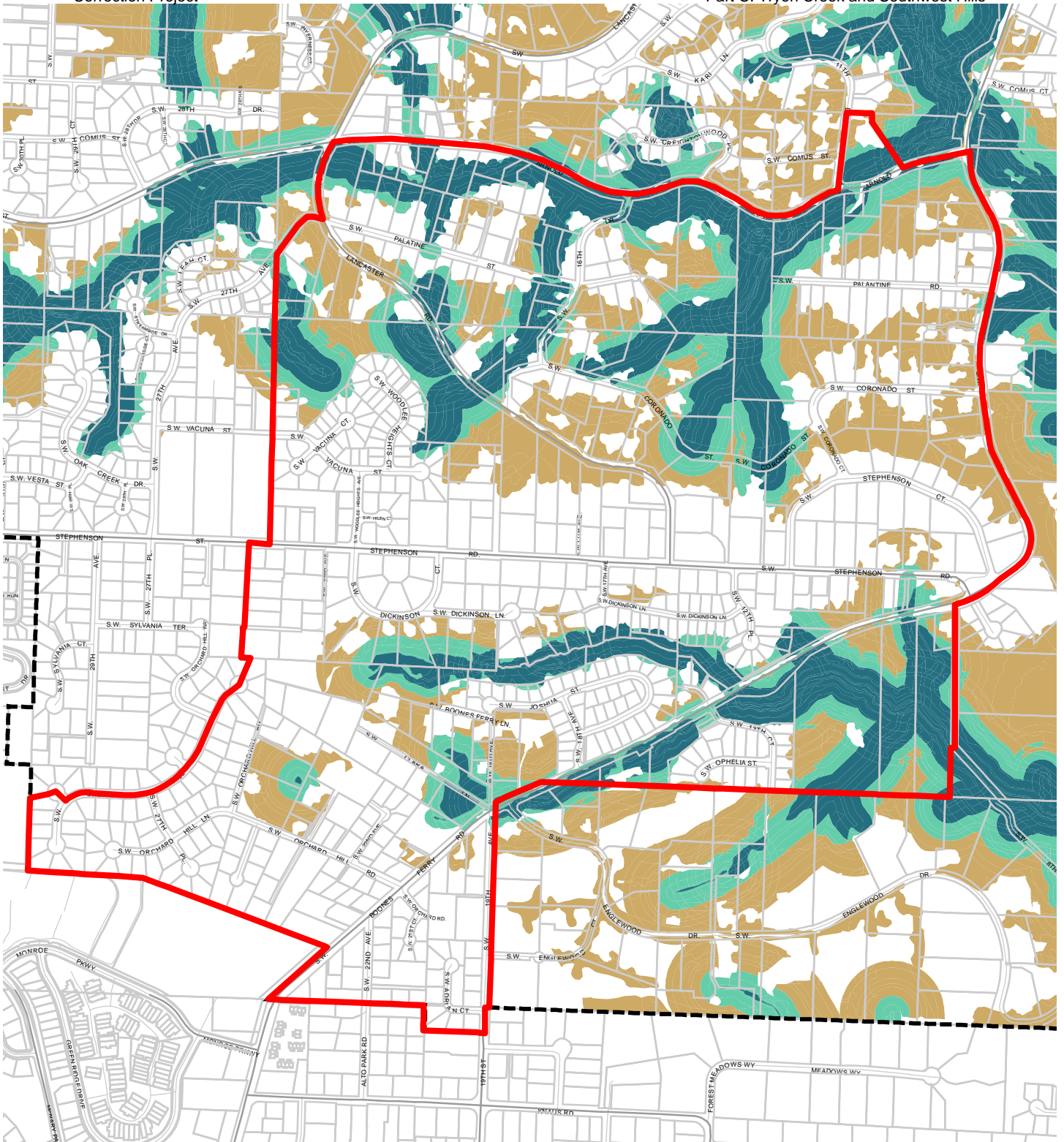
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Special Habitat Areas (SHAs)
- Taxlots
- Open Stream Channel
- Piped Stream Segment
- Parks
- Schools



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022

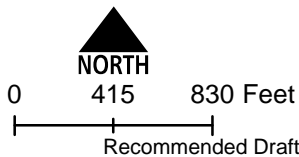


**Map D: Riparian
Corridors Habitat
Classification**

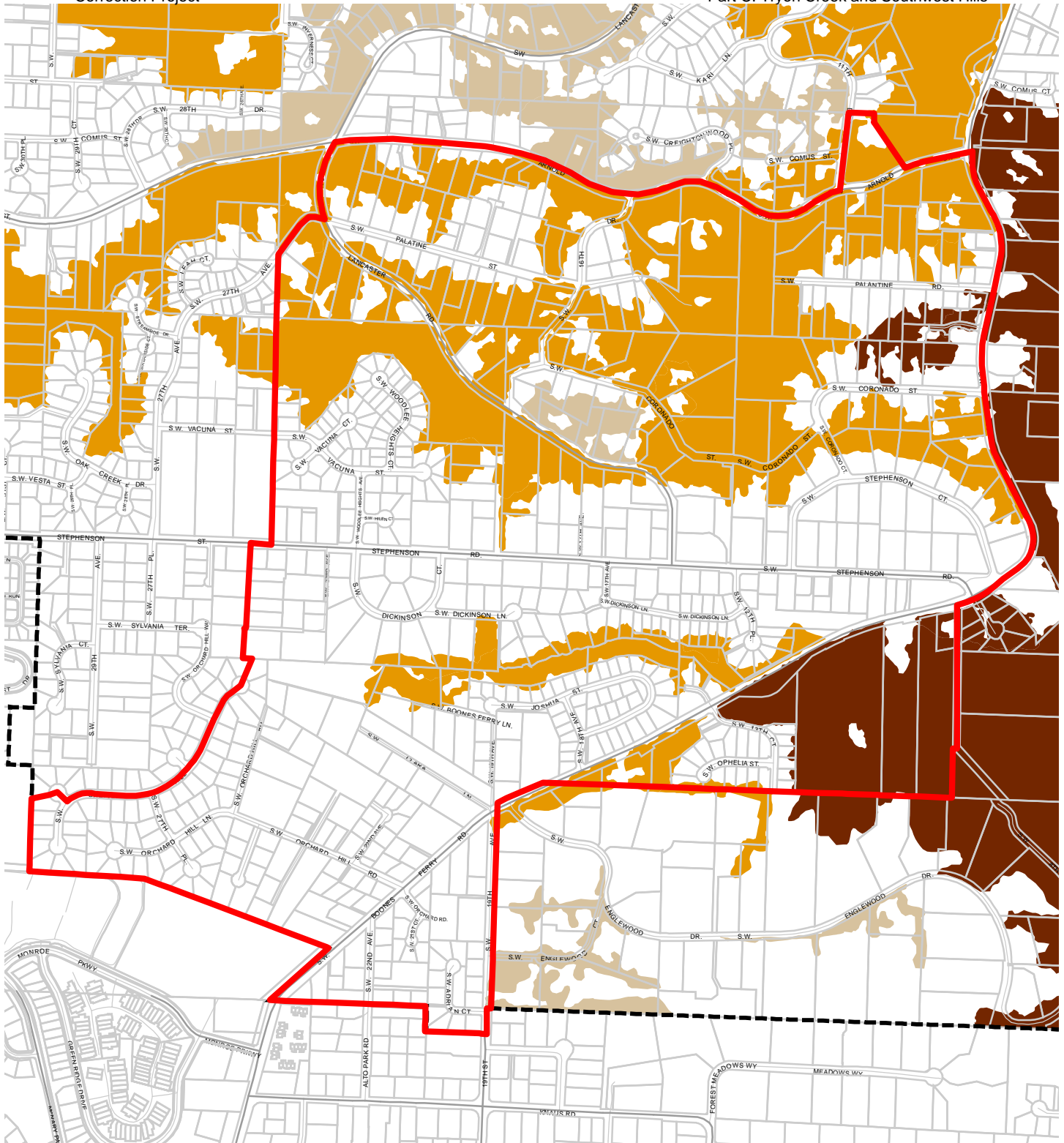
**Resource Site:
SW21**

Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots

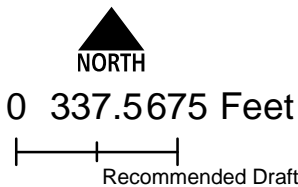








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May 2022



**Map E: Wildlife
Habitat Classification**
Resource Site:
SW21

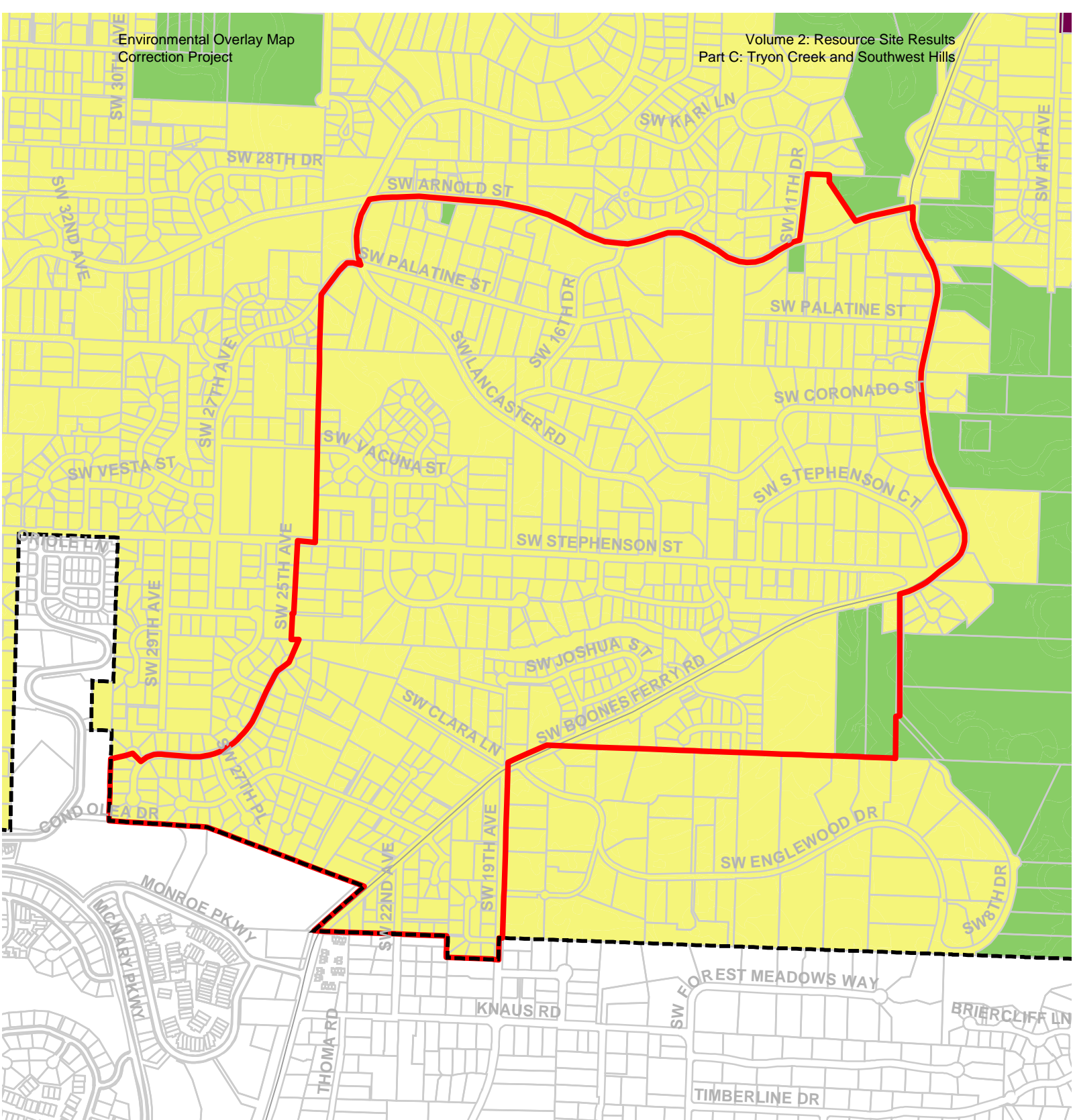
Updated: May 2022



-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots



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May 2022



Map F: Urban Development Value (Title 13)
Resource Site: SW21

-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks

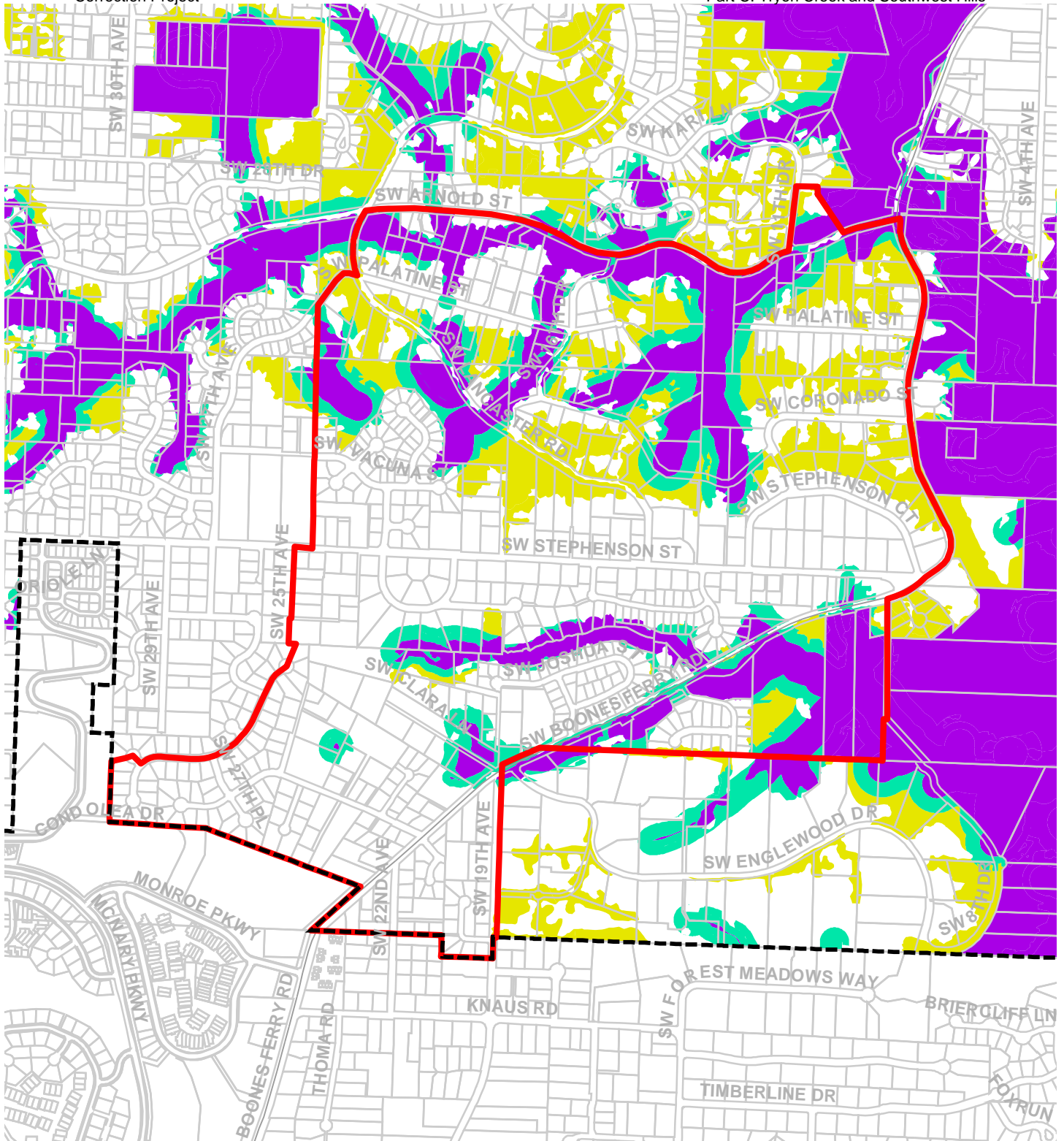


Updated: July 2021



0 550 Feet
Recommended Draft - As Amended

The information on the map was derived from digital databases. 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 aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.









Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW21

Updated: May 2022

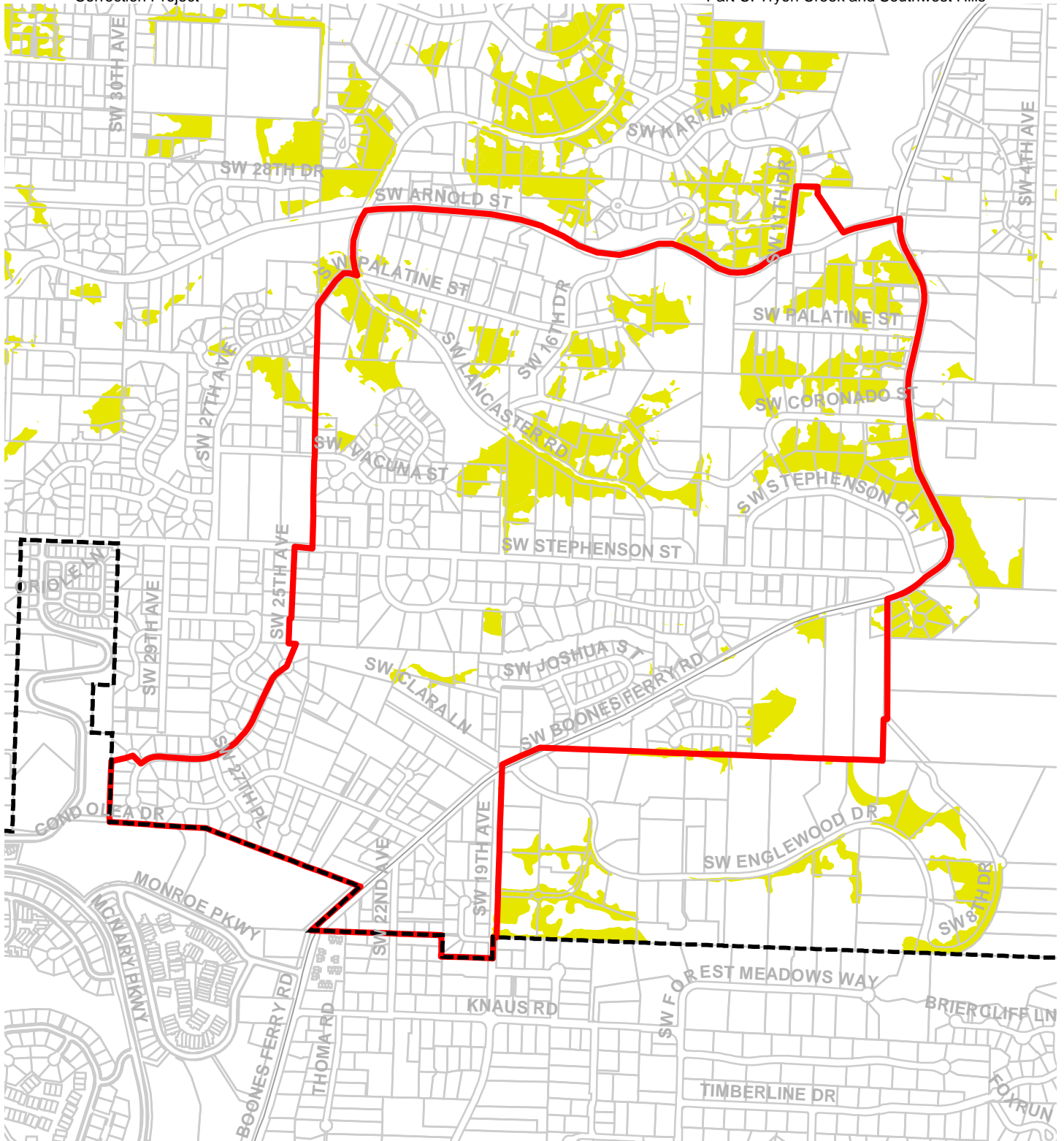


Recommended Draft - As Amended

-  Urban Service Boundary
-  Resource Sites
-  HCA High Value
-  HCA Moderate Value
-  HCA Low Value
-  Goal 5 Significant Natural Resources



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Map H: Goal 5 Resources

Resource Site: SW21

Updated: May 2022

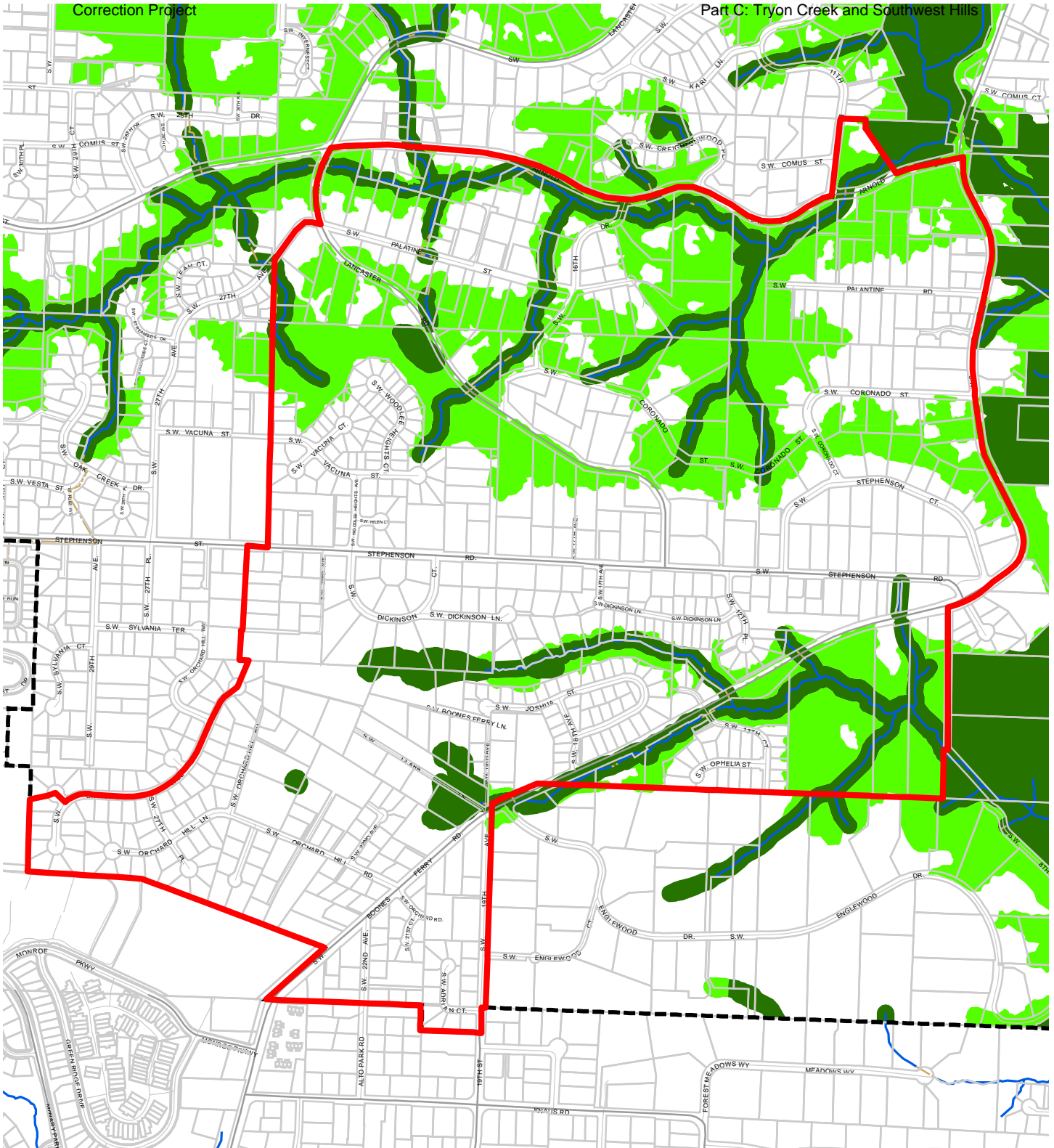


Recommended Draft - As Amended

-  Urban Service Boundary
-  Resource Sites
-  Goal 5 Significant Natural Resources



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.



Map I: DRAFT Proposed Environmental Overlay Zones

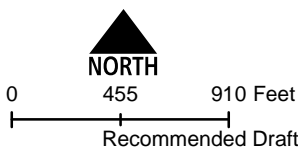
**Resource Site:
SW21**

Updated: May 2022

- Resource Sites
- Open Stream Channel
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone
- Urban Service Boundary
- Taxlots



The information on the map was derived from digital databases. 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, auxiliary aids and services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711. May 2022



Natural Resource Description

Within resource site SW21 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; wetland; flood area; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: Tryon Creek State Natural Area (S, M, C); Wetlands (W)

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW21	
	Study Area
Stream (Miles)	3.0
Wetlands (acres)	4.5
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	141.8
Woodland (acres)	22.1
Shrubland (acres)	3.8
Herbaceous (acres)	32.8
Flood Area*	
Vegetated (acres)	0.3
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	158.5
* 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 areas with a slope greater than 25%.	

Between Mt. Sylvania's northeast and south slope lies a deep canyon where Arnold Creek flows. Arnold Creek drops 500 feet over its two-mile course between the headwaters (in Site 121) and the confluence with Tryon Creek near the junction of Boones Ferry and Arnold Street (in Site SW16). The canyon is about 2,000 feet wide and, unlike the other canyons in the study area, runs east/west. The creek parallels the south side of Arnold Street. Prior to the 1980's this area was sparsely developed. Since that time, there have been 300-400 homes built (Sites 121 and 122). Arnold and Stephenson Streets are the only east/west streets through the site and there are no connecting north/south streets.

The forest is densely wooded and dominated with mature western red cedars and hemlocks. The forest is in the conifer topping hardwood stage. The shrub layer is well established with 50 percent closure and the herbaceous layer is 70 percent closed.

Arnold Creek and its tributaries are important to Tryon Creek because they provide habitat continuity and augment low summer base flows. "In-stream habitat such as pools and gravel and riffle substrates are adequate in many of the upper reaches of Arnold Creek... Vegetated areas, such as wide and intact riparian habitat, provide habitat for many small and adaptive mammal species. Up to 60 species of birds, and a number of amphibian and reptile species may inhabit some of these areas. Rainbow and cutthroat are present in Arnold Creek. Portions of Arnold Creek may provide important spawning and rearing habitat to resident fish species" (City of Portland (BES), Fanno and Tryon Creeks Watershed Management Plan, 2005). "Low density urban development, characteristic of the Arnold Creek subwatershed, retains a relatively high degree of vegetation cover and minimized impervious cover, both of which help to retain some natural watershed functions" (City of Portland (BES), Fanno and Tryon Creeks Watershed Management Plan, 2005).

Table B: Quality of Natural Resource Functions in Resource Site SW21				
Resource Site (acres) = 394				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	66.6	41.1	68.4	176.0
percent total inventory site area	16.9%	10.4%	17.4%	44.7%
Wildlife Habitat*				
acres	25.6	117.7	3.7	146.9
percent total inventory site area	6.5%	29.9%	0.9%	37.3%
Special Habitat Areas**				
acres	10.6			
percent total inventory site area	2.7%			
Combined Total⁺				
acres	79.5	76.9	21.7	178.1
percent total inventory site area	20.2%	19.5%	5.5%	45.2%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.				
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.				
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called "effective impervious area." The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter

pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For Resource Area SW21, 10.1% of the total area is effectively impervious, indicating a critical level of vulnerability, with negative impacts beginning to impact natural functions, but natural processes are still in place and providing support to biologic systems.

Table C. Impervious Area within Resource Site SW21			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
393.9	63.8	39.9	10.1%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW21. Natural resources should be protected within HCA as follows:

1. *Strictly limit* or *limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit* or *limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit* or *limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or limiting conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting or limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW21 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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. 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW21, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW21, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands, seeps, and land within 50 feet of stream top-of-bank, wetlands or seeps.
2. Apply a conservation overlay zone ('c' zone) to areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank or wetlands.
3. Allow conflicting uses within all other areas containing significant natural resources.

There is a seep located just south of SW Coronado St, near SW Lancaster Rd, that forms the headwaters of a tributary to Arnold Creek. There are likely other seeps in the area; however, those have not been documented to-date. If additional seeps are found, it is appropriate to apply the *strictly limit* decision to those natural resource features to protect hydrology and water quality in Arnold Creek.

Resource Site No.: SW22 **Site Name:** Tryon Creek State Park

Previous Plan: Southwest hills Resource Protection Plan

Previous resource site No.: 123

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

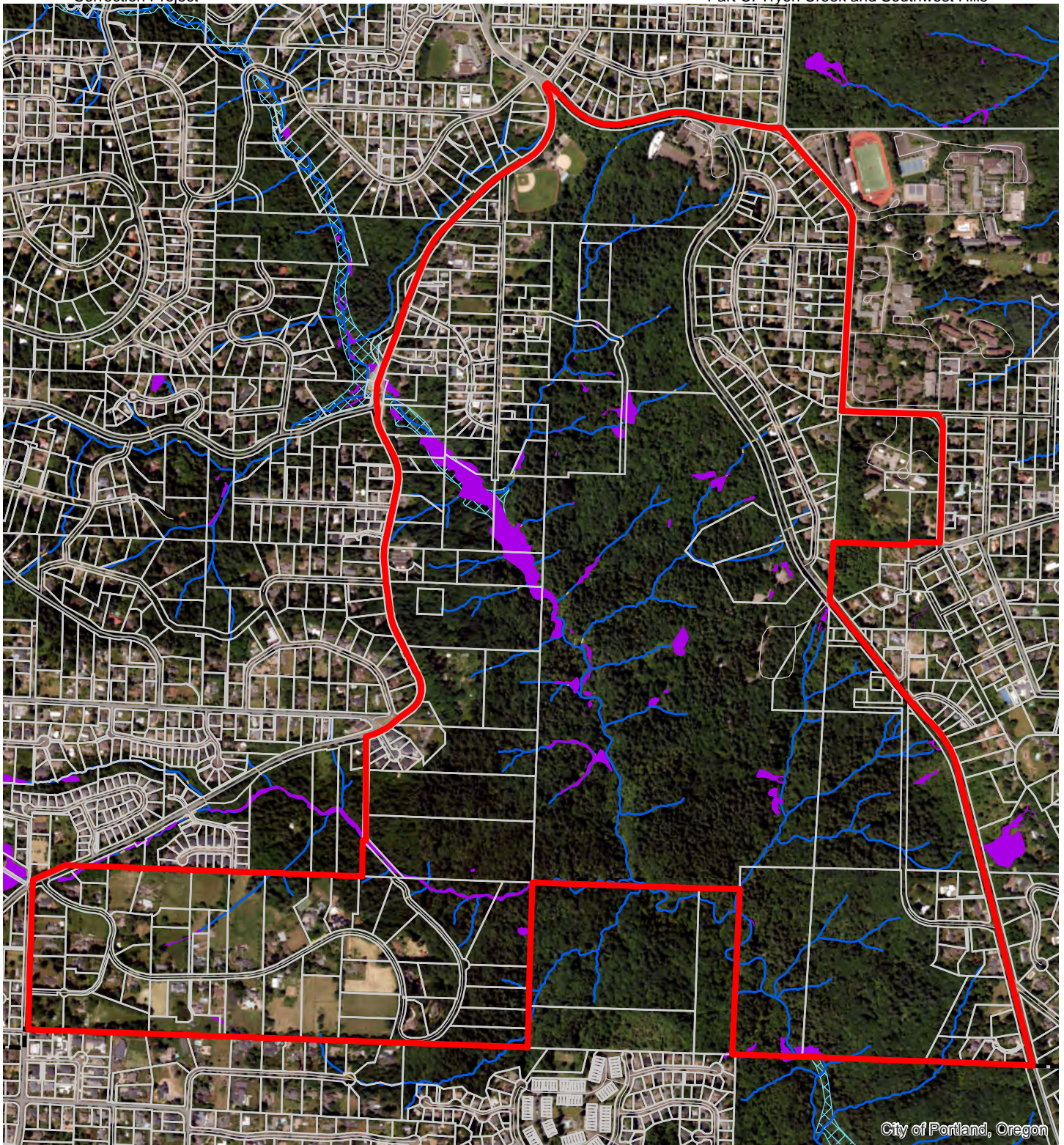
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site SW22 includes the following:

Site (acres)	714.5
Base zones (acres)	
CI1	55.0
OS	402.5
R10	56.1
R20	90.9
RF	110.0



City of Portland, Oregon

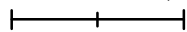
Map A: Water Features

Resource Site: SW22

Updated: May 2022



0 500 1,000 Feet

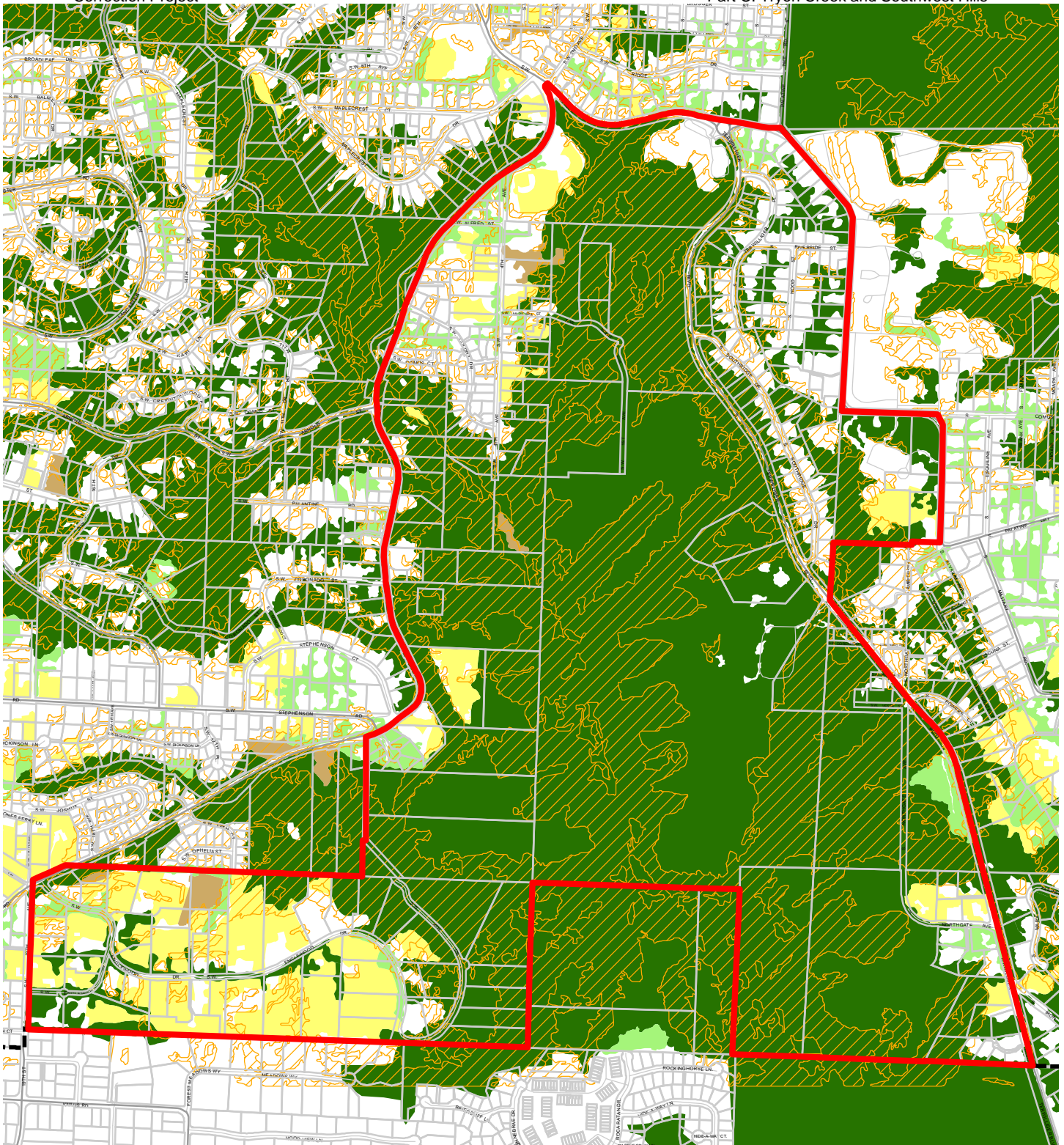


Recommended Draft - As Amended

- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



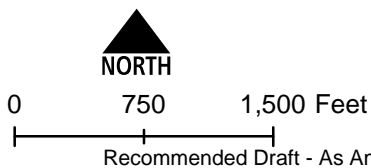
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May 2022



Map B: Vegetation and Steep Slopes

Resource Site: SW22

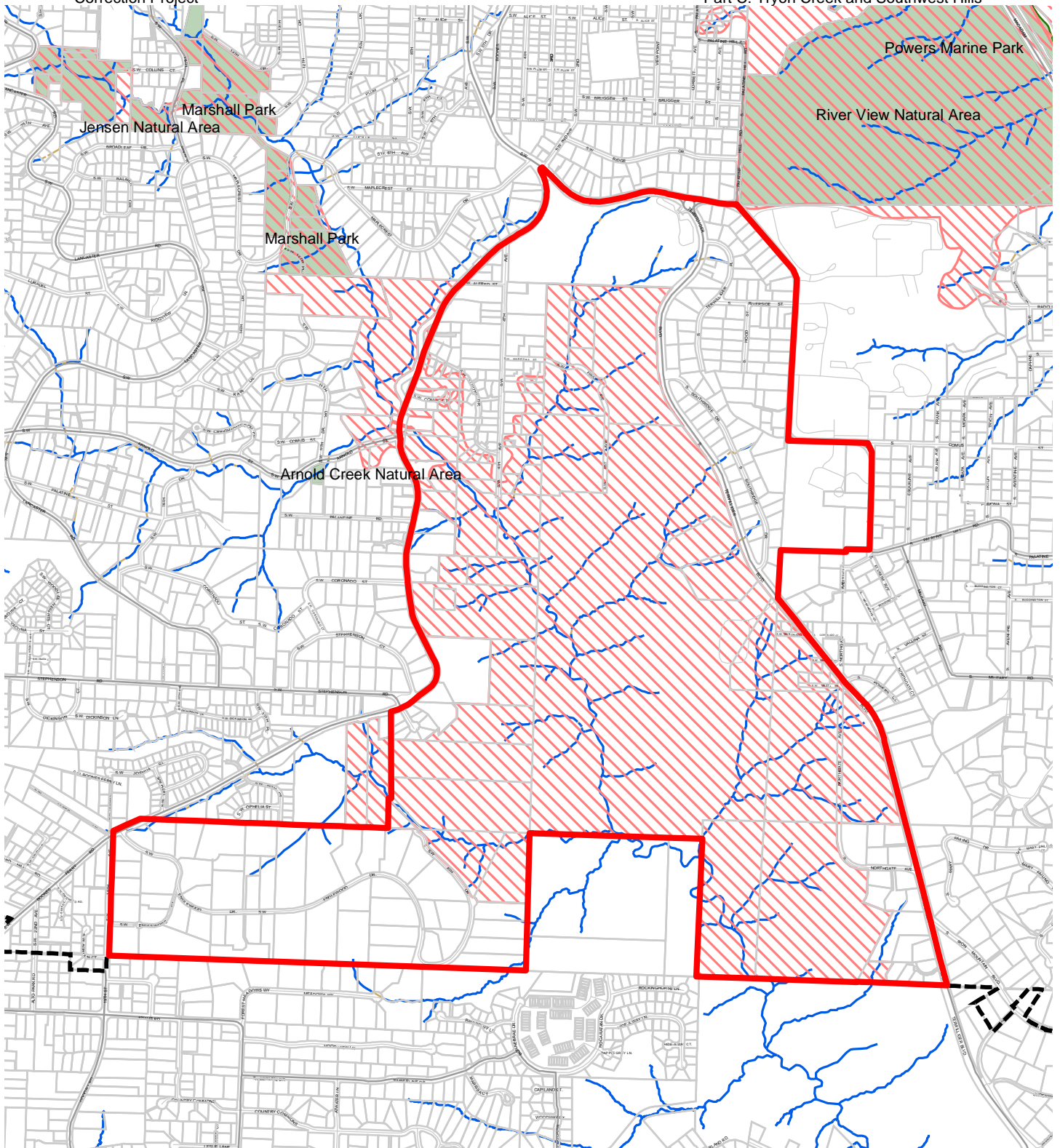
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous



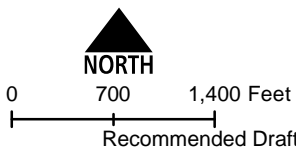
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**Map C: Special
Habitat Areas**



**Resource Site:
SW22**

Updated: May 2022



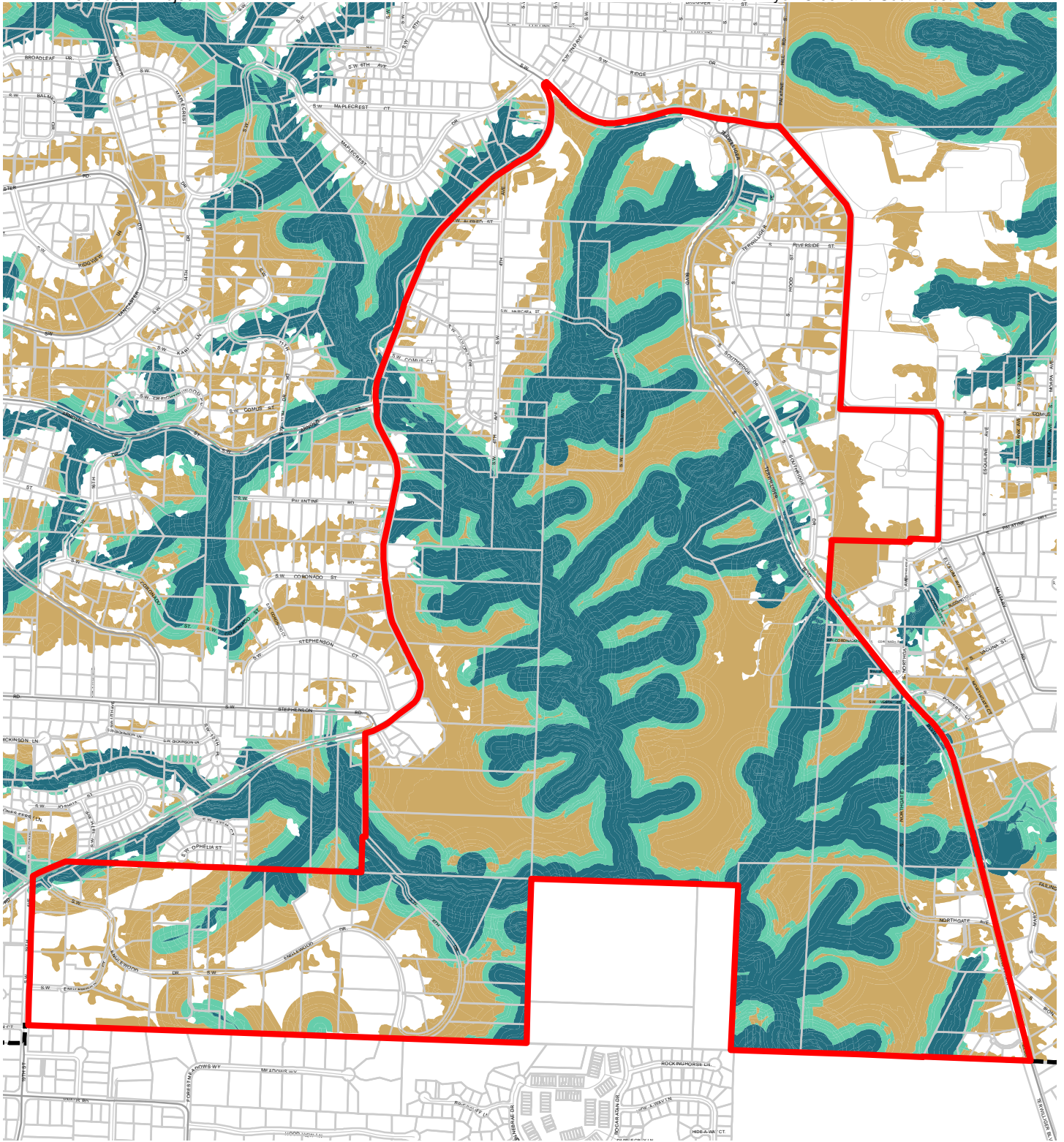
Recommended Draft - As Amended

-  Resource Sites
-  Special Habitat Areas (SHAs)
-  Open Stream Channel
-  Piped Stream Segment
-  Parks

-  Urban Service Boundary
-  Taxlots



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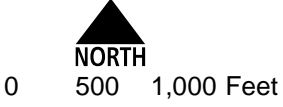


**Map D: Riparian
Corridors Habitat
Classification**

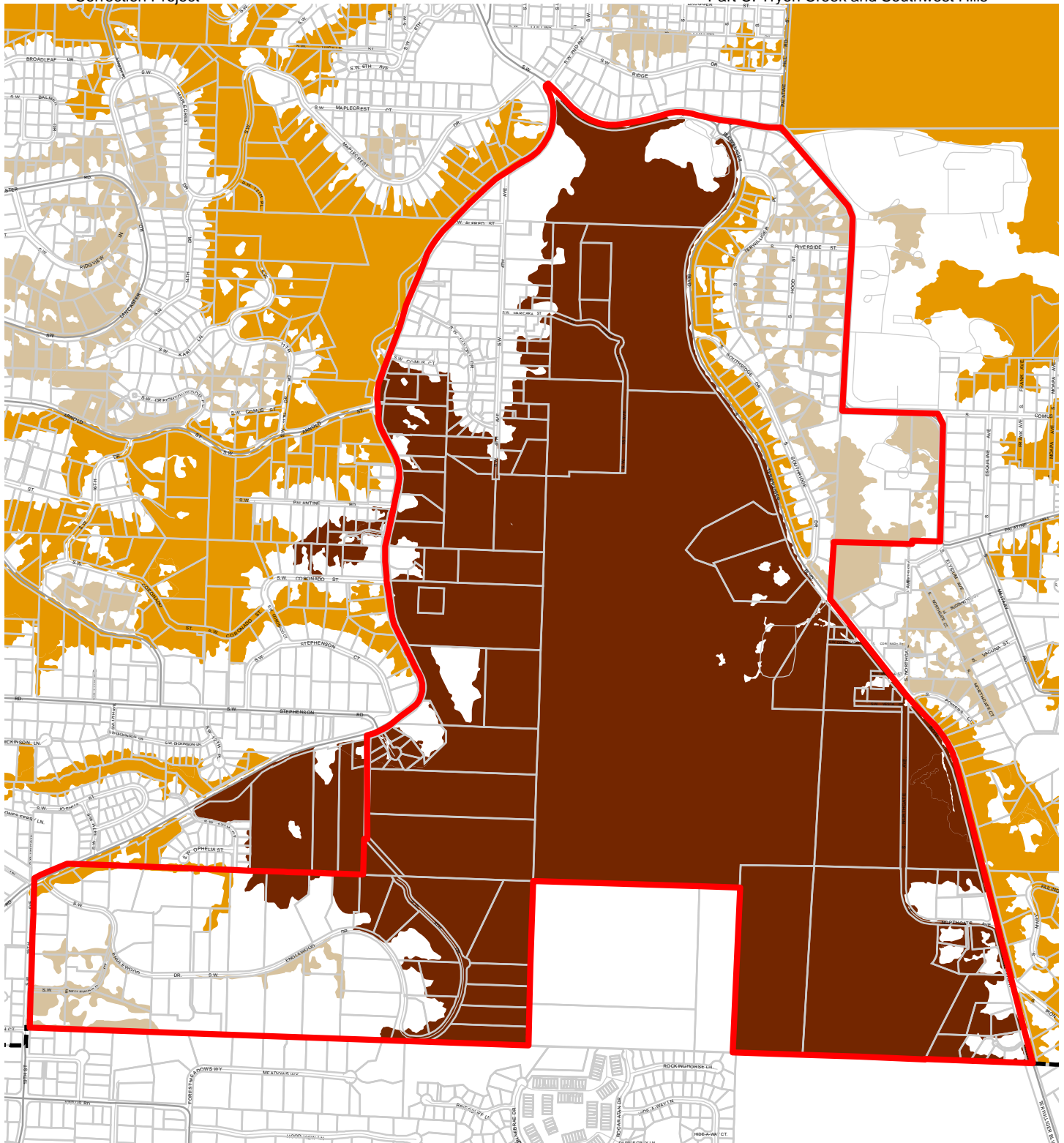
**Resource Site:
SW22**

Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots

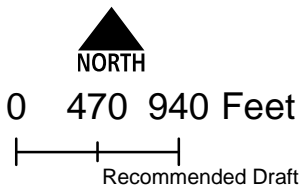








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**Map E: Wildlife
Habitat Classification**
Resource Site:
SW22

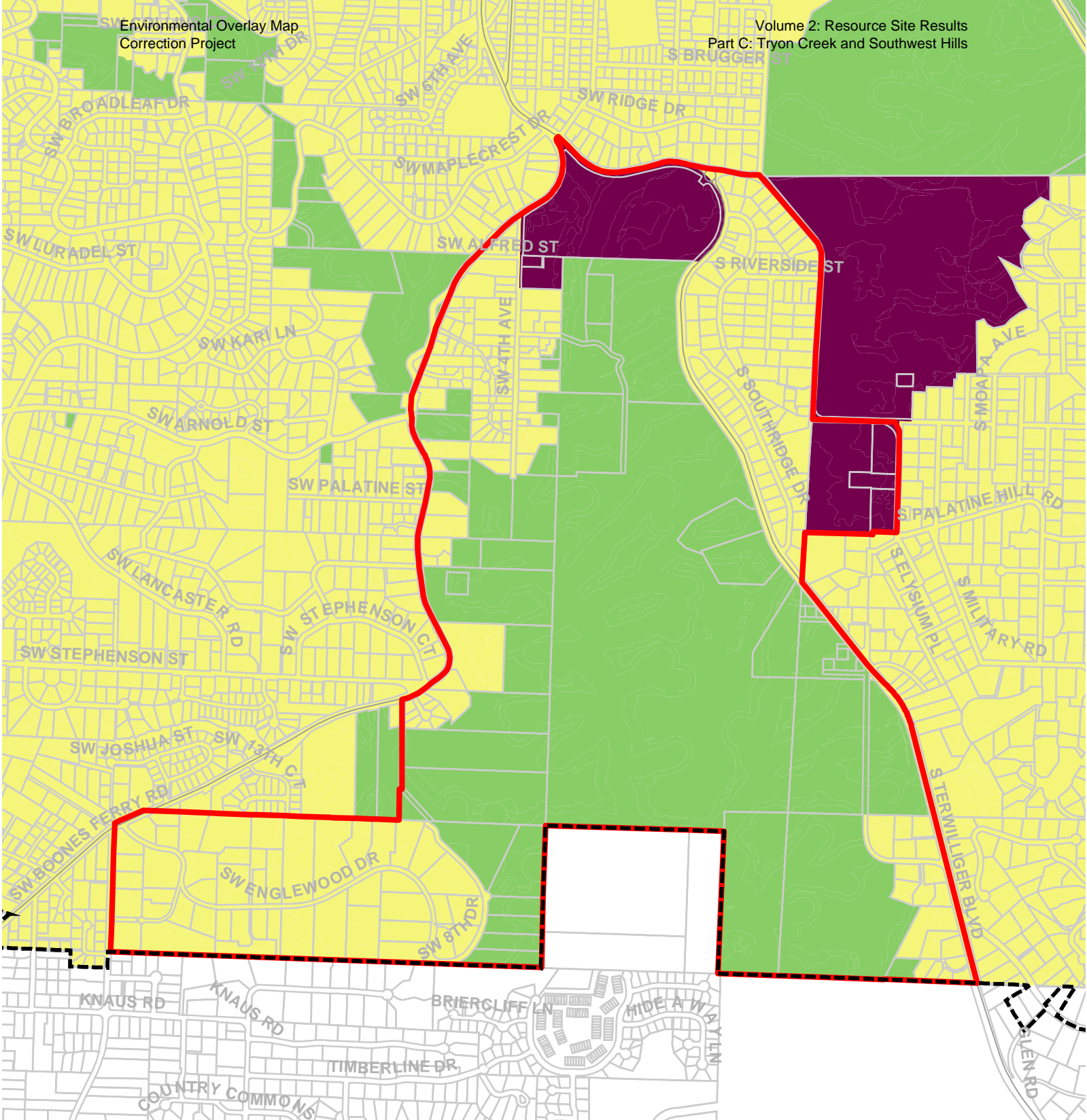
Updated: May 2022



-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots



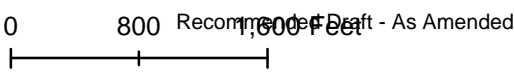
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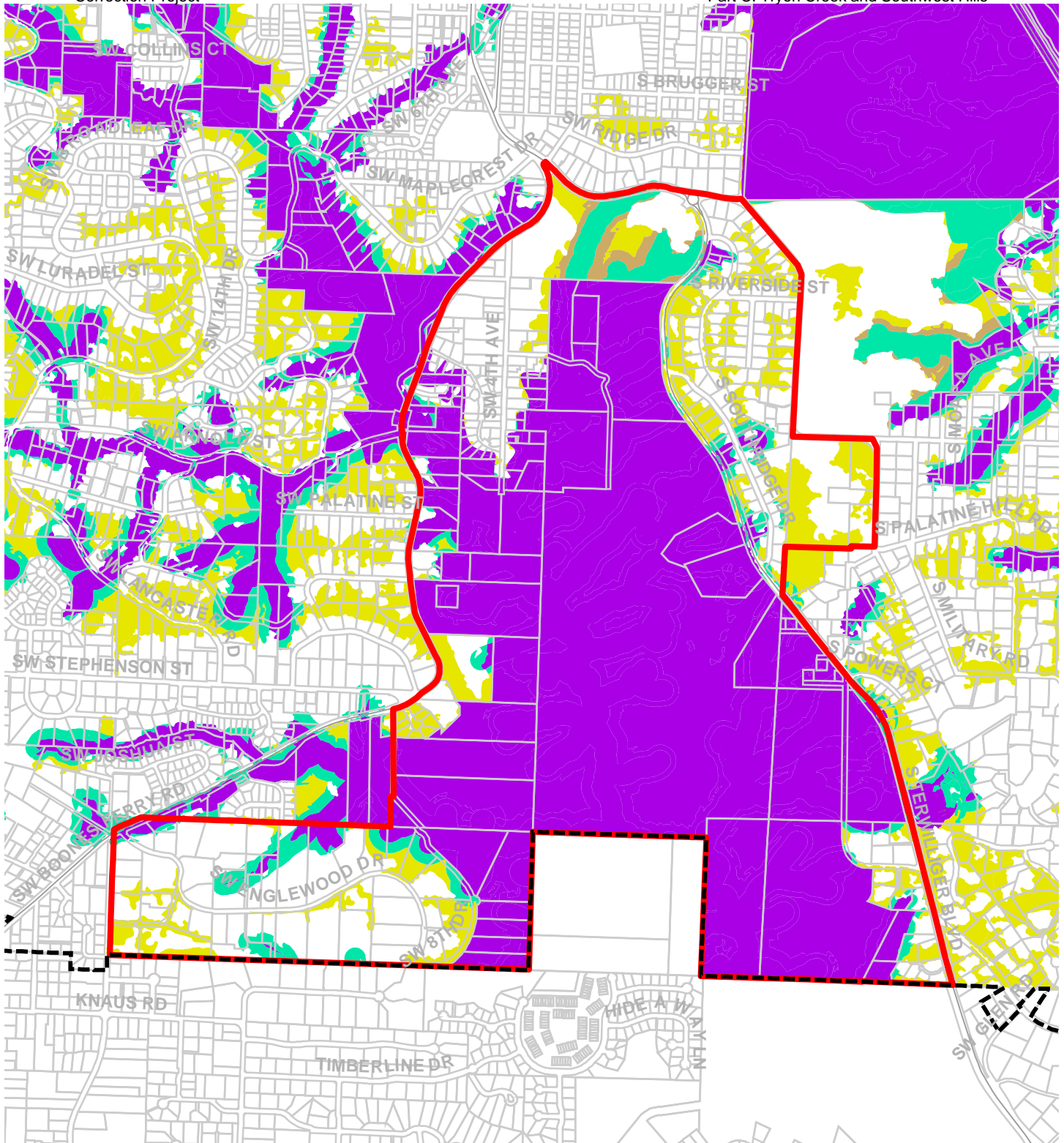
Map F: Urban Development Value (Title 13)
Resource Site: SW22

-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks

Updated: July 2021

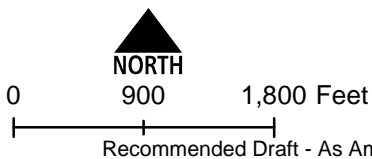


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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW22
Updated: May 2022

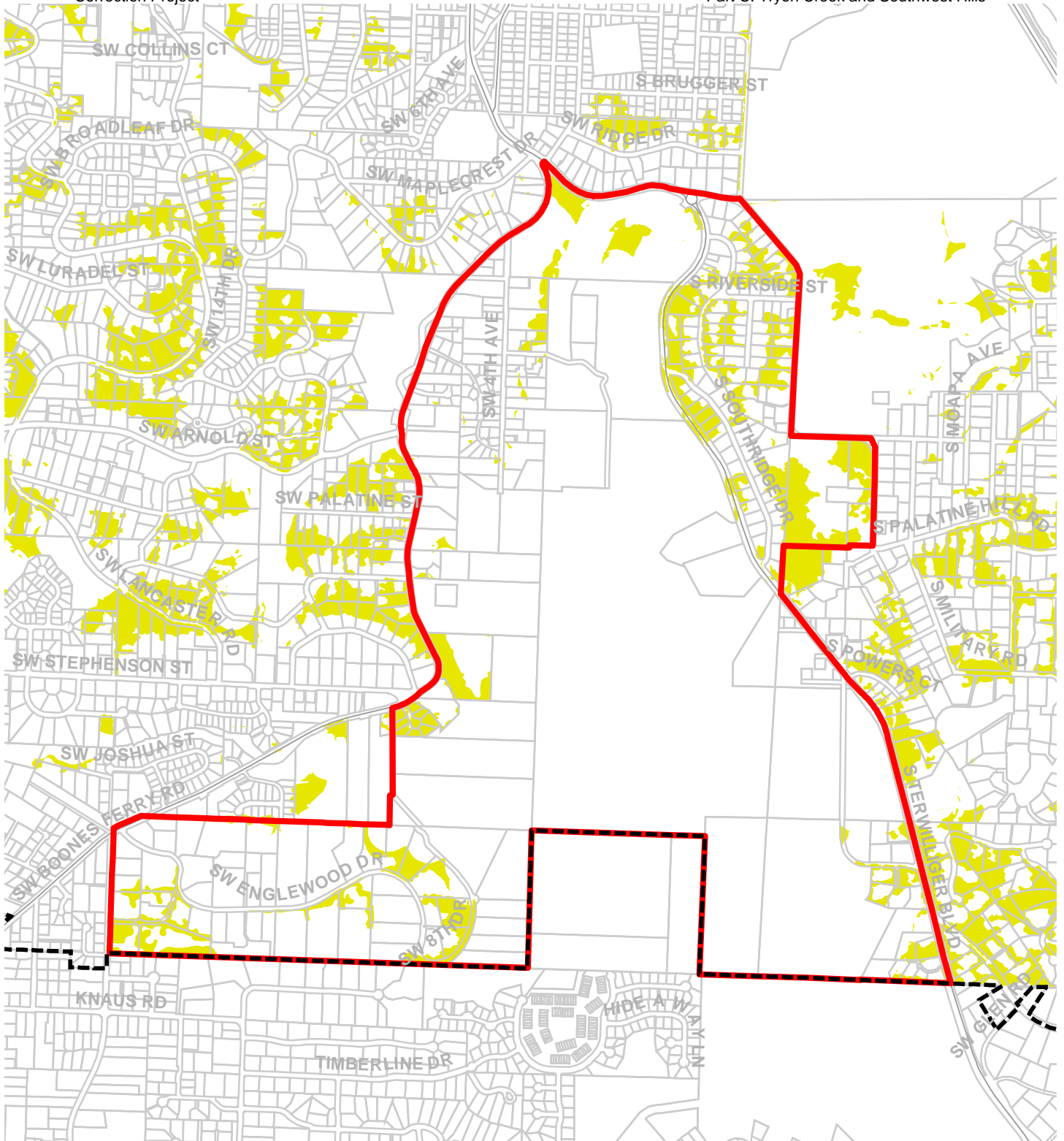


- Urban Service Boundary
- Resource Sites
- HCA High Value
- HCA Moderate Value
- HCA Low Value
- Goal 5 Significant Natural Resources



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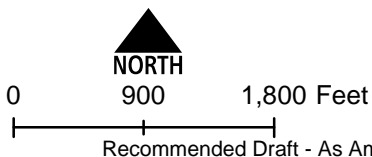
May 2022



Map H: Goal 5 Resources

Resource Site: SW22

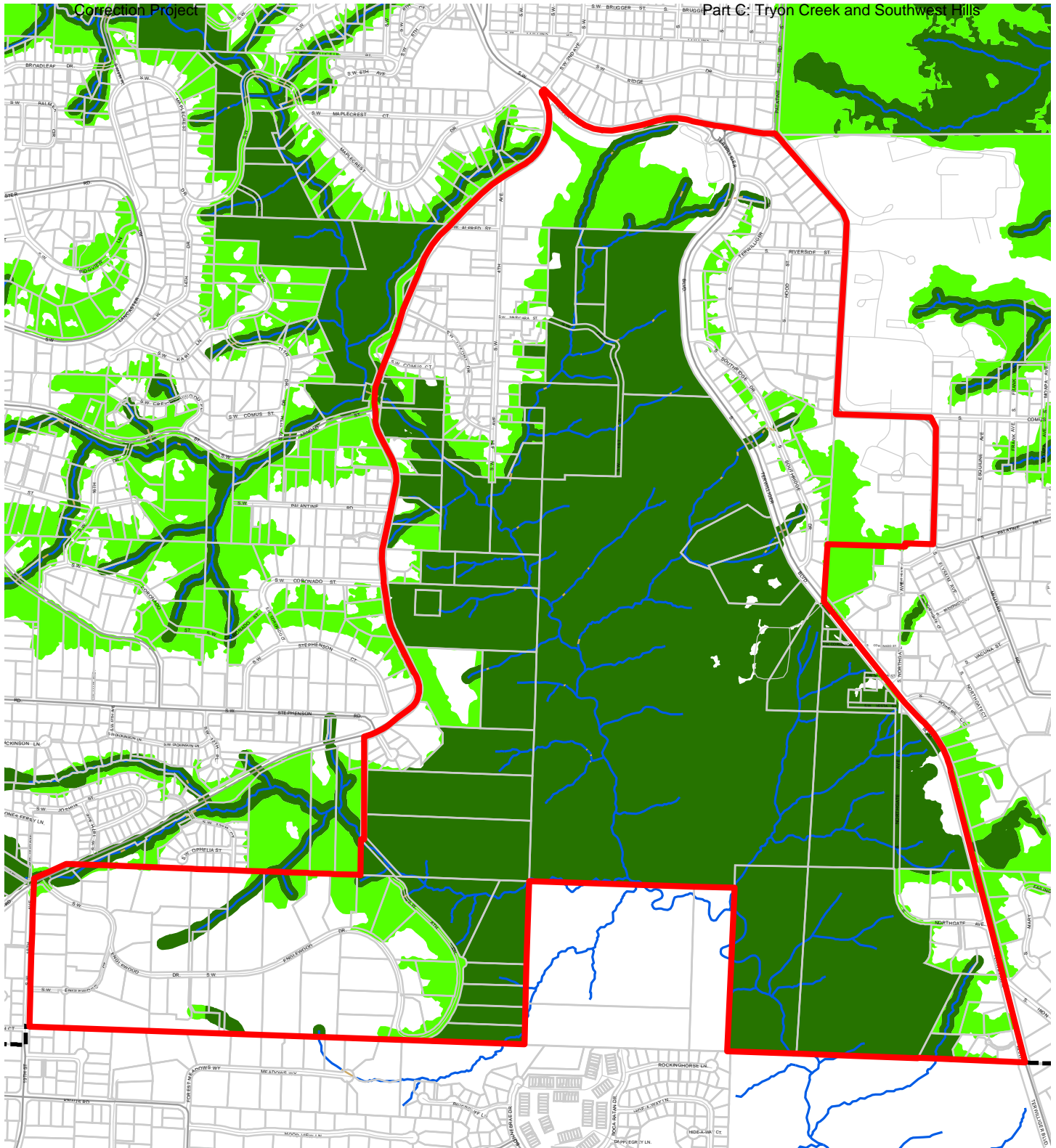
Updated: May 2022



- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources




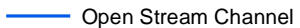
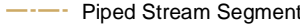




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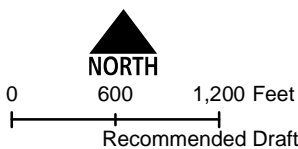


Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site: SW22

Updated: May 2022

-  Resource Sites
-  Open Stream Channel
-  Piped Stream Segment
-  Proposed Conservation Zone
-  Proposed Protection Zone
-  Urban Service Boundary
-  Taxlots



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Natural Resource Description

Within resource site SW22 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; wetland; flood area; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: Tryon Creek State Natural Area (S, M, C, W)

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW22	
	Study Area
Stream (Miles)	9.3
Wetlands (acres)	12.4
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	520.8
Woodland (acres)	20.7
Shrubland (acres)	4.3
Herbaceous (acres)	64.6
Flood Area*	
Vegetated (acres)	4.3
Non-vegetated (acres)	0.1
Steep Slopes (acres)**	350.9
* 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 areas with a slope greater than 25%.	

The site is primarily a V-shaped canyon formed by the east slope of Mt. Sylvania and west slope of Palatine Hill. (The elevation of Mt. Sylvania's summit is 970 and located about 1.7 miles to the southwest. Palatine Hill reaches 450 feet in height where the ridge top is relatively wide and long. The east slope of Palatine Hill borders the Willamette River). The site elevations are 400 feet near Boones Ferry Rd.; 100 feet along Tryon Creek canyon floor; and 450 feet at the eastern border of the site. The majority of the site is in Tryon Creek State Park which is 641-acres in size. Tryon Creek originates northwest of Barbur Boulevard and Terwilliger and flows into the Willamette River near the Boones Ferry and State Street in Lake Oswego. The remaining site acreage consists of sparsely developed low-density housing and the Lewis and Clark Law School. The law school is on 20 acres bisected by two tributary streams located near the Boones Ferry Road and Terwilliger Boulevard intersection.

Tryon Creek drainage basin is 4,477 acres in size. In 1982, the basin was estimated to have 22 percent of the land vacant. Over 80 species of birds and small mammals including beaver occur in the park. The second growth forest is 60 to 80 years old and has a coniferous and deciduous tree mixture (40 and 60 percent respectively). The sensitive Pileated Woodpecker inhabits the area. Plant species that are notable are western wahoo and pacific yew.

Tryon Creek is one of the largest (approximately 16.8 km²), relatively protected, urban watersheds in Oregon (Callison et al. 2002). Native salmonid species currently found in this stream include Coastal Cutthroat Trout (*Oncorhynchus clarki*), resident Rainbow Trout and anadromous Steelhead Trout (*O. mykiss*), Coastal Cutthroat Trout (*O. mykiss hybrids*) (Tinus et al. 2003), Coho Salmon (*O. kisutch*), and Chinook Salmon (*O. tshawytscha*) (Hudson et al. 2009). Historically, Pacific Lamprey (*Entosphenus tridentatus*) and Western Brook Lamprey (*Lampetra richardsoni*) may have utilized this stream. However, a culvert that currently runs under Oregon State Highway 43 and the adjacent railroad potentially inhibits, if not prevents, passage of lamprey and salmonids.

The park has eight miles of hiking trails, three and a half miles of horse trails and three miles of bike trails for recreational uses. There are some disturbances in the surrounding area which affect the creek. There is periodic trash dumping, residential development has caused some erosion in the area, and oil can be detected in the creek.

Table B: Quality of Natural Resource Functions in Resource Site SW22				
Resource Site (acres) = 714				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	228.4	115.0	215.7	559.0
percent total inventory site area	32.0%	16.1%	30.2%	78.2%
Wildlife Habitat*				
acres	474.1	15.6	35.2	524.9
percent total inventory site area	66.4%	2.2%	4.9%	73.5%
Special Habitat Areas**				
acres	409.7			
percent total inventory site area	57.3%			
Combined Total⁺				
acres	478.8	23.6	69.5	571.9
percent total inventory site area	67.0%	3.3%	9.7%	80.0%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.				
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.				
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called "effective impervious area." The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter

pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For resource site SW22, 5.1% of the total area is effectively impervious. This indicates a significant degree of stormwater management and/or existing natural resources that should be preserved. Areas with very low impervious cover and existing vegetation are more likely to be functioning properly to support biologic systems.

Table C. Impervious Area within Resource Site SW22			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
714.5	35.6	18.9	5.1%

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW22. Natural resources should be protected within HCA as follows:

1. *Strictly limit* or *limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit* or *limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit* or *limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.

5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or *limiting* conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting* or *limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW22 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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. Commercial uses are allowed in the CI1 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW22, with the following additional information that clarifies the analysis.

Strictly limiting or limiting conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW22, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or wetlands.
2. Inside Tryon Creek State Park, apply a protection overlay zone ('p' zone) to areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank or wetlands.
3. Outside of Tryon Creek State Park, apply a conservation overlay zone ('c' zone) to areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank; and within areas of forest vegetation on steep slopes adjacent to SW Terwilliger Blvd.
4. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: SW23 **Site Name:** Dunthorpe

Previous Plan: Multnomah County Urban Lands

Previous Resource Site No.: 117-A

The results of the analysis found in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

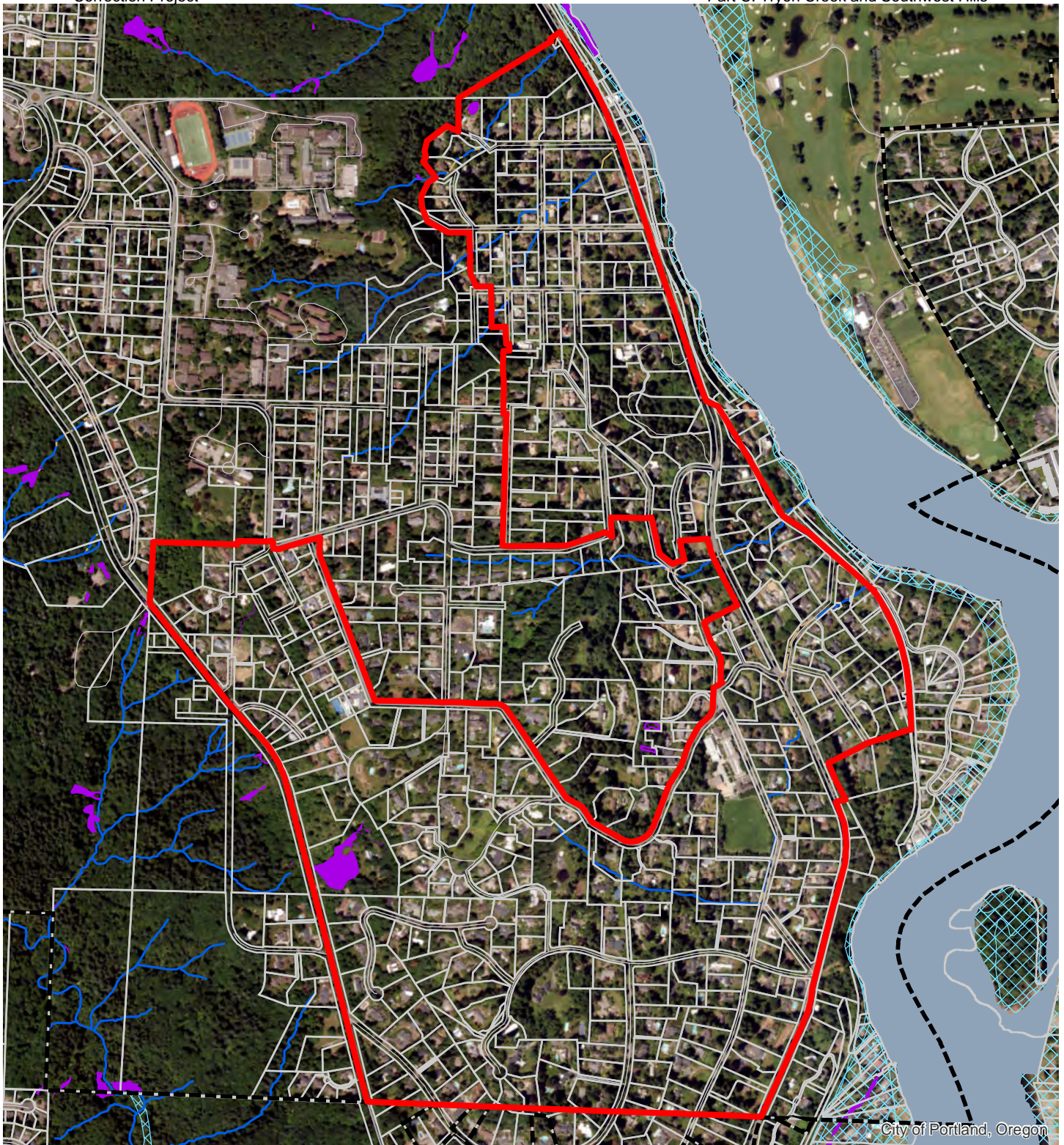
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 13 Habitat Conservation Areas
- H. Statewide Planning Goal 5 Areas
- I. Recommended Natural Resource Protections

Following the maps, additional information about existing natural resource features and functions in the resource site is presented.

Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

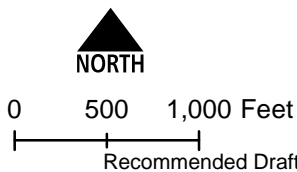
Resource site SW23 includes the following:

Site (acres)	428.0
Base zones (acres)	
CI1	0.1
OS	4.8
R10	22.2
R20	400.9



Map A: Water Features
Resource Site: SW23

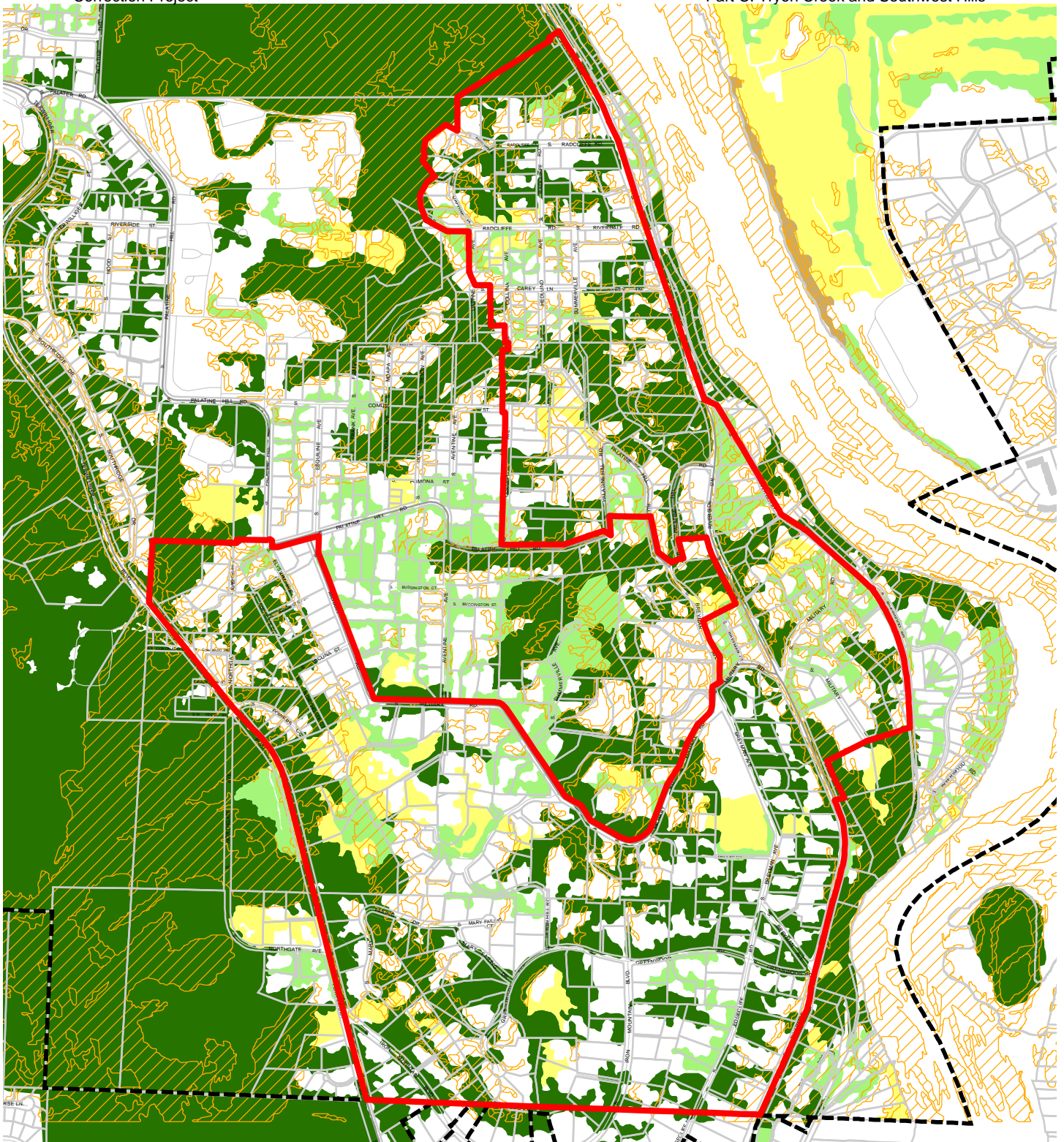
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Wetlands
- Rivers
- Open stream channel
- Piped Stream Segment
- Flood Area



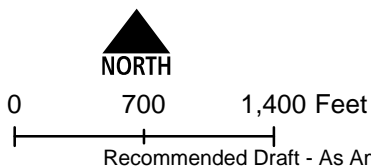
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Map B: Vegetation and Steep Slopes

Resource Site: SW23

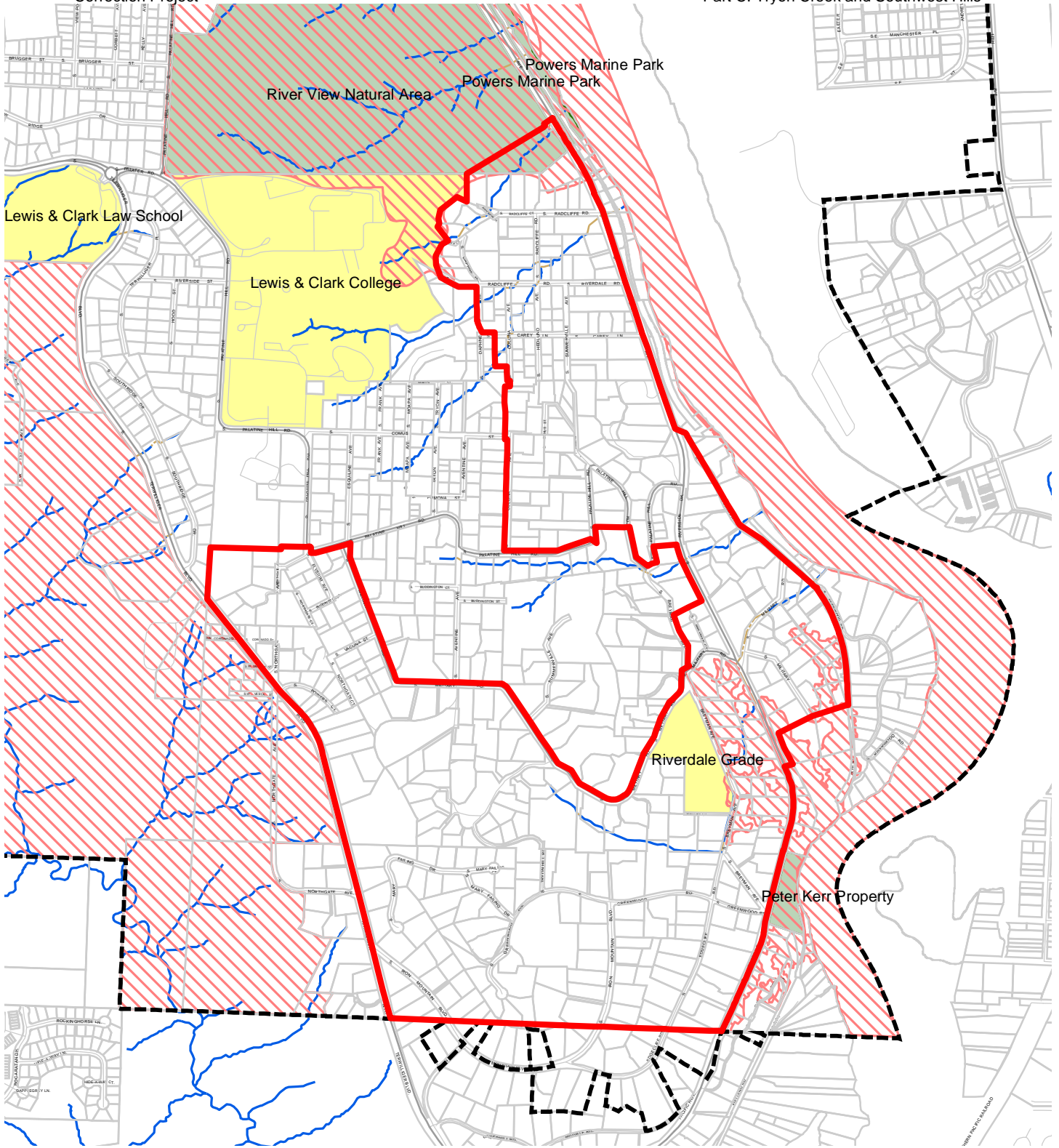
Updated: May 2022



- Resource Sites
- Urban Service Boundary
- Taxlots
- Forest
- Woodland
- Shrubland
- Herbaceous

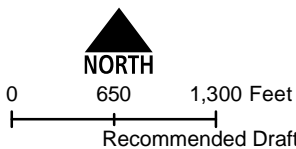


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**Map C: Special
Habitat Areas**
**Resource Site:
SW23**

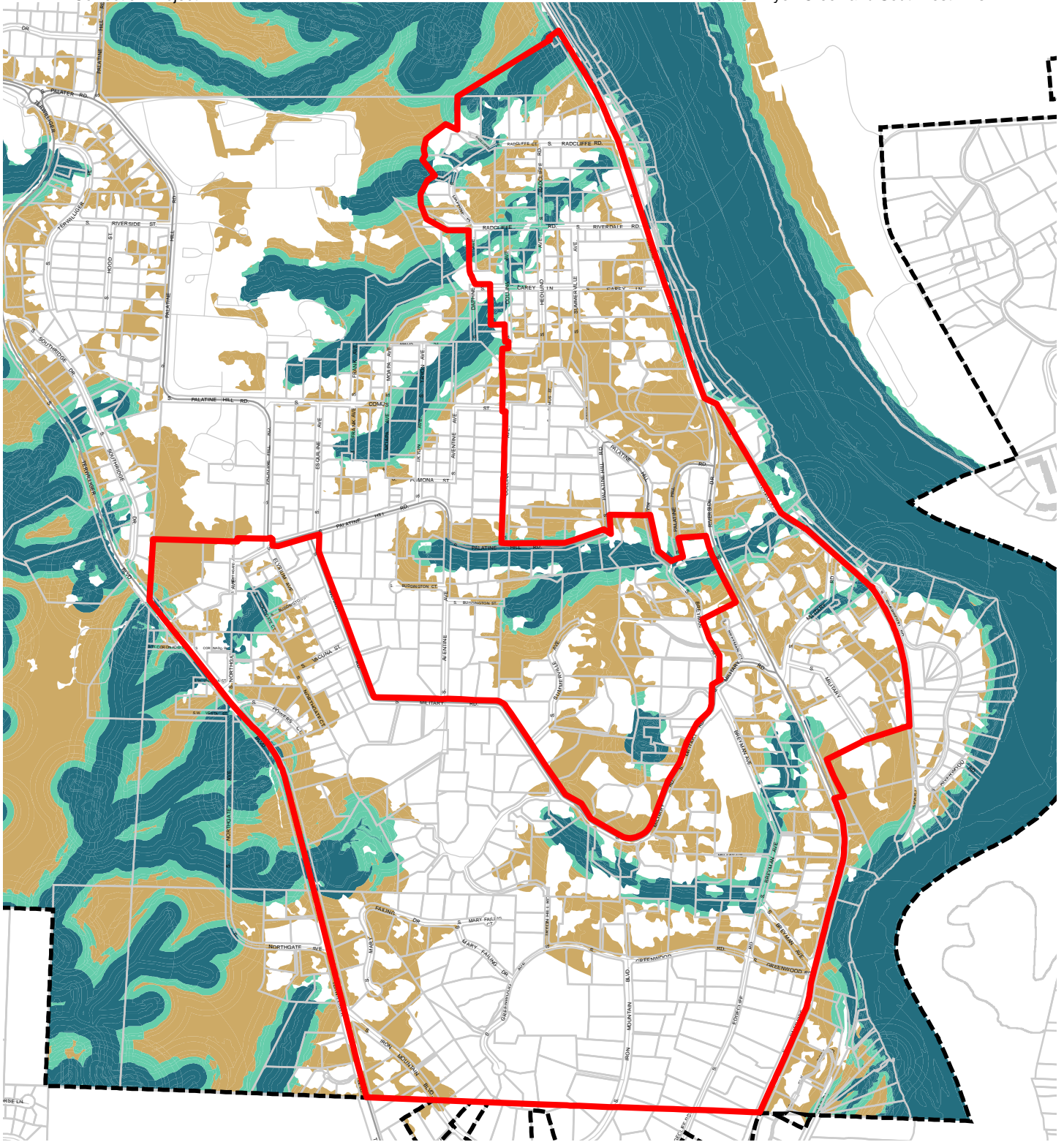
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- Resource Sites
- Urban Service Boundary
- Special Habitat Areas (SHAs)
- Taxlots
- Open Stream Channel
- Piped Stream Segment
- Parks
- Schools



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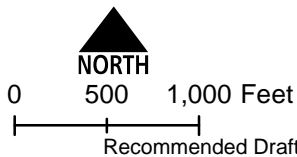


**Map D: Riparian
Corridors Habitat
Classification**

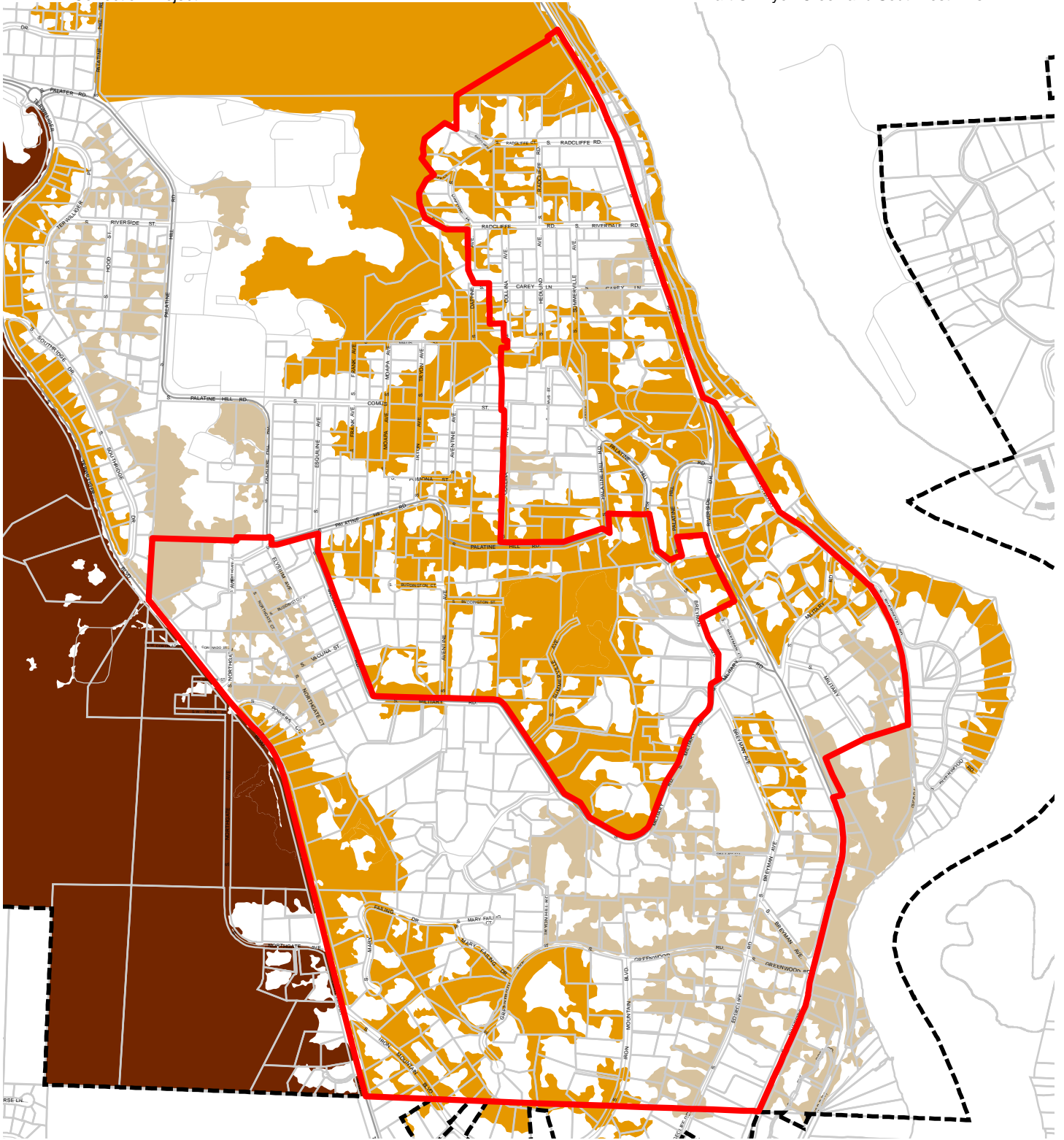
**Resource Site:
SW23**

Updated: May 2022

- Class I (high rank)
- Class II (medium rank)
- Class III (low rank)
- Resource Sites
- Urban Service Boundary
- Taxlots









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May 2022



**Map E: Wildlife
Habitat Classification
Resource Site:
SW23**

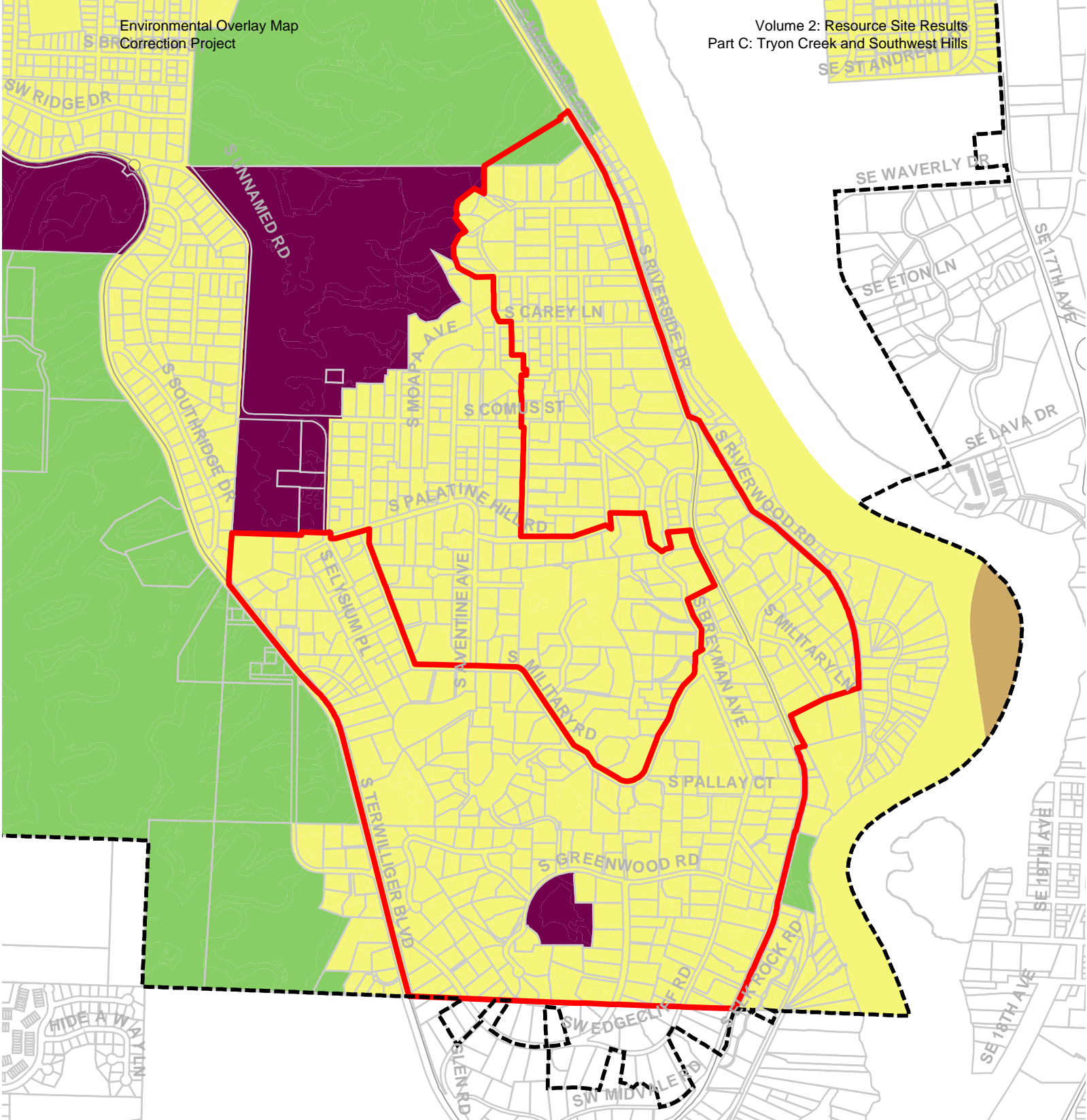
Updated: May 2022



-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots



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May 2022



Map F: Urban Development Value (Title 13)
Resource Site: SW23

-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks

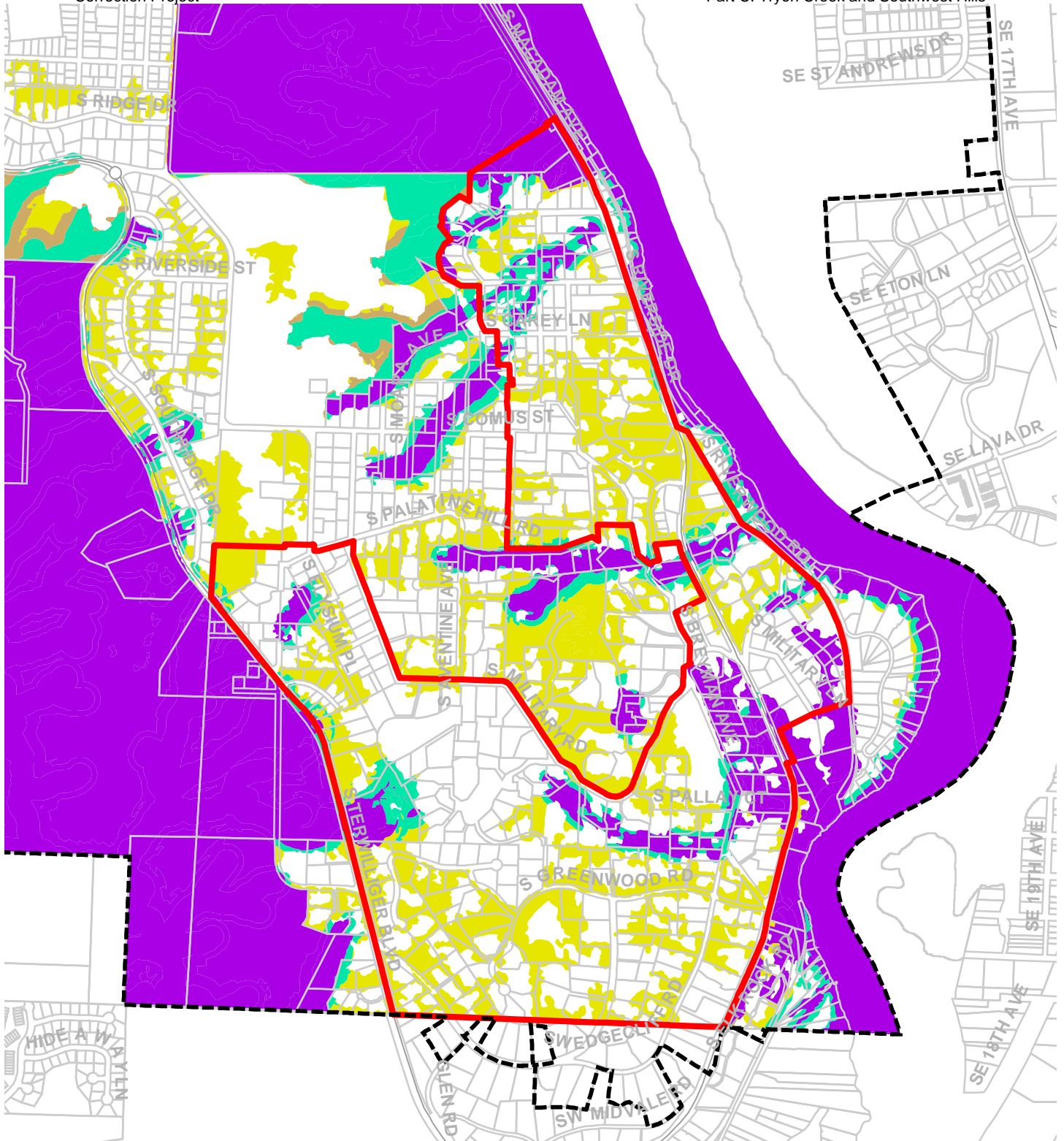


Updated: July 2021



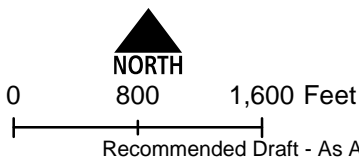
0 750 1,500 Feet
Recommended Draft - As Amended

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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: SW23
Updated: May 2022

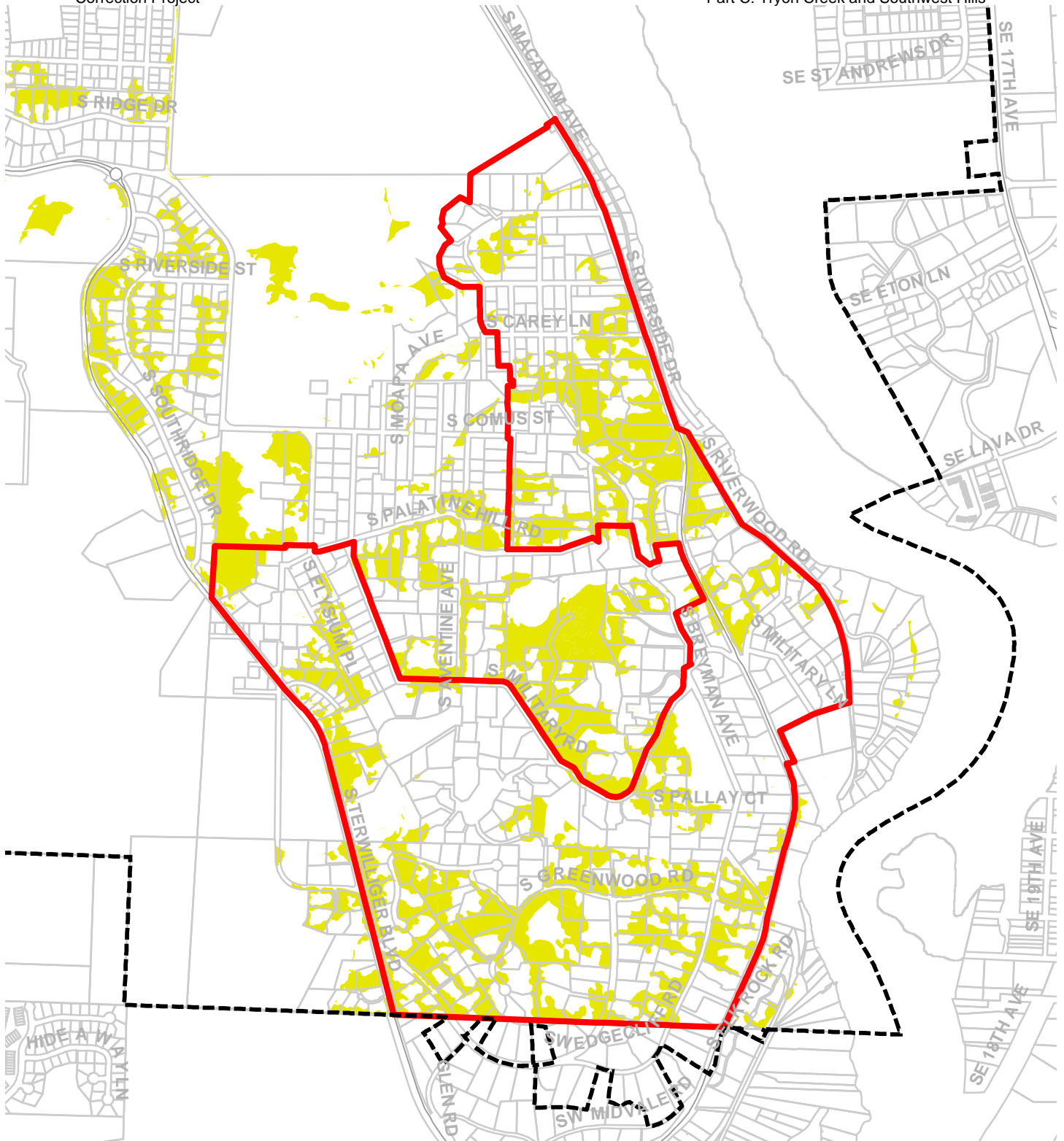


- Urban Service Boundary
- Resource Sites
- HCA High Value
- HCA Moderate Value
- HCA Low Value
- Goal 5 Significant Natural Resources



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May 2022






Map H: Goal 5 Resources

Resource Site: SW23

Updated: May 2022



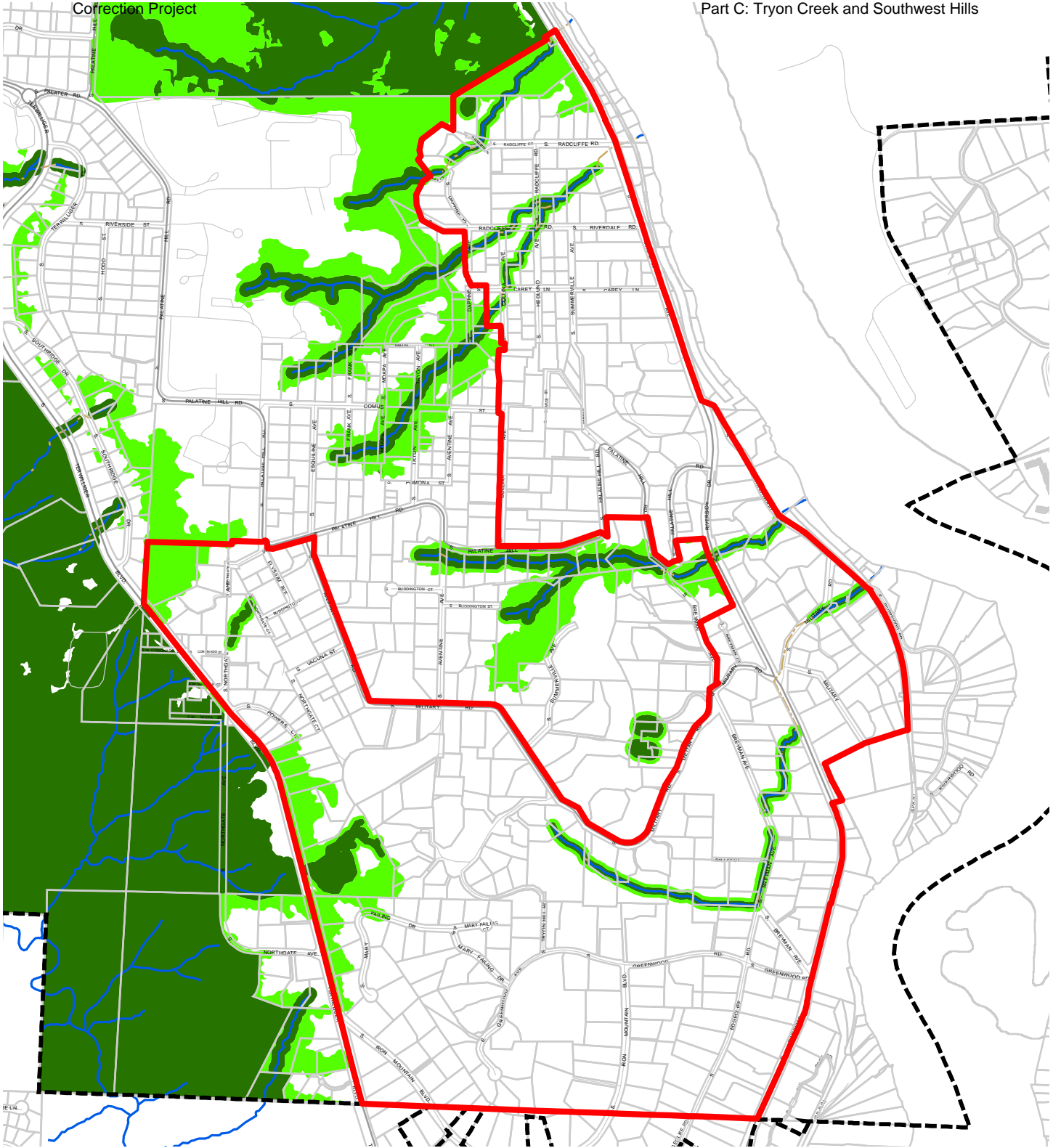
Recommended Draft - As Amended

-  Urban Service Boundary
 -  Resource Sites
 -  Goal 5 Significant Natural Resources
- Page 374



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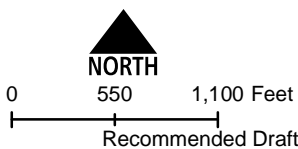
May 2022



Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
SW23**

Updated: May 2022



- Resource Sites
- Open Stream Channel
- Piped Stream Segment
- Proposed Conservation Zone
- Proposed Protection Zone
- Urban Service Boundary
- Taxlots



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May 2022

Natural Resource Description

Within resource site SW23 the following significant natural resource features and functions are present:

Significant Riparian Corridor Features: open stream; wetland; land within 50 feet of waterbodies; forest, woodland, shrubland and herbaceous vegetation within 300 feet of waterbodies; and forest vegetation on steep slopes (>25% slope) contiguous to and within 780 feet of waterbodies.

Significant Wildlife Habitat Features: forest patches, and associated and contiguous wetlands, two acres in size or larger.

Special Habitat Areas: Dunthorpe Oaks (O), Wetlands (W)

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.

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.

Table A: Quantity of Natural Resource Features in Resource Site SW23	
	Study Area
Stream (Miles)	1.3
Wetlands (acres)	1.8
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	166.3
Woodland (acres)	39.6
Shrubland (acres)	0.0
Herbaceous (acres)	23.9
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	148.5
* 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 areas with a slope greater than 25%.	

This site is a predominantly low-density residential area covering the ridge between Tryon Creek State Park and the Willamette River. It also contains a small portion of River View Natural Area (RVNA) along the northernmost boundary of the resource area along SW Riverside Drive (see Resource Site SW18 for additional information about RVNA). Lake Oswego is located south of the site and the City of Portland is to the north and west. Across the river to the east is the City of Milwaukie.

The south and east boundaries of this site are relatively well defined as the Multnomah Clackamas County line and the Willamette River, respectively. To the north, the site borders Lewis and Clark College and the River View Cemetery. The western boundary is the Portland City Limits, which follows a circuitous route around properties and rights-of-way in the vicinity of Terwilliger Boulevard.

A north to south ridge passes through the site, with several secondary ridges and ravines extending east toward the Willamette River. This ridge is the southern tip of the Tualatin Mountain Range, before it descends to the Willamette lowlands. The site has an elevation change of 500 feet from the high point along the ridge-top to the Willamette River at near sea level. The hilltop terrain has moderate to gentle grades. Near the river, the terrain becomes steep, particularly at the south end of the site where a 200-foot, near-vertical cliff drops from the bluff along Riverside Drive to the river below. Low-lying floodplain and riparian areas up to 800 feet wide occur along certain parts of the Willamette.

To the west of the ridge, the site descends at up to 30 percent grades into the Tryon Creek basin. Several springs and seasonal watercourses form headwater tributaries to the creek. Like some of the steeper areas draining to the Willamette, the slopes along the western boundary of this site (near Terwilliger Boulevard) remain partly forested.

Several partners including Portland Parks & Recreation, Bureau of Environmental Services (BES), The Trust for Public Land, and Metro worked together to identify and acquire the River View Natural Area in 2011 to protect the habitat connection between Tryon Creek State Natural Area and Forest Park. Metro continues to hold a conservation easement on the property to ensure it is retained in its natural condition for wildlife, habitat, water quality resources, and nature-based recreation. Significant investment has been made by Portland Parks and Recreation and Bureau of Environmental Services since 2010 to restore this resource area through invasive vegetation removal and revegetation with native plants.

Table B: Quality of Natural Resource Functions in Resource Site SW23				
Resource Site (acres) = 428				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	26.9	27.1	115.8	169.8
percent total inventory site area	6.3%	6.3%	27.1%	39.7%
Wildlife Habitat*				
acres	0.0	113.9	62.3	176.3
percent total inventory site area	0.0%	26.6%	14.6%	41.2%
Special Habitat Areas**				
acres	25.8			
percent total inventory site area	6.0%			
Combined Total⁺				
acres	26.9	111.8	67.2	205.8
percent total inventory site area	6.3%	26.1%	15.7%	48.1%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.				
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.				
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

Stormwater runs off impervious surfaces (e.g., rooftops, driveways, parking areas, streets, etc..) rapidly. Without a place to retain the water (such as wetlands or adequate stormwater facilities), stormwater runoff results in spikes in stream levels which can cause or exacerbate flooding and increase stream erosion. In addition, when water runs off quickly, it does not have a chance to infiltrate and recharge streams or aquifers to provide water during drier periods.

The type and capacity of stormwater facilities to manage the runoff from impervious surfaces varies in the city, affecting the local rate and amount of runoff, and the amount of pollutants in the water. Much of the city was developed prior to any stormwater regulations and receives limited or no management prior to discharging to pipes and surface waters.

Table C shows the total amount of impervious area within the resource site and how much of that impervious area lacks stormwater management; the percentage of total impervious area that is not managed is called "effective impervious area." The higher the percent of effective impervious area in a watershed, the greater the negative impacts of stormwater runoff to streams. Stream science indicates that when effective impervious area reaches 10% of a watershed, negative stream impacts become significant; and at 25%, these impacts on waterways can be substantial. An additional consideration is the differences in soil conditions and other factors that influence the ability of pervious areas to retain, infiltrate or filter

pollutants from stormwater. For example, a mature forest is much more effective in managing stormwater than a manicured lawn; both areas would have a lower effective impervious surface percentage than a developed site, but they have different outcomes for stormwater management.

For Resource Area SW23, almost the entire area is located outside current city boundaries and calculations on the impervious area managed are not currently available. The area likely falls into the category of 10-25% effective impervious area, which indicates a critical level of vulnerability, as negative impacts may be beginning to influence natural functions, with ecological processes still in place and providing support to biologic systems

Table C. Impervious Area within Resource Site SW23			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
427.9	88.3	not available	not available

*Total unmanaged impervious area refers to the number of acres within a resource area that receives no formal stormwater management measures to regulate flow or treat pollutants before they reach surface waters, also referred to as effective impervious area.

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 3 and supports compliance with Metro Title 13 and Oregon Plan Goal 5.

Title 13 Habitat Conservation Areas

Map G presents the Habitat Conservation Areas (HCA) within the resource site SW23. Natural resources should be protected within HCA as follows:

1. *Strictly limit* or *limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit* or *limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit* or *limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.

5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, except parks and open space.

Strictly limiting or *limiting* conflicting uses in HCA will protect and conserve existing streams and wetlands to maintain significant natural resource functions including: 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 fish and wildlife habitat. *Strictly limiting* or *limiting* conflicting uses in HCA will allow for additional urban development that is sensitive to the natural resource features and requires mitigation for unavoidable negative impacts to features and functions. The recommendation will also contribute towards meeting other regulatory requirements including the Metro Title 3, Water Quality and Flood Management; Oregon Goal 6, Air, Water and Land Resources Quality; Oregon Goal 7, Areas Subject to Natural Hazards; the Clean Water Act; and the Endangered Species Act.

Goal 5 Significant Natural Resources

Resource site SW23 contains natural resource features that are not a Title 13 HCA and are therefore subject to Statewide Planning Goal 5 OAR 660-023-0110. The General ESEE analysis, Volume 3, 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.

The common impacts of conflicting uses in the resource site include clearing vegetation; grading activities and soil compaction; adding impervious surface; modifying streams, wetlands and flood areas; 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. 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.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site SW23, with the following additional information that clarifies the analysis.

Strictly limiting or *limiting* conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, 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 Class A or Class B wildlife habitat should be required.

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*.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and Goal 5 Compliance, and the resource site-specific evaluation for SW23, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 25 feet of stream top-of-bank or wetlands.
2. Inside the River View Natural Area, apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands; and within areas of vegetation that are contiguous to but more than 50 feet from stream top-of-bank or wetlands.
3. Outside the River View Natural Area, apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of stream top-of-bank or wetlands.
4. Outside the River View Natural Area, apply a conservation overlay zone ('c' zone) to areas of forest vegetation on steep slopes adjacent to SW Terwilliger Blvd right-of-way or within Special Habitat Area W19.
5. Allow conflicting uses within all other areas containing significant natural resources.

Special Habitat Area W19 contains large stands of Oregon White Oak, a special status plant species. This habitat type is found on the ridge lines along the Willamette River. Forest vegetation contiguous to the Oak Habitat may not contain Oregon White Oak, but does increase wildlife habitat functions of the overall vegetation patch by increasing area and decreasing edge impacts.

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

Volume 1: Project Overview, Zoning Amendments, Ezone Remapping

The purpose of the Project Report is to document the overall project approach and methodology, summarize public engagement, and it includes all of the zoning code amendments. An appendix provides summary information on the mapping protocols that are used to map ezones, as well as maps of the existing and proposed ezone mapping in each resource site.

Volume 2: Resource Site Inventory and Resource Protection Decisions

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

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 3: Natural Resources Inventory, Compliance, and Appendix

This volume contains a summary of the approach and methodology used to produce the citywide Natural Resources Inventory, documentation that demonstrates compliance with Metro Urban Growth Management Plan Title 13 for Habitat Conservation Areas and Oregon State Planning Goal 5 for significant natural resources that are not a Habitat Conservation Area, and appendices that provide background information on the Environmental Overlay Zone Map Correction Project.