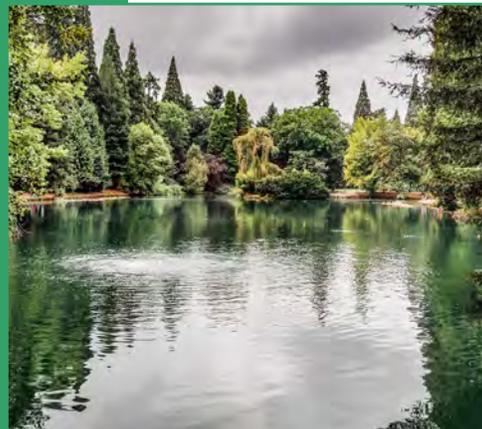


ENVIRONMENTAL OVERLAY ZONE MAP CORRECTION PROJECT

VOLUME 2, PART A2: Forest
Park and Northwest District,
Natural Resources Inventory
and Protection Decisions

(Resource Sites 21-41)



Recommended Draft

January 2022



THE BUREAU OF
**PLANNING &
SUSTAINABILITY**

How to Testify

You may submit comments to Portland City Council on the Environmental Overlay Zone Map Correction Project Recommended Draft in the following ways:

Use the Map App:

Go to: <https://www.portlandmaps.com/bps/ezones/#/map/> and then click the "Testify" button.

By email: cctestimony@portlandoregon.gov

By U.S. Mail

Council Clerk
1221 SW 4th Avenue
Room 130
Portland, OR 97204

In person at the public hearings

City Council will hold a public hearing on the Environmental Overlay Zone Map Correction Project on February 16, 2022. The meeting will be held virtually, by video conference. It can be viewed live, or after the meeting concludes. City Council meetings can be viewed on the City of Portland website: www.portlandoregon.gov/video or on the Portland eGov PDX YouTube channel:

<https://www.youtube.com/channel/UCcPIUh7CWwtBXisMPHWG65g>

To register to testify verbally, please visit the Portland City Council Agenda website: <https://www.portland.gov/council/agenda>. The deadline to sign up for the February 16 hearing is Tuesday, February 15 at 4:00 p.m.

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| www.portland.gov/bps/accommodation

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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The Environmental Overlay Zone Map Correction Project documents have been reorganized. After the Planning and Sustainability Commission voted to recommend the Ezone Project to City Council, the Proposed Draft – As Amended Volume 1 Part A and Volume 1 Part B were consolidated into Volume 1 of the Recommended Draft. Volumes 3, 4, and 5 of the Proposed Draft – As Amended were consolidated into Volume 3 of the Recommended Draft.

A. INTRODUCTION

Volume 2, Part A2, includes the results for Resource Sites 21-41 in the Forest Park and Northwest 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.

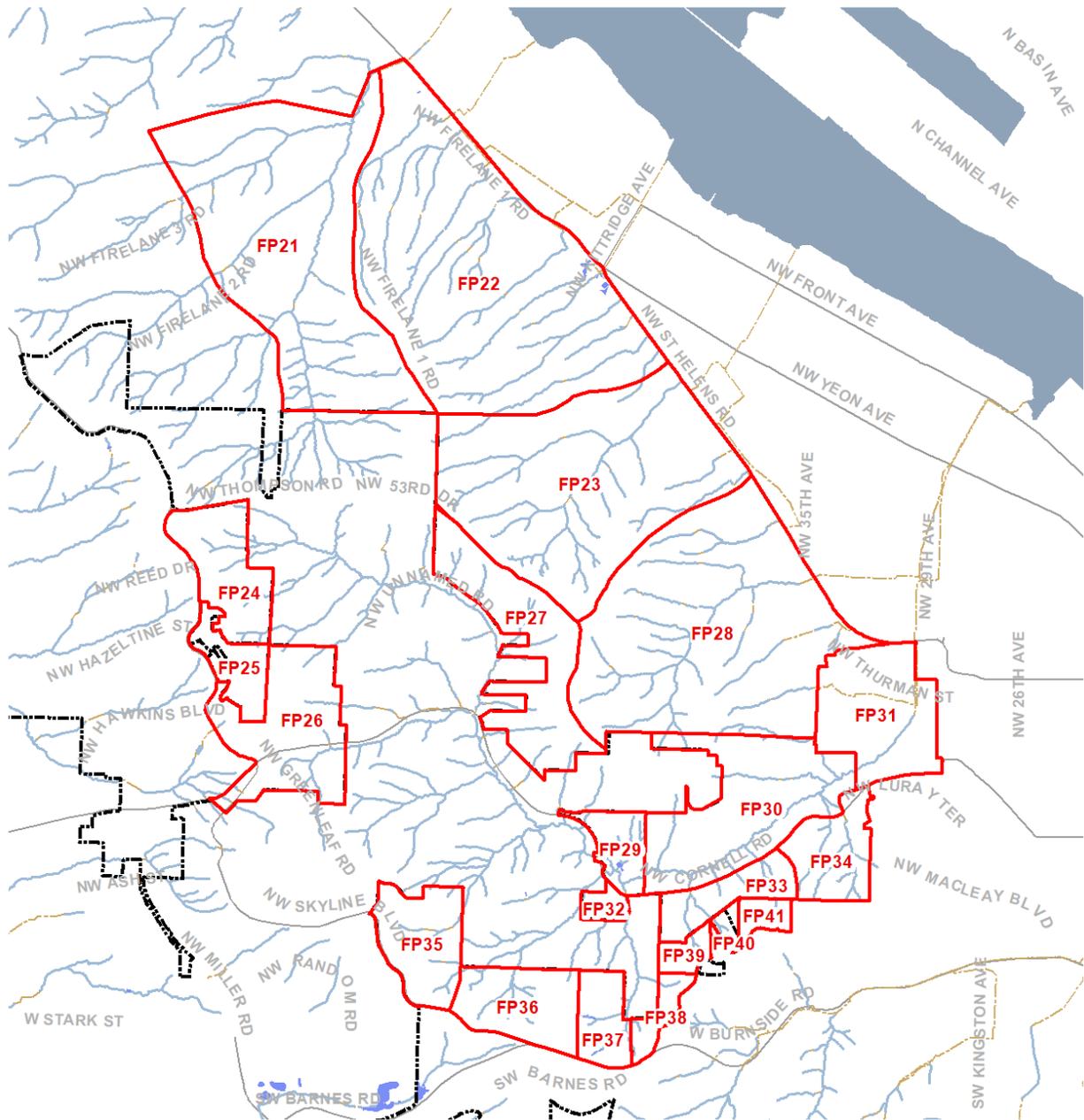
Area Descriptions

Volume 2, Part A2, 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

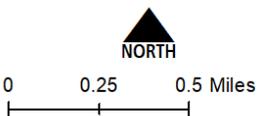
Metro Title 13 and Statewide Planning Goal 5, wildlife habitat, rules require verification of natural resource features and classifications. Natural resource features include rivers, streams, wetlands, flood area, vegetation (forest, woodland, shrubland and herbaceous), steep slopes and Special Habitat 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.



Forest Park and Northwest Hill Resource Sites 21-41

Updated: April 2020



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



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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 1: Forest Park and Northwest District Resource Geography (Resource Sites 21 – 41)

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 the 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 Forest Park and Northwest Hills 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. Forest Park and Northwest District Natural Resources

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

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

The forest moderates extreme heat events. The microclimate of the forest, created in part by the shade of the vegetation and the transpiration of water from the leaves, reduces extreme temperatures. The forest thus acts as a natural "air conditioner" for adjacent residential areas, cooling the air during the day and warming it at night.

The forest provides additional values to local landowners and broader segments of society. The dense, coniferous and deciduous forest acts as a buffer from the sights and sounds of the large urban metropolis. The forest mutes the noise of highways and nearby industrial activities and absorbs some air pollutants produced by auto and industrial emissions.

E.1.a Geology

Portland has been the site of a series of spectacular geologic events dating back 22 million years. These events have included some of the largest lava and water floods on the face of the earth (Price 1987). The major events leading to the formation of the Portland Hills (Tualatin Mountains) began sixteen million years ago during the Miocene period. Volcanic fissures far to the east of Portland began discharging hundreds of cubic miles of molten lava which flowed through an ancient Columbia River Gorge, flooding the Willamette River Basin region. The solidified lava, known today as Columbia River Basalt, covered the Scappoose Formation, a siltstone and shale deposit which had formed 22 million years ago when the Portland area was

submerged under marine waters. Today, after millions of years of weathering, the basalt measures roughly 700 feet in depth below the West Hills (Houle 1987).

Geologic disturbances continued through the late Miocene period, when the present-day Cascade and Coast Ranges were formed. At the same time, a large upheaval of Portland's basalt base created the Tualatin Mountain ridge and simultaneously formed the Portland and Tualatin valleys. The valley floors settled over the course of several million years until, in the Pliocene period, their basins breached, forming eddies in the Columbia River into which large quantities of quartzite and granite river rock were deposited. Today these deposits, known as the Troutdale Formation, cover the original basalt layer along the lower half of the West Hills and provide an excellent aquifer (Price 1987). Later in the Pliocene period, the West Hills became volcanically active. Small volcanoes along the Tualatin Mountain ridge began erupting Boring Lava, evident today in the form of a grey basalt found at several sites along the West Hills.

The last major activity affecting the soils of the Northwest Hills area were formed through the deposition of up to 100 feet of Portland Hills Silt at elevations above 600 feet. This silt was eroded from the Columbia River floodplain, carried down the gorge, and finally wind-deposited on the West Hills. In the more recent geological past, silt and sand (alluvium) deposits formed along the Willamette River flood plain (Price 1987).

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

E.1.b Soils

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

Most of the west hills are made up of Goble soils. The soil is dark, greyish brown silt loam to a depth of about 14 inches, below which a silty clay loam mixes with silt loam forming a yellowish brown, mottled fragipan at a depth of 30 to 48 inches. This fragipan is a hard, brittle soil layer with low permeability: a hardpan that impedes percolation of groundwater causing a thin groundwater table to develop, perched above the regional water table.¹ The fragipan restricts rooting depth for plants to 30 to 48 inches. The Goble silt loams have severe limitations for building site development and septic systems.

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

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

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

E.1.c. Topography and Slopes

The eastern face of the Tualatin Mountain range has many streams flowing northeast to the Willamette River. The streams flow through, or are piped through, the lowland area between the Willamette River and Highway 30 (with elevations ranging from 30 to 40 feet mean sea level). Climbing southwest from Highway 30, the hillside slopes become steep before leveling off near the ridgetop along Skyline Boulevard. Elevations range between 900 and 1,180 feet mean sea level along the crest of the Tualatin Mountains.

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

A physiographic inventory of Portland (Redfern 1976) classified slopes in excess of 30 percent as generally having "severe landslide potential." Between 90 and 95 percent of the upland slopes within the study area exceed 30 percent. Slopes of only 15 percent have been known to fail in the West Hills, particularly during the saturated soil conditions in mid-winter (Redfern 1976). Most soils in the West Hills drain poorly. The subsoil usually includes a fragipan, which is a layer less permeable to water than the upper layers. Fragipans limit the rooting depth of many plants. A seasonal water table is perched on top of fragipans every winter. The typical soil profile amounts to high erosion and slumping hazard due to the seasonal water table, slow permeability, low strength, and the tendency of the upper layers to slide over the fragipan whenever they become saturated.

Slumping is common in the West Hills, especially when bare soil is exposed to rainfall or when soil is cut or filled. Several major landslides have occurred in the West Hills. The instability of the soil is a major reason why much of the West Hills have not been developed and is now included in parkland, wildlife sanctuaries, open space, farm, and forest zones. Extreme care must be taken when disturbing these soils, and vegetation must be reestablished quickly on disturbed areas to prevent erosion, sliding, and slumping.

E.1.d. Surface Water and Flooding

Surface water resources within the study area were identified using USGS topographic map, LiDAR data, National Wetlands Inventory maps, aerial photos, and field work. Stream lengths and drainage basin areas are calculated using a Geographical Information System (GIS) and LiDAR data.

There are approximately 37.3 miles of perennial and intermittent creeks within the project study area. Most of these creeks are intermittent riverine systems. As described earlier, all the creek channels have steep to moderately steep gradients which result in high flow velocities and a relatively large capacity for sediment transport and erosion.

Associated with the creeks are several palustrine wetlands formed principally as a result of mining and roadway excavations, beaver damming activity, and natural depressions in the uplands and along the Willamette River flood plain.

Surface water drainage between the crest of the Tualatin Mountains and Highway 30 passes primarily through natural channels. Most of the creeks pass through culverts under Highway 30 and the Burlington Northern Railroad and from there enter pipes that outfall to the Willamette River.

Balch and other creeks within the area flow through steep, forested ravines and provide wildlife with a protected travel corridor, refuge from high summer temperatures, and a perennial source of water. Thick riparian forests protect streams and the integrity of their banks and influence the quality of stream habitat throughout. Large quantities of silt are present in several of the streams, providing evidence of the consequences of vegetation removal associated with previous upstream development. Other sources of silt include upstream landslides and bank failures related to new construction.

E.1.e. Vegetation

Information on plant communities, successional patterns and general vegetation resources was compiled from several sources. Data on vegetation types, distribution and resource values was gathered through aerial photo interpretation and field visits.

The eastern slopes of the Tualatin Mountains are clothed by coniferous forest of the *Tsuga heterophylla* (western hemlock) vegetation zone. This zone extends throughout the wet, mild, maritime climate of British Columbia, western Washington and western Oregon. A vegetation zone delineates a region of essentially uniform macroclimatic conditions with similar moisture and temperature gradients where one plant association predominates. The lowlands immediately adjacent to the forest are part of the more prairie-like Willamette Valley Zone. Emergent, scrub-shrub and forested wetland plant communities reside along some of the creeks and in the palustrine wetlands that occur within the study area.

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

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

The *Tsuga heterophylla/Polystichum munitum* (western hemlock/sword fern) association generally characterizes the herb-rich community found in the Northwest Hills forests. Overstory species of this association typically include Douglas fir, western red cedar and western hemlock. In areas where invasive species like ivy have not taken over, the understory is dominated by a lush growth of herb species including sword fern, wild ginger, inside-out flower, Oregon oxalis, trillium, Smith's fairybells and deer fern. Shrubs occurring in the understory include red huckleberry, Oregon grape, trailing blackberry, Wood's rose and salmonberry.

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

The forest types occurring in the Northwest Hills represent a sequence of successional stages of forest regeneration following logging and fire. These stages closely parallel those of the Western Hemlock Zone as described by Franklin and Dyrness (1988) and Hall (1980). Six distinct successional stages are evident within the study area; their patchwork distribution reflects the location, degree and chronology of past disturbances. Houle (1982) describes the stages of the West Hills forest succession as: grass-forb, shrub, hardwood with young conifer, hardwood topped by conifer, mid-aged conifer and old growth vegetation types. One additional vegetation type, mature hardwood, is also recognized but is not related to the Western Hemlock Zone successional sequence. This type typically occurs in moist to wet areas at lower elevations although occasionally it is found on dryer, upland sites. The distinguishing characteristics of the mature hardwood type are the dense stands of bigleaf maple and red alder and the sparse distribution of conifers.

The grass-forb stage is comprised of low, herbaceous plants such as fireweed, bracken fern and Canadian thistle which initially colonize an area after removal of vegetation. This stage lasts approximately two to five years and occurs along fire lanes, power-line rights-of-way and in open fields along the crest of the hills and in lowland areas. The early seral shrub stage often develops as a thicket of thimbleberry, salmonberry, blackberry, red huckleberry, salal and Indian plum. This stage typically lasts between three and ten years but will persist as long as 30 years in the absence of conifer regeneration.

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

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

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

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

The Tualatin Mountain forest is home to several special or unique flora features. The pacific yew (*Taxus brevifolia*) is an exceptionally slow growing climax tree species most abundant in ancient forests of the Pacific Northwest. In recent years, a cancer fighting substance known as "taxol" was discovered in the bark of the yew. Taxol has proven effective in fighting ovarian cancer and

early results indicate that the substance may also prove effective for treating leukemia and colon, lung, mammary, prostrate and pancreatic cancers (Wood 1990; Norse 1990).

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

English ivy (*Hedera helix*) was introduced to the area at the end of 19th century as a horticultural plant and is identified as an escapee as early as 1929 (Christy et al. 2009). As time has progressed, so has the distribution of this invasive species. In the west hills, English ivy is dominant throughout the disturbed edges of the forests, including backyards. In 1994, in an effort to provide meaningful employment for local youth while raising the profile of English ivy as an invasive species, the No Ivy League was born with help from various community partners. In 2004, the City of Portland conducted a vegetation inventory of Forest Park, which makes up much of the west hills. This survey revealed that over 2,300 acres or 49% of the park had no presence of English ivy (City of Portland Parks and Recreation 2011). Of the total acreage, approximately 1,112 acres or 23% of the park included trace amounts of English ivy which is defined as less than 1 percent of a given area. From this analysis the conclusion can be drawn that over 70% of the park is not significantly impacted by English ivy. It is critical that its distribution be controlled to ensure that the larger percentage of the park continues to remain free of ivy. Figure 1 shows the distribution of English Ivy in Forest Park (2004).

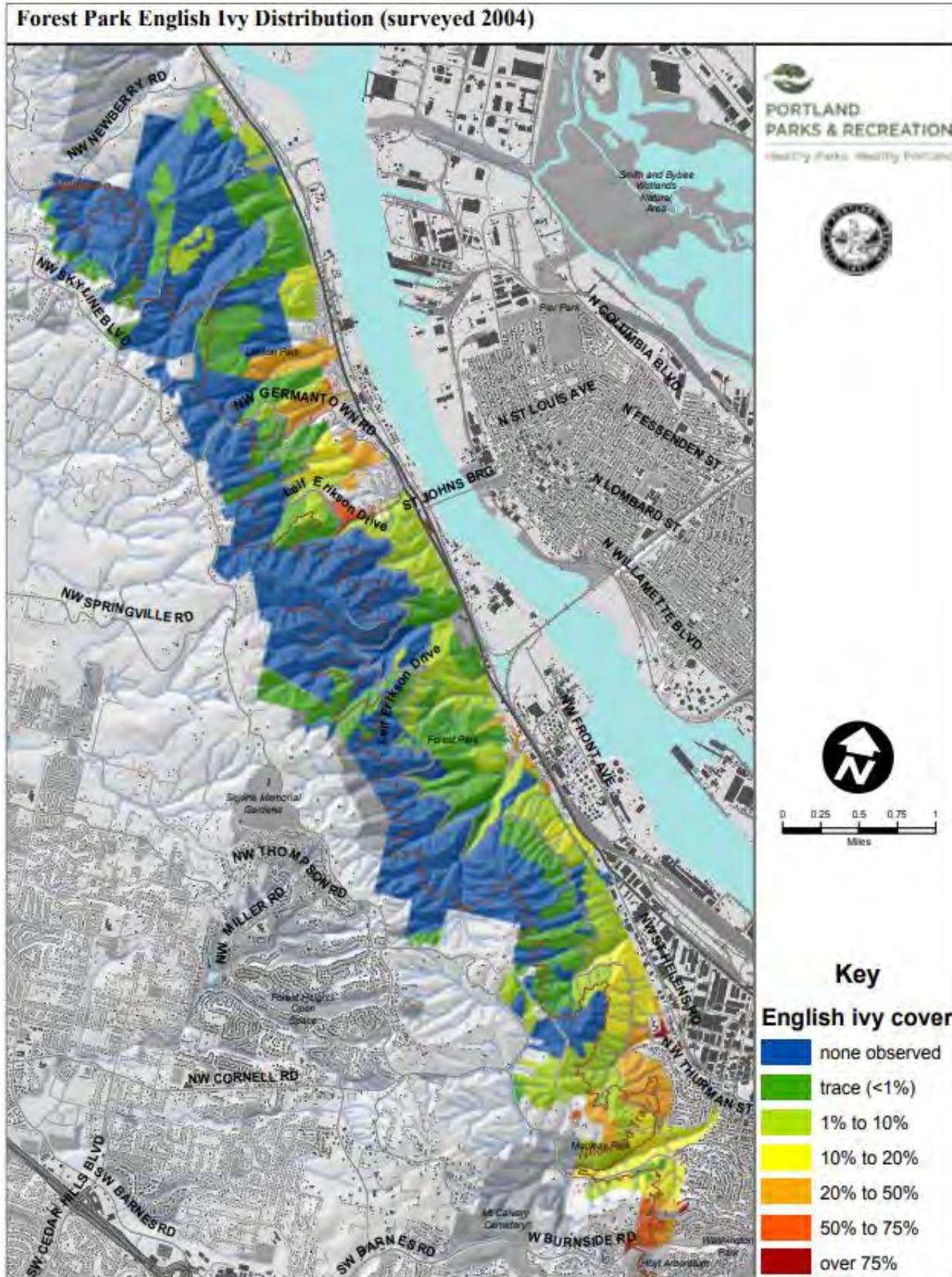


Figure 1: Distribution of English Ivy in Forest Park (2004)

While English ivy might be the most publicly recognizable invasive species in the west hills, other species pose a threat to ecosystem health. In addition to English ivy and clematis (*Clematis vitalba*), invasive tree species such as English holly (*Ilex aquifolium*), non-native laurel (*Prunus lusitanica* and *P. laurocerasus*), non-native cherry (*Prunus avium*), English hawthorn (*Crataegus monogyna*), horse chestnut (*Aesculus hippocastanum*), and Norway maple (*Acer platanoides*) are found. In Forest Park, of particular concern is English holly as it is present in greater numbers than other invasive trees and was found to be the most widely distributed invasive species in Forest Park (City of Portland 2004).

A coordinated campaign to address garlic mustard (*Alliaria petiolata*) throughout the Portland Metro area and in the west hills has been ongoing. In Forest Park, garlic mustard is found along roadsides and trails; it has been inadvertently distributed by park users and domesticated and wild animals. This particular species is of significant concern because of its documented ability to disturb woodland ecosystems. Garlic mustard exudes chemicals from its roots that may prevent other plants from thriving. As a result, it has the capacity to significantly alter the native woodland herbaceous plant community – reducing plant diversity, destroying palatable forage for wildlife, and reducing opportunities for pollinators.

The potential for the introduction of new invasive species to Forest Park due to the disturbed edge that exists along the park boundary and the proximity to residential properties is high. This requires constant vigilance and a quick response to new invasive plants as they appear. Portland Parks and Recreation is addressing several invasive species that have newly arrived to the park's perimeter, primarily through the illegal dumping of yard debris. These species include lesser celandine (*Ranunculus ficaria*), yellow archangel (*Lamium galeobdolon*), butterbur (*Petasites japonica*), and spurge laurel (*Daphne laureola*). Long-term protection of Forest Park from invasive species will require a significant outreach program to private property landowners to address invasive species control at the interface between public and private property.

Within Forest Park, Portland Parks and Recreation and the Bureau of Environmental Services have conducted restoration and enhancement projects. As part of the Renew Forest Park Initiative started in 2014, a significant investment has been made by Portland Parks and Recreation, and partners, to control invasive weeds and replant with native species in this Resource Site. As part of Restore Forest Park a significant investment has been made by a partnership including City of Portland, Bonneville Power Administration and Metro to control invasive weeds and plant native pollinator species within the powerline corridors.

E.1.f. Aquatic Species

Most of the streams and their tributaries flowing through the study area are cool, well-shaded, and well-aerated free-flowing aquatic systems. However, many roads and trails bisect Forest Park streams, and where culverts pass flows through undersized culverts (such as Leif Erikson Drive), surcharging, erosion, and debris flow events can occur.

Special status fish species observed in the study area include coho salmon, cutthroat trout, and steelhead trout. All resource area streams flow into the lower Willamette River, designated as critical habitat for five populations of Pacific salmon and steelhead. One stream in particular, Miller Creek, is designated critical habitat for Lower Columbia River coho salmon. Miller Creek also supports a population of steelhead trout, although it is not federally designated specifically as critical habitat for this species. Miller, Saltzman, and Balch Creeks continue to serve coastal cutthroat trout as both spawning and rearing habitat.

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.² 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

² 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
	Road crossings	Number of road crossings per kilometer
Large Wood	Large wood volume	Volume of wood with diameter \geq 15cm & length \geq 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
	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 benchmarks³ and the City’s Watershed Health Index⁴ 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 2 shows the results of the streams survey within the Forest Park and Northwest Hills area.

³ 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/files/interpgd.pdf>

⁴ City of Portland Bureau of Environmental Services, Watershed Health Index and Report Cards.

<https://www.portlandoregon.gov/bes/reportcards>.

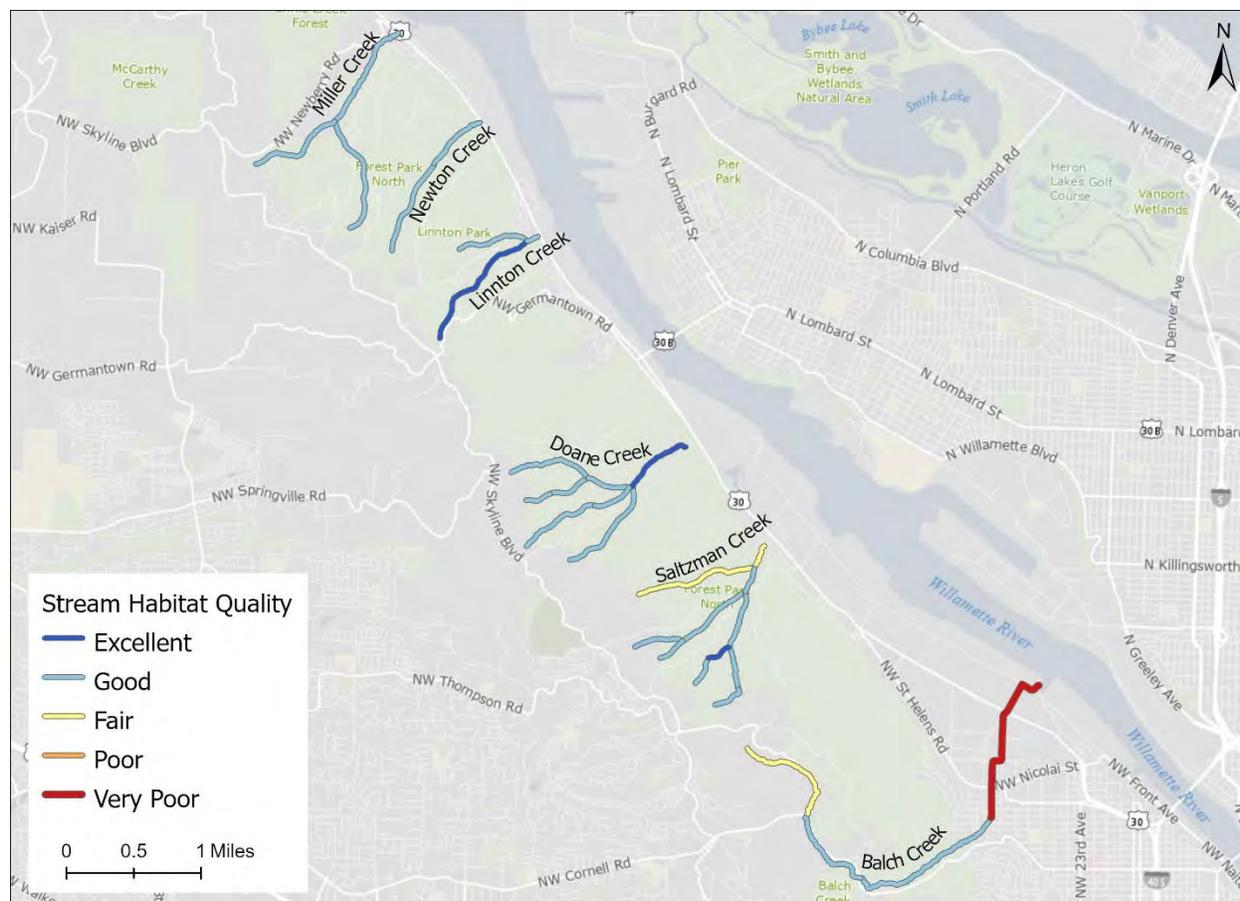


Figure 2: Stream Survey Results

E.1.f. Wildlife

For additional information about wildlife species within Forest Park please refer to the Forest Park Wildlife Report, Portland Parks and Recreation, December 2012 (<https://www.portlandoregon.gov/parks/article/427357>).

Wildlife use Northwest Hills forest habitats to complete various life cycle stages 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 shaping the distribution and abundance of wildlife (Thomas 1979). Each stage of forest succession in the Northwest Hills has its own specific structure. Wildlife species have known preferences for structural components found in distinct successional stages and use these vegetation types to meet all or part of their life cycle requirements (Maser and Thomas 1978; Harris 1984).

A broad range of terrestrial vertebrates use the forested riparian and upland habitats found in the west hills. Salamanders use stream and riparian habitat and moist uplands, where they feed on insects and other invertebrates such as slugs, and are prey to other amphibians (frogs), reptiles (snakes), birds (hawks), and mammals (weasels, raccoons). These local salamanders are

dependent on a moist, forested environment and cool, high quality water. Coastal giant salamanders are abundant as neonates in the low reaches of major streams in the park, and adults are occasionally found in streams and nearby upland habitat. A single survey in Saltzman Creek in 2011 found 90 juvenile giant salamanders there.

Several frog species are also dependent on the moist forested environment found in the Northwest Hills. These species feed on salamanders, insects and other invertebrates, and are prey to many local snakes, birds and mammals. Northern red-legged frogs, an Oregon vulnerable species and federal species of concern, are relatively common in both riparian and upland habitats in Forest Park. Special status amphibians observed in the study area includes coastal giant salamander, northwestern salamander, and spotted frog. The presence of these native amphibians is of further significance because of the decline of amphibian populations worldwide due in part to predation (e.g., by bullfrogs) and to increased UV radiation that results from deforestation.

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

The mature conifer, conifer-topping hardwood and old growth stages of the forest described in the previous section support populations of breeding birds. Bald eagles are observed throughout Forest Park. Other birds of prey include Cooper's hawk and sharp-shinned hawk which rely on tall conifers for nest sites. Several nocturnal avian predators including screech, sawwhet and northern pygmy owls also occur in the Northwest Hills. These owls are cavity-nesters that rely on snags with holes excavated by pileated woodpeckers or flickers.

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

One hundred and four avian species are known to occur in Forest Park, and about a dozen of these are rare (City of Portland, Parks and Recreation 2012). Several migratory bird species, which typically nest at higher elevations or further north, use the west hills forest as an overwintering ground due in part to the area's mild climate. Still other species, which migrate from Central and South America, use the forest as a stop-over and resting place on their journey along the Pacific Flyway. These birds (e.g., flycatchers, warblers, vireos, etc.) use prominent geographic landforms such as the western terminus of the Columbia Gorge and the confluence of the Willamette and Columbia Rivers to orient themselves when migrating. Many of these species are "forest-interior" birds that only use large forested areas, and the west hills provide the largest forest near the river confluence. In recent years, the varied thrush, a Special Status

Species, has been detected singing in the North Management Unit throughout the spring and early summer, and is now considered a breeding species in the park. In contrast, large flocks of varied thrush overwinter in the park annually.

Many mammal species use the west hills forest habitat. Forty-five species of mammals representing seven taxonomic orders are known to occur in Forest Park (City of Portland, Bureau of Parks and Recreation 2012). These species include northern flying squirrel, Townsend's chipmunk, black-tailed deer, mountain beaver, and bobcat. Bobcat are secretive and nocturnal, but adults with young have been photographed near Balch Creek. Bobcats breed annually beyond the park boundary along Cedar Mill Creek on the west side of the Tualatin Mountains. Bobcats are presumed to occupy and use Forest Park at the low densities typical for medium-sized, wide-ranging carnivorous species. Cougar have never been reported in Forest Park. Coyote, raccoons, striped skunks, long-tailed weasels, and short-tailed weasels are relatively common and well distributed in Forest Park. All of these species are primarily active at night and are seldom encountered by park visitors. In contrast, several other carnivores are considered rare in Forest Park.

Many of the species found in the area are also found in the natural areas of the Oregon Coast Range. In addition to its habitat functions, the forested hills extend northwest from Portland toward the coast and serve as a travel corridor for wildlife, facilitating the seasonal and longer-term dispersal of individuals, thus maintaining genetic and biological diversity.

E.1.g. Special Habitat Areas

Special Habitat Areas are habitat or unique features 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.

There are many areas in the west hills 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: bald eagle, band-tailed pigeon, black-throated gray warbler, brown creeper, bushtit, common yellowthroat, downy woodpecker, Hammond's flycatcher, Hutton's vireo, merlin, Nashville warbler, olive-sided flycatcher, orange-crowned warbler, osprey, pacific-slope flycatcher, pacific wren, peregrine falcon, pileated woodpecker, purple finch, red-eyed vireo, rufous hummingbird, Swainson's thrush, varied thrush, Vaux's swift, western wood-pewee, willow flycatcher, Wilson's warbler, Pacific western big-eared bat, long-eared myotis, fringed myotis, long-legged myotis, northern red-legged frog, and coastal cutthroat trout.

Forest Park 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.

- 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.)
- 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

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

Wetlands are also designated Special Habitat Areas because they meet the criterion for wetland (W). Wetlands and associated seeps and springs provide criteria watershed functions including improving water quality, storing water and reducing flood risks, contributing to summer in-stream flows and providing habitat for wildlife, including some at-risk species like red-legged frog. Some of these wetlands are found within Forest Park and others are on private property outside of the park. The relationship between forests and wetlands, in and outside of Forest Park is particularly important to red-legged frog, a Special Status Species.

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.

Resource Site No.: FP21 **Resource Site Name:** Lower Saltzman Creek

Previous Plan: West hills Natural Areas Protection Plan

Previous Resource Site No.: 89

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

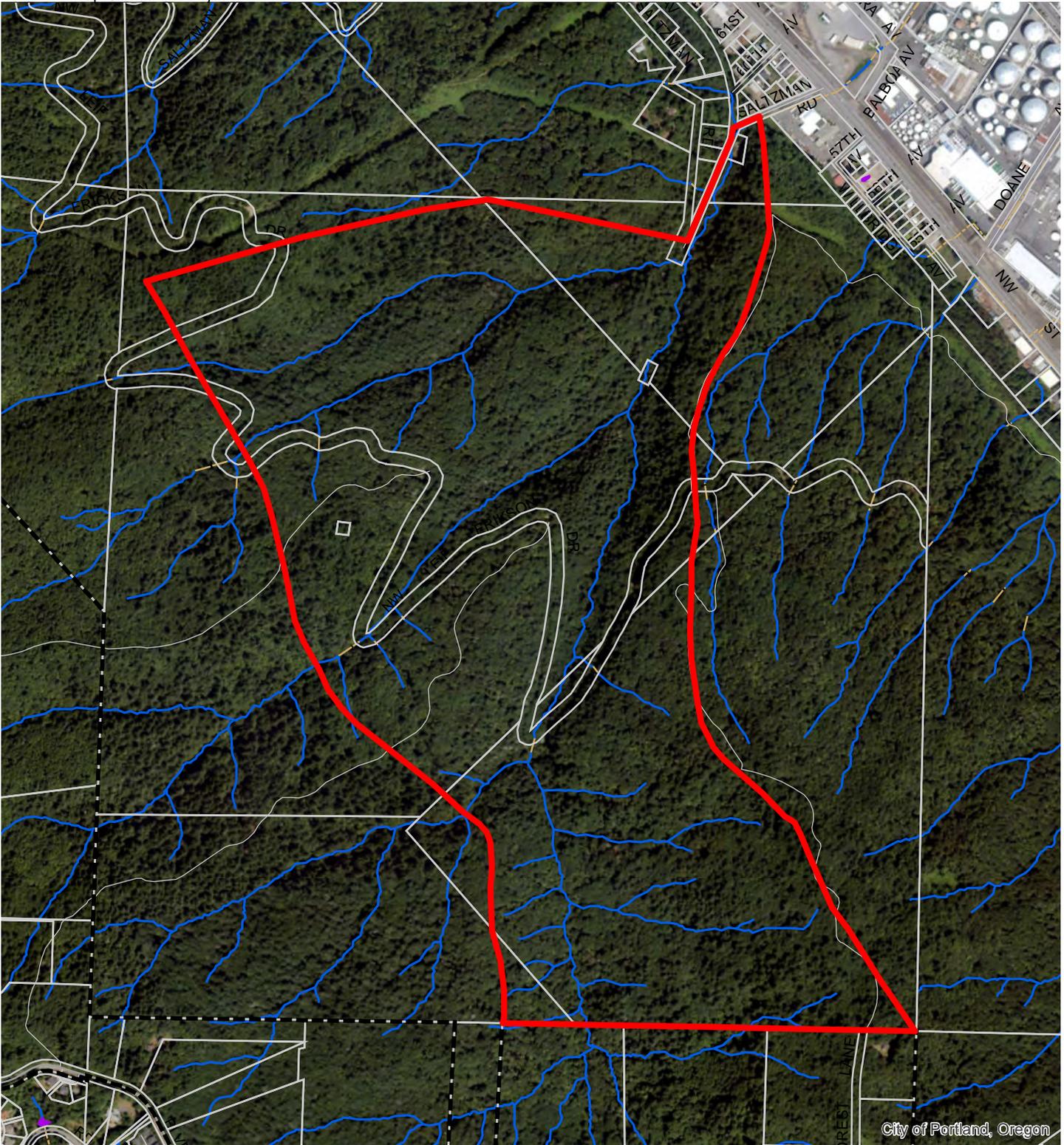
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 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 FP21 includes the following:

Site (acres)	302.1
Base zones (acres)	
OS	301.6
R10	0.4
R2.5	0.0

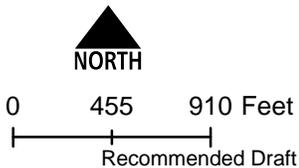


City of Portland, Oregon

Map A: Water Features

Resource Site: FP21

Updated: July 2021



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



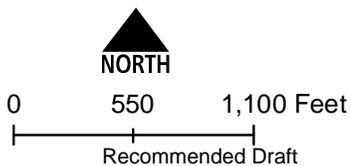
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.
January 2022



Map B: Vegetation and Steep Slopes

Resource Site: FP21

Updated: July 2021



- Resource Sites
- Urban Service Boundary
- Taxlots
- Slopes >25%
- Forest
- Woodland
- Shrubland
- Herbaceous

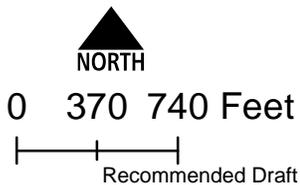


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January 2022



**Map E: Wildlife
Habitat Classification
Resource Site:
FP21**

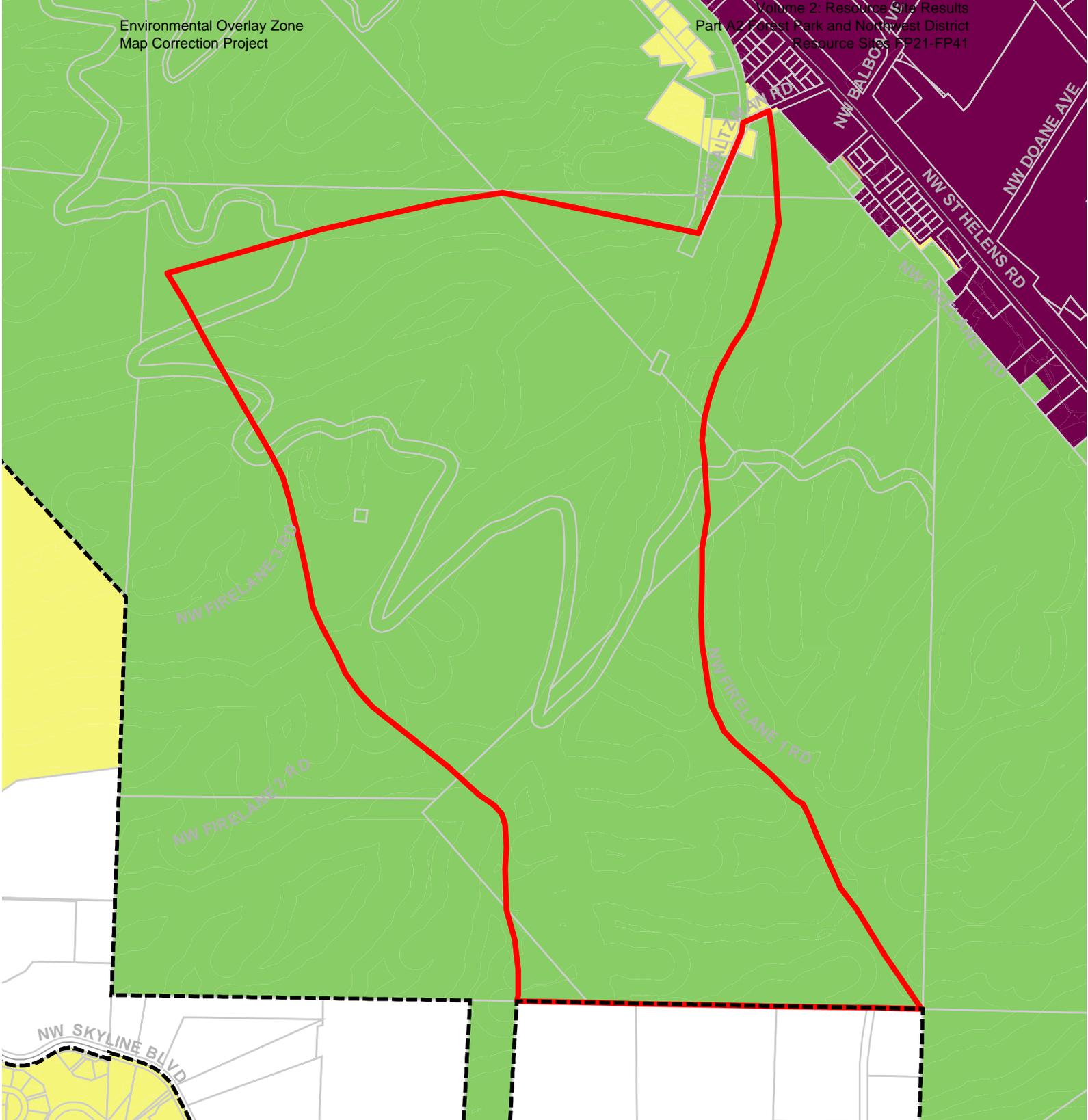
Updated: July 2021



-  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.
January 2022

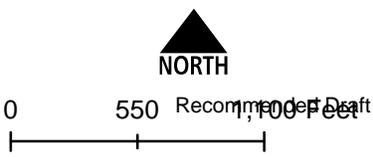


Map F: Urban Development Value (Title 13)
Resource Site: FP21

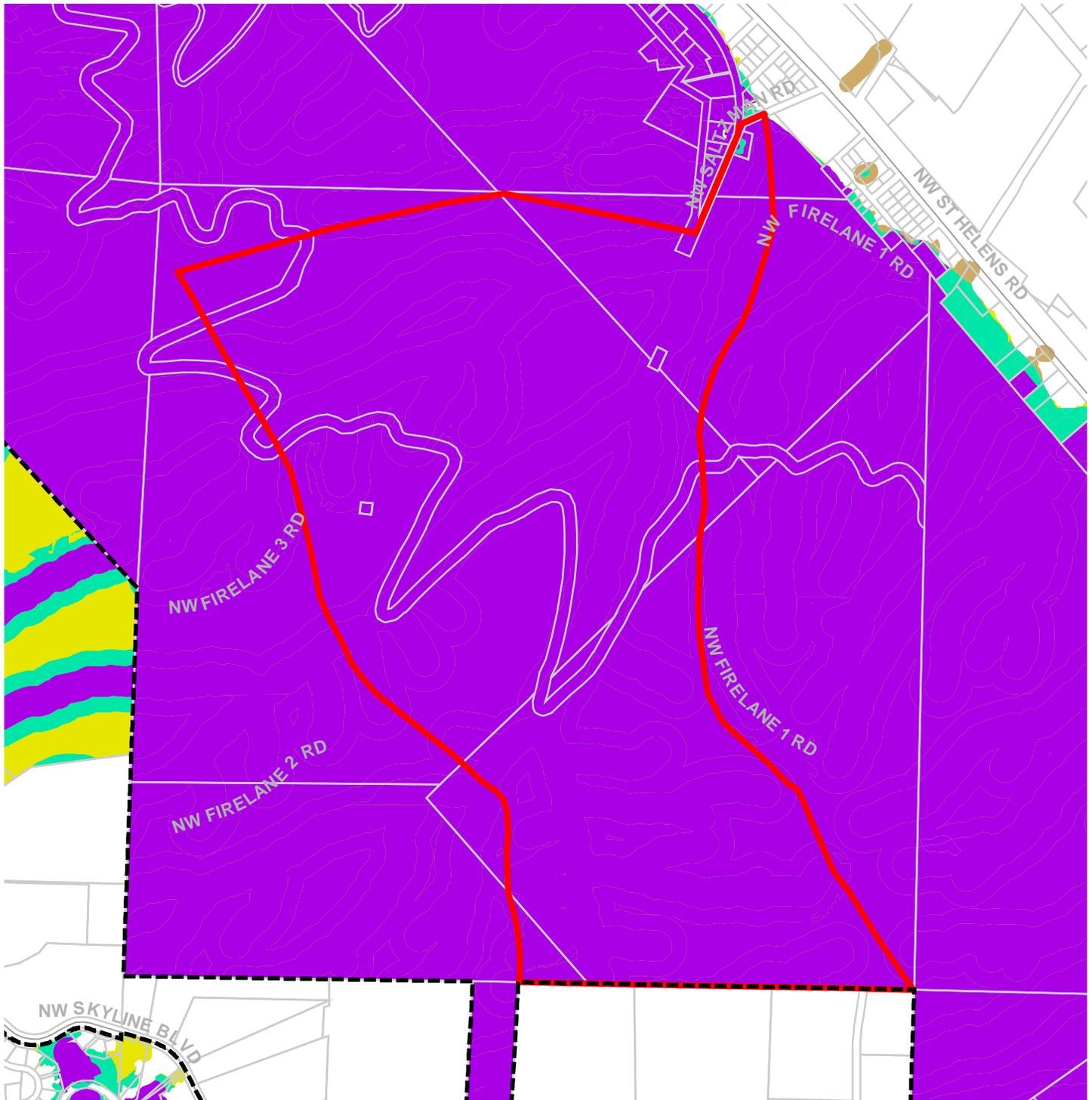
-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks



Updated: July 2021



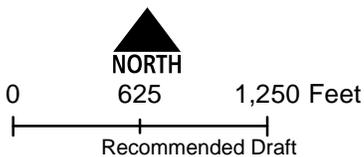
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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: FP21

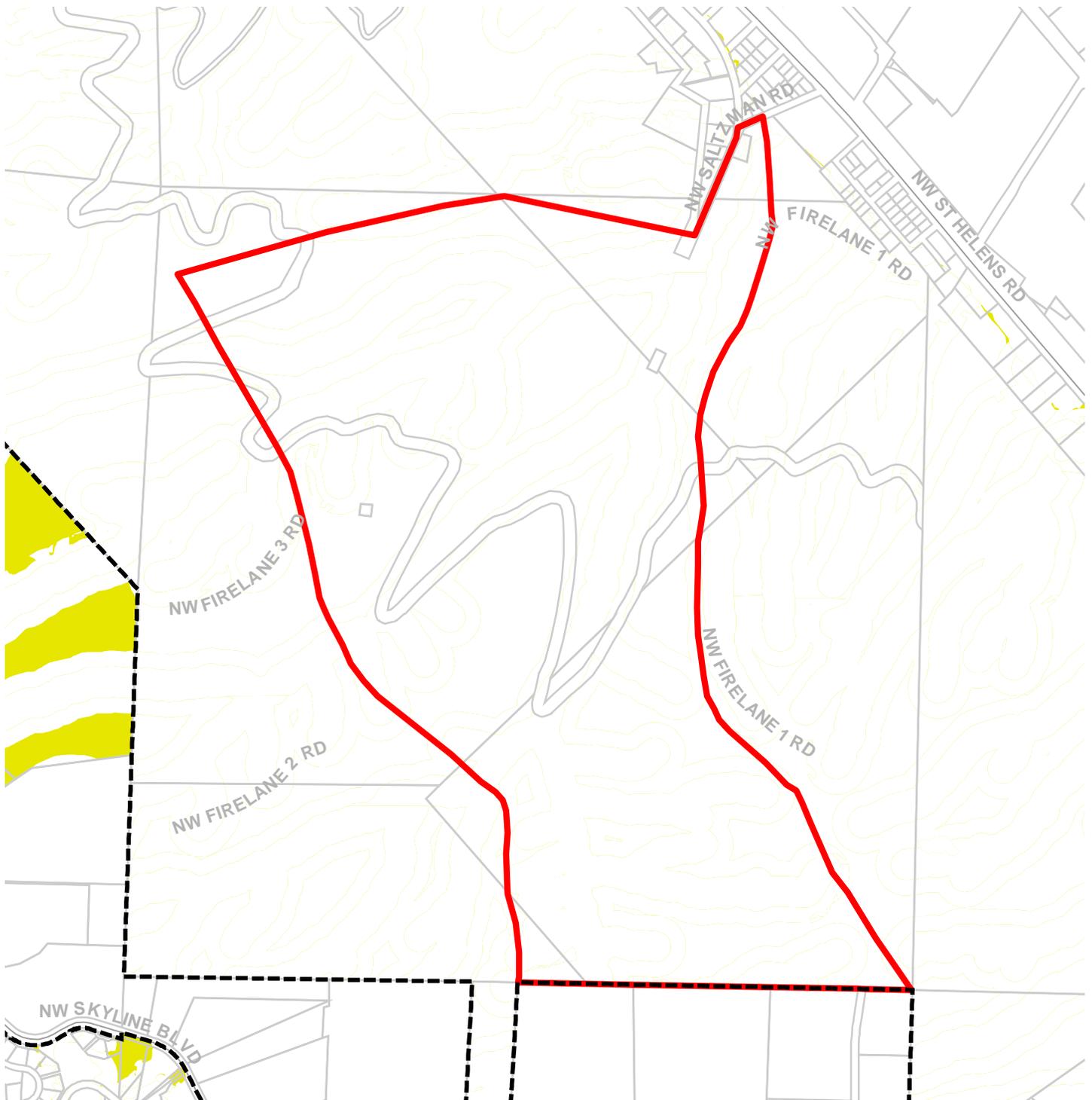
Updated: July 2021



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



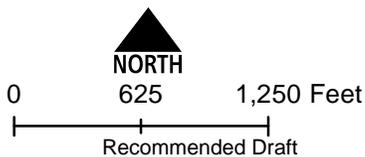
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Map H: Goal 5 Resources

Resource Site: FP21

Updated: July 2021



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



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January 2022

Natural Resource Description

Within resource site FP21 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: Forest Park (O, B, M, C, S, P, 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 FP21	
	Study Area
Stream (Miles)	5.0
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	301.7
Woodland (acres)	0.2
Shrubland (acres)	0.0
Herbaceous (acres)	0.0
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	297.1
* 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 forms the lower half of the Saltzman Creek watershed. The lower basin is clothed in a predominantly deciduous second growth forest, with well-developed riparian vegetation including western wahoo and galleries of alder along the creek bed. The two most common vegetation types are mature hardwood and conifer-topping hardwood, the former typical of riparian areas and the latter common on upland slopes. Forest cover provides open space, scenic and recreational resources; serves as habitat for resident and migratory wildlife; and helps to balance the local water regimen. Snags, downed logs and woody debris found at the site are critical structural and functional components of the watershed. Invasive species such as ivy, holly, morning glory and laurel are present and may impact the native plant community, particularly around Saltzman Road.

Saltzman is a year-round creek which provides high quality habitat for coastal cutthroat trout, macroinvertebrates and amphibians. The site also provides food, water and cover habitat for birds (e.g., pileated woodpecker, great horned and pygmy owls, red-tailed hawk and a variety of songbirds) and mammals (e.g., shrew mole and coyote). The site’s interspersion with adjacent forest habitat permits wildlife migration in all directions except east. St. Helens Road and industrial development to the east impede wildlife movement between the forest and the Willamette River. The site’s aquatic habitat has been adversely impacted by the establishment of Highway 30 and industrial hardscape on top of the stream that force Saltzman Creek into long culverts and concrete ditches, urban garbage, and by an infestation of Himalayan blackberry.

Table B: Quality of Natural Resource Functions in Resource Site FP21				
Resource Site (acres) = 302				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	115.5	94.2	92.4	302.1
percent total inventory site area	38.2%	31.2%	30.6%	100.0%
Wildlife Habitat*				
acres	301.9	0.0	0.0	301.9
percent total inventory site area	100.0%	0.0%	0.0%	100.0%
Special Habitat Areas**				
acres	301.7			
percent total inventory site area	99.9%			
Combined Total⁺				
acres	301.9	0.1	0.0	302.1
percent total inventory site area	100.0%	0.0%	0.0%	100.0%
* 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 FP21, 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 FP21			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
302.1	0.1	0.0	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 FP21. 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

All of the significant natural resources within resource site FP21 are designated Habitat Conservation Areas under Metro Title 13; therefore, no resource site-specific ESEE is required.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and the resource site-specific evaluation for FP21, 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. Within public parks, apply a protection overlay zone ('p' zone) to land between 25 and 50 feet of stream top-of-bank or wetlands; and within areas of forest, woodland, shrubland or herbaceous vegetation that are contiguous to but more than 50 feet from stream top-of-bank or wetlands.
3. Outside of public parks, apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet from stream top-of-bank or wetlands; and within areas of forest or woodland 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.: FP22 **Resource Site Name:** Firelane 1 East Bluff

Previous Plan: West hills Natural Areas Protection Plan

Previous Resource Site No.: 88

The results of the analysis found in Volume 3 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.

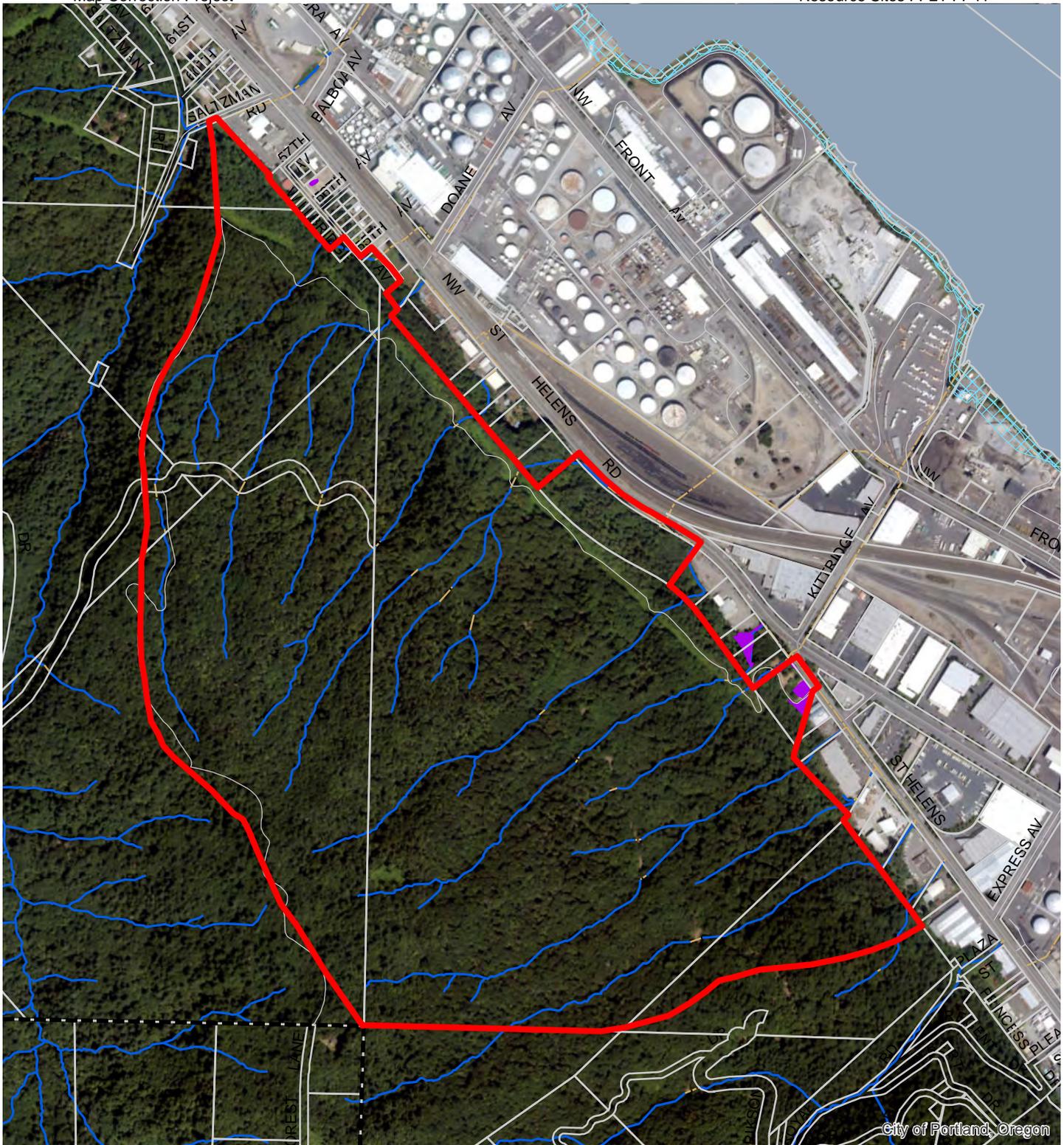
Resource site FP22 includes the following:

Site (acres) 344.3

Base zones (acres)

 IH 0.0

 OS 344.3

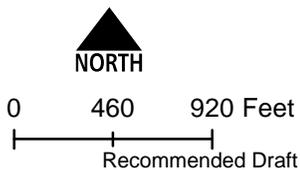


City of Portland, Oregon

Map A: Water Features

Resource Site: FP22

Updated: July 2021



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



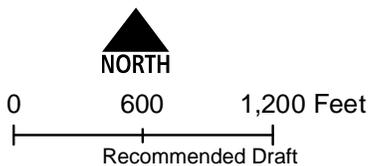
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Map B: Vegetation and Steep Slopes

Resource Site: FP22

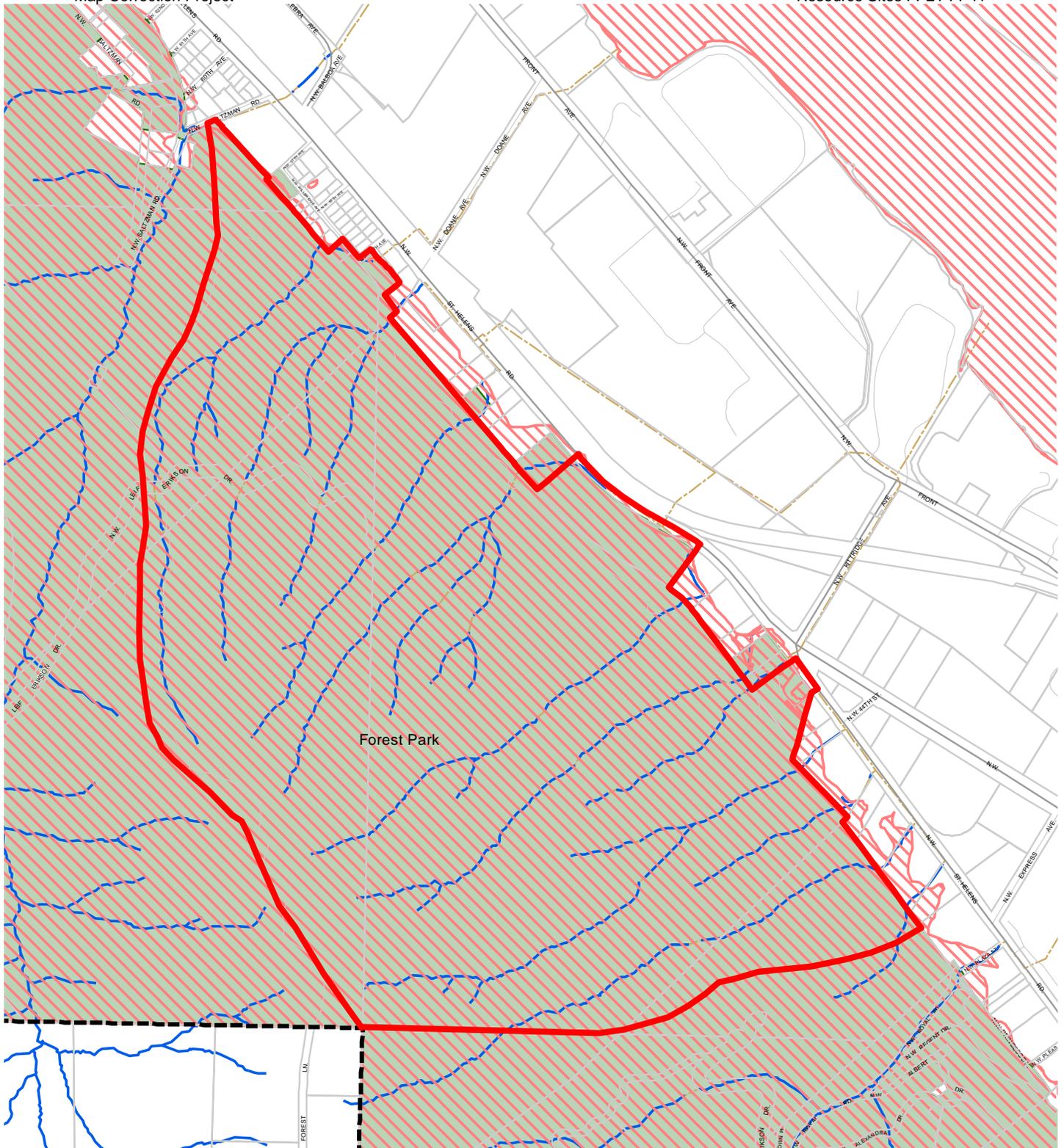
Updated: July 2021



- Resource Sites
- Urban Service Boundary
- Taxlots
- Slopes >25%
- Forest
- Woodland
- Shrubland
- Herbaceous

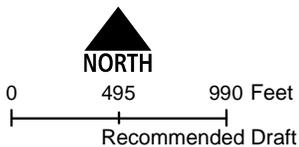


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**Map C: Special
Habitat Areas**
**Resource Site:
FP22**

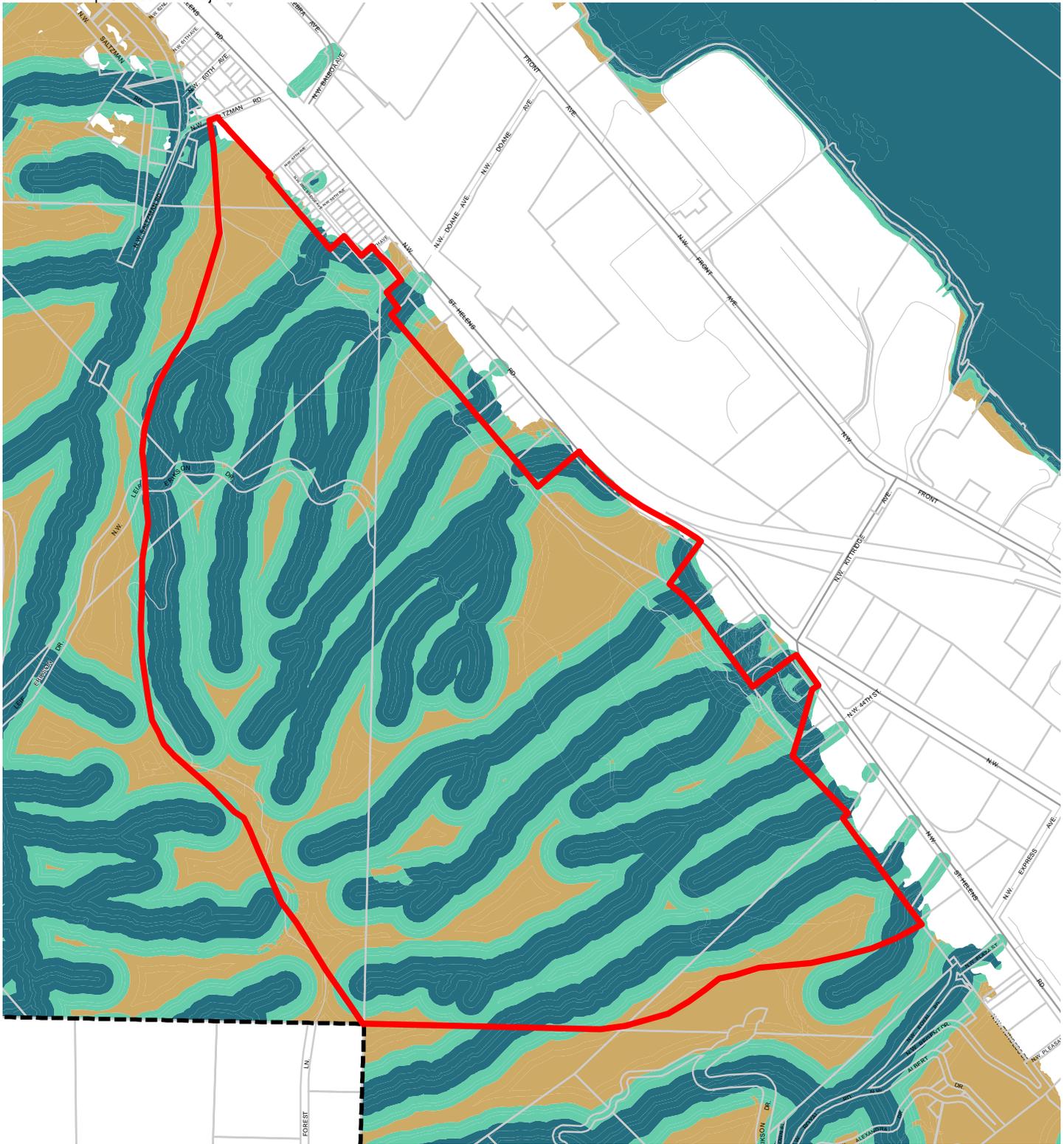
Updated: June 2021



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



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January 2022

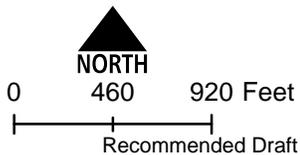


**Map D: Riparian
Corridors Habitat
Classification**

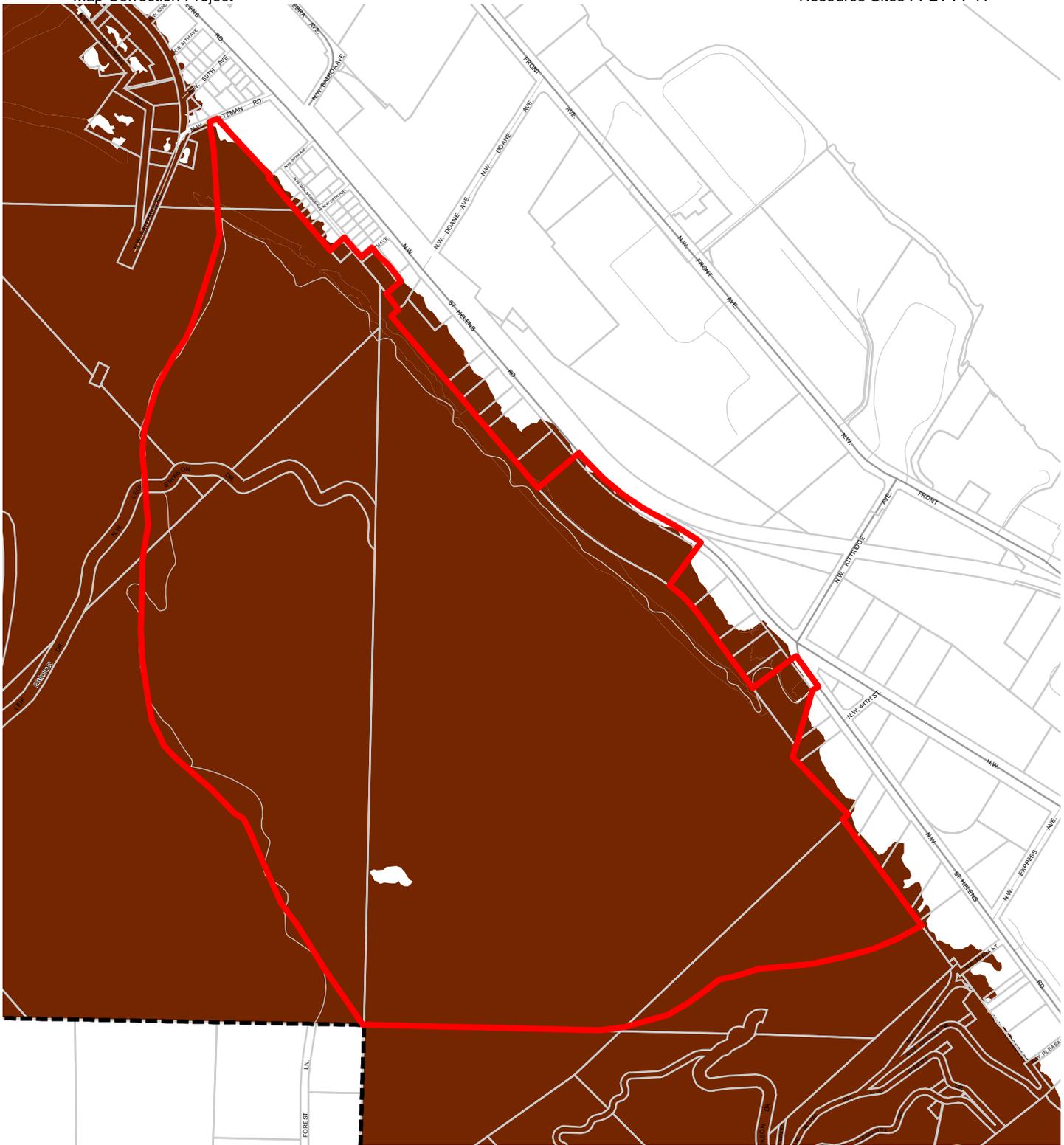
**Resource Site:
FP22**

Updated: July 2021

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

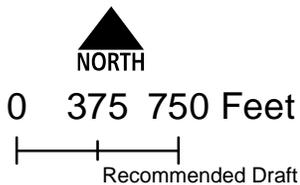


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**Map E: Wildlife
Habitat Classification
Resource Site:
FP22**

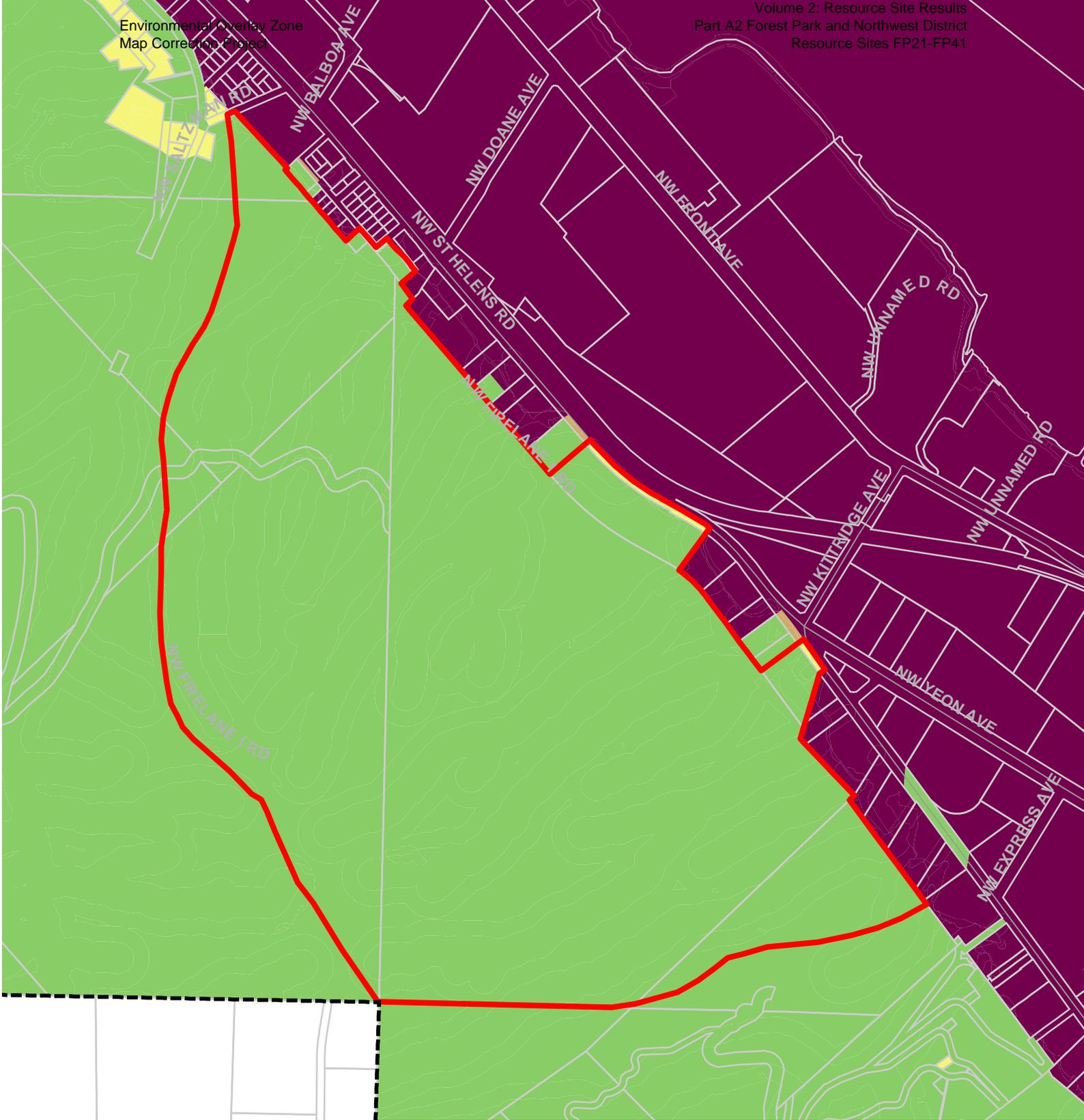
Updated: July 2021



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



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January 2022

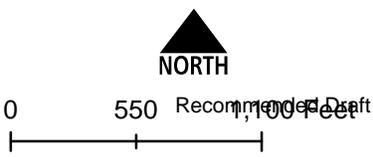


Map F: Urban Development Value (Title 13)
Resource Site: FP22

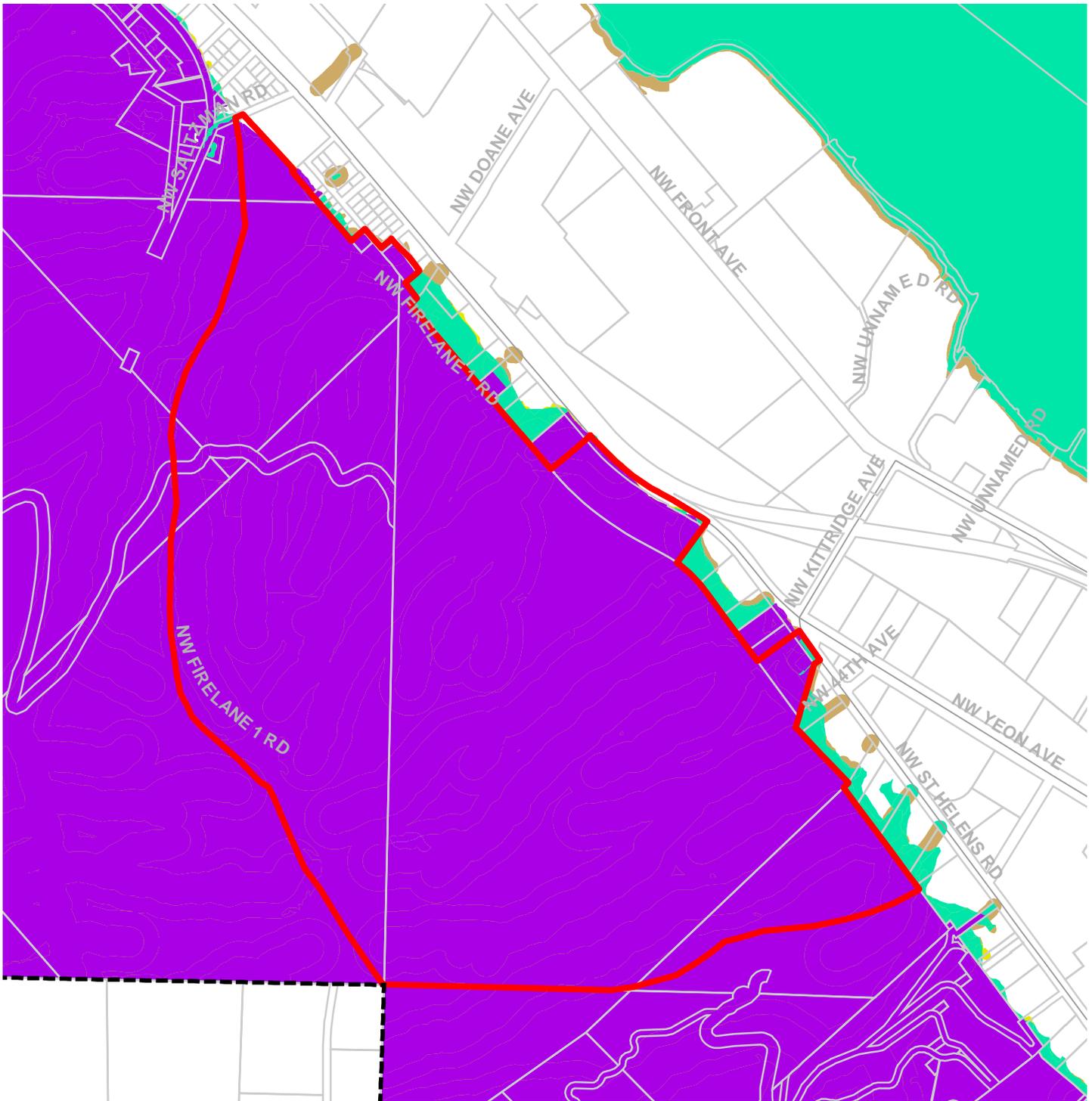
-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks



Updated: July 2021



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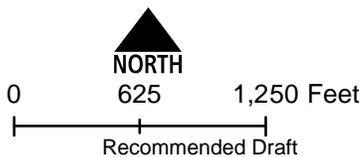


Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

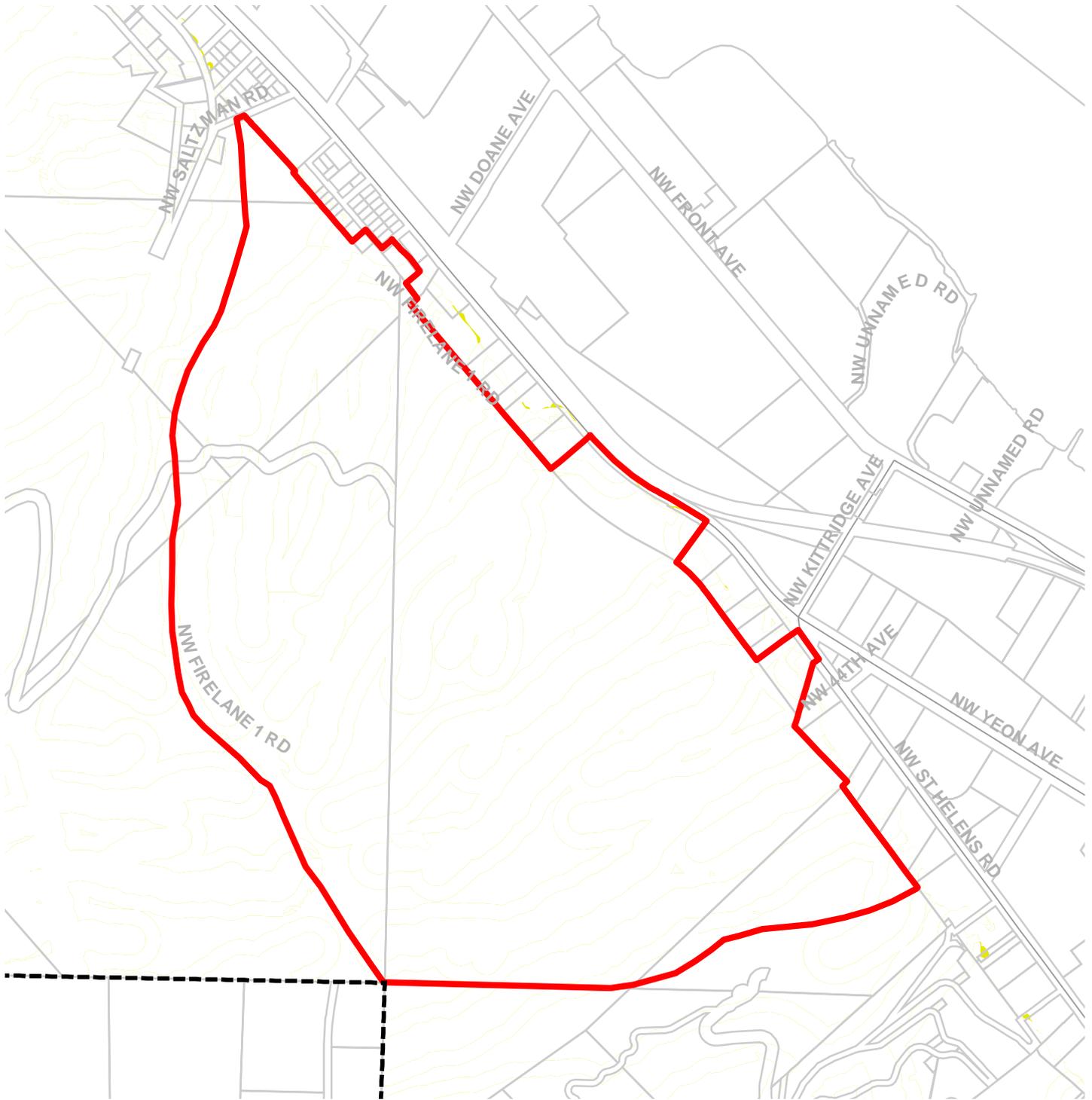
Resource Site: FP22

Updated: July 2021

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



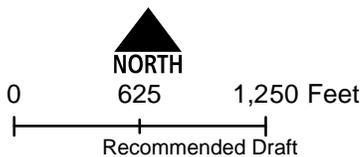
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Map H: Goal 5 Resources

Resource Site: FP22

Updated: July 2021



-  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.

January 2022

Natural Resource Description

Within resource site FP22 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: Forest Park (O, B, M, C, S, P, E); 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 FP22	
	Study Area
Stream (Miles)	6.6
Wetlands (acres)	0.4
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	333.6
Woodland (acres)	8.6
Shrubland (acres)	0.0
Herbaceous (acres)	0.5
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	338.4
* 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%.	

The largest stand of mature hardwood within the resource area exists in a wide band across the central portion of the hillside. Conifers are underrepresented throughout much of this area and are altogether absent along some of the drainages. Smaller stands of young to mid-aged second growth western hemlock forest exist along the base of the hillside and along the ridge. Forest cover protects watershed resources, serves as habitat for wildlife and provides open space, scenic and recreational values. The structure of the forest community is limited by the lack of tall conifers, large snags and herbaceous cover. Downed logs and woody debris found at the site, however, are critical structural and functional components of the watershed ecosystem. English ivy is spreading into the site near St. Helens Road.

This site provides moderate to high quality food and cover habitat for wildlife. Sources of water are limited to several small, seasonal drainages. Birds observed at this site include great horned owl, pileated woodpecker, pygmy owl, red-tailed hawk and ruby crowned kinglet. Interspersion with surrounding habitat increases the site’s habitat value. St. Helens Road (Highway 30) creates fish passage barriers between each stream and Willamette River confluence in this vicinity.

Table B: Quality of Natural Resource Functions in Resource Site FP22				
Resource Site (acres) = 344				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	161.8	121.1	60.7	343.6
percent total inventory site area	47.0%	35.2%	17.6%	99.8%
Wildlife Habitat*				
acres	342.5	0.0	0.0	342.5
percent total inventory site area	99.5%	0.0%	0.0%	99.5%
Special Habitat Areas**				
acres	342.3			
percent total inventory site area	99.4%			
Combined Total⁺				
acres	342.5	0.9	0.2	343.6
percent total inventory site area	99.5%	0.3%	0.1%	99.8%
* 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 FP22, 3.2% 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 FP22			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
387.5	20.5	12.4	3.2%

*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 FP22. 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 FP22 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 industrial uses are allowed in the IH 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 FP22, 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 the resource site-specific evaluation for FP22, 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. Within public parks, apply a protection overlay zone ('p' zone) to land between 25 and 50 feet of stream top-of-bank or wetlands; and within areas of forest, woodland, shrubland or herbaceous vegetation that are contiguous to but more than 50 feet from stream top-of-bank or wetlands.
3. Outside of public parks, apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet from stream top-of-bank or wetlands; and within areas of forest or woodland vegetation that are contiguous to but more than 50 feet from stream top-of-bank or wetlands.
4. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: FP23 **Resource Site Name:** Express Creek

Previous Plan: West hills Natural Areas Protection Plan

Previous Resource Site No.: 87

The results of the analysis found in Volume 3 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.

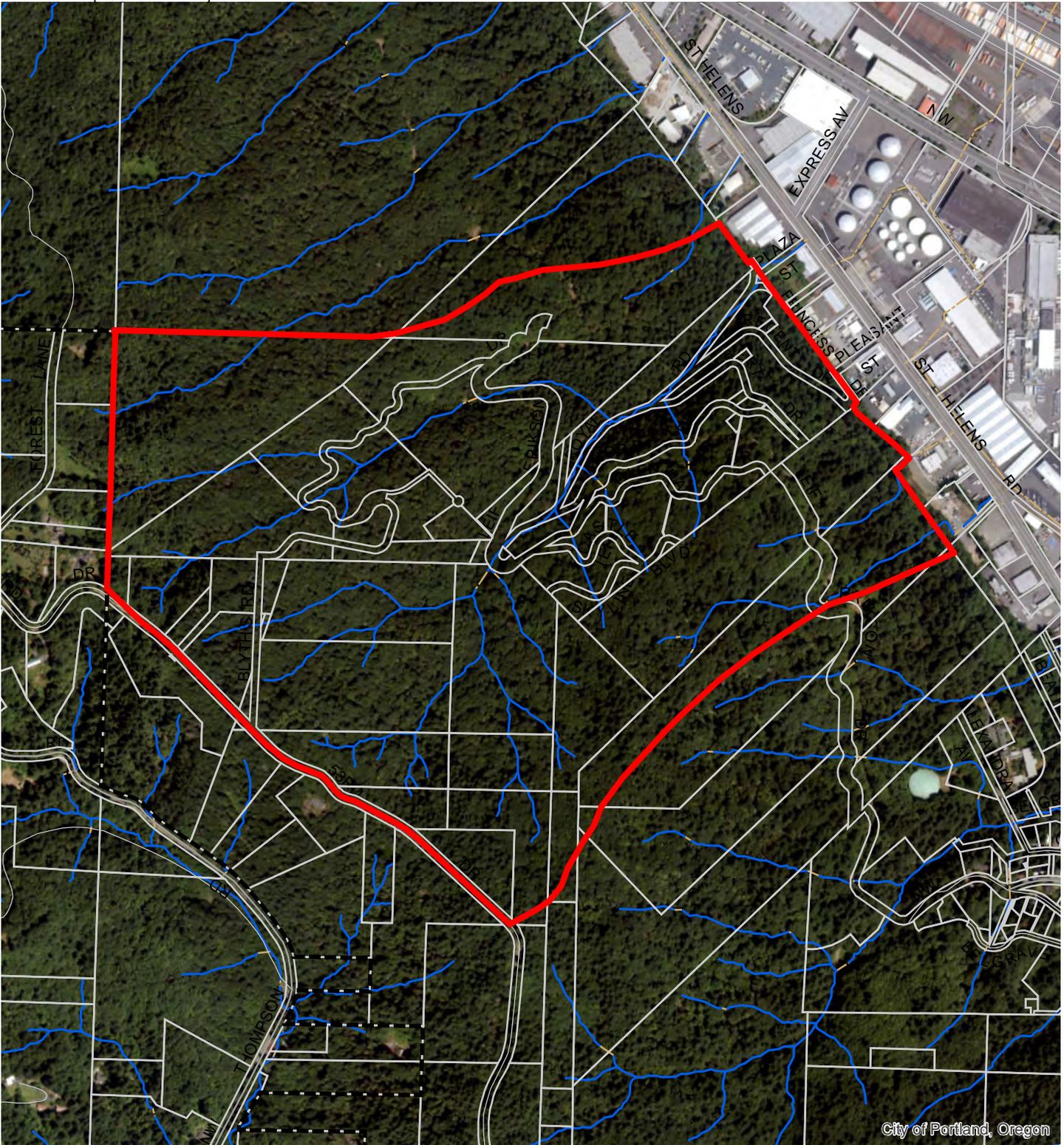
Resource site FP23 includes the following:

Site (acres) 265.8

Base zones (acres)

OS 261.9

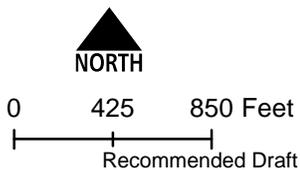
RF 3.9



City of Portland, Oregon

Map A: Water Features
Resource Site: FP23

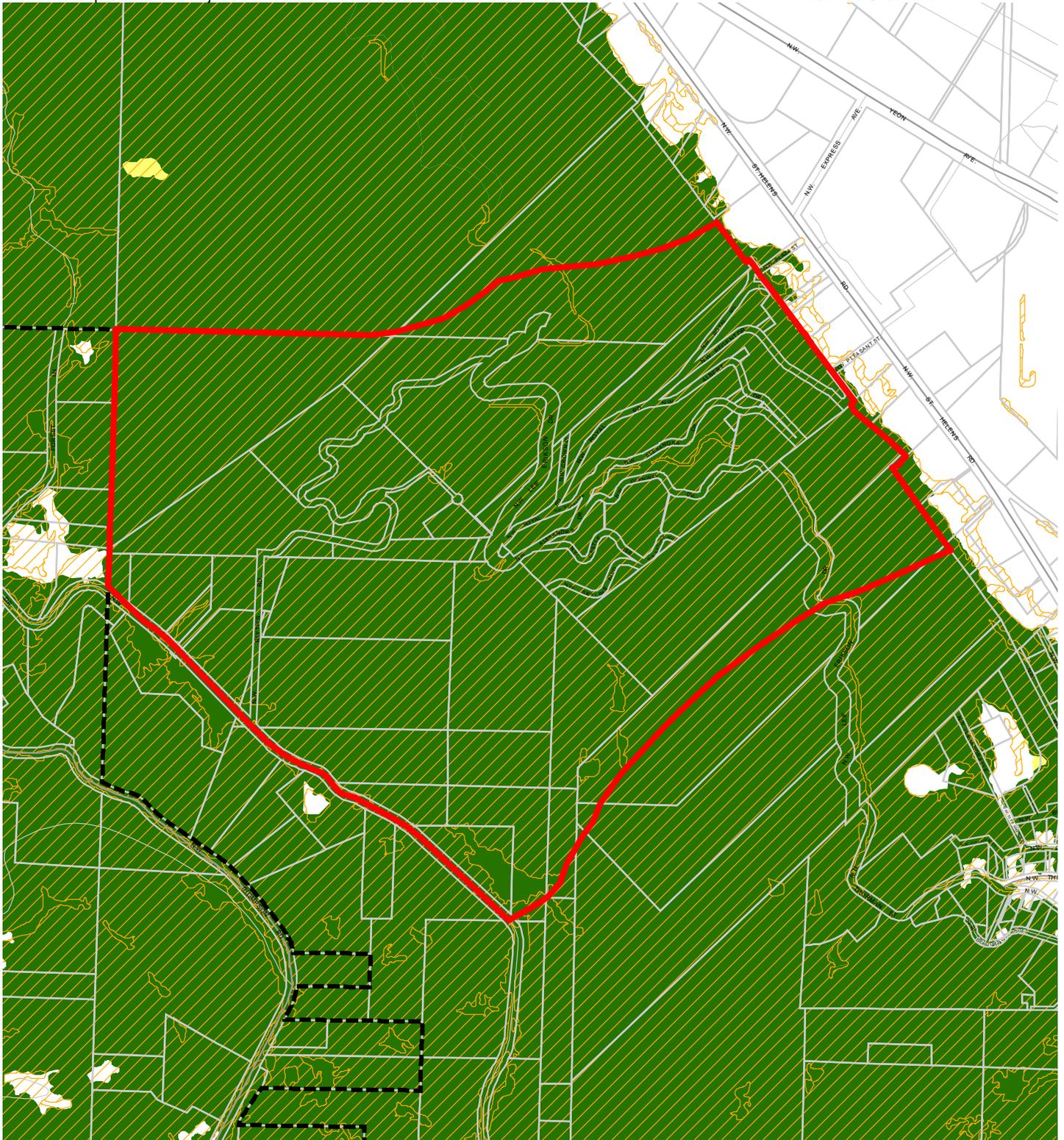
Updated: July 2021



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



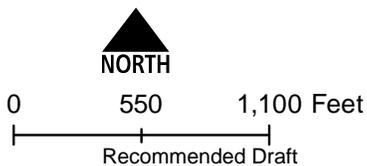
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.
January 2022



Map B: Vegetation and Steep Slopes

**Resource Site:
FP23**

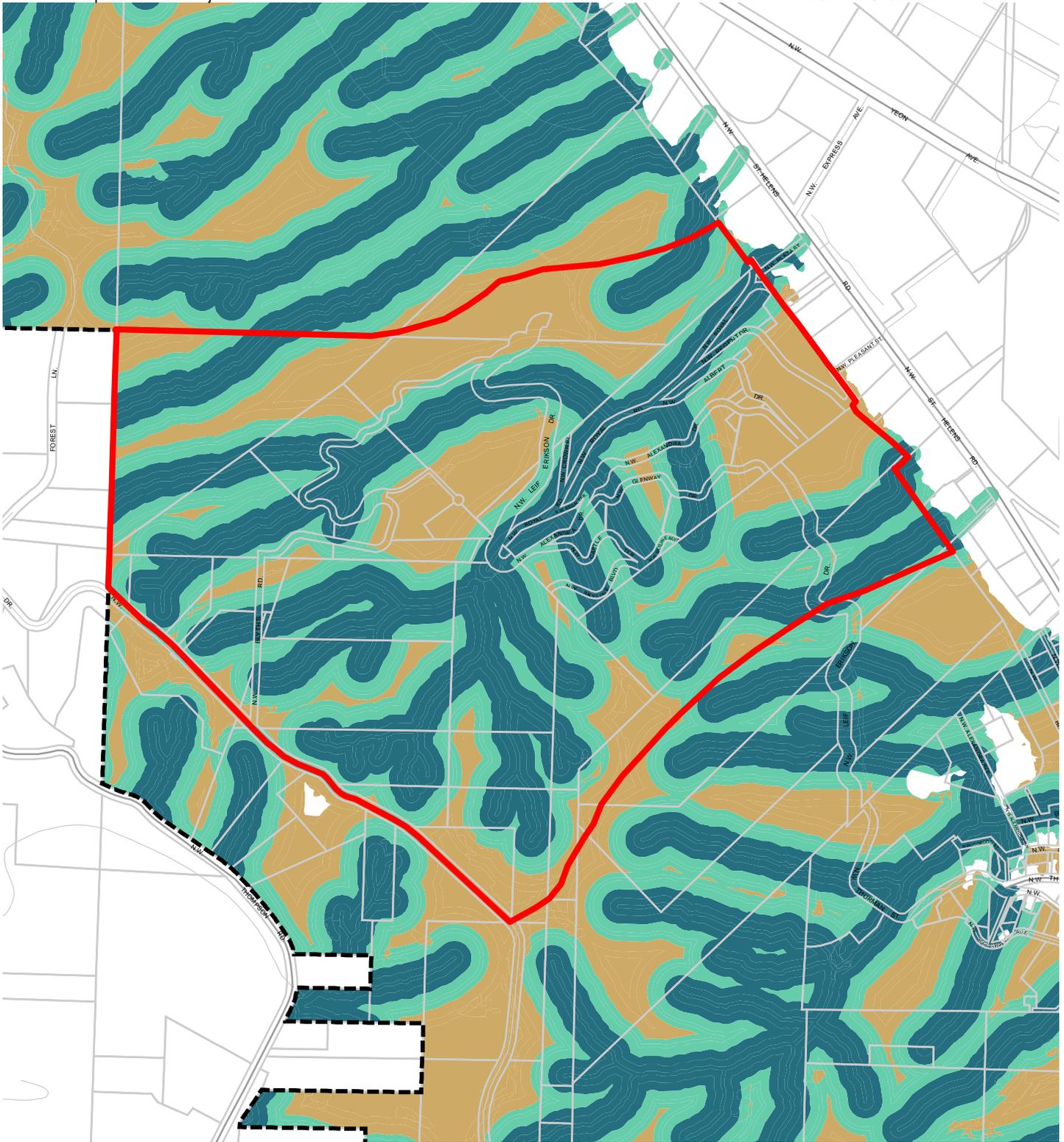
Updated: July 2021



- Resource Sites
- Urban Service Boundary
- Taxlots
- Slopes >25%
- Forest
- Woodland
- Shrubland
- Herbaceous



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January 2022

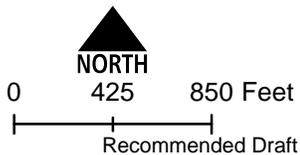


**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
FP23**

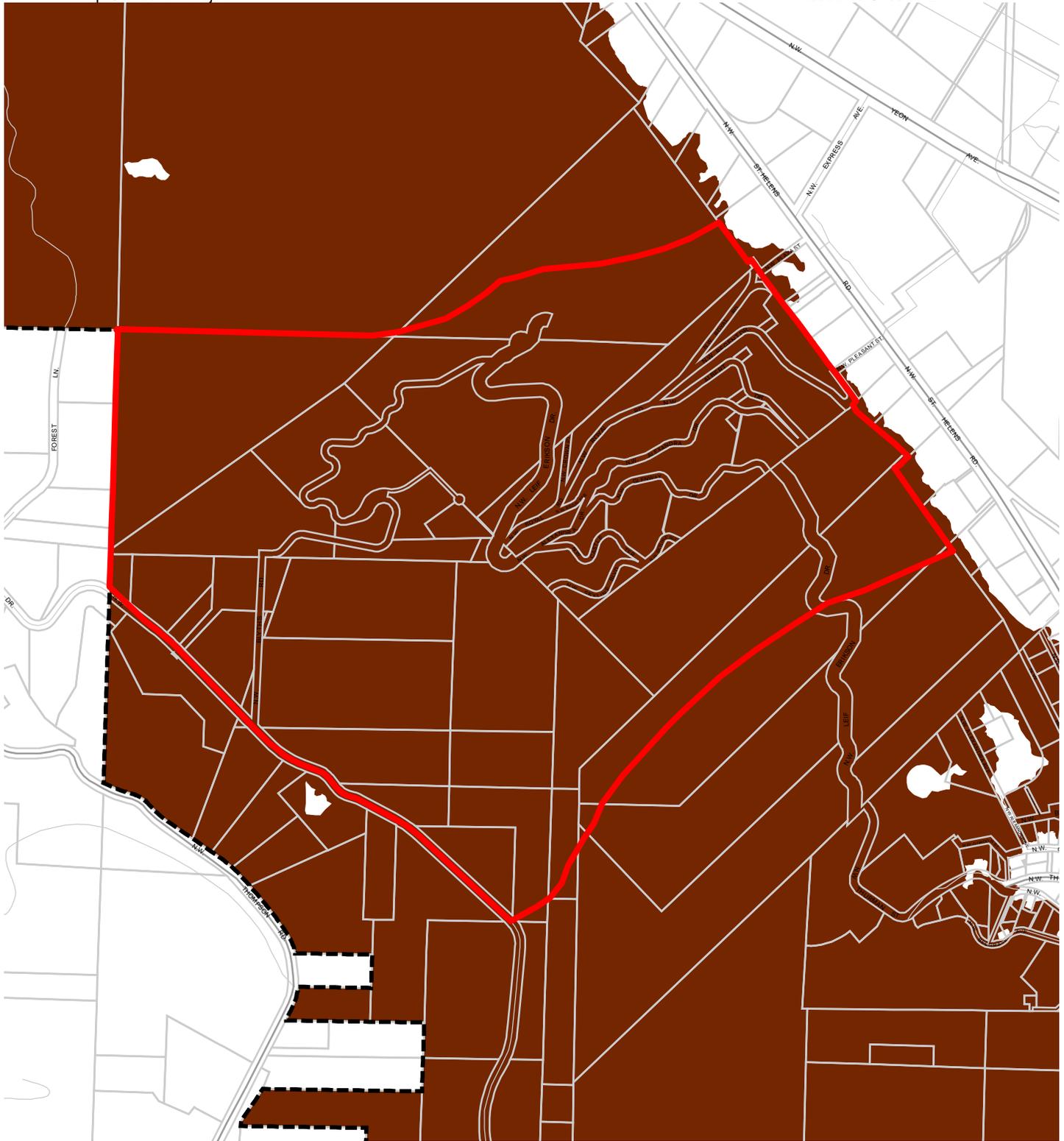
Updated: July 2021

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



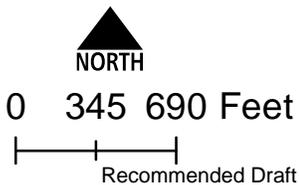
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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:
FP23**

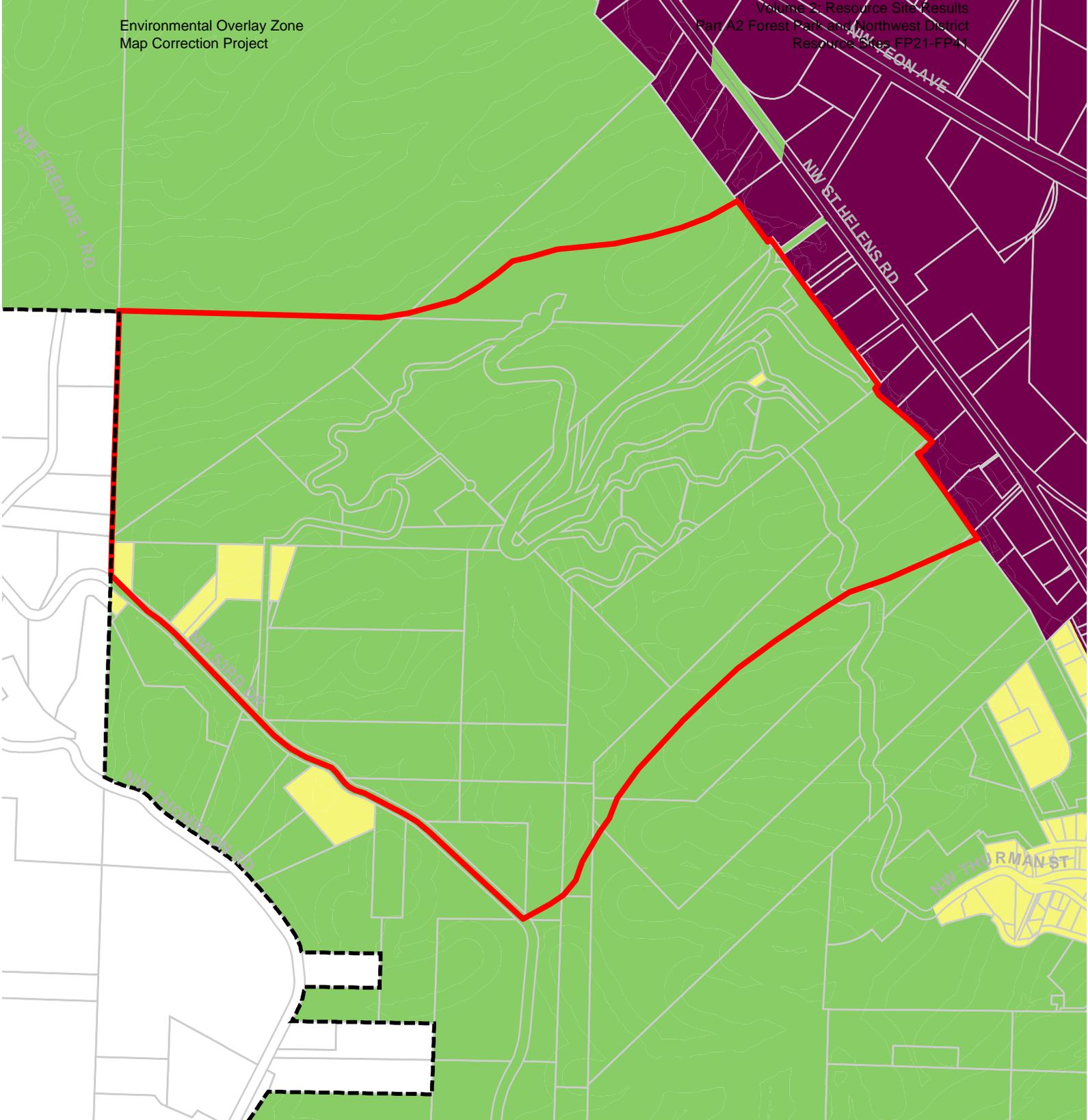
Updated: July 2021



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



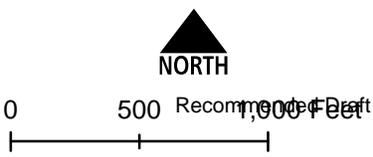
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.
January 2022



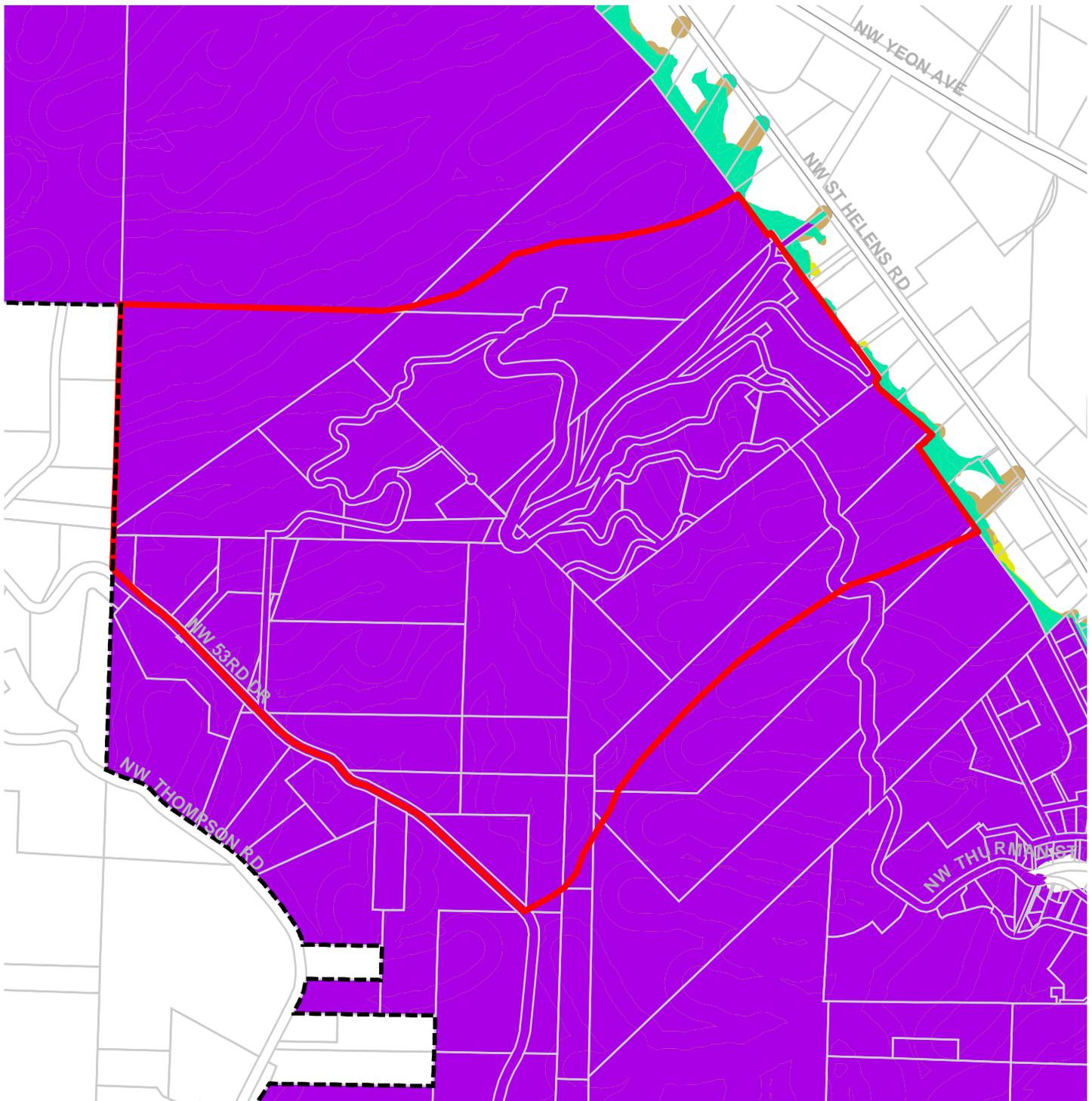
Map F: Urban Development Value (Title 13)
Resource Site: FP23

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

Updated: July 2021



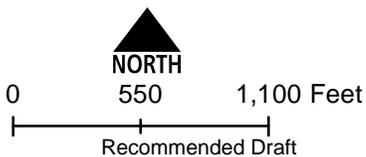
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, and 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: FP23

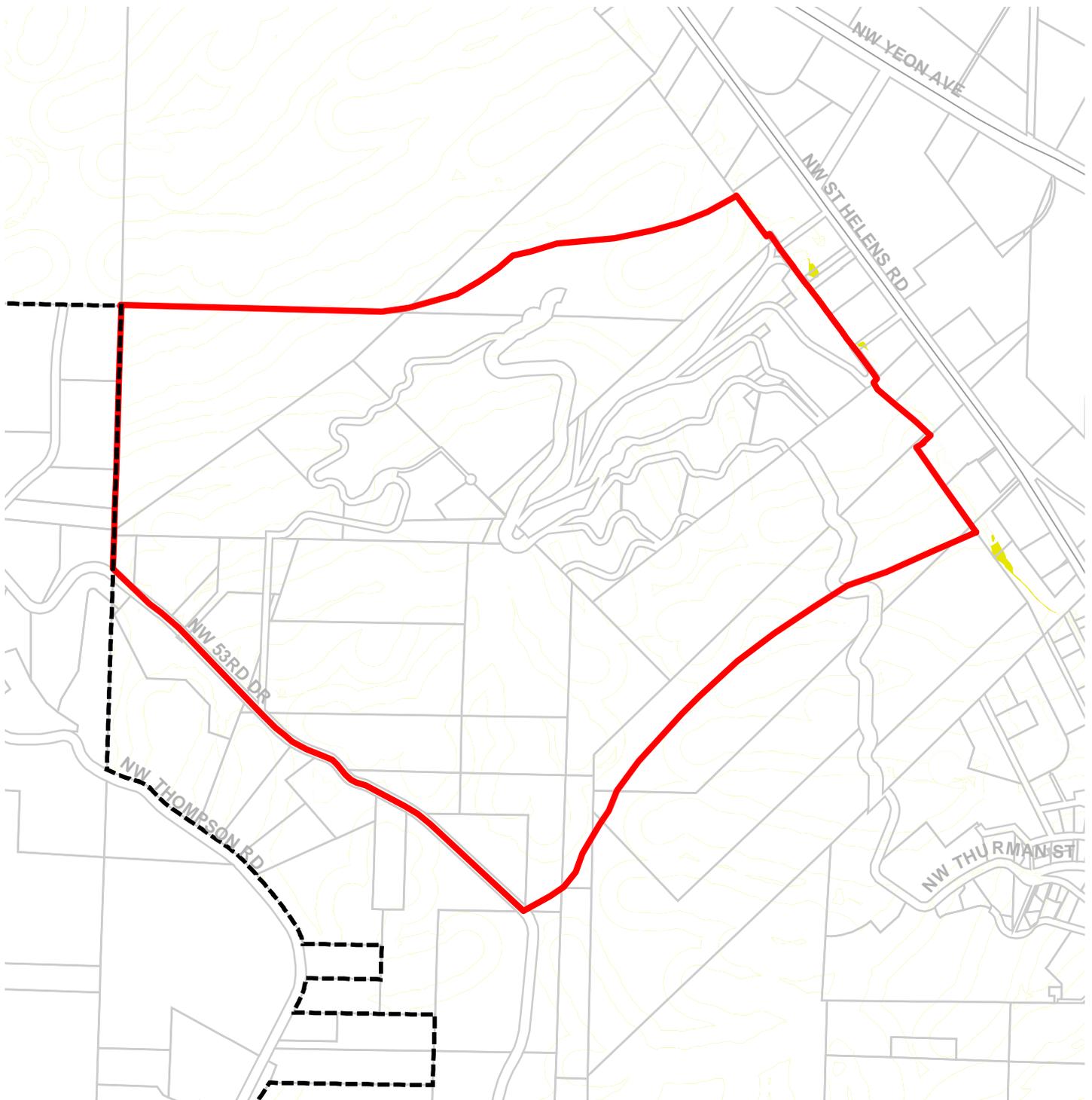
Updated: July 2021



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



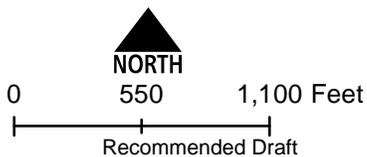
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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: FP23

Updated: July 2021

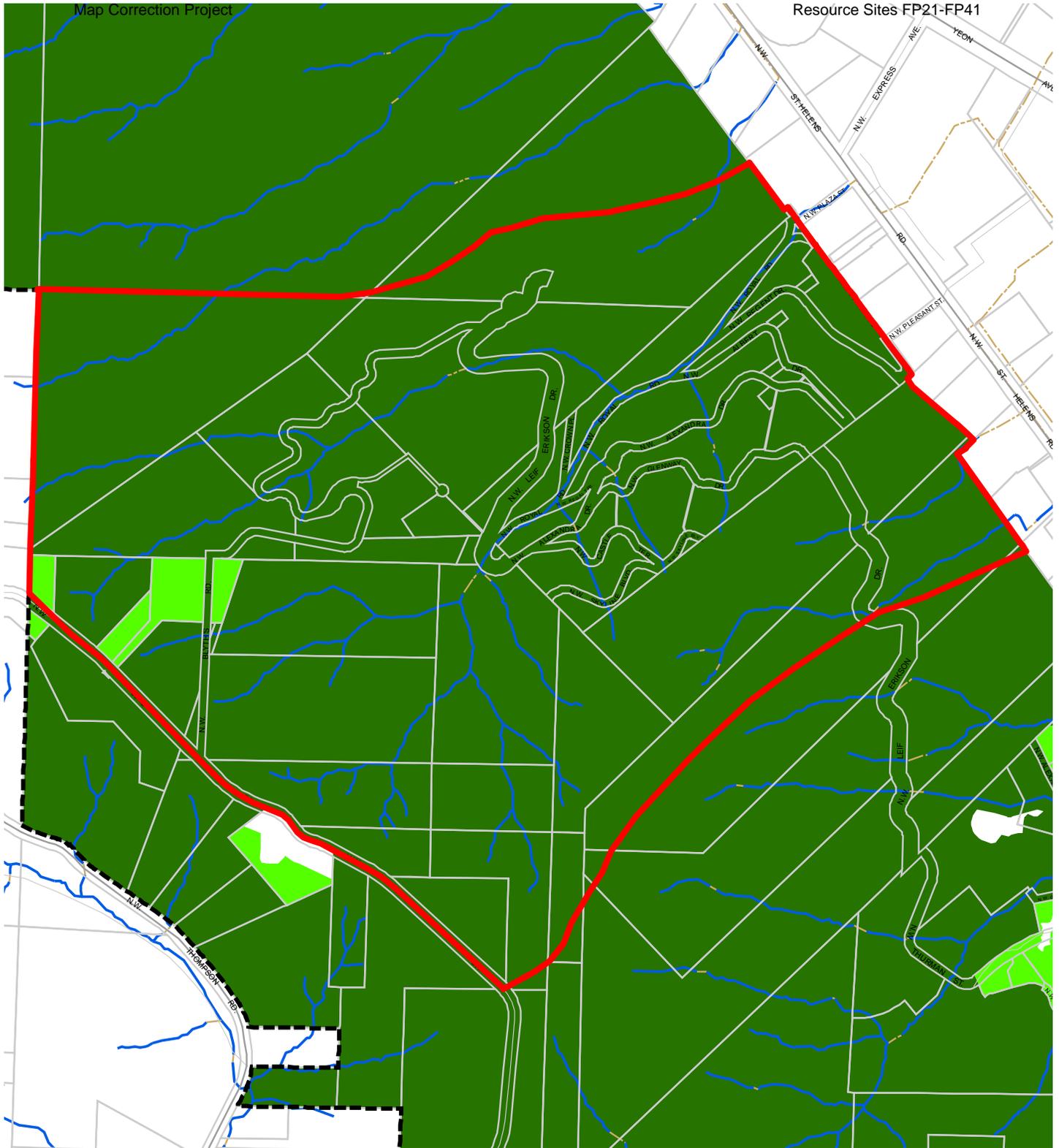


-  Urban Service Boundary
-  Resource Sites
-  Goal 5 Significant Natural Resources



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January 2022

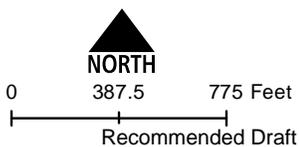


Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
FP23**

Updated: January 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.
January 2022

Natural Resource Description

Within resource site FP23 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: Forest Park (O, B, M, C, S, P, 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 FP23	
	Study Area
Stream (Miles)	4.5
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	265.8
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)**	259.7
* The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area.	
**Slopes are derived from LiDAR. Steep slopes are areas with a slope greater than 25%.	

The Express Creek watershed is clothed in a mosaic of vegetation types ranging from the *hardwood with young conifer* to the *mid-aged conifer* stage of secondary succession. The older forest contains mature grand fir, western hemlock and Douglas fir specimens. Forest cover protects watershed resources, serves as habitat for wildlife and provides open space, scenic and recreational resources. Snags, downed logs and woody debris found at the site are critical structural and functional components of the watershed ecosystem. The rare phantom orchid (*Cephalanthera austiniiae*) also occurs in the older forest. Invasive species such as ivy and holly are proliferating in the lower parts of the site, near St. Helens Road.

Like most Forest Park perennial streams, the largest stream in the resource area likely supports a healthier macroinvertebrate community in comparison to other Portland streams. The creek and the site’s forest cover provide food, water and cover for a variety of birds including pileated woodpecker, Oregon junco, robin, Wilson’s warbler, house finch and golden-crowned kinglet. The site’s interspersed with surrounding habitat permits wildlife to migrate through the site to Holman and Macleay Parks to the south and to the rest of Forest Park to the north. Industrial activities and traffic on and along St. Helens Road impede fish passage between the Willamette River and the resource area’s streams, as well as wildlife migration to the east.

Table B: Quality of Natural Resource Functions in Resource Site FP23				
Resource Site (acres) = 266				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	106.9	86.4	72.4	265.8
percent total inventory site area	40.2%	32.5%	27.2%	100.0%
Wildlife Habitat*				
acres	265.8	0.0	0.0	265.8
percent total inventory site area	100.0%	0.0%	0.0%	100.0%
Special Habitat Areas**				
acres	265.8			
percent total inventory site area	100.0%			
Combined Total⁺				
acres	265.8	0.0	0.0	265.8
percent total inventory site area	100.0%	0.0%	0.0%	100.0%
* 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 FP23, 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 FP23			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
285.8	12.6	12.4	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 FP23. 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

All of the significant natural resources within resource site FP23 are designated Habitat Conservation Areas under Metro Title 13; therefore, no resource site-specific ESEE is required.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and the resource site-specific evaluation for FP23, 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 and wetlands, and land within 25 feet of stream top-of-bank or wetlands.
2. Within public parks, apply a protection overlay zone ('p' zone) to land between 25 and 50 feet of stream top-of-bank or wetlands; and within areas of forest, woodland, shrubland or herbaceous vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
3. Outside of public parks, apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet from stream top-of-bank or wetlands; and within areas of forest or woodland 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.: FP24 Resource Site Name: Skyline Headwaters

Previous Plan: Balch Creek Watershed Protection Plan

Previous Resource Site No.: 84

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

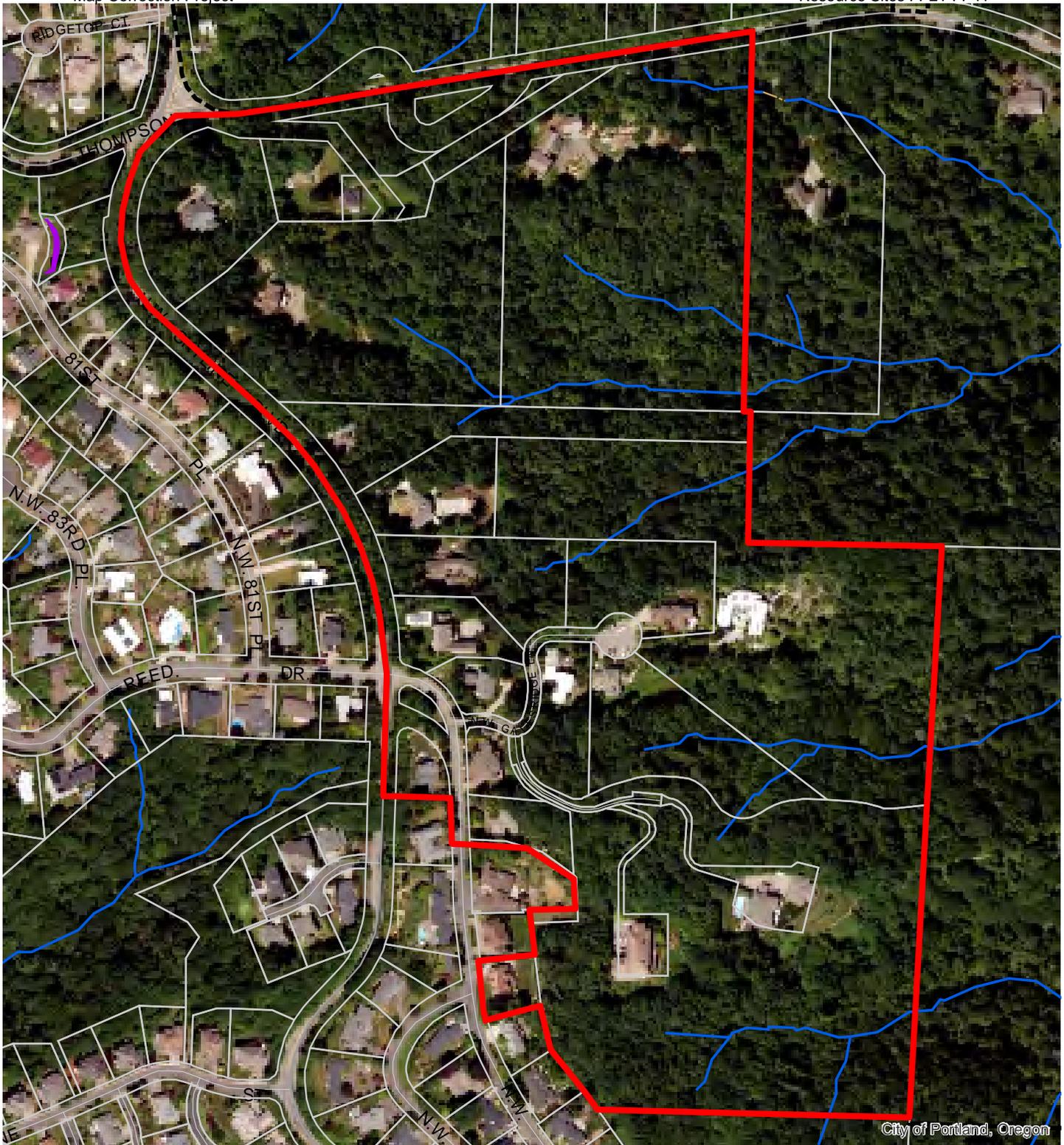
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 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 FP24 includes the following:

Site (acres)	57.1
Base zones (acres)	
OS	1.7
R10	0.0
RF	55.4

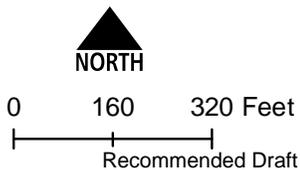


City of Portland, Oregon

Map A: Water Features

Resource Site: FP24

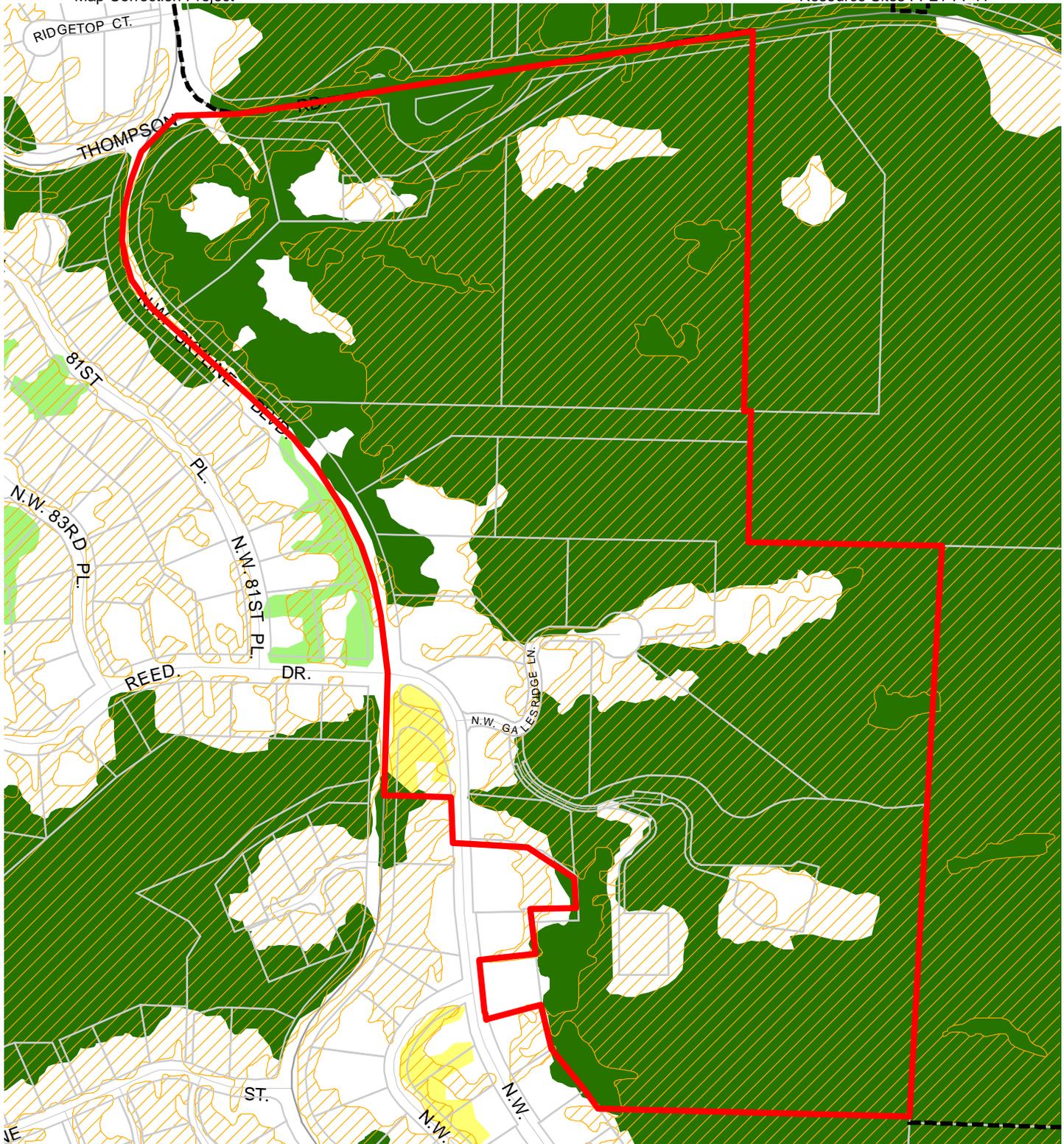
Updated: December 2021



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



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.
January 2022



Map B: Vegetation and Steep Slopes

Resource Site: FP24

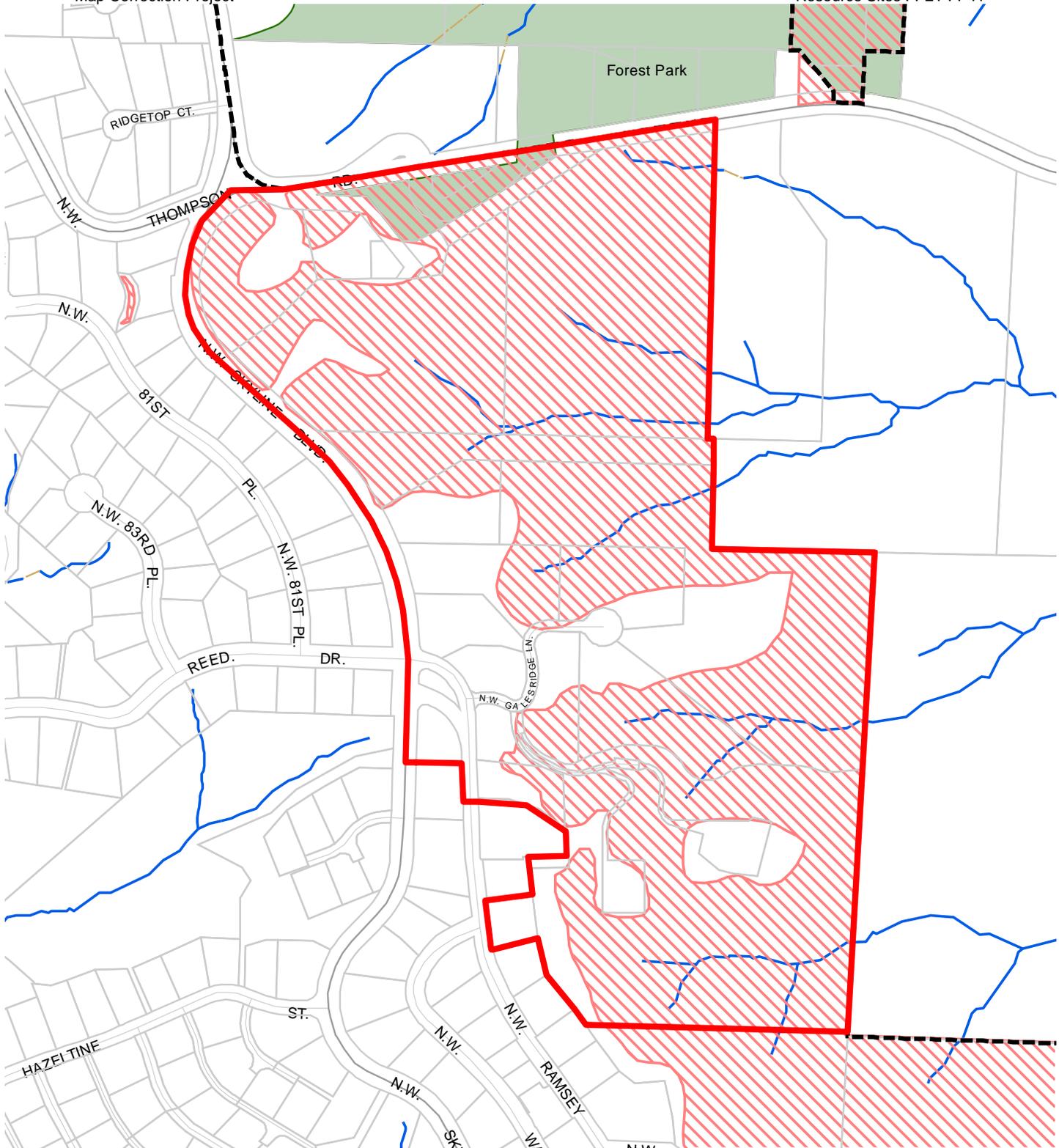
Updated: December 2021



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

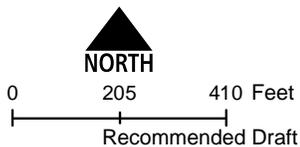


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January 2022



**Map C: Special
Habitat Areas**
**Resource Site:
FP24**

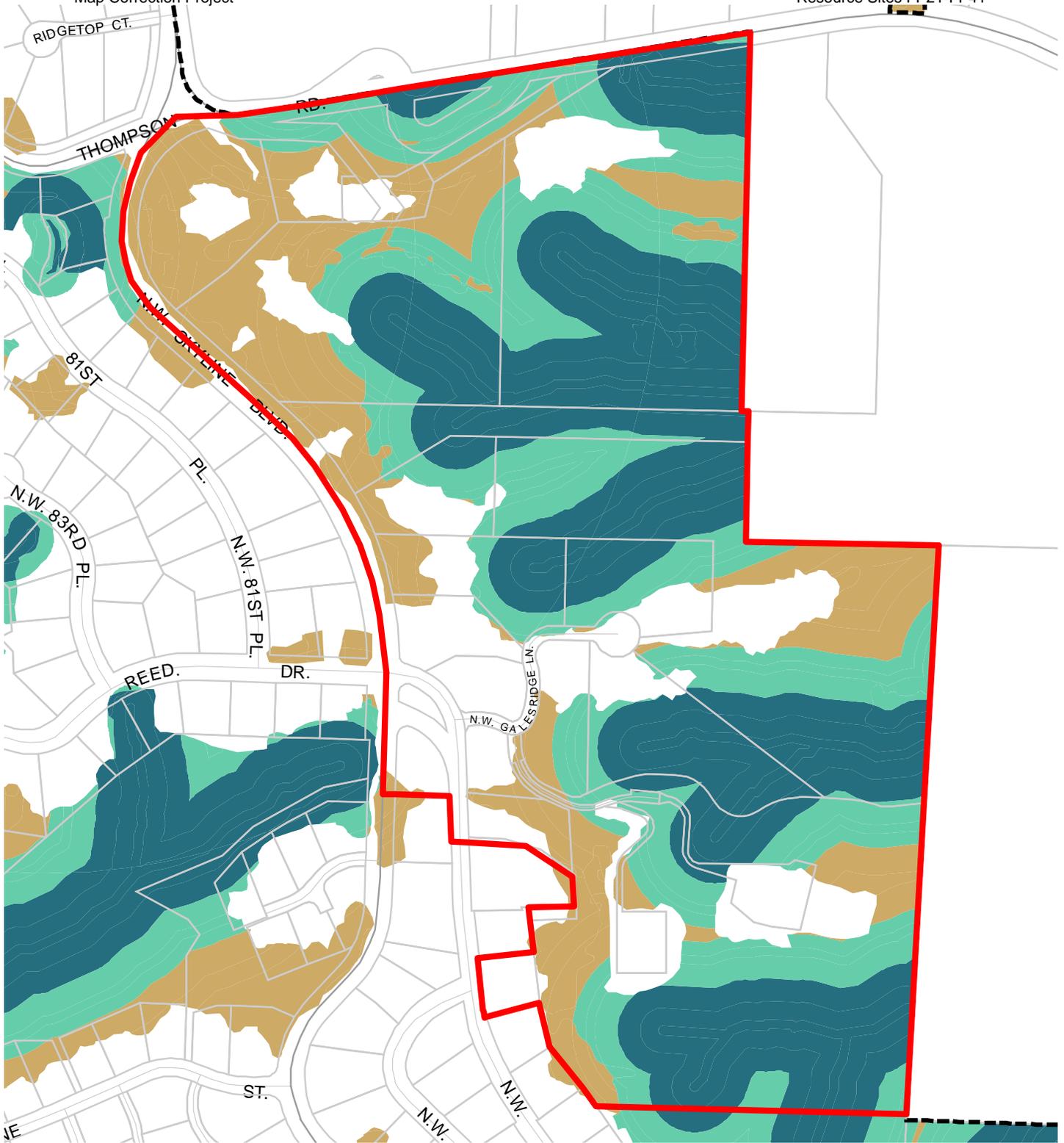
Updated: June 2021



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



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January 2022

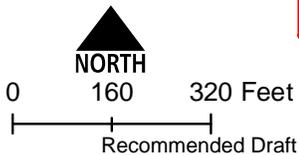


**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
FP24**

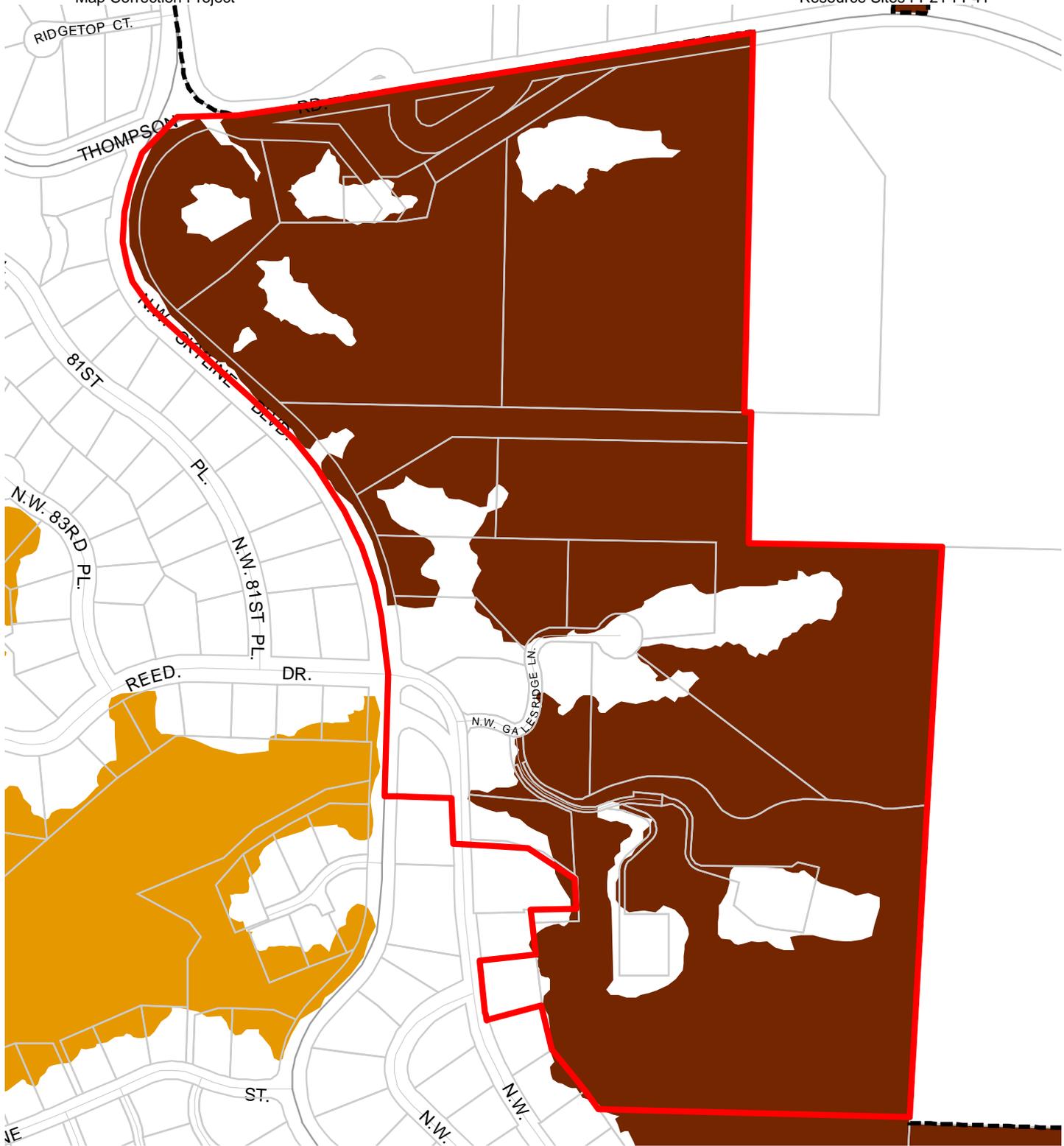
Updated: January 2022

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



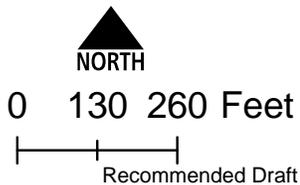
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January 2022



**Map E: Wildlife
Habitat Classification**
Resource Site:
FP24

Updated: January 2022

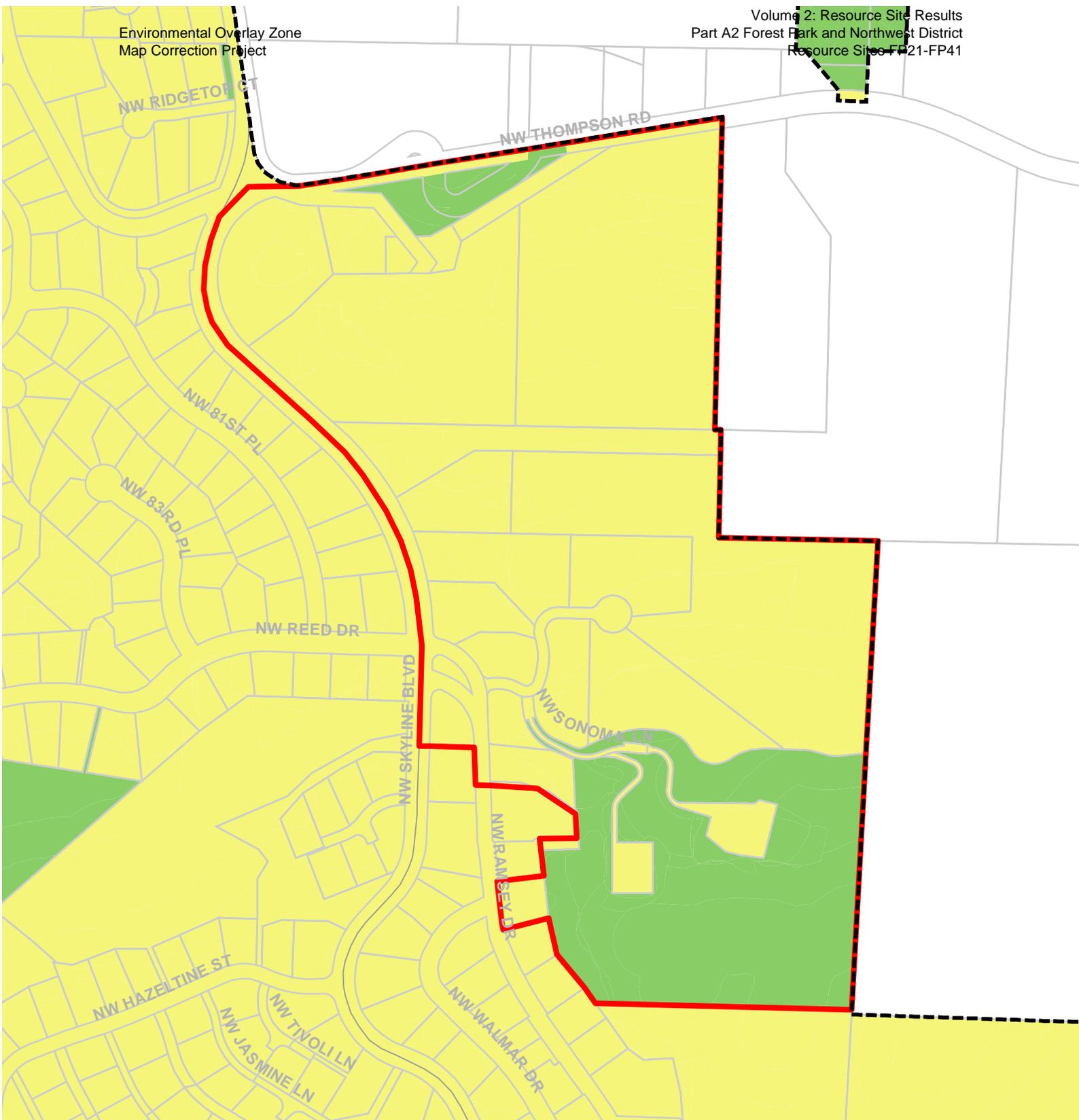


-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots



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January 2022

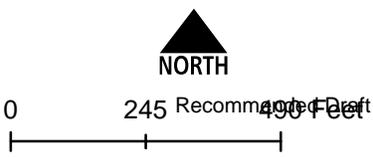


Map F: Urban Development Value (Title 13)
Resource Site: FP24

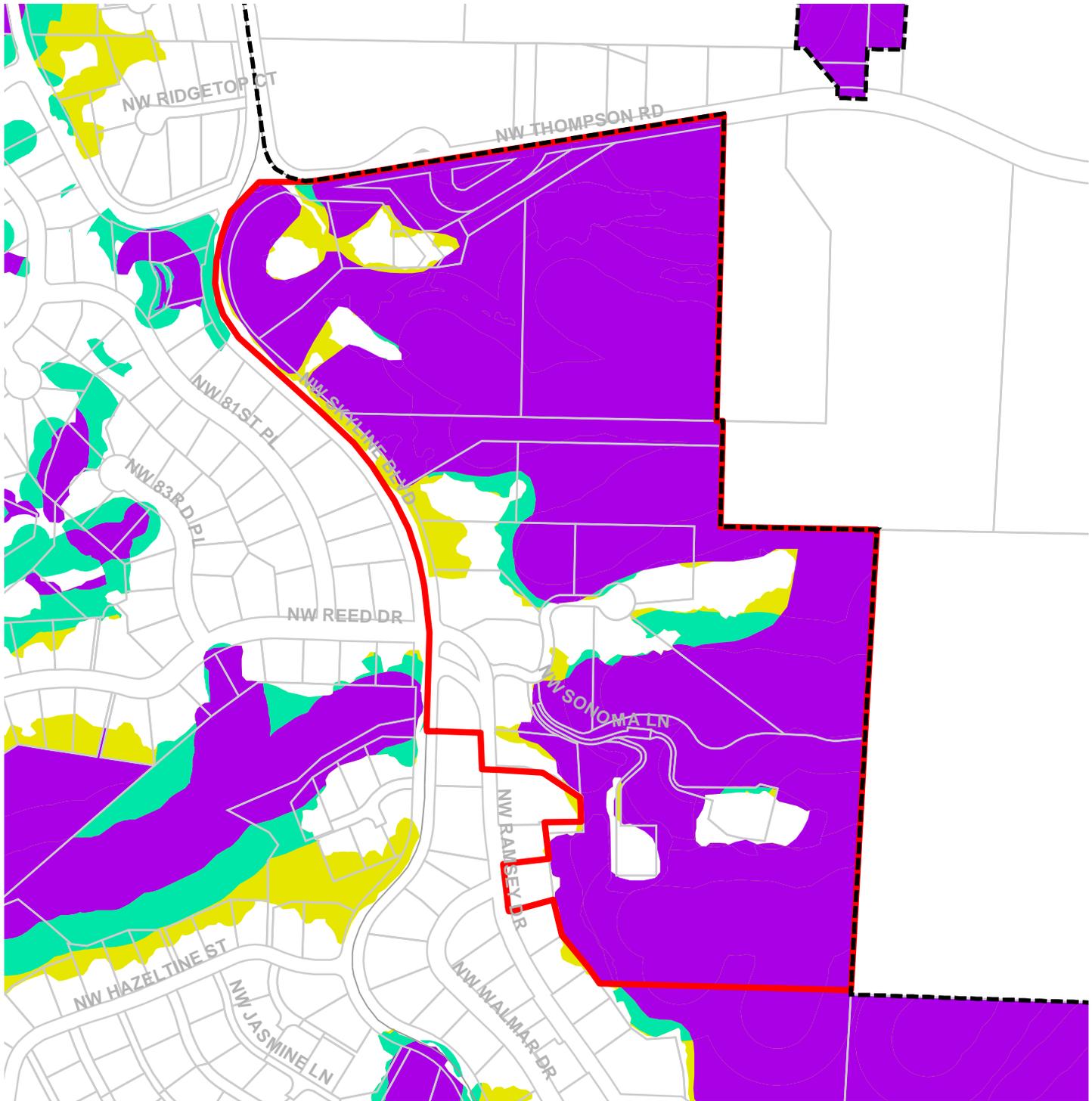
-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks



Updated: July 2021



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

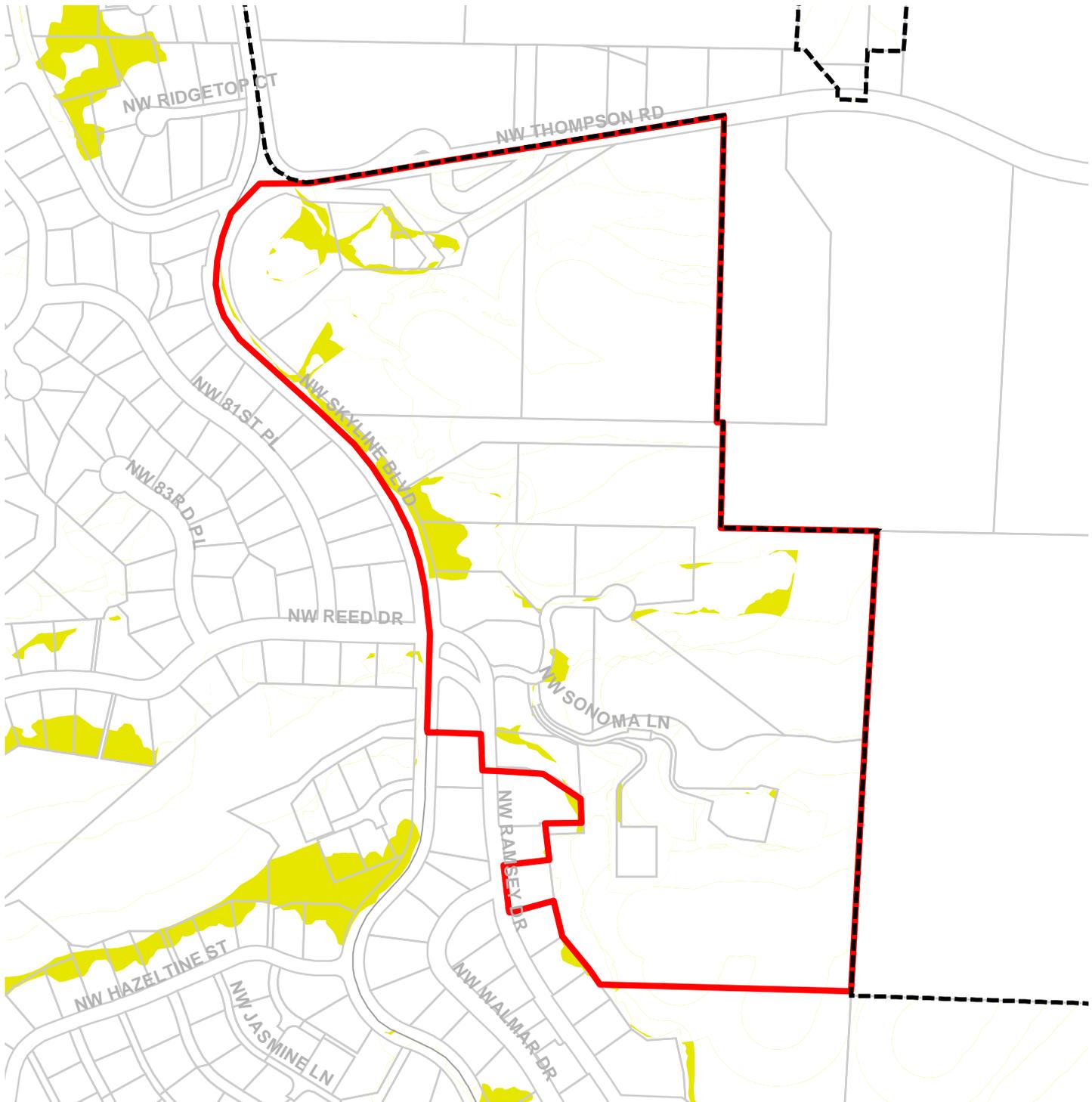
Resource Site: FP24

Updated: July 2021

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



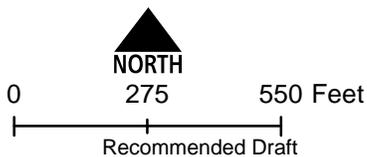
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Map H: Goal 5 Resources

Resource Site: FP24

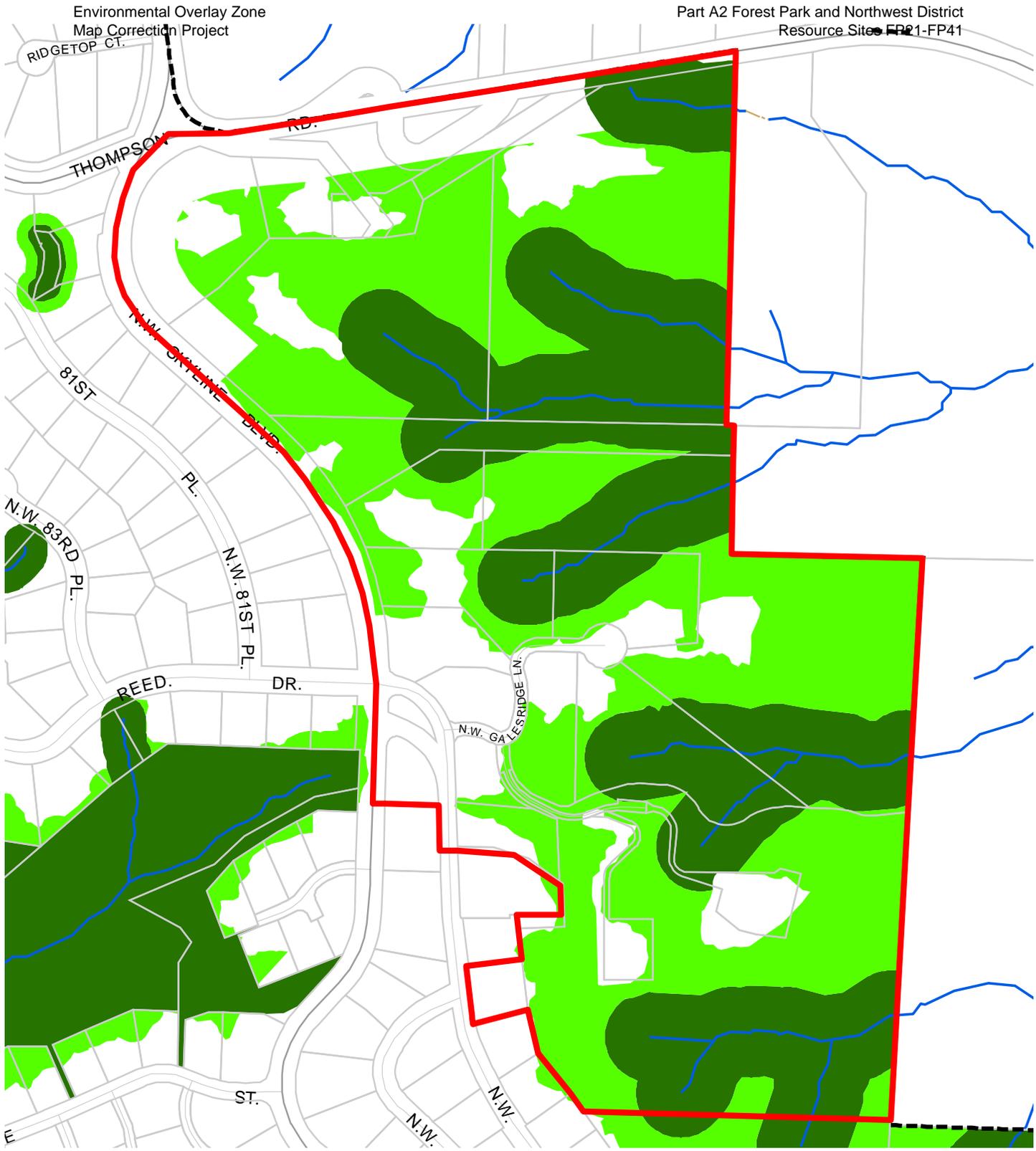
Updated: July 2021



- 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.

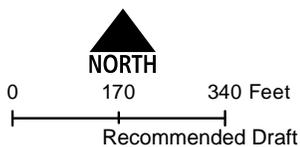


Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site: FP24

Updated: January 2022

- Resource Sites
- Open Stream Channel
- Urban Service Boundary
- 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.
 January 2022

Natural Resource Description

Within resource site FP24 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 FP24	
	Study Area
Stream (Miles)	0.8
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	45.8
Woodland (acres)	0.0
Shrubland (acres)	0.0
Herbaceous (acres)	0.5
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	44.5
* 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%.	

The bedrock of Portland's West Hills is largely composed of uplifted Columbia Flood Basalt, which is overlaid with silt layers that are wind and water deposited to depths up to 100 feet. The presence of these silts has important implications for land use and development. The silt becomes very unstable when wet and the potential for slope failure is particularly high after winter rains have saturated the soil. These slope failures, often associated with logging and building activities, have substantially altered the face of the hillside over the last century.

Most soils in the West Hills drain poorly. The subsoil usually includes a fragipan, which is a layer less permeable to water than the upper layers. Fragipans limit the rooting depth of many plants. A seasonal water table is perched on top of fragipans every winter. The typical soil profile amounts to high erosion and slumping hazards due to the seasonal water table, slow permeability, low strength, and the tendency of the upper layers to slide over the fragipan whenever they become saturated. Slumping is common in the West Hills, especially when bare soil is exposed to rainfall or when soil is cut or filled. Several major landslides have occurred in the West Hills. The instability of the soil is a major reason why much of the West Hills have not been developed and is now included in parkland, wildlife sanctuaries, open space, farm, and forest zones. Extreme care must be taken when disturbing these soils, and vegetation must be reestablished quickly on disturbed areas to prevent erosion, sliding, and slumping.

Balch Creek supports a population of 2,000 to 4,000 coastal cutthroat trout. These trout have been isolated from exchange with the Willamette River since the replacement of lower Balch Creek by a mile-long culvert in 1921. The culvert may pass fish downstream; however, upstream passage into Balch Creek from the river is not possible. City and state regulations prohibit fishing in Balch Creek. The existence of these trout is threatened by watershed development and water quality impacts.

High volumes of large wood instream create habitat complexity that supports cutthroat trout and Coastal Giant Salamanders from the headwaters down through Macleay Park.

The stream is bound by steep forested slopes that provide cover and habitat for wildlife. Rare plant species found in the site include western wahoo shrubs. The trees on steep slopes help maintain slope stability and reduce the risk of landslides and erosion. The trees also capture and use rainwater, reducing overland flow that can contribute to culvert surcharging, stream bank erosion, and downstream flooding.

Table B: Quality of Natural Resource Functions in Resource Site FP24				
Resource Site (acres) = 57				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	19.4	14.4	12.1	45.9
percent total inventory site area	33.9%	25.2%	21.3%	80.3%
Wildlife Habitat*				
acres	45.8	0.0	0.0	45.8
percent total inventory site area	80.2%	0.0%	0.0%	80.2%
Special Habitat Areas**				
acres	43.0			
percent total inventory site area	75.3%			
Combined Total⁺				
acres	45.8	0.0	0.1	45.9
percent total inventory site area	80.2%	0.0%	0.1%	80.3%
* 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 24, 5.3% 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 FP24			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
57.1	5.1	3.1	5.3%

*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 FP24. 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 FP24 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 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 FP24, 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 the resource site-specific evaluation for FP24, 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 and land within 50 feet of stream top-of-bank and 25 feet of wetlands.
2. 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 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.
4. Apply a conservation overlay zone ('c' zone) to areas of forest vegetation contiguous to but more than 100 feet from stream top-of-bank.
5. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: FP25 **Resource Site Name:** NW Ramsey & Walmar

Previous Plan: Multnomah County Urban Lands

Previous Resource Site No.: 111

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

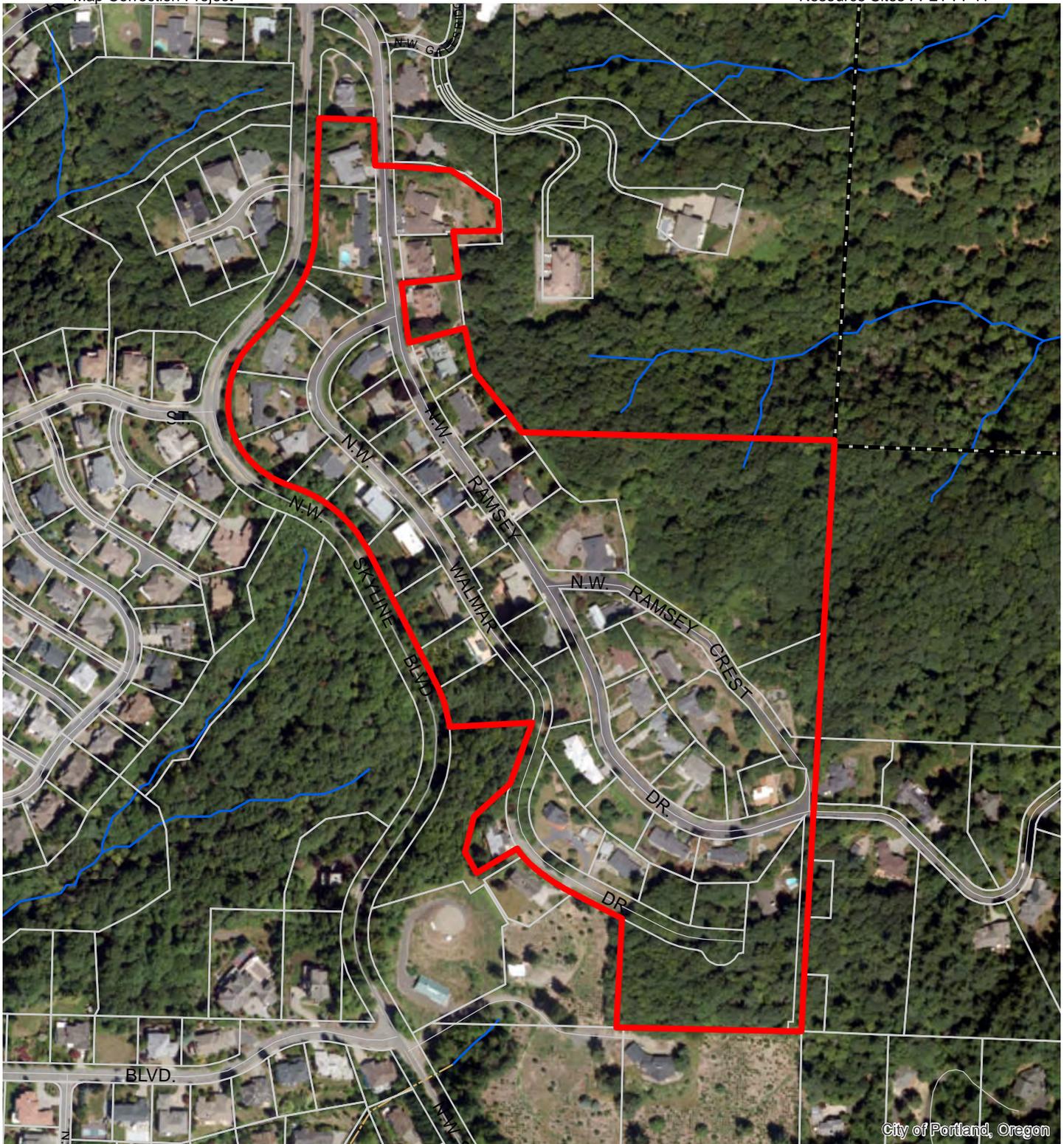
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 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 FP25 includes the following:

Site (acres)	28.8
Base zones (acres)	
R10	28.8



Map A: Water Features
Resource Site: FP25

Updated: July 2021

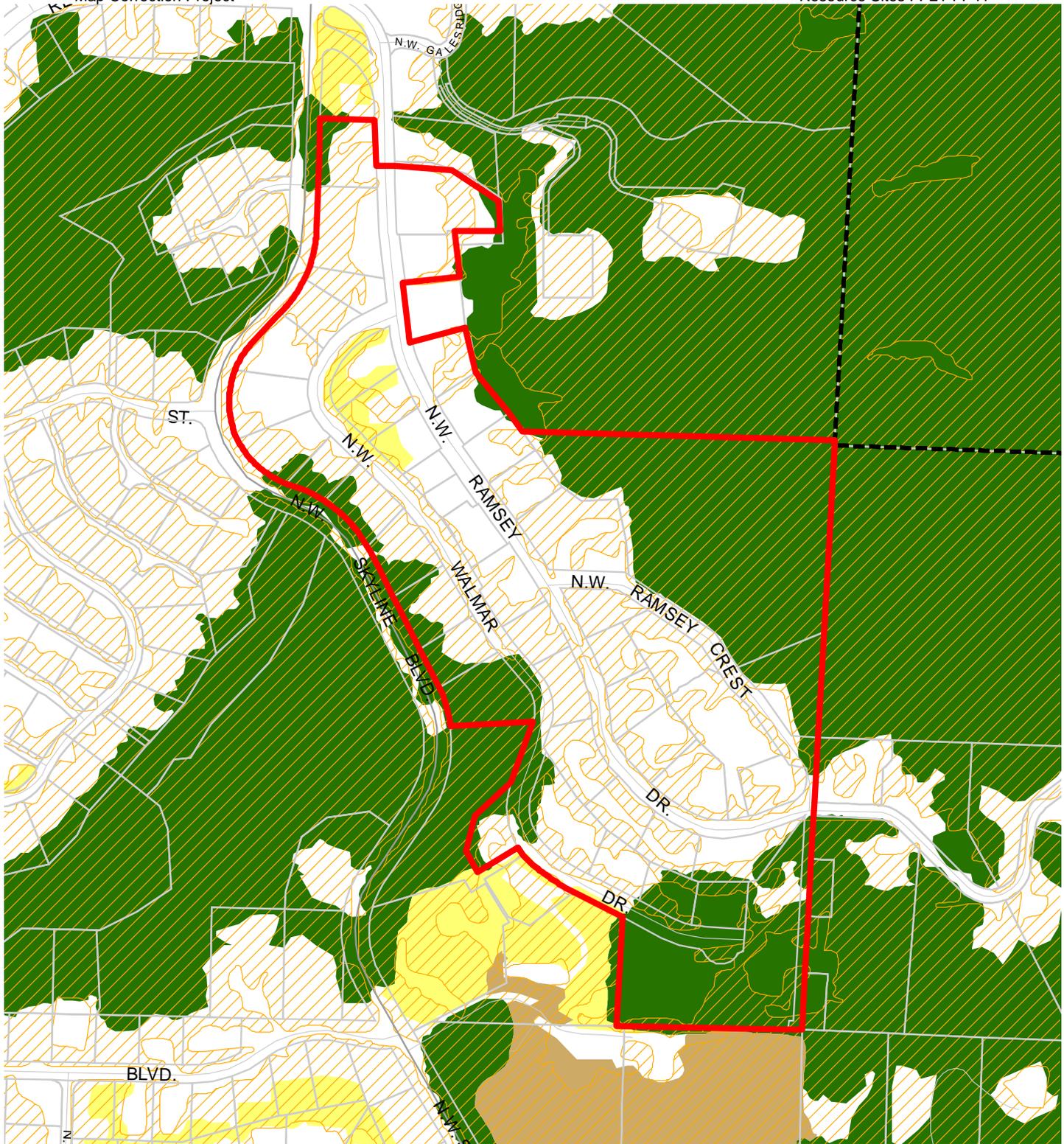


0 160 320 Feet
Recommended Draft

- 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: FP25

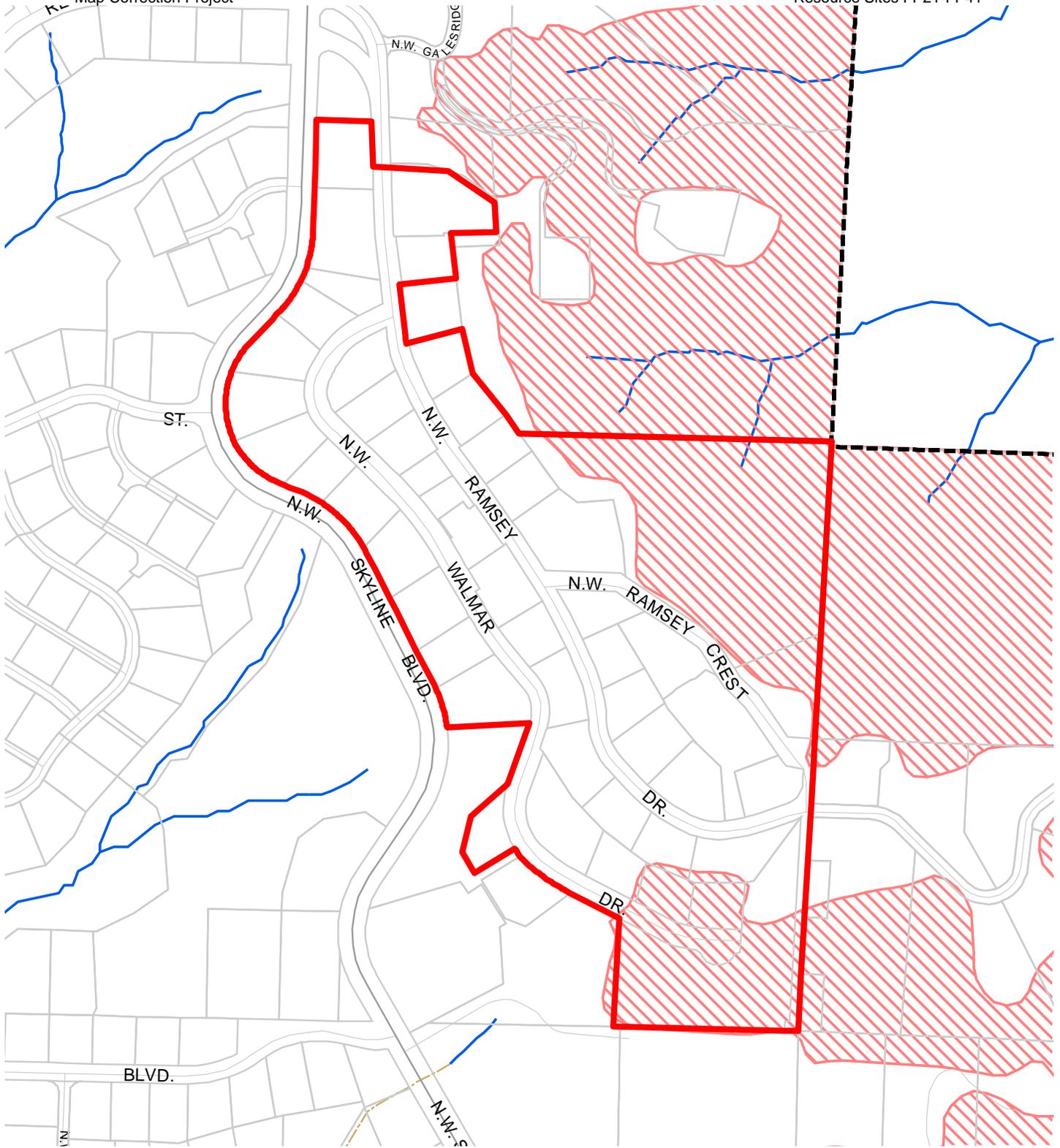
Updated: July 2021



- Resource Sites
- Urban Service Boundary
- Taxlots
- Slopes >25%
- Forest
- Woodland
- Shrubland
- Herbaceous

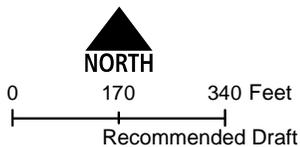


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**Map C: Special
Habitat Areas**
**Resource Site:
FP25**

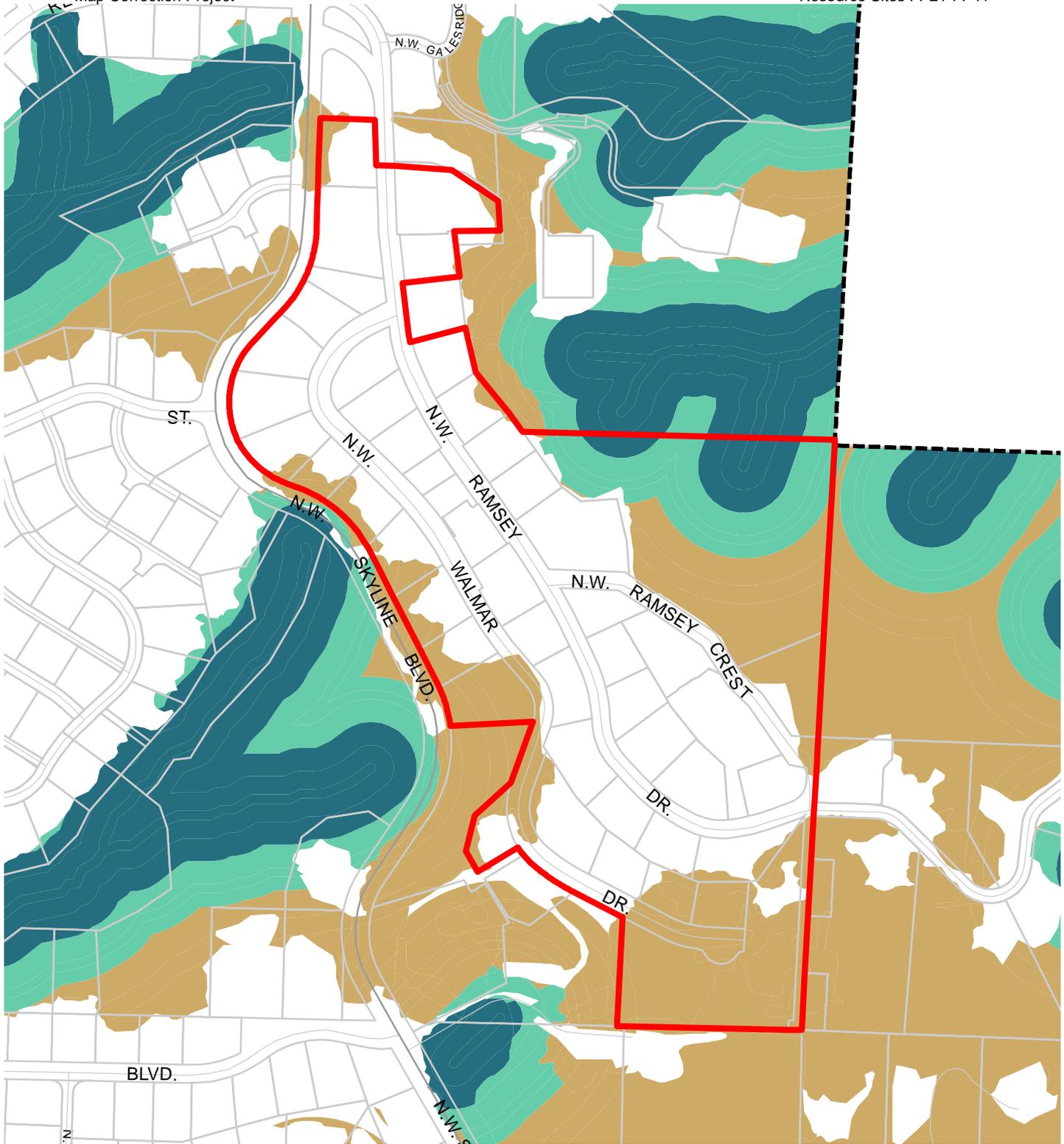
Updated: June 2021



-  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**

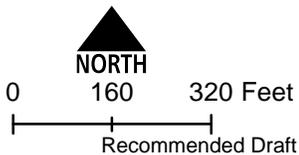
**Resource Site:
FP25**

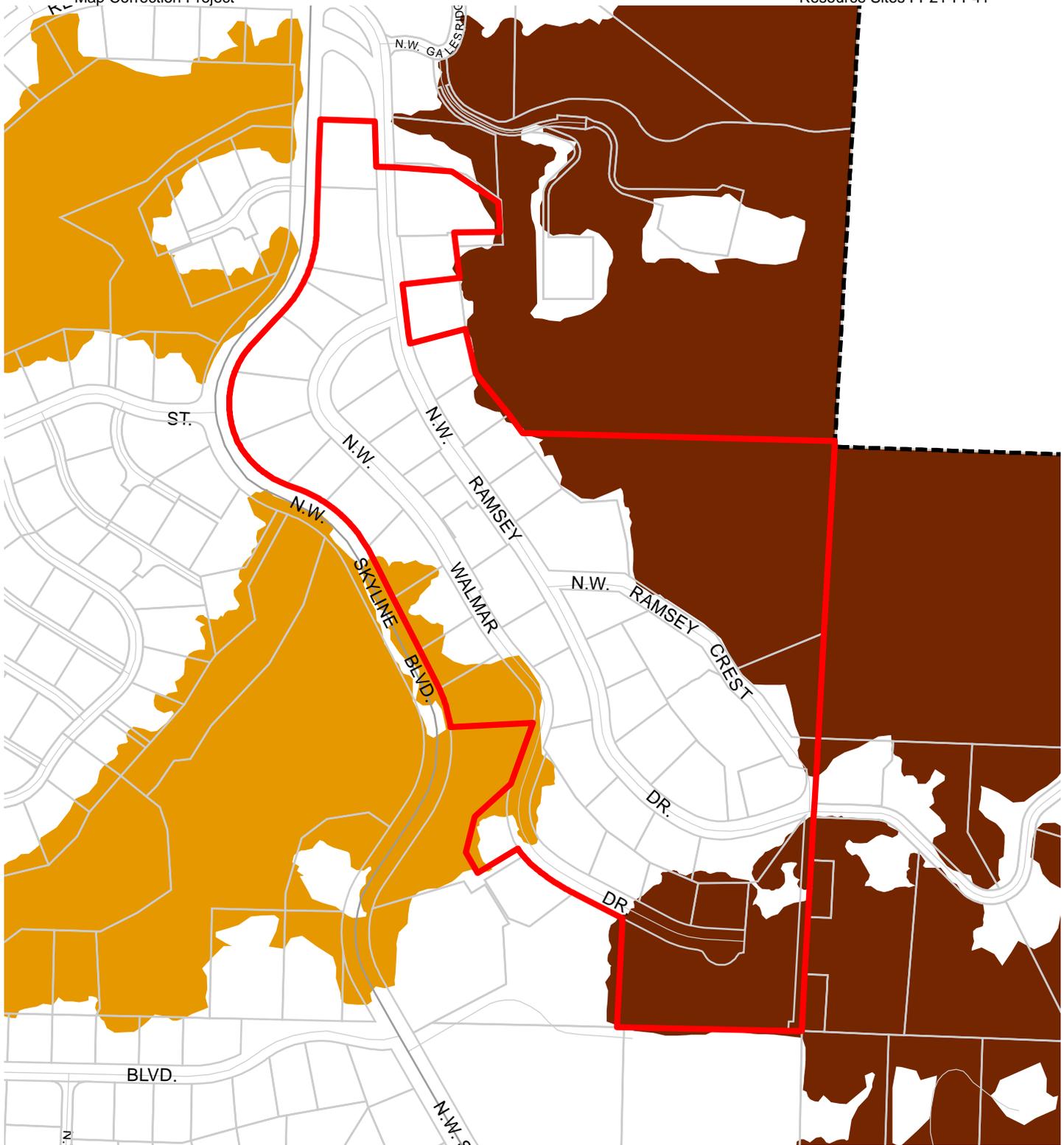
Updated: July 2021

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



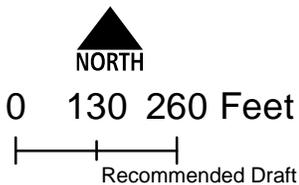
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**Map E: Wildlife
Habitat Classification
Resource Site:
FP25**

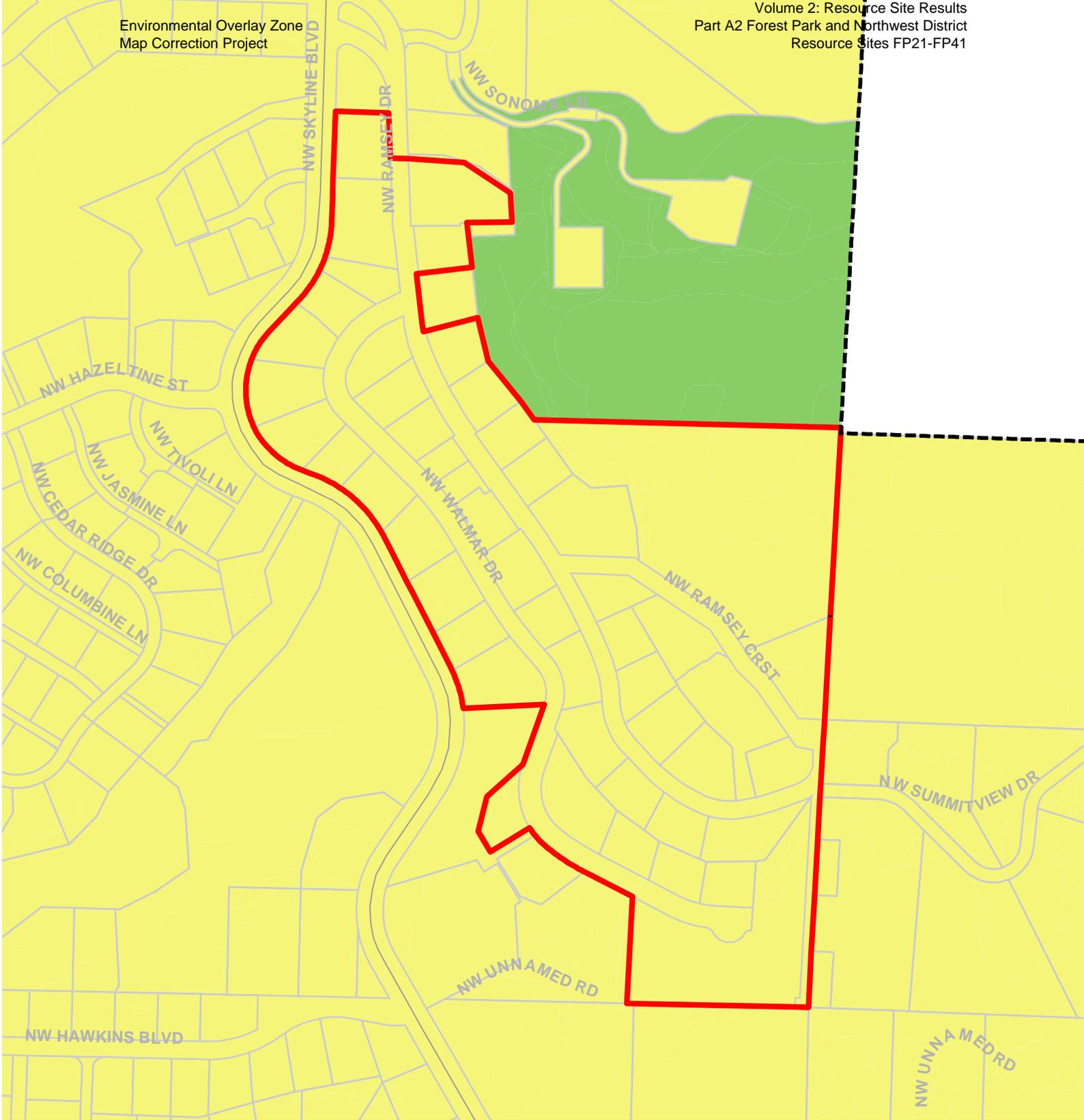
Updated: July 2021



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



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January 2022

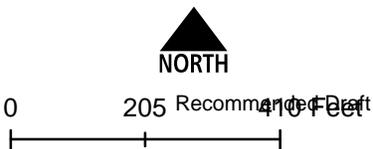


Map F: Urban Development Value (Title 13)
Resource Site: FP25

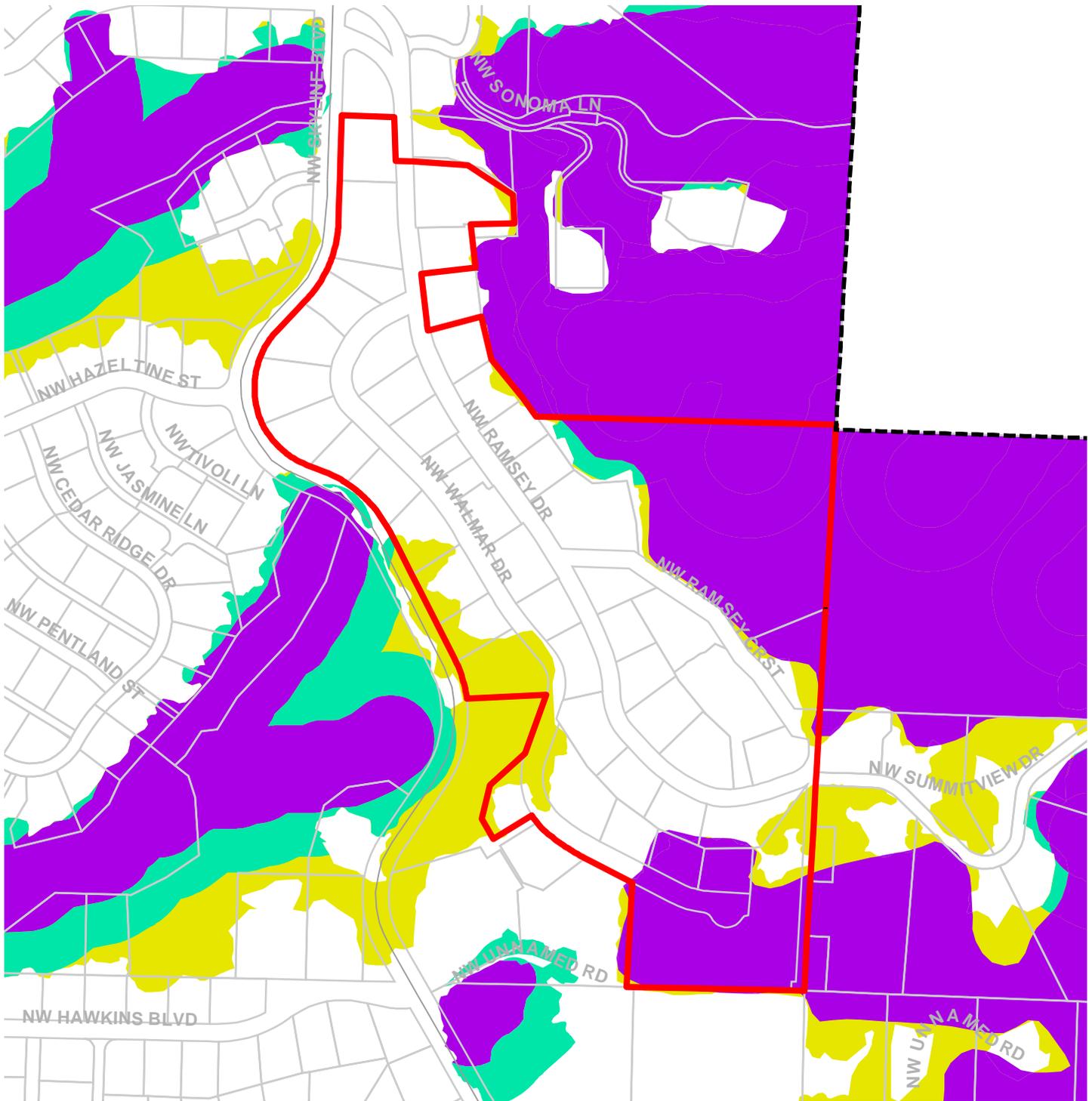
-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks



Updated: July 2021



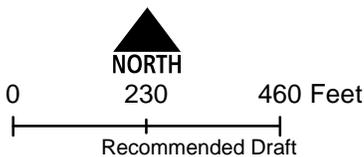
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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: FP25

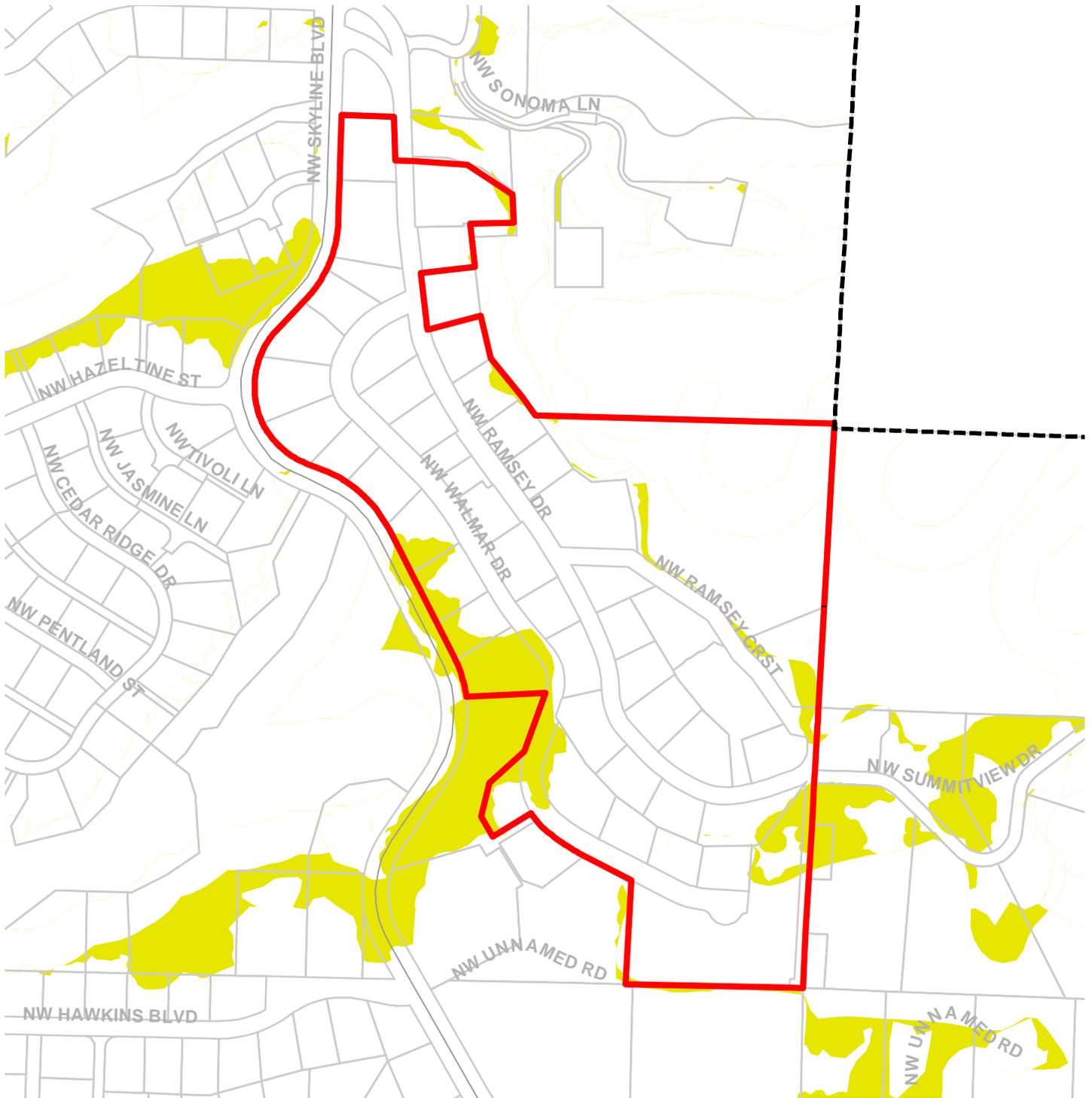
Updated: July 2021



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



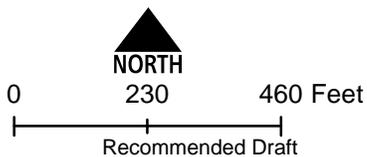
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Map H: Goal 5 Resources

Resource Site: FP25

Updated: July 2021

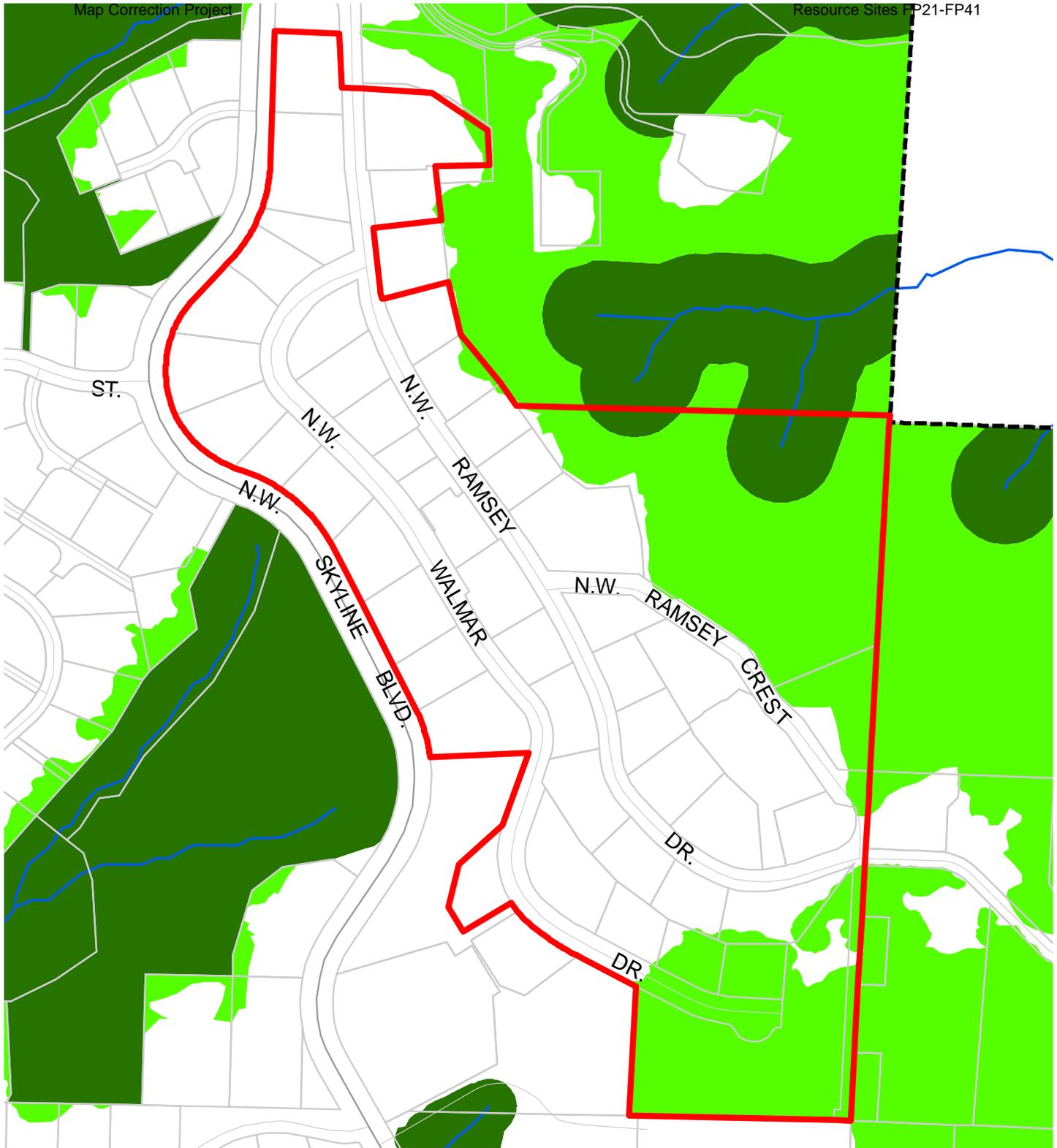


- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



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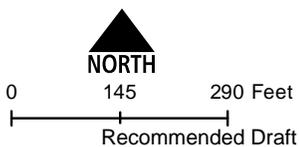


Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site: FP25

Updated: January 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.
January 2022

Natural Resource Description

Within resource site FP25 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 FP25	
	Study Area
Stream (Miles)	0.0
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	10.4
Woodland (acres)	0.0
Shrubland (acres)	0.0
Herbaceous (acres)	0.7
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	17.6
* The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area.	
**Slopes are derived from LiDAR. Steep slopes are areas with a slope greater than 25%.	

This site is composed of a patchwork of three soil types: Cascade silt loam, Cascade-Urban land complex and Goble silt loam. The predominant soils are the Cascade silt loam and the Cascade Urban complex. Cascade soils are somewhat poorly drained soils formed from silty materials. A two- to four-foot thick fragipan exists at a depth of 20 to 30 inches. A fragipan is a compacted layer of soil that creates a hard, impervious layer difficult for water and roots to penetrate. In winter and spring, it creates a perched water table; in summer, it creates a nearly rock-hard layer. The wetness of this layer can reduce the effectiveness of septic tank absorption fields and increases the likelihood of erosion. In addition, the shallow depth to the fragipan makes installation of some drainage systems difficult.

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

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

Table B: Quality of Natural Resource Functions in Resource Site FP25				
Resource Site (acres) = 29				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	0.8	1.9	7.7	10.4
percent total inventory site area	2.8%	6.5%	26.8%	36.1%
Wildlife Habitat*				
acres	8.5	1.5	0.0	10.0
percent total inventory site area	29.5%	5.2%	0.0%	34.7%
Special Habitat Areas**				
acres	7.6			
percent total inventory site area	26.3%			
Combined Total⁺				
acres	8.5	1.5	0.4	10.4
percent total inventory site area	29.5%	5.2%	1.5%	36.1%
* 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 FP25, 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 FP25			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
28.8	8.1	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 FP25. 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 FP25 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 FP25, 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 the resource site-specific evaluation for FP25, 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 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 areas of forest vegetation that are contiguous to but more than 100 feet from stream top-of-bank.
4. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands.
5. Apply a conservation overlay zone ('c' zone) to the 2-acre patch of forest vegetation that is contiguous to the open stream located in Resource Site SK6.
6. Allow conflicting uses within all other areas containing significant natural resources.

The forest canopy that extends across NW Skyline Blvd is providing riparian corridor and wildlife habitat functions for the stream located in Resource Site SK6.

Resource Site No.: FP26 Resource Site Name: Cornell Headwaters

Previous Plan: Balch Creek Watershed Protection Plan

Previous Resource site No.: 83

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

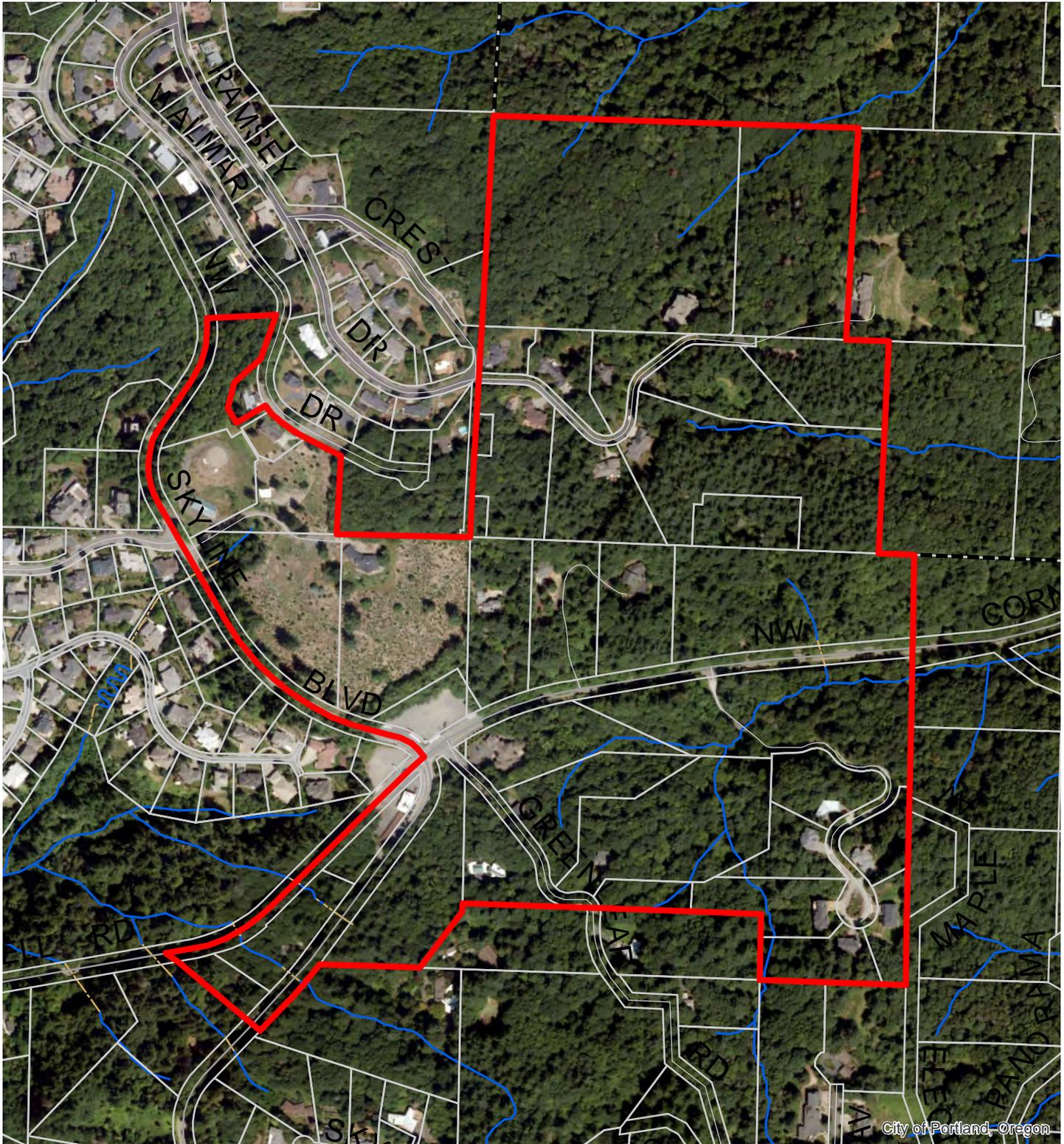
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 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.

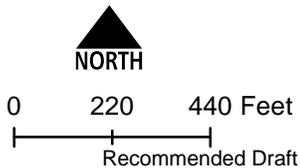
Resource site FP26 includes the following:

Site (acres)	93.7
Base zones (acres)	
CM1	2.9
R10	0.8
RF	90.0



Map A: Water Features
Resource Site: FP26

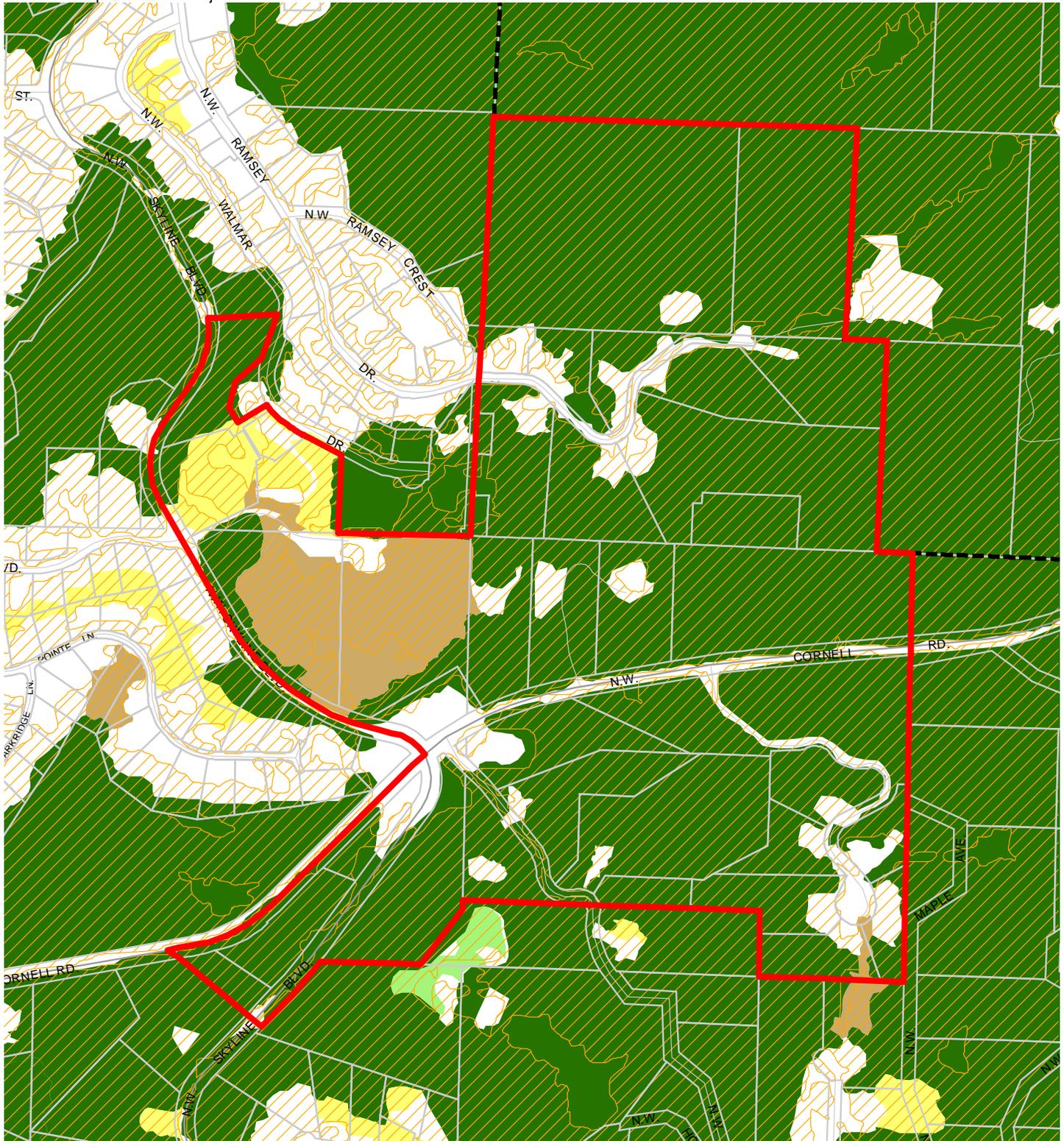
Updated: July 2021



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



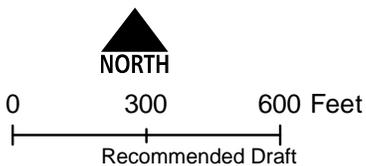
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.
January 2022



Map B: Vegetation and Steep Slopes

Resource Site: FP26

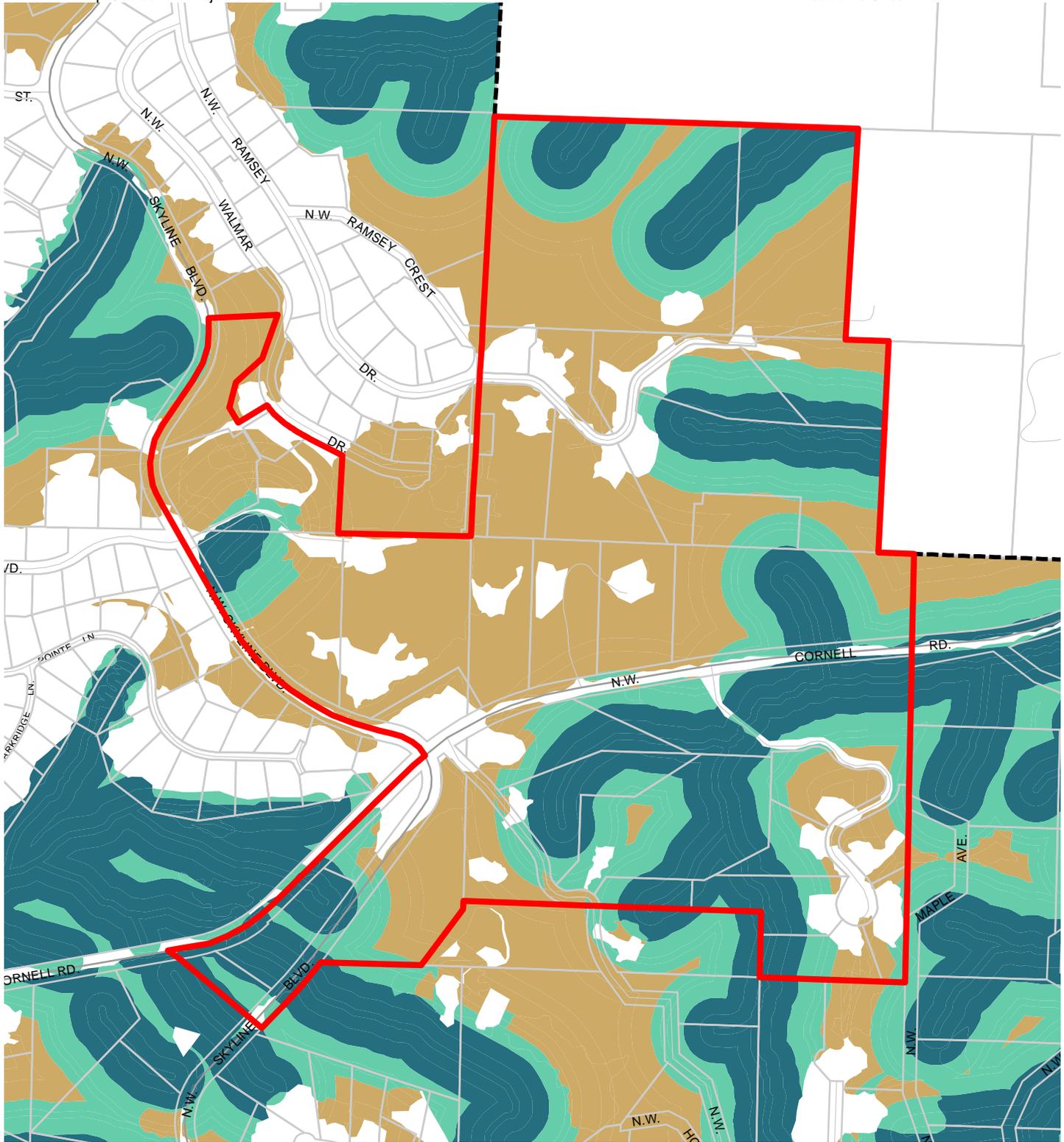
Updated: July 2021



- Resource Sites
- Urban Service Boundary
- Taxlots
- Slopes >25%
- Forest
- Woodland
- Shrubland
- Herbaceous



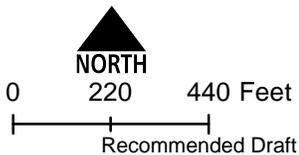
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.
January 2022



**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
FP26**

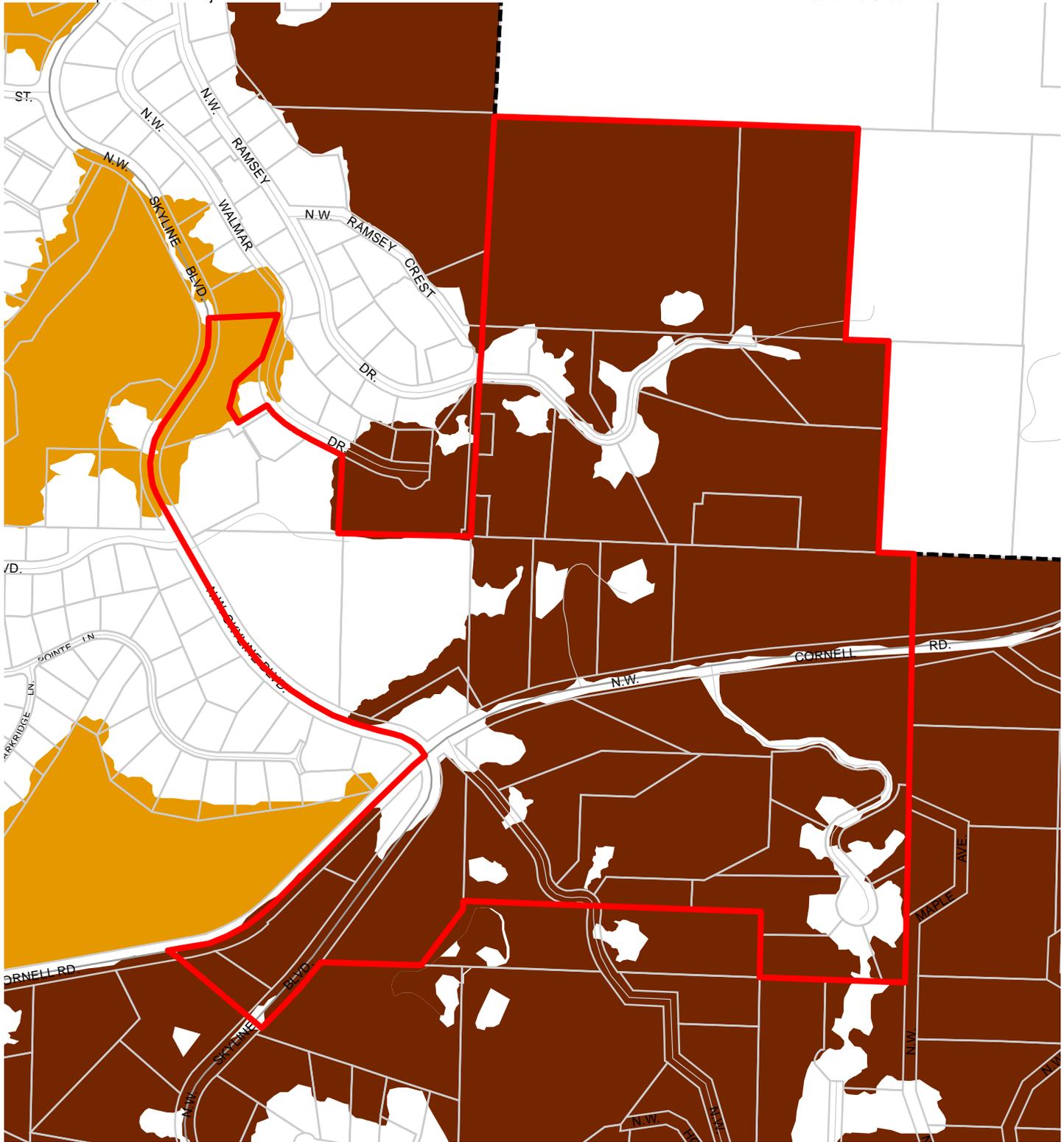
Updated: July 2021



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

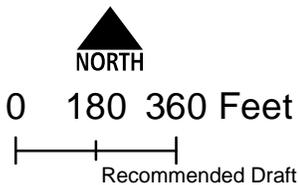


The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.
January 2022



**Map E: Wildlife
Habitat Classification**
Resource Site:
FP26

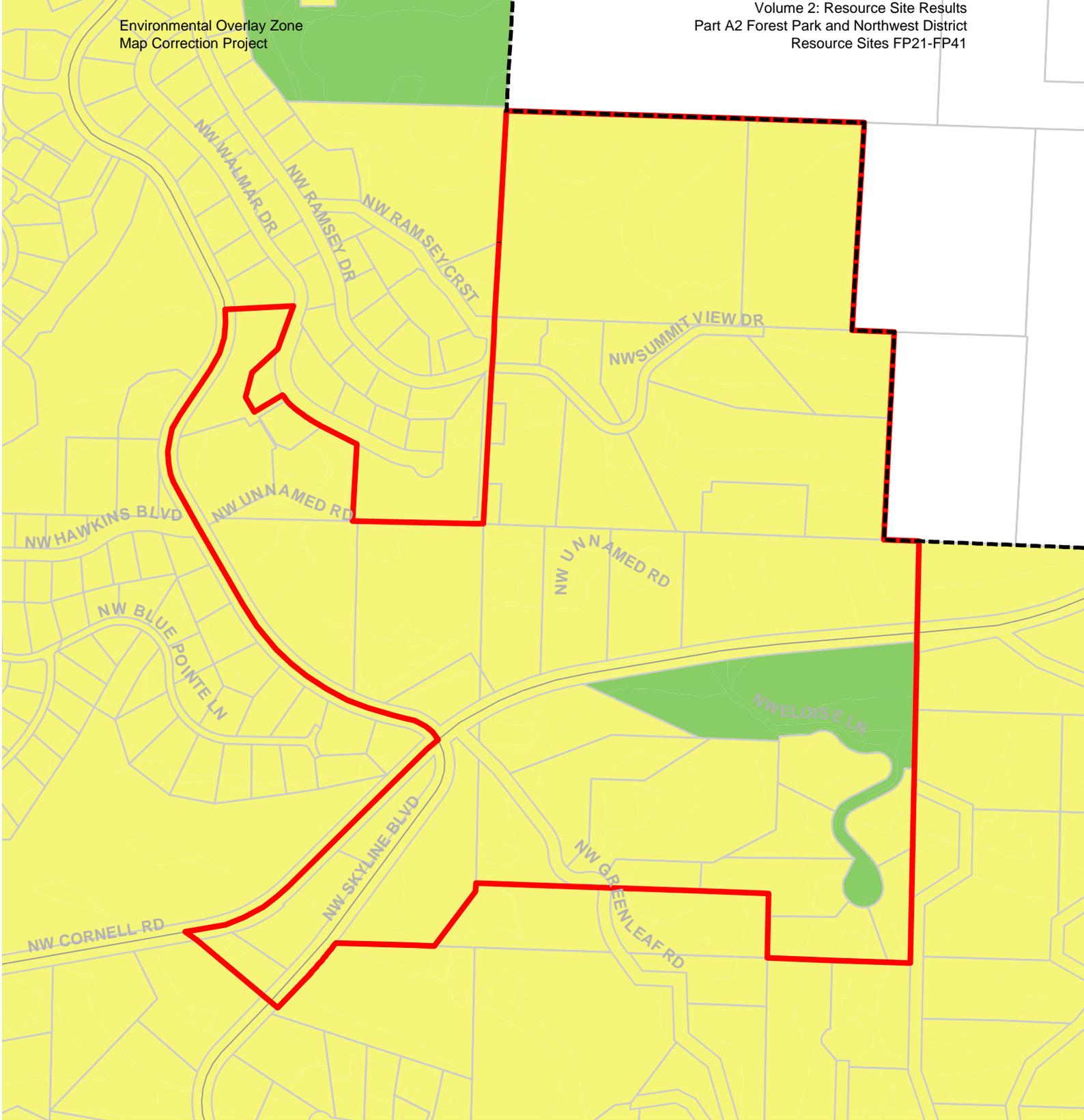
Updated: July 2021



- 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.
January 2022

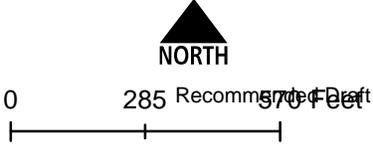


Map F: Urban Development Value (Title 13)
Resource Site: FP26

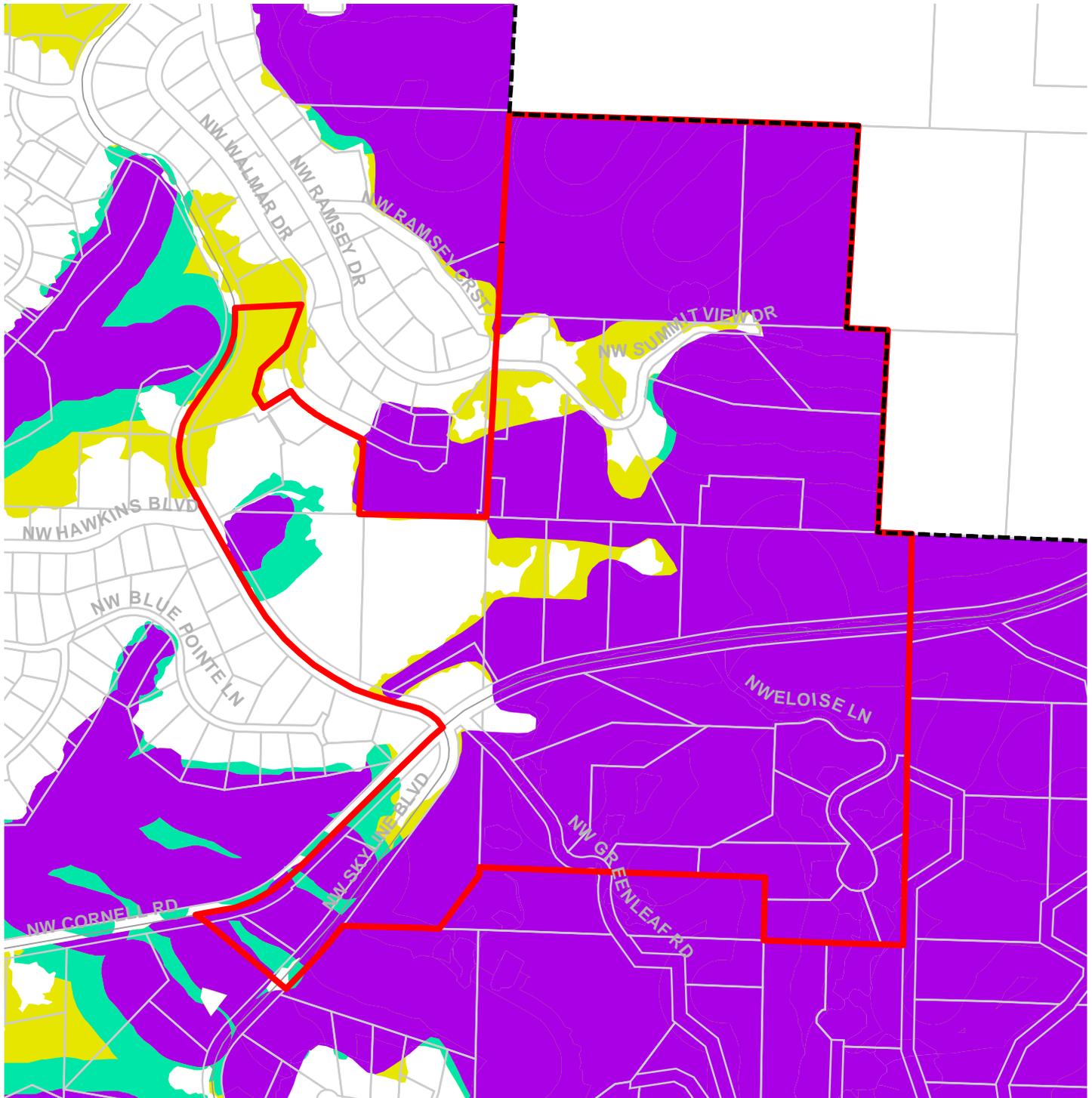
- Urban Service Boundary
- Resource Sites
- High Development Value
- Medium Development Value
- Low Development Value
- Parks



Updated: July 2021



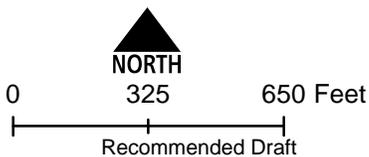
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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: FP26

Updated: July 2021

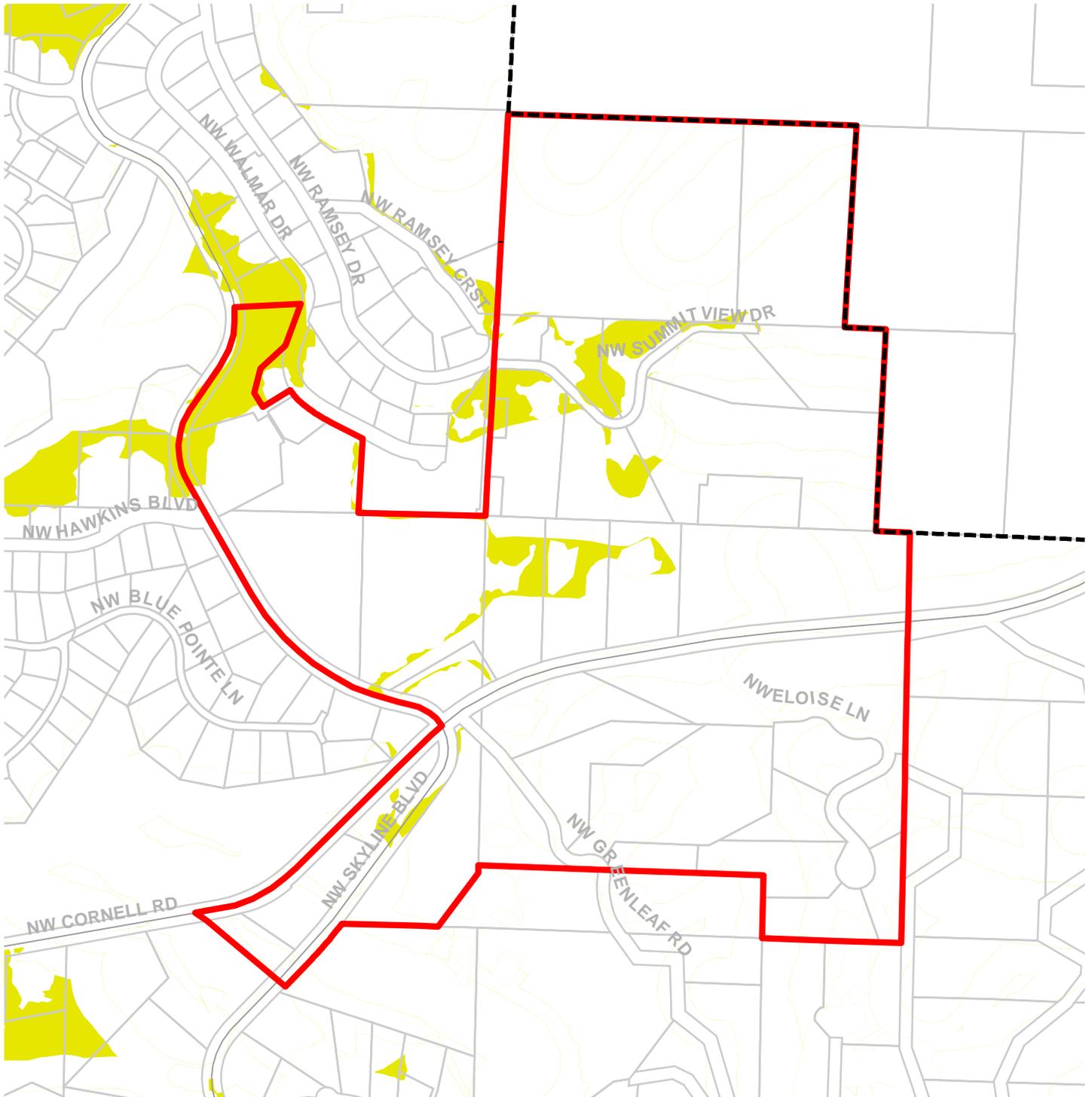


- Urban Service Boundary
- ▭ Resource Sites
- ▭ HCA High Value
- ▭ HCA Moderate Value
- ▭ HCA Low Value
- ▭ Goal 5 Significant Natural Resources



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.

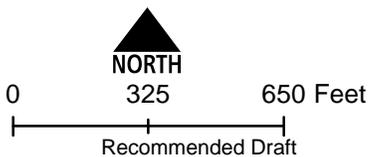
January 2022



Map H: Goal 5 Resources

Resource Site: FP26

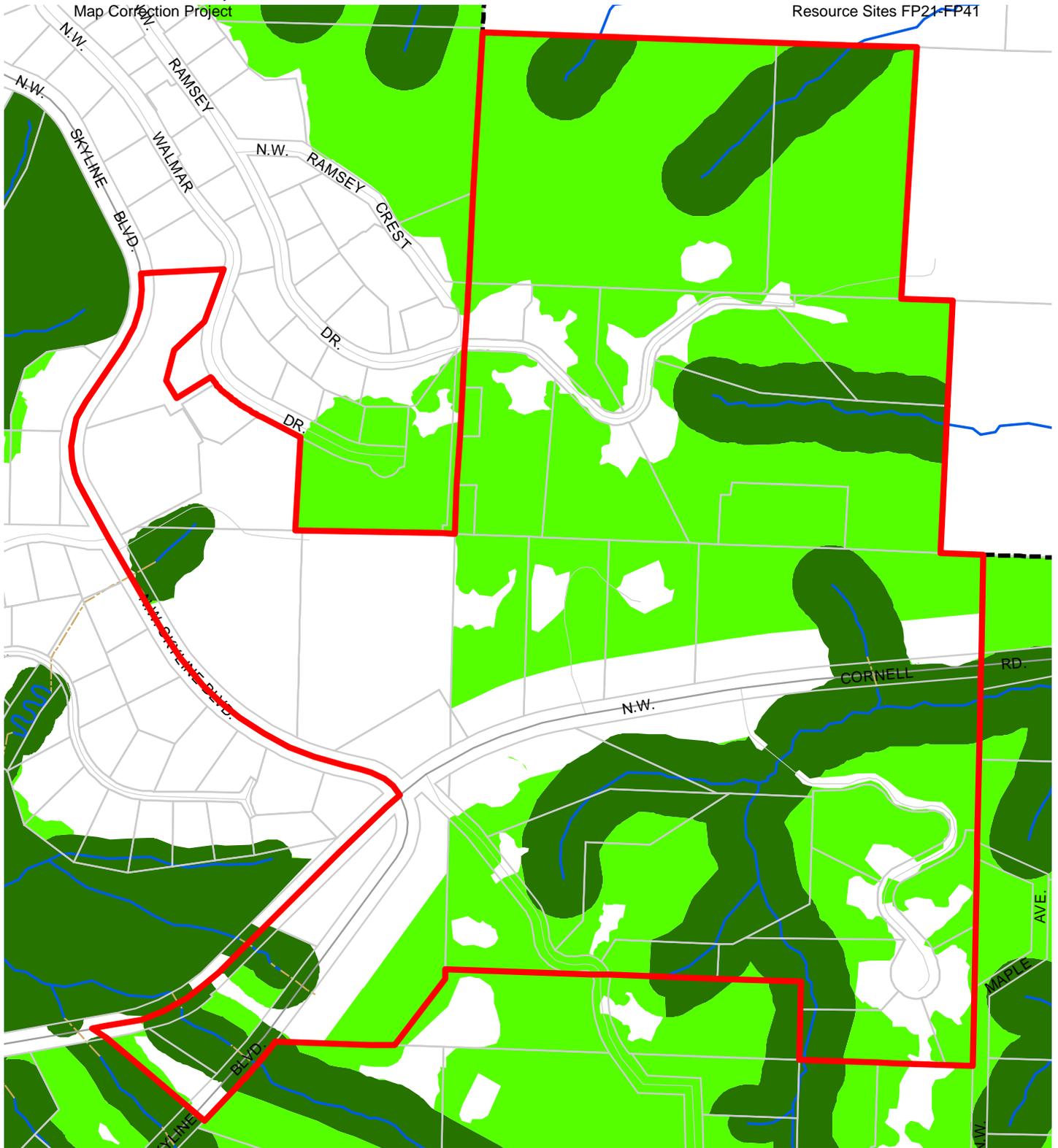
Updated: July 2021



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



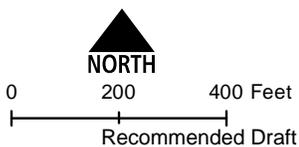
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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:
FP26**

Updated: January 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.
January 2022

Natural Resource Description

Within resource site FP26 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 FP26	
	Study Area
Stream (Miles)	0.8
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	73.8
Woodland (acres)	0.0
Shrubland (acres)	6.6
Herbaceous (acres)	2.5
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	83.8
* 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%.	

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 FP26				
Resource Site (acres) = 94				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	21.7	20.5	39.7	81.9
percent total inventory site area	23.2%	21.9%	42.3%	87.4%
Wildlife Habitat*				
acres	70.6	1.9	0.0	72.5
percent total inventory site area	75.4%	2.0%	0.0%	77.4%
Special Habitat Areas**				
acres	67.7			
percent total inventory site area	72.3%			
Combined Total⁺				
acres	71.4	3.0	7.4	81.9
percent total inventory site area	76.3%	3.2%	7.9%	87.4%
* 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 FP26, 4% 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 FP26			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
93.7	7.8	3.7	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 FP26. 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 FP26 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 and R10 base zones. Commercial uses are allowed in the CM1 base zone. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

The analysis of economic, social, environmental and energy consequences provided in Volume 3 is confirmed for resource site FP26, 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 the resource site-specific evaluation for FP26, 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 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 that are contiguous 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 areas of forest vegetation contiguous to but more than 100 feet from top-of-bank.
4. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands.
5. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: FP27 Resource Site Name: Thompson

Headwaters

Previous Plan: Balch Creek Watershed Protection Plan

Previous Resource Site No.: 85

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

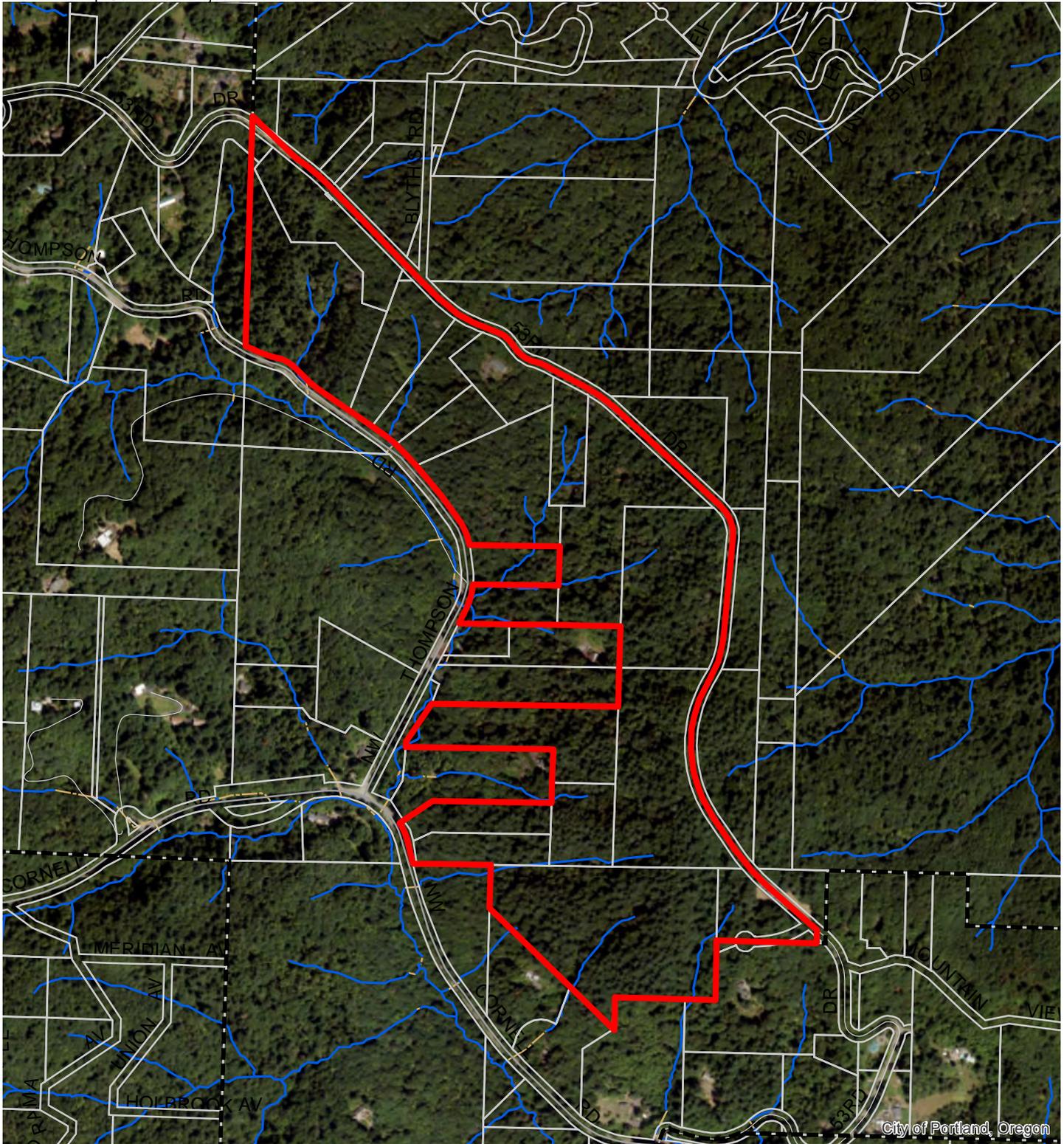
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 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 FP27 includes the following:

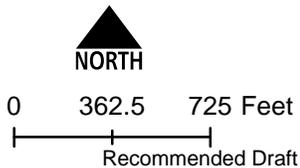
Site (acres)	101.6
Base zones (acres)	
OS	98.1
RF	3.5



Map A: Water Features

Resource Site: FP27

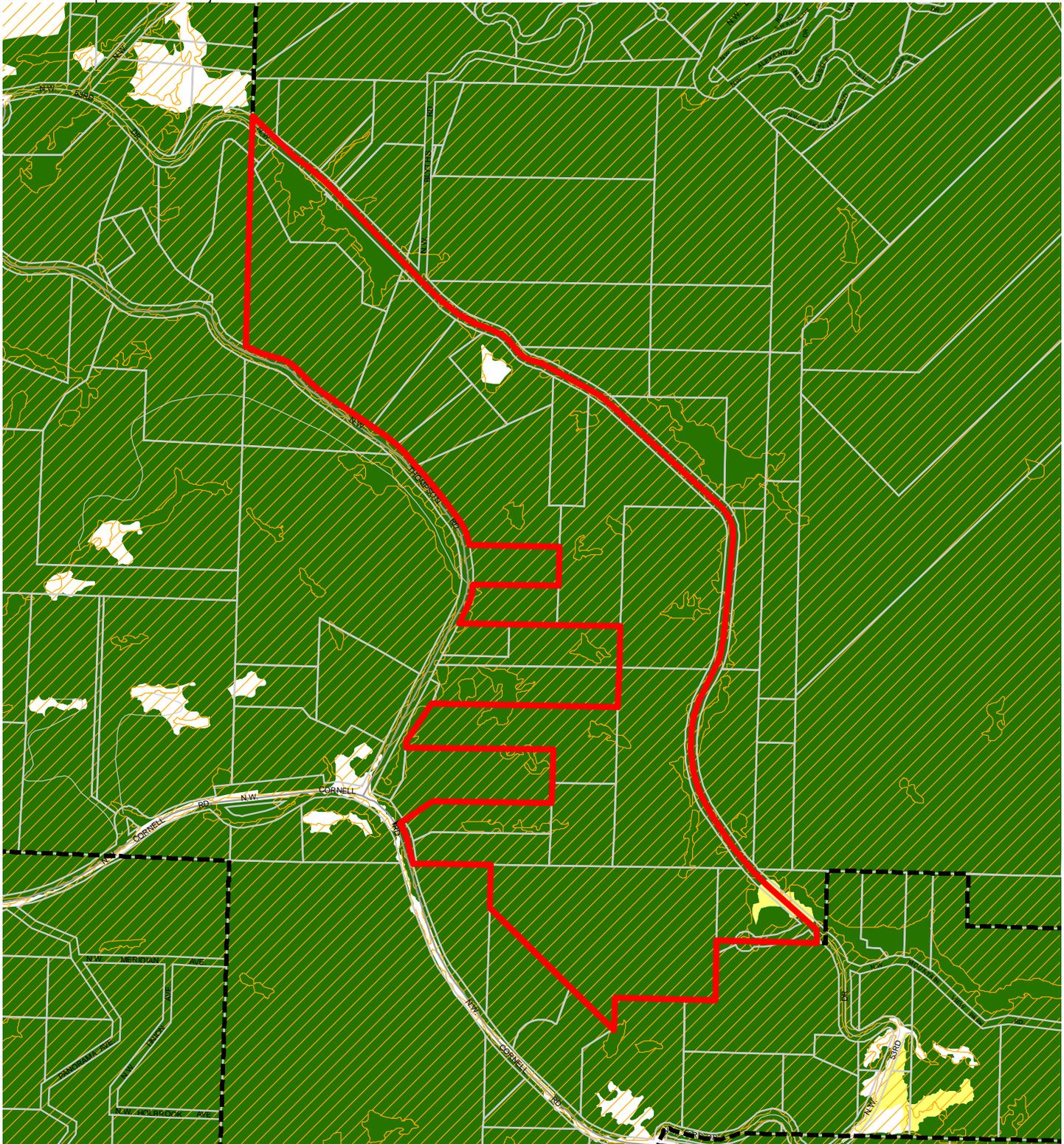
Updated: July 2021



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



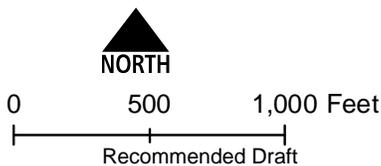
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.
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Map B: Vegetation and Steep Slopes

**Resource Site:
FP27**

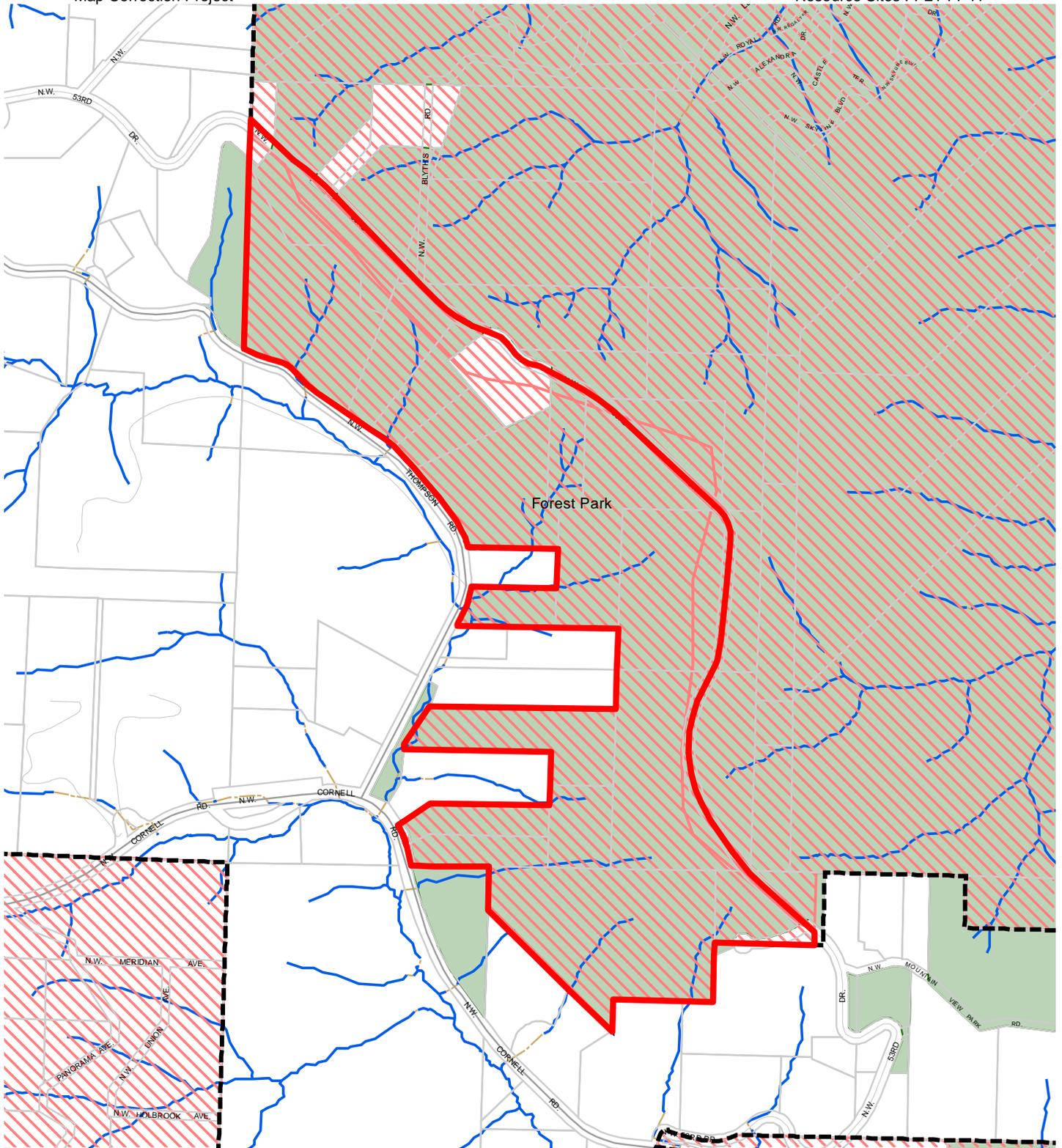
Updated: July 2021



- Resource Sites
- Urban Service Boundary
- Taxlots
- Slopes >25%
- Forest
- Woodland
- Shrubland
- Herbaceous



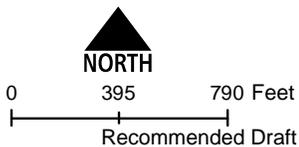
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**Map C: Special
Habitat Areas**

**Resource Site:
FP27**

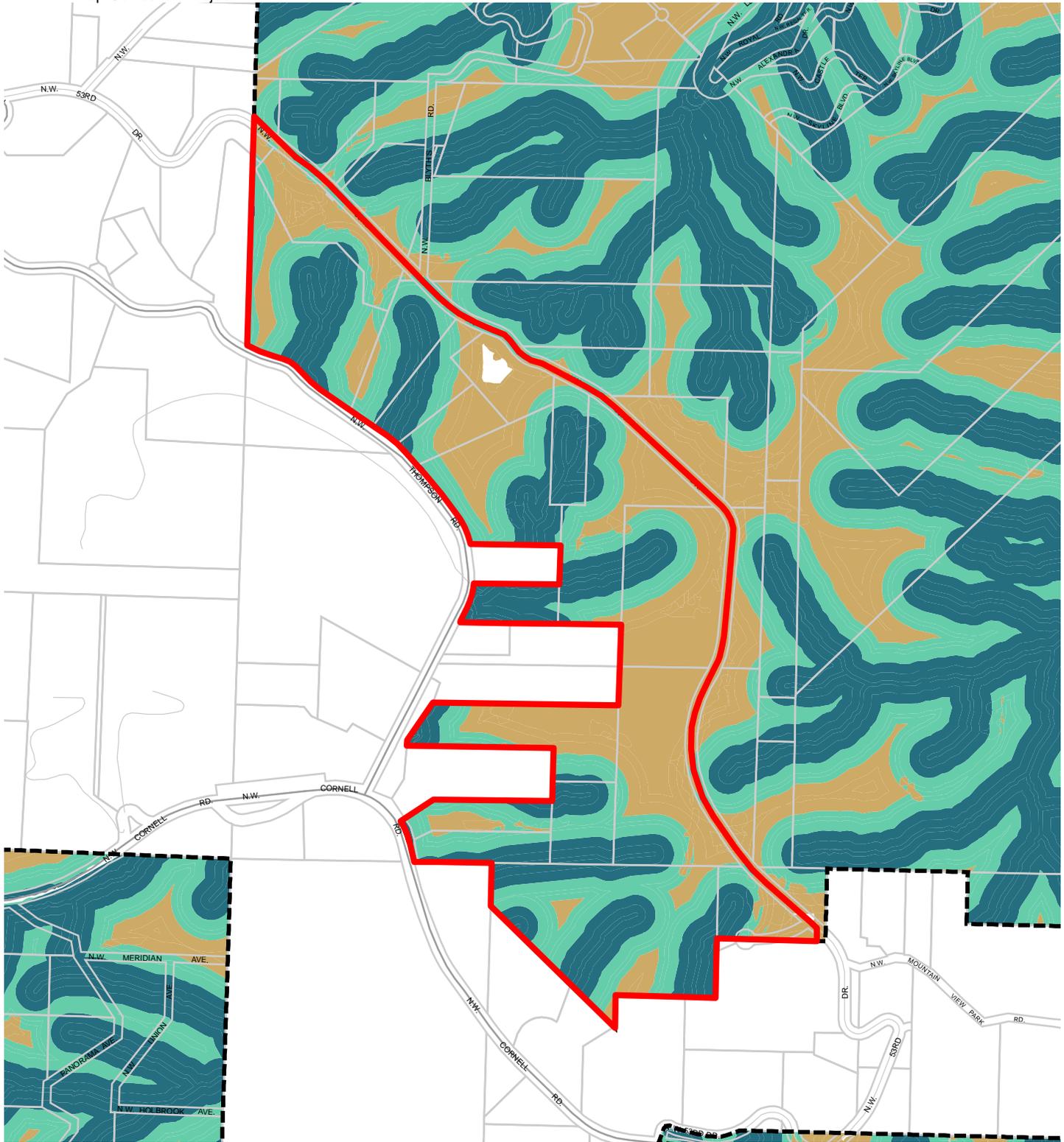
Updated: June 2021



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



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January 2022

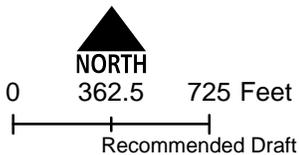


**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
FP27**

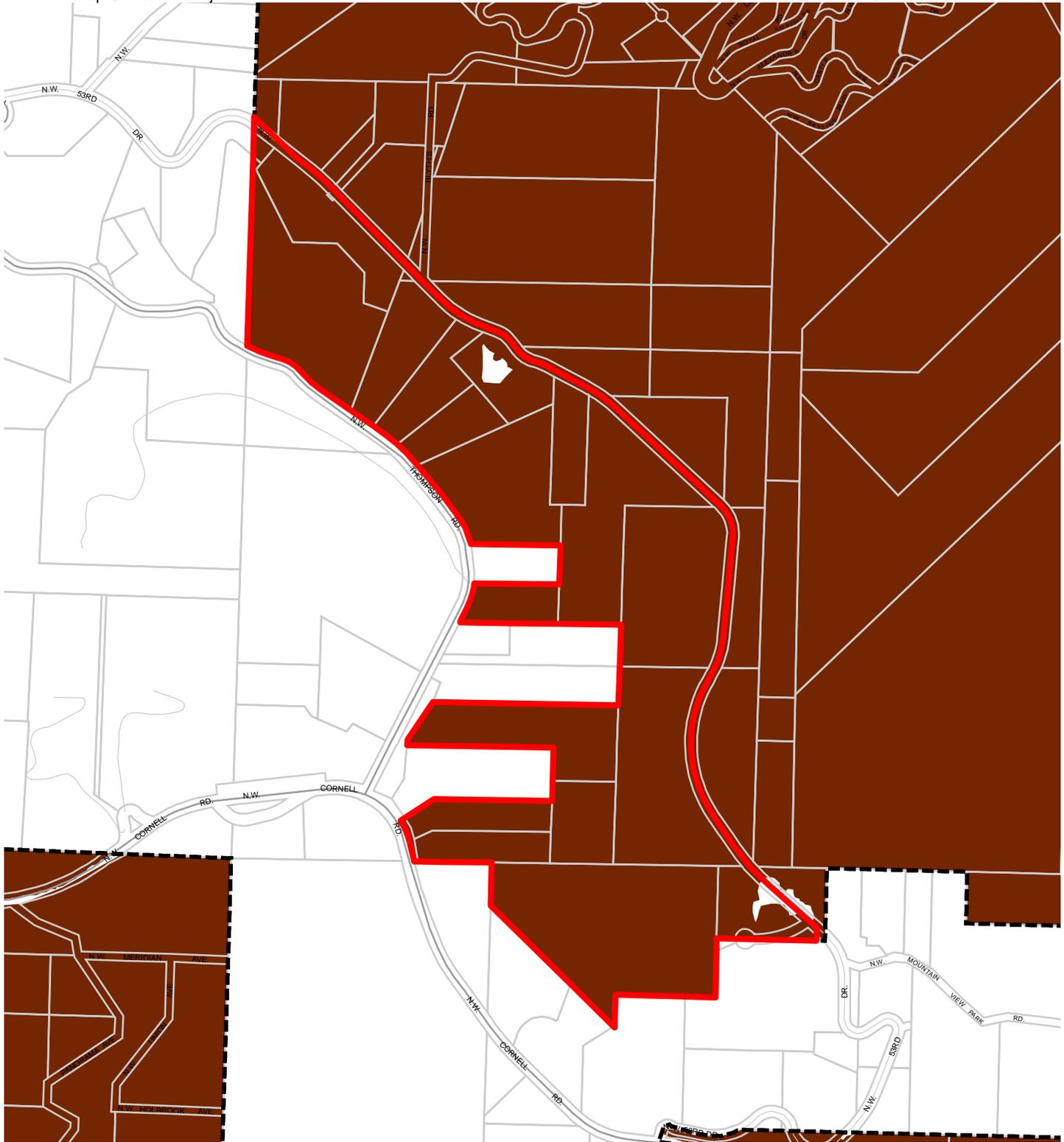
Updated: July 2021

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



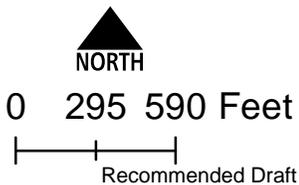
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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:
FP27**

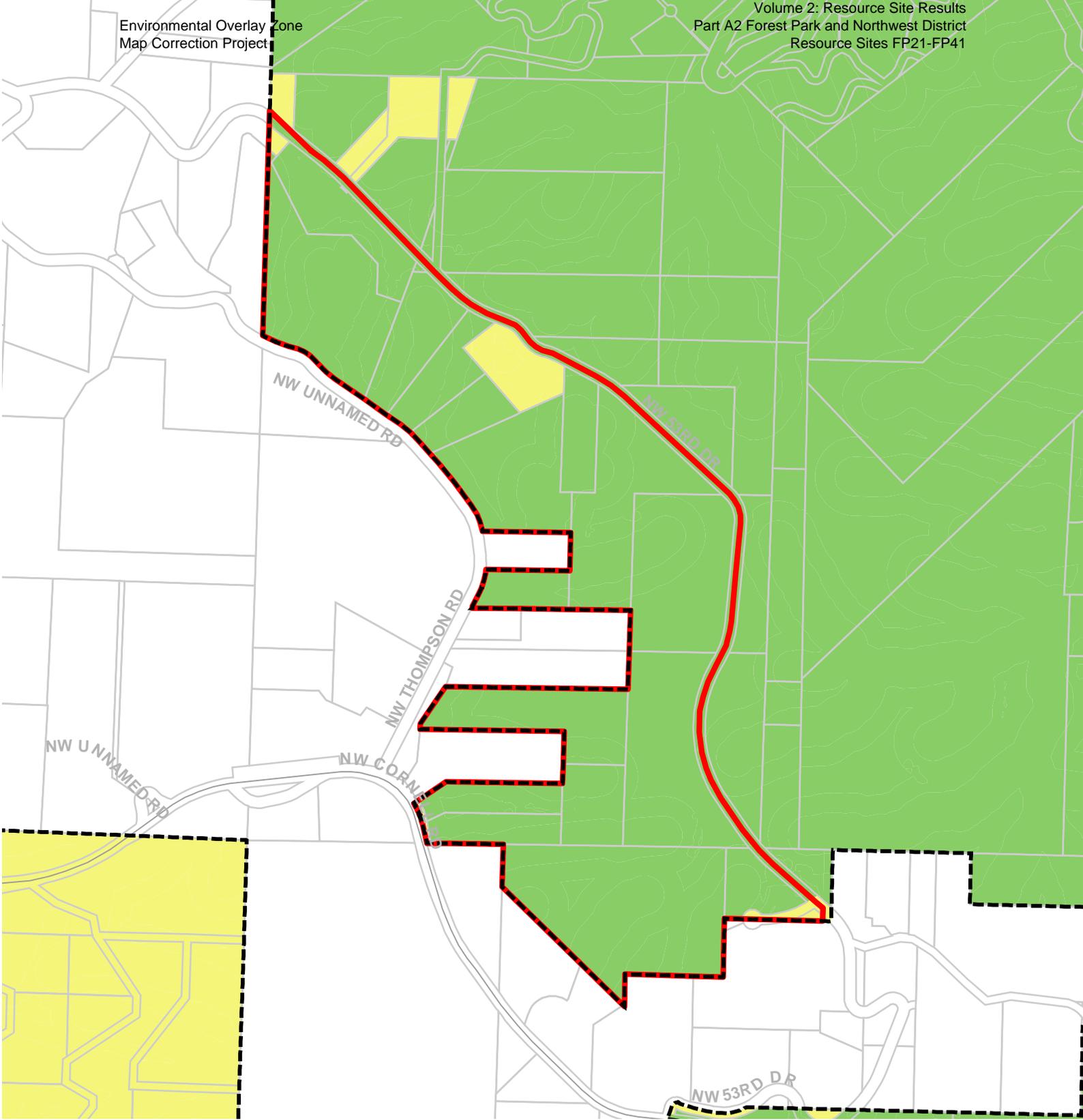
Updated: July 2021



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



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January 2022

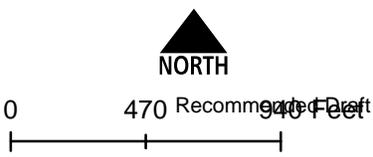


**Map F: Urban Development Value (Title 13)
Resource Site: FP27**

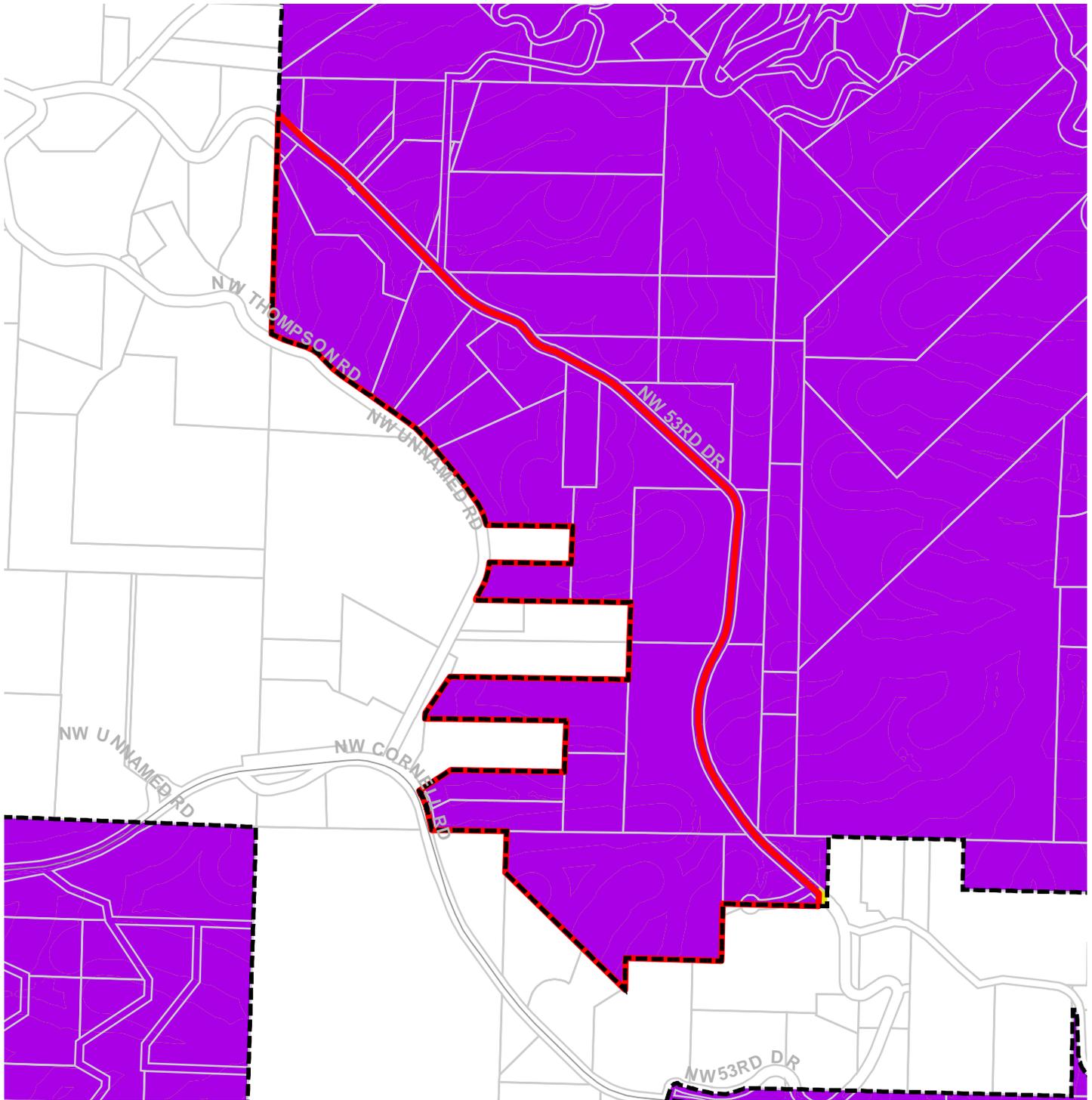
-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks



Updated: July 2021



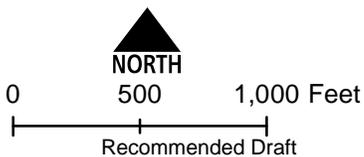
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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: FP27

Updated: July 2021



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



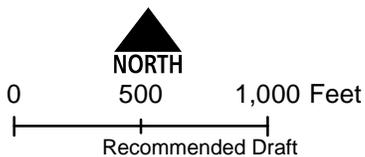
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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: FP27

Updated: July 2021

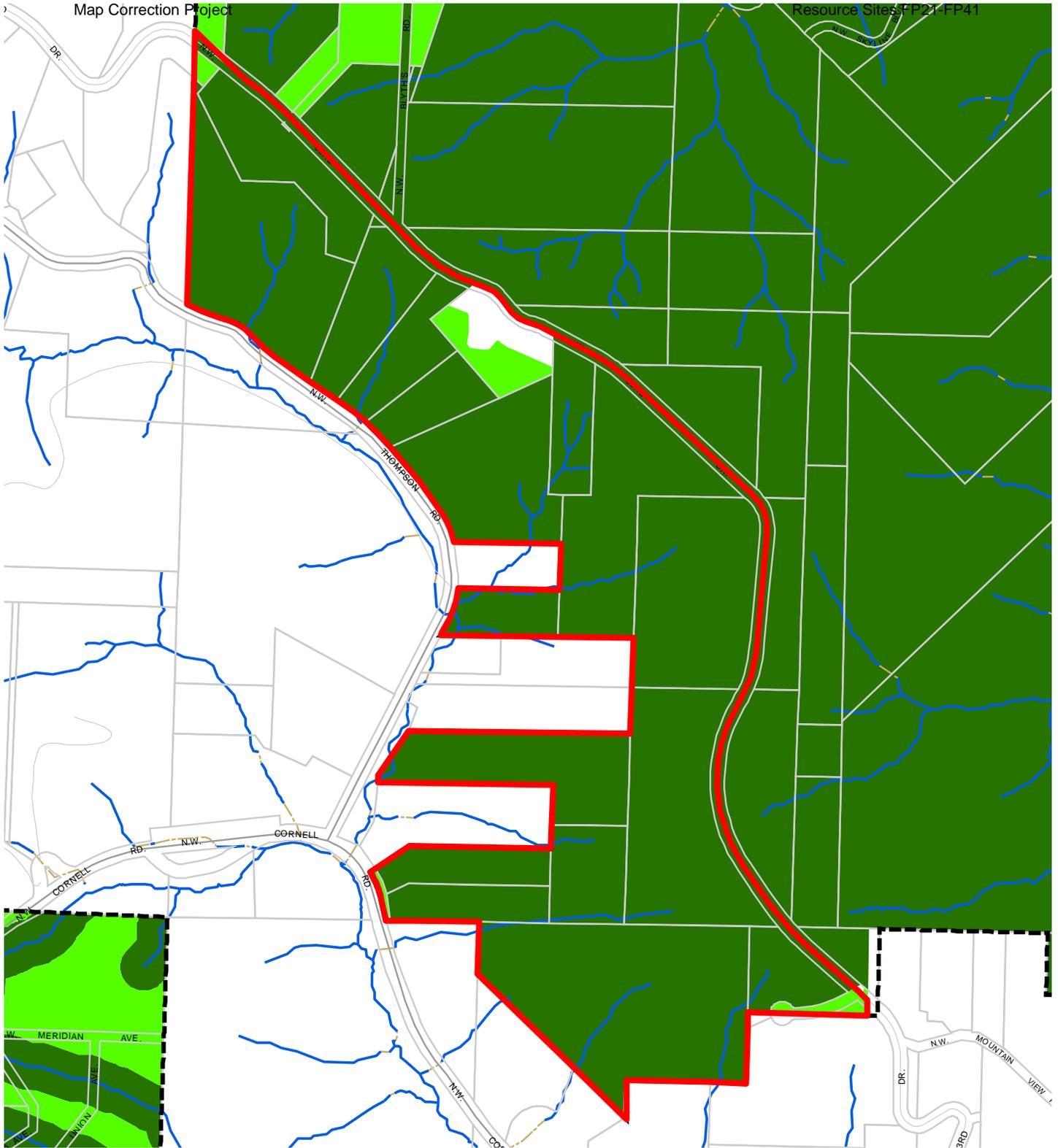


- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



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.

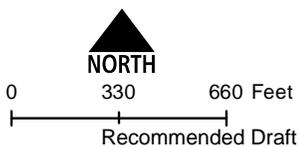
January 2022



Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site: FP27

Updated: January 2022



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



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January 2022

Natural Resource Description

Within resource site FP27 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 FP27	
	Study Area
Stream (Miles)	1.2
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	100.9
Woodland (acres)	0.0
Shrubland (acres)	0.0
Herbaceous (acres)	0.4
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	93.3
* 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%.	

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 FP27				
Resource Site (acres) = 102				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	29.8	33.5	38.0	101.2
percent total inventory site area	29.3%	32.9%	37.3%	99.6%
Wildlife Habitat*				
acres	100.9	0.0	0.0	100.9
percent total inventory site area	99.2%	0.0%	0.0%	99.2%
Special Habitat Areas**				
acres	101.6			
percent total inventory site area	100.0%			
Combined Total⁺				
acres	100.9	0.0	0.4	101.2
percent total inventory site area	99.2%	0.0%	0.4%	99.6%
* 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 FP27, 0.6% 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 FP27			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
101.7	1.5	0.6	0.6%

*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 FP1. 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

All of the significant natural resources within resource site FP27 are designated Habitat Conservation Areas under Metro Title 13; therefore, no resource site-specific ESEE is required.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and the resource site-specific evaluation for FP27, 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 and wetlands, and land within 25 feet of stream top-of-bank or wetlands.
2. Within public parks, apply a protection overlay zone ('p' zone) to land between 25 and 50 feet of stream top-of-bank or wetlands; and within areas of forest, woodland, shrubland or herbaceous vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
3. Outside of public parks, apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet from stream top-of-bank or wetlands; and within areas of forest or woodland 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.: FP28 **Resource Site Name:** Holman
Park/Thurman St.

Previous Plan: West hills Natural Areas Protection Plan

Previous Resource Site No.: 86

The results of the analysis found in Volume 3 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.

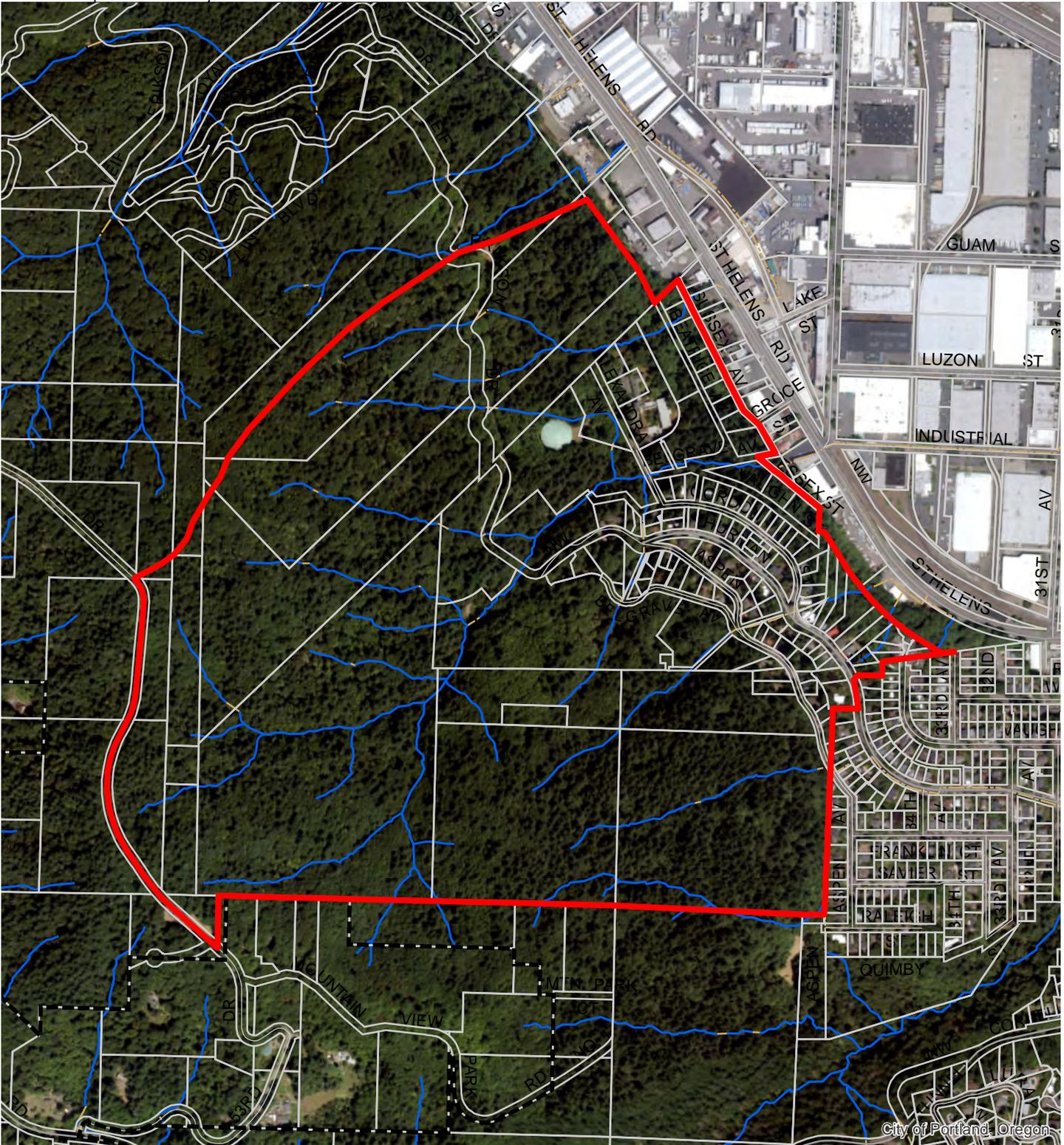
Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site FP28 includes the following:

Site (acres) 294.4

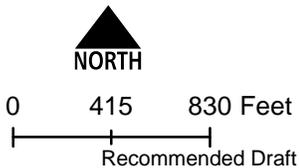
Base zones (acres)

IG1	0.0
OS	254.9
R10	18.6
R5	17.1
RF	0.0
RM1	3.7



Map A: Water Features
Resource Site: FP28

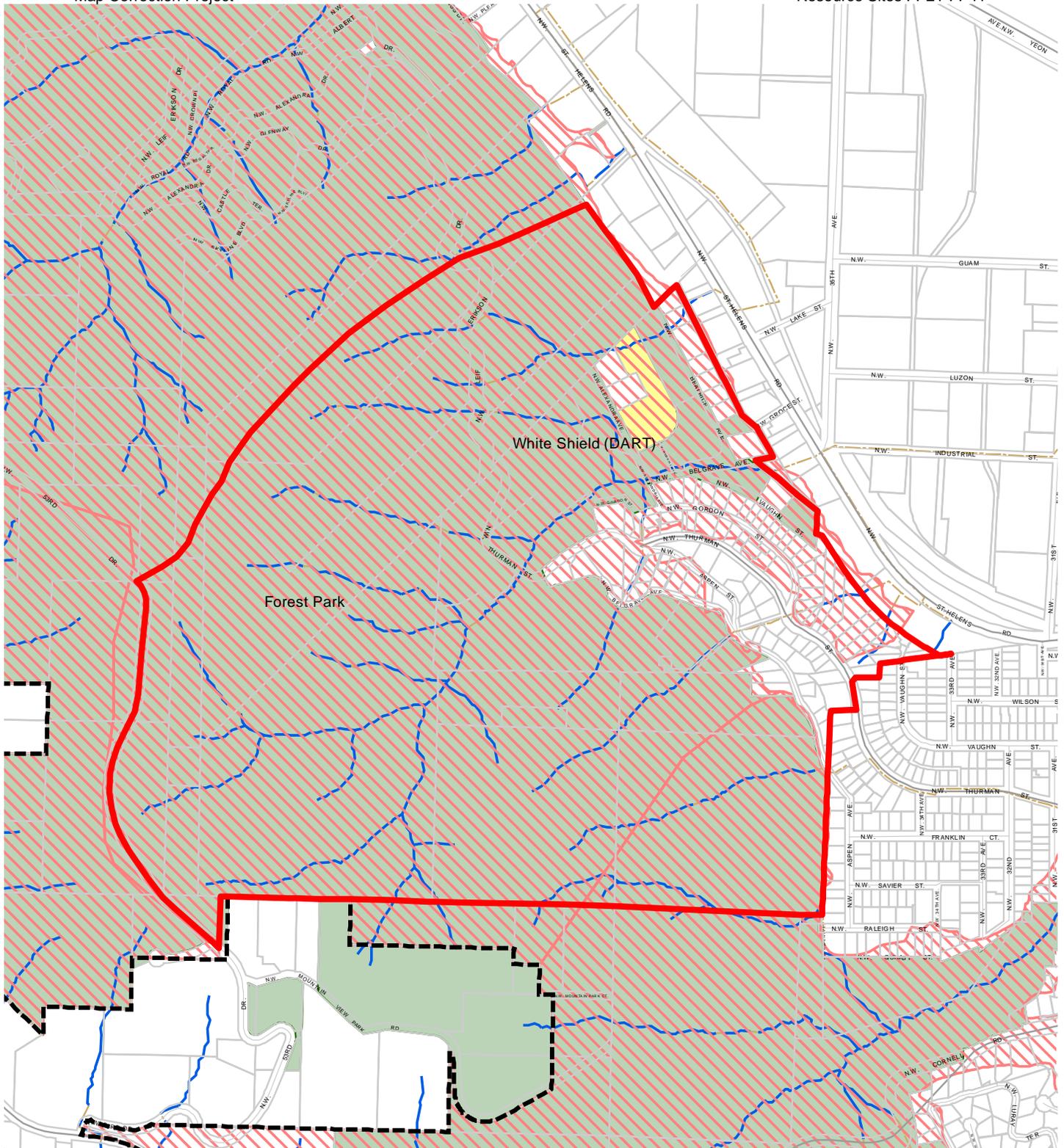
Updated: July 2021



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

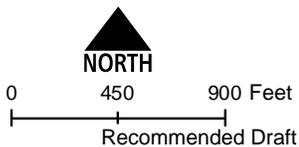


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**Map C: Special
Habitat Areas**
**Resource Site:
FP28**

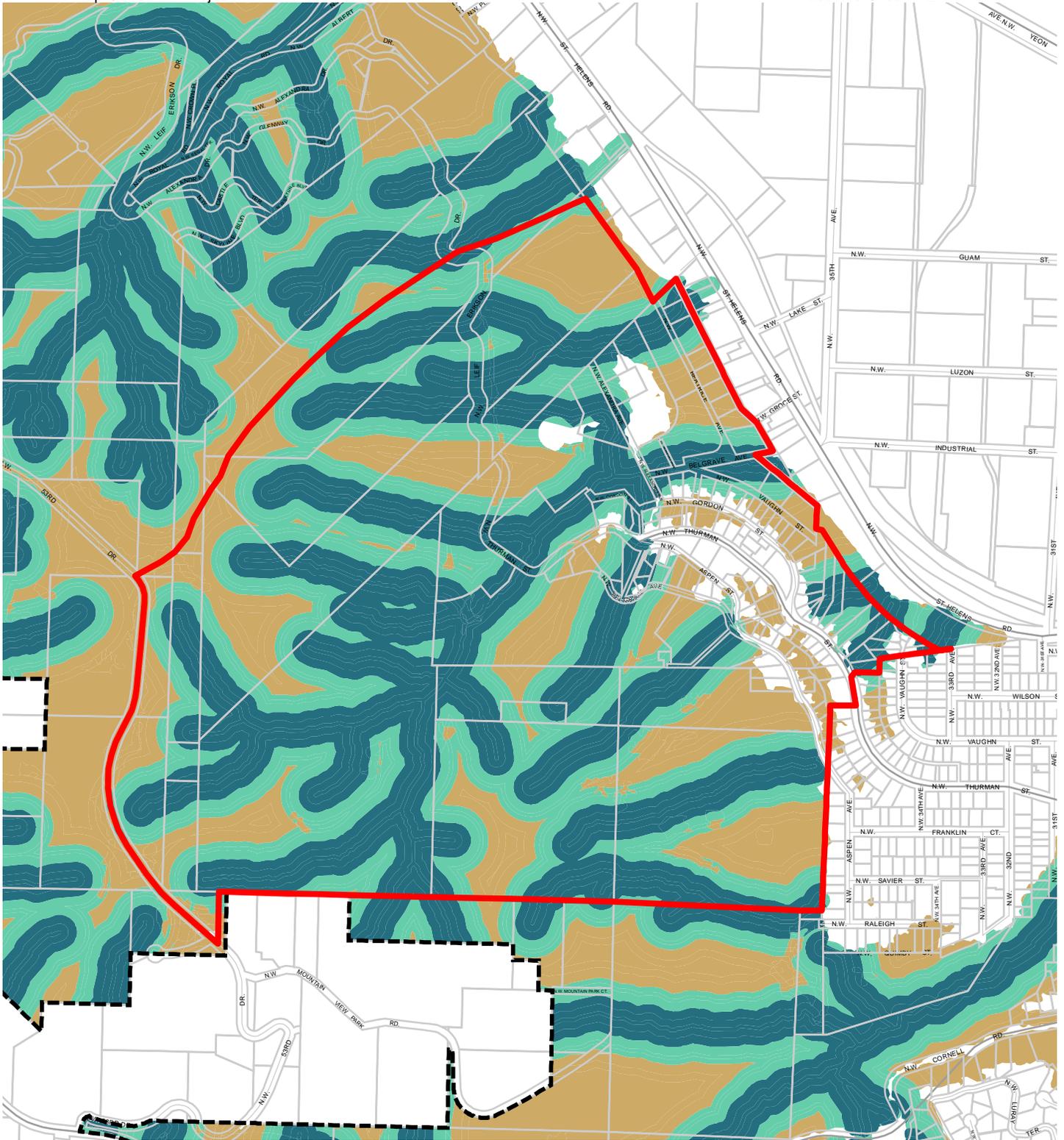
Updated: June 2021



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



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January 2022

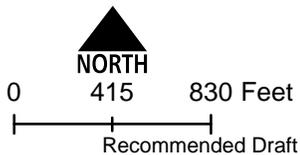


**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
FP28**

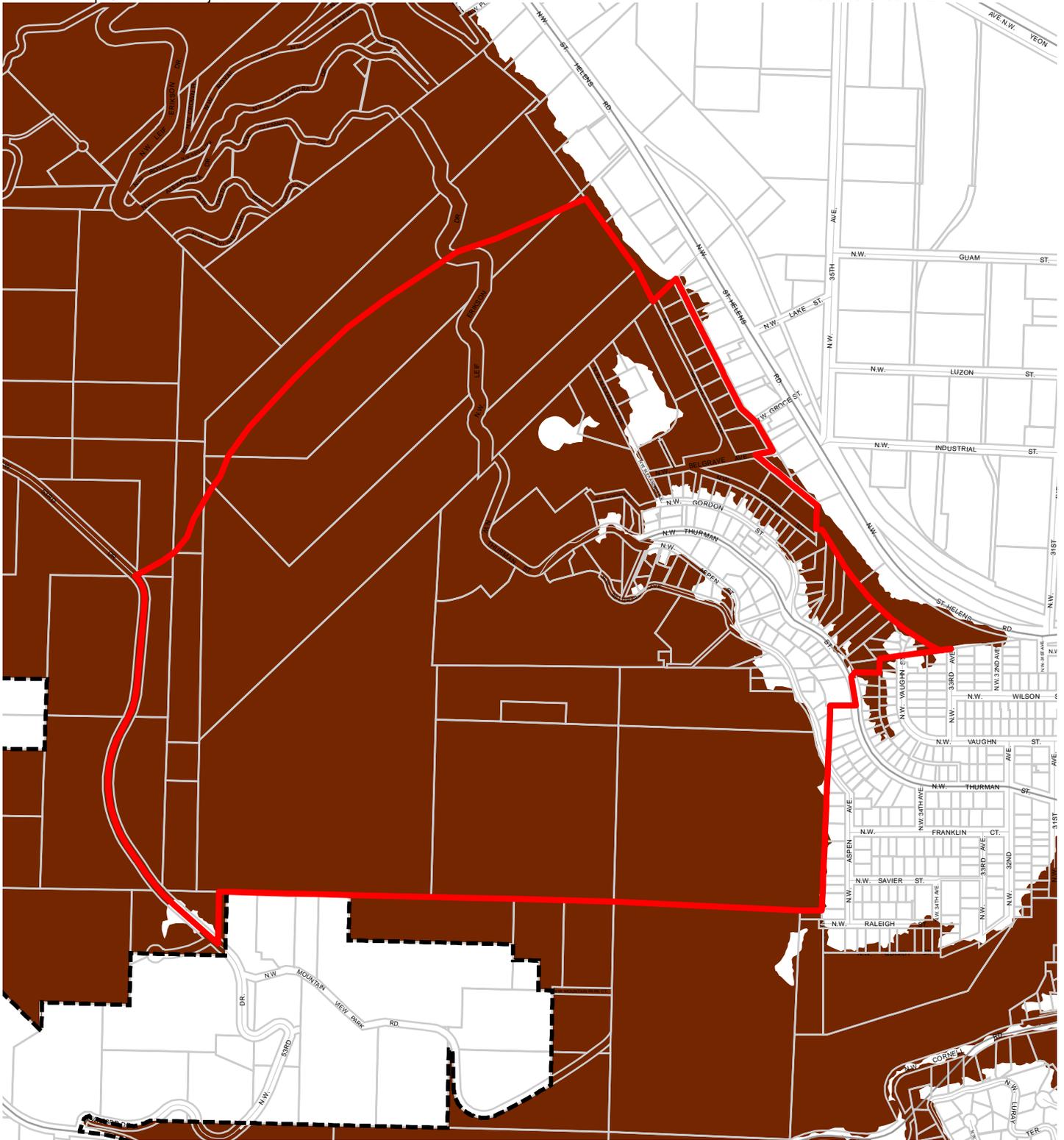
Updated: July 2021

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



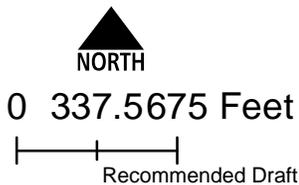
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**Map E: Wildlife
Habitat Classification
Resource Site:
FP28**

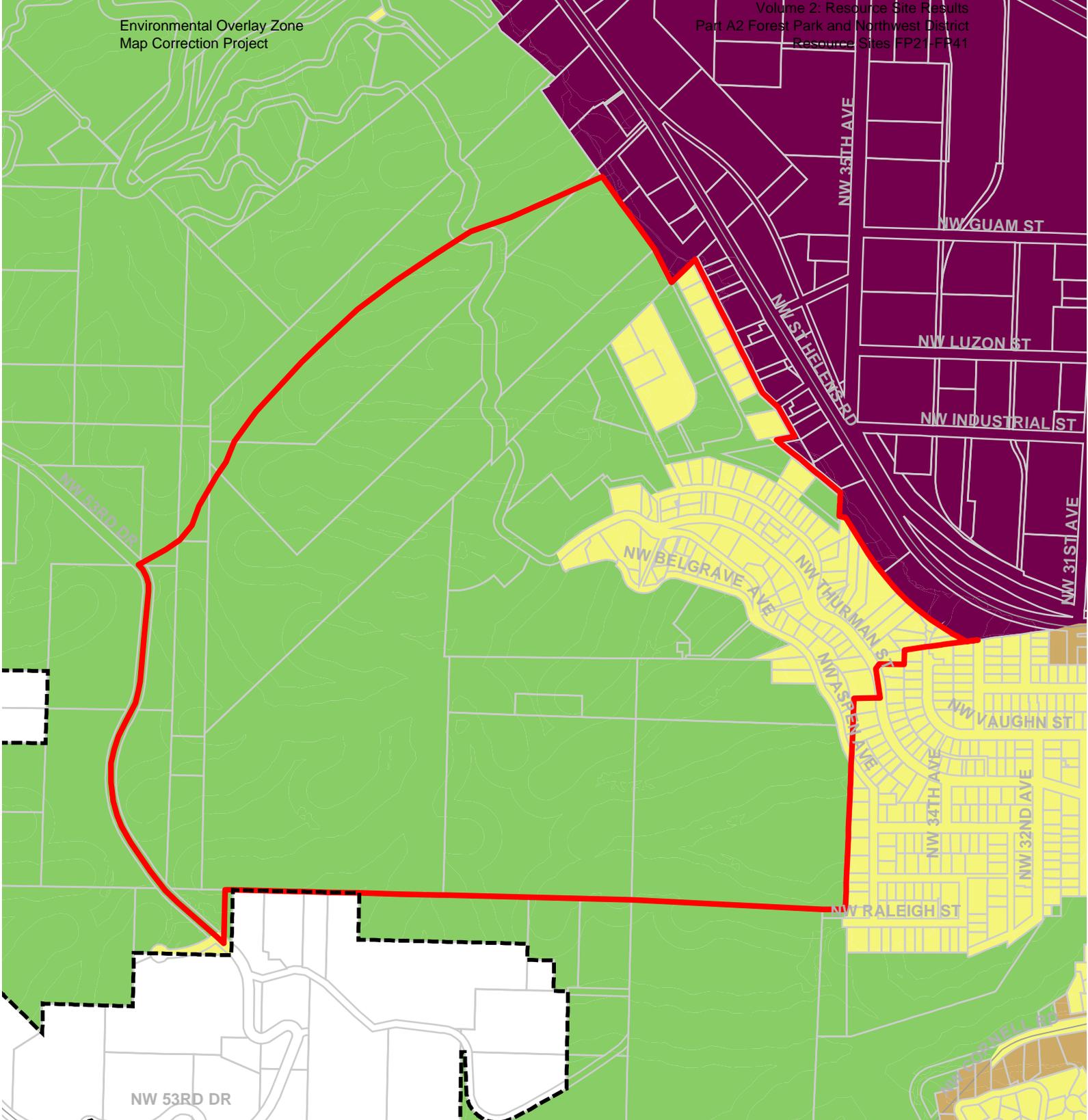
Updated: July 2021



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



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January 2022

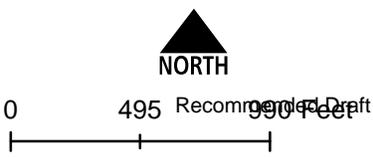


Map F: Urban Development Value (Title 13)
Resource Site: FP28

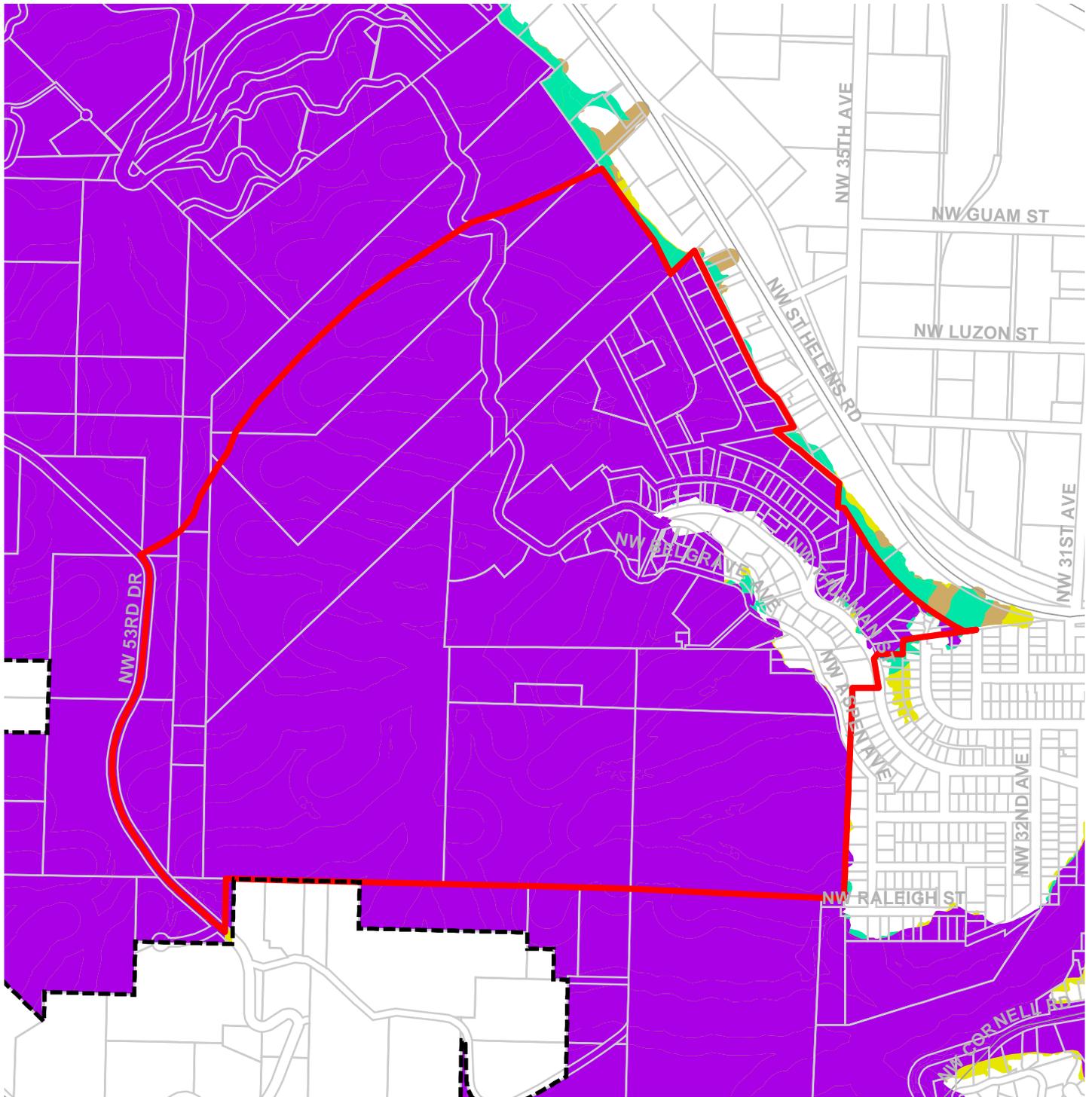
-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks



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.

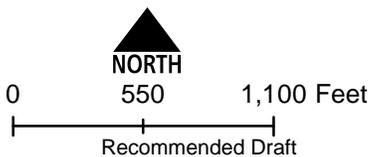


Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

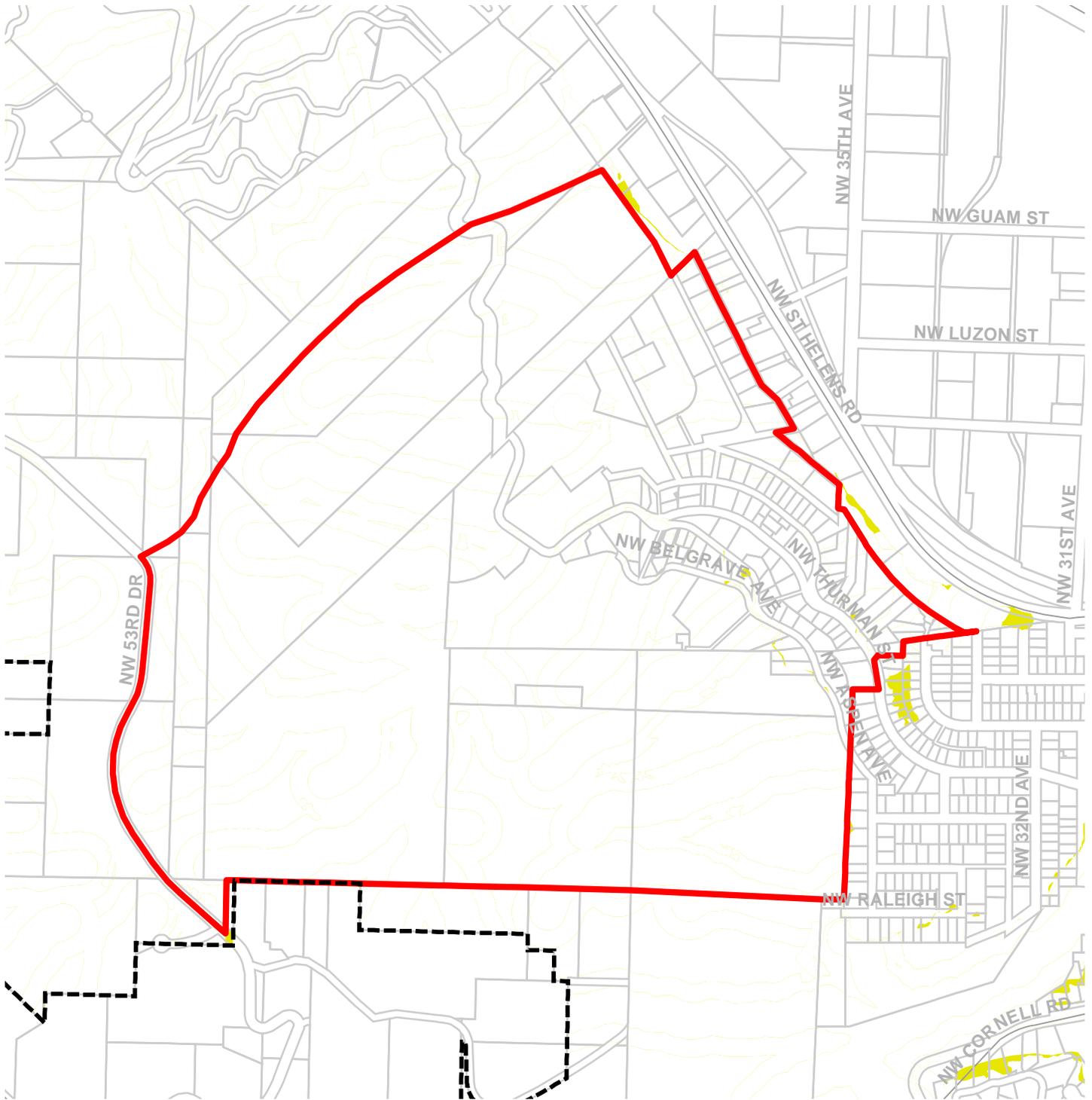
Resource Site: FP28

Updated: July 2021

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



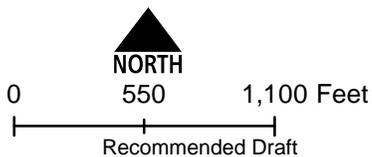
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Map H: Goal 5 Resources

Resource Site: FP28

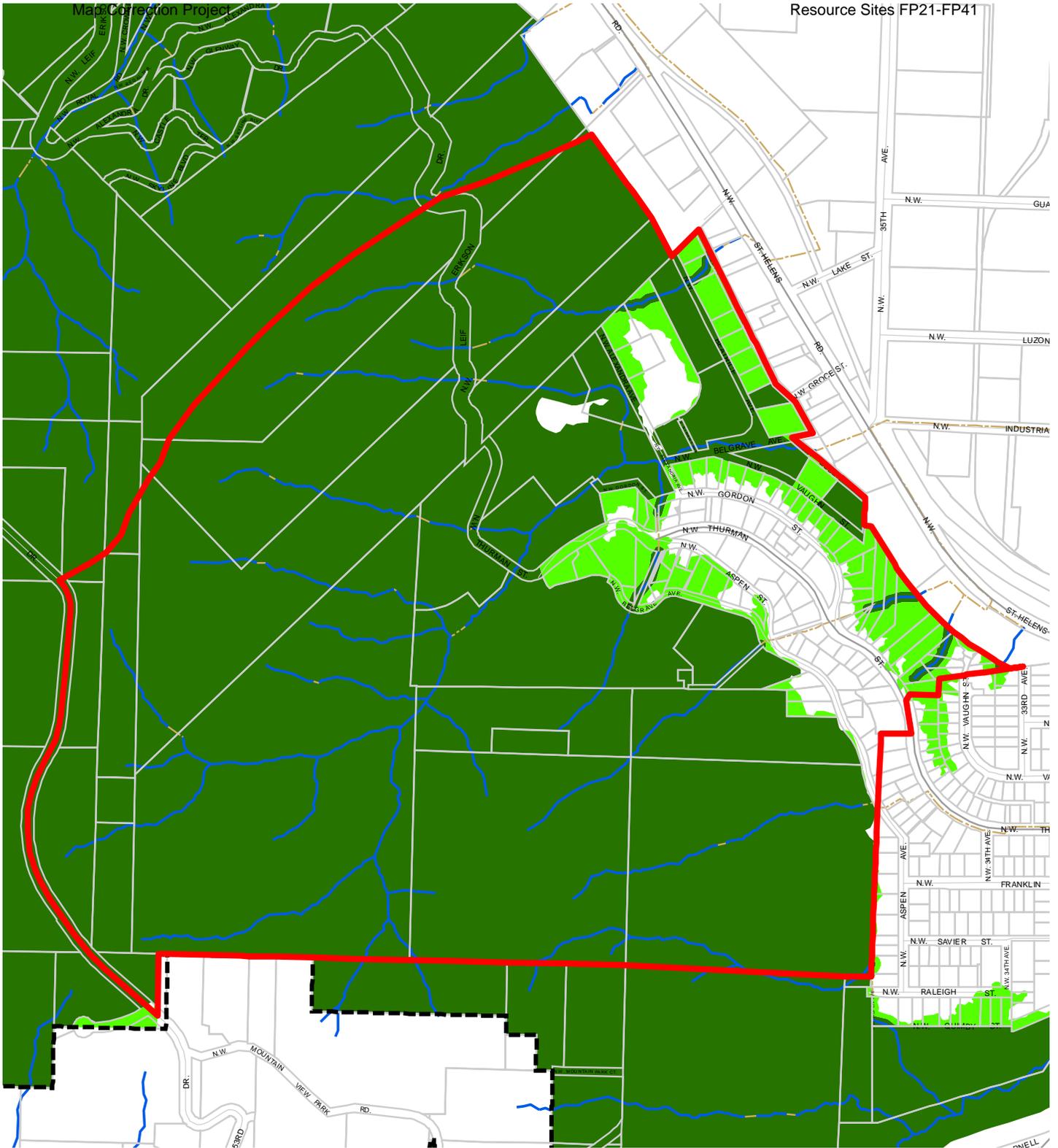
Updated: July 2021



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



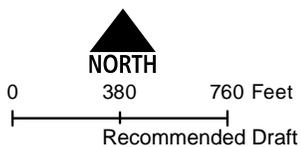
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Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
FP28**

Updated: January 2022



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



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January 2022

Natural Resource Description

Within resource site FP28 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: Forest Park (O, B, M, C, S, P, E); 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 FP28	
	Study Area
Stream (Miles)	4.8
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	276.1
Woodland (acres)	1.9
Shrubland (acres)	0.0
Herbaceous (acres)	0.4
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	278.9
* 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 vegetation community is a mosaic of three principle types of second growth western hemlock forest: mid-aged conifer, conifer topping hardwood and mature hardwood. The forest is structurally diverse and offers variety within each canopy layer. Forest cover provides open space, scenic and recreational resources; serves as habitat for resident and migratory wildlife; and helps to balance the local water regimen. Snags, downed logs and woody debris found at the site are critical structural and functional components of the watershed ecosystem. The rare phantom orchid (*Cephalanthera austiniae*) is found within the forest. Ivy and clematis have spread widely throughout the eastern portion of the site and may impact the ecosystem services provided by the local plant community.

Food and cover habitat are of progressively higher quality to the north and to the west of the site. The principle drainage (and water source for local wildlife) passes from south to north through the site. Bird species observed at the site include pileated woodpecker, sharp-shinned hawk, great blue heron and a variety of songbirds. Mammals observed at the site include black-tailed deer, coyote and deer mouse. Red fox have been observed in the area. Coastal Giant Salamanders are monitored throughout the Balch watershed on a regular basis. Reptiles sited in the area include the northwestern garter snake. This site provides an important link between the Balch Creek ecosystem and the genetic reservoirs to the north. Residential and industrial development to the east limit migration opportunities for wildlife.

Table B: Quality of Natural Resource Functions in Resource Site FP28				
Resource Site (acres) = 294				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	117.8	90.6	70.3	278.8
percent total inventory site area	40.0%	30.8%	23.9%	94.7%
Wildlife Habitat*				
acres	273.6	0.0	0.0	273.6
percent total inventory site area	92.9%	0.0%	0.0%	92.9%
Special Habitat Areas**				
acres	281.3			
percent total inventory site area	95.6%			
Combined Total⁺				
acres	273.6	0.6	4.6	278.8
percent total inventory site area	92.9%	0.2%	1.5%	94.7%
* 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 site FP28, 6.5% 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 FP28			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
316.4	22.3	20.7	6.5%

*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 FP28. 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 FP28 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 and R2 base zones. Industrial uses are allowed in the IH and IG1 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 FP28, 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 the resource site-specific evaluation for FP28, 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. Within public parks, apply a protection overlay zone ('p' zone) to land between 25 and 50 feet of stream top-of-bank or wetlands; and within areas of forest, woodland, shrubland or herbaceous vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
3. Outside of public parks, apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet from stream top-of-bank or wetlands; and within areas of forest or woodland 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.: FP29 **Resource Site Name:** Pittock Sanctuary

Previous Plan: Balch Creek Watershed Protection Plan

Previous Resource Site No.: 75

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

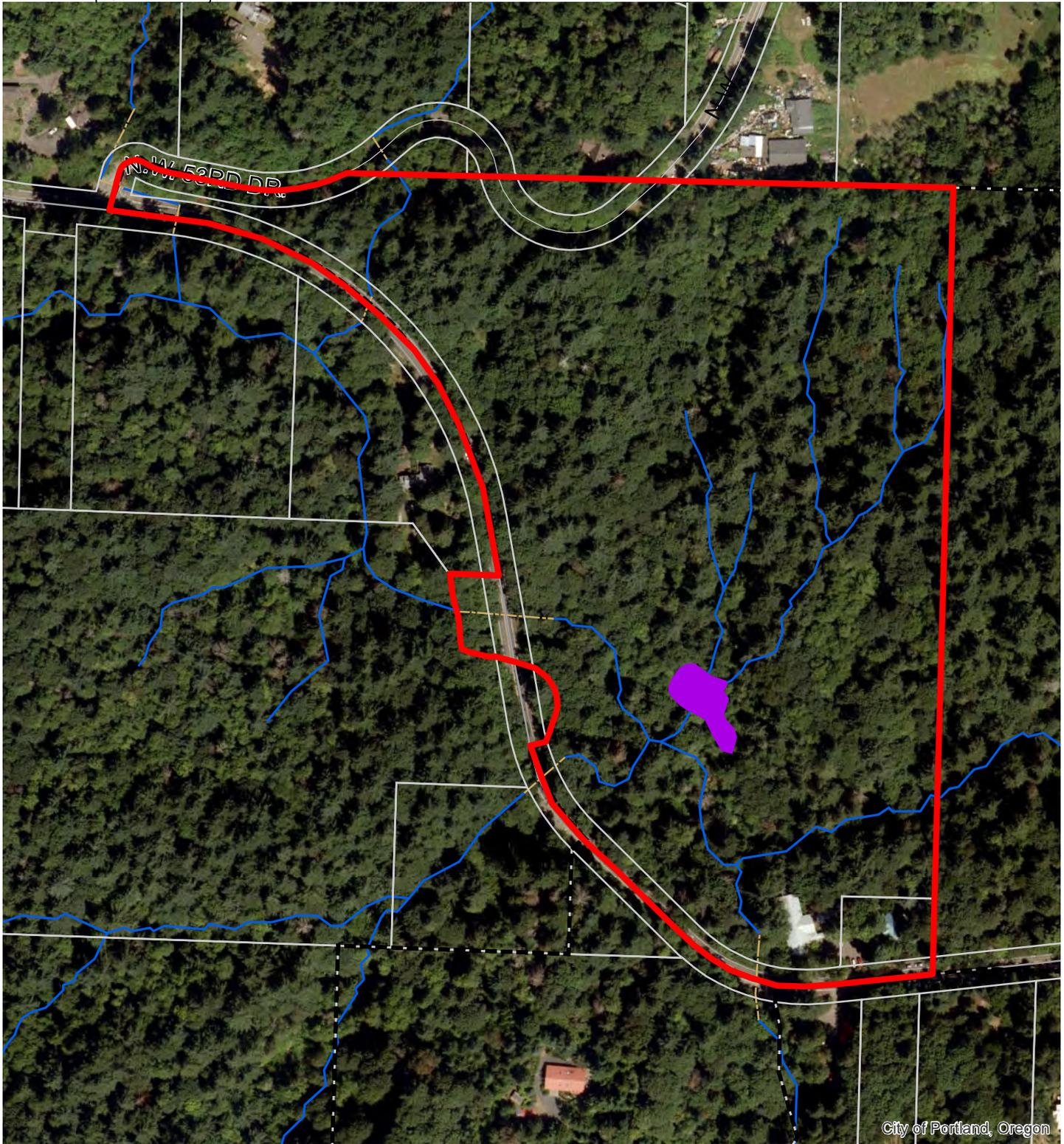
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 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 FP29 includes the following:

Site (acres)	25.4
Base zones (acres)	
OS	24.9
RF	0.4

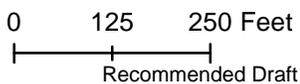


City of Portland, Oregon

Map A: Water Features

Resource Site: FP29

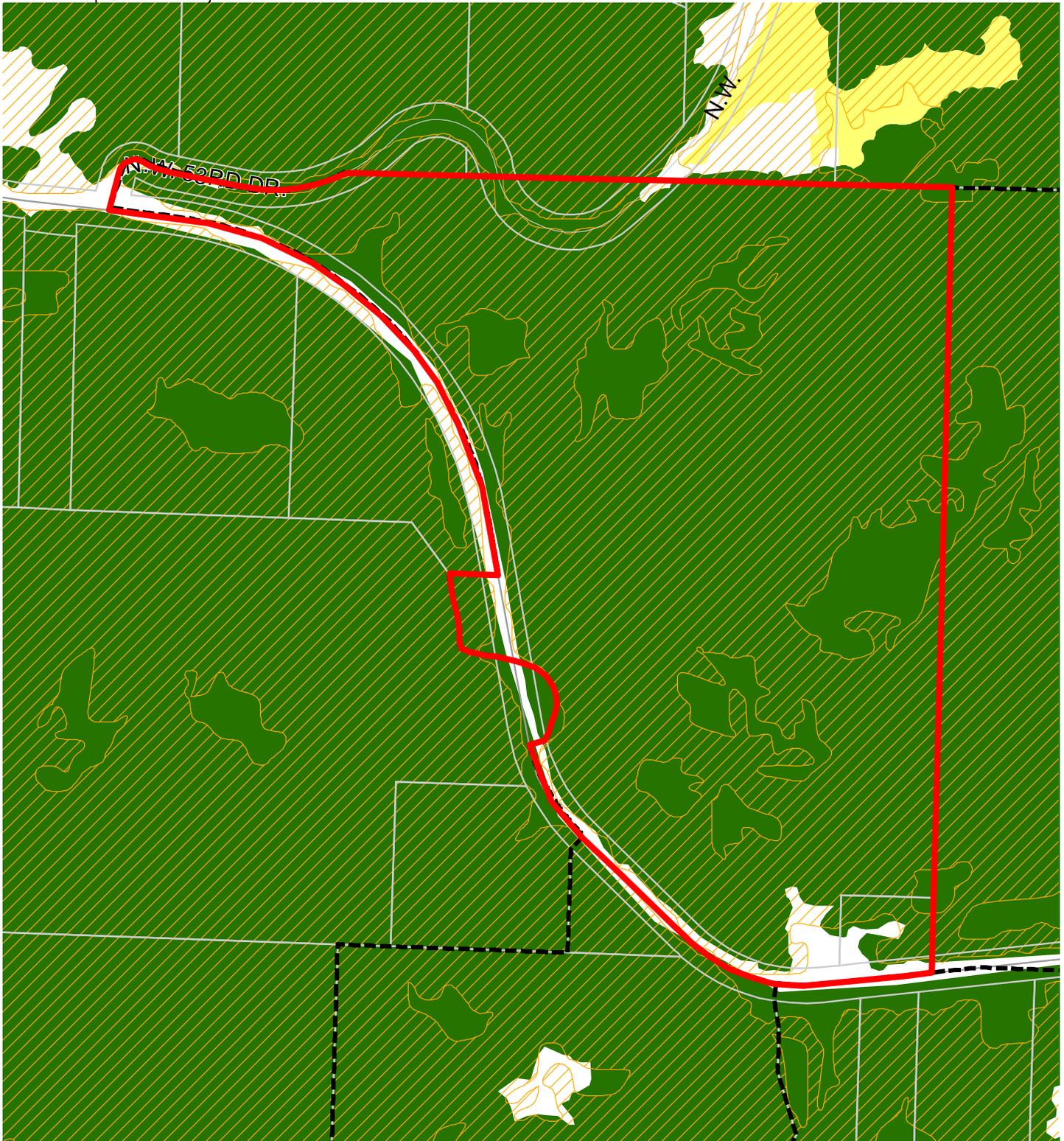
Updated: July 2021



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



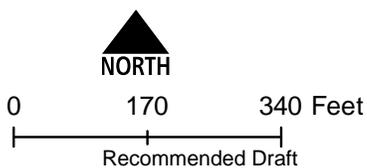
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January 2022



Map B: Vegetation and Steep Slopes

**Resource Site:
FP29**

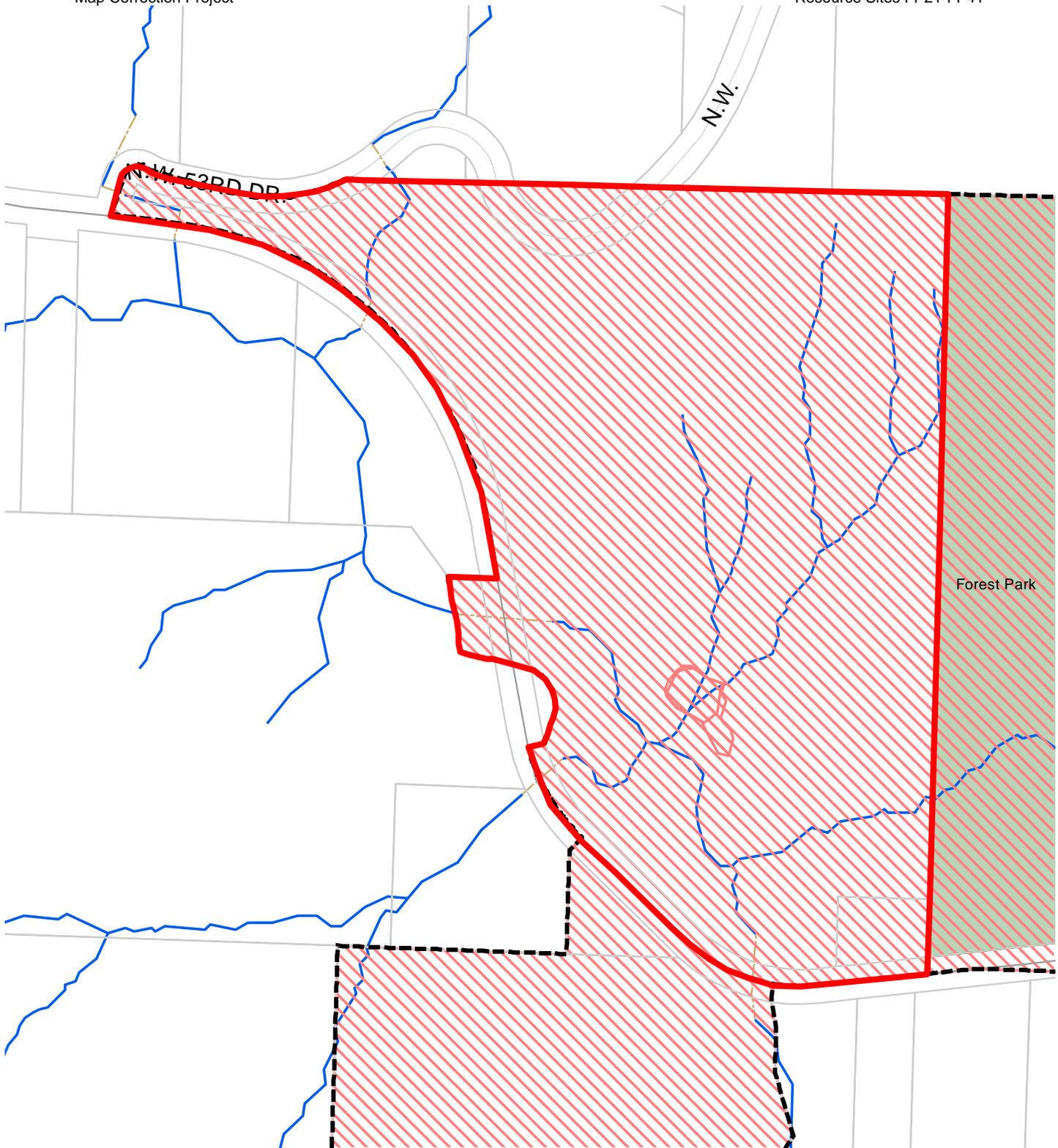
Updated: July 2021



- Resource Sites
- Urban Service Boundary
- Taxlots
- Slopes >25%
- Forest
- Woodland
- Shrubland
- Herbaceous

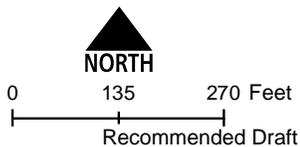


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**Map C: Special
Habitat Areas**
**Resource Site:
FP29**

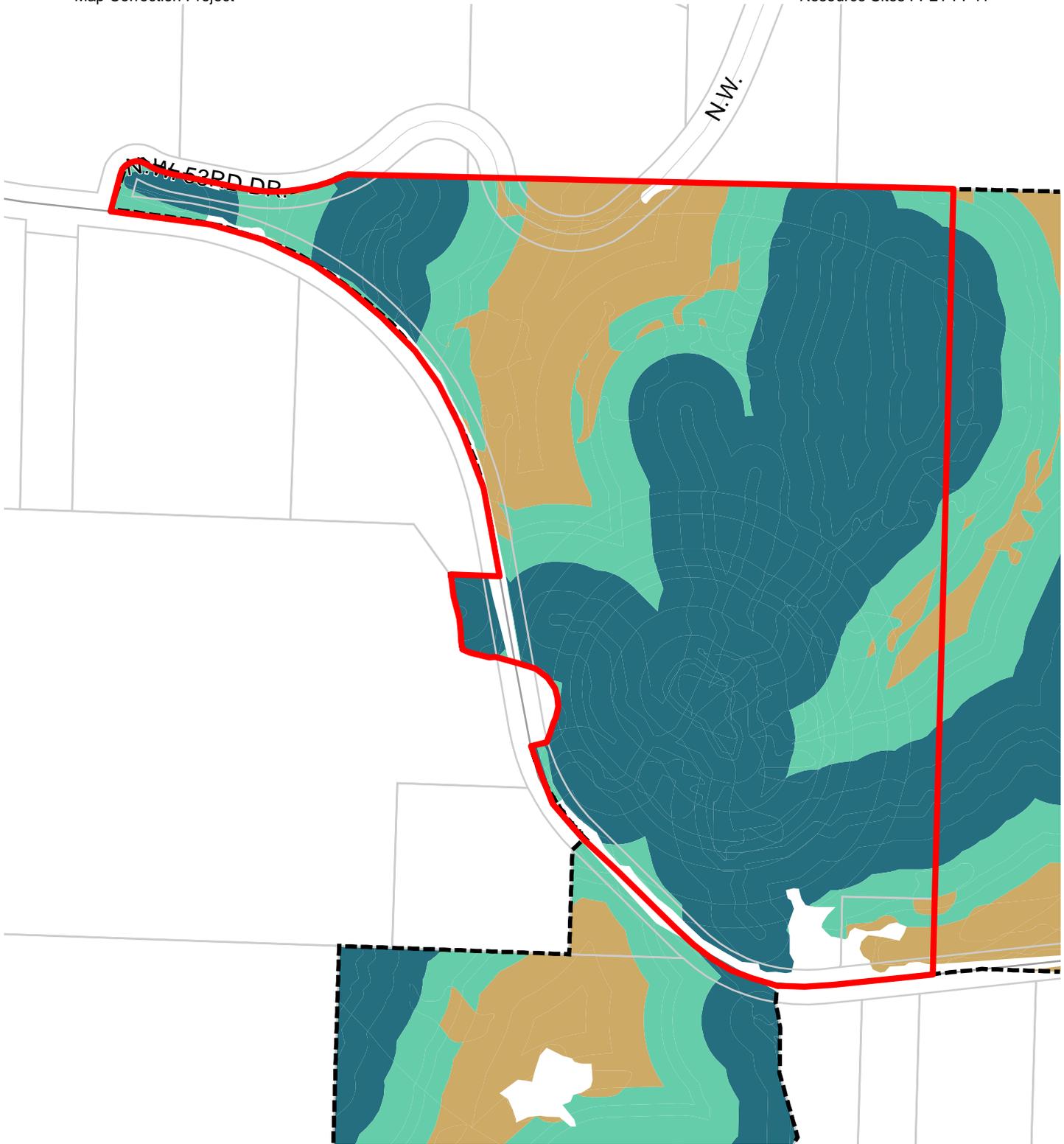
Updated: June 2021



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



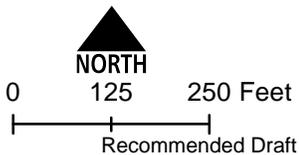
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**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
FP29**

Updated: July 2021

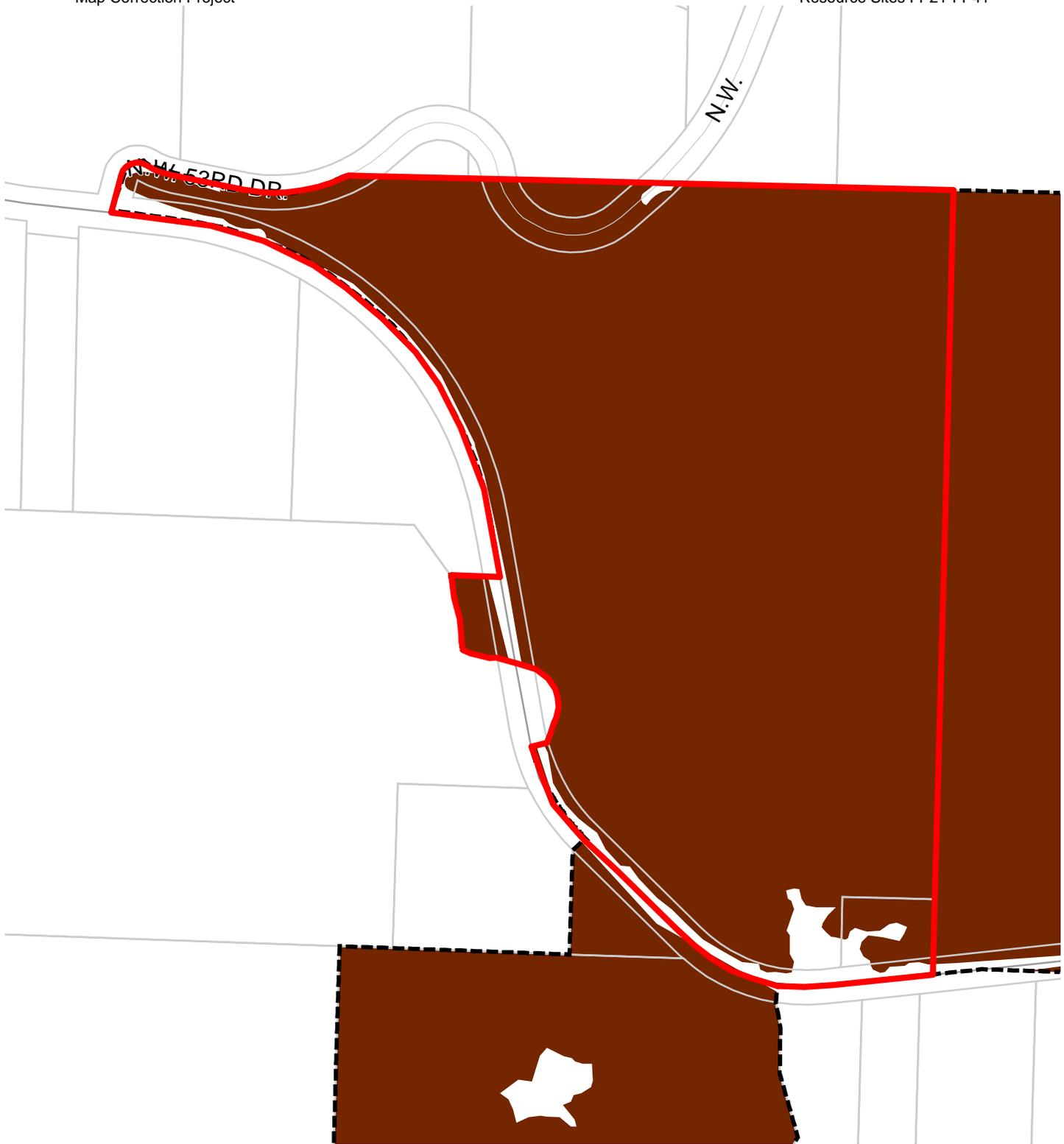


- Resource Sites
- Urban Service Boundary
- Class I (high rank)
- Taxlots
- Class II (medium rank)
- Class III (low rank)



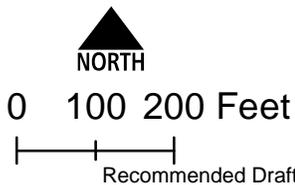
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**Map E: Wildlife
Habitat Classification
Resource Site:
FP29**

Updated: July 2021

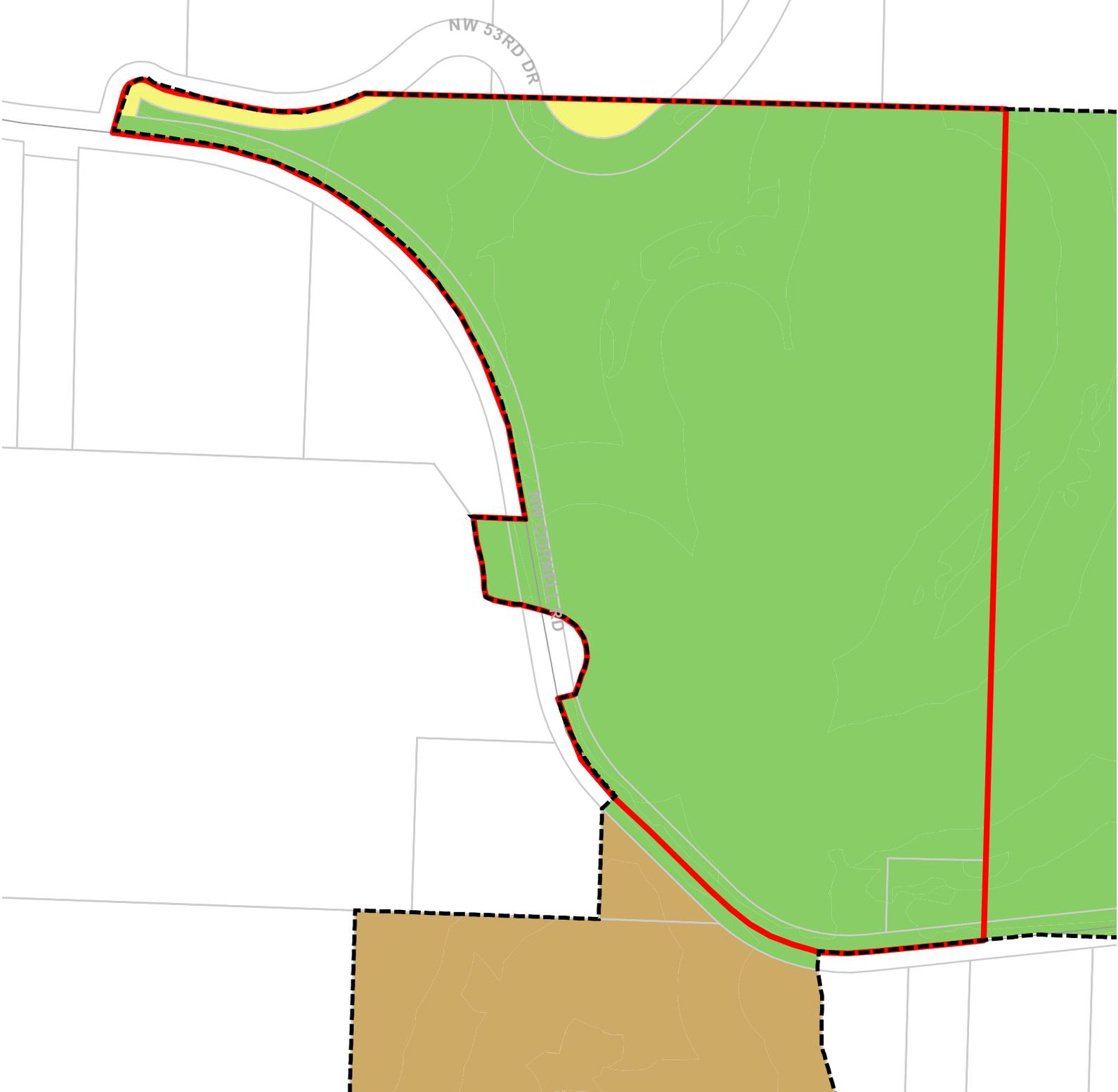


-  Resource Sites
-  Class A (high rank)
-  Class B (medium rank)
-  Class C (low rank)
-  Urban Service Boundary
-  Taxlots



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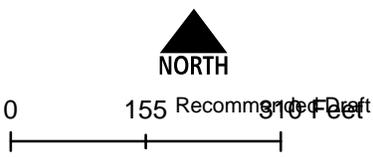


Map F: Urban Development Value (Title 13)
Resource Site: FP29

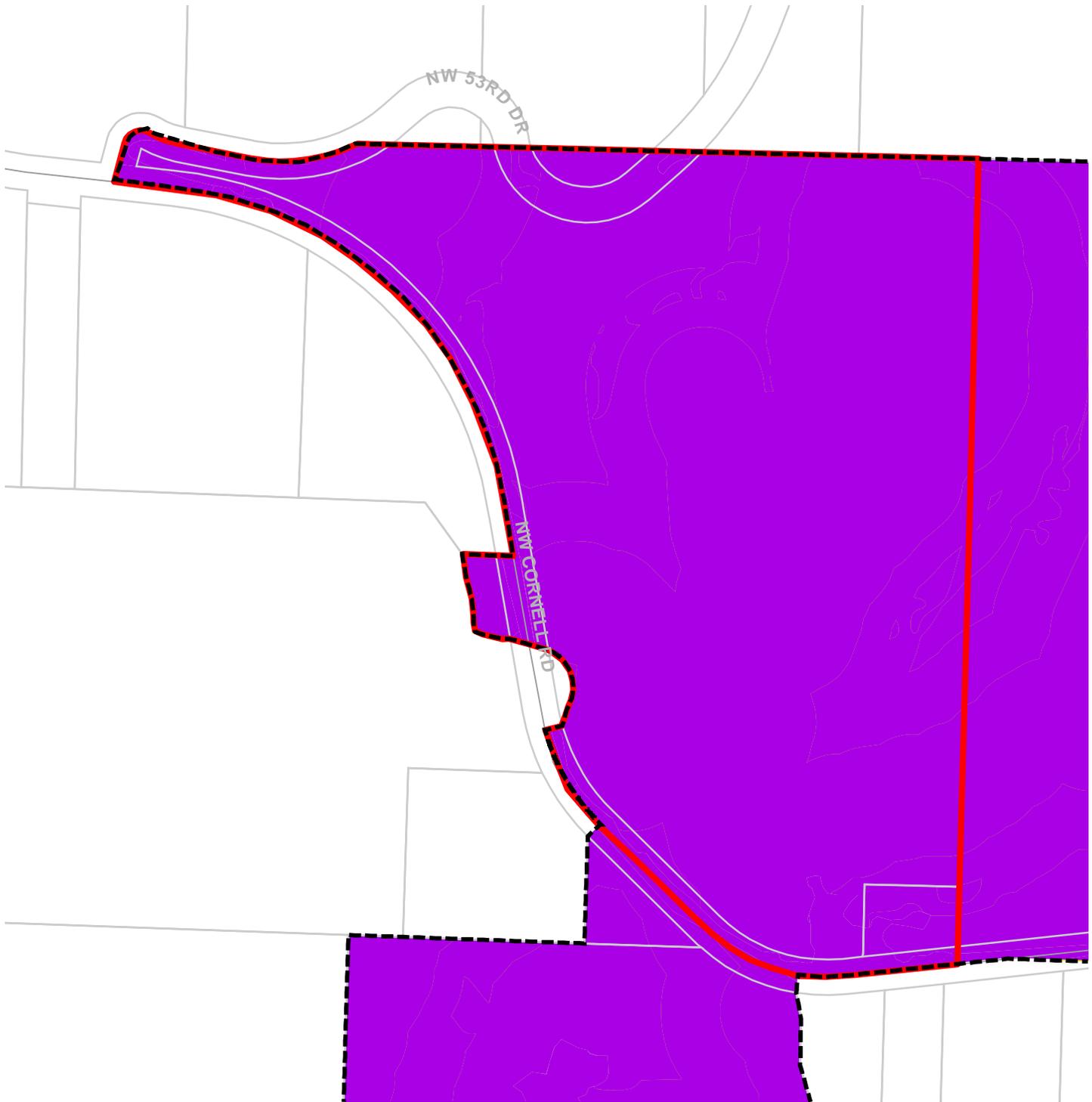
-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks



Updated: July 2021



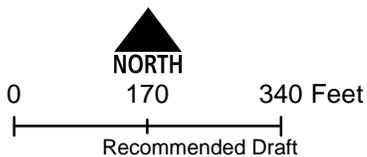
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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: FP29

Updated: July 2021

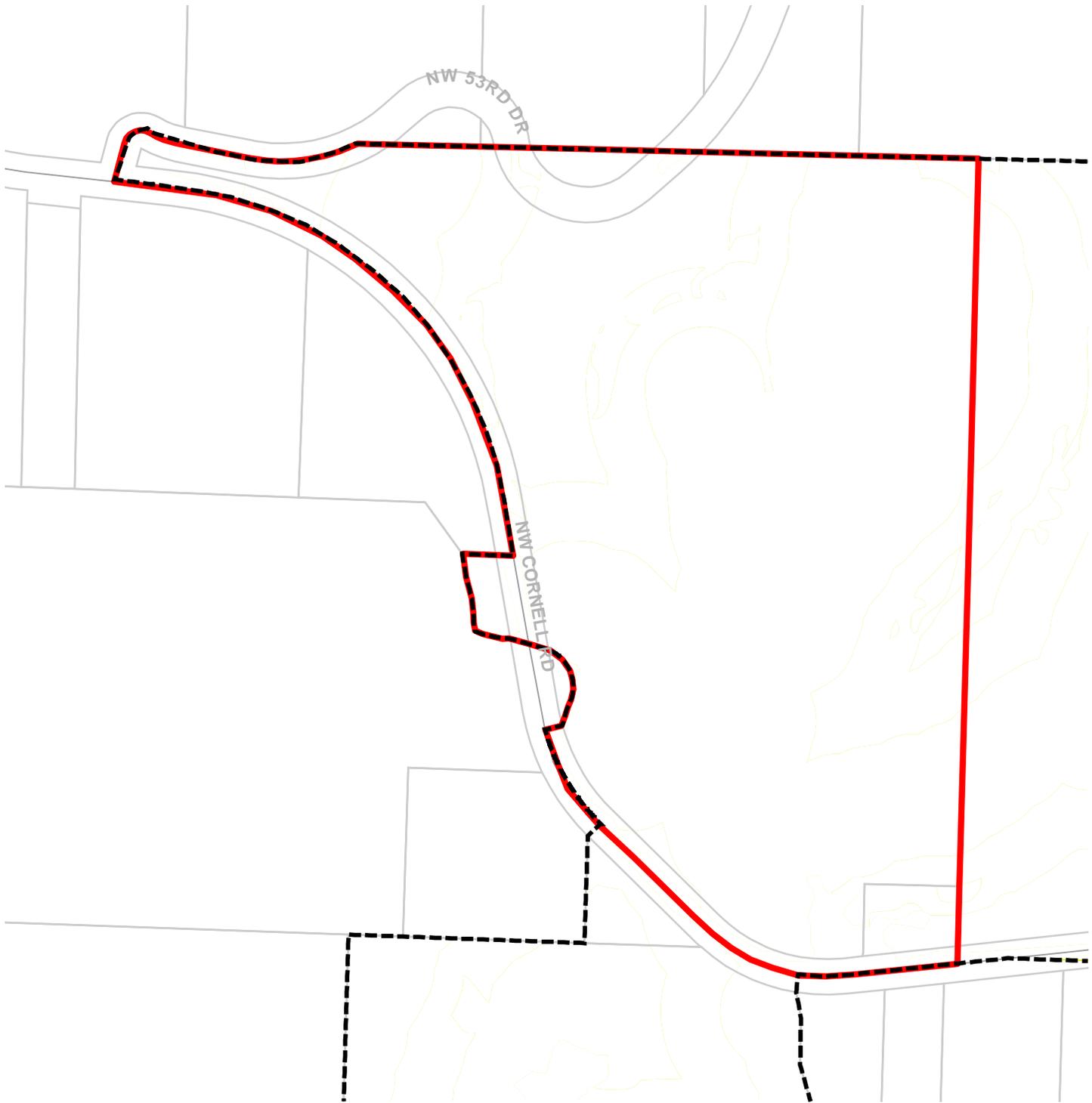


-  Urban Service Boundary
-  Resource Sites
-  HCA High Value
-  HCA Moderate Value
-  HCA Low Value
-  Goal 5 Significant Natural Resources



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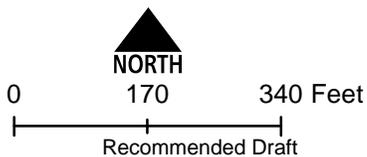
January 2022



Map H: Goal 5 Resources

Resource Site: FP29

Updated: July 2021

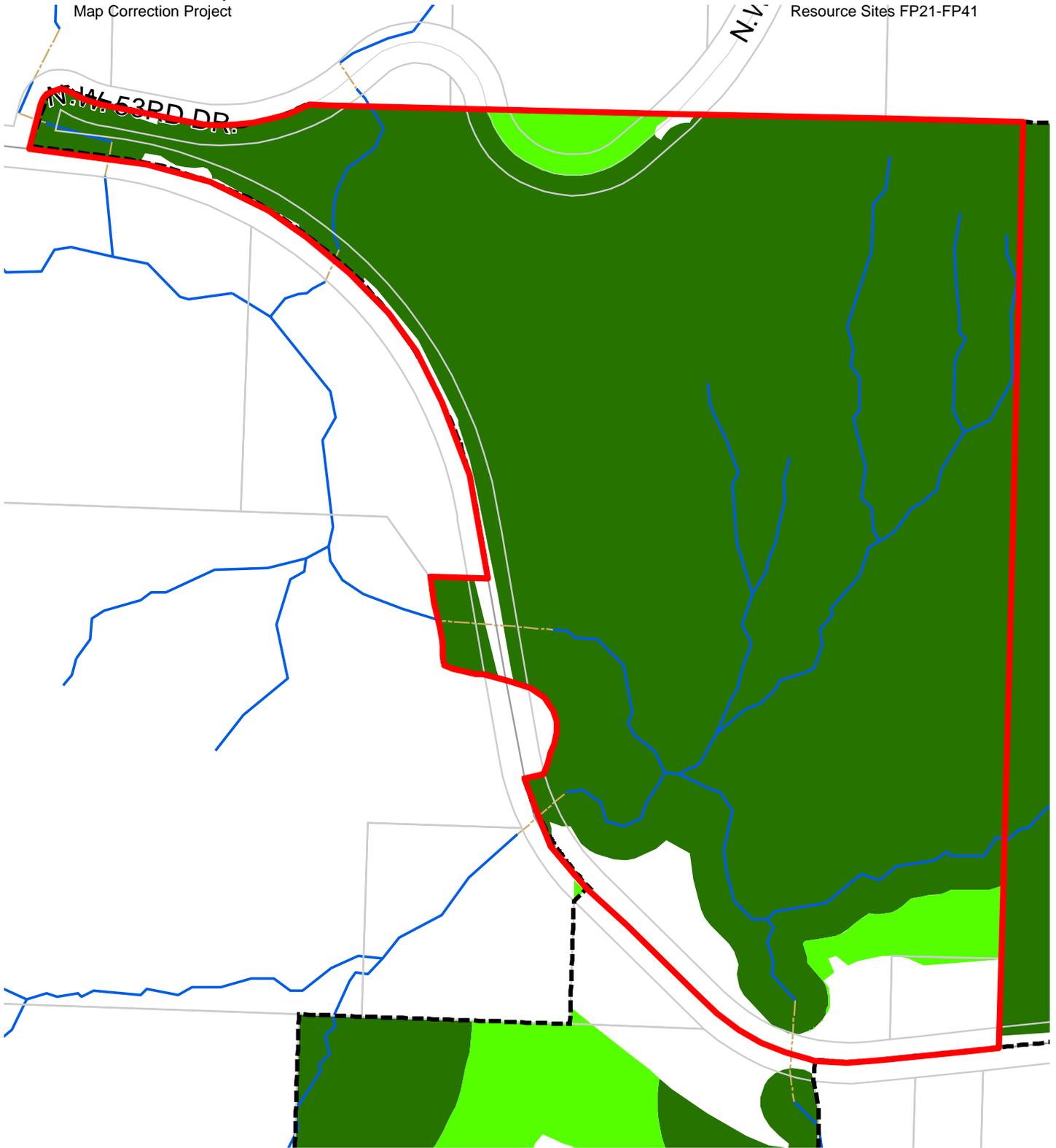


- Urban Service Boundary
- ▭ Resource Sites
- Goal 5 Significant Natural Resources



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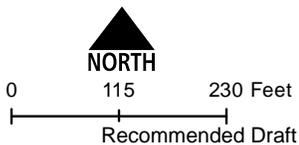
January 2022

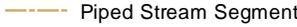


Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site: FP29

Updated: January 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.
January 2022

Natural Resource Description

Within resource site FP29 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: 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 FP29	
	Study Area
Stream (Miles)	0.8
Wetlands (acres)	0.2
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	24.3
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)**	20.9
* 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%.	

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 FP29				
Resource Site (acres) = 25				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	15.2	5.4	3.9	24.4
percent total inventory site area	59.9%	21.1%	15.4%	96.4%
Wildlife Habitat*				
acres	24.3	0.0	0.0	24.3
percent total inventory site area	95.7%	0.0%	0.0%	95.7%
Special Habitat Areas**				
acres	25.3			
percent total inventory site area	99.7%			
Combined Total⁺				
acres	24.3	0.2	0.0	24.4
percent total inventory site area	95.7%	0.7%	0.0%	96.4%
* 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 FP29, 1.8% 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 FP29			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
25.4	0.9	0.5	1.8%

*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 FP29. 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

All of the significant natural resources within resource site FP29 are designated Habitat Conservation Areas under Metro Title 13; therefore, no resource site-specific ESEE is required.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and the resource site-specific evaluation for FP29, 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, within 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 that are contiguous to but more than 50 feet from stream top-of-bank (except as noted in 4 below).
3. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands.
4. Apply a conservation overlay zone ('c' zone) to the forest canopy located immediately north of the Portland Audubon's care center that is more than 50 feet from stream top-of-bank.
5. Allow conflicting uses within all other areas containing significant natural resources.

The forest canopy located north of the Audubon's care center is an expansion area for the wildlife care facilities and the recommendation is to apply a 'c' zone applied to allow for future development through environmental review and with appropriate mitigation for impacts to the natural resources. The area within 50 feet of the stream top-of-bank should remain within a 'p' zone, as is consistent with citywide policy for streams within the Open Space (OS) base zone in the Northwest Hills.

Resource Site No.: FP30 **Resource Site Name:** North of Cornell Rd.

Previous Plan: Balch Creek Watershed Protection Plan

Previous Resource Site No.: 74

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

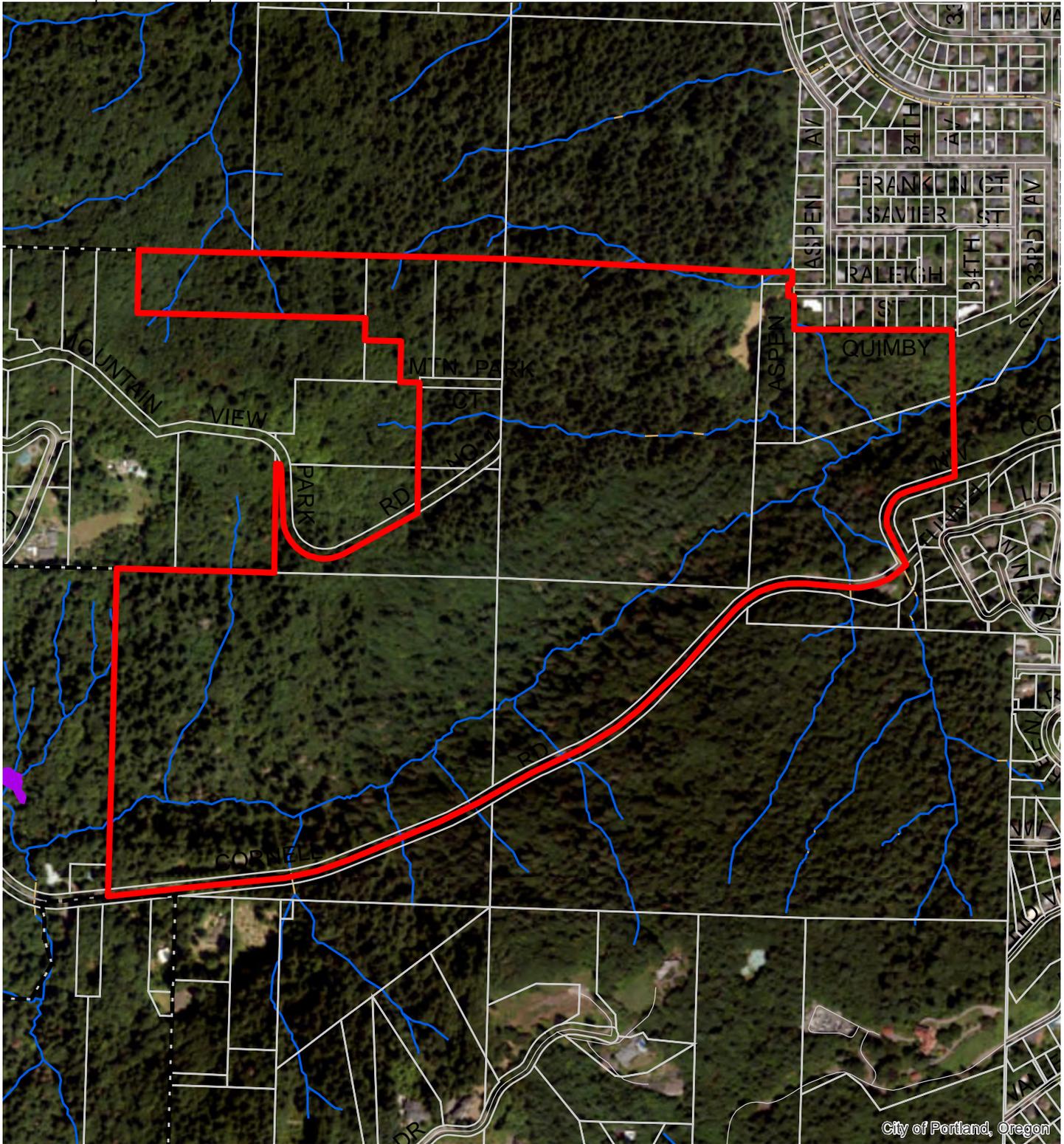
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 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 FP30 includes the following:

Site (acres)	126.9
Base zones (acres)	
OS	126.9

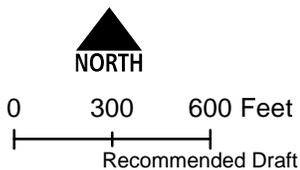


City of Portland, Oregon

Map A: Water Features

Resource Site: FP30

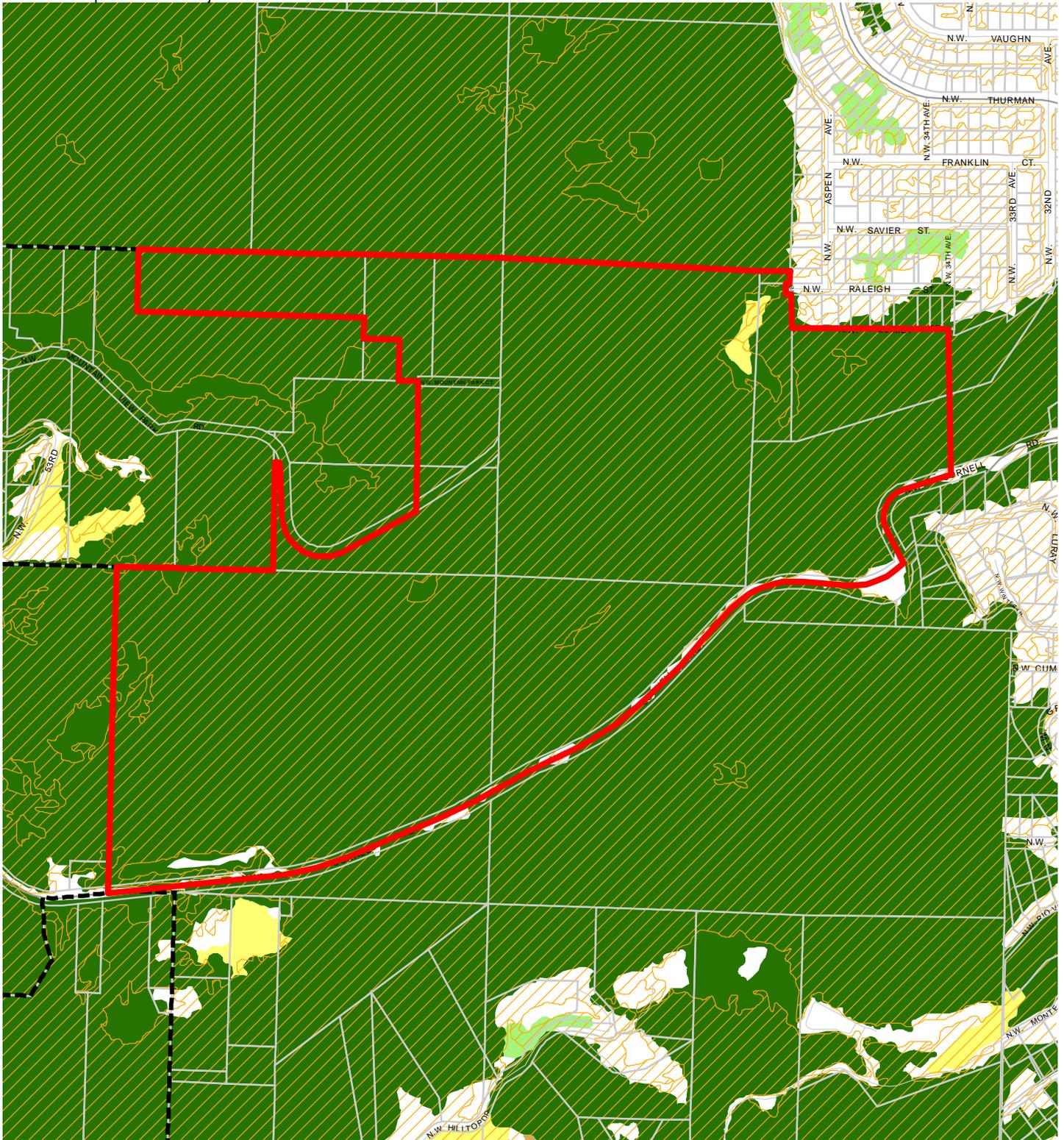
Updated: July 2021



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



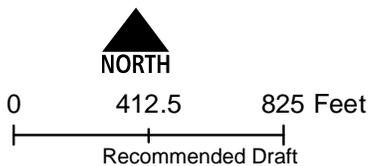
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.
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Map B: Vegetation and Steep Slopes

Resource Site: FP30

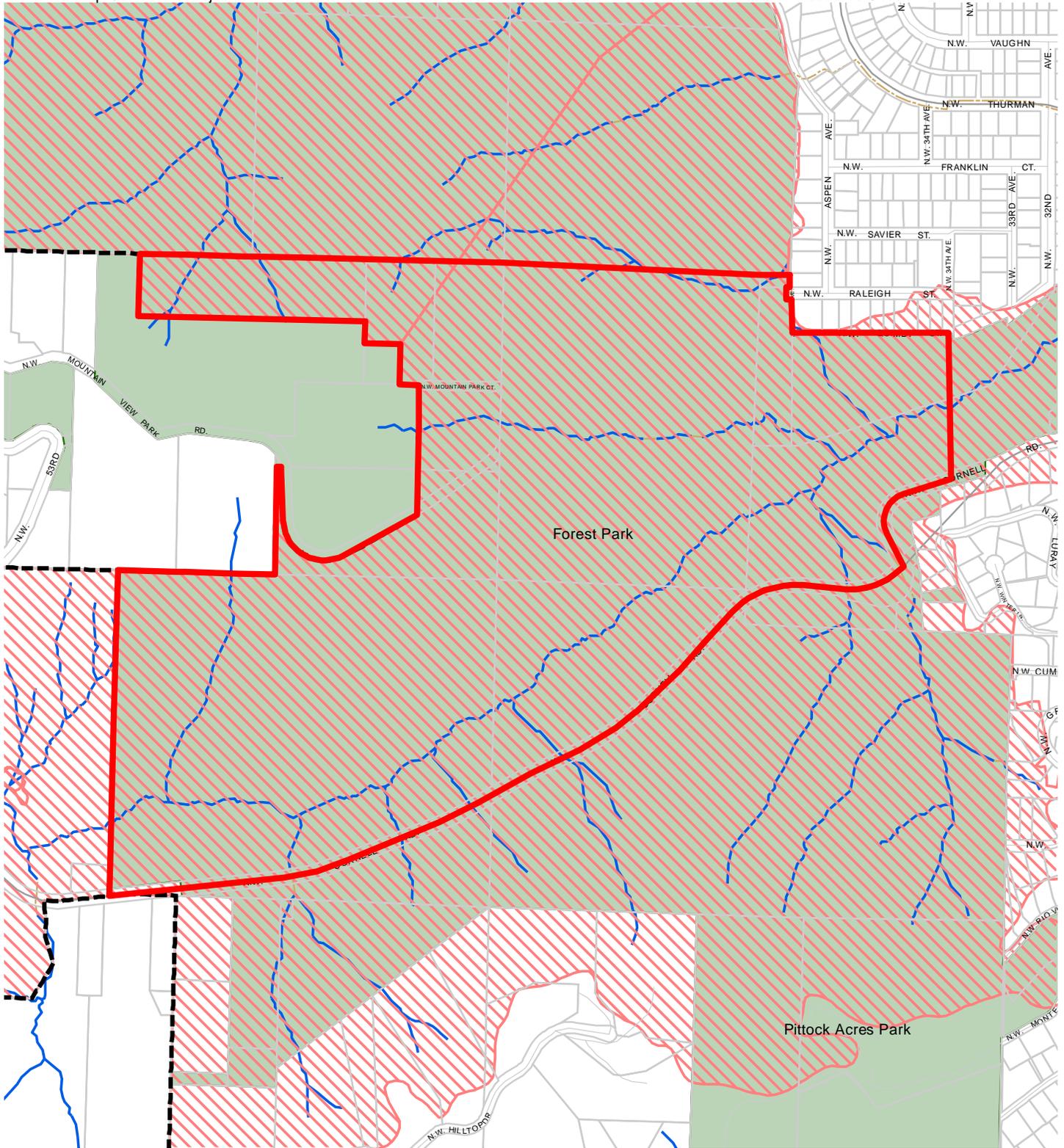
Updated: July 2021



- Resource Sites
- Urban Service Boundary
- Taxlots
- Slopes >25%
- Forest
- Woodland
- Shrubland
- Herbaceous

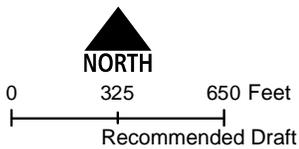


The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.
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**Map C: Special
Habitat Areas**
**Resource Site:
FP30**

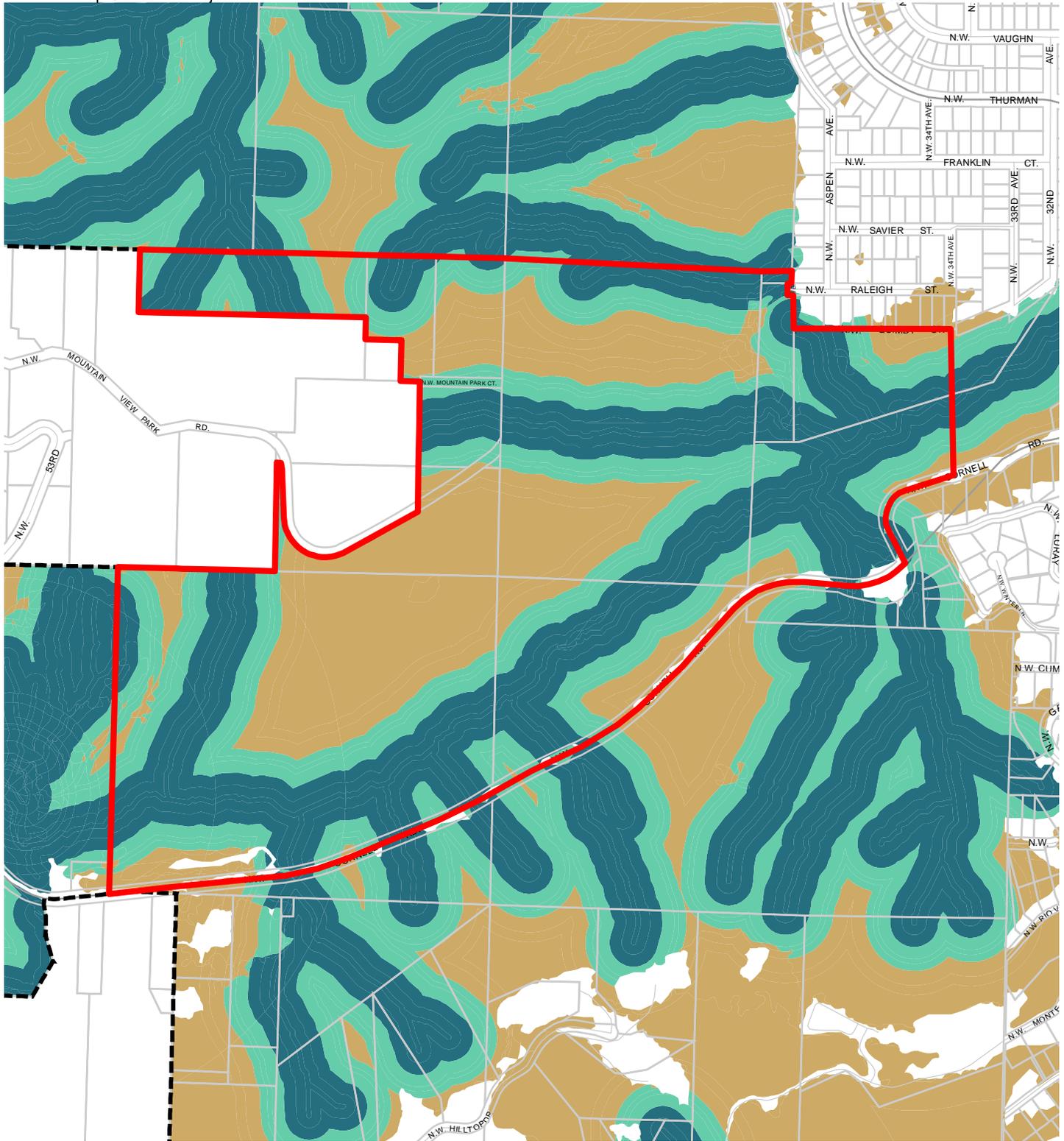
Updated: June 2021



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



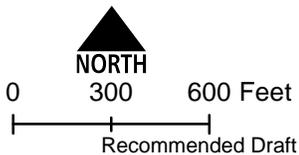
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.
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**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
FP30**

Updated: July 2021

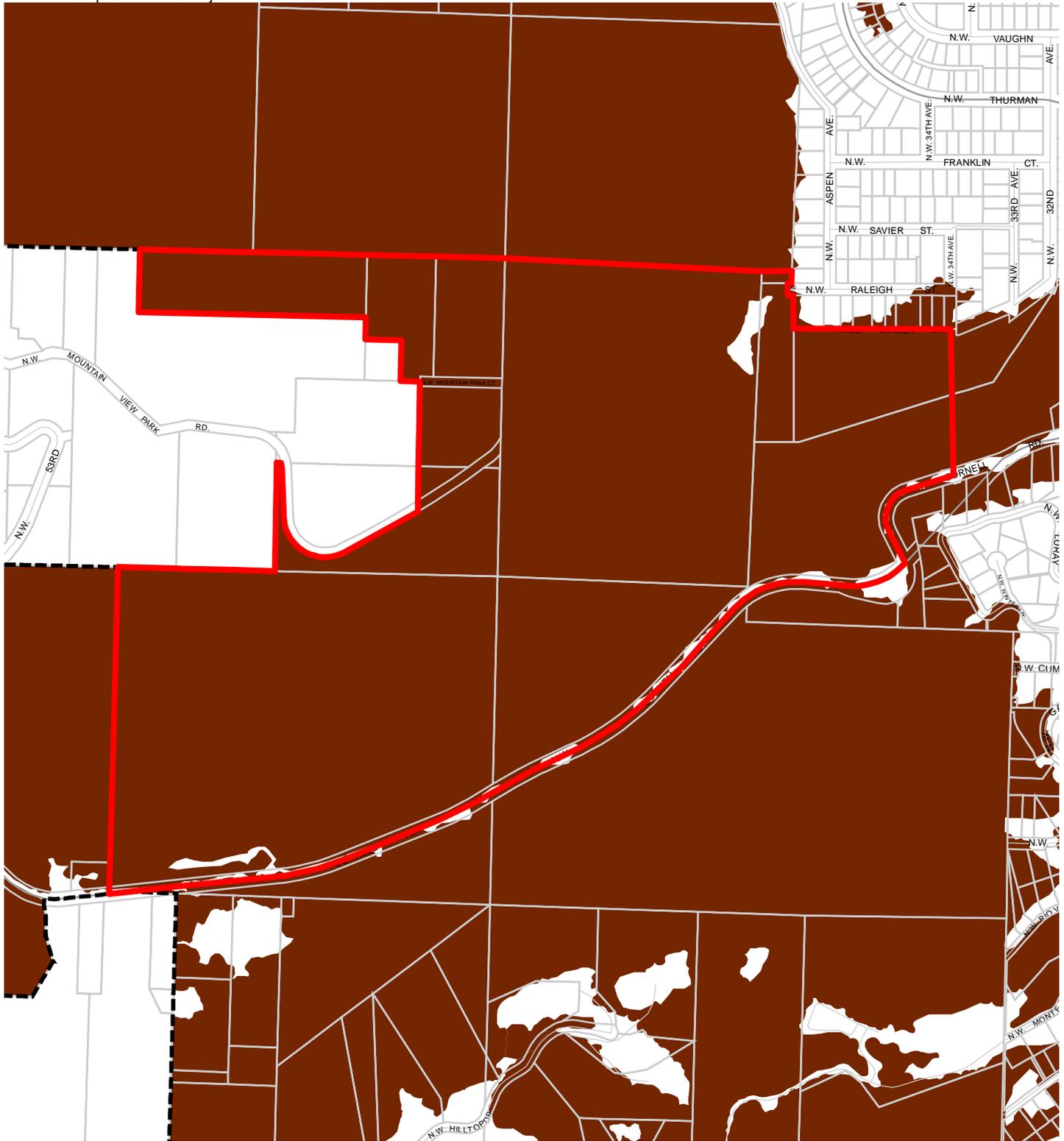


- Resource Sites
- Urban Service Boundary
- Class I (high rank)
- Taxlots
- Class II (medium rank)
- Class III (low rank)



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:
FP30**

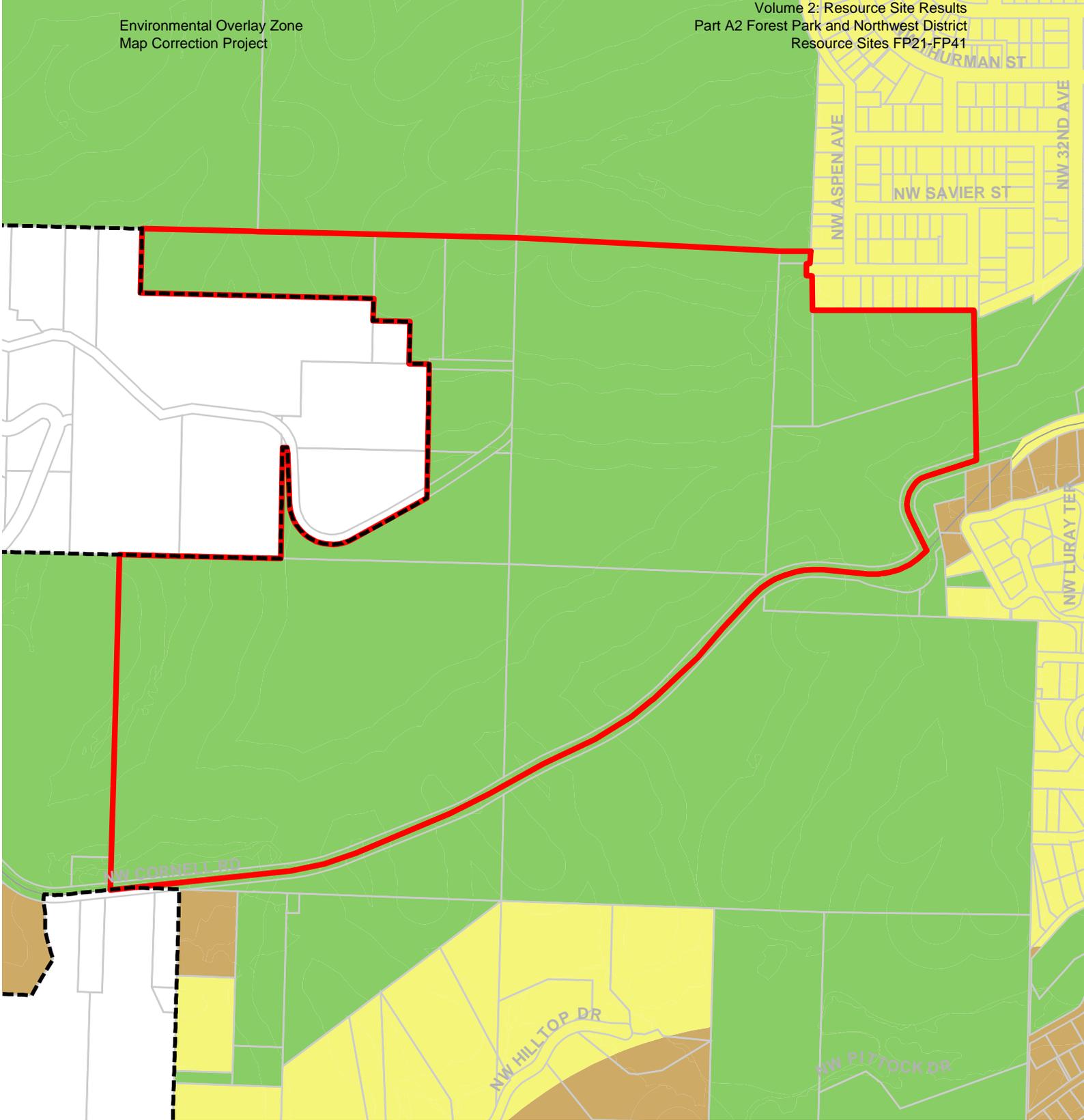
Updated: July 2021



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



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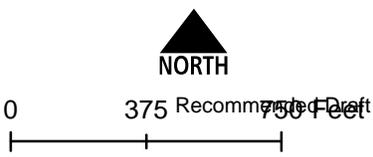


Map F: Urban Development Value (Title 13)
Resource Site: FP30

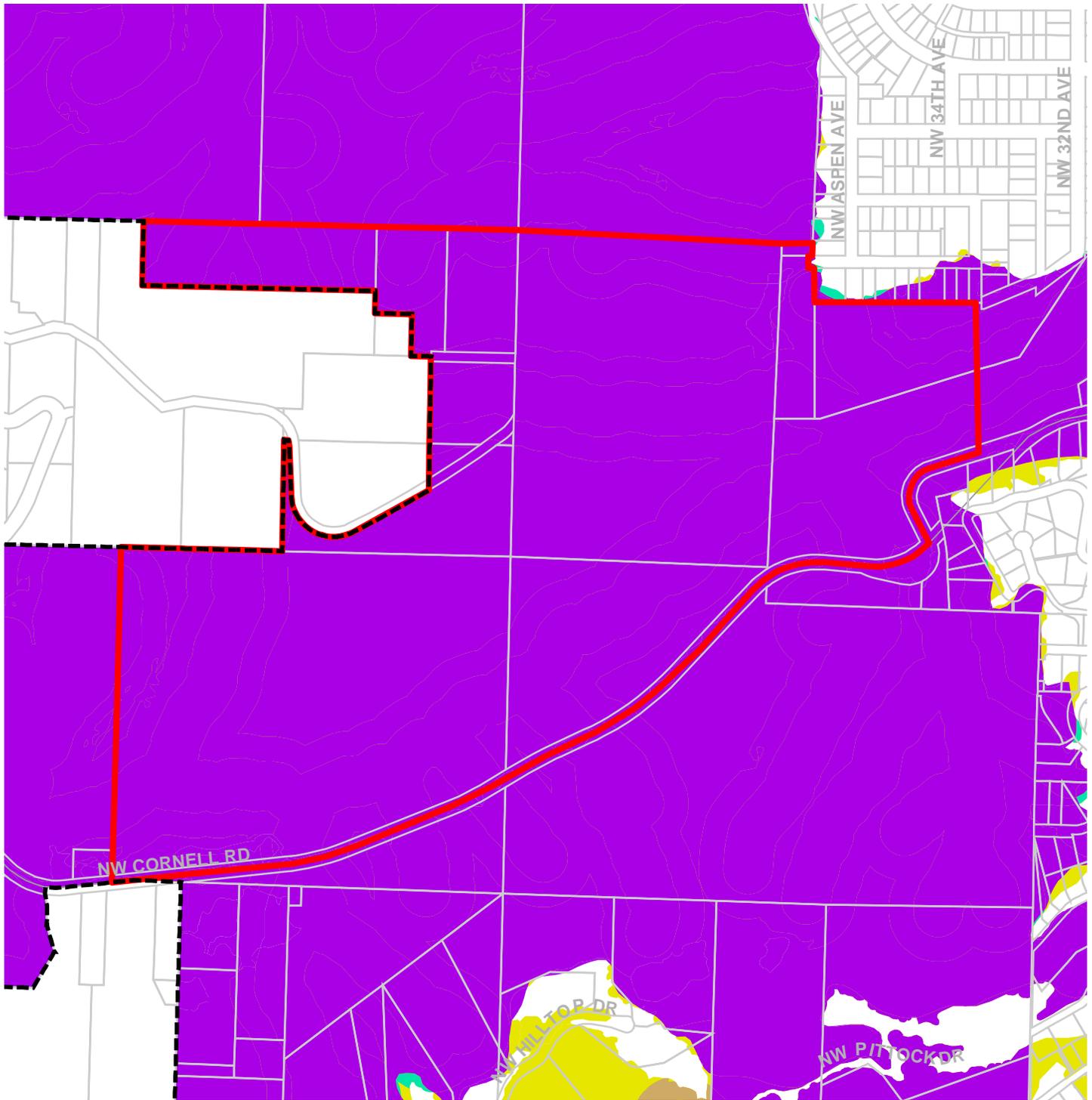
-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks



Updated: July 2021



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

Resource Site: FP30

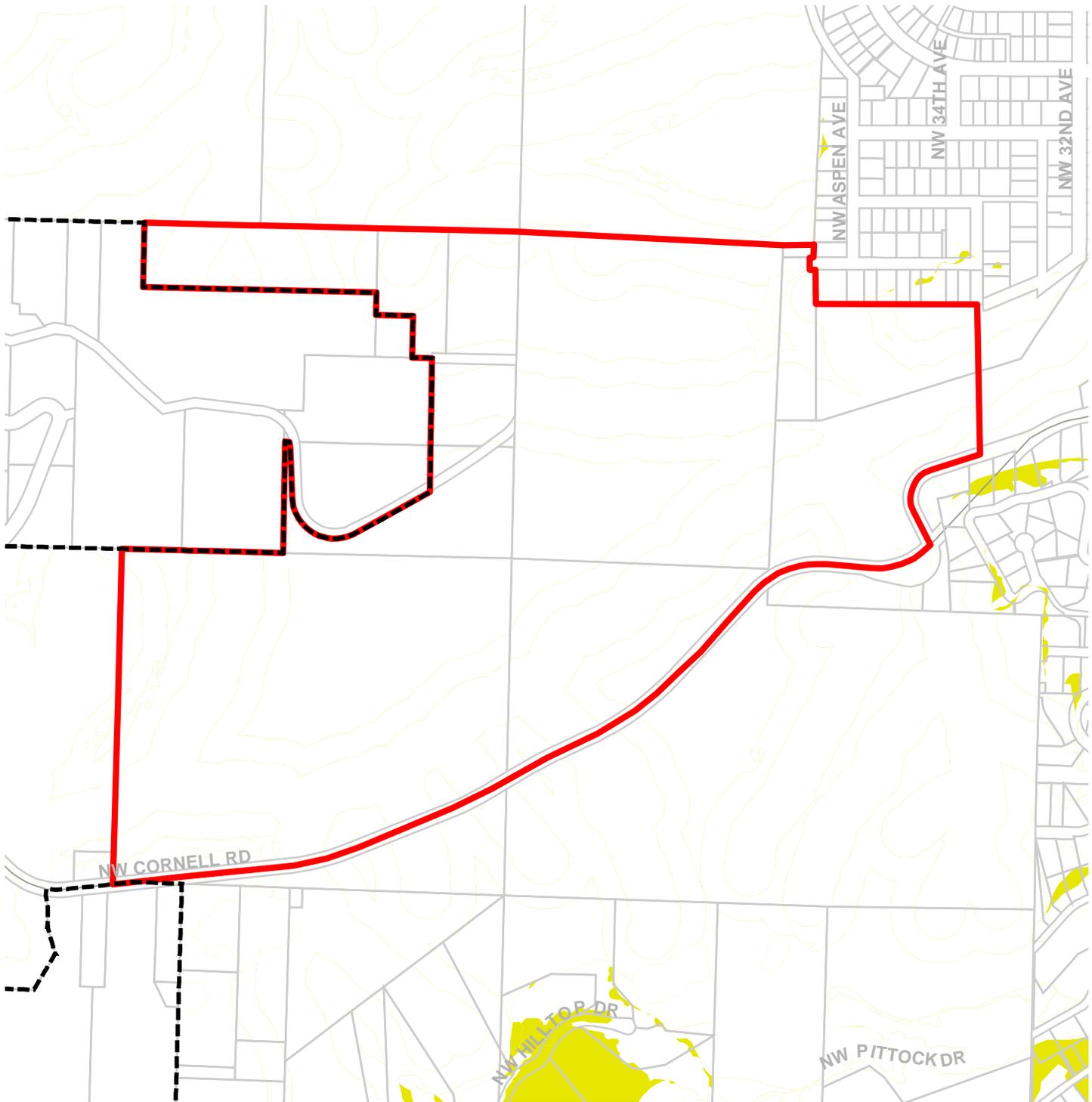
Updated: July 2021



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



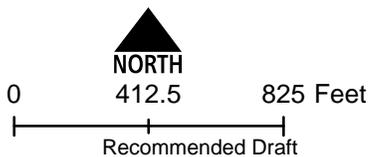
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Map H: Goal 5 Resources

Resource Site: FP30

Updated: July 2021

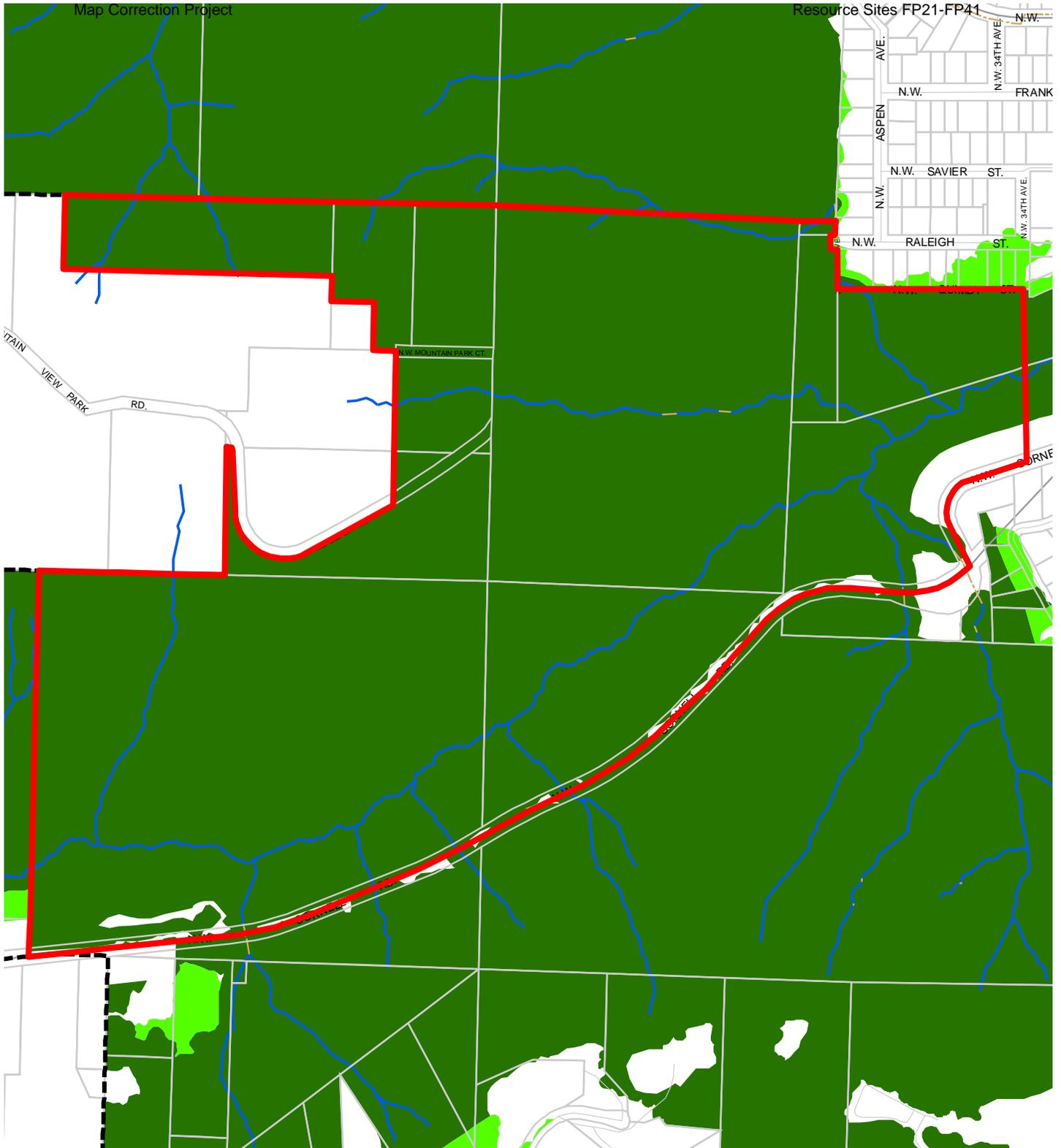


-  Urban Service Boundary
-  Resource Sites
-  Goal 5 Significant Natural Resources



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.

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Map I: DRAFT Proposed Environmental Overlay Zones

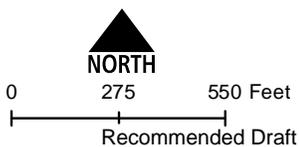
**Resource Site:
FP30**

Updated: January 2022

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



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January 2022



Natural Resource Description

Within resource site FP30 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: Forest Park (O, B, M, C, S, P, E); 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 FP30	
	Study Area
Stream (Miles)	2.1
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	124.5
Woodland (acres)	0.0
Shrubland (acres)	0.0
Herbaceous (acres)	0.5
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	122.5
* 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 FP30				
Resource Site (acres) = 127				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	47.4	37.1	40.7	125.2
percent total inventory site area	37.4%	29.3%	32.1%	98.7%
Wildlife Habitat*				
acres	124.5	0.0	0.0	124.5
percent total inventory site area	98.1%	0.0%	0.0%	98.1%
Special Habitat Areas**				
acres	126.9			
percent total inventory site area	100.0%			
Combined Total⁺				
acres	124.5	0.3	0.5	125.2
percent total inventory site area	98.1%	0.2%	0.4%	98.7%
* 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 site FP30, 1.1% 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 FP30			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
126.9	1.5	1.5	1.1%

*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 FP30. 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

All of the significant natural resources within resource site FP30 are designated Habitat Conservation Areas under Metro Title 13; therefore, no resource site-specific ESEE is required.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and the resource site-specific evaluation for FP30, 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 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 woodland, shrubland and herbaceous 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.: FP31 **Resource Site Name:** Lower Macleay

Previous Plan: Balch Creek Watershed Protection Plan

Previous Resource Site No.: 73

The results of the analysis found in Volume 3 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.

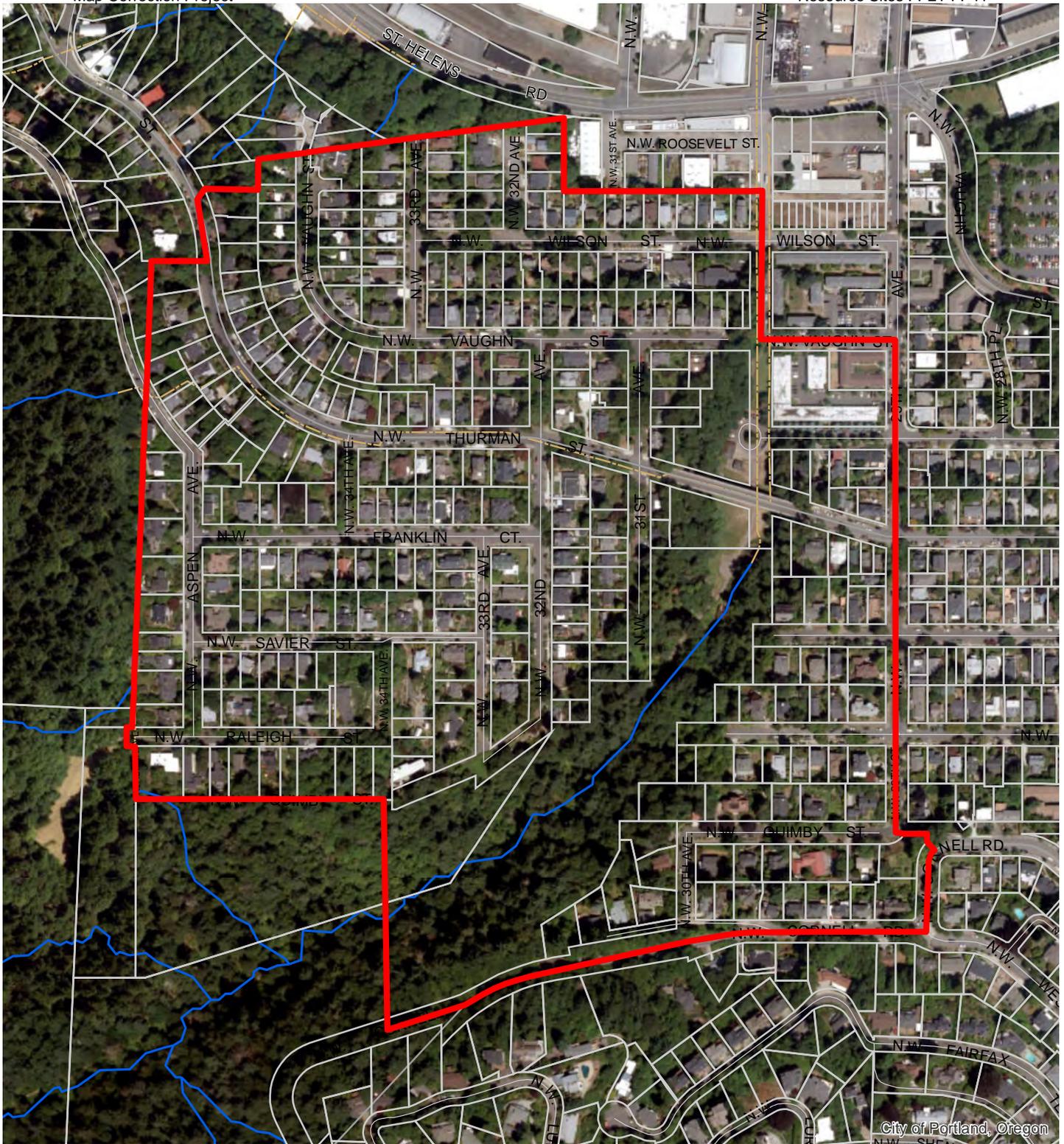
Implementation of the results is found in Volume 1, Part B, updates to zoning maps and zoning code.

Resource site FP31 includes the following:

Site (acres) 85.7

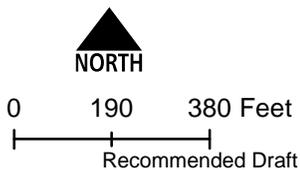
Base zones (acres)

IG1	0.0
OS	16.2
R5	61.3
R7	5.8
RM2	2.3



Map A: Water Features
Resource Site: FP31

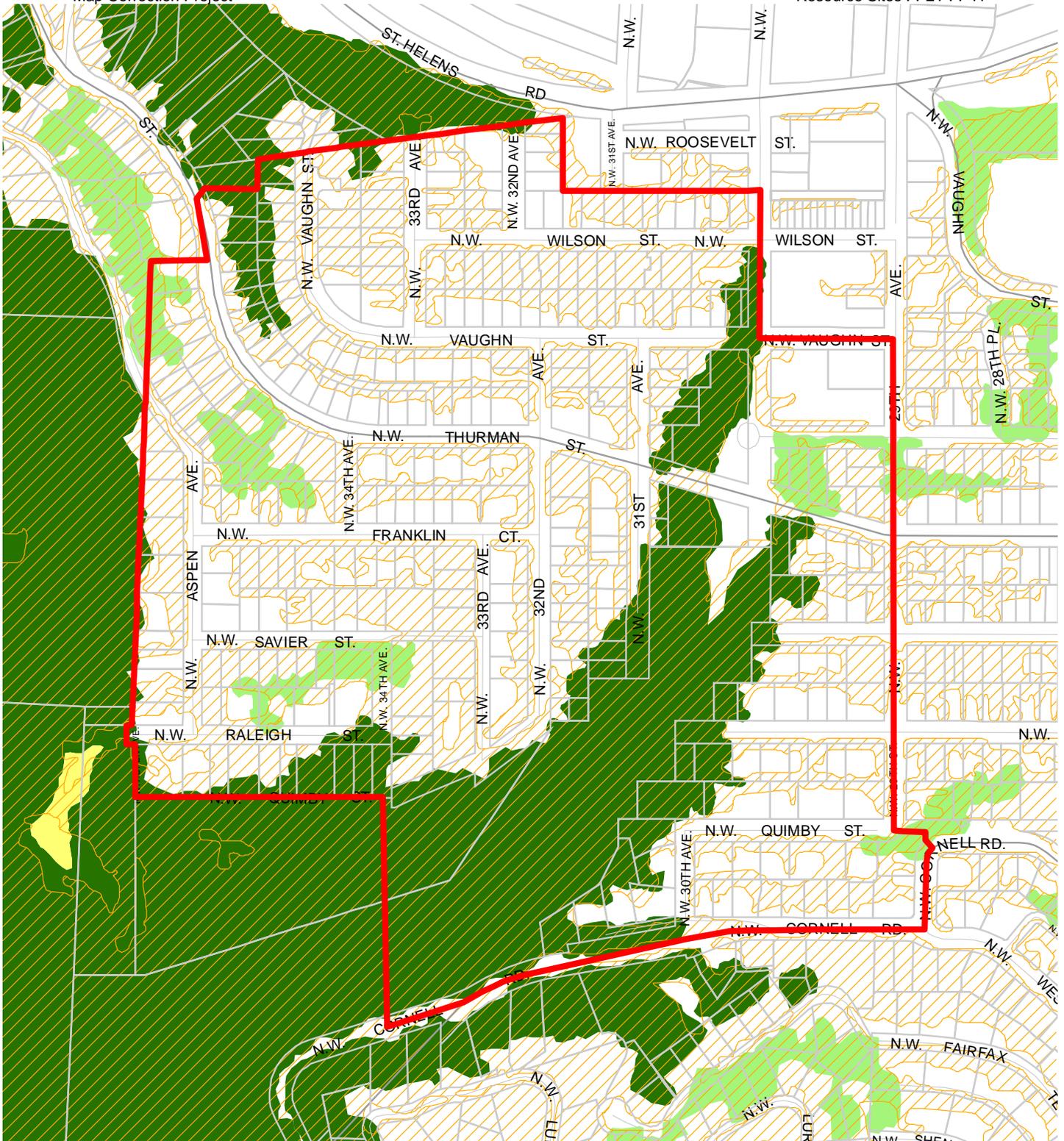
Updated: July 2021



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



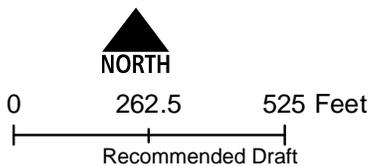
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Map B: Vegetation and Steep Slopes

Resource Site: FP31

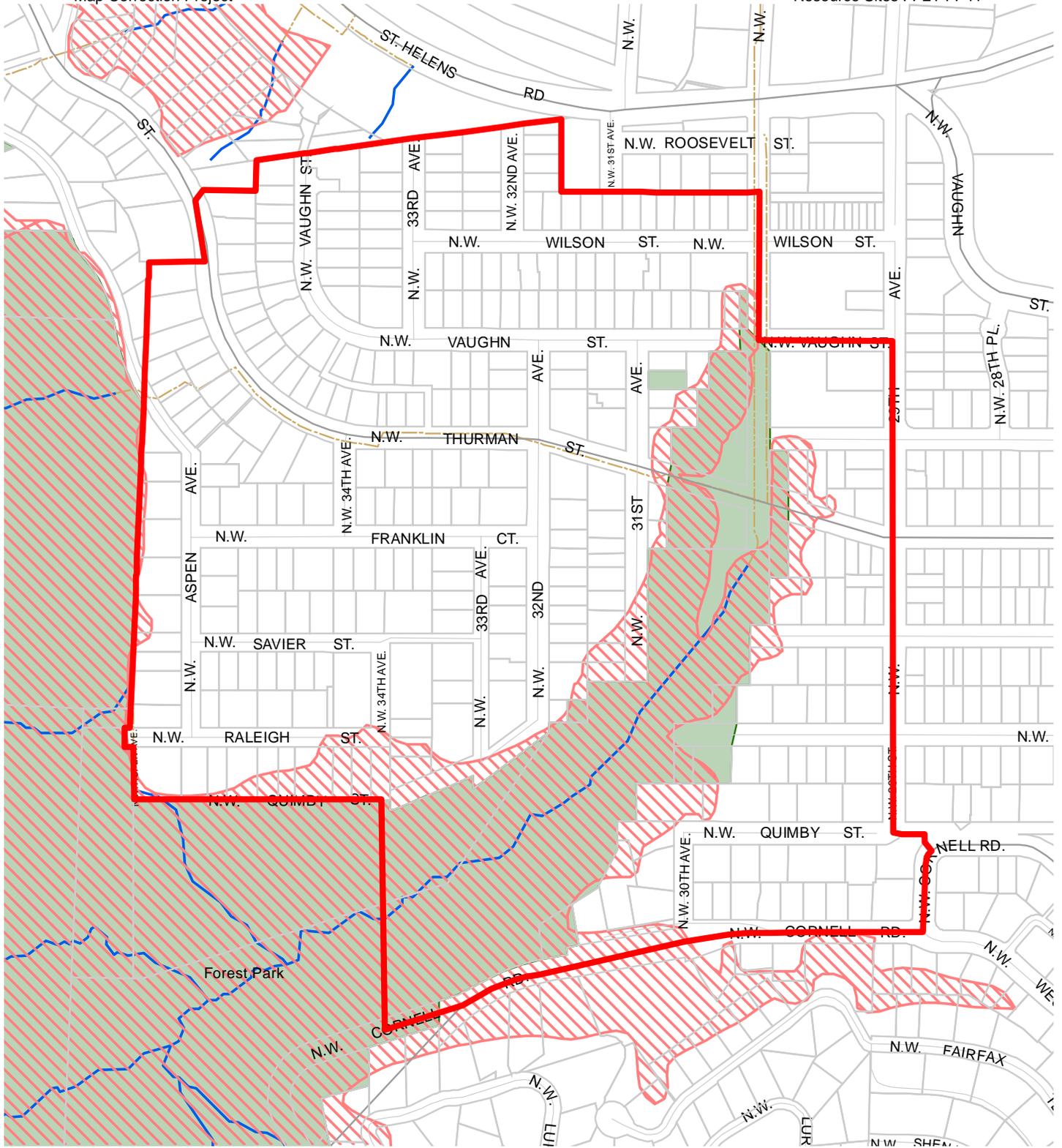
Updated: July 2021



- Resource Sites
- Urban Service Boundary
- Taxlots
- Slopes >25%
- Forest
- Woodland
- Shrubland
- Herbaceous



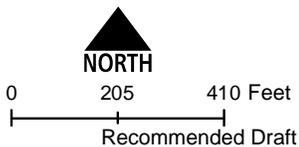
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**Map C: Special
Habitat Areas**

**Resource Site:
FP31**

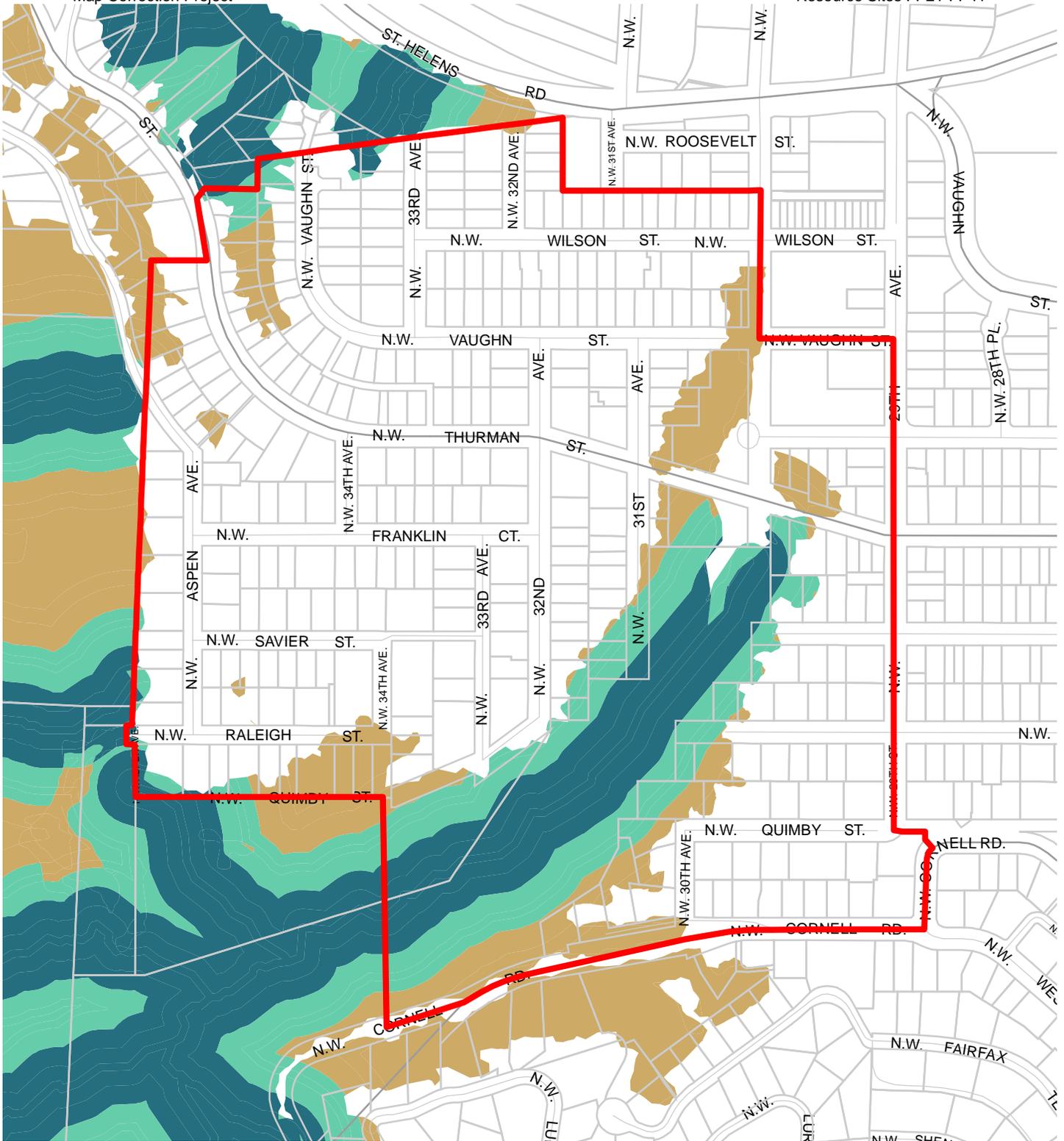
Updated: June 2021



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



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January 2022

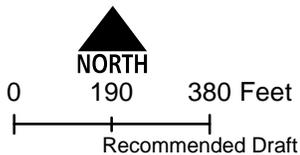


**Map D: Riparian
Corridors Habitat
Classification**

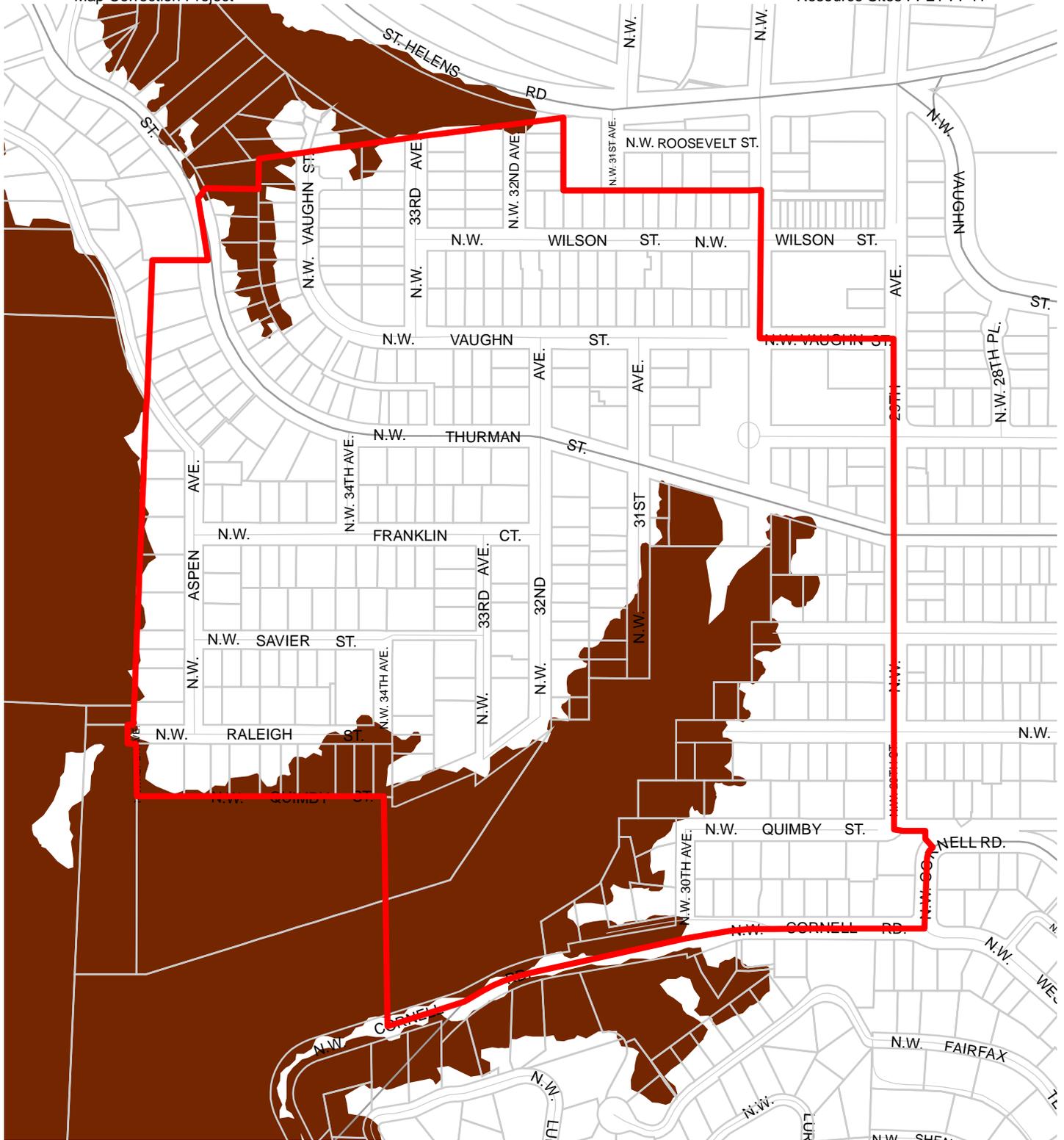
**Resource Site:
FP31**

Updated: July 2021

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

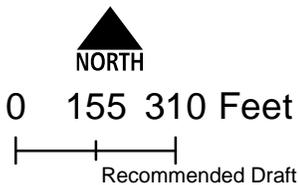


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**Map E: Wildlife
Habitat Classification
Resource Site:
FP31**

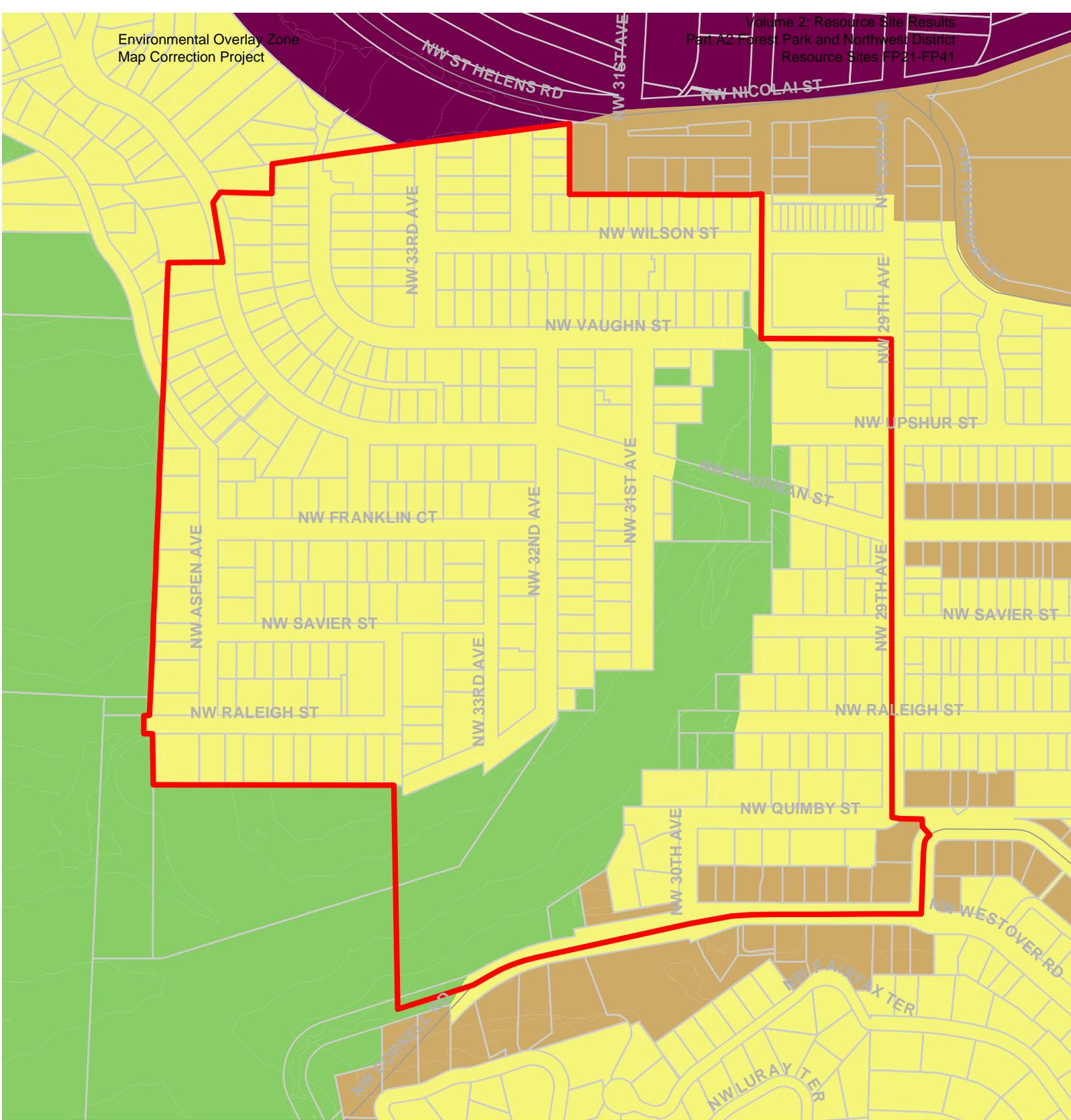
Updated: July 2021



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



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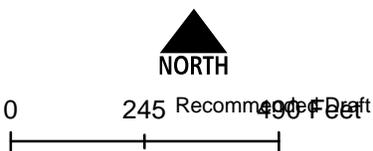


Map F: Urban Development Value (Title 13)
Resource Site: FP31

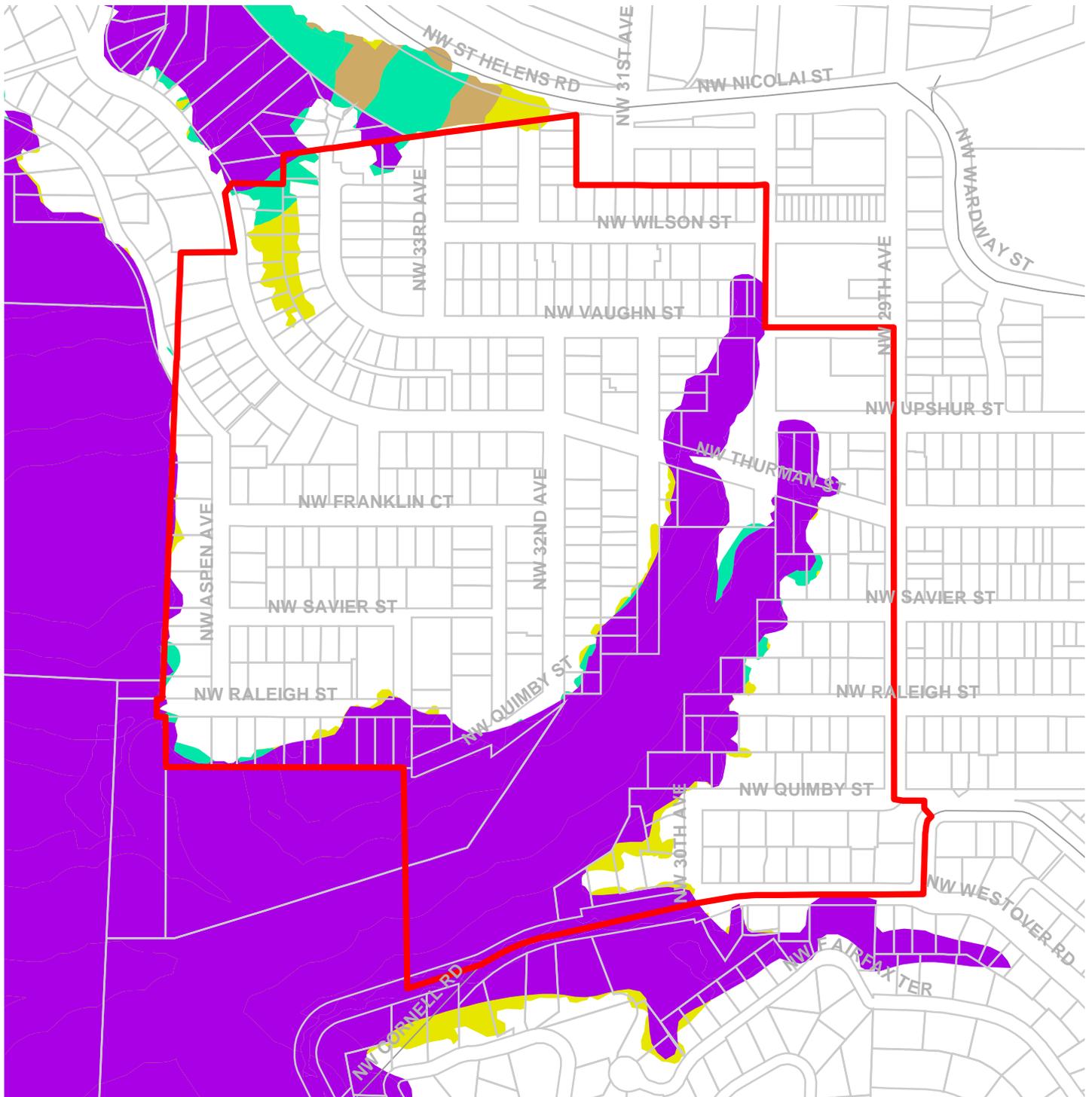
-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks



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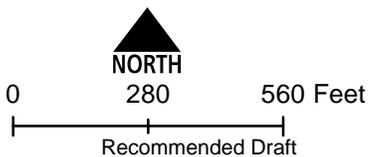


Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

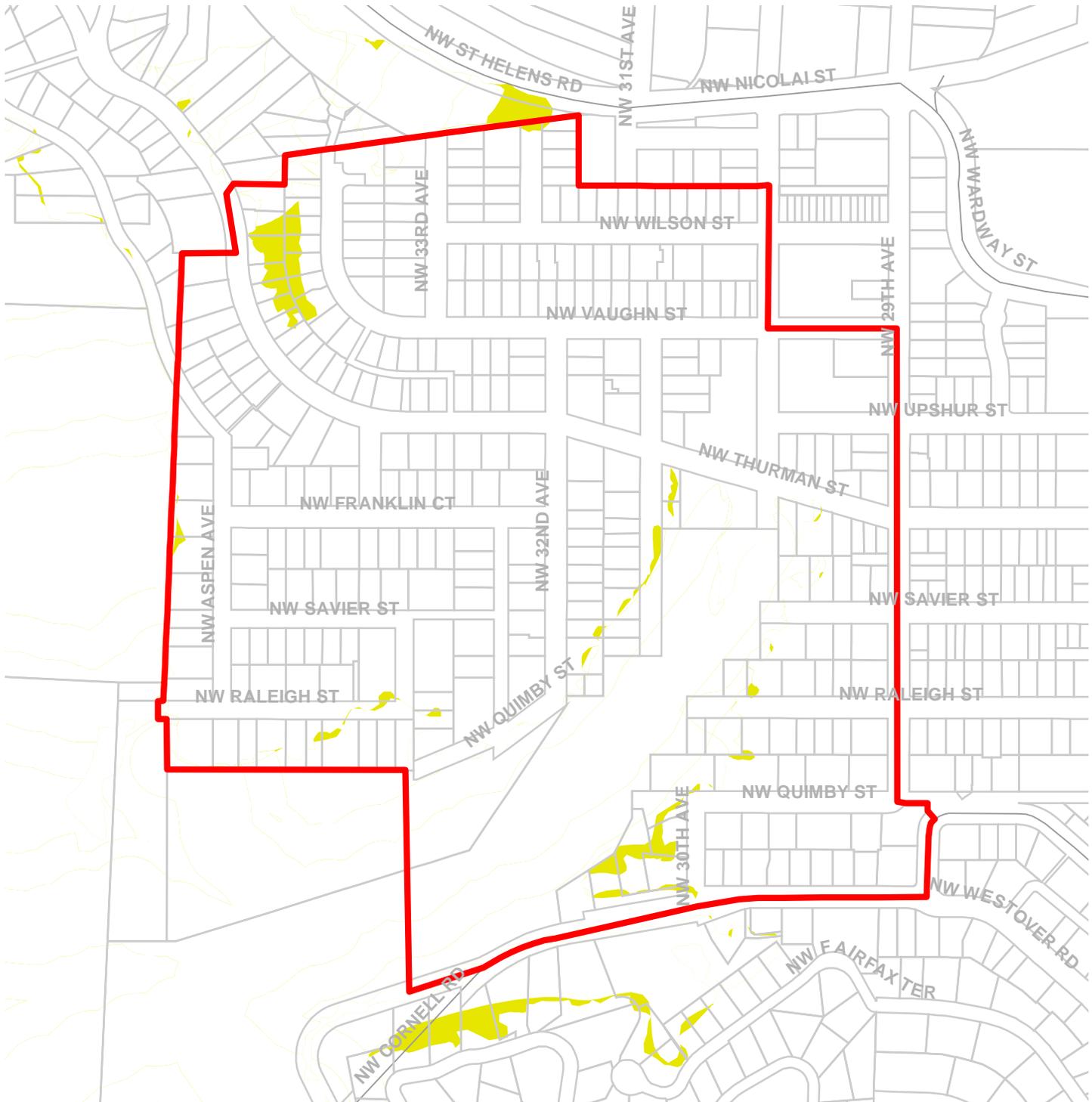
Resource Site: FP31

Updated: July 2021

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



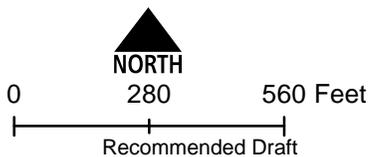
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Map H: Goal 5 Resources

Resource Site: FP31

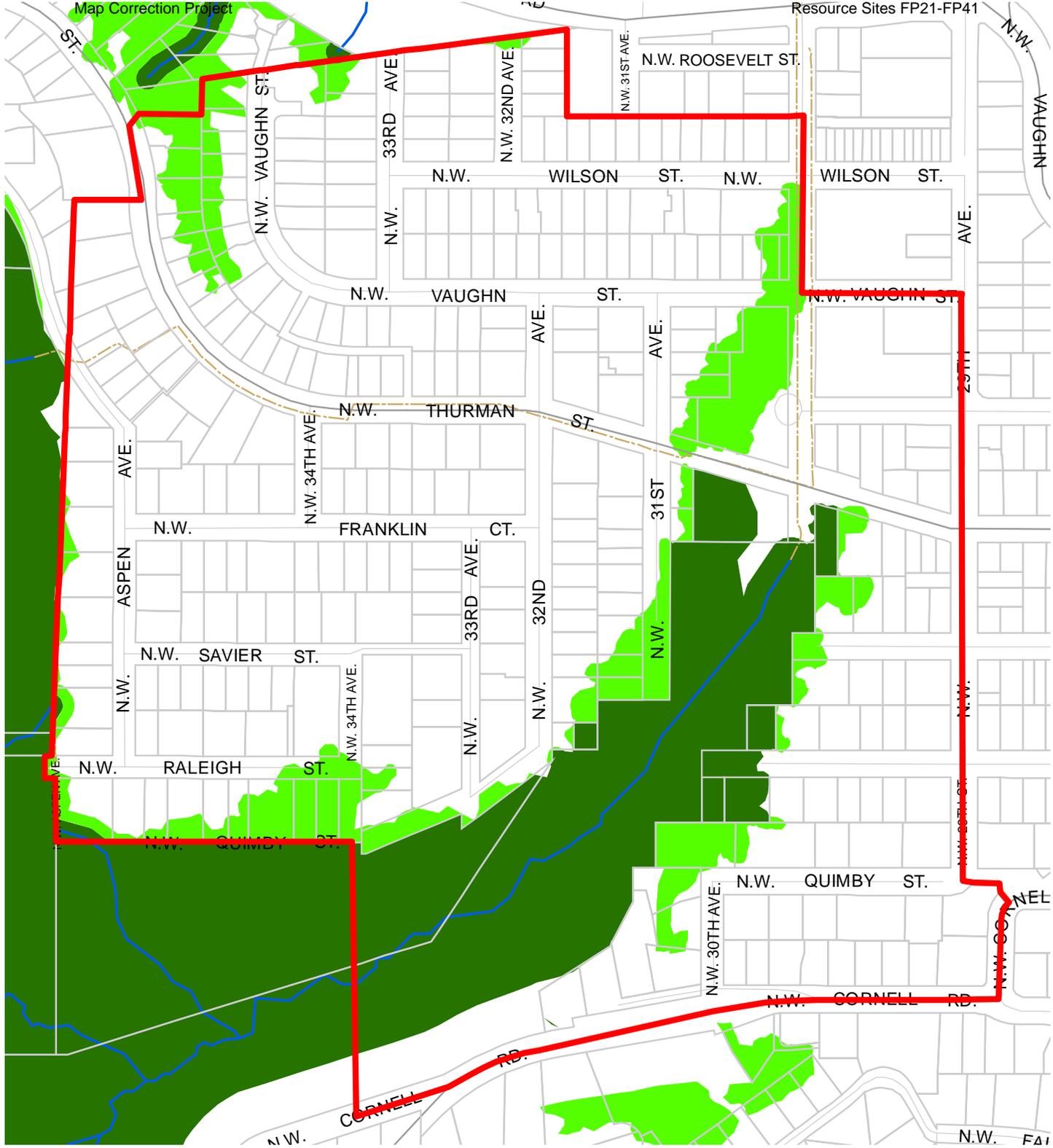
Updated: July 2021



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



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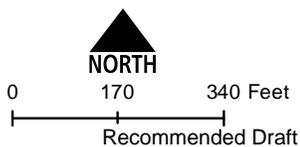


Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
 FP31**

Updated: January 2022

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



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 January 2022

Natural Resource Description

Within resource site FP31 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 FP31	
	Study Area
Stream (Miles)	0.3
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	20.8
Woodland (acres)	3.6
Shrubland (acres)	0.0
Herbaceous (acres)	0.0
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	54.5
* 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%.	

High volumes of large wood instream create habitat complexity that supports cutthroat trout and Coastal Giant Salamanders from the headwaters down through Macleay Park in this resource area. From there, the active channel of Balch Creek ends when it flows into a mile-long culvert that routes flow into the Willamette River. The culvert is not passable upstream by fish and has eliminated all-natural resource function of the lower mile of the stream.

Table B: Quality of Natural Resource Functions in Resource Site FP31				
Resource Site (acres) = 86				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	6.9	7.1	8.1	22.1
percent total inventory site area	8.0%	8.3%	9.5%	25.7%
Wildlife Habitat*				
acres	19.1	0.0	0.0	19.1
percent total inventory site area	22.2%	0.0%	0.0%	22.2%
Special Habitat Areas**				
acres	19.3			
percent total inventory site area	22.5%			
Combined Total⁺				
acres	19.1	0.4	2.6	22.1
percent total inventory site area	22.2%	0.4%	3.1%	25.7%
* 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

For Resource Area FP31, 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 FP31			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
88.1	23.9	23.2	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 FP31. 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 FP31 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 and R1 base zones. Employment uses are 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 FP31, 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 the resource site-specific evaluation for FP31, 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 and land within 25 feet of stream top-of-bank or 25 feet of wetlands.
2. Within public parks, apply a protection overlay zone ('p' zone) to land between 25 and 50 feet of wetlands and land between 25 and 50 feet of streams, and to all vegetation (forest, woodland, shrubland or herbaceous) that is contiguous to streams or wetlands.
3. Outside of public parks, apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands and land between 25 and 50 feet of streams.
4. Apply a conservation overlay zone ('c' zone) to all areas of forest vegetation located more than 50 feet from stream top-of-bank or wetlands (the forest does not need to be contiguous to waterbodies).
5. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: FP32 **Resource Site Name:** Southwest Cornell Rd.

Previous Plan: Balch Creek Watershed Protection Plan

Previous Resource Site No.: 78

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

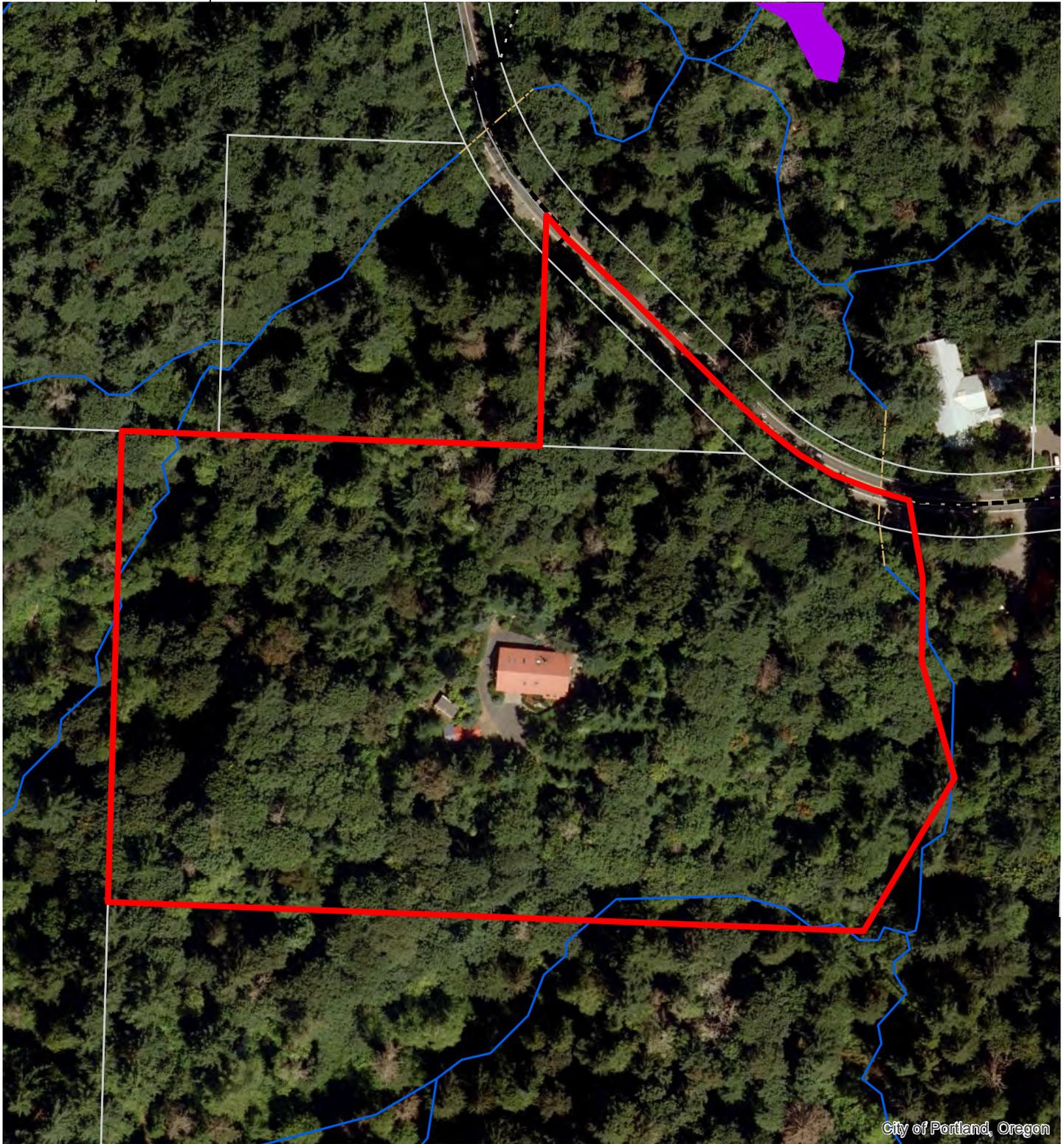
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 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 FP32 includes the following:

Site (acres)	8.4
Base zones (acres)	
RF	8.4



Map A: Water Features

Resource Site: FP32

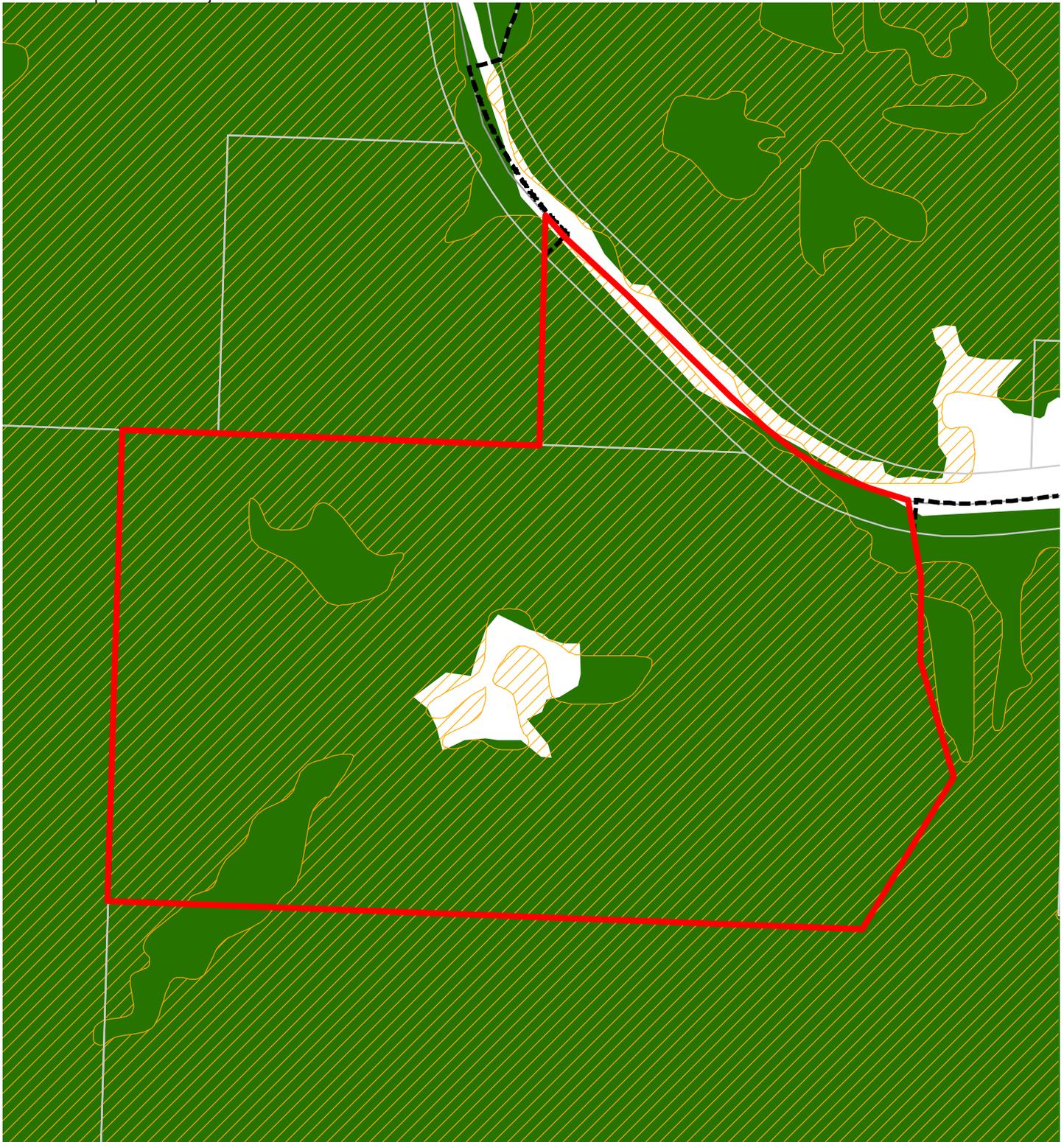
Updated: July 2021



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



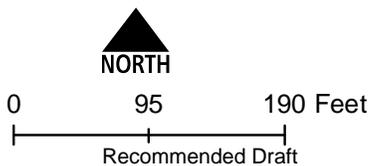
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Map B: Vegetation and Steep Slopes

**Resource Site:
FP32**

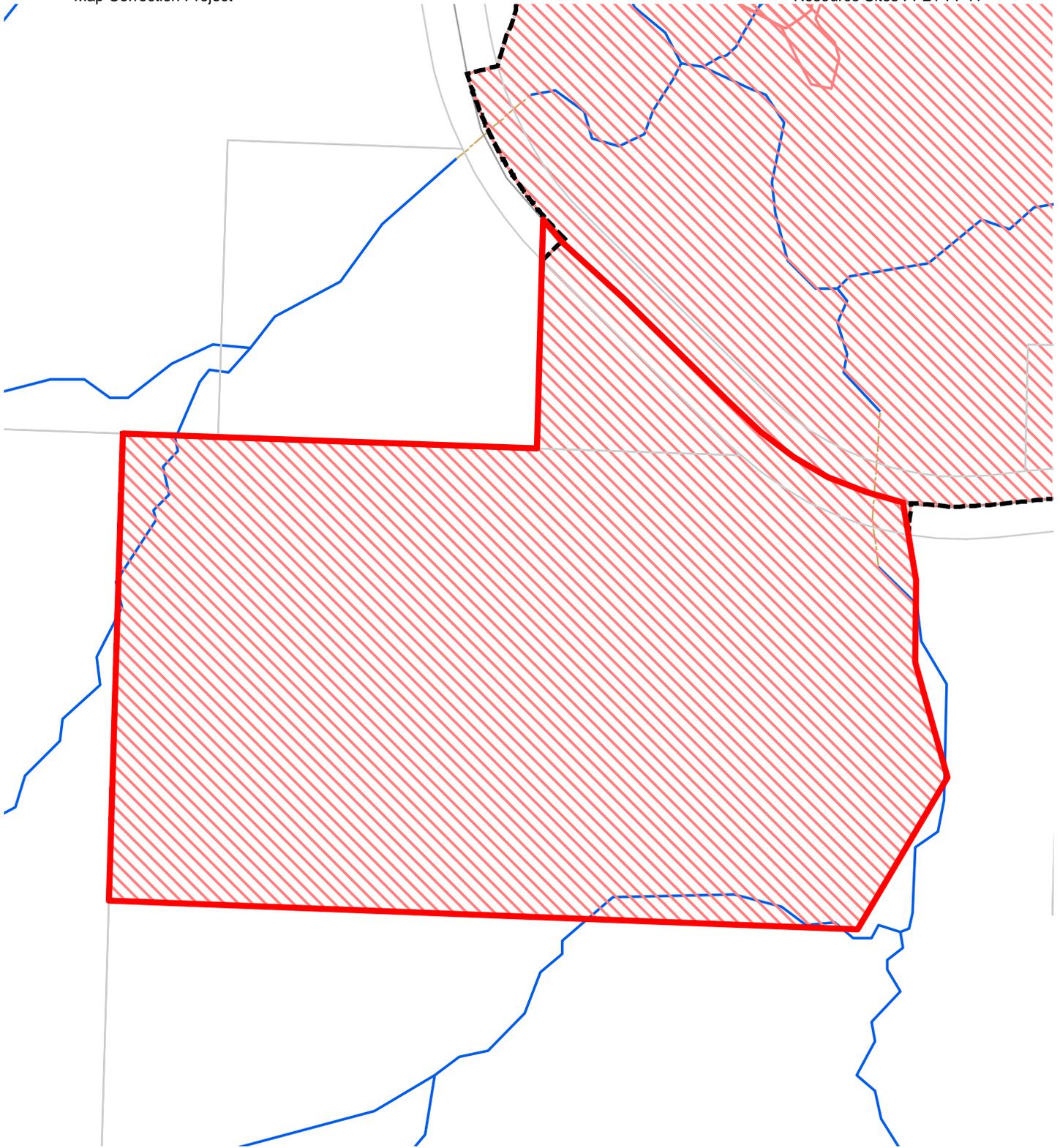
Updated: July 2021



- Resource Sites
- Urban Service Boundary
- Taxlots
- Slopes >25%
- Forest
- Woodland
- Shrubland
- Herbaceous

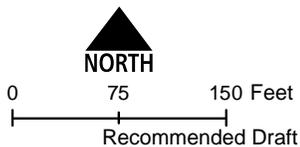


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**Map C: Special
Habitat Areas**
**Resource Site:
FP32**

Updated: June 2021



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



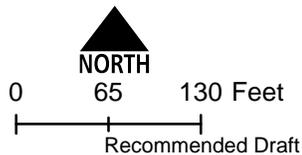
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**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
FP32**

Updated: July 2021

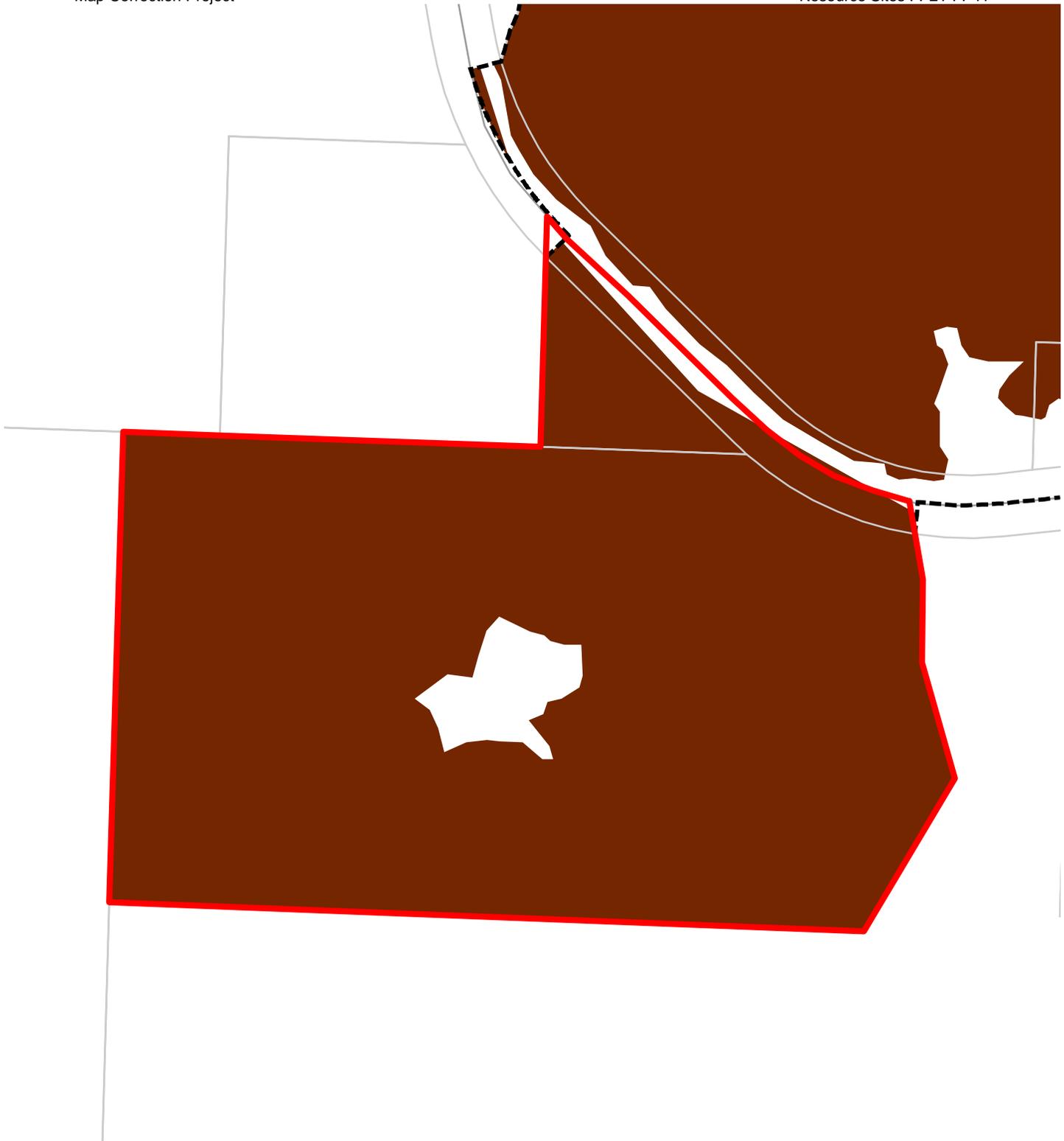


-  Resource Sites
-  Urban Service Boundary
-  Class I (high rank)
-  Class II (medium rank)
-  Class III (low rank)
-  Taxlots



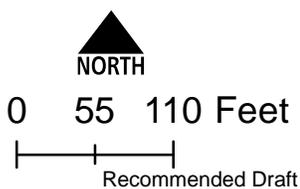
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**Map E: Wildlife
Habitat Classification
Resource Site:
FP32**

Updated: July 2021



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



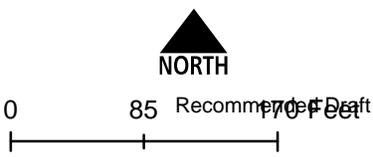
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January 2022



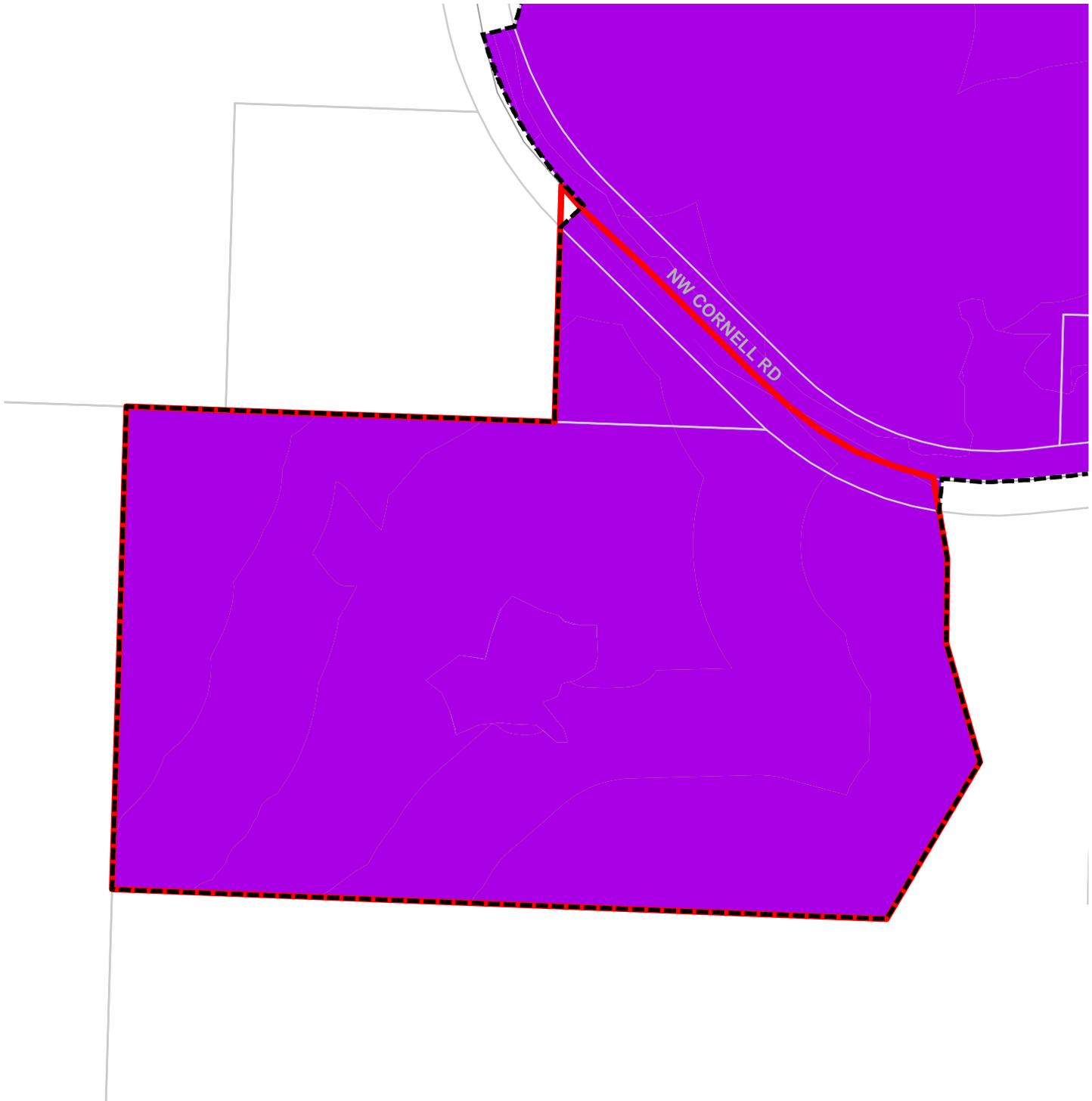
Map F: Urban Development Value (Title 13)
Resource Site: FP32

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

Updated: July 2021



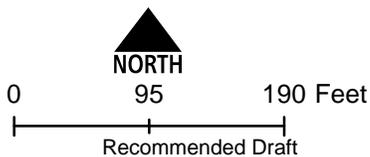
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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: FP32

Updated: July 2021

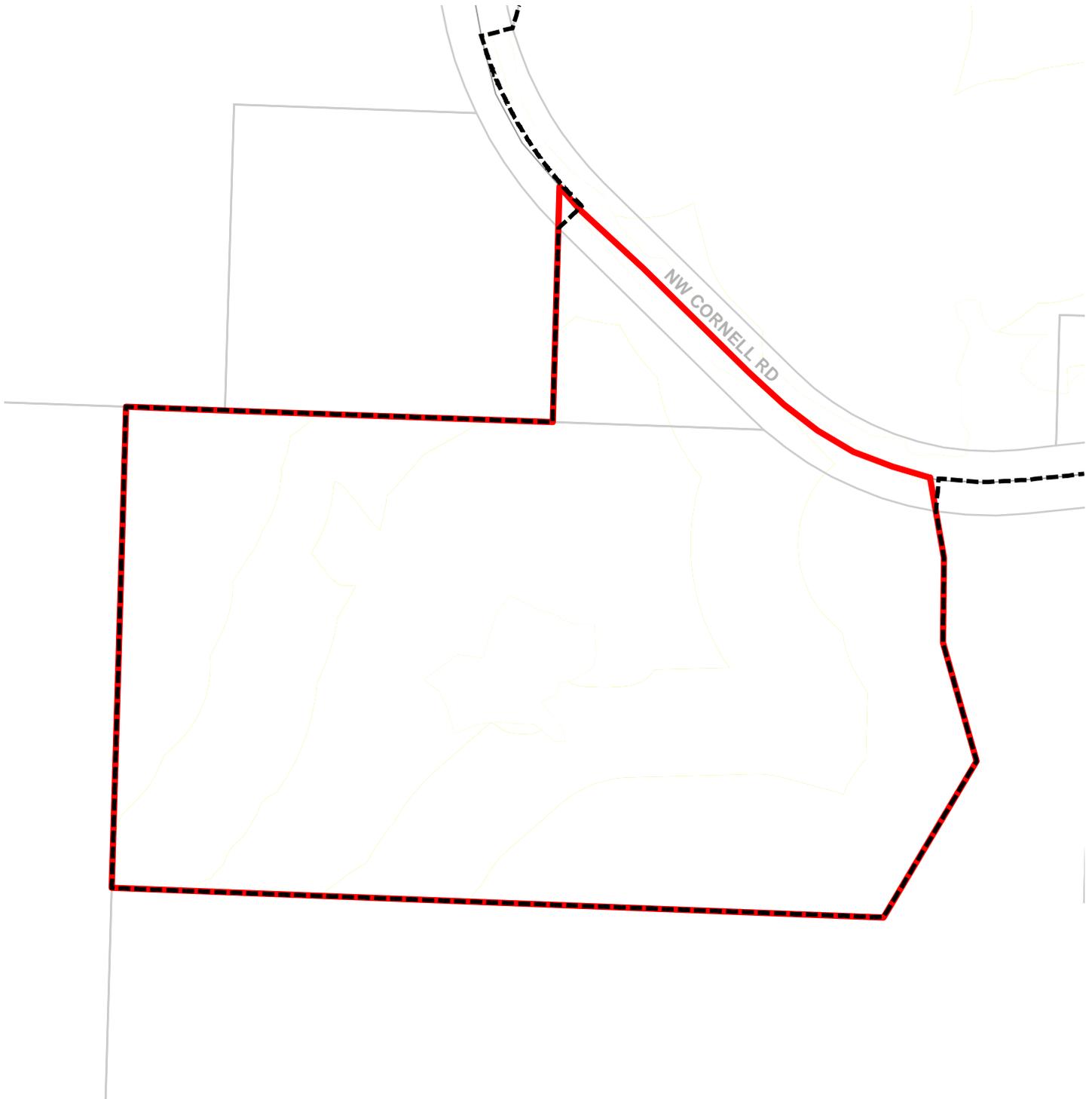


-  Urban Service Boundary
-  Resource Sites
-  HCA High Value
-  HCA Moderate Value
-  HCA Low Value
-  Goal 5 Significant Natural Resources



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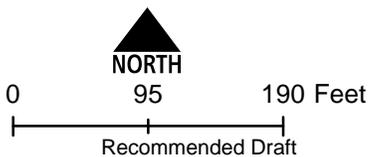
January 2022



Map H: Goal 5 Resources

Resource Site: FP32

Updated: July 2021



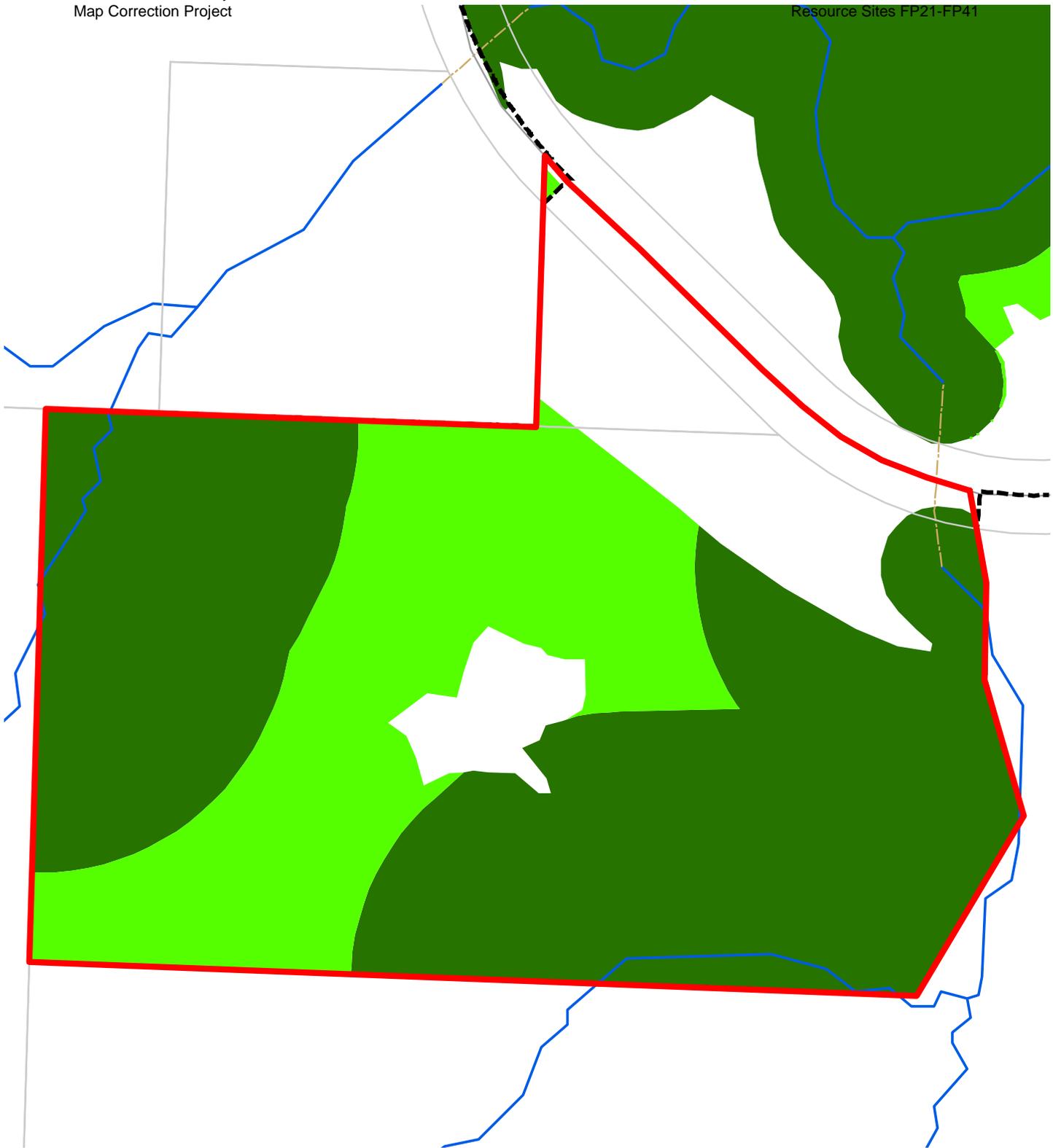
- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



**THE BUREAU OF
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SUSTAINABILITY**

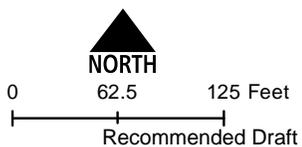
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**Map I: DRAFT Proposed
Environmental Overlay Zones**
**Resource Site:
FP32**

Updated: January 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.
January 2022

Natural Resource Description

Within resource site FP32 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 FP32	
	Study Area
Stream (Miles)	0.1
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	8.1
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)**	7.7
* The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area.	
**Slopes are derived from LiDAR. Steep slopes are areas with a slope greater than 25%.	

There are short segments of a small Balch Creek tributary stream that flow within the boundary of this resource area. City biologists have monitored water quality, macroinvertebrates, fish population, and riparian habitat features since 2010. The data show that these sites generally have good water quality and habitat (though low in wood volume, BES 2018) There is a wet meadow on site, likely created by undersized culverts underneath NW Cornell Road. Flow spreads out and moves across fine sediments and wetland marsh plants before joining Balch Creek on the other end of the pipe.

Table B: Quality of Natural Resource Functions in Resource Site FP32				
Resource Site (acres) = 8				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	2.7	3.1	2.4	8.1
percent total inventory site area	31.6%	36.3%	28.0%	96.0%
Wildlife Habitat*				
acres	8.1	0.0	0.0	8.1
percent total inventory site area	96.0%	0.0%	0.0%	96.0%
Special Habitat Areas**				
acres	8.4			
percent total inventory site area	100.0%			
Combined Total⁺				
acres	8.1	0.0	0.0	8.1
percent total inventory site area	96.0%	0.0%	0.0%	96.0%
* 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.

For resource site FP32, 1.0% 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 FP32			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
8.5	0.2	0.1	1.0%

*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 FP32. 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

All of the significant natural resources within resource site FP32 are designated Habitat Conservation Areas under Metro Title 13; therefore, no resource site-specific ESEE is required.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and the resource site-specific evaluation for FP32, 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 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 that are contiguous to but more than 50 feet from stream top-of-bank extending to 200 feet from top-of-bank.
3. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands; and areas of forest vegetation that are contiguous to but more than 200 feet from stream top-of-bank.
4. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: FP33 **Resource Site Name:** Cornell Tunnels

Previous Plan: Balch Creek Watershed Protection Plan

Previous Resource Site No.: 77

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

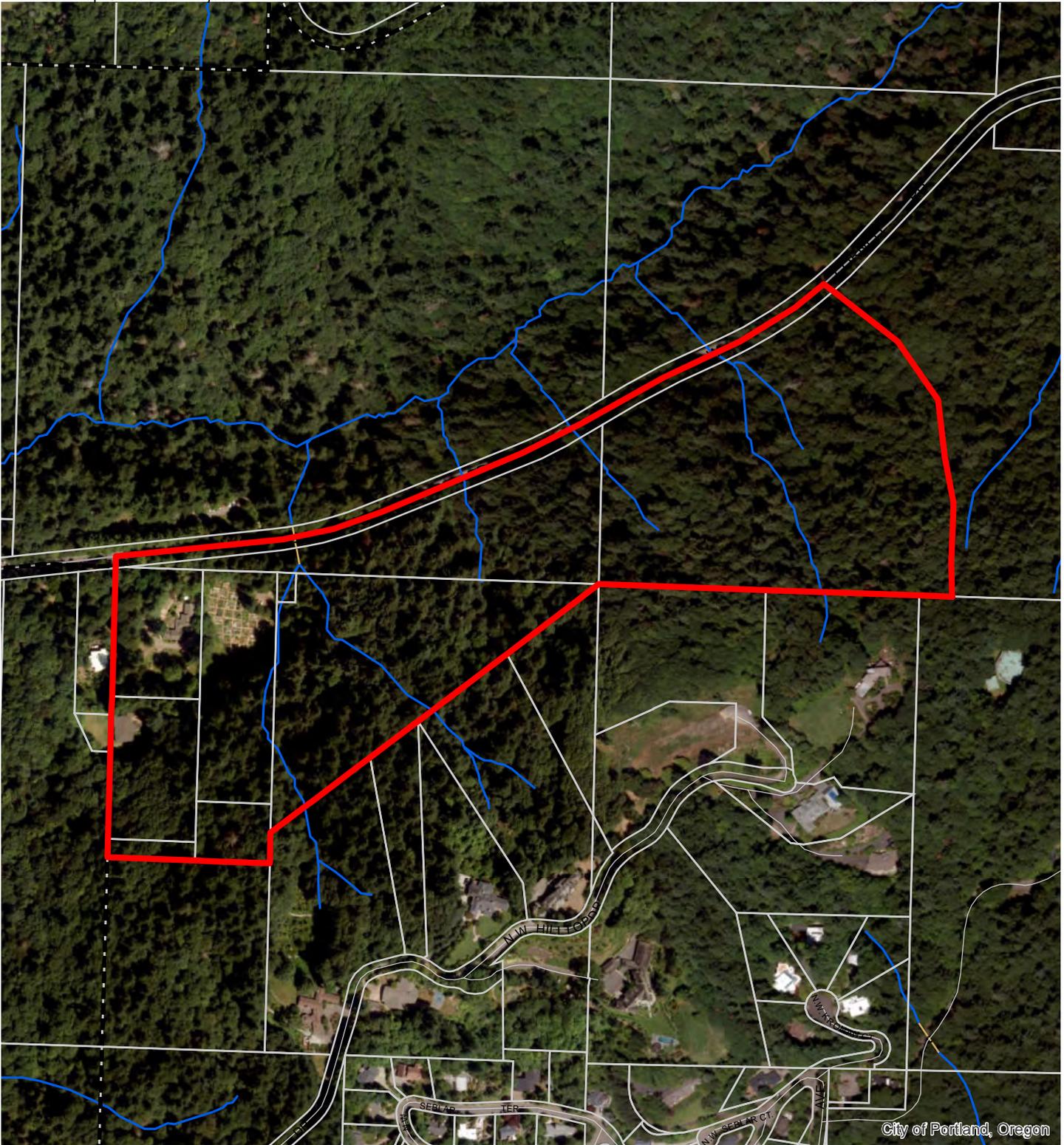
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 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 FP33 includes the following:

Site (acres)	34.6
Base zones (acres)	
OS	29.6
RF	5.0

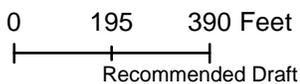


City of Portland, Oregon

Map A: Water Features

Resource Site: FP33

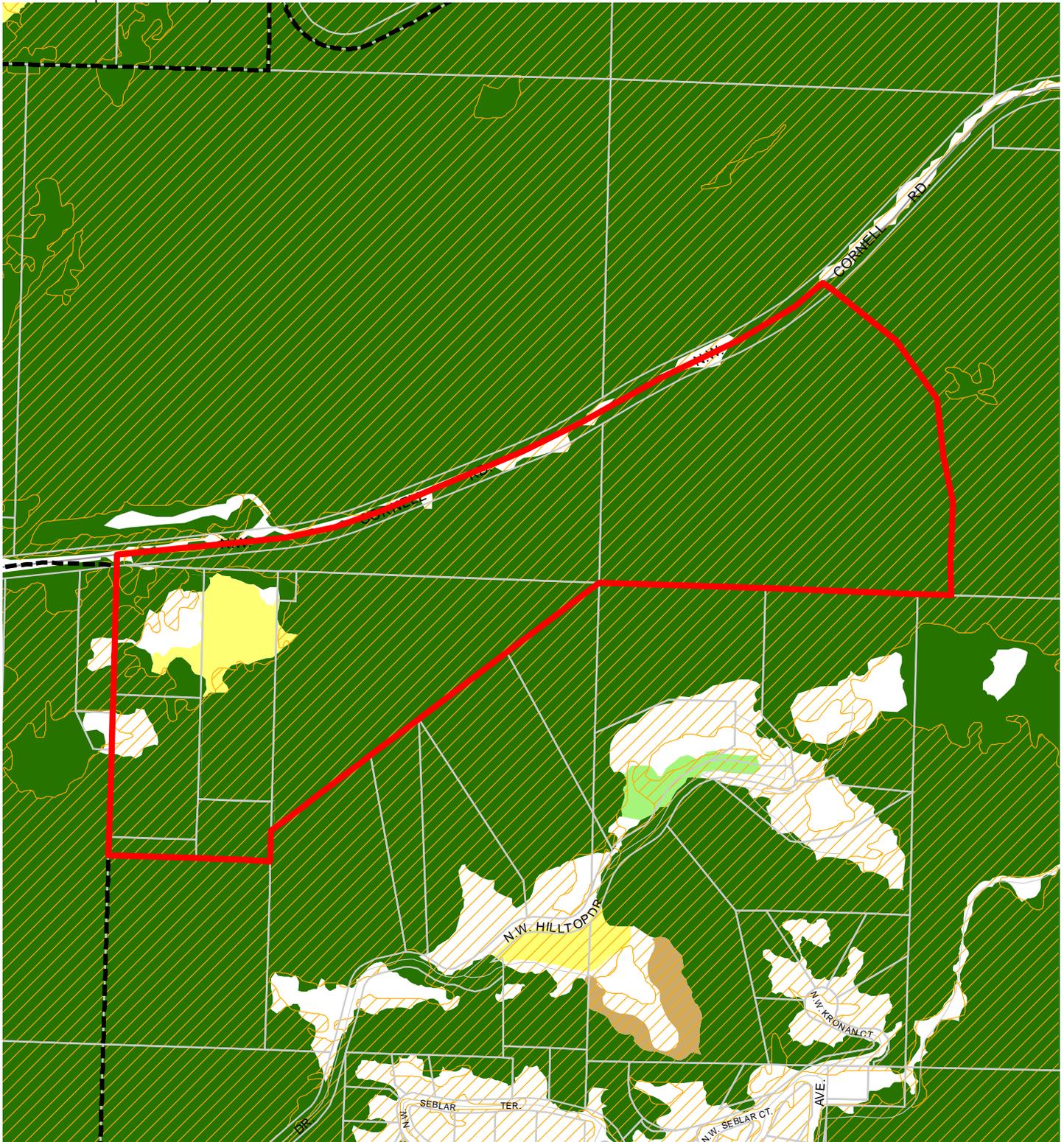
Updated: July 2021



- 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.
January 2022



Map B: Vegetation and Steep Slopes

Resource Site: FP33

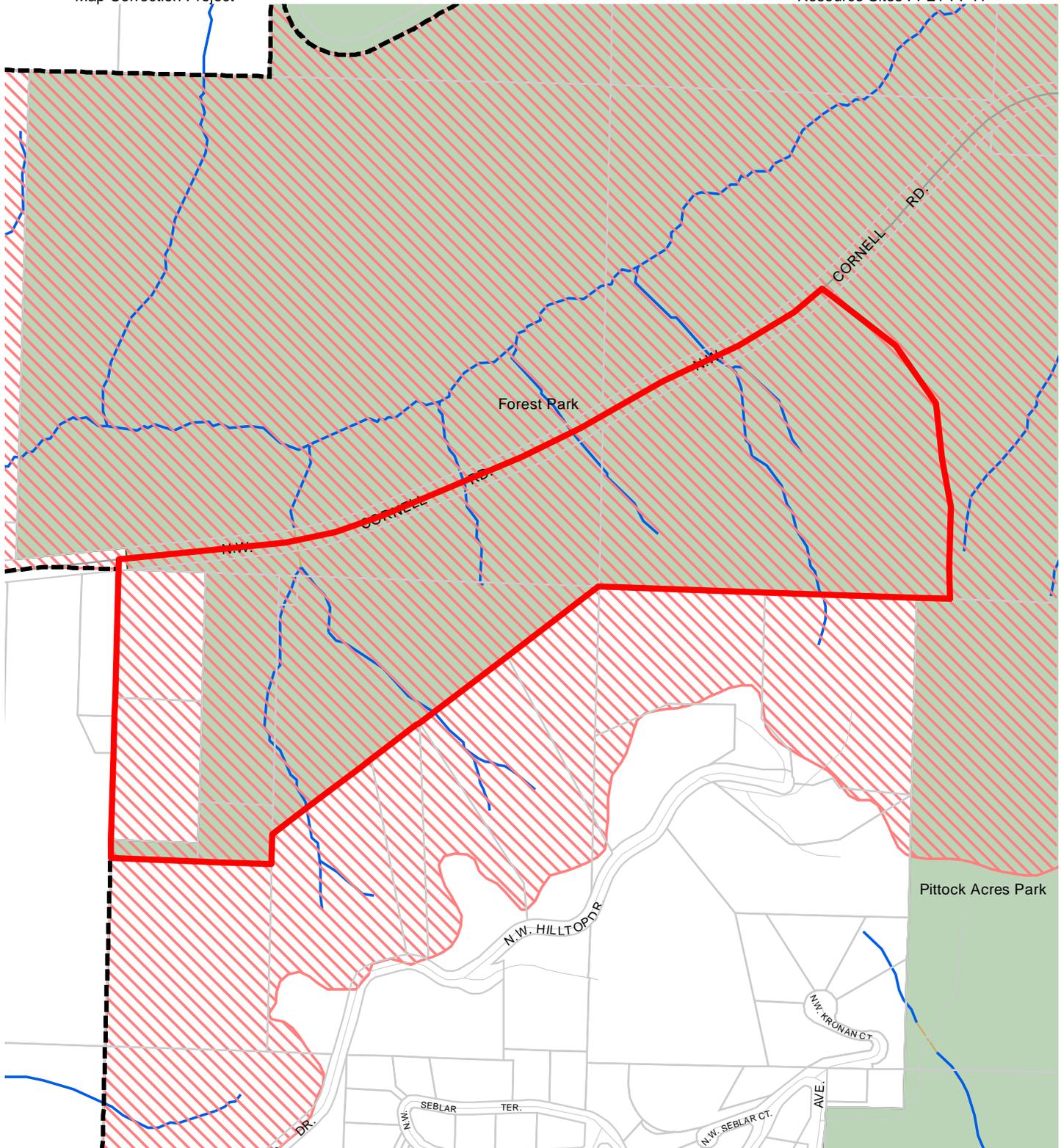
Updated: July 2021



- Resource Sites
- Urban Service Boundary
- Taxlots
- Slopes >25%
- Forest
- Woodland
- Shrubland
- Herbaceous

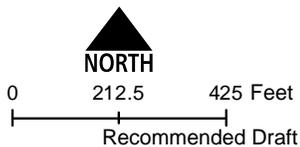


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January 2022



**Map C: Special
Habitat Areas**
**Resource Site:
FP33**

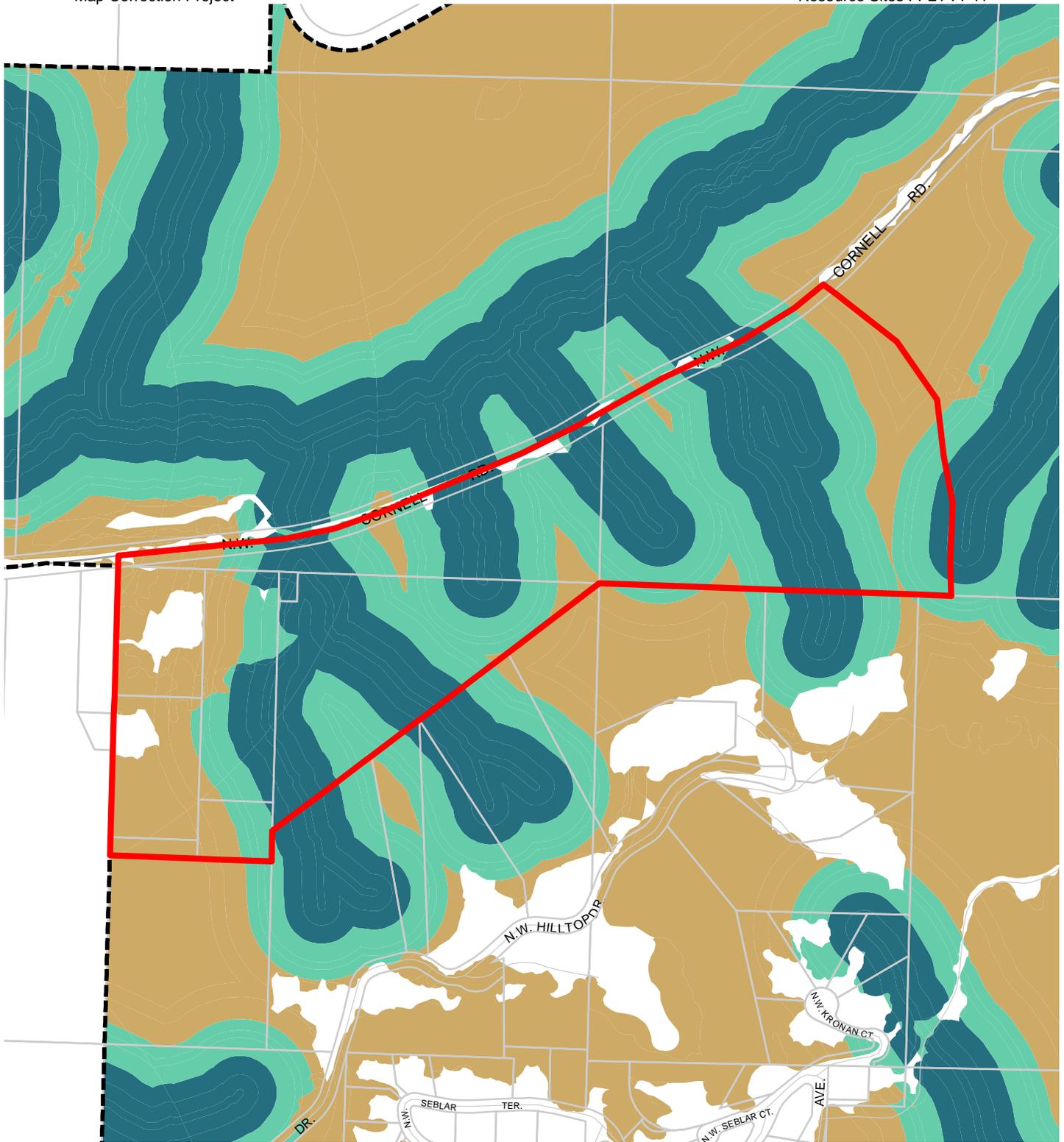
Updated: June 2021



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



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January 2022



**Map D: Riparian
Corridors Habitat
Classification**

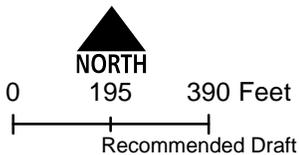
**Resource Site:
FP33**

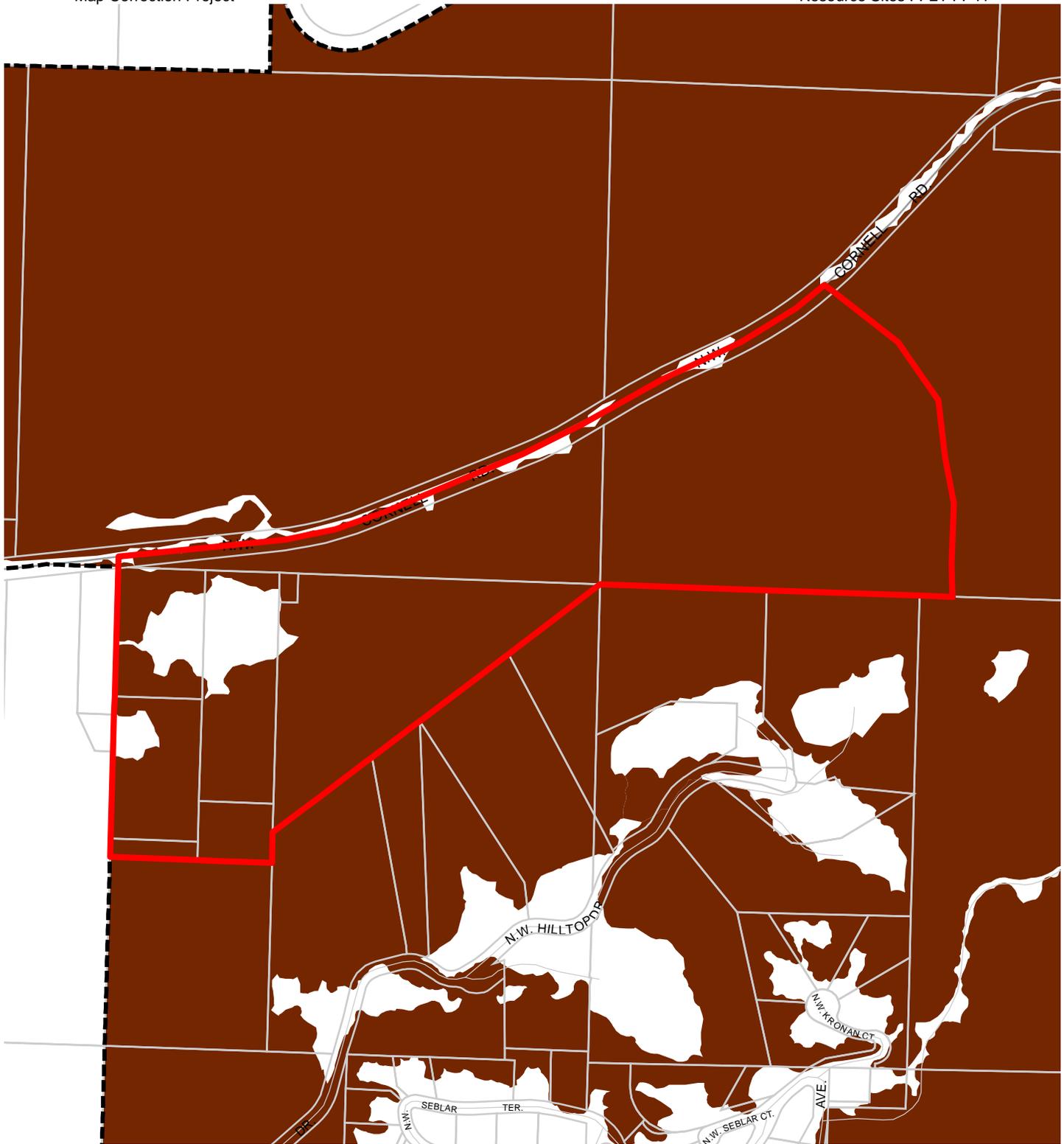
Updated: July 2021

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



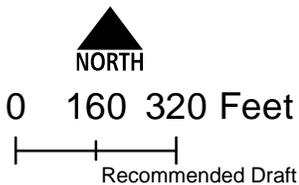
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**Map E: Wildlife
Habitat Classification
Resource Site:
FP33**

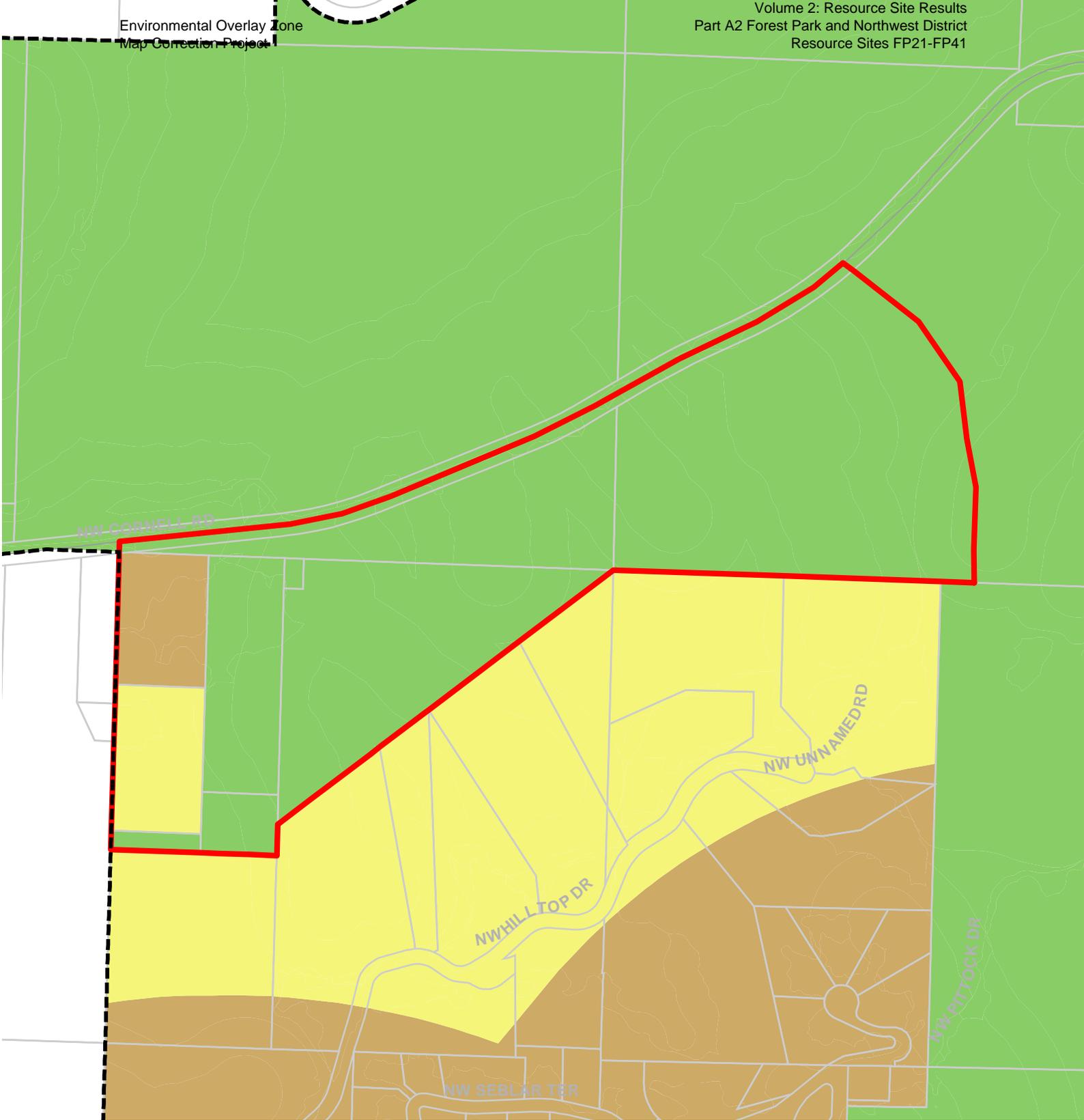
Updated: July 2021



- 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.
January 2022

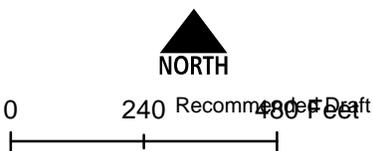


Map F: Urban Development Value (Title 13)
Resource Site: FP33

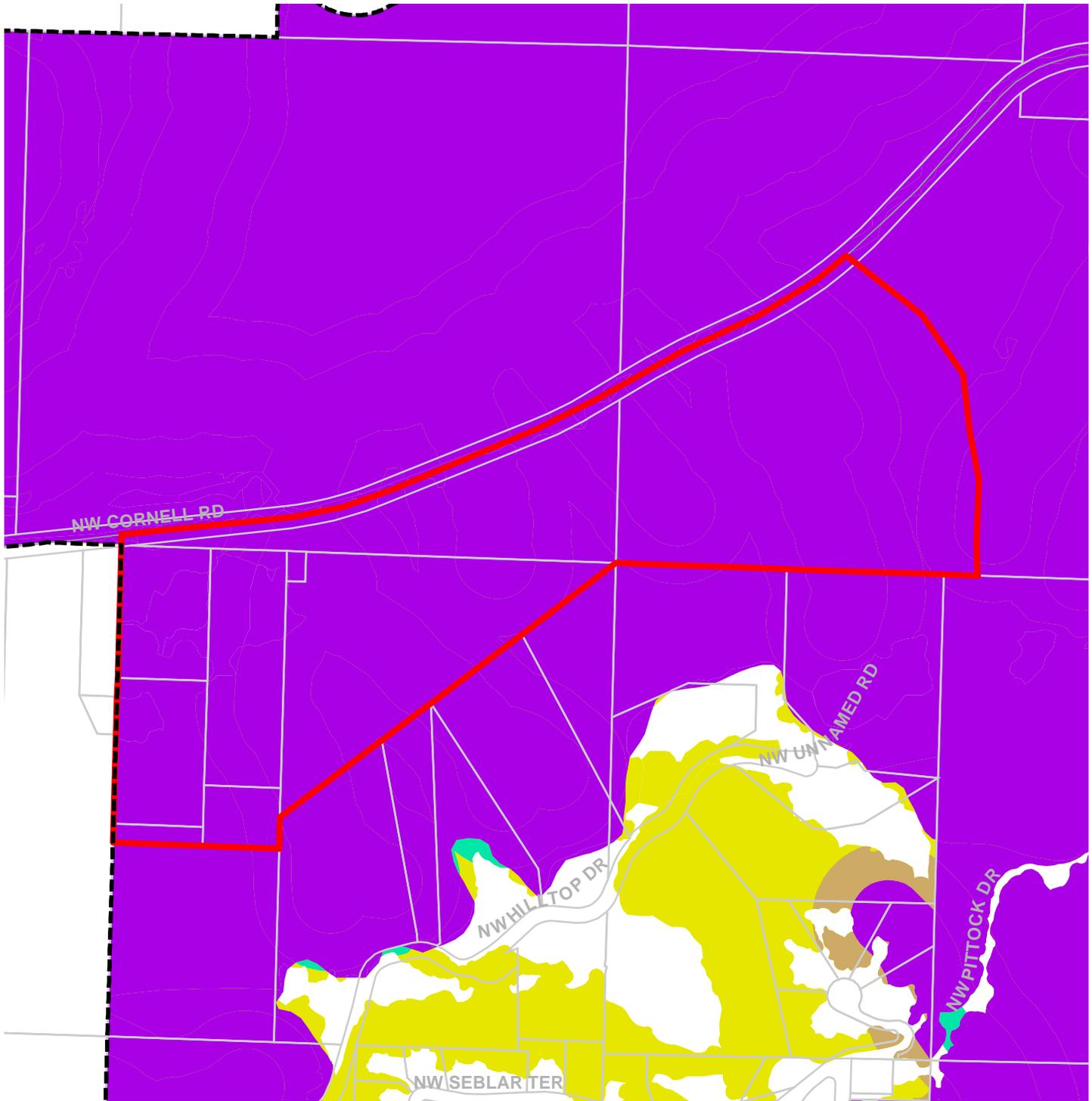
-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks



Updated: July 2021



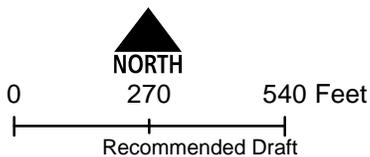
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative January 2022 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: FP33

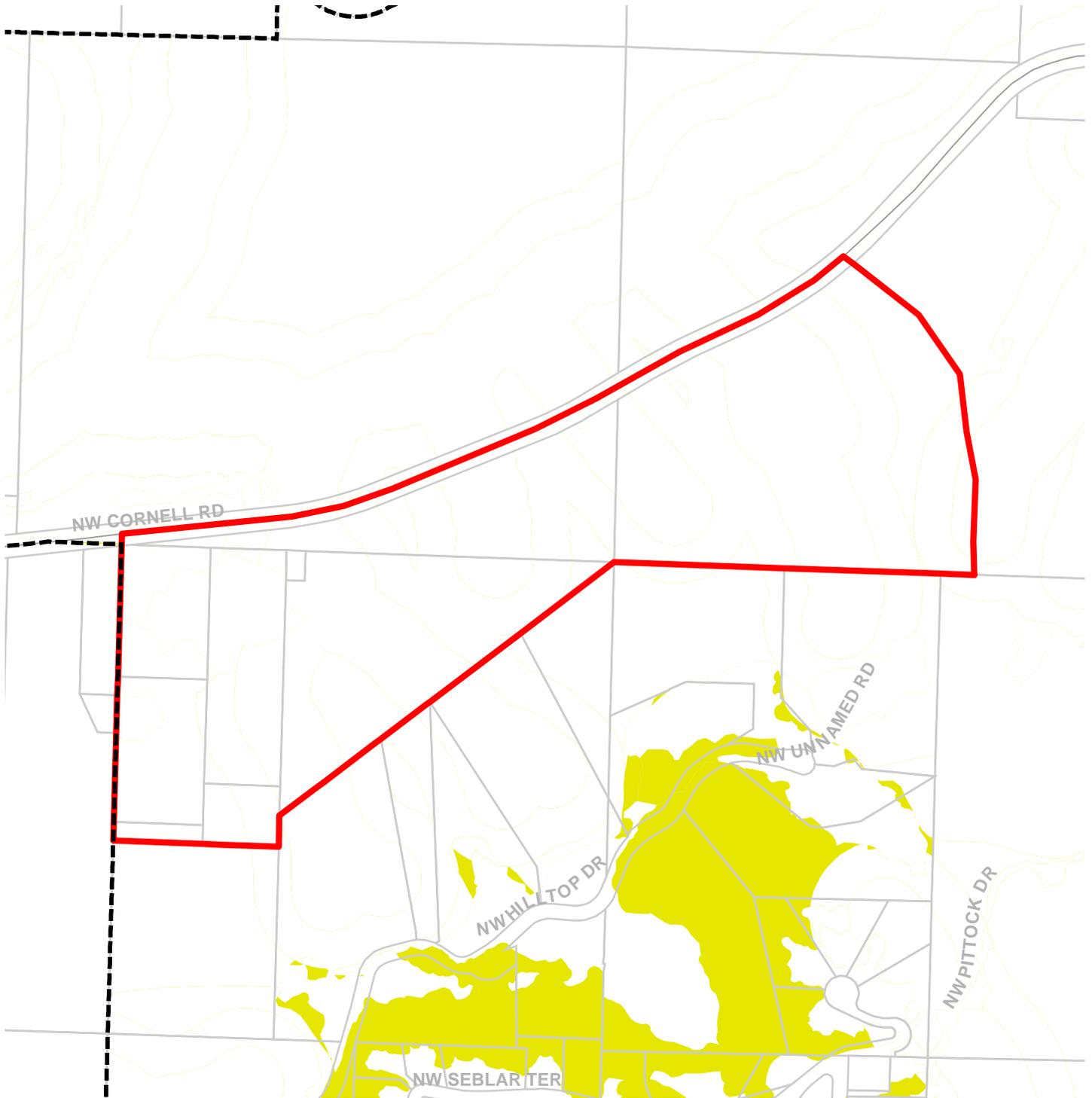
Updated: July 2021



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



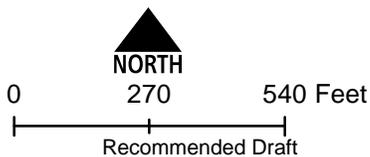
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Map H: Goal 5 Resources

Resource Site: FP33

Updated: July 2021

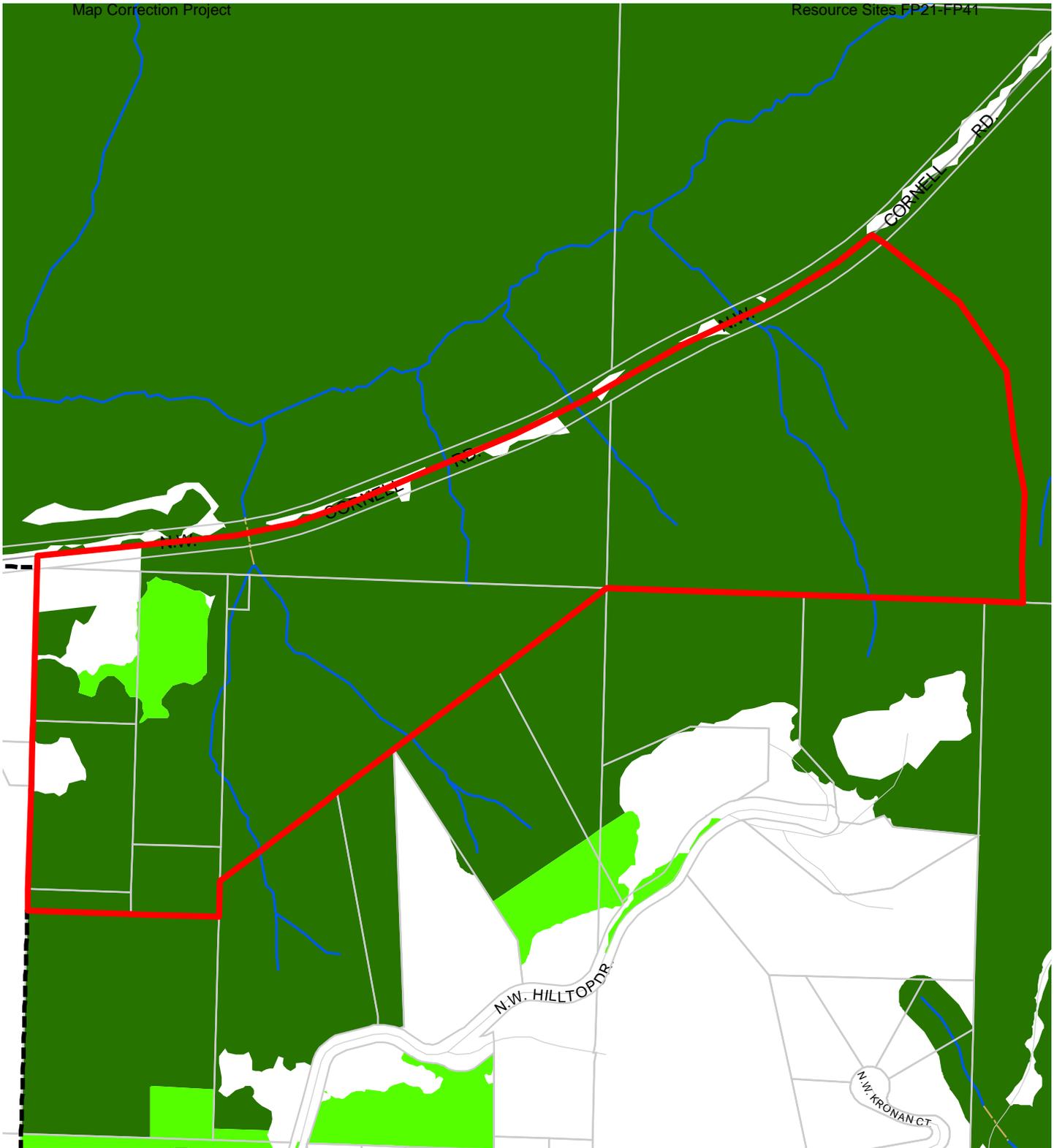


-  Urban Service Boundary
-  Resource Sites
-  Goal 5 Significant Natural Resources



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January 2022

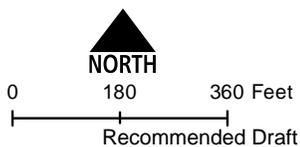


Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site: FP33

Updated: January 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.
January 2022

Natural Resource Description

Within resource site FP33 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 FP33	
	Study Area
Stream (Miles)	0.6
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	32.1
Woodland (acres)	0.0
Shrubland (acres)	0.0
Herbaceous (acres)	1.3
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	32.0
* 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%.	

There are short segments of small Balch Creek tributary streams that flow within the boundary of this resource area.

Table B: Quality of Natural Resource Functions in Resource Site FP33				
Resource Site (acres) = 35				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	13.1	12.8	7.7	33.5
percent total inventory site area	37.8%	36.9%	22.2%	96.9%
Wildlife Habitat*				
acres	32.1	0.0	0.0	32.1
percent total inventory site area	92.9%	0.0%	0.0%	92.9%
Special Habitat Areas**				
acres	34.6			
percent total inventory site area	100.0%			
Combined Total⁺				
acres	32.1	0.6	0.8	33.5
percent total inventory site area	92.9%	1.7%	2.4%	96.9%
* 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 site FP33, 1.9% 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 FP33			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
34.6	0.7	0.7	1.9%

*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 FP33. 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

All of the significant natural resources within resource site FP33 are designated Habitat Conservation Areas under Metro Title 13; therefore, no resource site-specific ESEE is required.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3 and the resource site-specific evaluation for FP33, 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 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 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; and within areas of woodland, shrubland and herbaceous vegetation 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.: FP34 **Resource Site Name:** South of Cornell Rd

Previous Plan: Balch Creek Watershed Protection Plan

Previous Resource Site No.: 76

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

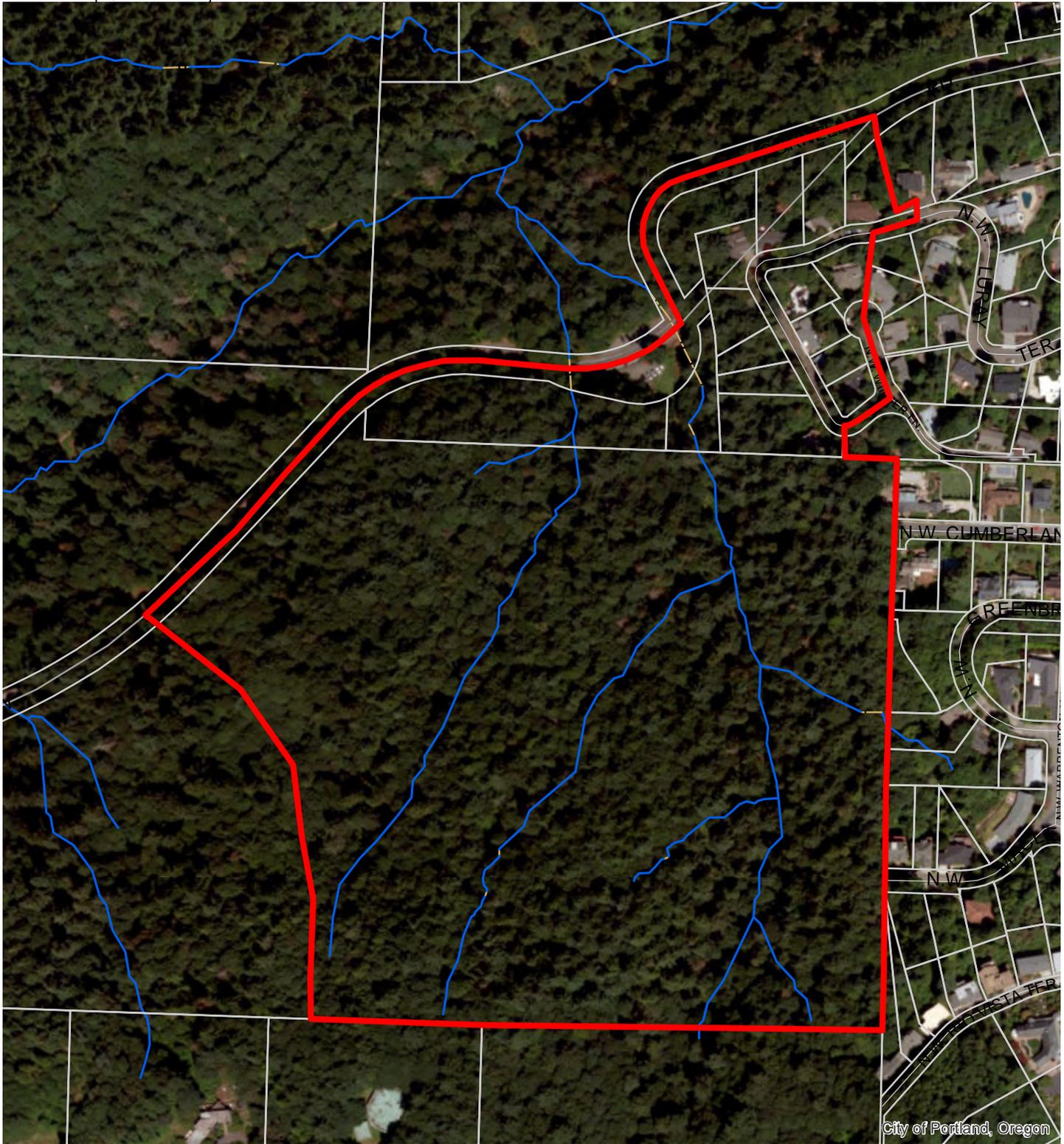
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 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 FP34 includes the following:

Site (acres)	45.1
Base zones (acres)	
OS	40.5
R7	4.6



Map A: Water Features
Resource Site: FP34

Updated: July 2021



0 150 300 Feet
Recommended Draft

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



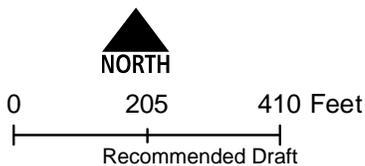
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January 2022



Map B: Vegetation and Steep Slopes

**Resource Site:
FP34**

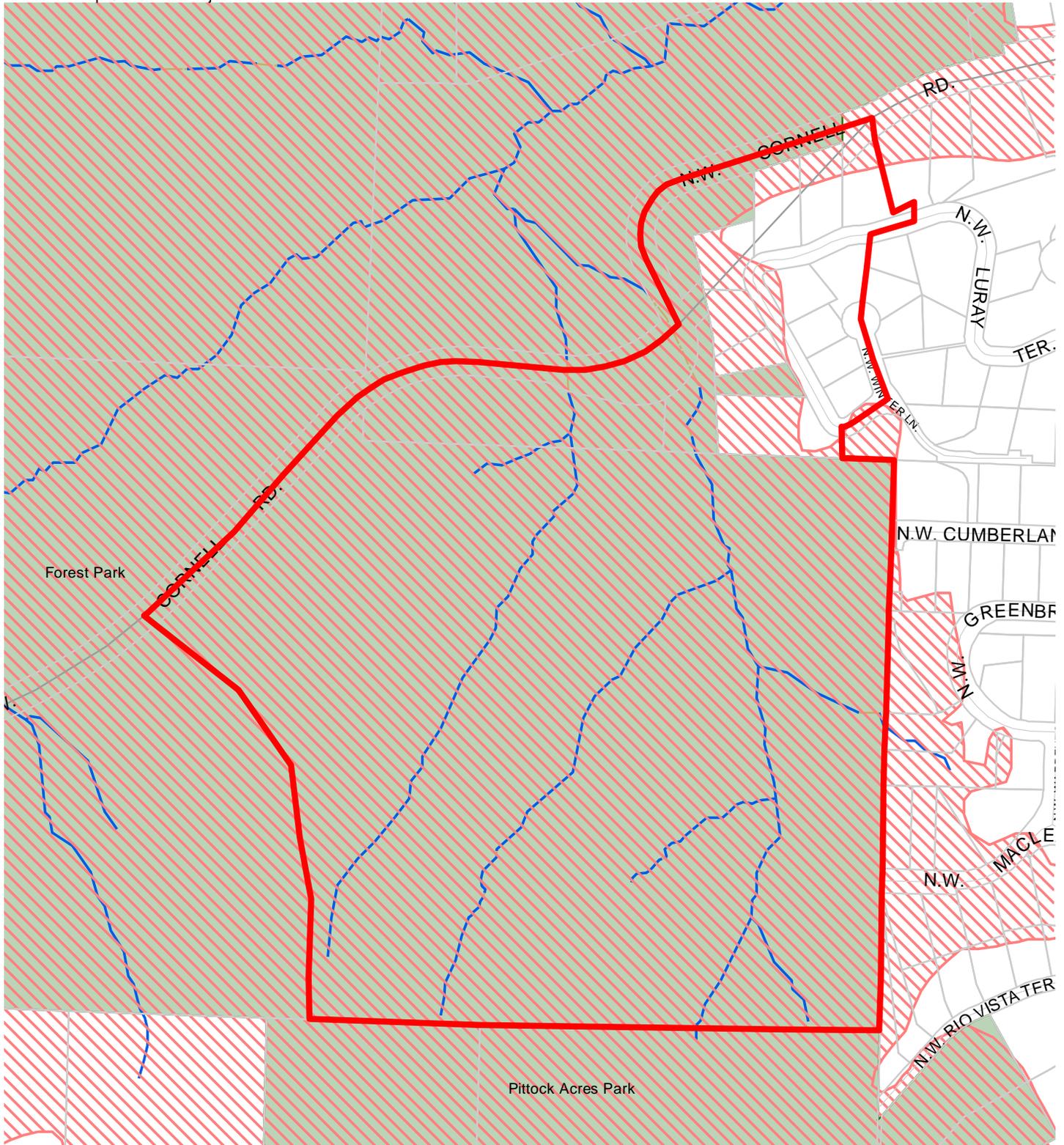
Updated: July 2021



- Resource Sites
- Urban Service Boundary
- Taxlots
- Slopes >25%
- Forest
- Woodland
- Shrubland
- Herbaceous

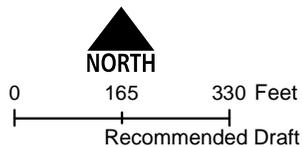


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January 2022



**Map C: Special
Habitat Areas**
**Resource Site:
FP34**

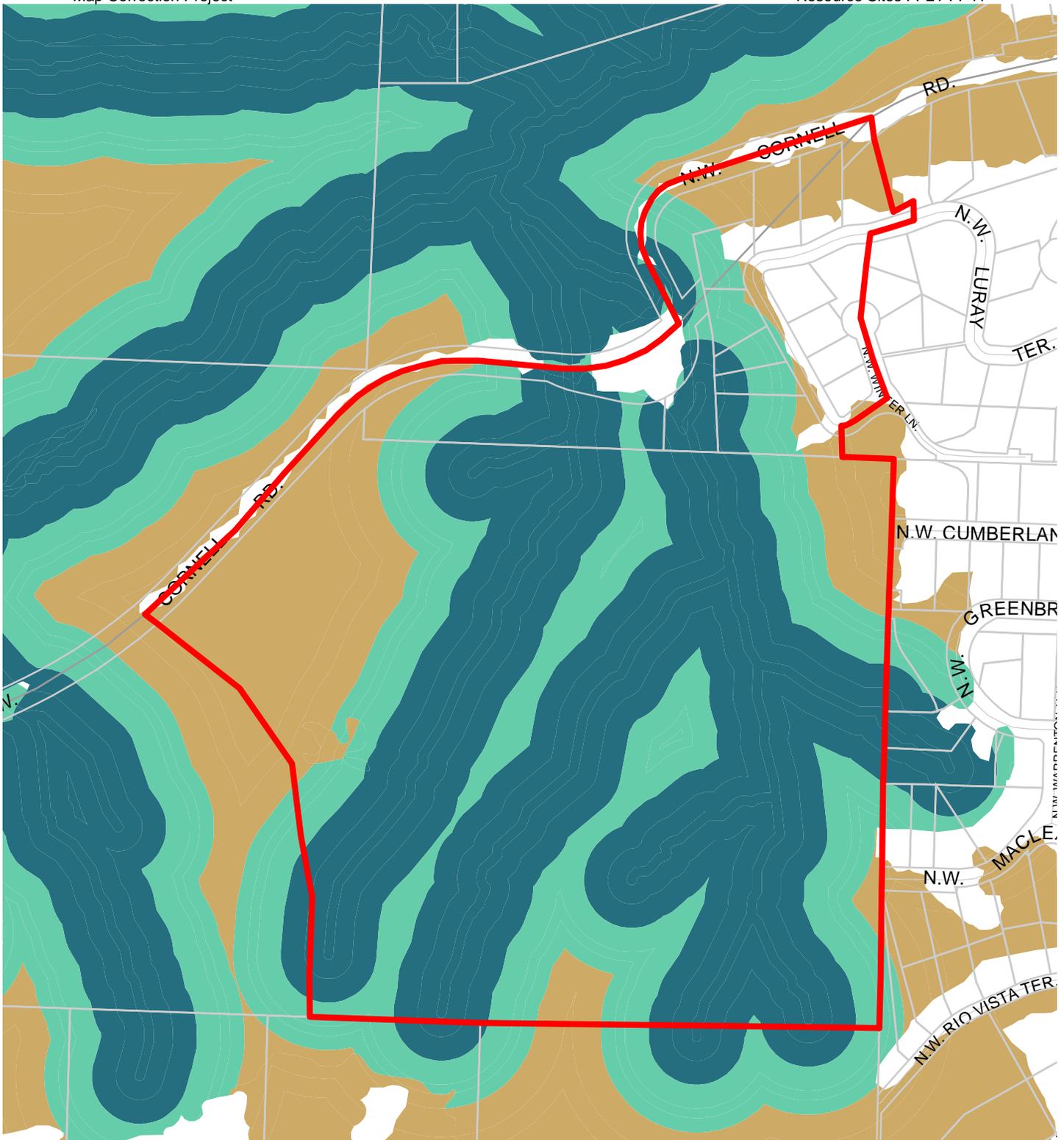
Updated: June 2021



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



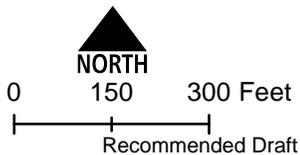
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January 2022



**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
FP34**

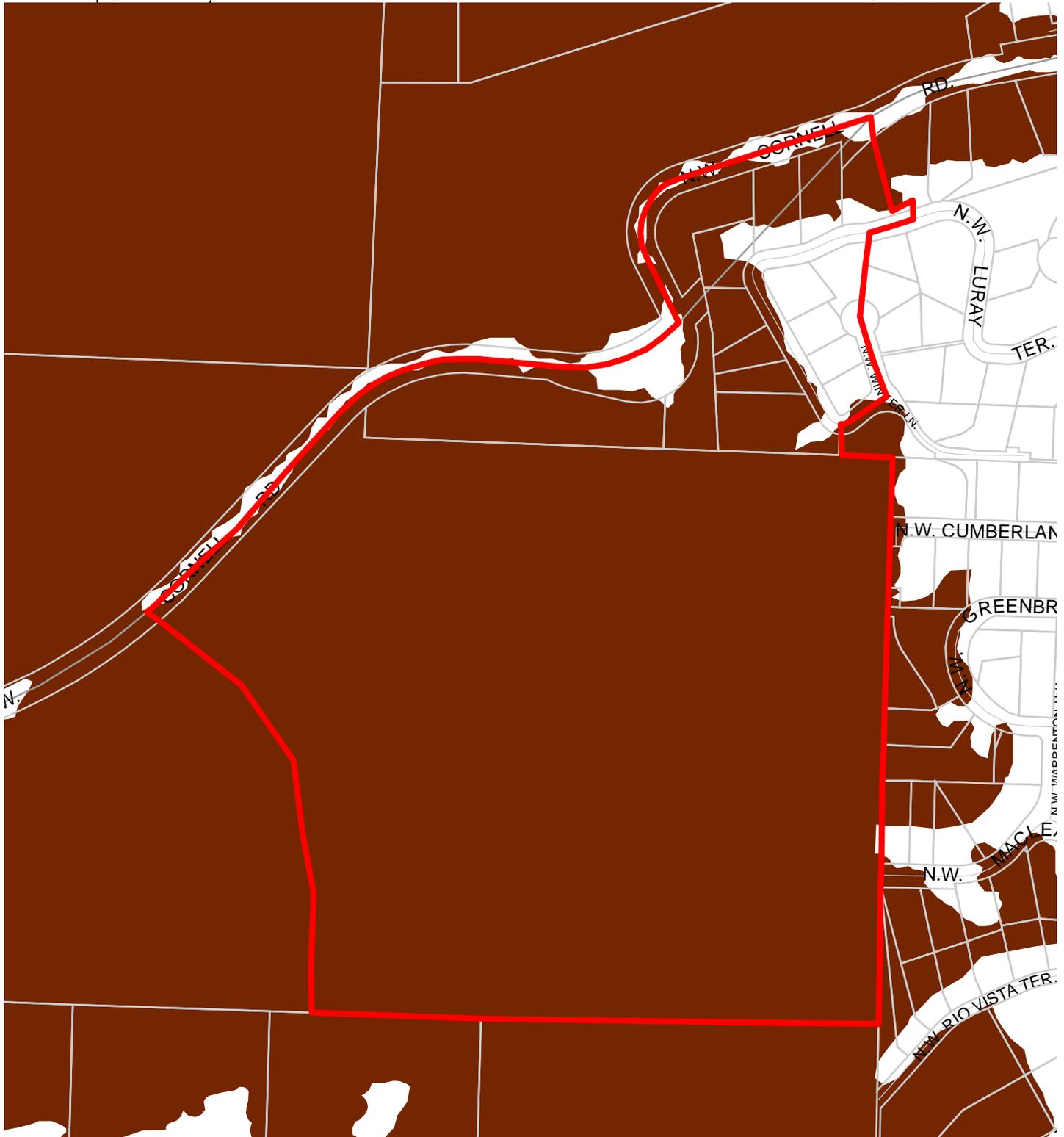
Updated: July 2021



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

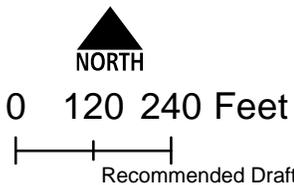


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January 2022



**Map E: Wildlife
Habitat Classification
Resource Site:
FP34**

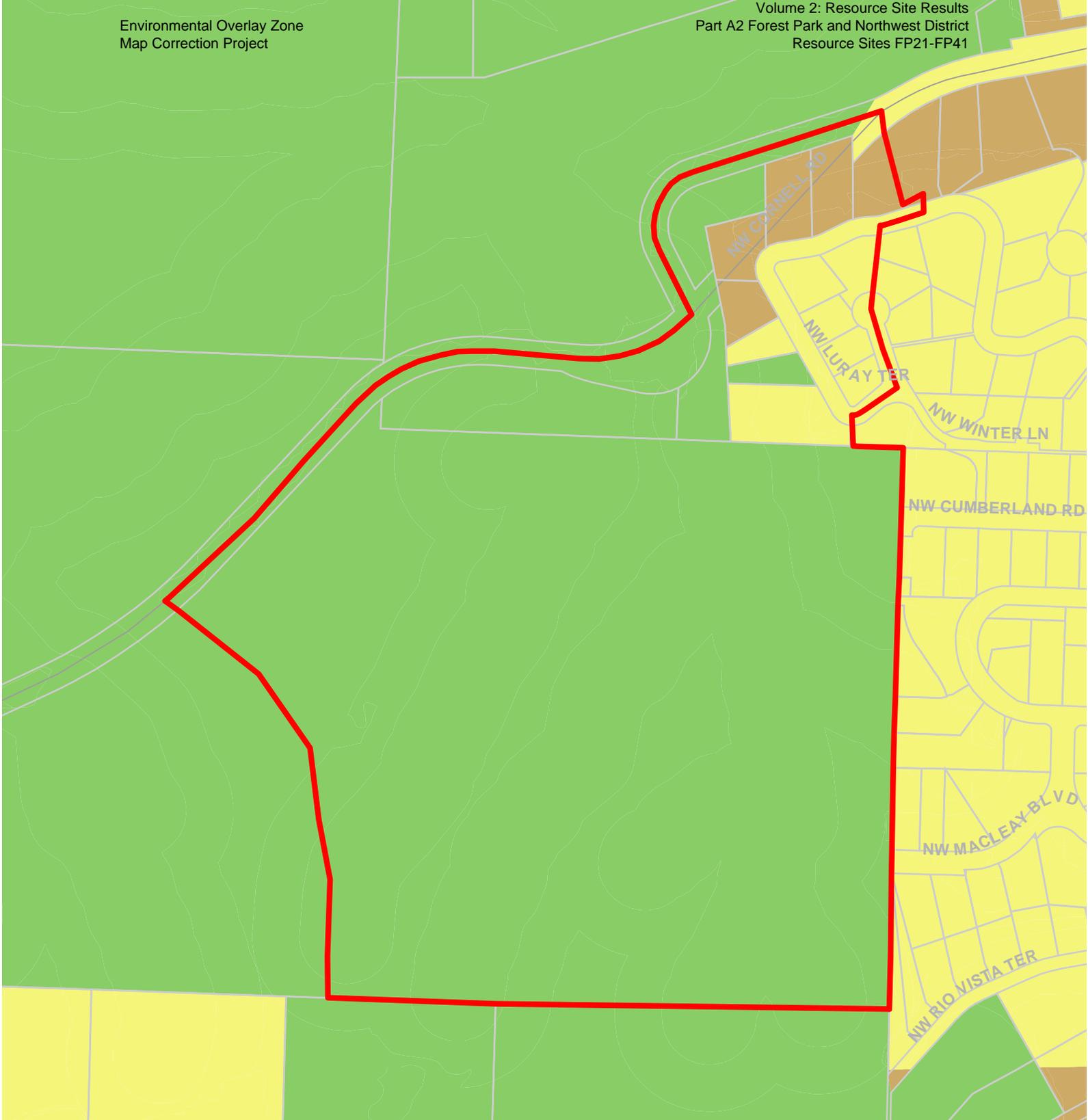
Updated: July 2021



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



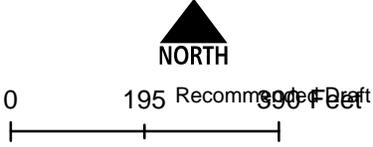
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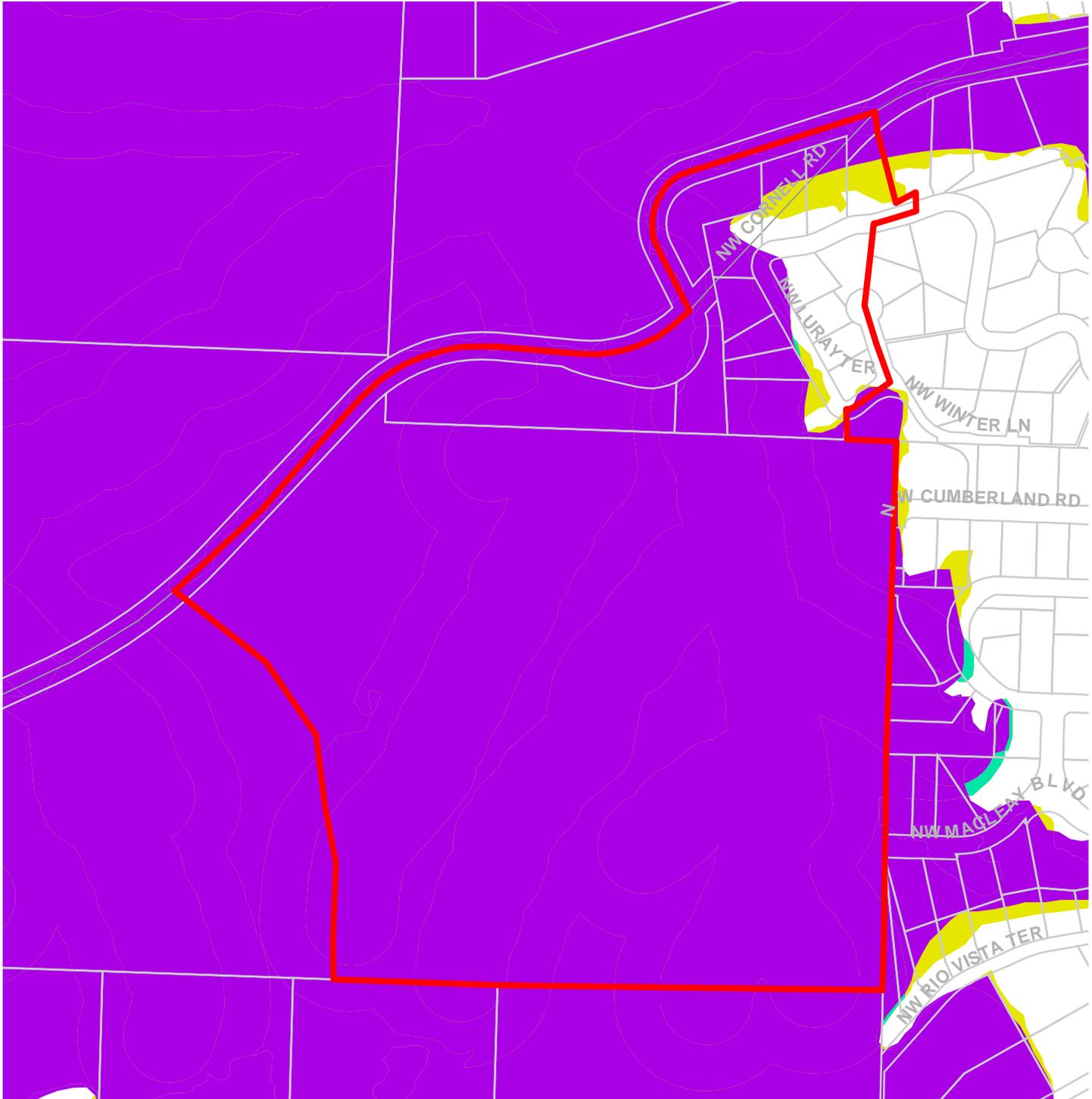
Map F: Urban Development Value (Title 13)
Resource Site: FP34

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

Updated: July 2021



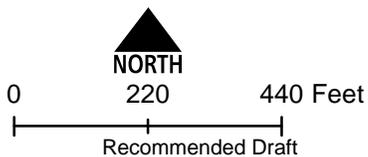
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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: FP34

Updated: July 2021



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



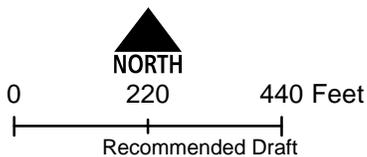
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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: FP34

Updated: July 2021

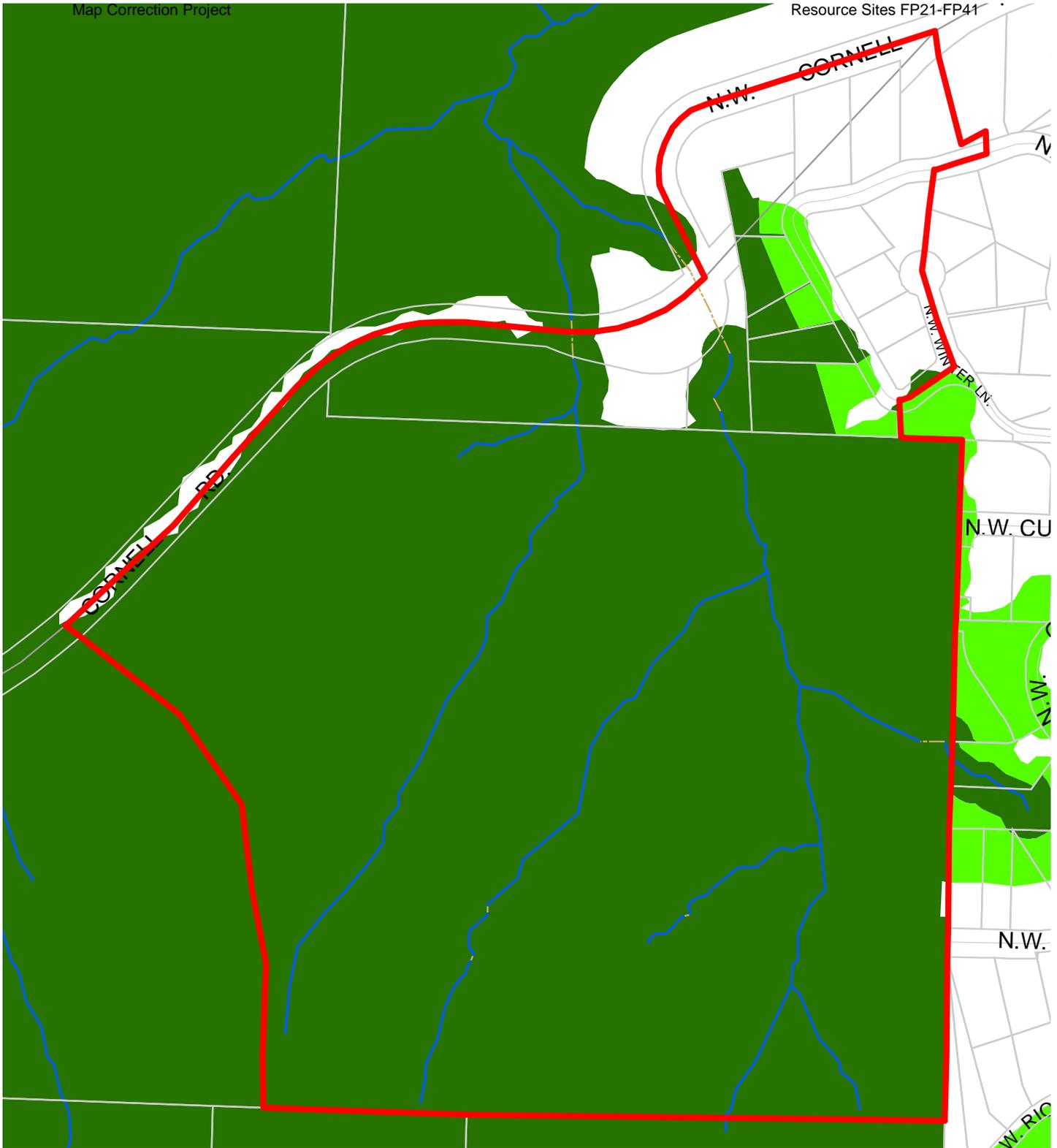


- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



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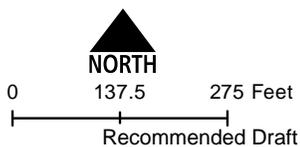
January 2022



Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site: FP34

Updated: January 2022



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



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January 2022

Natural Resource Description

Within resource site FP34 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 FP34	
	Study Area
Stream (Miles)	1.0
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	42.3
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)**	43.7
* The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area.	
**Slopes are derived from LiDAR. Steep slopes are areas with a slope greater than 25%.	

Several tributary streams flow through this resource area, into culverts underneath NW Cornell Rd, and into Balch Creek. These streams have not been monitored for fish or amphibian use; however, they are surrounded by steep forested slopes that provide high quality habitat for wildlife.

Table B: Quality of Natural Resource Functions in Resource Site FP34				
Resource Site (acres) = 45				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	22.2	11.7	8.3	42.3
percent total inventory site area	49.4%	26.0%	18.4%	93.8%
Wildlife Habitat*				
acres	42.3	0.0	0.0	42.3
percent total inventory site area	93.8%	0.0%	0.0%	93.8%
Special Habitat Areas**				
acres	42.5			
percent total inventory site area	94.3%			
Combined Total⁺				
acres	42.3	0.0	0.0	42.3
percent total inventory site area	93.8%	0.1%	0.0%	93.8%
* 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 FP34, 2.8% 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 FP34			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
45.1	1.9	1.3	2.8%

*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 FP34. 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 FP34 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 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 FP34, 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 the resource site-specific evaluation for FP34, 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 and land within 50 feet of stream top-of-bank or 25 feet of wetlands.
2. Within public parks, apply a protection overlay zone ('p' zone) to land between 25 and 50 feet of wetlands; and areas of forest vegetation contiguous to but more than 50 feet from stream top-of-bank.
3. Outside of public parks, apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands; and areas of forest or woodland vegetation 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.: FP35 **Resource Site Name:** Meridian Royal Manor

Previous Plan: Balch Creek Watershed Protection Plan

Previous Resource Site No.: 82

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

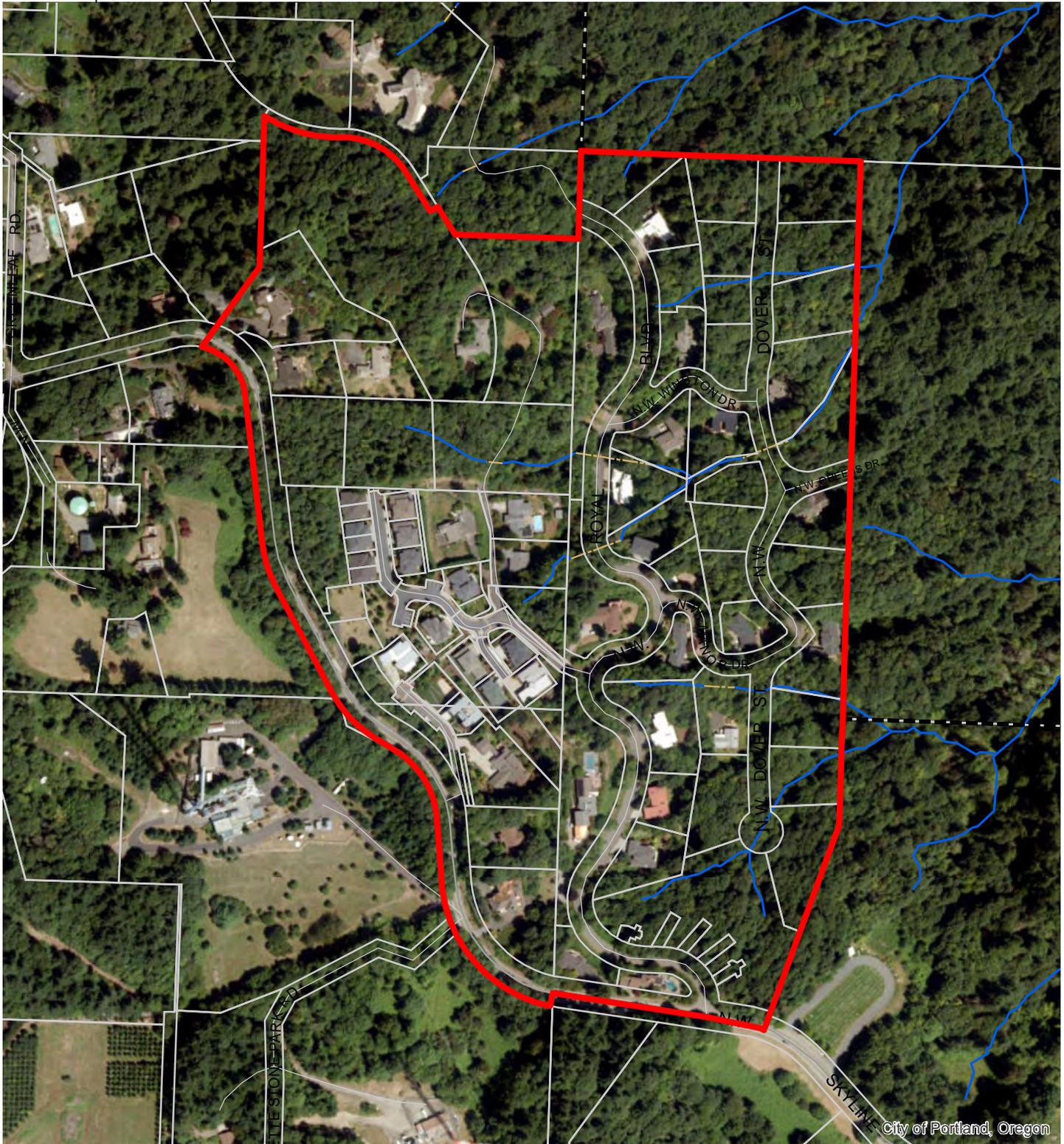
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 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.

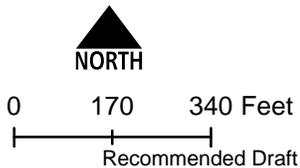
Resource site FP35 includes the following:

Site (acres)	54.1
Base zones (acres)	
OS	0.0
R10	7.7
R20	31.7
RF	14.7



Map A: Water Features
Resource Site: FP35

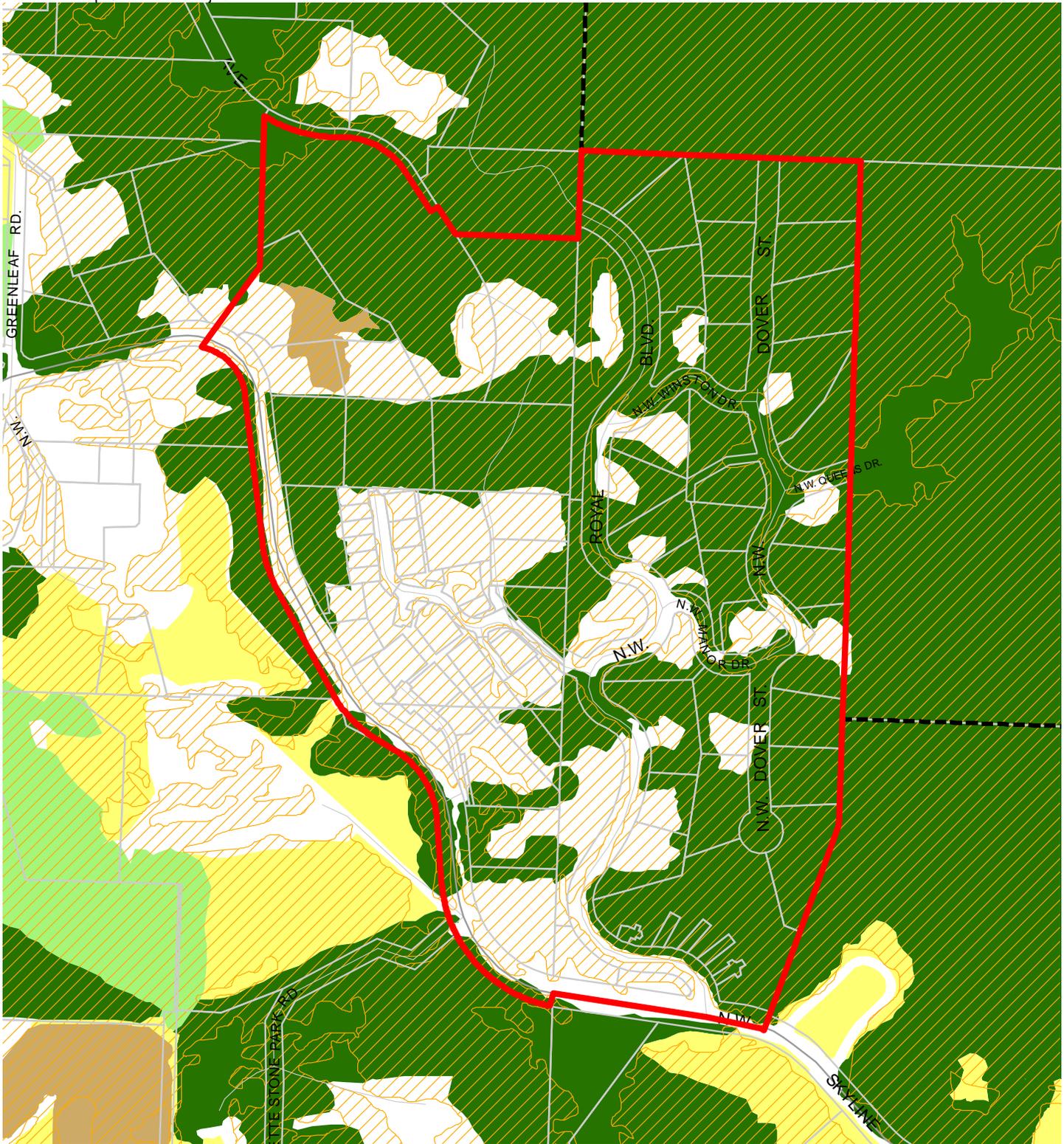
Updated: July 2021



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



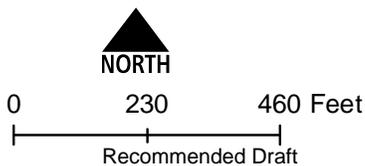
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January 2022



Map B: Vegetation and Steep Slopes

Resource Site: FP35

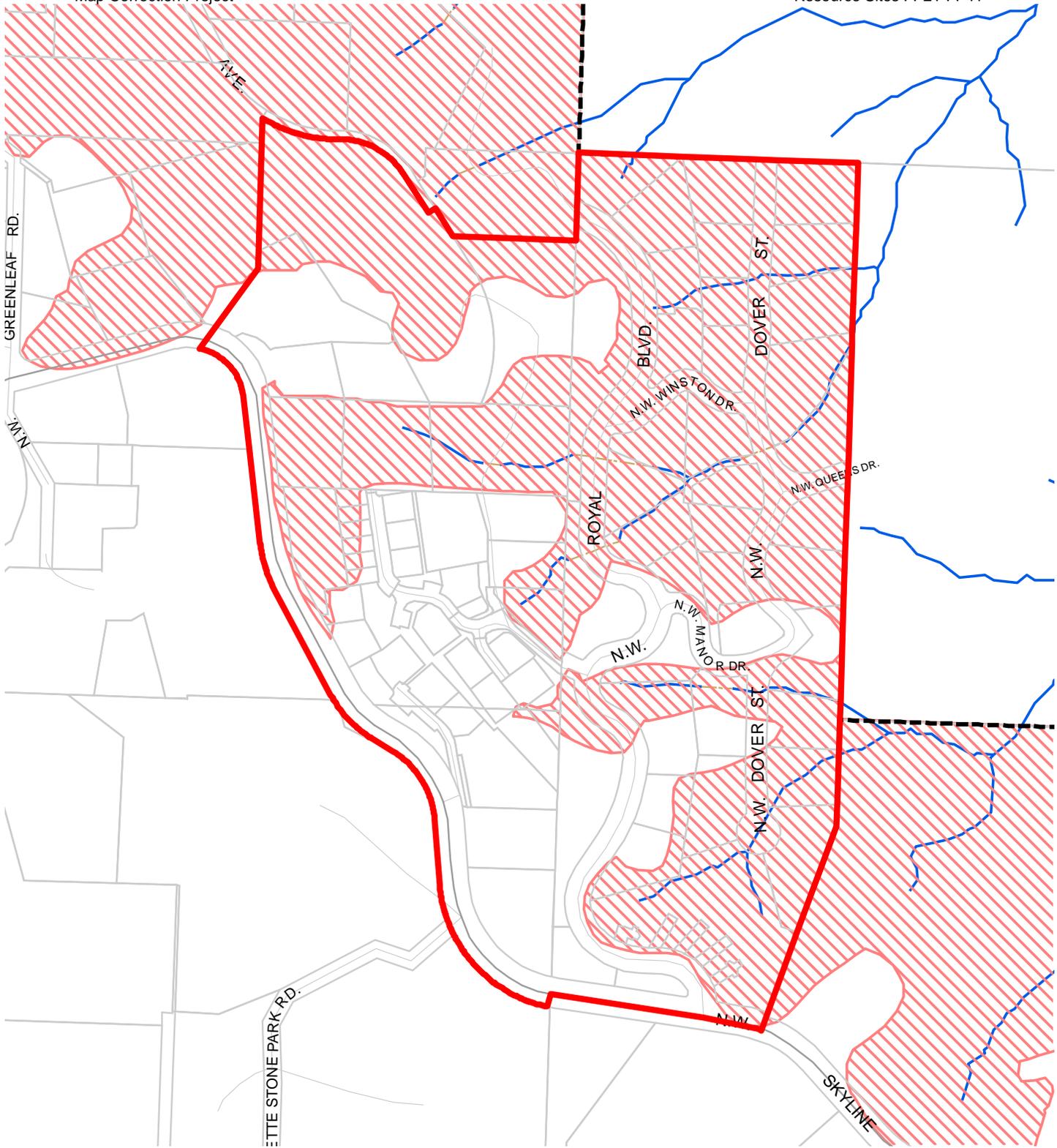
Updated: July 2021



- Resource Sites
- Urban Service Boundary
- Taxlots
- Slopes >25%
- Forest
- Woodland
- Shrubland
- Herbaceous

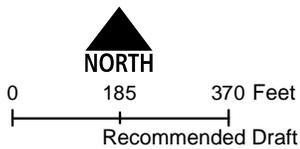


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**Map C: Special
Habitat Areas**
**Resource Site:
FP35**

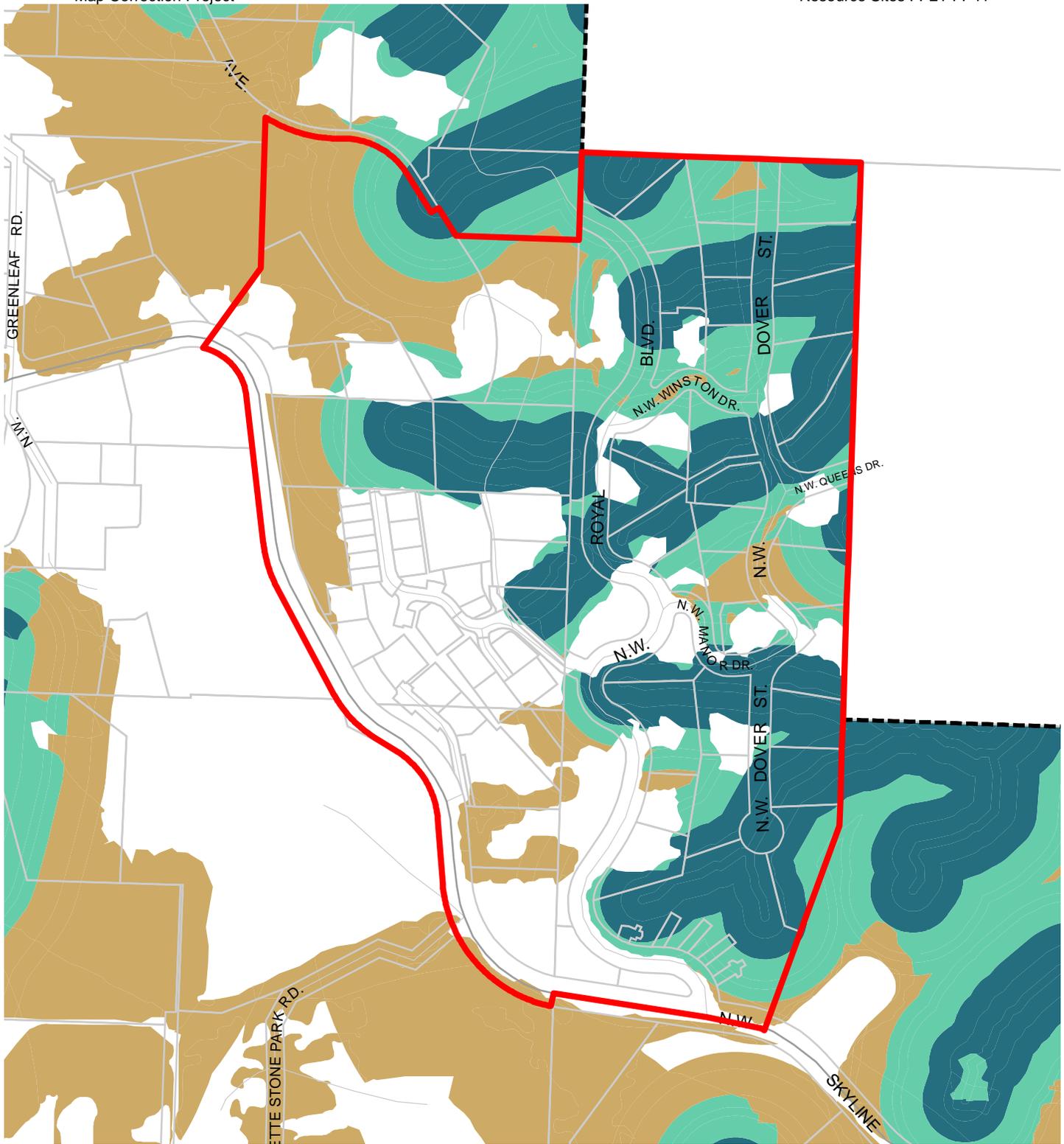
Updated: June 2021



- 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**

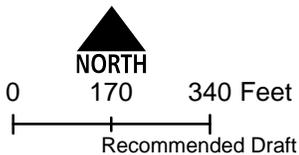
**Resource Site:
FP35**

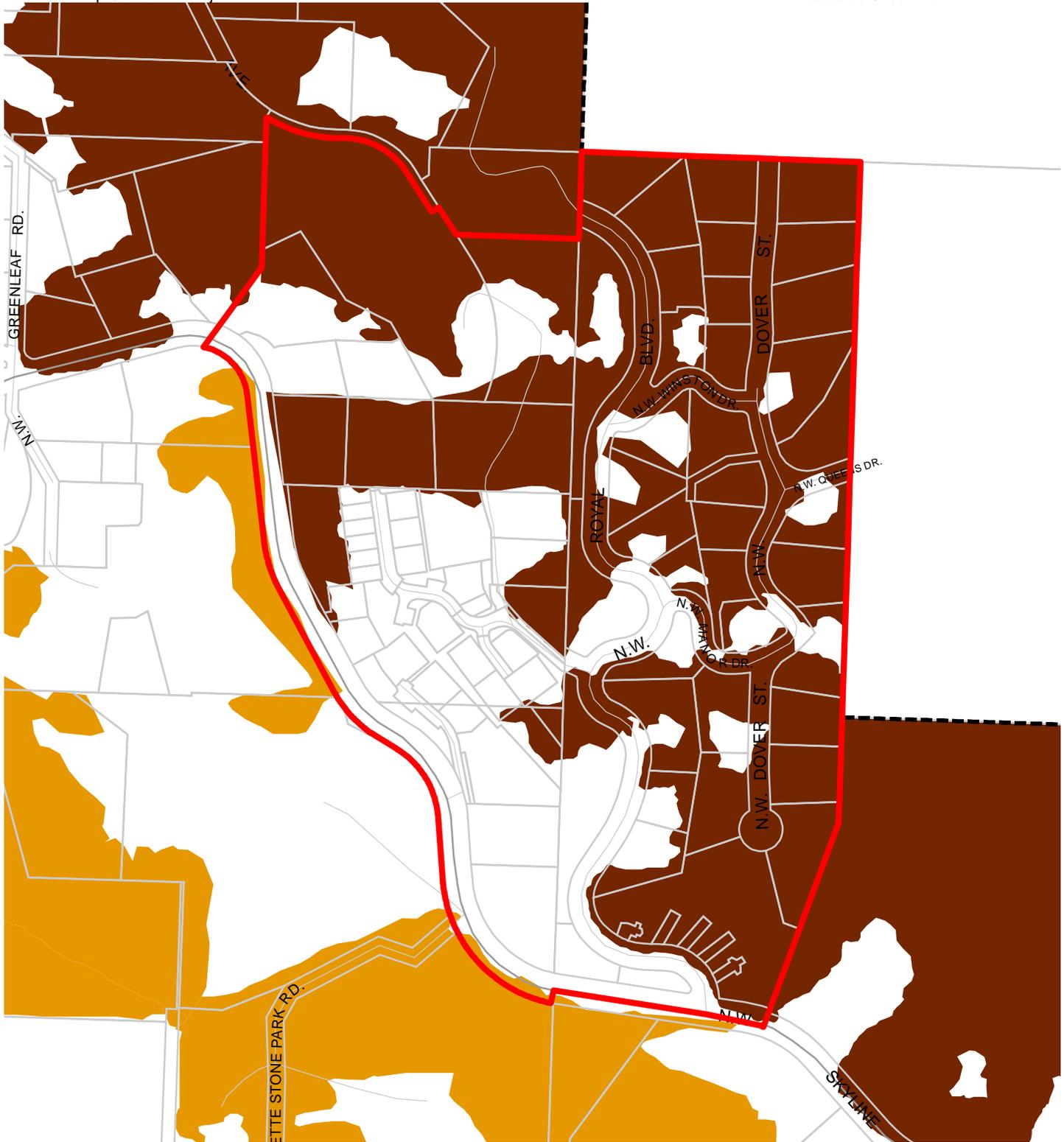
Updated: July 2021

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



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**Map E: Wildlife
Habitat Classification
Resource Site:
FP35**

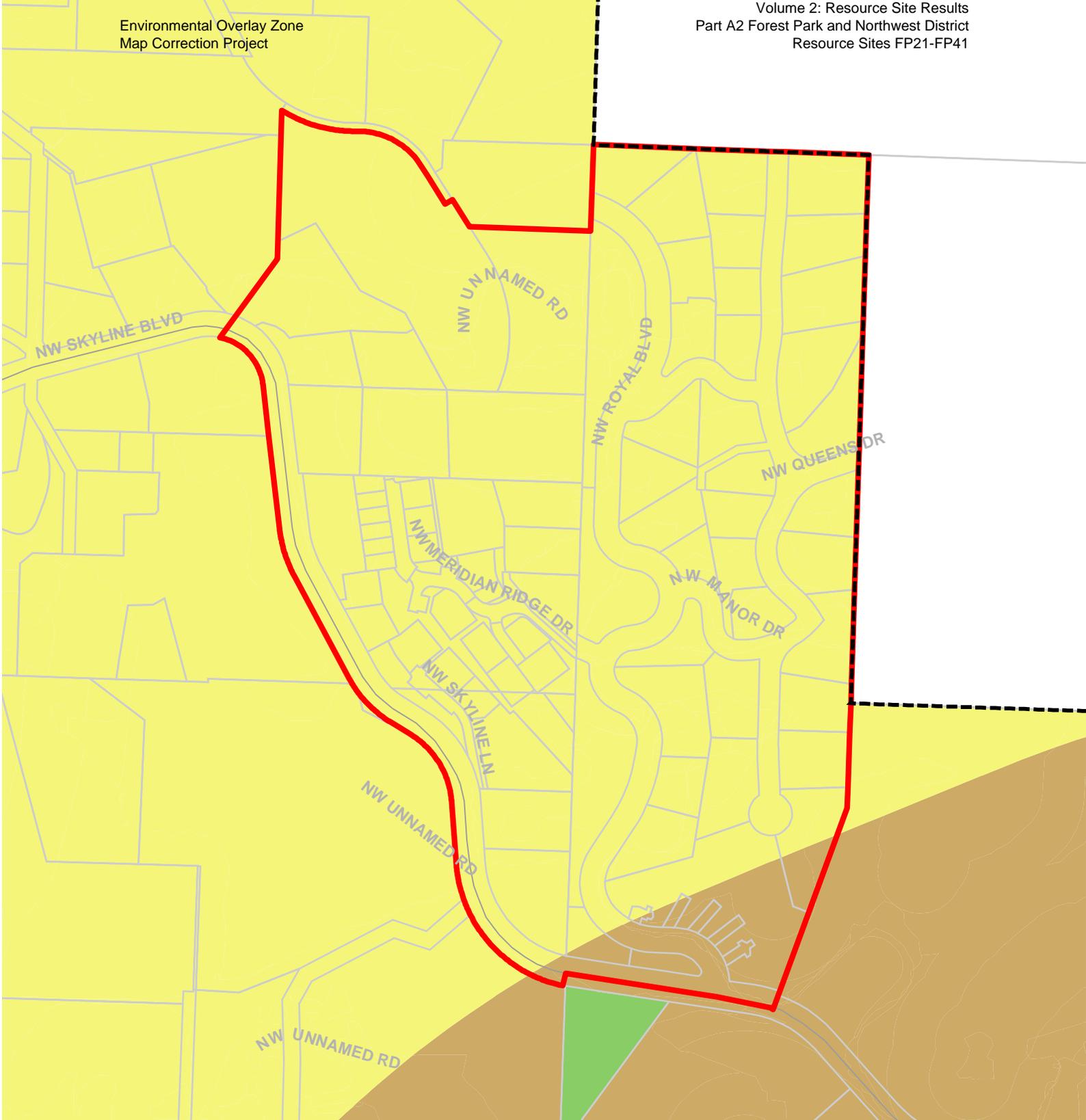
Updated: July 2021



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



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January 2022

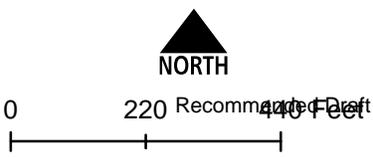


Map F: Urban Development Value (Title 13)
Resource Site: FP35

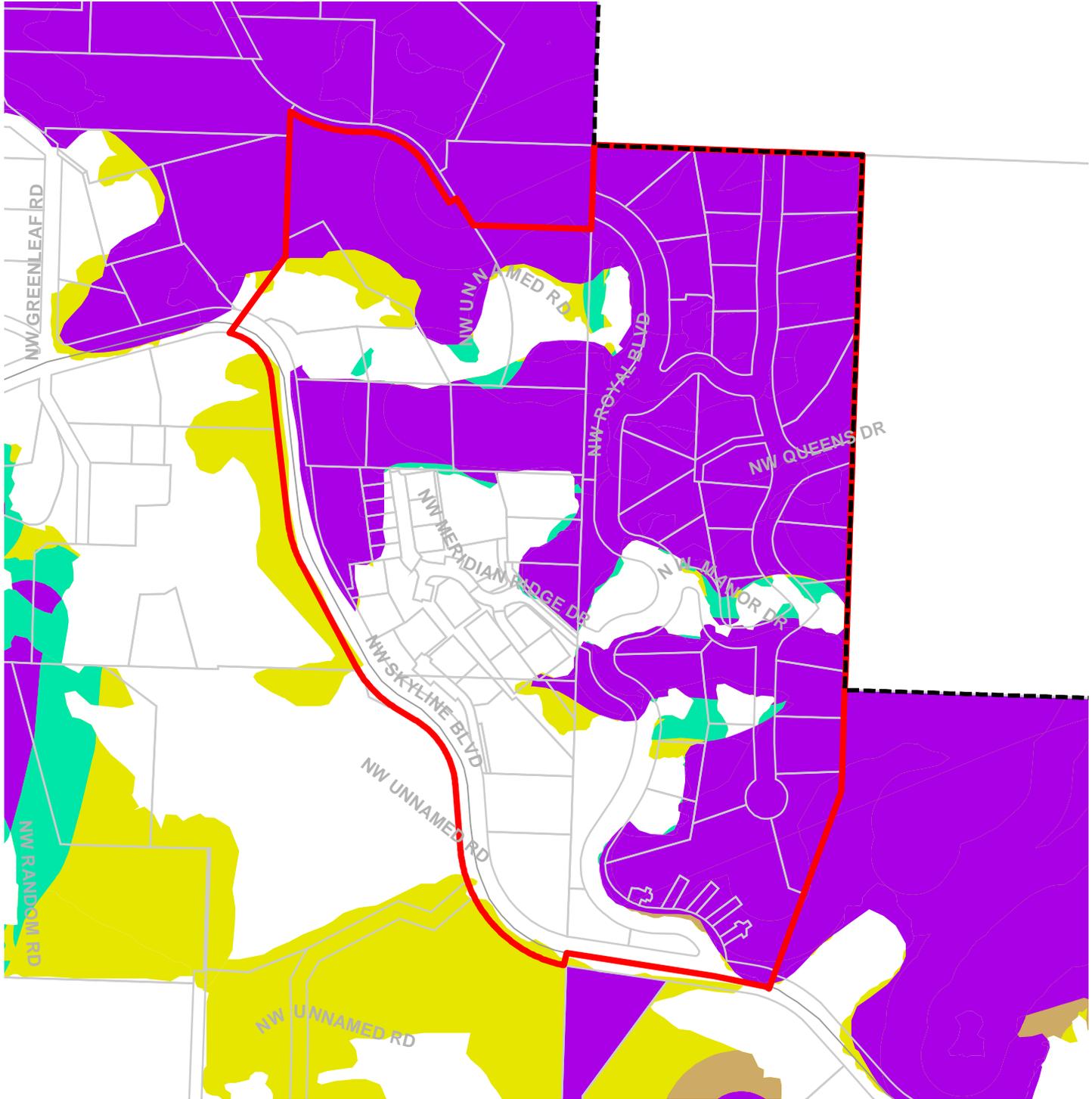
-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks



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 services. To request these services, contact 503-823-7700, City TTY 503-823-6868, Relay Service: 711.

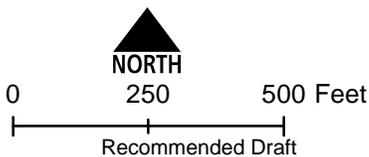


Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

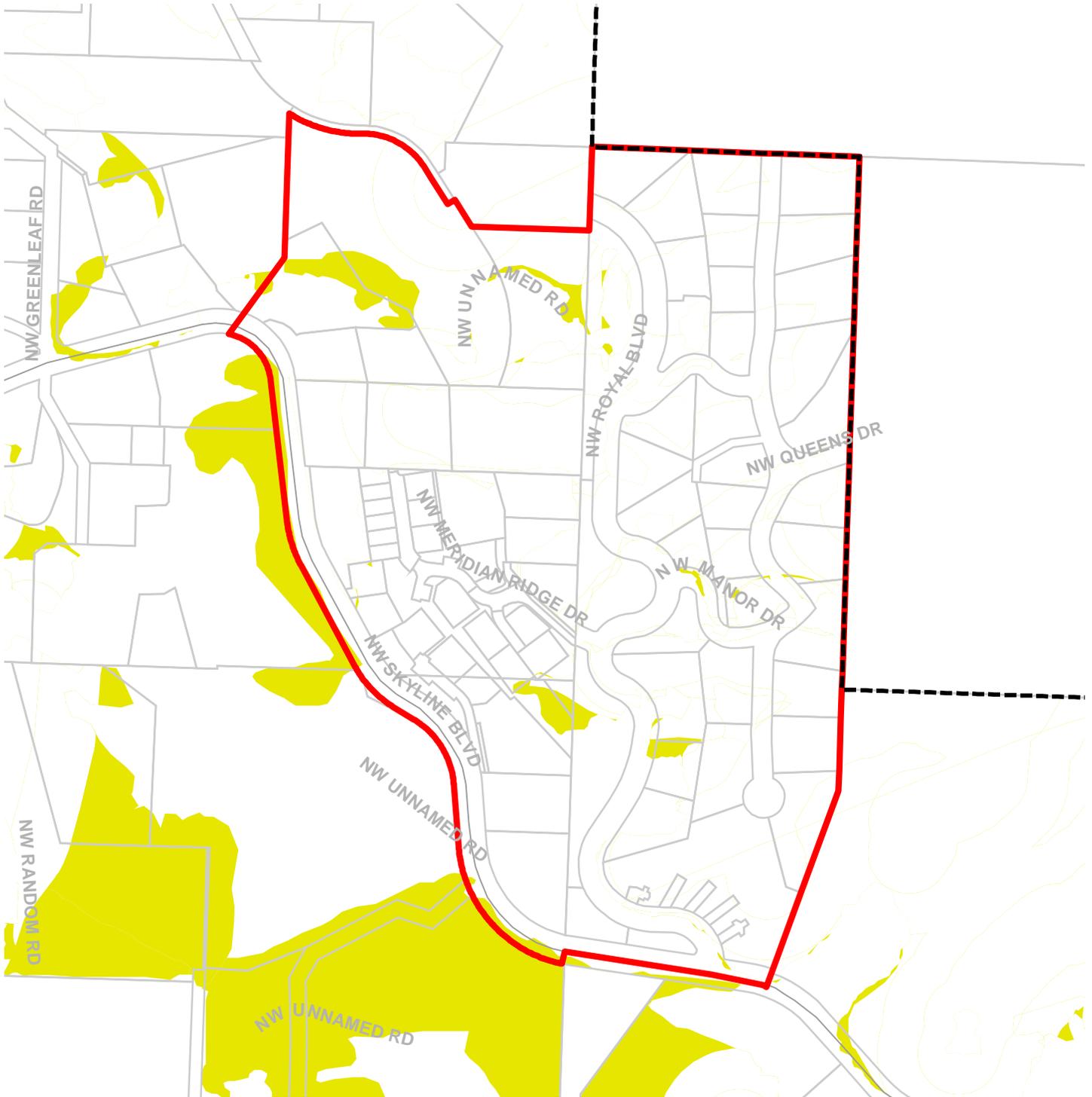
Resource Site: FP35

Updated: July 2021

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



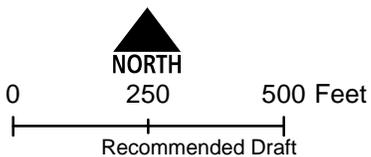
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Map H: Goal 5 Resources

Resource Site: FP35

Updated: July 2021

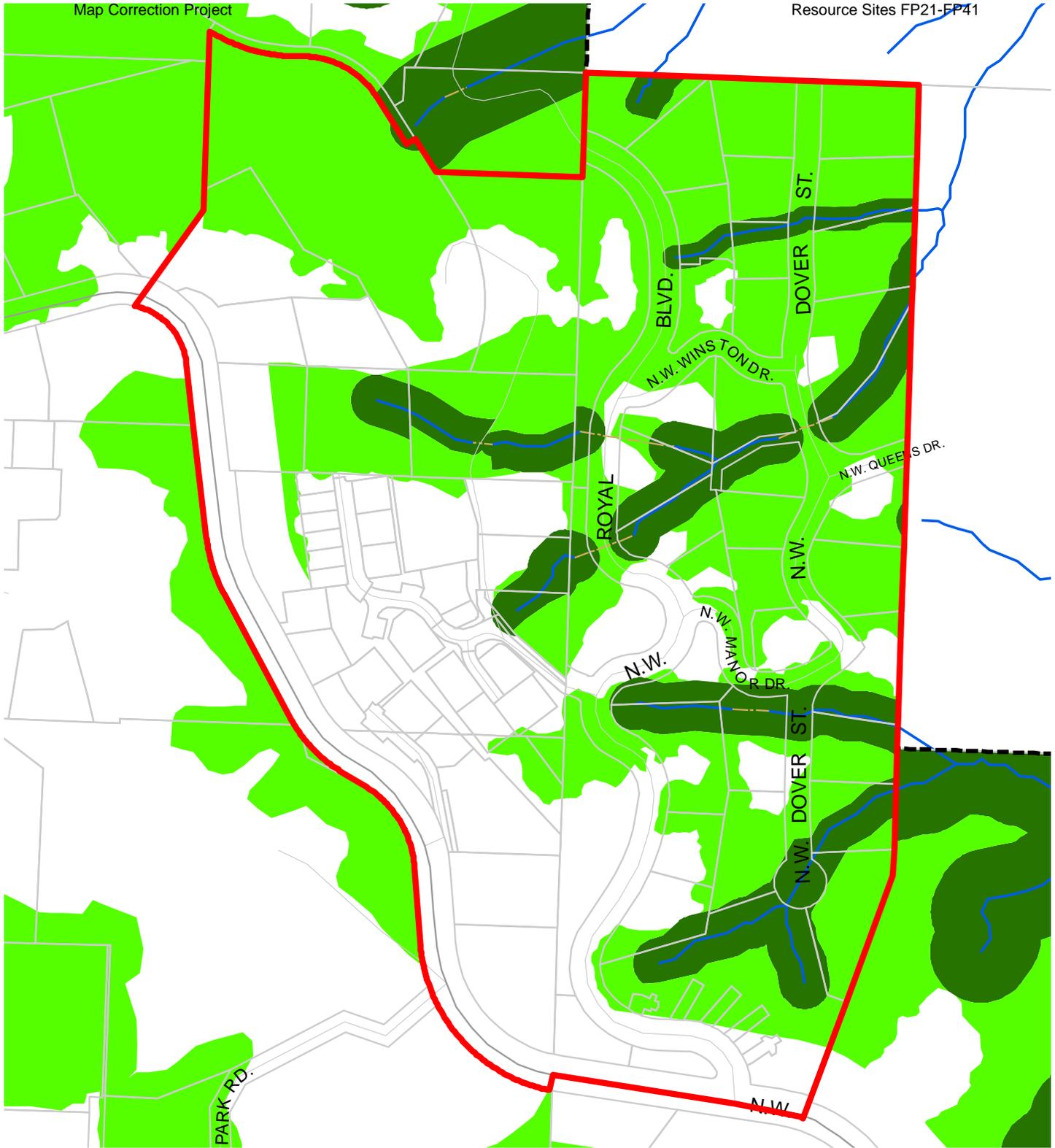


-  Urban Service Boundary
-  Resource Sites
-  Goal 5 Significant Natural Resources



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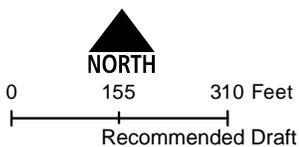
January 2022



Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site: FP35

Updated: January 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.
January 2022

Natural Resource Description

Within resource site FP35 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 FP35	
	Study Area
Stream (Miles)	0.6
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	35.0
Woodland (acres)	0.0
Shrubland (acres)	0.6
Herbaceous (acres)	0.0
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	48.4
* 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%.	

There are short segments of small Balch Creek tributary streams that flow within the boundary of this resource area. These streams have been bisected multiple times by culverts passing flows underneath surface streets. Although residential development is scattered around the resource area, the streams are mostly surrounded by mixed forest on steep slopes. The forested patches provide cover and habitat for wildlife.

Table B: Quality of Natural Resource Functions in Resource Site FP35				
Resource Site (acres) = 54				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	15.9	10.9	8.5	35.2
percent total inventory site area	29.4%	20.2%	15.6%	65.2%
Wildlife Habitat*				
acres	33.2	0.4	0.0	33.6
percent total inventory site area	61.4%	0.8%	0.0%	62.2%
Special Habitat Areas**				
acres	32.4			
percent total inventory site area	59.8%			
Combined Total⁺				
acres	33.2	0.7	1.6	35.5
percent total inventory site area	61.4%	1.2%	3.0%	65.6%
* 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 FP35, 10.5% of the total area is effectively impervious, indicating a critical level of vulnerability, with negative impacts beginning to impact natural functions, but natural processes are still in place and providing support to biologic systems.

Table C. Impervious Area within Resource Site FP35			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
54.1	9.4	5.7	10.5%

*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 FP35. 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 FP35 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. 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 FP35, 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 the resource site-specific evaluation for FP35, 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 and land within 50 feet of stream top-of-bank and 25 feet of wetlands.
2. 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. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands; and areas of forest vegetation 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.: FP36 **Resource Site Name:** Mount Calvary Cemetery

Previous Plan: Balch Creek Watershed Protection Plan

Previous Resource Site No.: 81

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

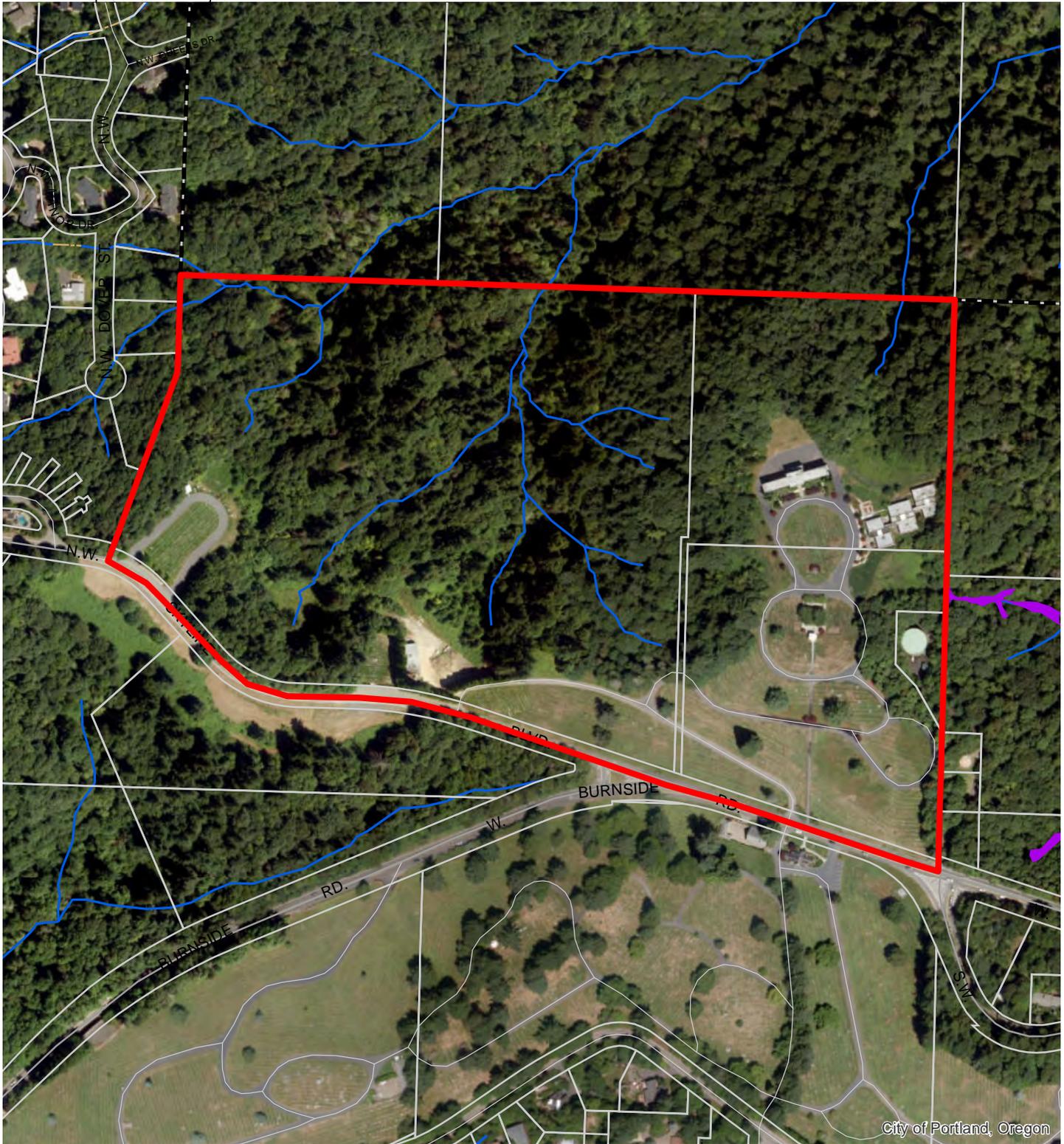
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 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 FP36 includes the following:

Site (acres)	54.6
Base zones (acres)	
OS	54.5
RF	0.1



Map A: Water Features

Resource Site: FP36

Updated: July 2021

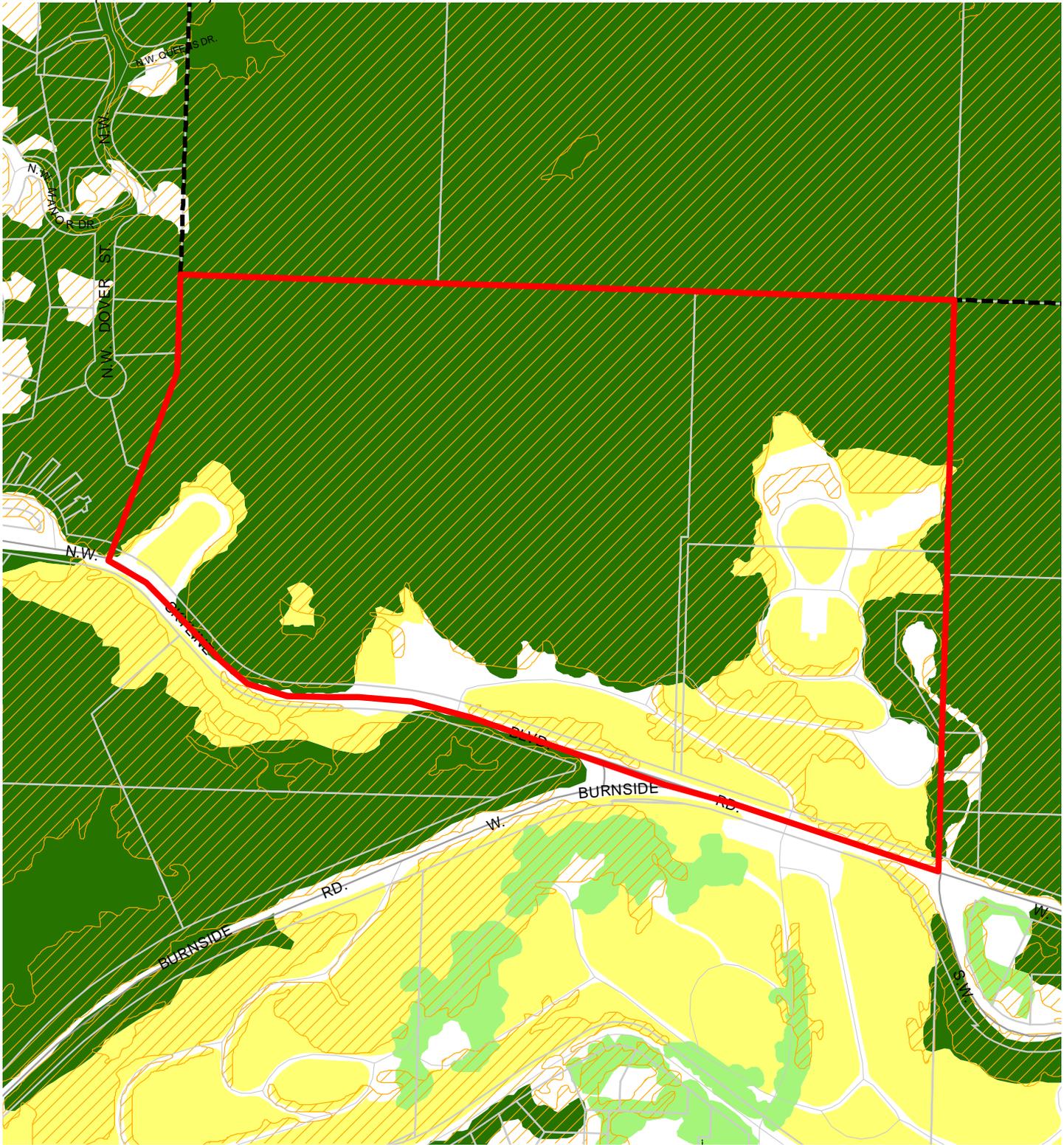


0 185 370 Feet
Recommended Draft

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



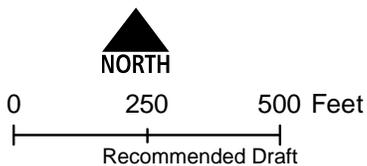
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.
January 2022



Map B: Vegetation and Steep Slopes

Resource Site: FP36

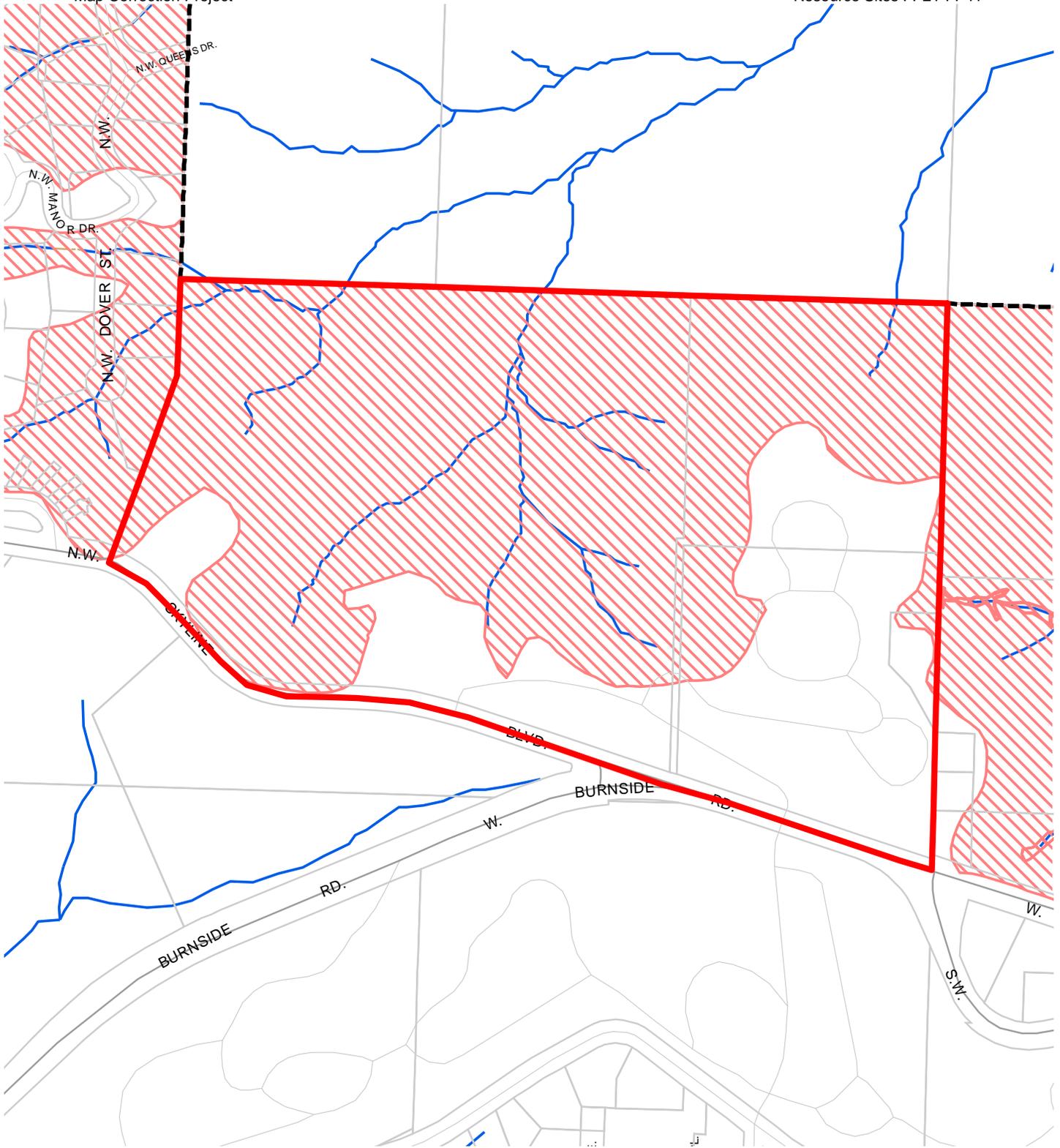
Updated: July 2021



- Resource Sites
- Urban Service Boundary
- Taxlots
- Slopes >25%
- Forest
- Woodland
- Shrubland
- Herbaceous

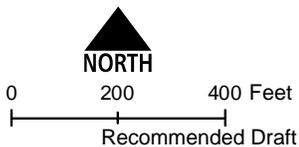


The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.
January 2022



**Map C: Special
Habitat Areas**
**Resource Site:
FP36**

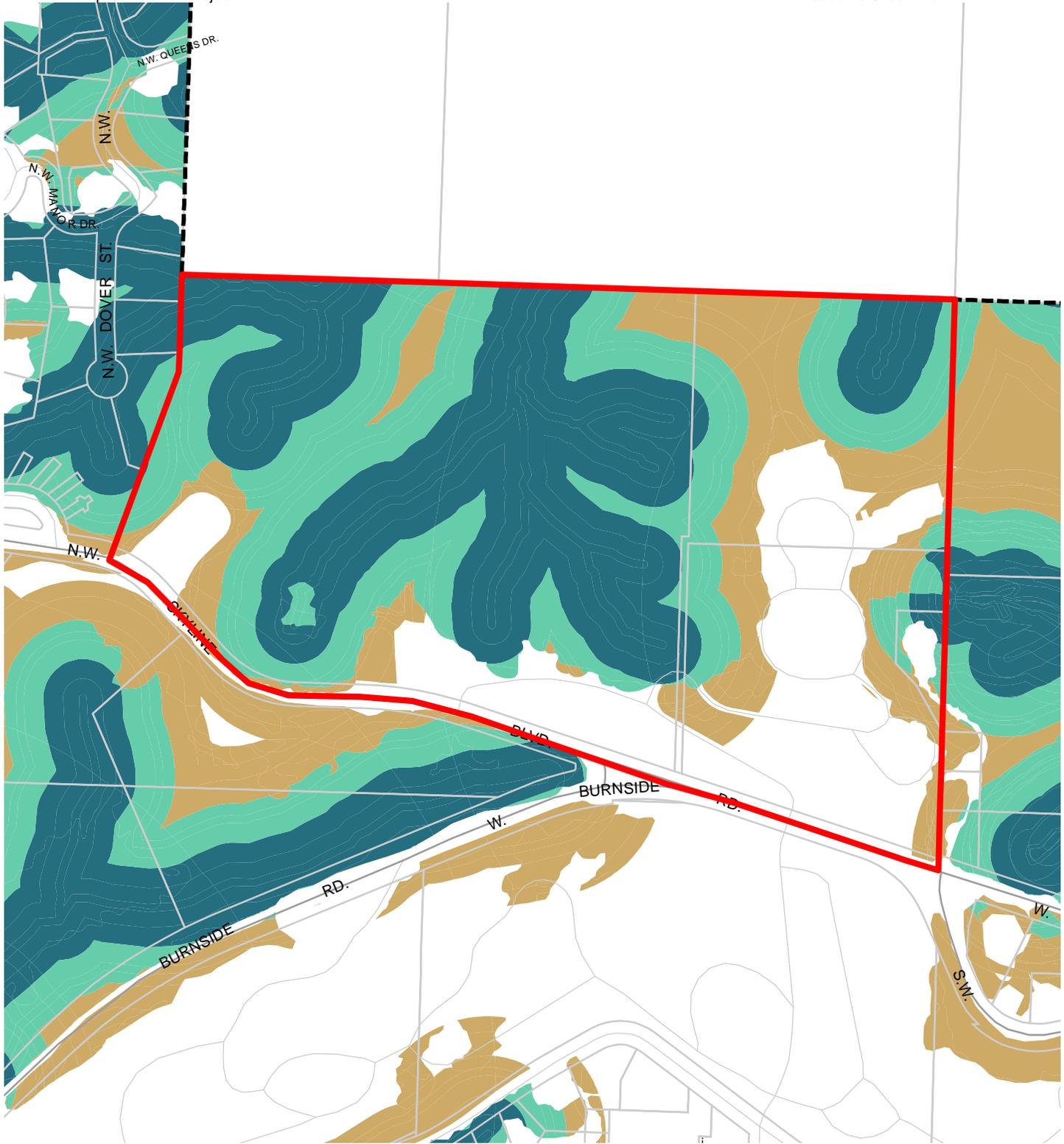
Updated: June 2021



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



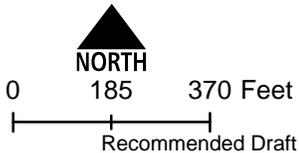
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.
January 2022



**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
FP36**

Updated: July 2021

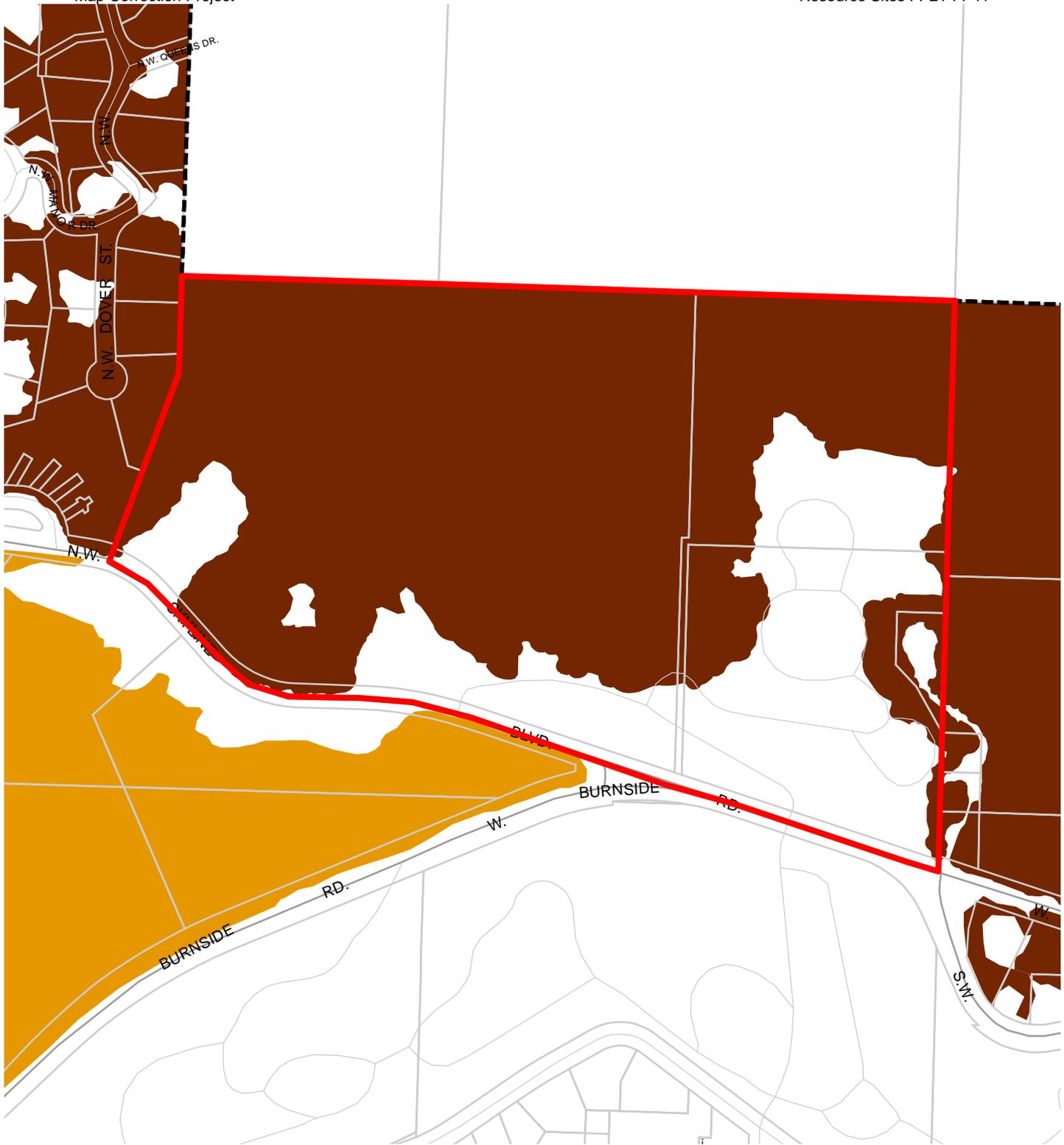


- Resource Sites
- Urban Service Boundary
- Class I (high rank)
- Taxlots
- Class II (medium rank)
- Class III (low rank)



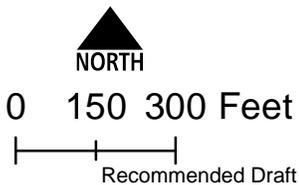
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.

January 2022



**Map E: Wildlife
Habitat Classification**
Resource Site:
FP36

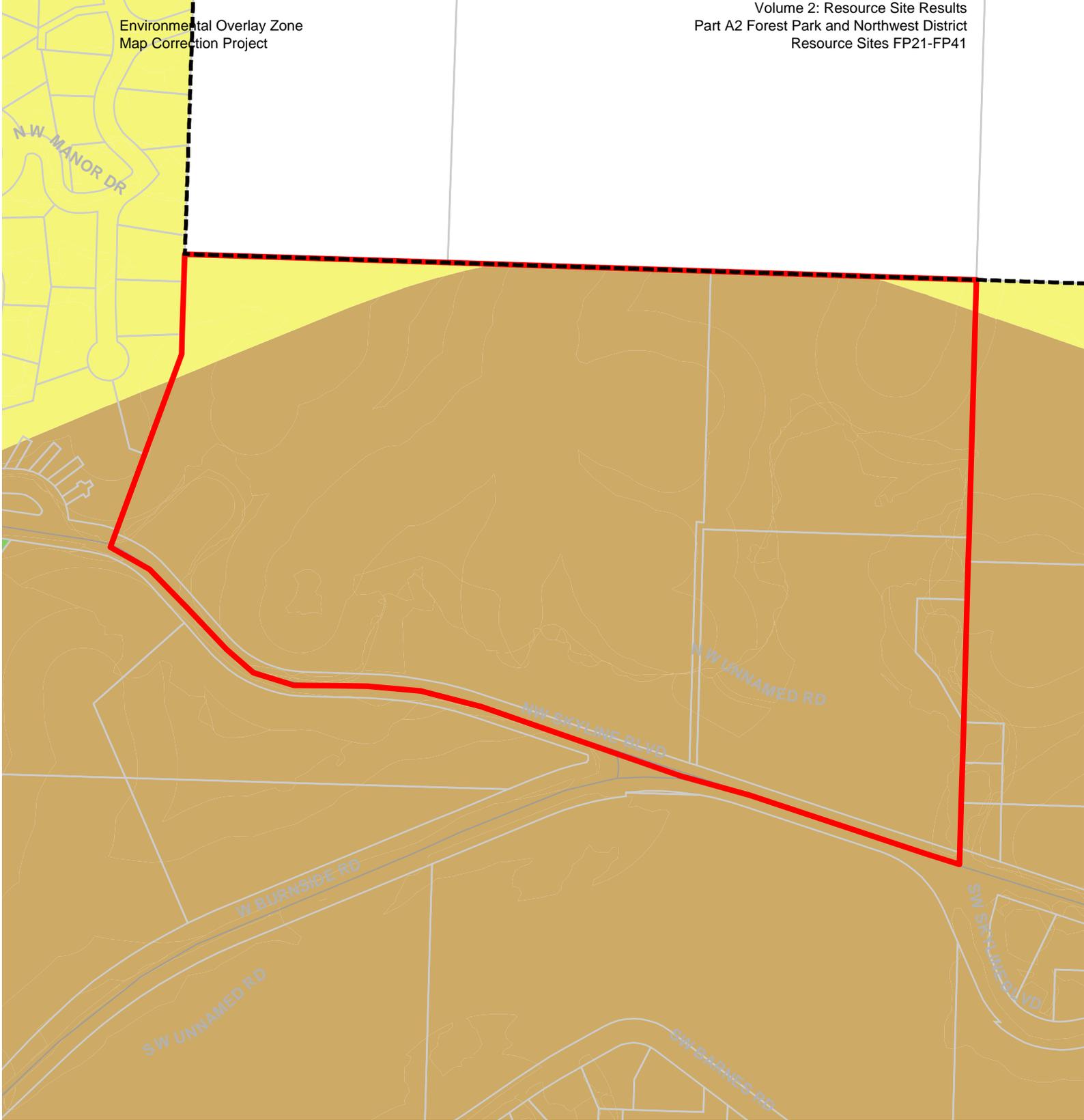
Updated: July 2021



-  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.
January 2022



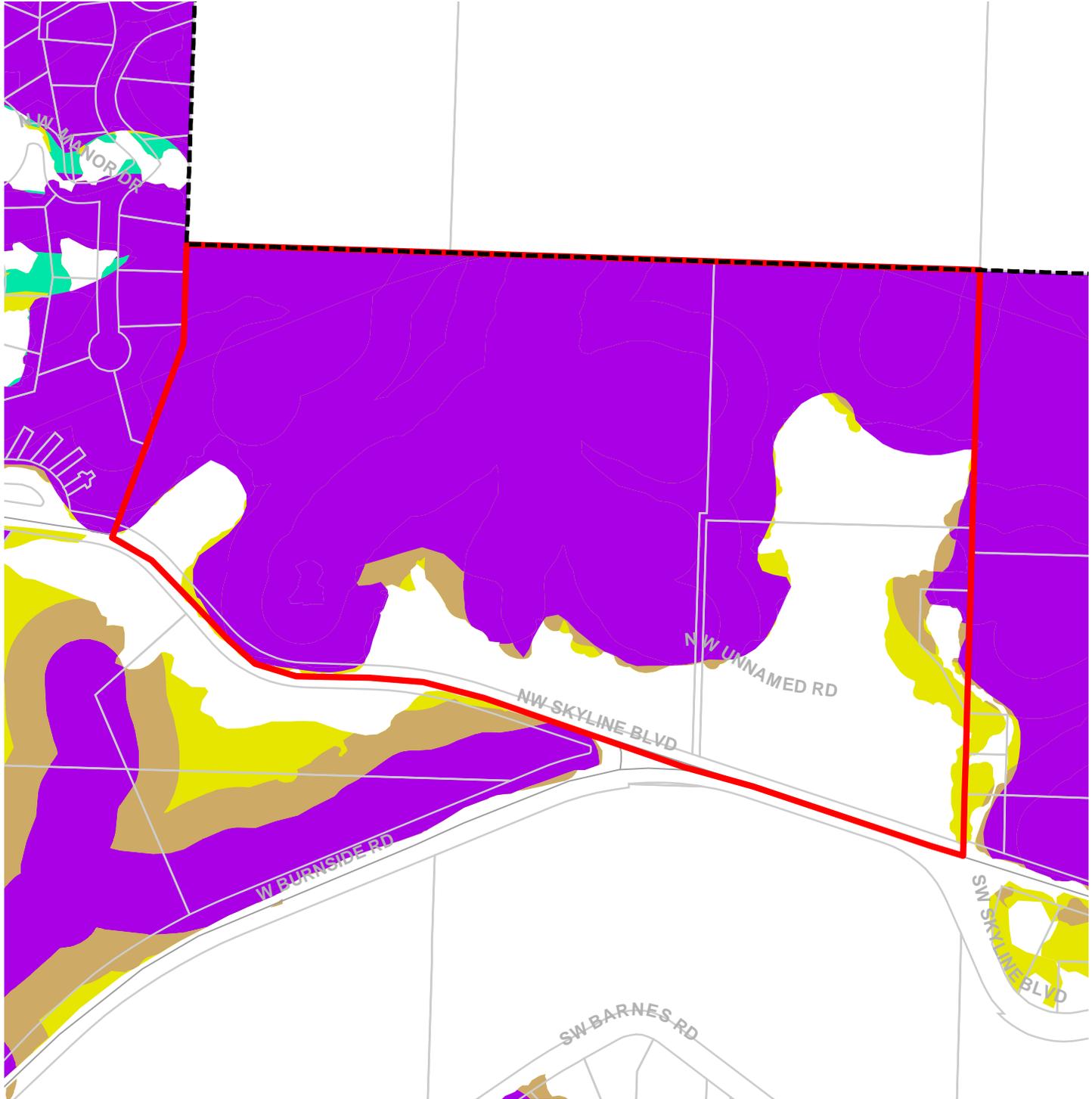
Map F: Urban Development Value (Title 13)
Resource Site: FP36

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

Updated: July 2021



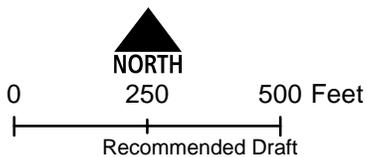
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, and 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: FP36

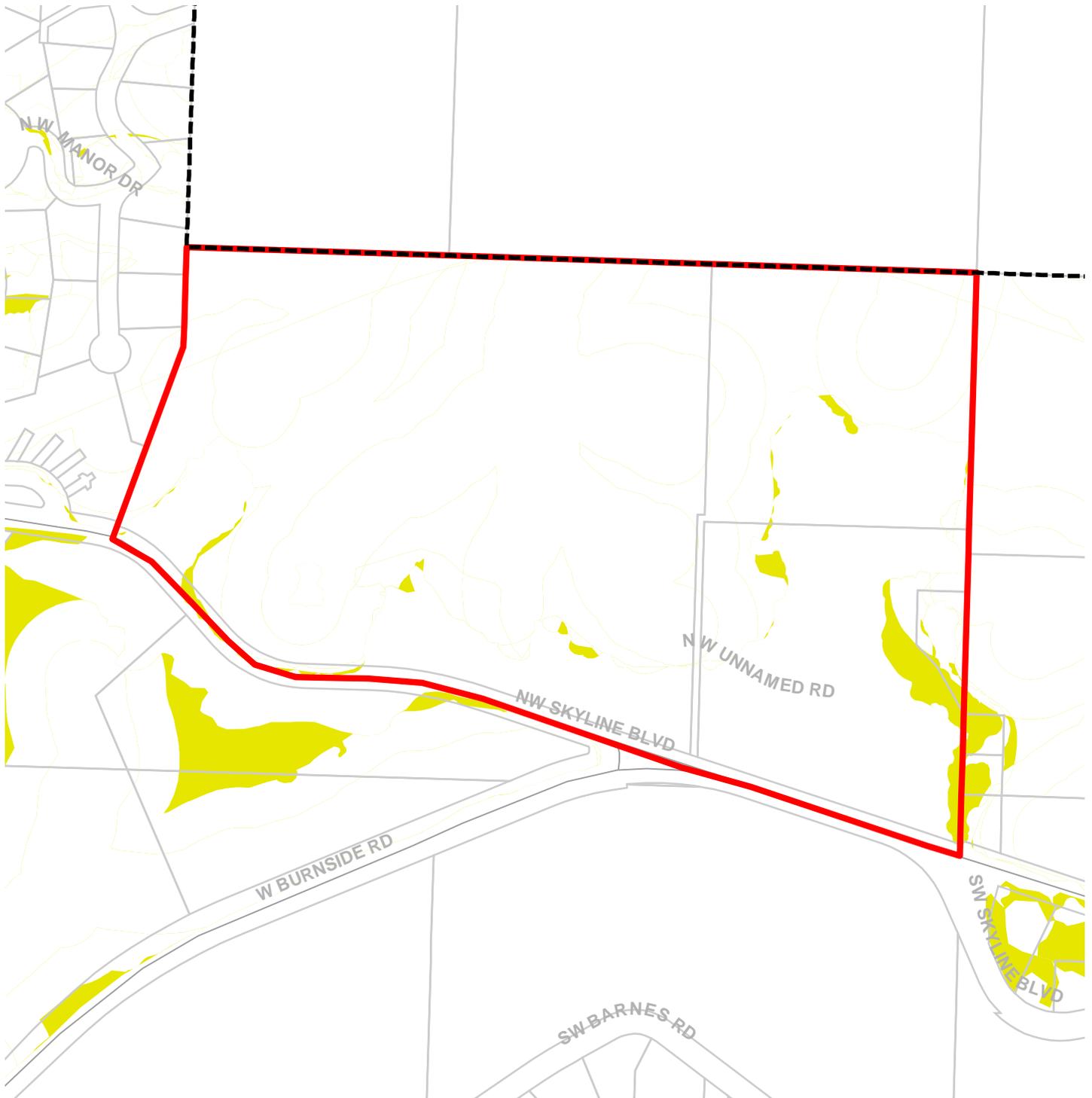
Updated: July 2021



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



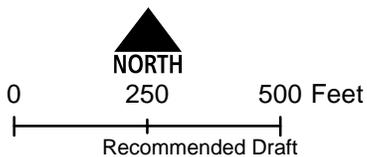
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Map H: Goal 5 Resources

Resource Site: FP36

Updated: July 2021

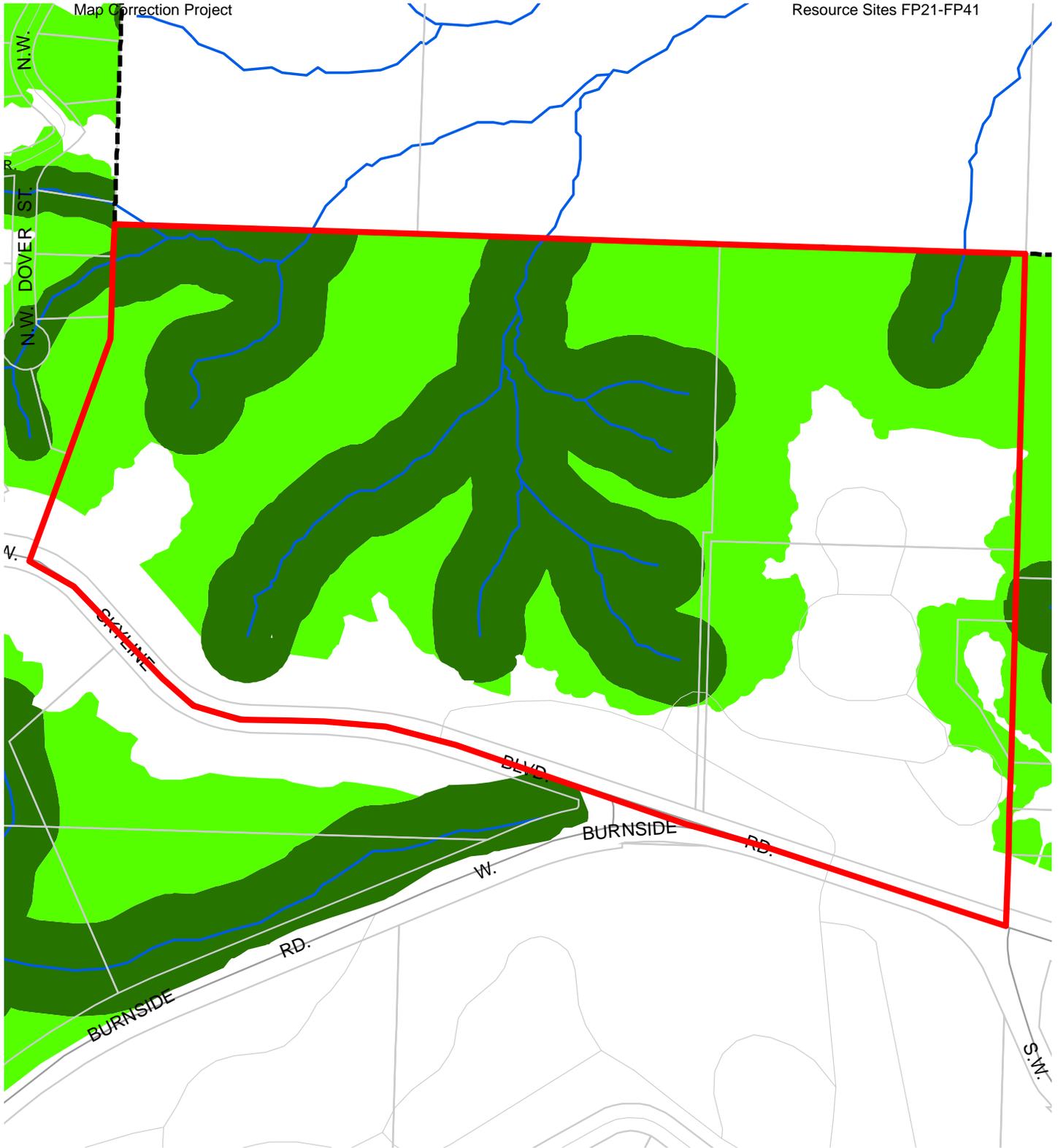


- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



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.

January 2022



Map I: DRAFT Proposed Environmental Overlay Zones

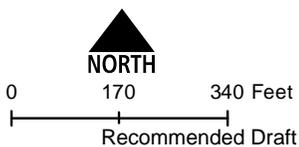
**Resource Site:
FP36**

Updated: January 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.
January 2022



Natural Resource Description

Within resource site FP36 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 FP36	
	Study Area
Stream (Miles)	0.9
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	38.2
Woodland (acres)	0.0
Shrubland (acres)	0.0
Herbaceous (acres)	10.7
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	42.6
* The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area.	
**Slopes are derived from LiDAR. Steep slopes are areas with a slope greater than 25%.	

There are short segments of small Balch Creek headwater streams that flow within the boundary of this resource area. The riparian corridors of these streams are intact, providing high quality habitat for fish that use Balch Creek and wildlife in the West Hills.

This site has experienced several significant slides in recent history, highlighting the instability of the soils and the importance of reestablishing vegetation after disturbance. Slides, although originating near the top of the watershed, impact water quality in Balch Creek. The effects of the erosion are attenuated by thick forest cover between an eroding fill and the nearest open water, but this cover is often not capable of capturing all sediment during storms.

Table B: Quality of Natural Resource Functions in Resource Site FP36				
Resource Site (acres) = 55				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	18.7	14.5	8.8	41.9
percent total inventory site area	34.2%	26.5%	16.1%	76.7%
Wildlife Habitat*				
acres	38.2	0.0	0.0	38.2
percent total inventory site area	70.0%	0.0%	0.0%	70.0%
Special Habitat Areas**				
acres	36.6			
percent total inventory site area	67.1%			
Combined Total⁺				
acres	38.2	0.3	3.4	41.9
percent total inventory site area	70.0%	0.5%	6.2%	76.7%
* 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 site FP36, 9.1% 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 FP36			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
54.6	5.0	4.9	9.1%

*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 FP36. 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 FP36 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 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 FP36, 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 the resource site-specific evaluation for FP36, 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 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 that are contiguous 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 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.: FP37 Resource Site Name: Burnside Headwaters

Previous Plan: Balch Creek Watershed Protection Plan

Previous Resource Site No.: 80

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

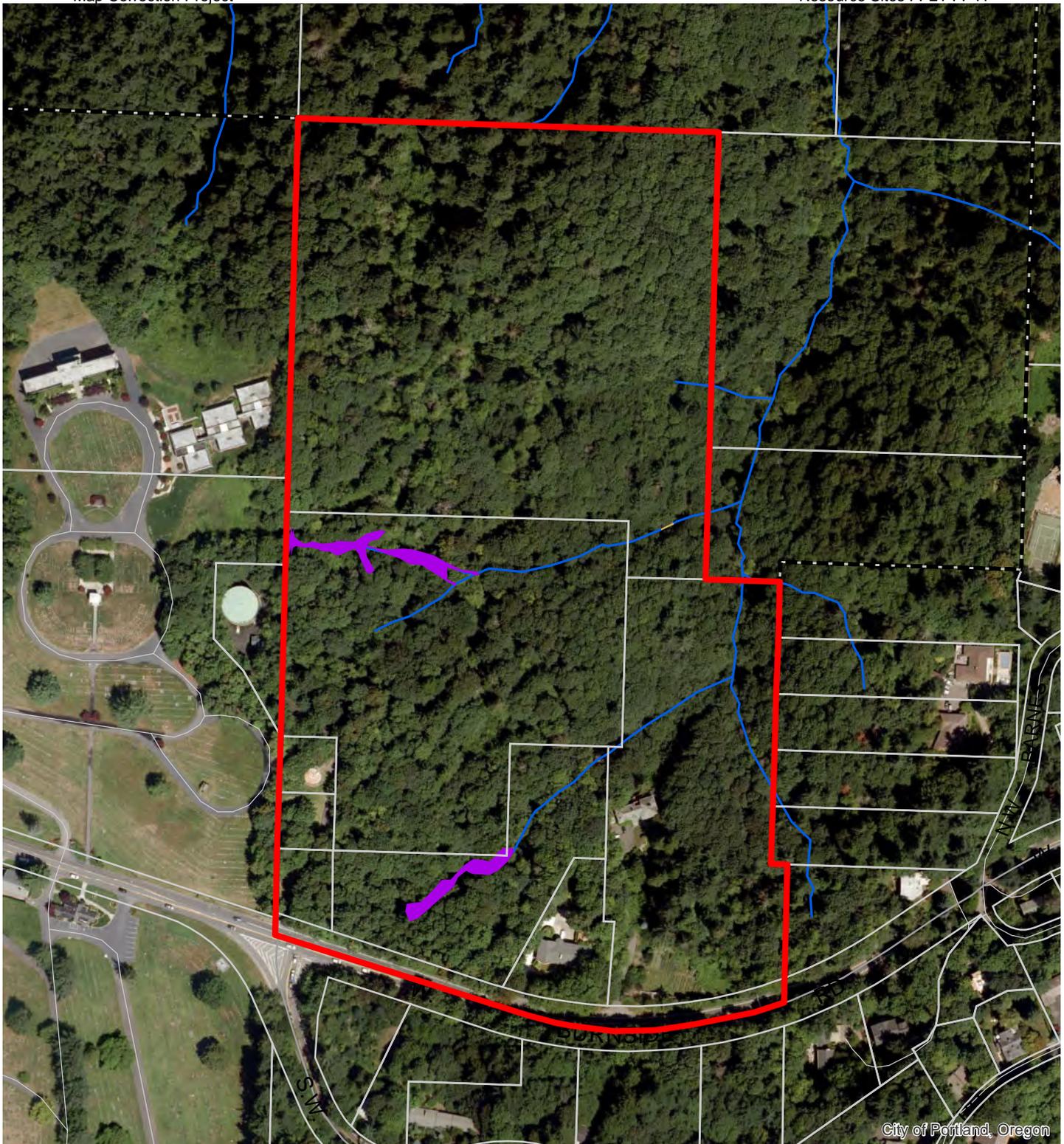
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 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 FP37 includes the following:

Site (acres)	29.1
Base zones (acres)	
R20	29.1



City of Portland, Oregon

Map A: Water Features

Resource Site: FP37

Updated: July 2021

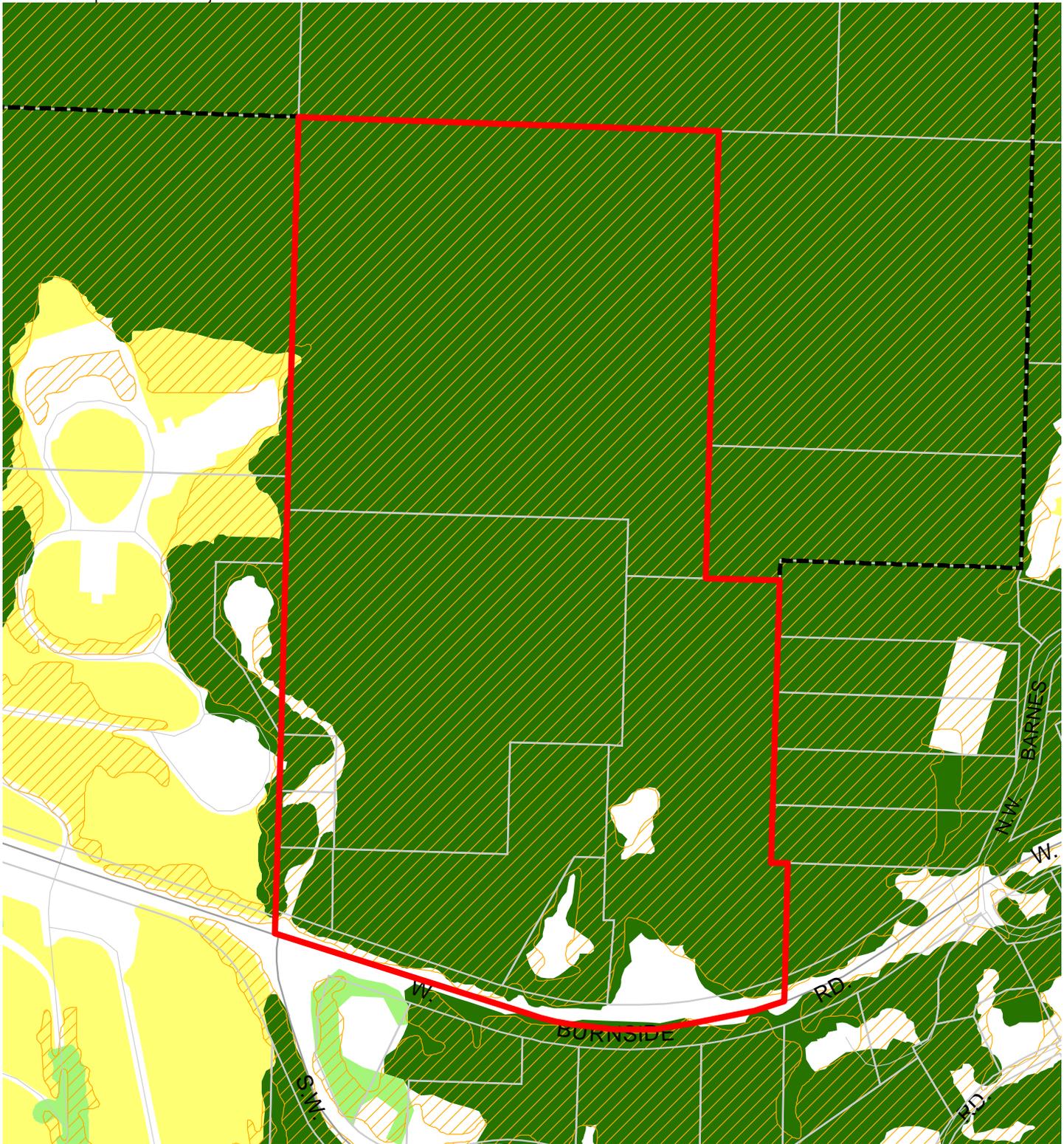


0 130 260 Feet
Recommended Draft

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



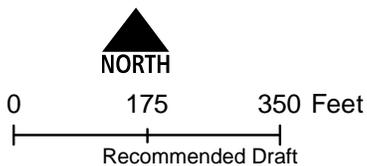
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January 2022



Map B: Vegetation and Steep Slopes

**Resource Site:
FP37**

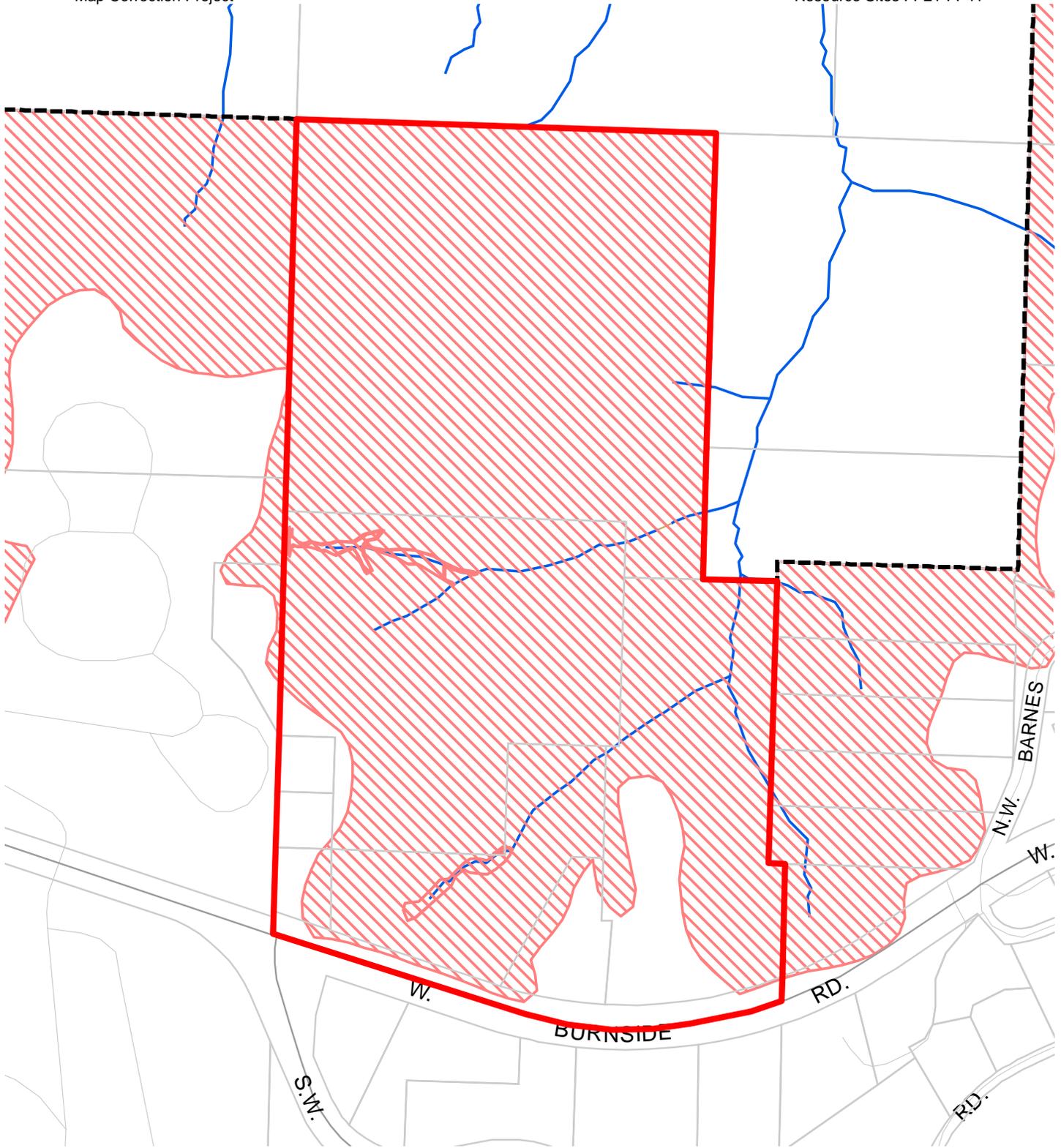
Updated: July 2021



- Resource Sites
- Urban Service Boundary
- Taxlots
- Slopes >25%
- Forest
- Woodland
- Shrubland
- Herbaceous

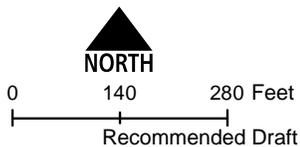


The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.
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**Map C: Special
Habitat Areas**
**Resource Site:
FP37**

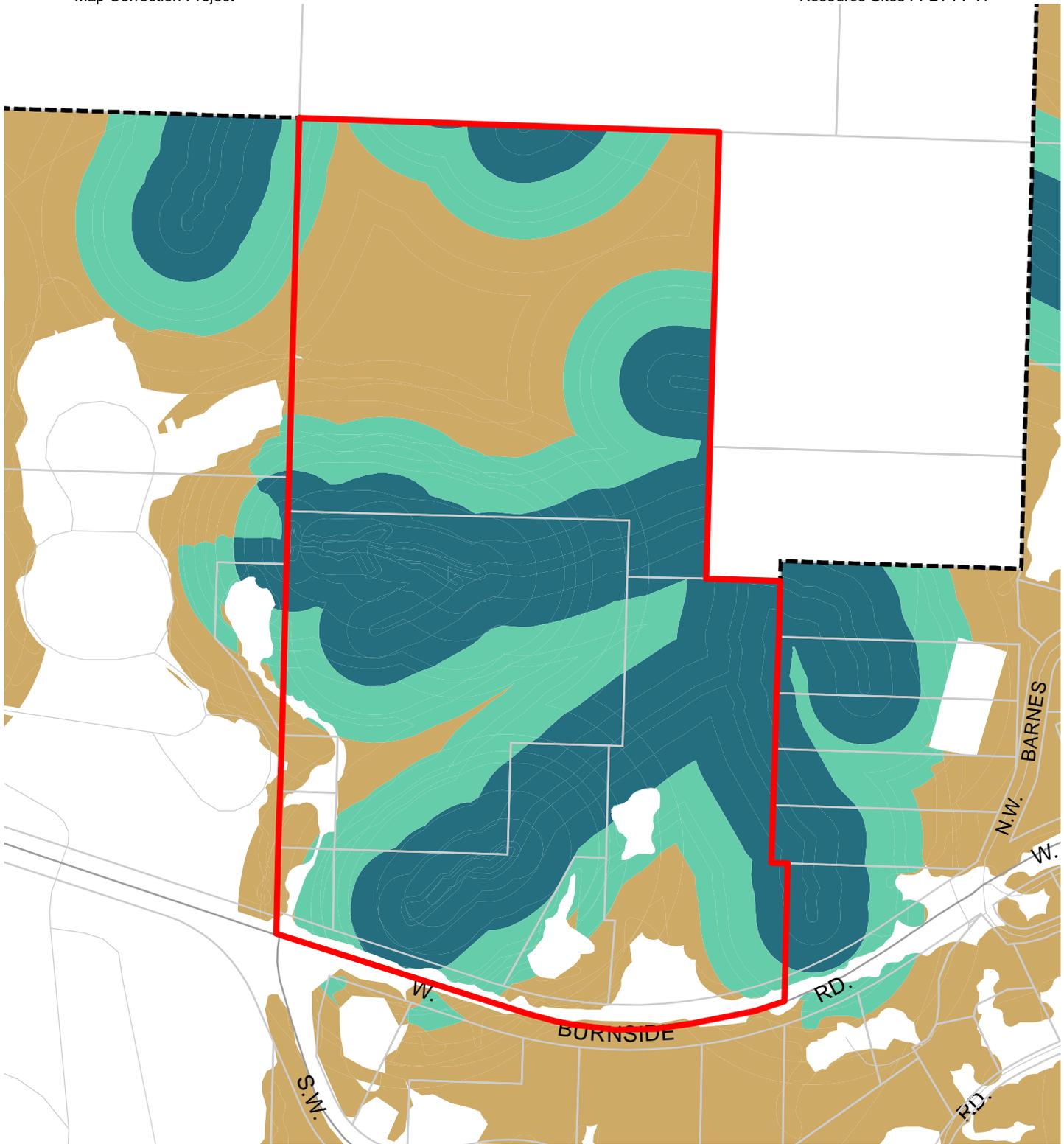
Updated: June 2021



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



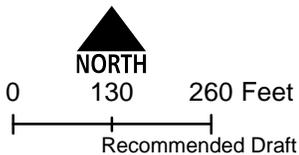
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**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
FP37**

Updated: July 2021



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

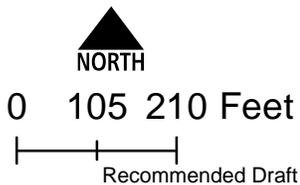


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**Map E: Wildlife
Habitat Classification
Resource Site:
FP37**

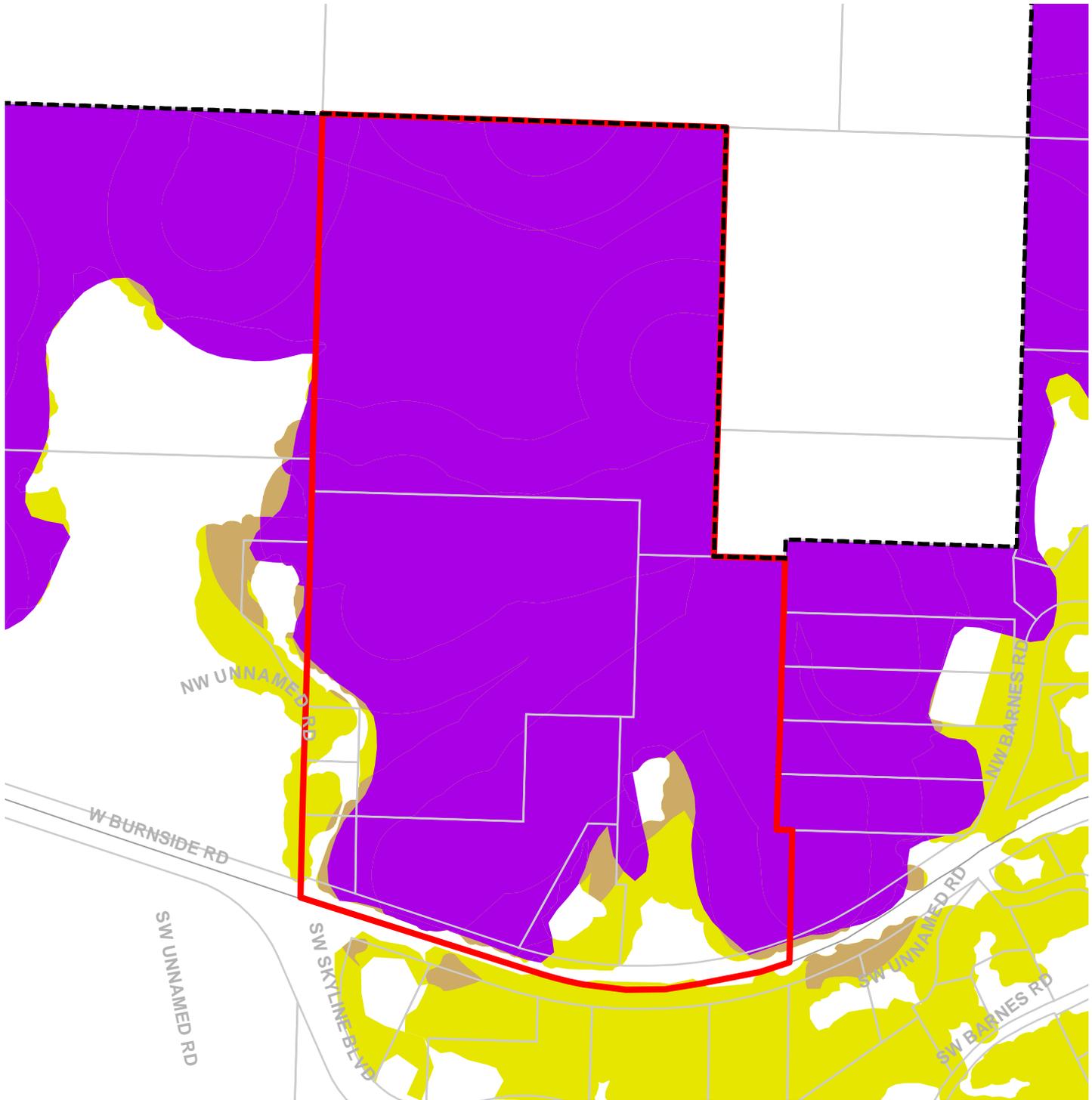
Updated: July 2021



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

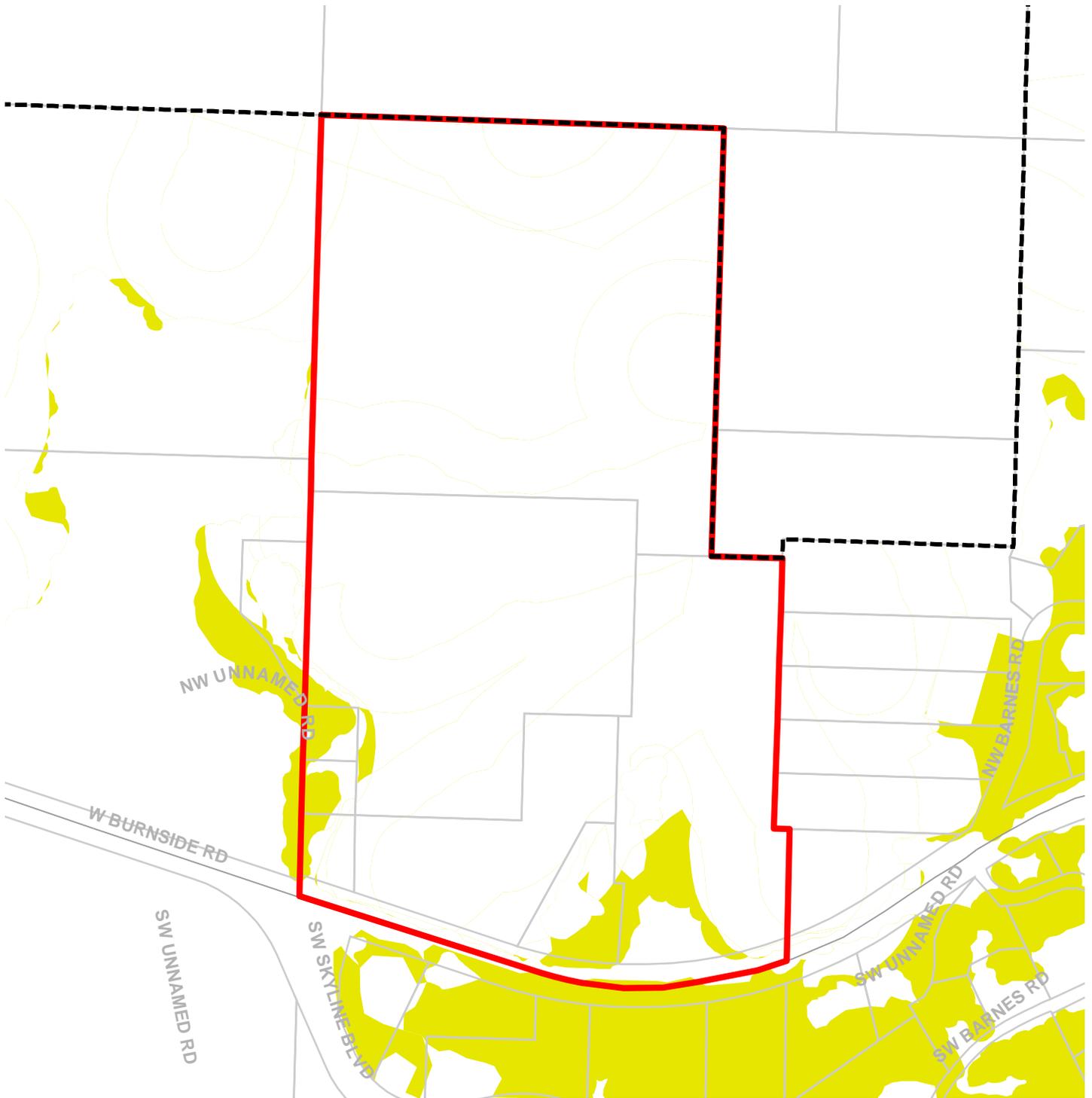
Resource Site: FP37

Updated: July 2021

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



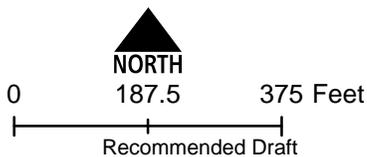
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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: FP37

Updated: July 2021

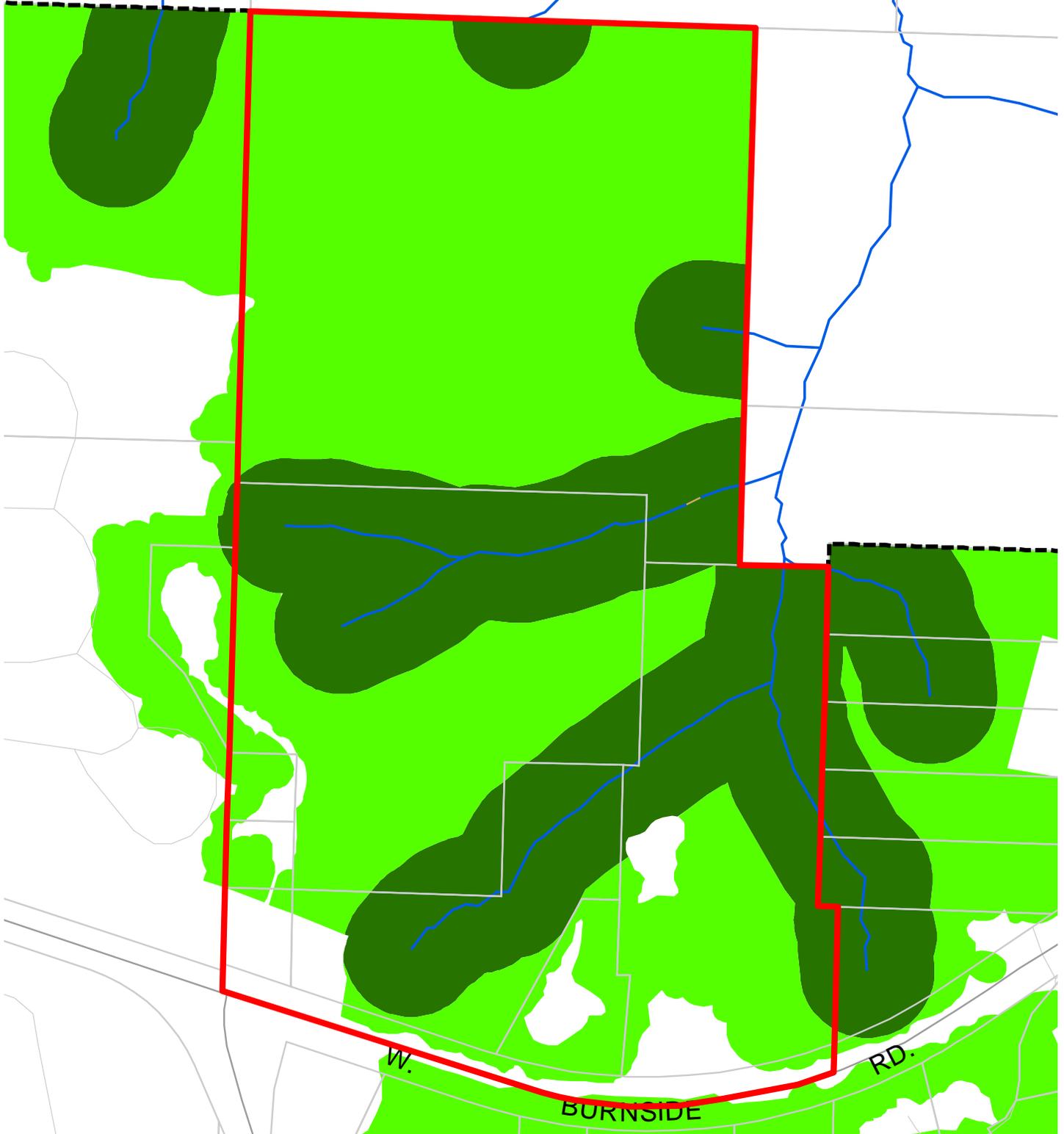


- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



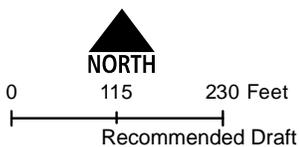
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January 2022



**Map I: DRAFT Proposed
Environmental Overlay Zones**
**Resource Site:
FP37**

Updated: January 2022



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



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January 2022

Natural Resource Description

Within resource site FP37 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: Balch Creek Watershed (O, B, M, C, E, 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 FP37	
	Study Area
Stream (Miles)	0.4
Wetlands (acres)	0.3
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	27.6
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)**	27.8
* 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%.	

There are short segments of small Balch Creek headwater streams that flow within the boundary of this resource area. The riparian corridors of these streams are intact, providing high quality habitat for fish that use Balch Creek and wildlife in the West Hills. The streams are surrounded by steep forested slopes that provide cover and habitat for wildlife. There are several steep ravines in the resource site. These ravines are completely vegetated, and this vegetation prevents soil erosion and helps to control storm flooding. The trees also capture and use rainwater, reducing overland flow that contributes to stream bank erosion and downstream flooding. The conifers are growing through the alder and maple canopy, and shade tolerant conifer tree species like cedar, yew, and hemlock are well established in the understory.

Table B: Quality of Natural Resource Functions in Resource Site FP37				
Resource Site (acres) = 29				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	10.8	9.3	7.6	27.6
percent total inventory site area	37.0%	31.9%	26.0%	94.9%
Wildlife Habitat*				
acres	27.6	0.0	0.0	27.6
percent total inventory site area	94.9%	0.0%	0.0%	94.9%
Special Habitat Areas**				
acres	25.9			
percent total inventory site area	89.0%			
Combined Total⁺				
acres	27.6	0.0	0.0	27.6
percent total inventory site area	94.9%	0.0%	0.0%	94.9%
* 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 site FP37, 2.5% 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 FP37			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
29.1	0.8	0.7	2.5%

*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 FP37. 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 FP37 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 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 FP37, 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 the resource site-specific evaluation for FP37, 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 25 feet of wetlands.
2. 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 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 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.: FP38 **Resource Site Name:** Lower Hilltop Dr.

Previous Plan: Balch Creek Watershed Protection Plan

Previous Resource Site No.: 79

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

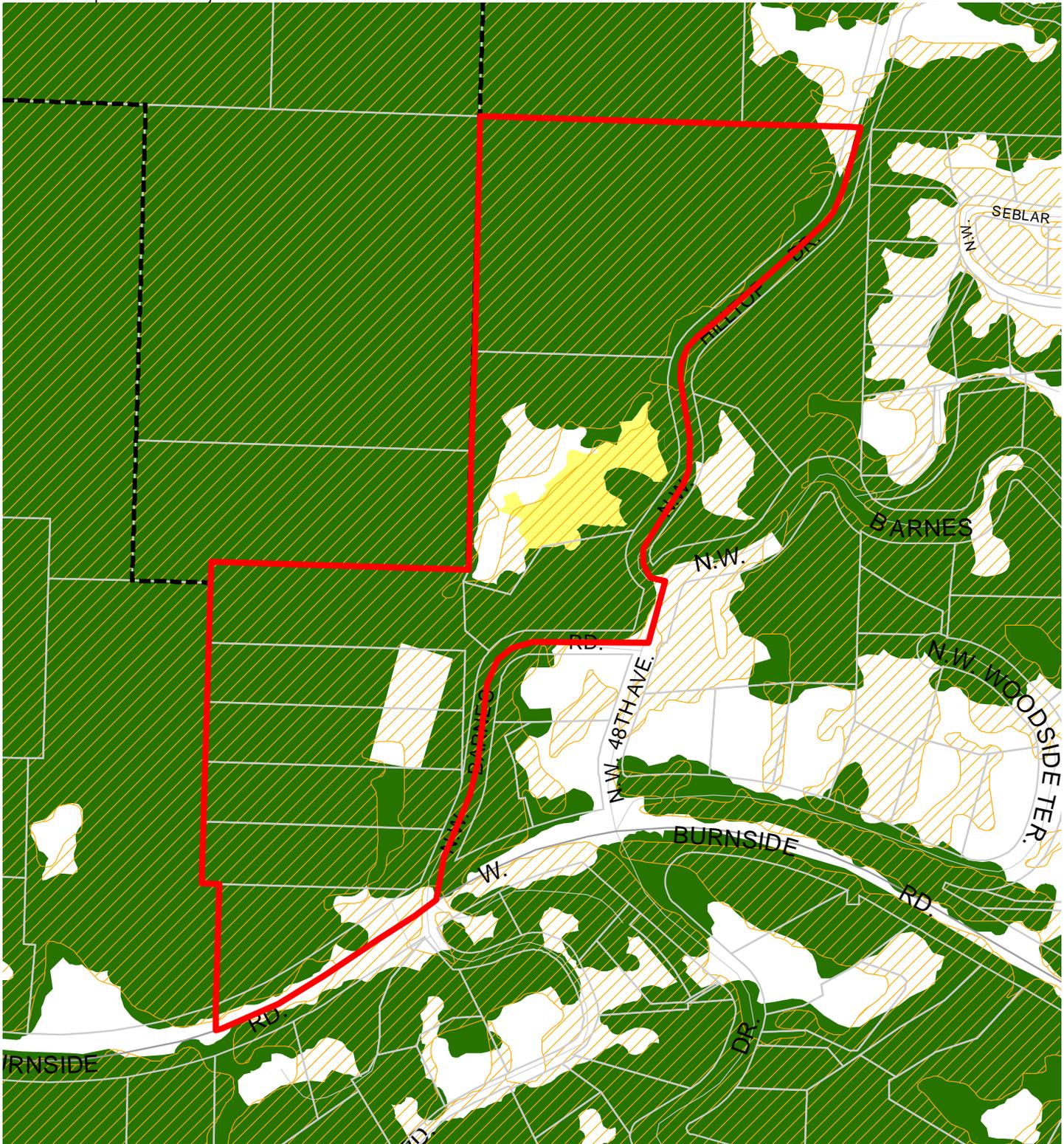
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 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 FP38 includes the following:

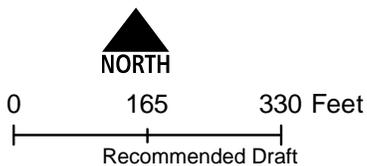
Site (acres)	15.1
Base zones (acres)	
R10	3.6
R20	0.0
RF	11.5



Map B: Vegetation and Steep Slopes

Resource Site: FP38

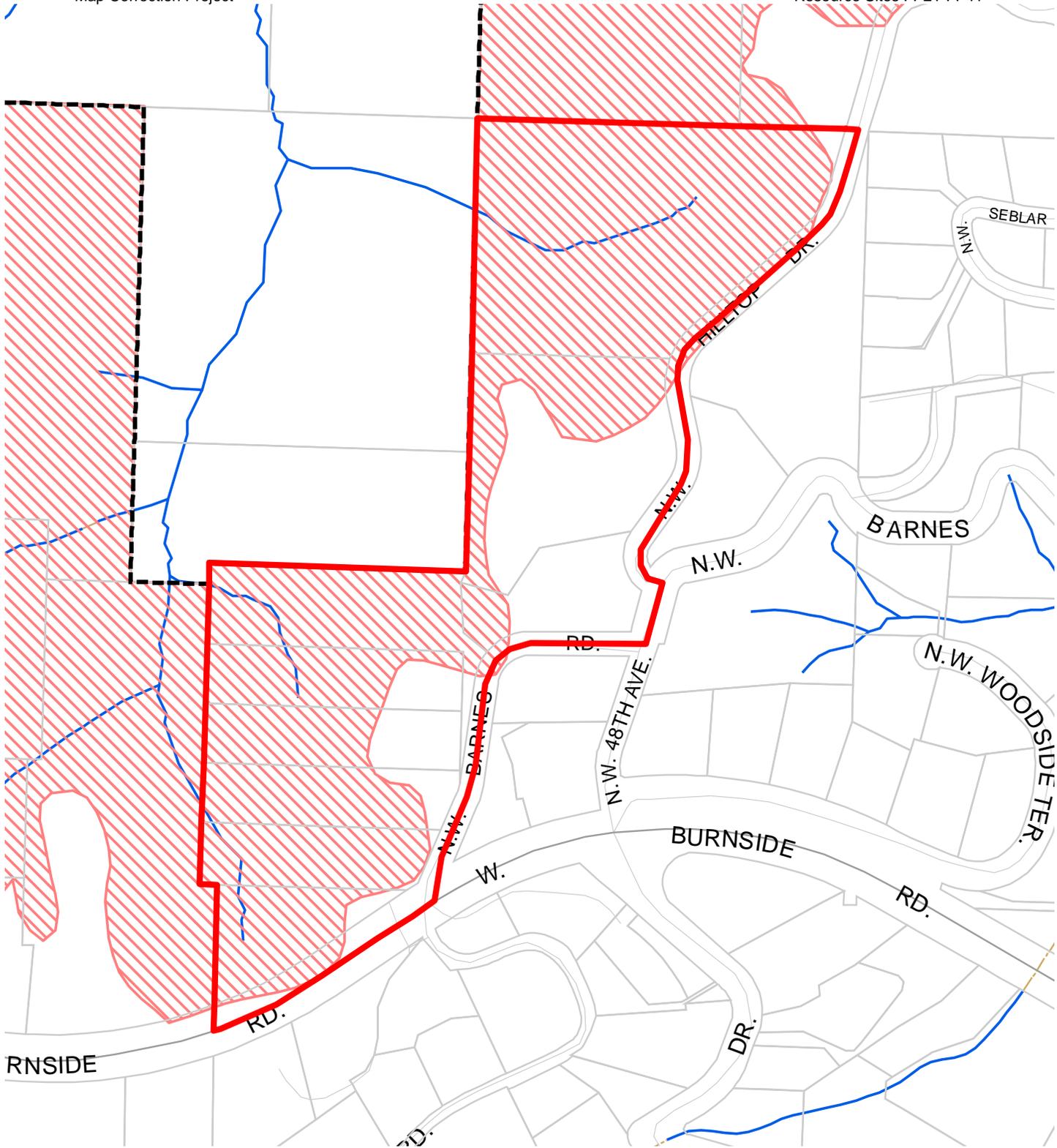
Updated: July 2021



- Resource Sites
- Urban Service Boundary
- Taxlots
- Slopes >25%
- Forest
- Woodland
- Shrubland
- Herbaceous

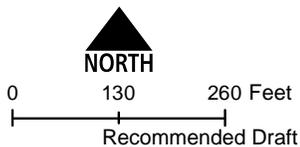


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**Map C: Special
Habitat Areas**
**Resource Site:
FP38**

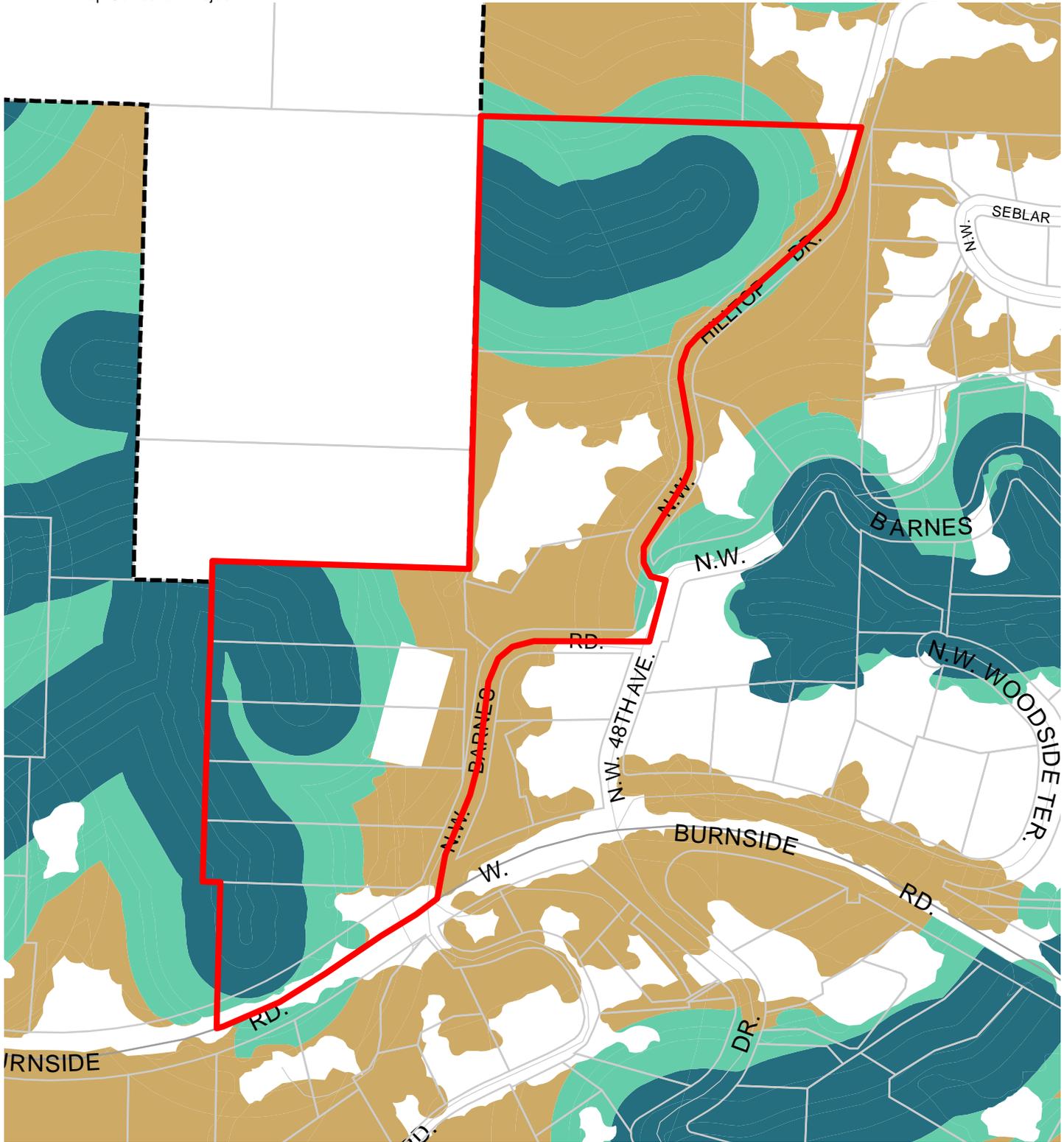
Updated: June 2021



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



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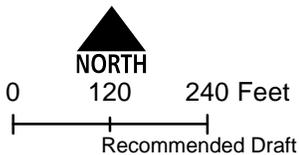


**Map D: Riparian
Corridors Habitat
Classification**

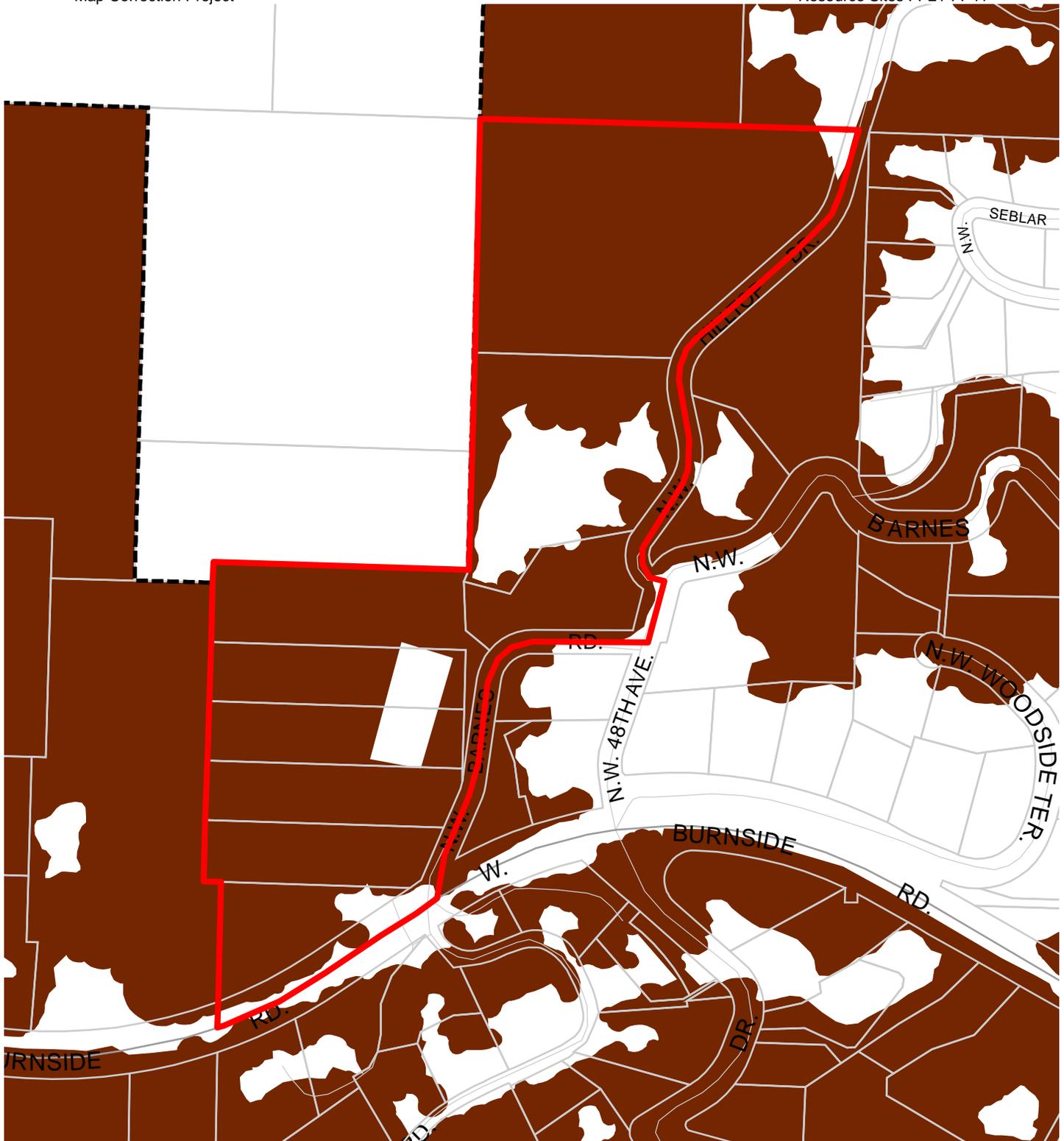
**Resource Site:
FP38**

Updated: July 2021

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

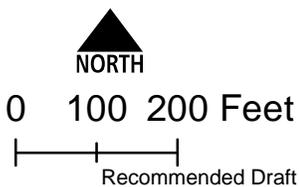


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**Map E: Wildlife
Habitat Classification
Resource Site:
FP38**

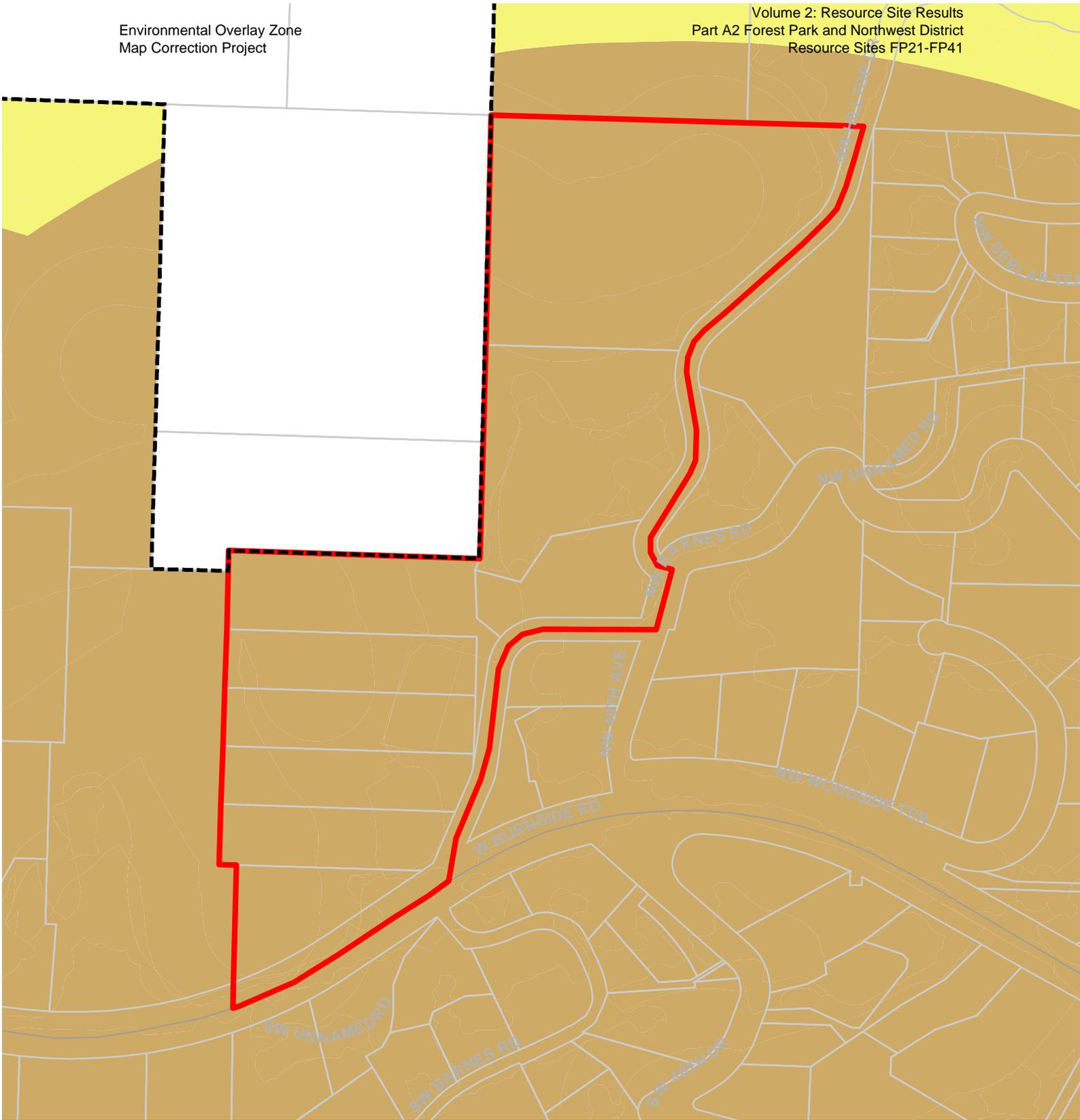
Updated: July 2021



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



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January 2022

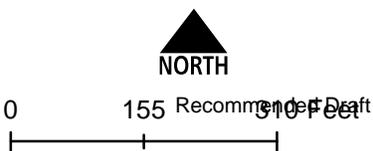


Map F: Urban Development Value (Title 13)
Resource Site: FP38

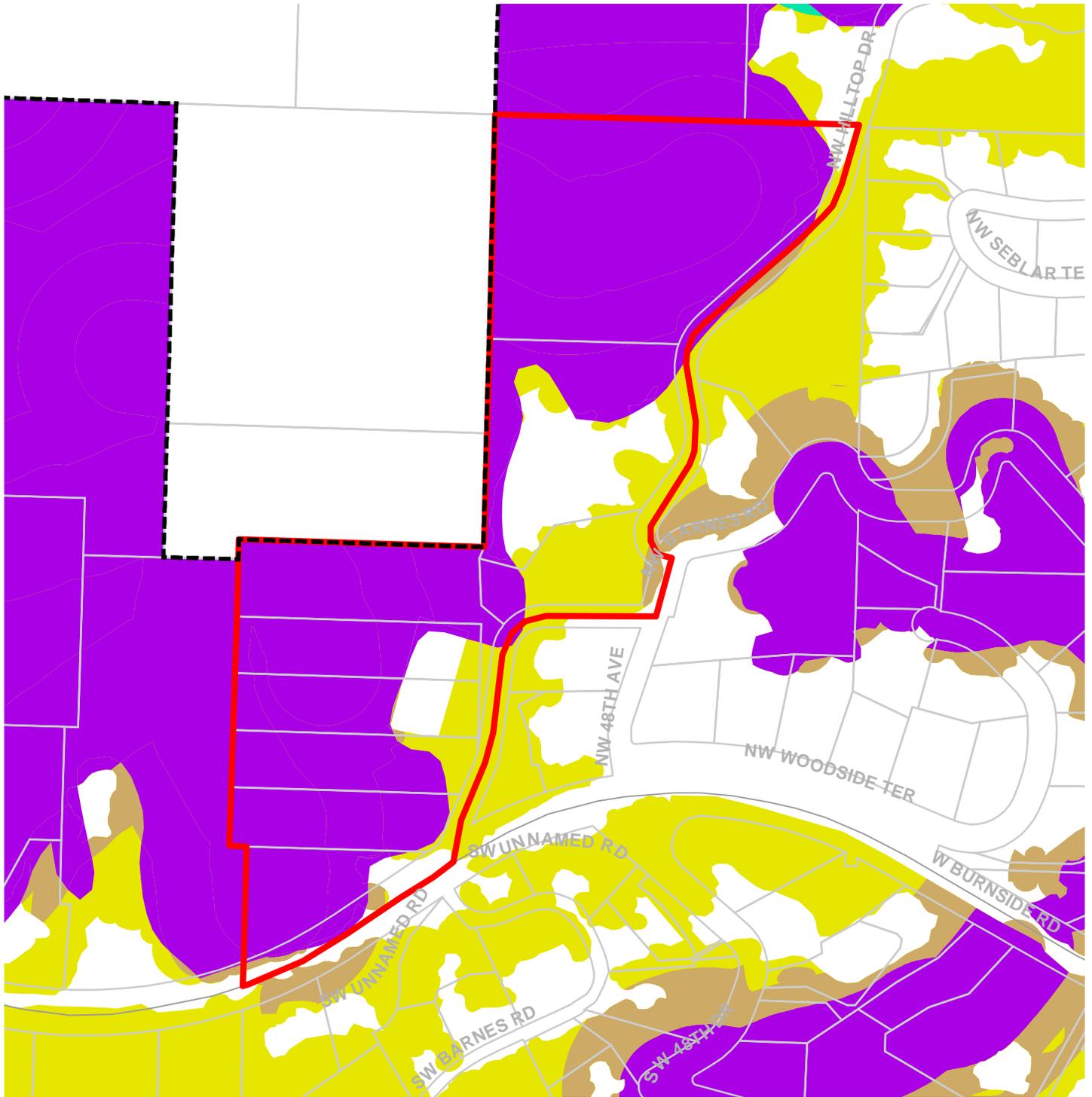
-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks



Updated: July 2021



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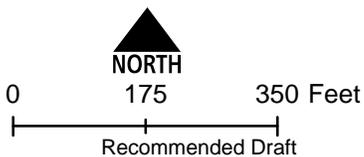


Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

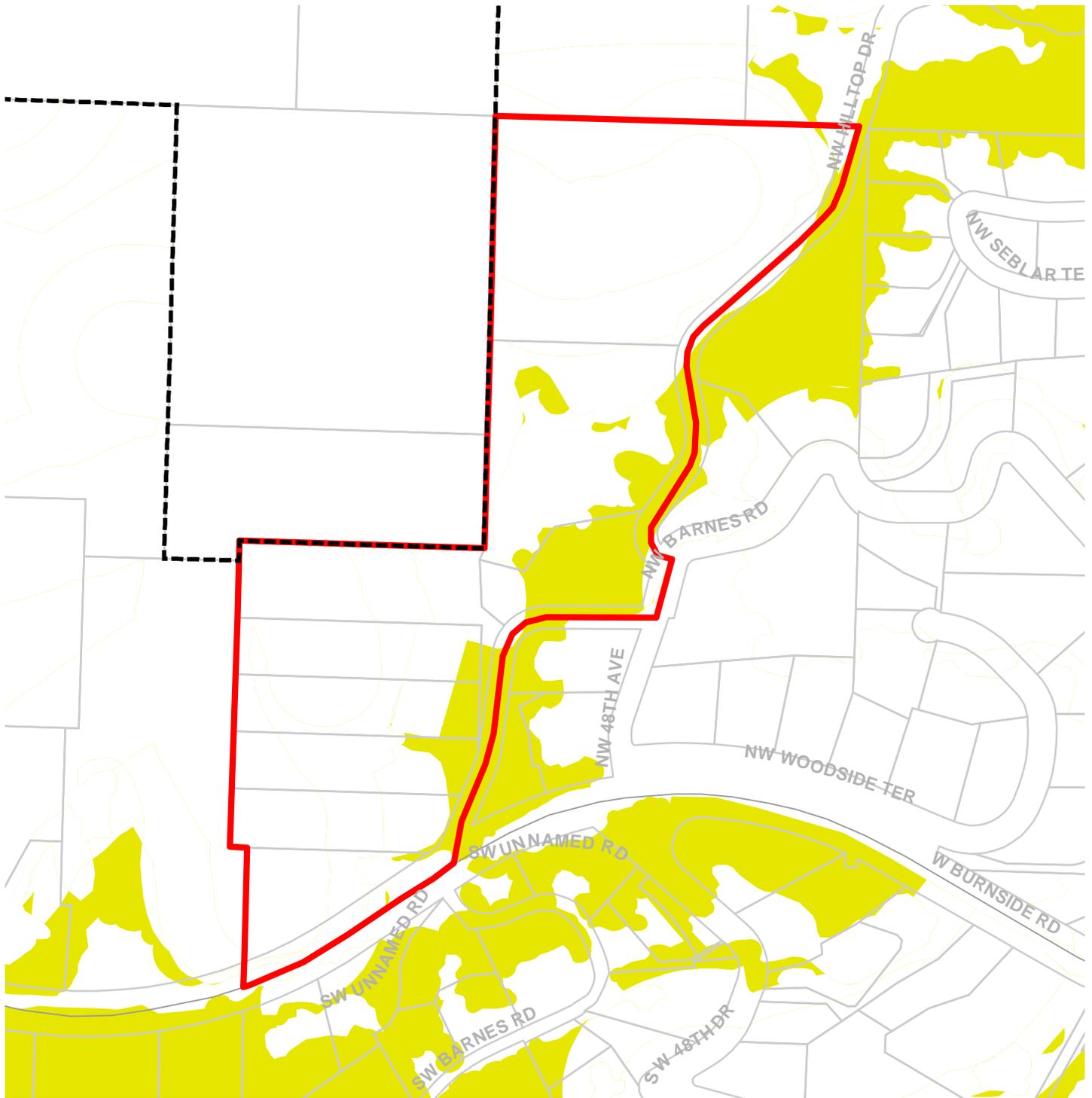
Resource Site: FP38

Updated: July 2021

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



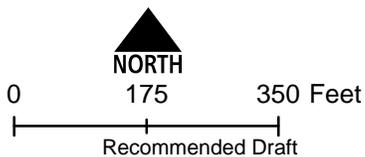
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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: FP38

Updated: July 2021

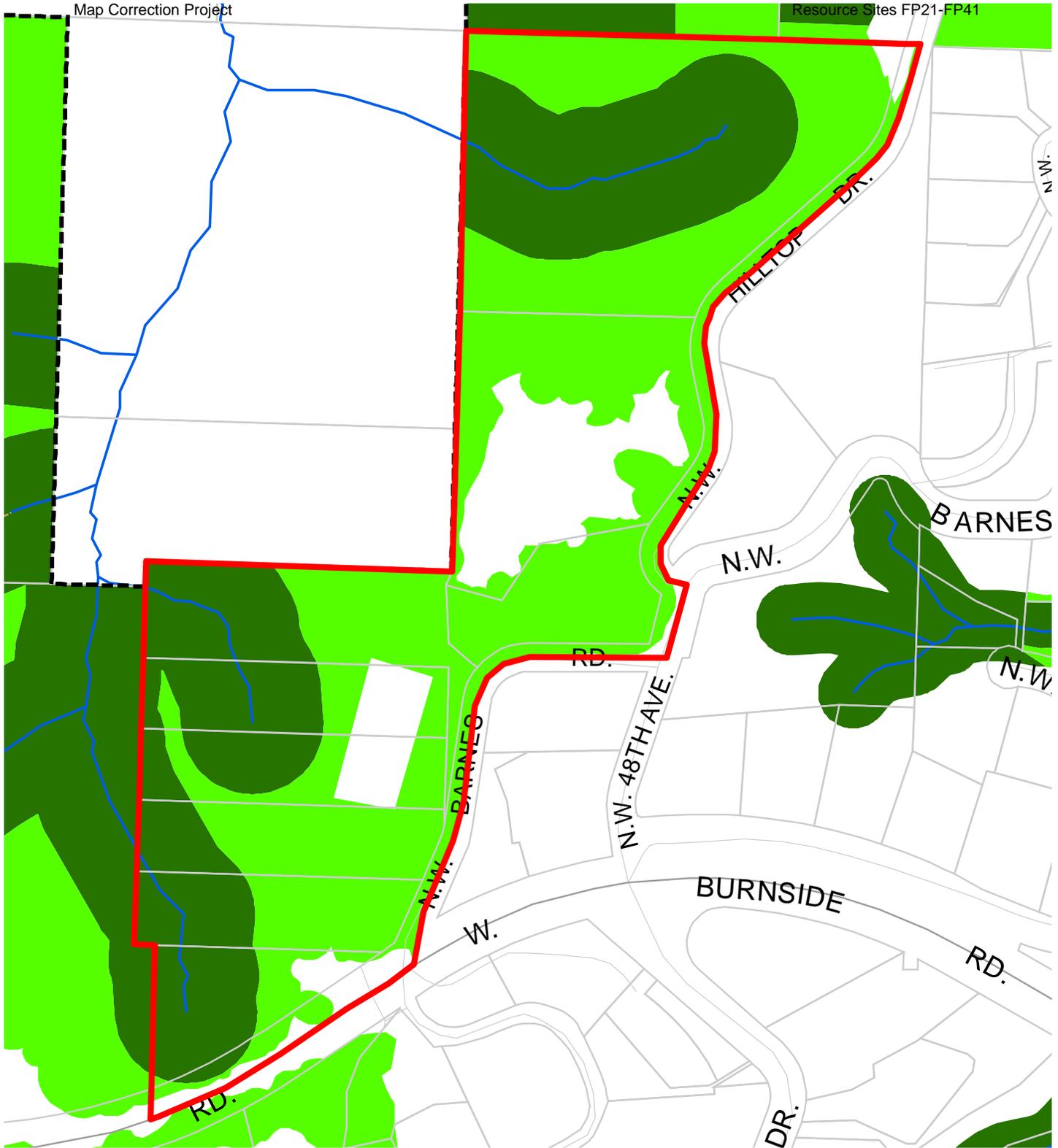


-  Urban Service Boundary
-  Resource Sites
-  Goal 5 Significant Natural Resources



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January 2022

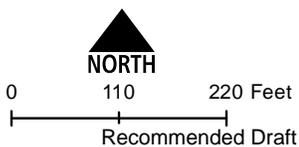


Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site: FP38

Updated: January 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.
January 2022

Natural Resource Description

Within resource site FP38 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 FP38	
	Study Area
Stream (Miles)	0.2
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	13.1
Woodland (acres)	0.0
Shrubland (acres)	0.0
Herbaceous (acres)	0.6
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	13.9
* 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%.	

There are short segments of small Balch Creek headwater streams that flow within the boundary of this resource area. The riparian corridors of these streams are intact, providing high quality habitat for fish that use Balch Creek and wildlife in the West Hills.

Table B: Quality of Natural Resource Functions in Resource Site FP38				
Resource Site (acres) = 15				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	5.1	3.8	4.3	13.2
percent total inventory site area	33.7%	25.3%	28.4%	87.4%
Wildlife Habitat*				
acres	13.1	0.0	0.0	13.1
percent total inventory site area	87.0%	0.0%	0.0%	87.0%
Special Habitat Areas**				
acres	11.2			
percent total inventory site area	74.2%			
Combined Total⁺				
acres	13.1	0.0	0.1	13.2
percent total inventory site area	87.0%	0.0%	0.4%	87.4%
* 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 FP38, 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 FP38			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
15.1	1.1	0.6	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 FP38. 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 FP38 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 RH 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 FP38, 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 the resource site-specific evaluation for FP38, 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 25 feet of wetlands.
2. 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 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 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.: FP39 **Resource Site Name:** Hilltop West

Previous Plan: Multnomah County Urban Lands

Previous Resource Site No.: 111

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

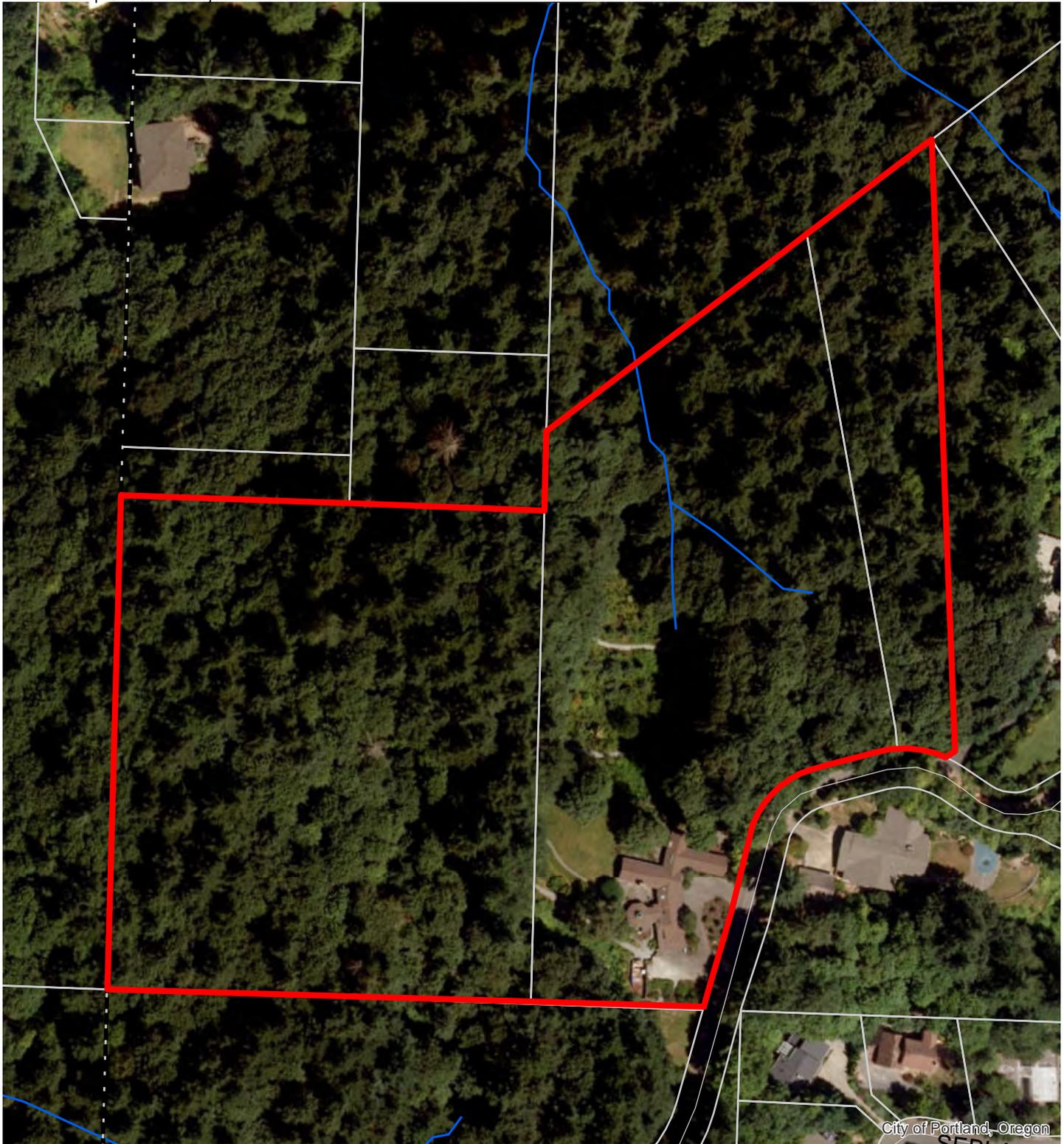
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 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 FP39 includes the following:

Site (acres)	11.1
Base zones (acres)	
RF	11.1

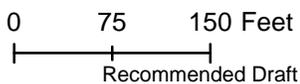


City of Portland, Oregon

Map A: Water Features

Resource Site: FP39

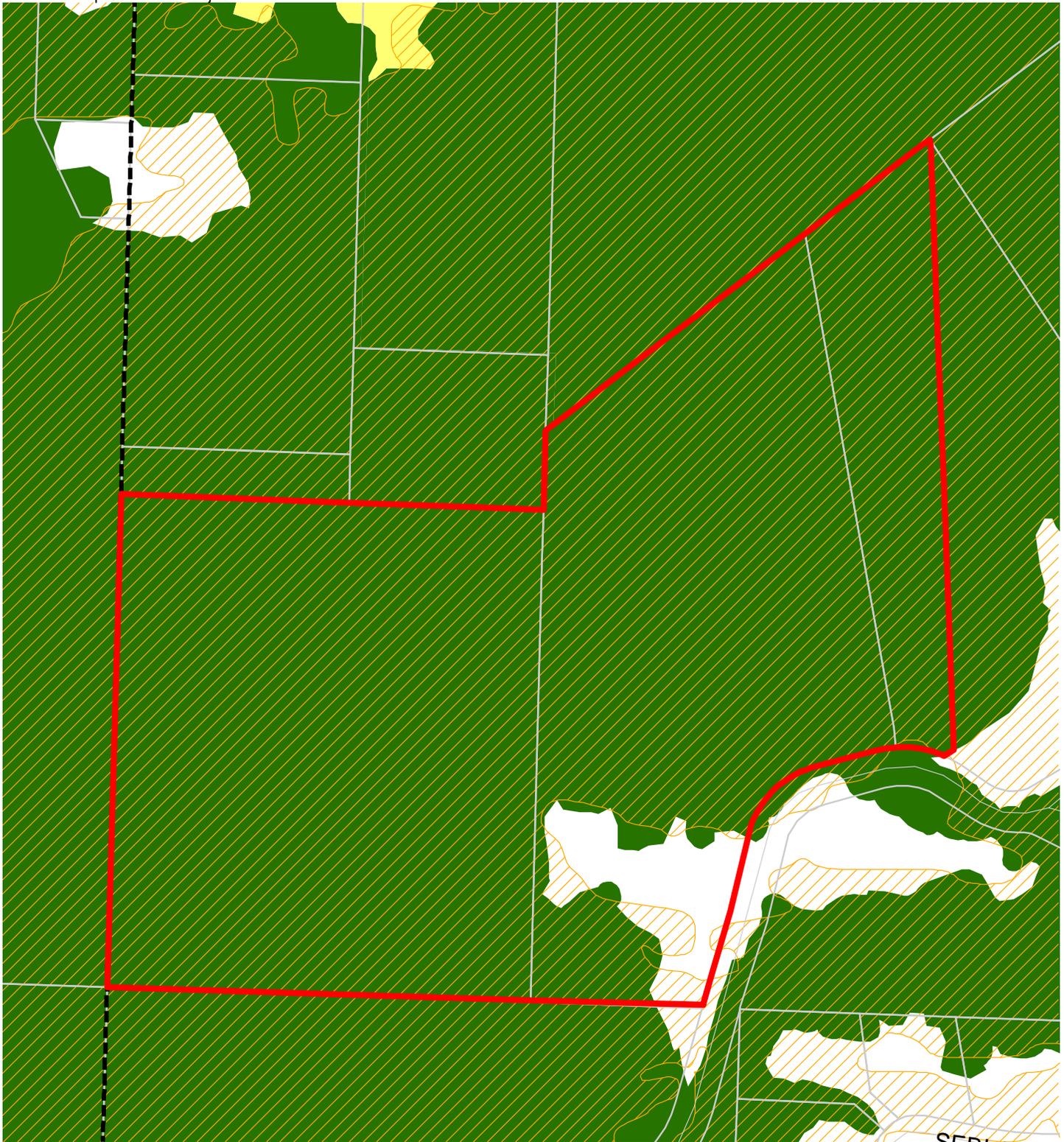
Updated: July 2021



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



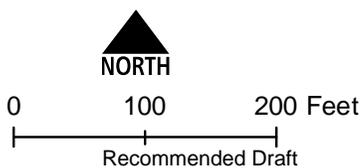
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.
January 2022



Map B: Vegetation and Steep Slopes

**Resource Site:
FP39**

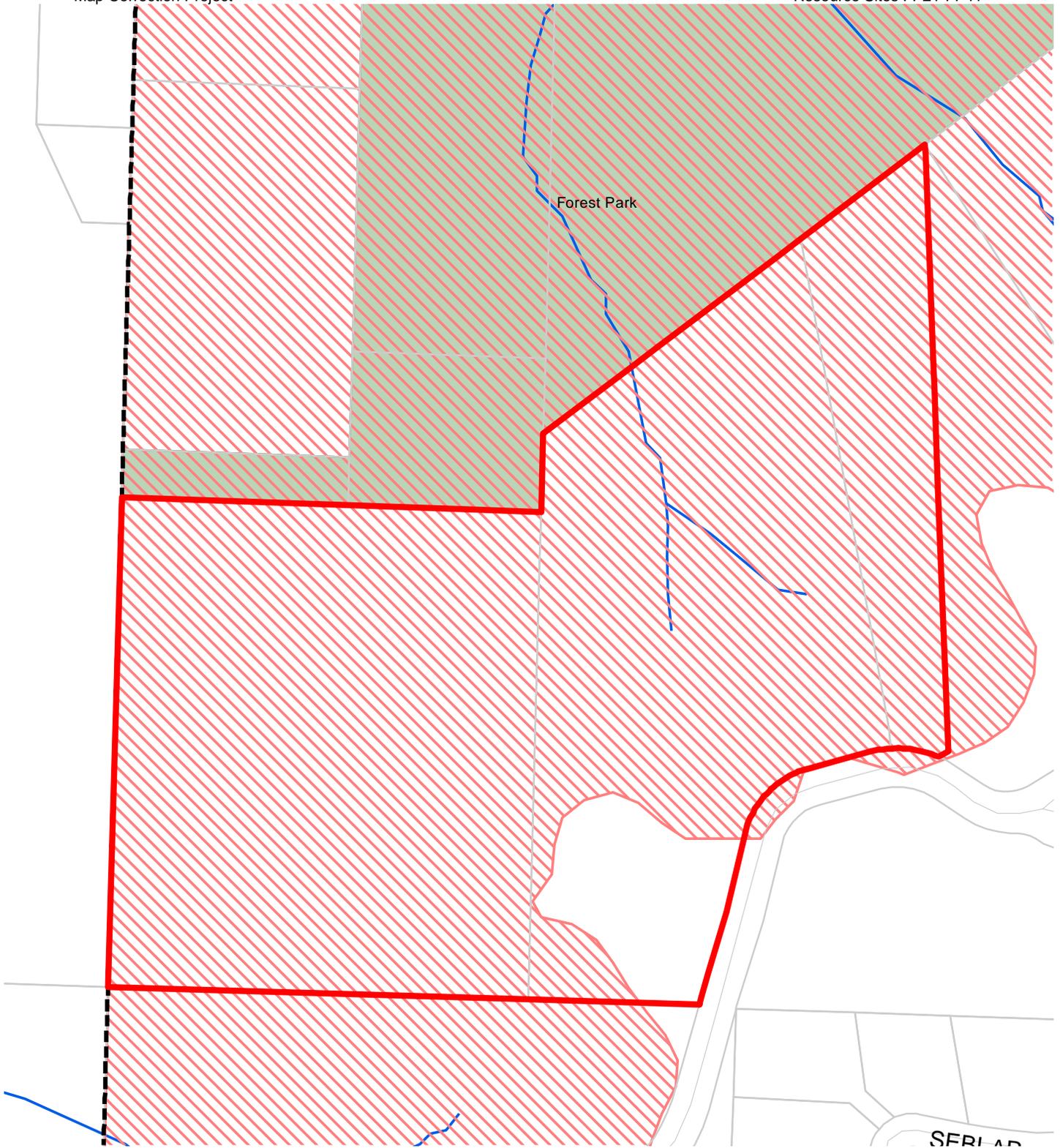
Updated: July 2021



- Resource Sites
- Urban Service Boundary
- Taxlots
- Slopes >25%
- Forest
- Woodland
- Shrubland
- Herbaceous

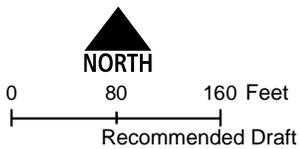


The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.
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**Map C: Special
Habitat Areas**
**Resource Site:
FP39**

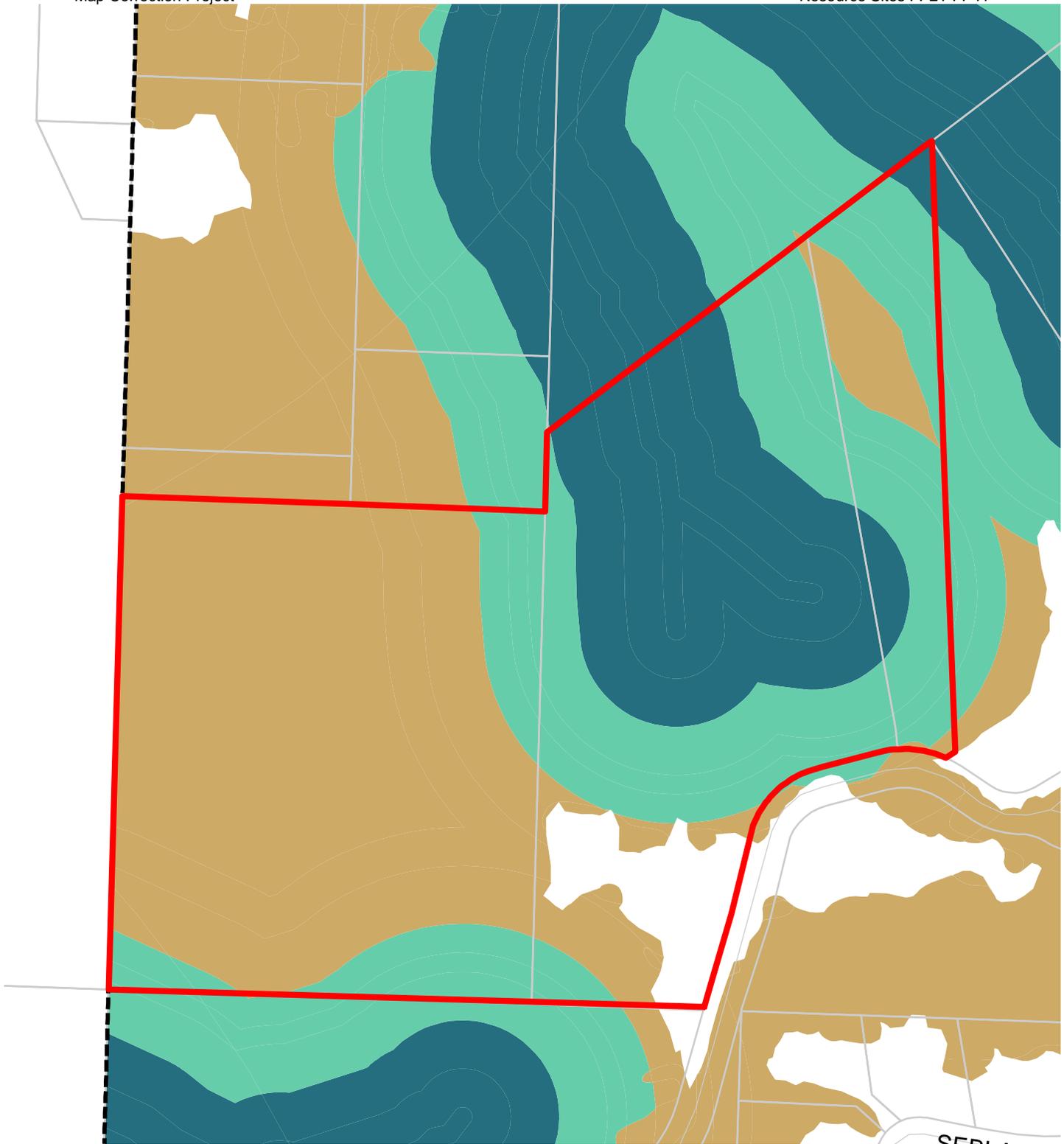
Updated: June 2021



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



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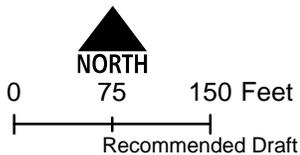


**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
FP39**

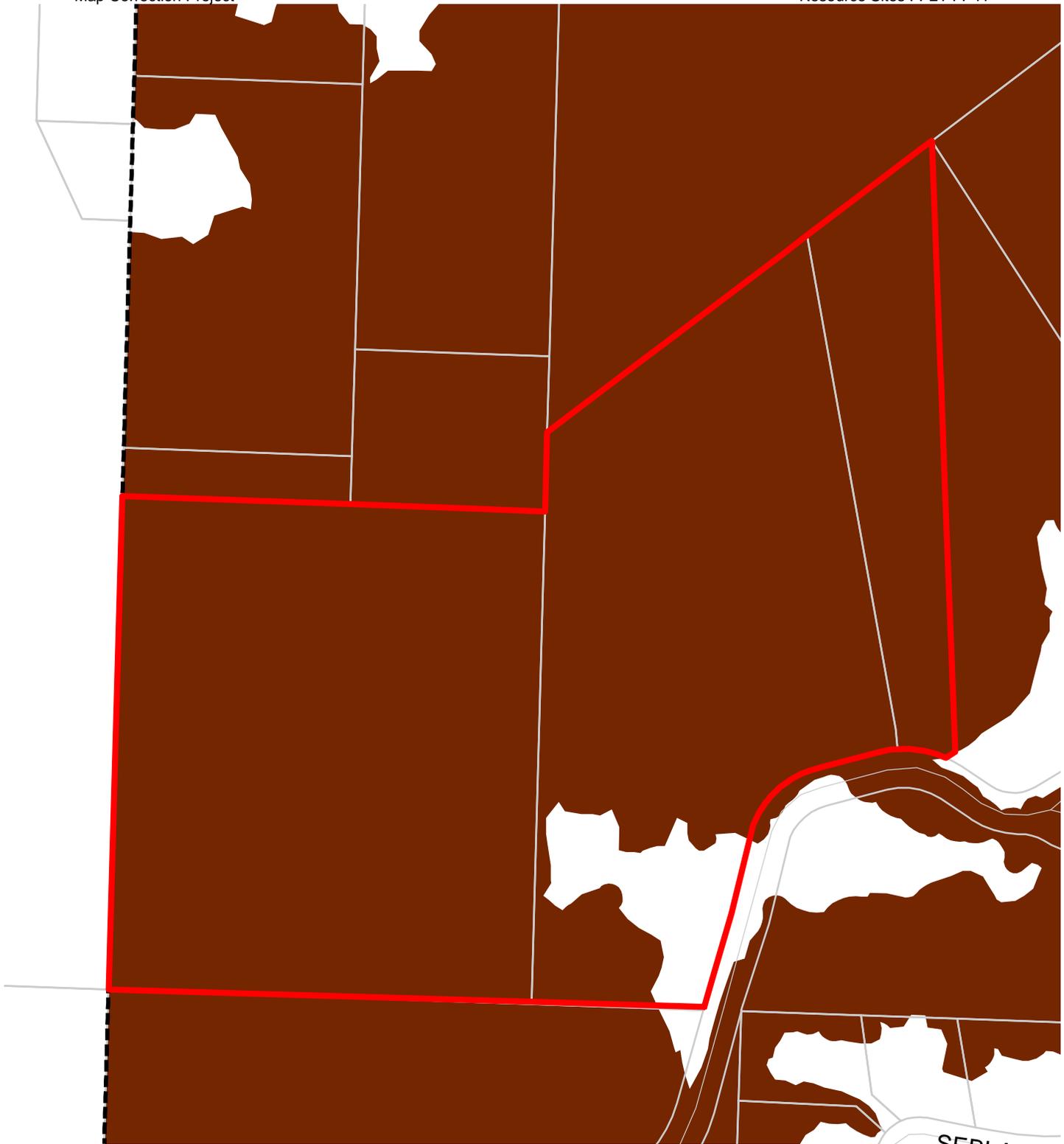
Updated: July 2021

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



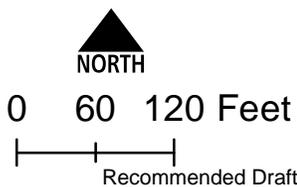
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**Map E: Wildlife
Habitat Classification
Resource Site:
FP39**

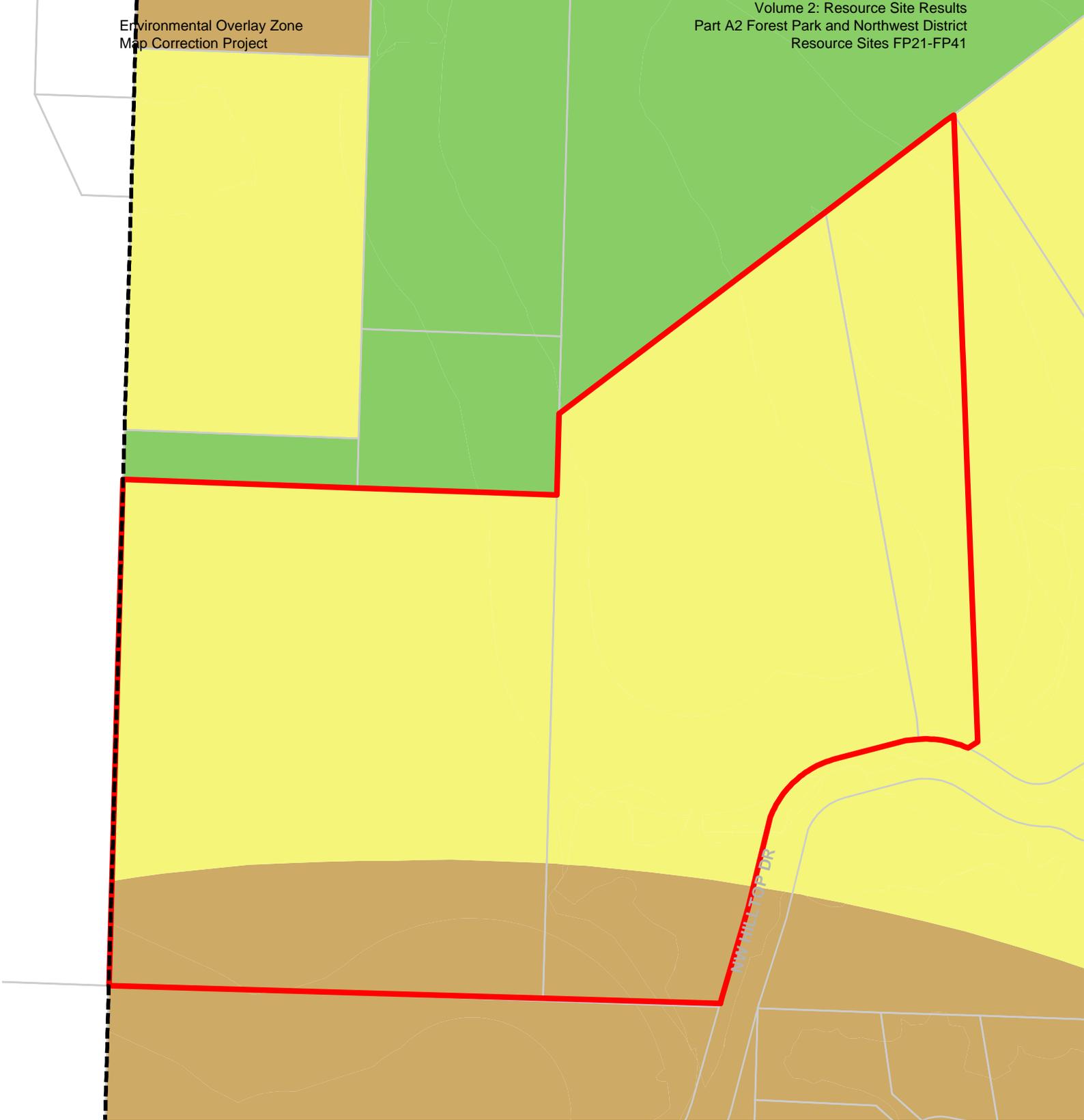
Updated: July 2021



-  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.
January 2022

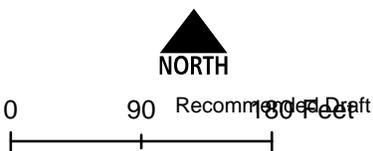


Map F: Urban Development Value (Title 13)
Resource Site: FP39

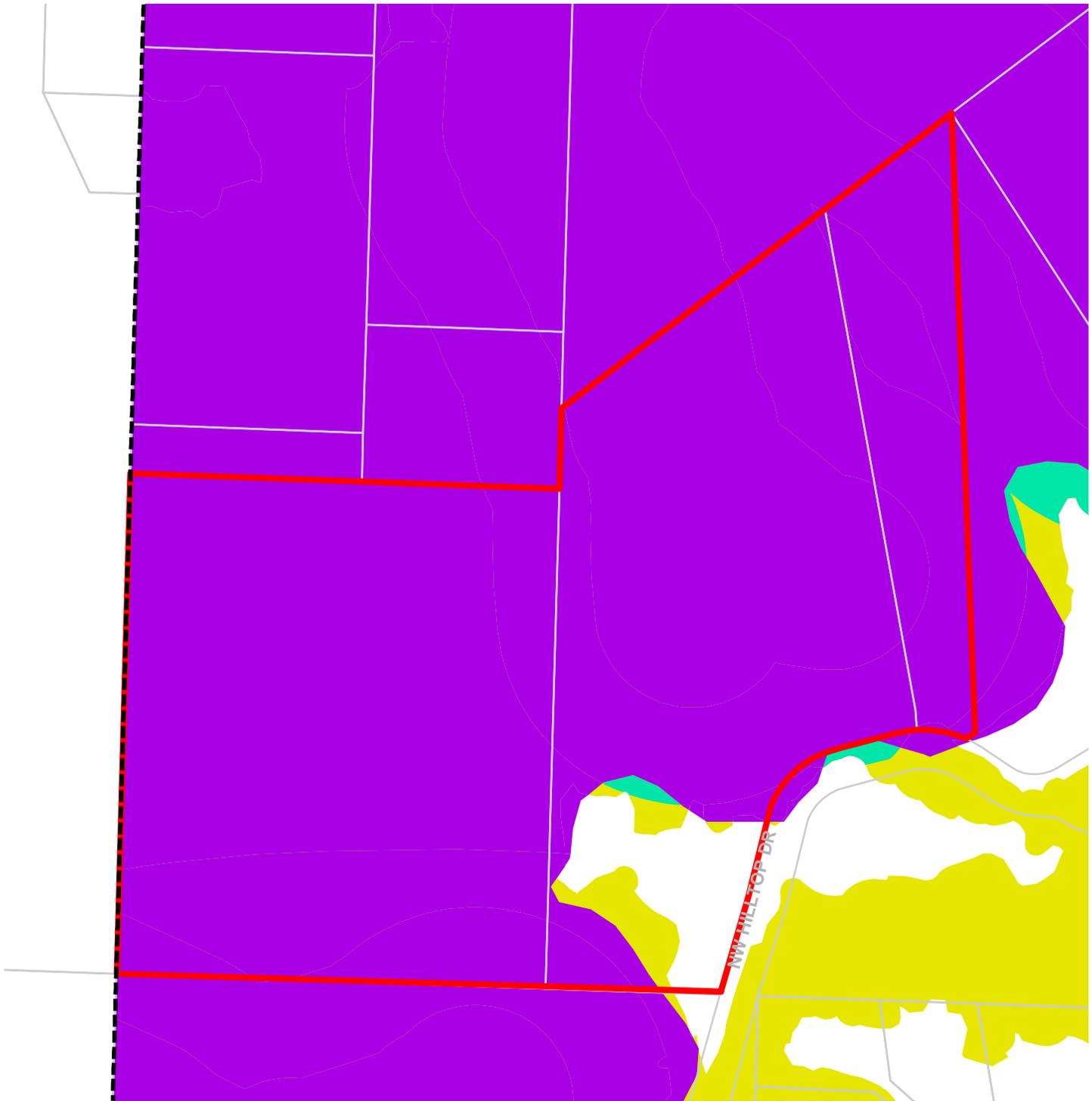
-  Urban Service Boundary
-  Resource Sites
-  High Development Value
-  Medium Development Value
-  Low Development Value
-  Parks



Updated: July 2021



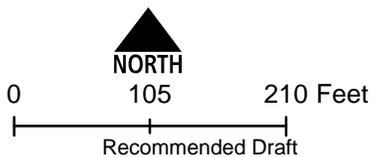
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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: FP39

Updated: July 2021

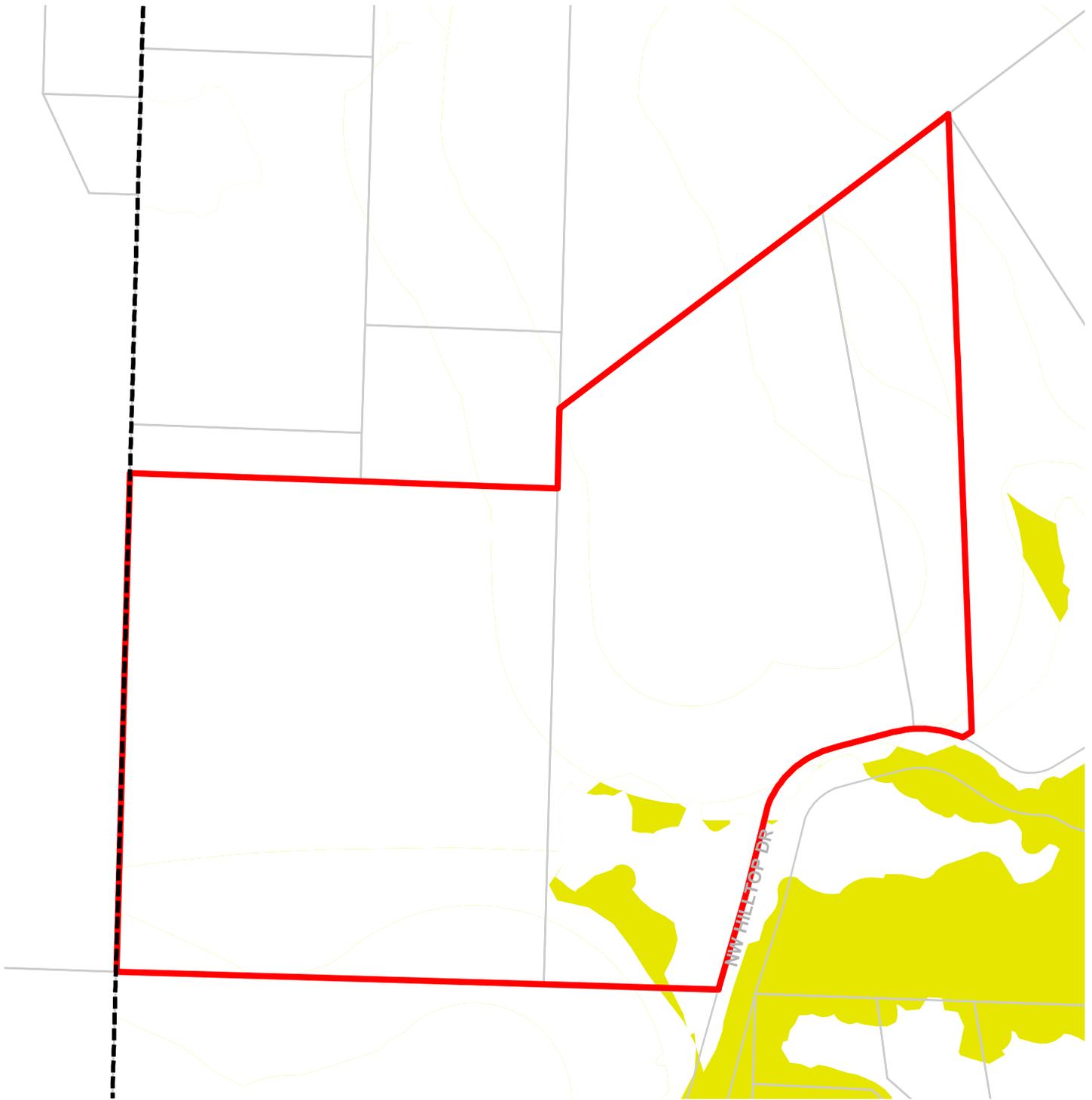


-  Urban Service Boundary
-  Resource Sites
-  HCA High Value
-  HCA Moderate Value
-  HCA Low Value
-  Goal 5 Significant Natural Resources



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.

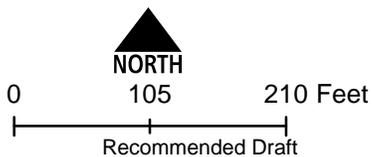
January 2022



Map H: Goal 5 Resources

Resource Site: FP39

Updated: July 2021

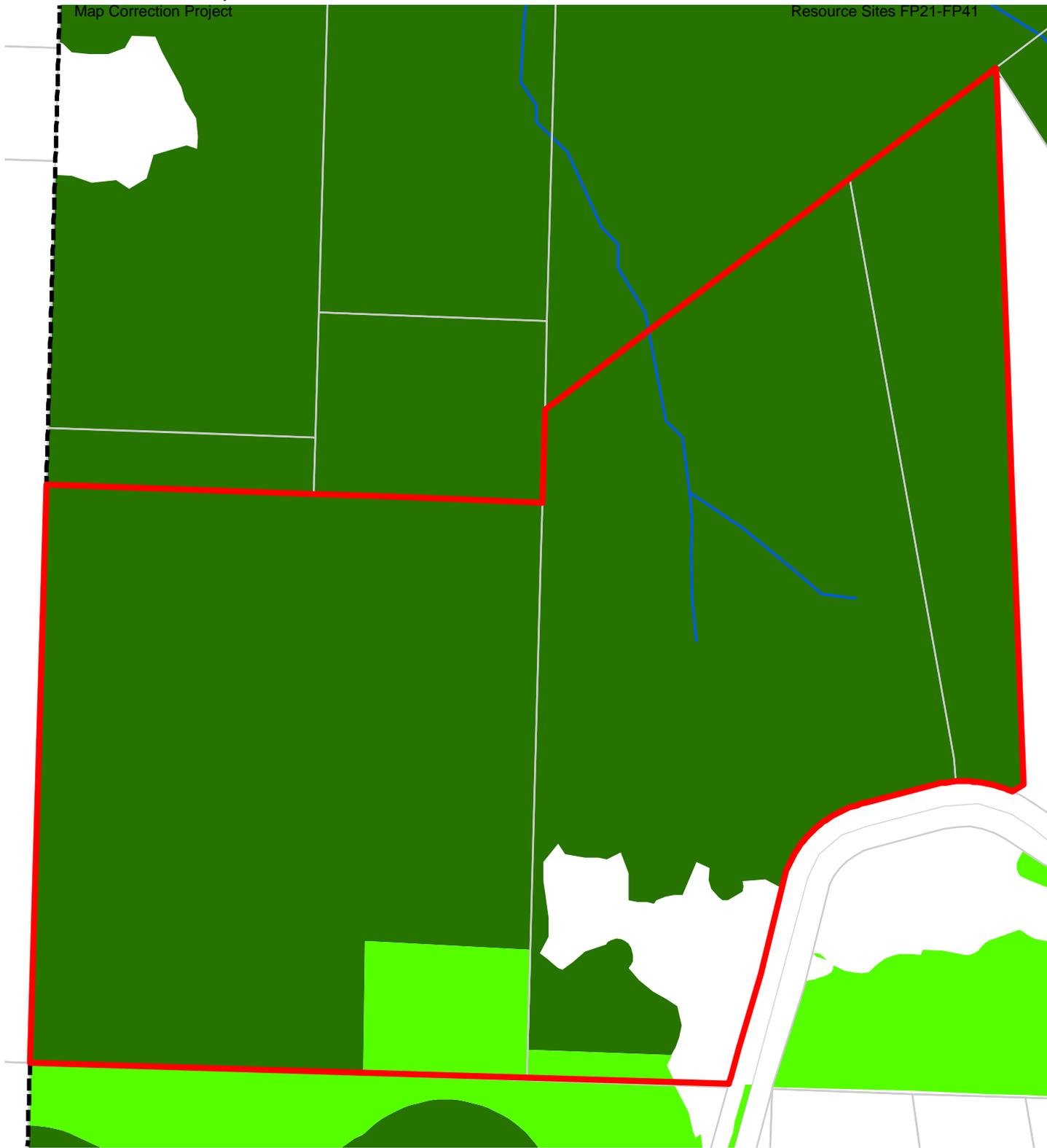


-  Urban Service Boundary
-  Resource Sites
-  Goal 5 Significant Natural Resources



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.

January 2022

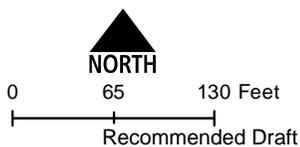


Map I: DRAFT Proposed Environmental Overlay Zones

**Resource Site:
 FP39**

Updated: January 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.
 January 2022

Natural Resource Description

Within resource site FP39 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 FP39	
	Study Area
Stream (Miles)	0.1
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	10.6
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)**	10.6
* The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area.	
**Slopes are derived from LiDAR. Steep slopes are areas with a slope greater than 25%.	

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

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

Table B: Quality of Natural Resource Functions in Resource Site FP39				
Resource Site (acres) = 11				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	2.3	3.2	5.0	10.6
percent total inventory site area	20.8%	29.3%	45.4%	95.4%
Wildlife Habitat*				
acres	10.6	0.0	0.0	10.6
percent total inventory site area	95.4%	0.0%	0.0%	95.4%
Special Habitat Areas**				
acres	10.4			
percent total inventory site area	93.7%			
Combined Total⁺				
acres	10.6	0.0	0.0	10.6
percent total inventory site area	95.4%	0.0%	0.0%	95.4%
* 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 FP39, 1.8% 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 FP39			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
11.1	0.2	0.2	1.8%

*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 FP39. 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 FP39 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 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 FP39, 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 the resource site-specific evaluation for FP39, 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 25 feet of wetlands.
2. 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. 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.

The Natural Resource Protection Decisions listed above reflect a proposed amendment that will be presented to City Council. Both the Ezone Computer Model and the Natural Resource Protection Decisions that are listed for FP39 in Volume 1 Page 139 apply a p zone to all forest vegetation contiguous to streams. In the Proposed Draft - As Amended, protection decisions only applied 'p' zone to forest vegetation within 100 feet of streams, which was in conflict with Volume 1 and the computer program.

Resource Site No.: FP40 **Resource Site Name:** Hilltop East

Previous Plan: Multnomah County Urban Lands

Previous Resource Site No.: 111

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

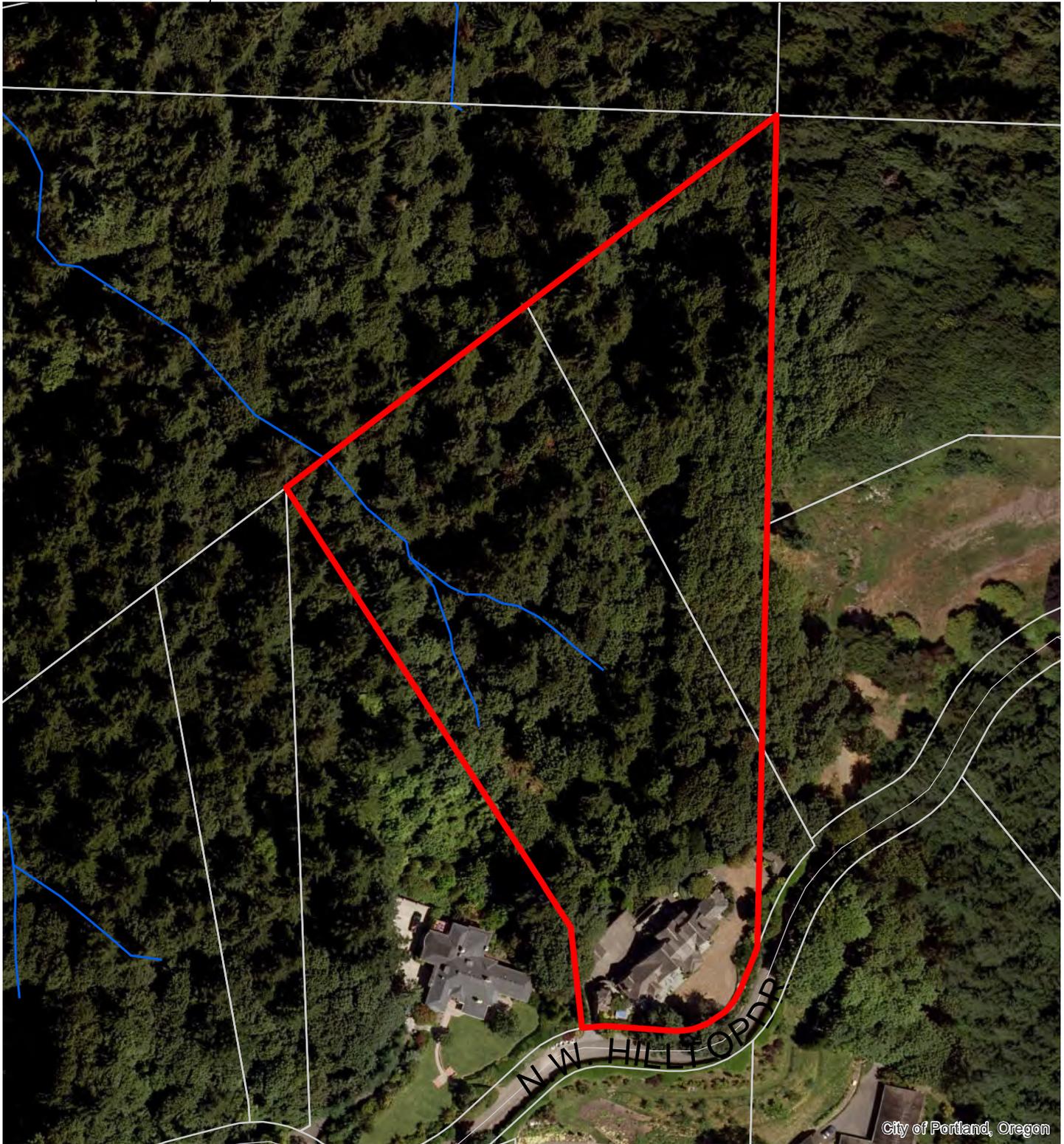
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 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 FP40 includes the following:

Site (acres)	5.7
Base zones (acres)	
RF	5.7



City of Portland, Oregon

Map A: Water Features

Resource Site: FP40

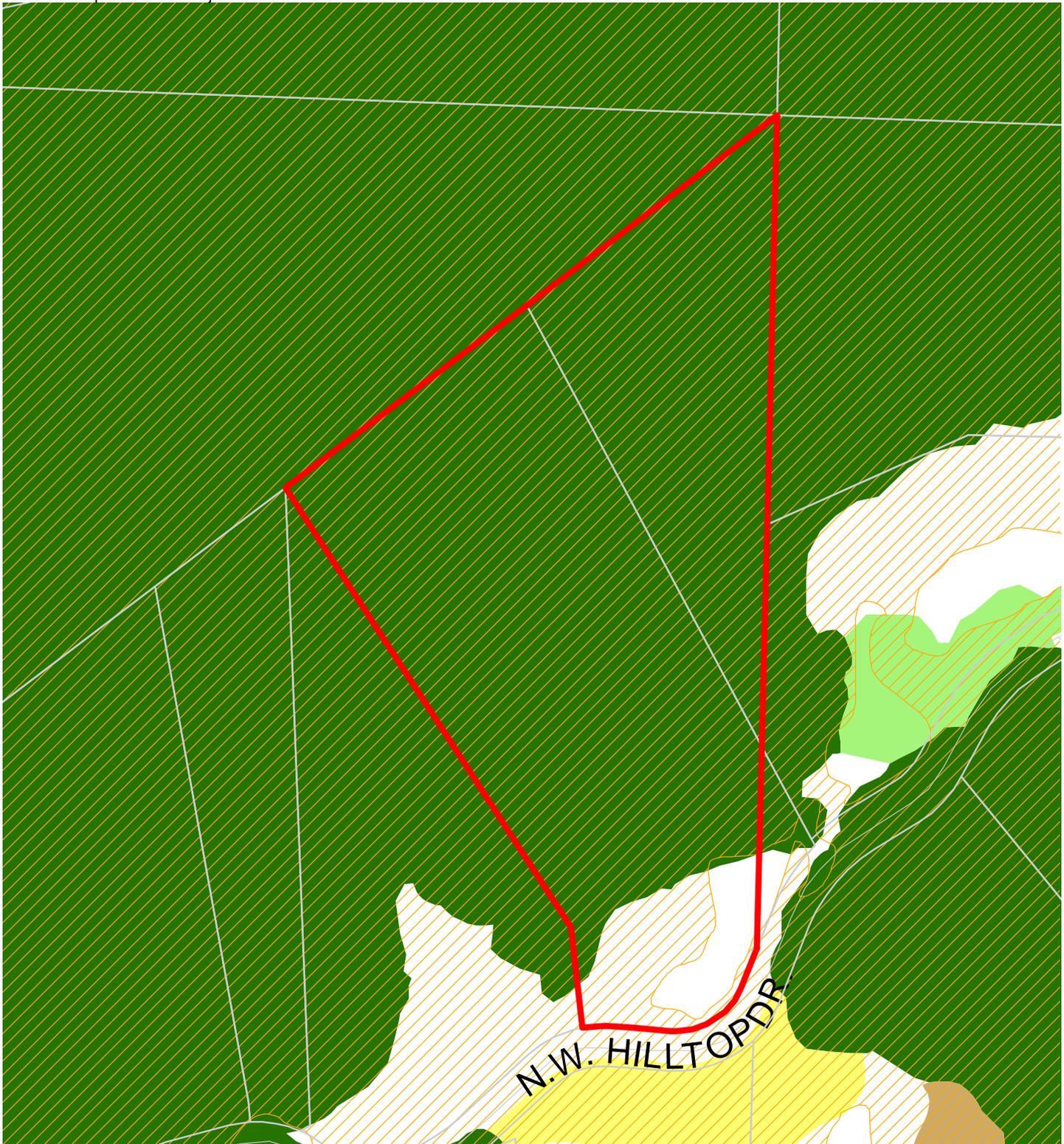
Updated: July 2021



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



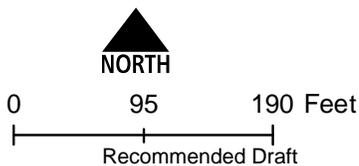
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.
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Map B: Vegetation and Steep Slopes

**Resource Site:
FP40**

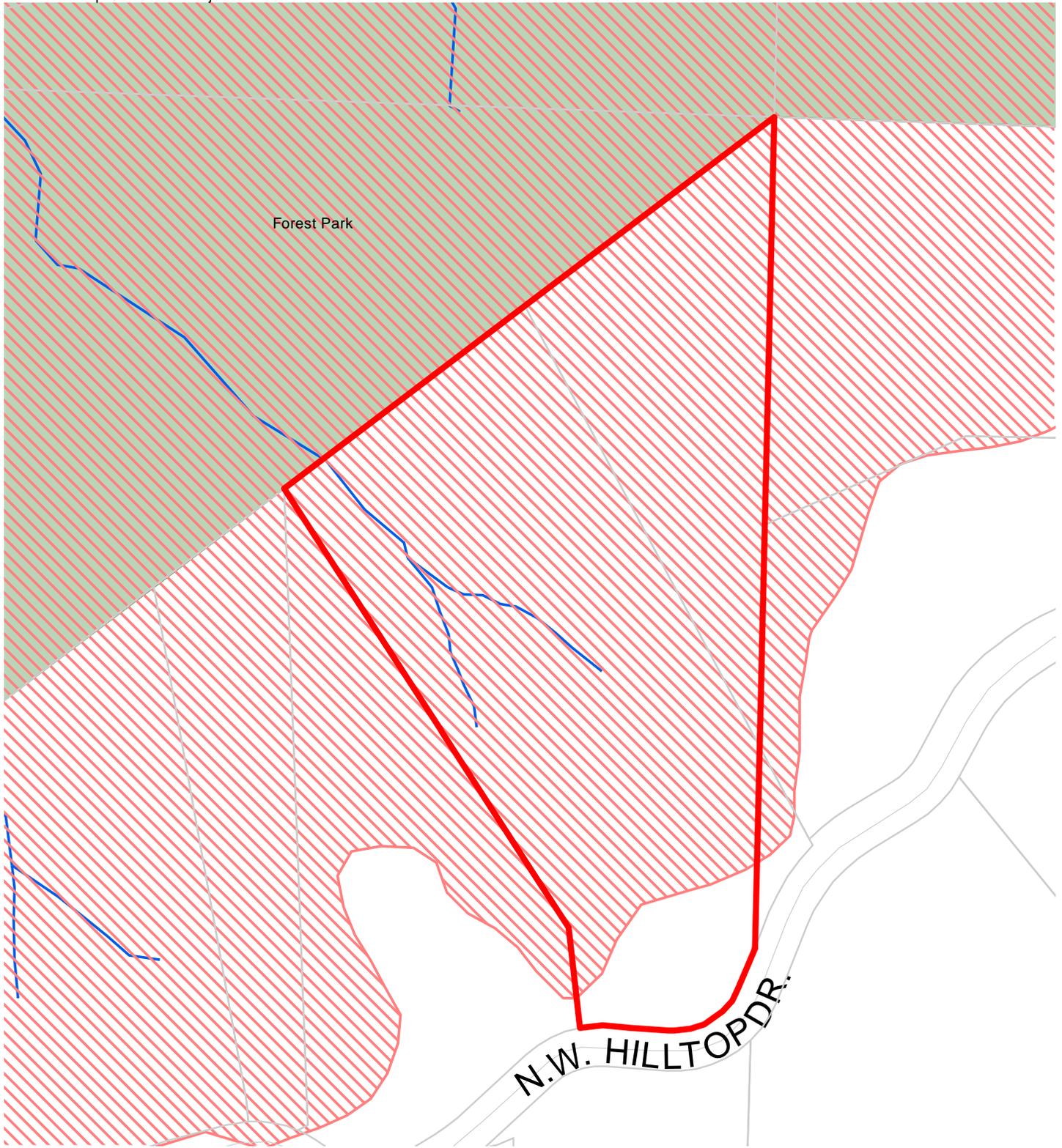
Updated: July 2021



-  Resource Sites
-  Urban Service Boundary
-  Taxlots
-  Slopes >25%
-  Forest
-  Woodland
-  Shrubland
-  Herbaceous

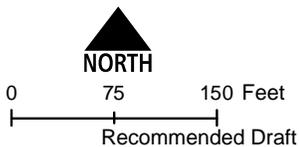


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**Map C: Special
Habitat Areas**
**Resource Site:
FP40**

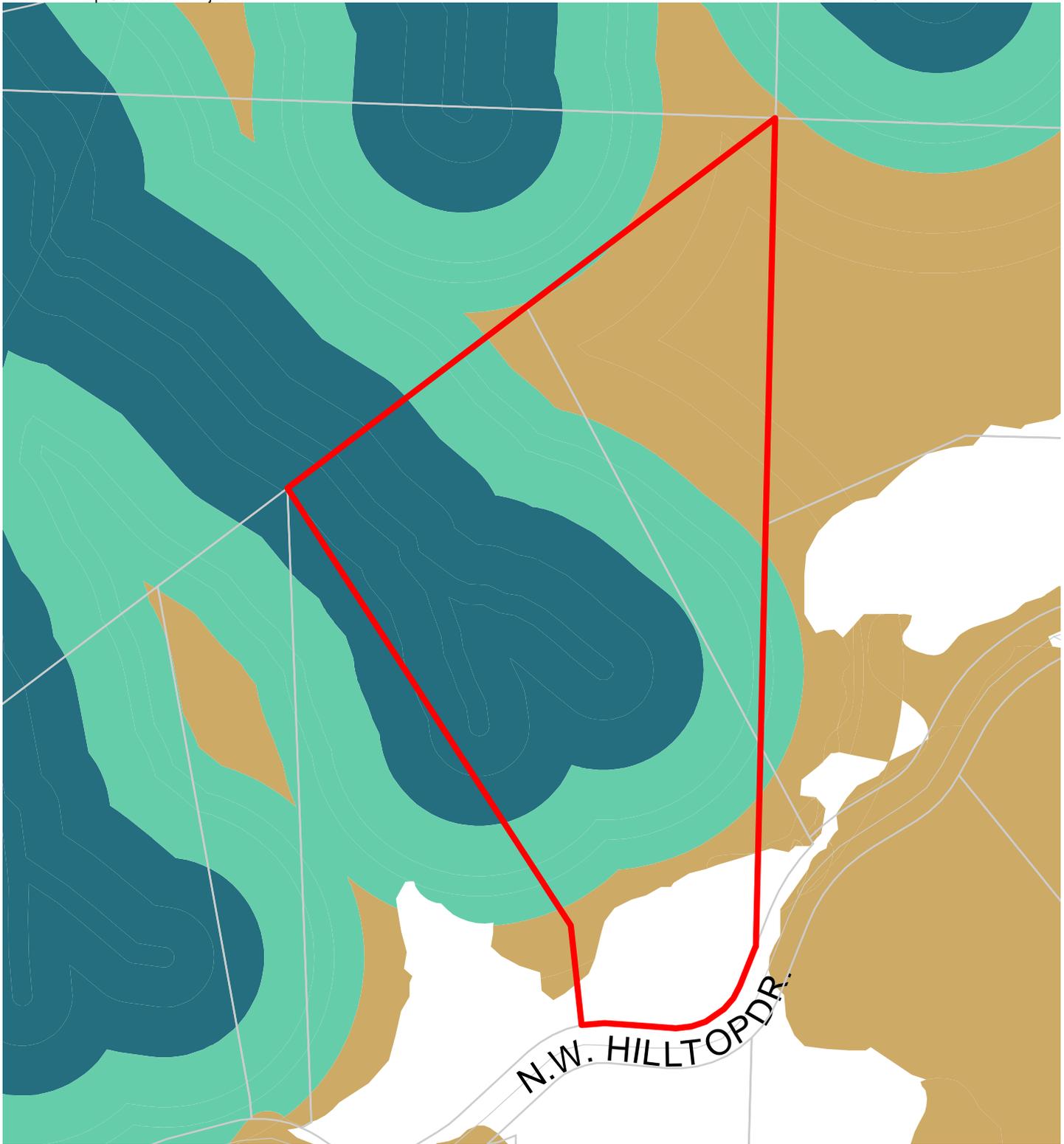
Updated: June 2021



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



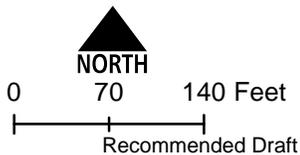
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.
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**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
FP40**

Updated: July 2021

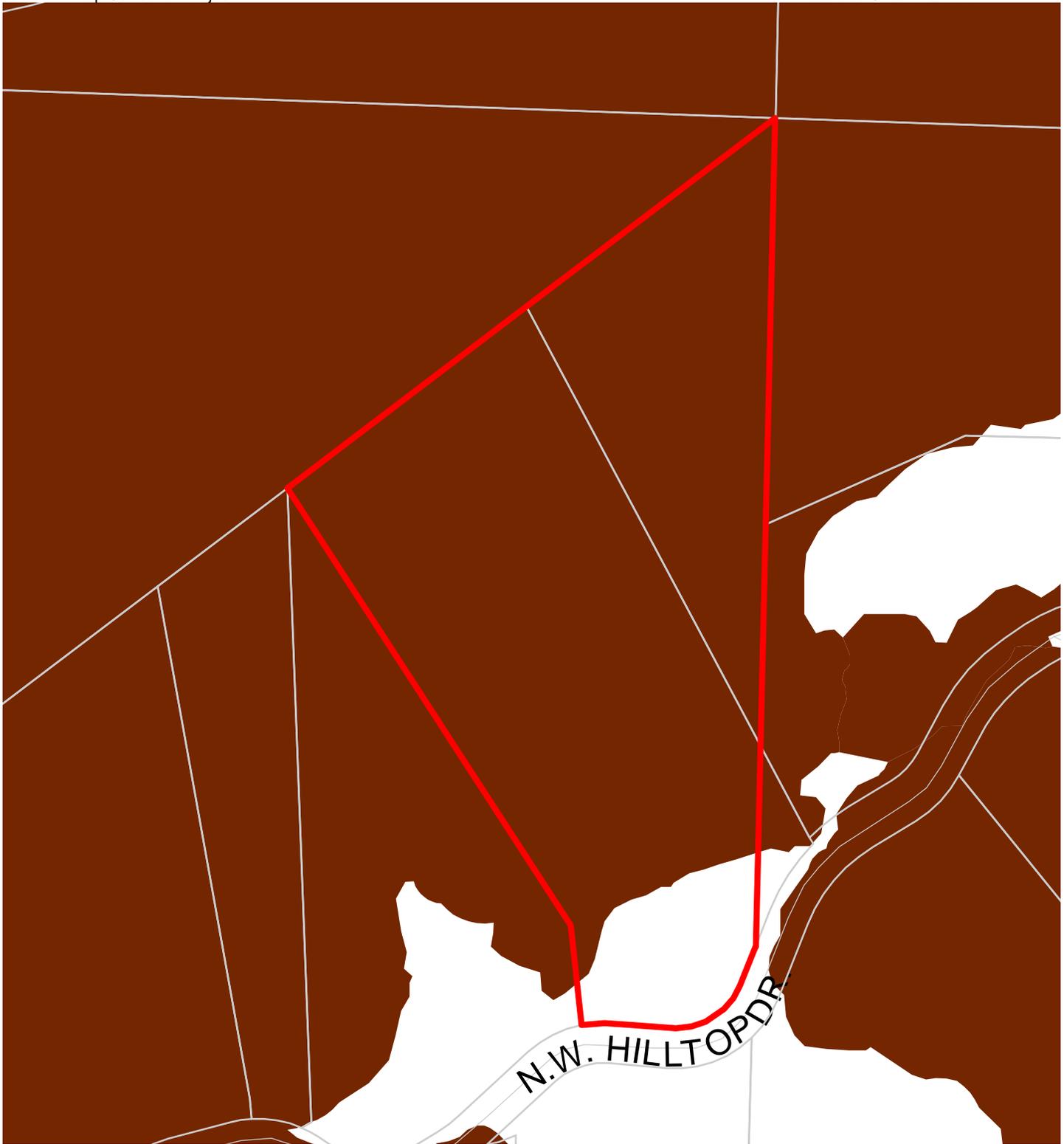


-  Resource Sites
-  Class I (high rank)
-  Class II (medium rank)
-  Class III (low rank)
-  Urban Service Boundary
-  Taxlots



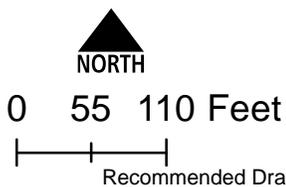
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**Map E: Wildlife
Habitat Classification**
Resource Site:
FP40

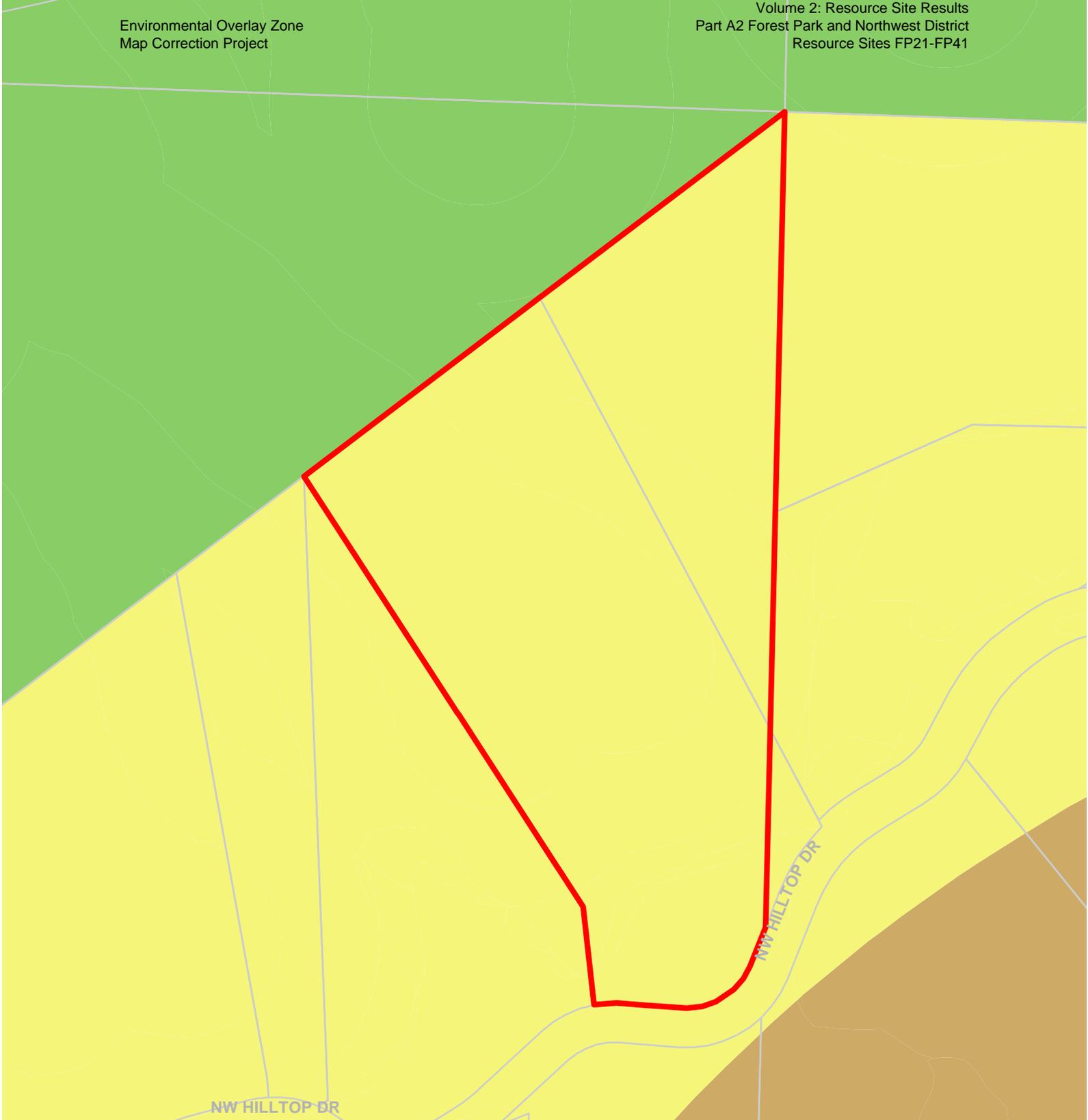
Updated: July 2021



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



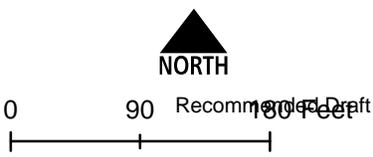
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January 2022



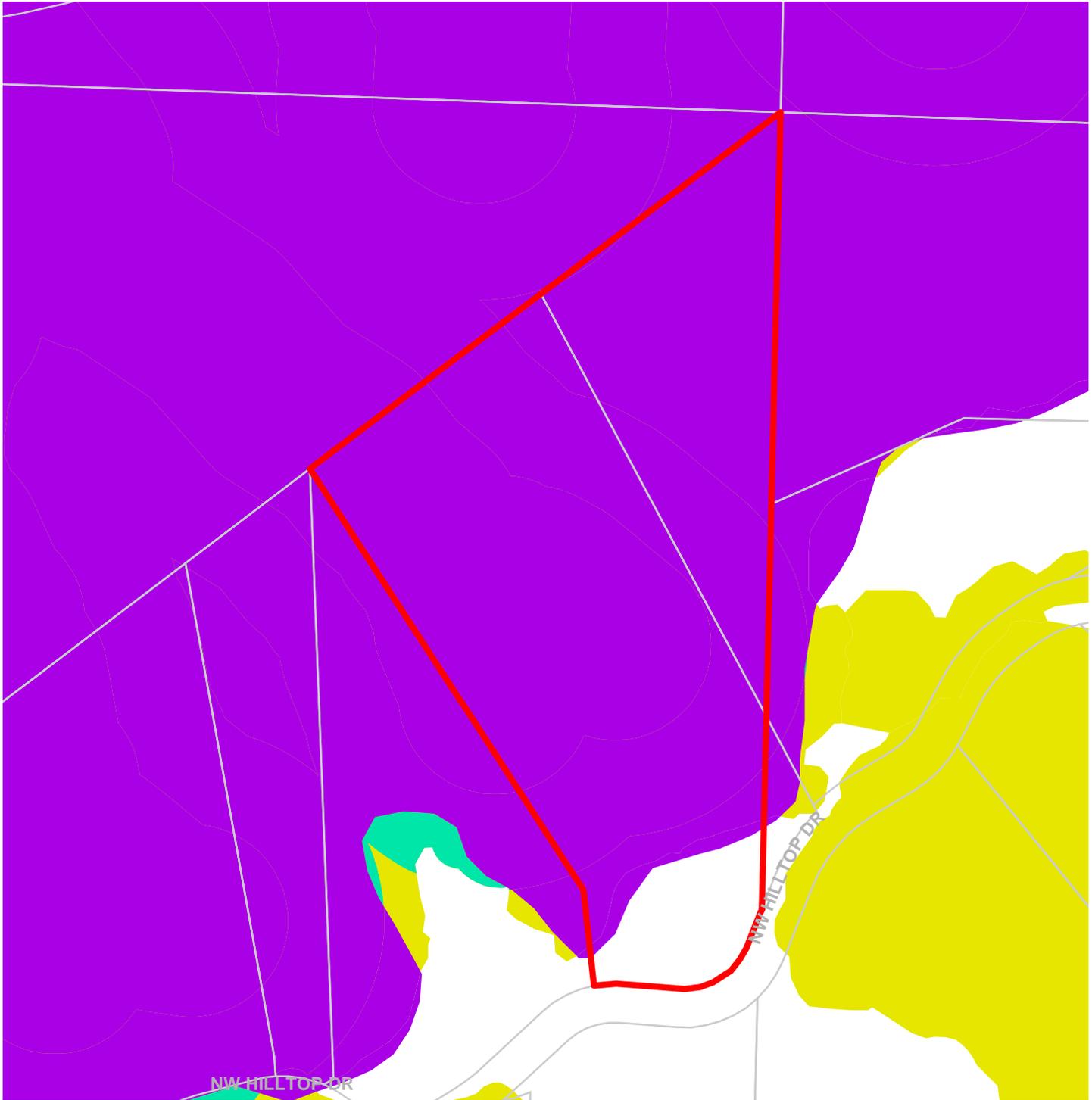
Map F: Urban Development Value (Title 13)
Resource Site: FP40

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

Updated: July 2021



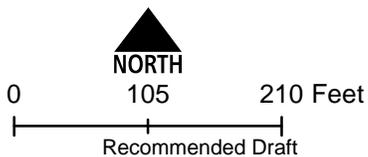
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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: FP40

Updated: July 2021

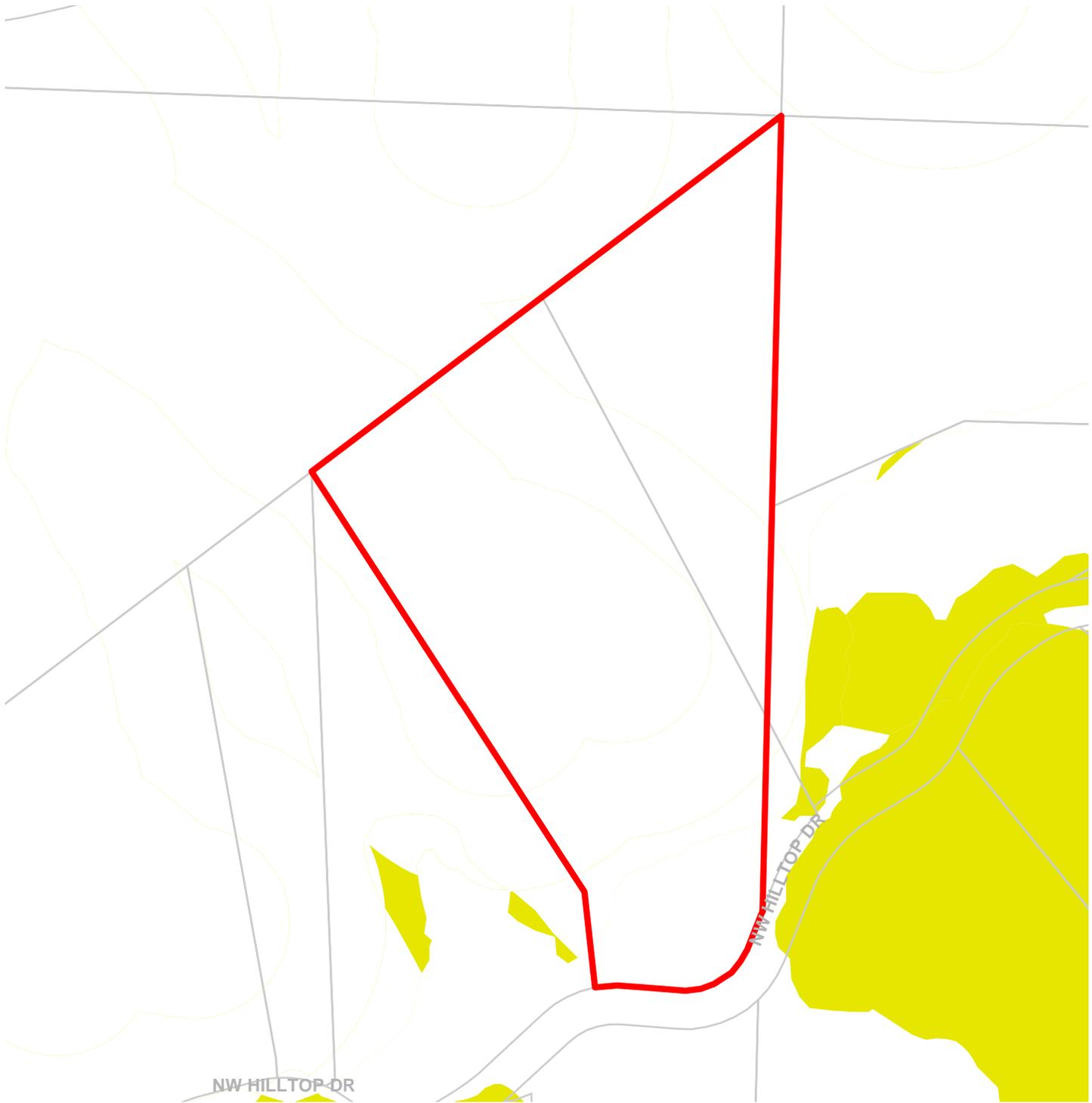


-  Urban Service Boundary
-  Resource Sites
-  HCA High Value
-  HCA Moderate Value
-  HCA Low Value
-  Goal 5 Significant Natural Resources



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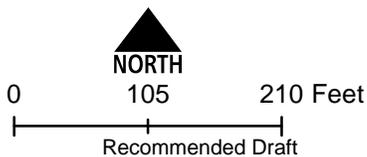
January 2022



Map H: Goal 5 Resources

Resource Site: FP40

Updated: July 2021

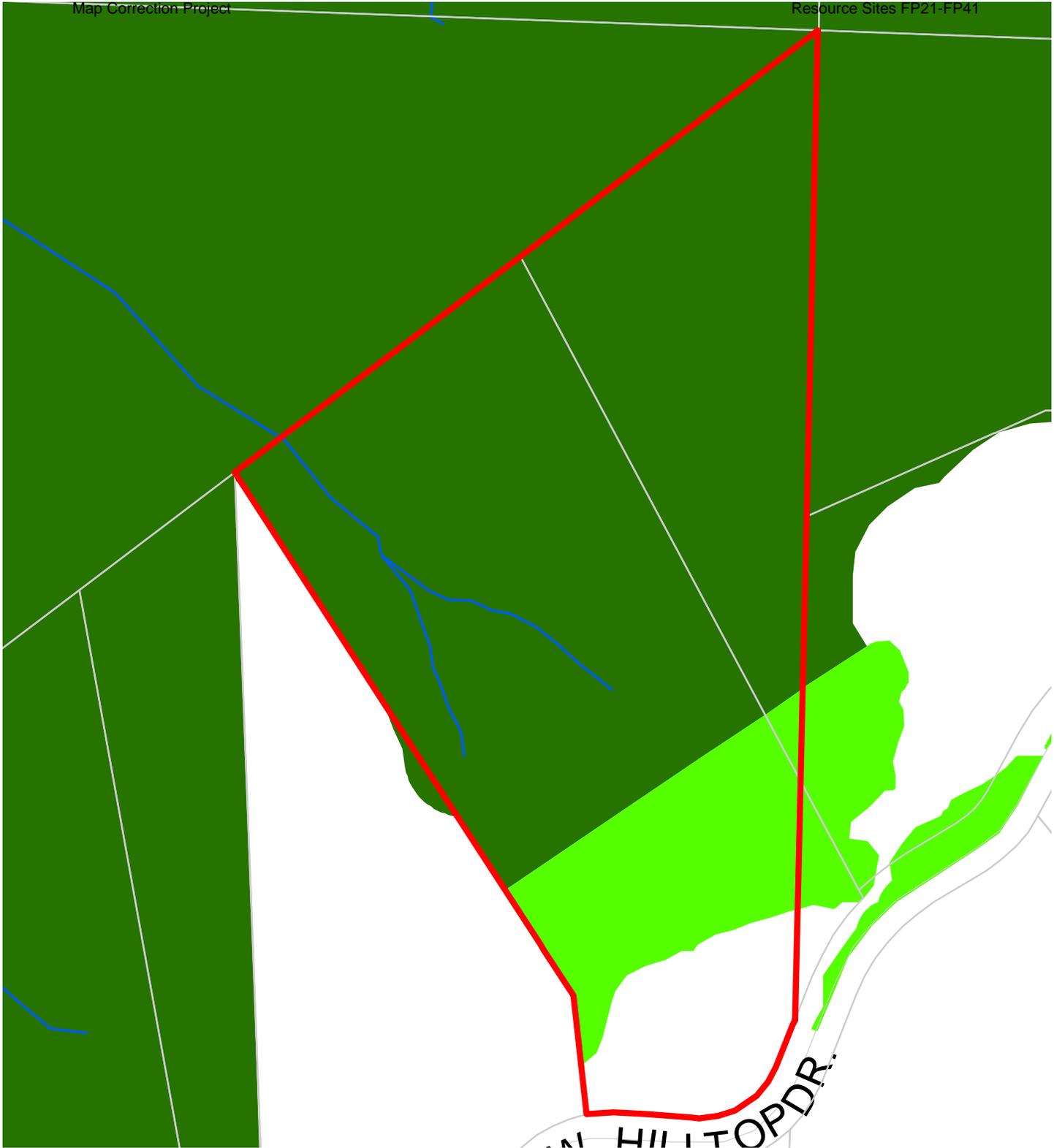


- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



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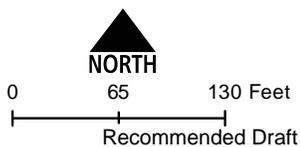
January 2022



Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site: FP40

Updated: January 2022



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



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January 2022

Natural Resource Description

Within resource site FP40 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 FP40	
	Study Area
Stream (Miles)	0.1
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	5.2
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)**	5.6
* The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area.	
**Slopes are derived from LiDAR. Steep slopes are areas with a slope greater than 25%.	

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

Several small headwater streams of Balch Creek flow through a portion of this site. Resident cutthroat trout inhabit the creek in lower reaches; historically, other species inhabited the drainage as well. Balch and other creeks within the site flow through steep forested ravines, providing wildlife with a protected travel corridor, refuge from high summer temperatures and a permanent source of water. Thick riparian forests protect the creeks and the integrity of their banks and influence the quality of stream habitat located downstream.

Table B: Quality of Natural Resource Functions in Resource Site FP40				
Resource Site (acres) = 6				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	2.0	1.6	1.6	5.2
percent total inventory site area	35.6%	28.4%	27.1%	91.2%
Wildlife Habitat*				
acres	5.2	0.0	0.0	5.2
percent total inventory site area	91.2%	0.0%	0.0%	91.2%
Special Habitat Areas**				
acres	5.3			
percent total inventory site area	92.4%			
Combined Total⁺				
acres	5.2	0.0	0.0	5.2
percent total inventory site area	91.2%	0.0%	0.0%	91.2%
* 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 site FP40, 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 FP40			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
5.7	0.1	0.0	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 FP40. 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 FP40 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 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 FP40, 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 the resource site-specific evaluation for FP40, 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 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.
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.

The Natural Resource Protection Decisions listed above reflect a proposed amendment that will be presented to City Council. Both the Ezone Computer Model and the Natural Resource Protection Decisions that are listed for FP40 in Volume 1 Page 140 apply a p zone to all forest vegetation contiguous to streams. In the Proposed Draft - As Amended, protection decisions only applied 'p' zone to forest vegetation within 100 feet of streams, which was in conflict with Volume 1 and the computer program.

Resource Site No.: FP41 **Resource Site Name:** Upper Hilltop Dr.

Previous Plan: Balch Creek Watershed Protection Plan

Previous Resource Site No.: 79

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

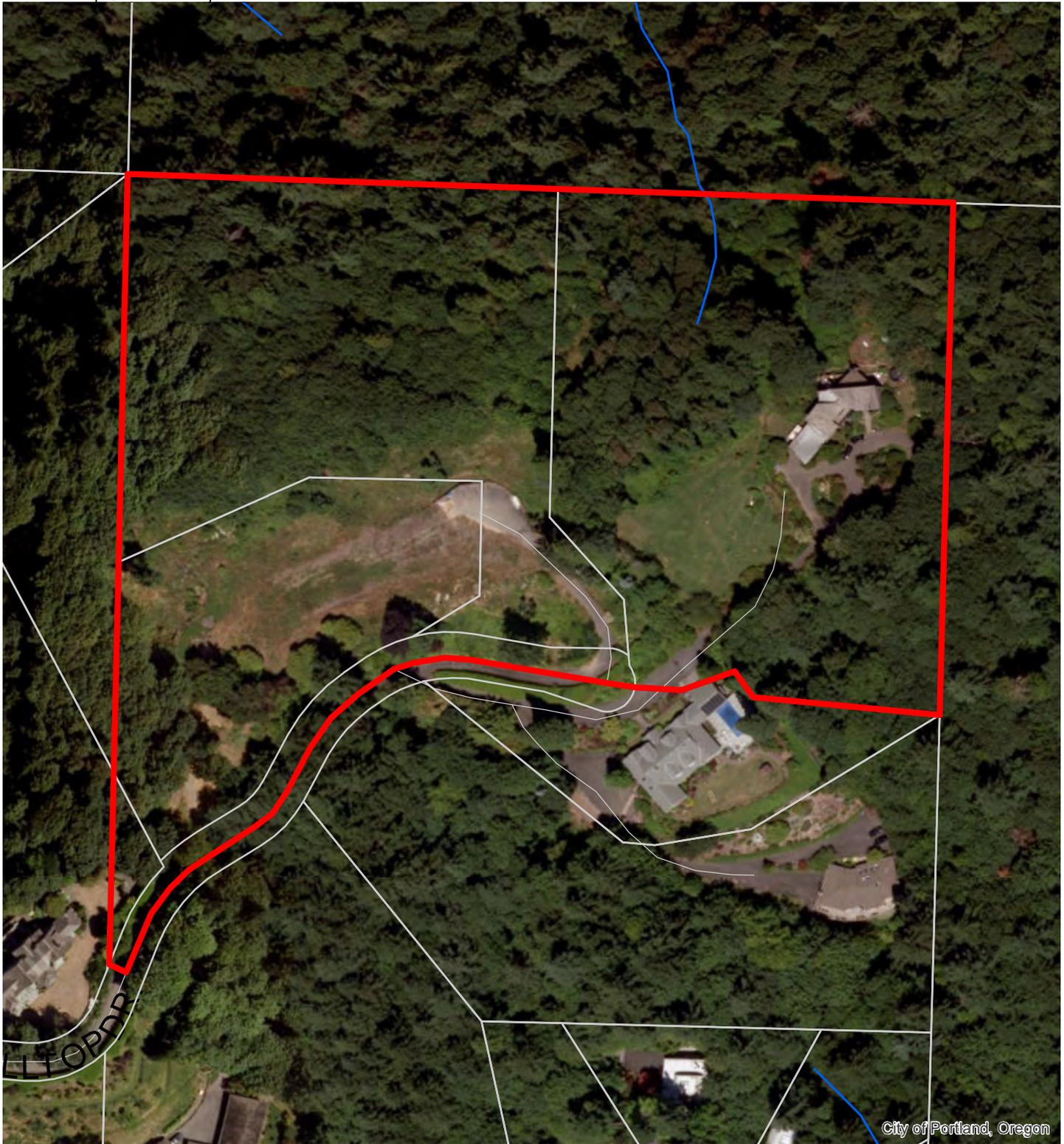
- A. Water Features – rivers, streams, wetlands and flood areas
- B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
- C. Special Habitat Areas
- D. Riparian Corridor Classifications
- E. Wildlife Habitat Classifications
- F. Urban Development Value
- G. Metro Title 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 FP41 includes the following:

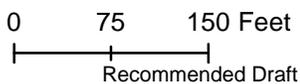
Site (acres)	11.2
Base zones (acres)	
R20	0.0
RF	11.2



City of Portland, Oregon

Map A: Water Features
Resource Site: FP41

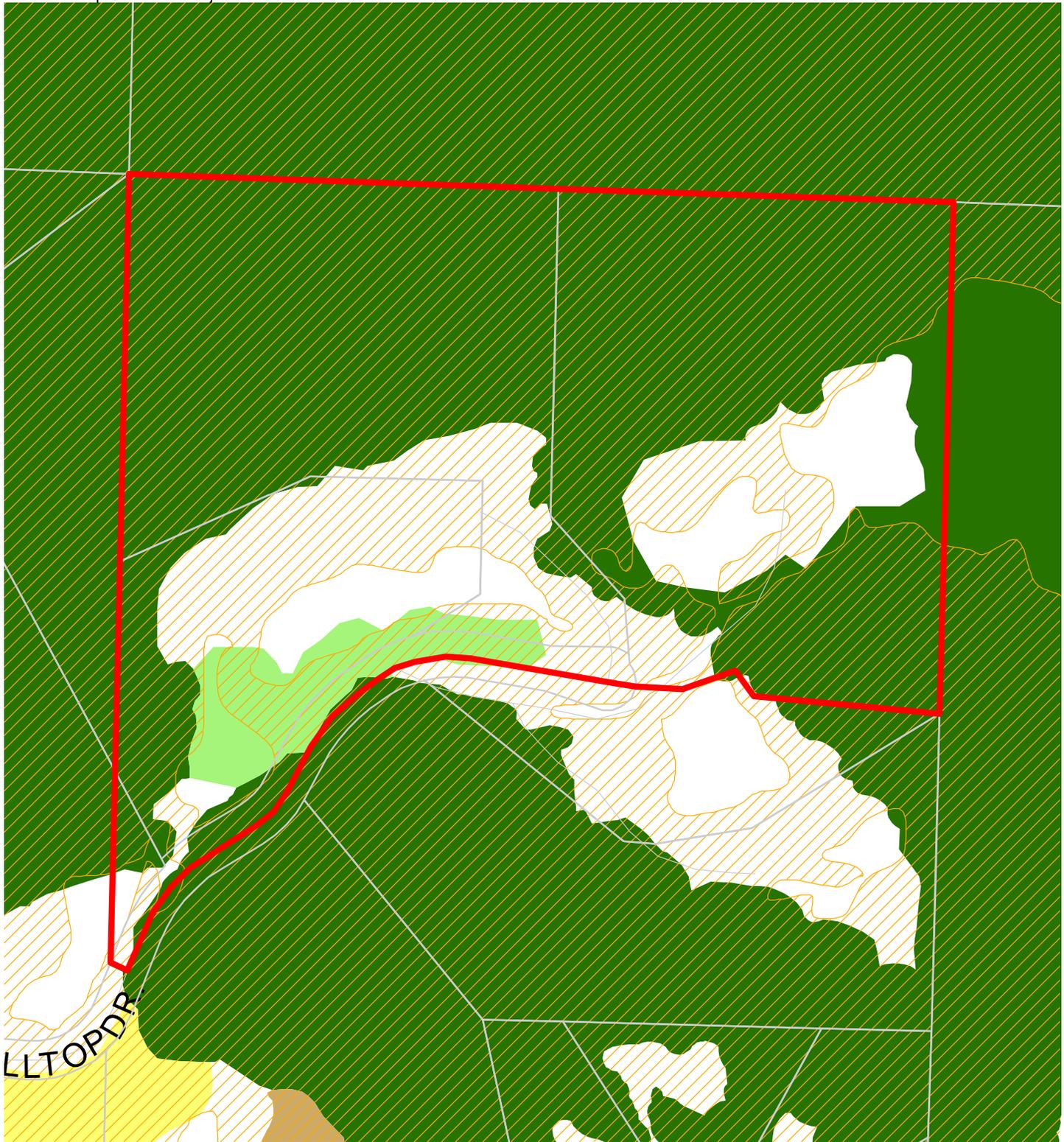
Updated: July 2021



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



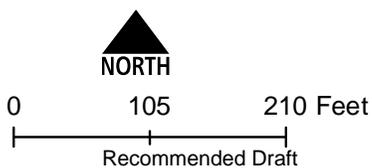
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Map B: Vegetation and Steep Slopes

**Resource Site:
FP41**

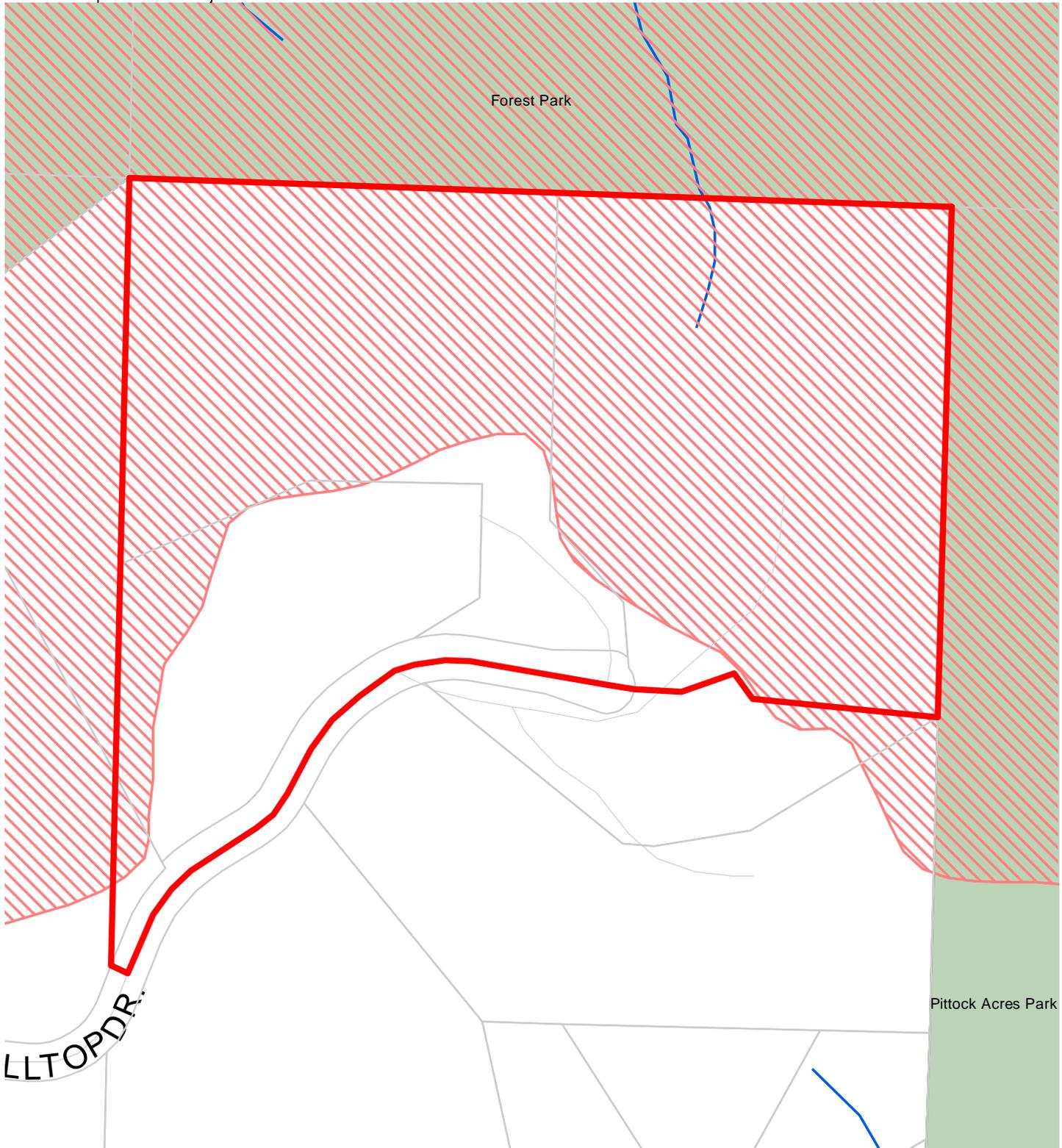
Updated: July 2021



- Resource Sites
- Urban Service Boundary
- Taxlots
- Slopes >25%
- Forest
- Woodland
- Shrubland
- Herbaceous

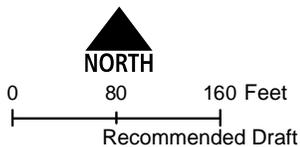


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January 2022



**Map C: Special
Habitat Areas**
**Resource Site:
FP41**

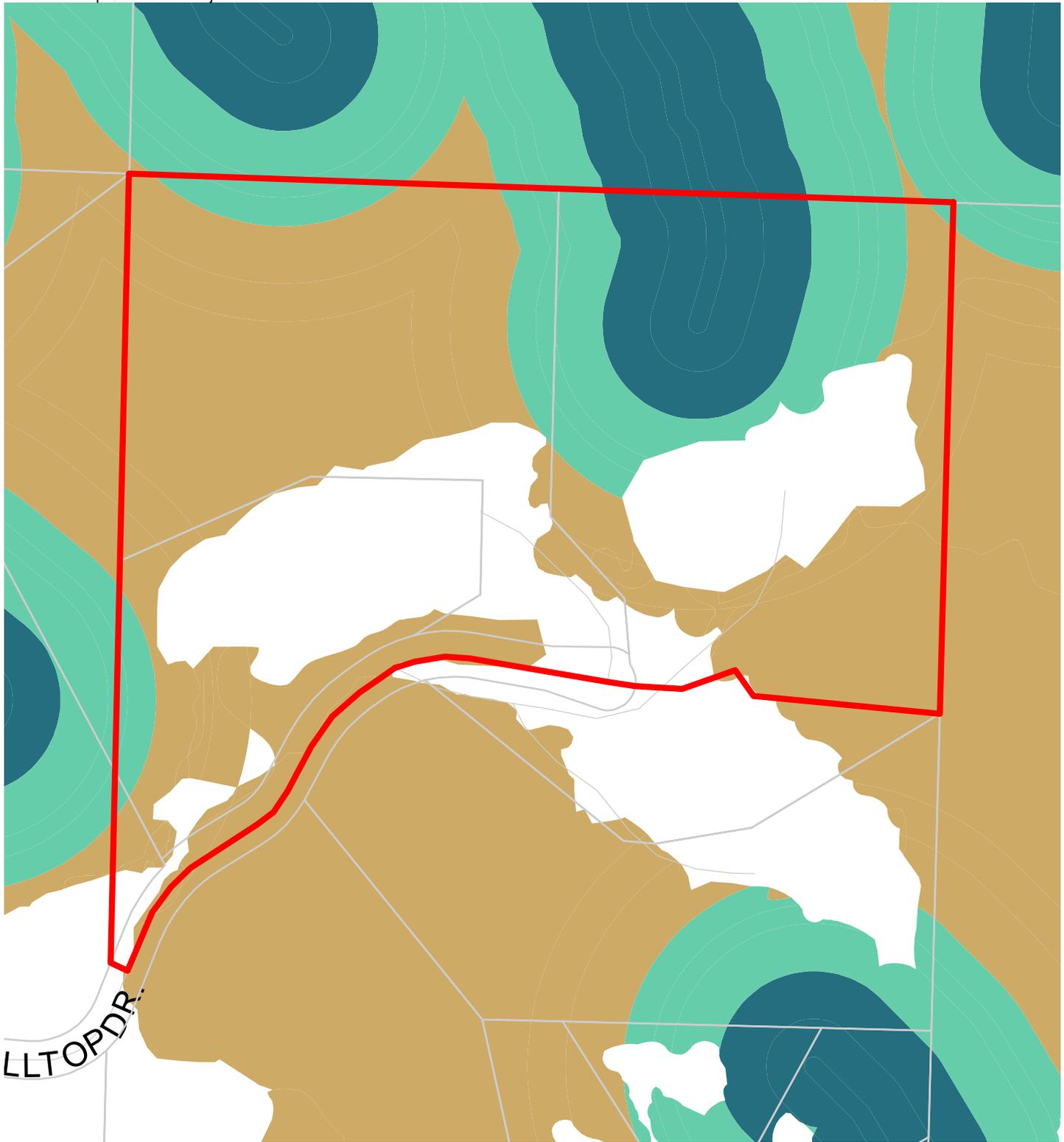
Updated: June 2021



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



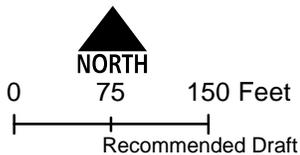
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January 2022



**Map D: Riparian
Corridors Habitat
Classification**

**Resource Site:
FP41**

Updated: July 2021



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



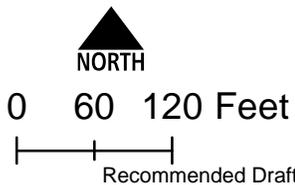
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: 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.

January 2022



**Map E: Wildlife
Habitat Classification
Resource Site:
FP41**

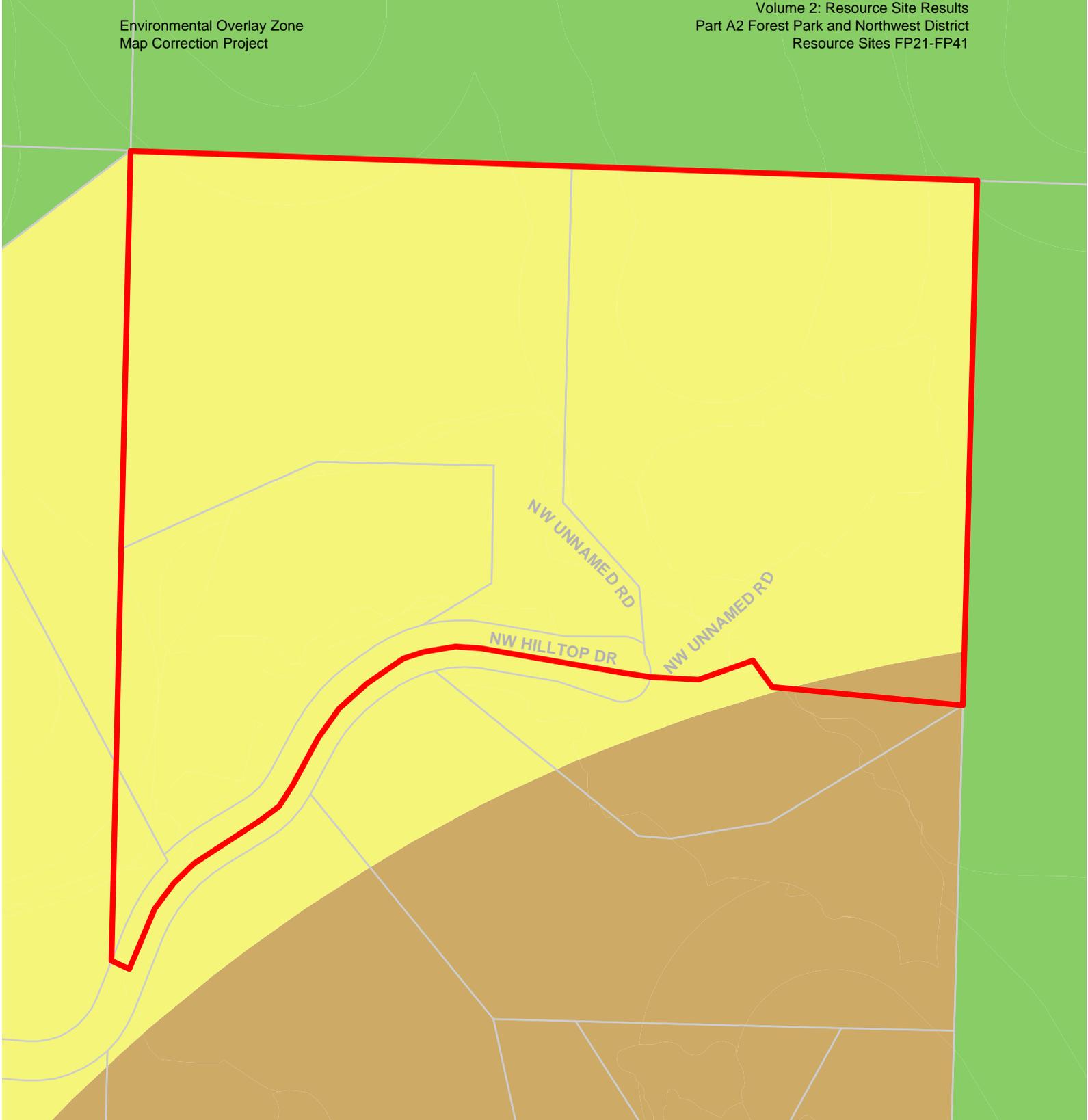
Updated: July 2021



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



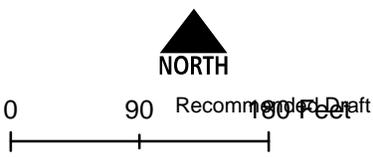
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Map F: Urban Development Value (Title 13)
Resource Site: FP41

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

Updated: July 2021



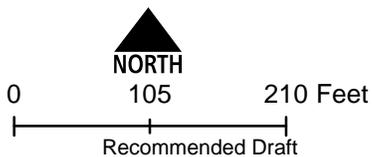
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Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: FP41

Updated: July 2021



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



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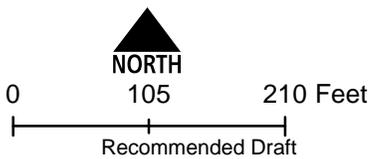
January 2022



Map H: Goal 5 Resources

Resource Site: FP41

Updated: July 2021

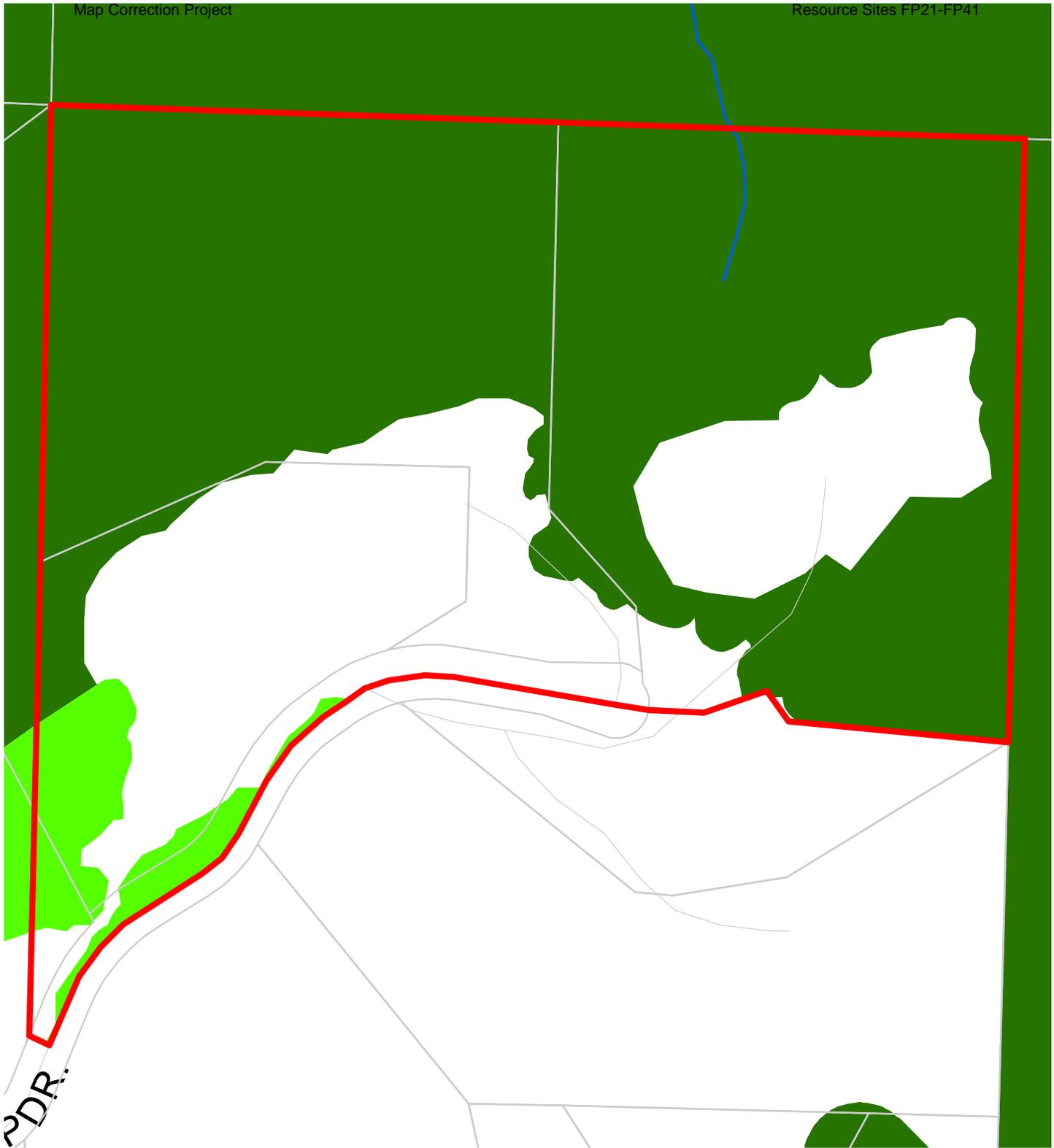


- Urban Service Boundary
- Resource Sites
- Goal 5 Significant Natural Resources



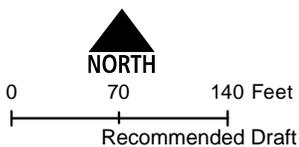
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January 2022



Map I: DRAFT Proposed Environmental Overlay Zones
Resource Site: FP41

Updated: January 2022



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



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January 2022

Natural Resource Description

Within resource site FP41 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 FP41	
	Study Area
Stream (Miles)	0.0
Wetlands (acres)	0.0
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	7.5
Woodland (acres)	0.7
Shrubland (acres)	0.0
Herbaceous (acres)	0.0
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	9.6
* The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area.	
**Slopes are derived from LiDAR. Steep slopes are areas with a slope greater than 25%.	

One small headwater stream of Balch Creek originates in a portion of this site. Resident cutthroat trout inhabit the creek in lower reaches; historically, other species inhabited the drainage as well. The headwater stream flows through steep forested ravines, providing wildlife with a protected travel corridor, refuge from high summer temperatures and a permanent source of water. Thick riparian forests protect the creeks and the integrity of their banks and influence the quality of stream habitat located downstream. The trees on steep slopes help maintain slope stability, reducing the risk of landslides and erosion. The trees also capture and use rainwater, reducing overland flow that contributes to stream bank erosion and downstream flooding.

Table B: Quality of Natural Resource Functions in Resource Site FP41				
Resource Site (acres) = 11				
	Class 1/A	Class 2/B	Class 3/C	Total
Riparian Corridors*				
acres	1.0	1.7	5.4	8.1
percent total inventory site area	9.0%	14.9%	48.3%	72.1%
Wildlife Habitat*				
acres	8.2	0.0	0.0	8.2
percent total inventory site area	73.0%	0.0%	0.0%	73.0%
Special Habitat Areas**				
acres	8.3			
percent total inventory site area	73.9%			
Combined Total⁺				
acres	8.2	0.0	0.0	8.2
percent total inventory site area	73.0%	0.0%	0.0%	73.0%
* 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 FP41, 3.0% 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 FP41			
Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
11.2	0.6	0.3	3.0%

*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 FP41. 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 FP41 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 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 FP41, 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 the resource site-specific evaluation for FP41, 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 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 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.

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.