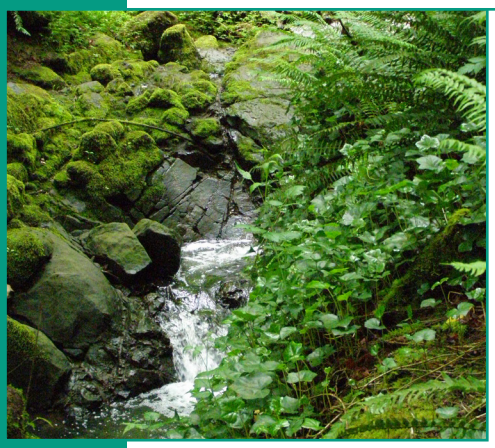
ENVIRONMENTAL OVERLAY ZONE MAP CORRECTION PROJECT



VOLUME 2, PART D:

Fanno Creek, Natural Resources Inventory and Protection Decisions

PROPOSED DRAFT, AS AMENDED

July 2021

THE BUREAU OF
PLANNING &
SUSTAINABILITY

How to Testify

You may submit comments to the Portland Planning and Sustainability Commission on the Environmental Overlay Zone Map Correction Project Proposed Draft – As Amended in the following ways:

Use the Map App:
Go to www.portlandmaps.com/bps/mapapp
Click on "Ezone Project" and then click the "Testify" button.

By U.S. Mail
Planning and Sustainability Commission
Ezone Map Correction Project Testimony
1810 SW 5th Ave, Suite 710
Portland, OR 97201

In person at the public hearings
The hearing on August 24, 2021 will be held virtually. The meeting starts at 5 p.m. Please check the PSC calendar at *www.portland.gov/bps/psc/events* a week in advance to confirm the time of this agenda item. You can use a computer, mobile device or telephone to testify during the hearing.

To testify during the hearing, please visit the project website to register: *www.portland.gov/bps/ezones*. You will receive a confirmation email containing information about joining the virtual hearing. The deadline to sign up for the August 24 hearing is Monday, August 23 at 4:00 p.m. Individuals have two minutes to testify, unless otherwise stated by the Commission Chair at the meeting.

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 BUREAU OF **PLANNING & SUSTAINABILITY**

Core Team

Mindy Brooks, Environmental Planner, Project Manager
Daniel Soebbing, City Planner
Neil Loehlein, GIS Analyst
Marc Peters, Environmental Specialist (BES)
Chad Smith, Environmental Specialist (BES)
Matt Vesh, Environmental Specialist (BES)
Xanthia Wolland, Intern

Contributing Staff

Shannon Buono, Eden Dabbs, Krista Gust, Carmen Piekarski, Derek Miller

Bureau of Environmental Services: Kaitlin Lovell, Marie Walkiewicz, Paul Ketcham, Jennifer Antak, Heidi Berg, Ethan Brown, Melissa Brown, Lisa Moscinski, Darian Santer, Naomi Tsurumi, and Christa Von Behren

Bureau of Parks and Recreation: Brett Horner, Laura Lehman, Emily Roth, Katie Dunham, Kendra Peterson-Morgan, Laura Guderyahn, Christian Haaning, Marshall Johnson, Steve Lower, Nathan Schulte and Becca Shivelly

Bureau of Development Services: Stephanie Beckman and Morgan Steele

Consultants: Barney & Worth, facilitation services

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A. INTRODUCTION

Volume 2, Part D, includes the results for Fanno Creek 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.

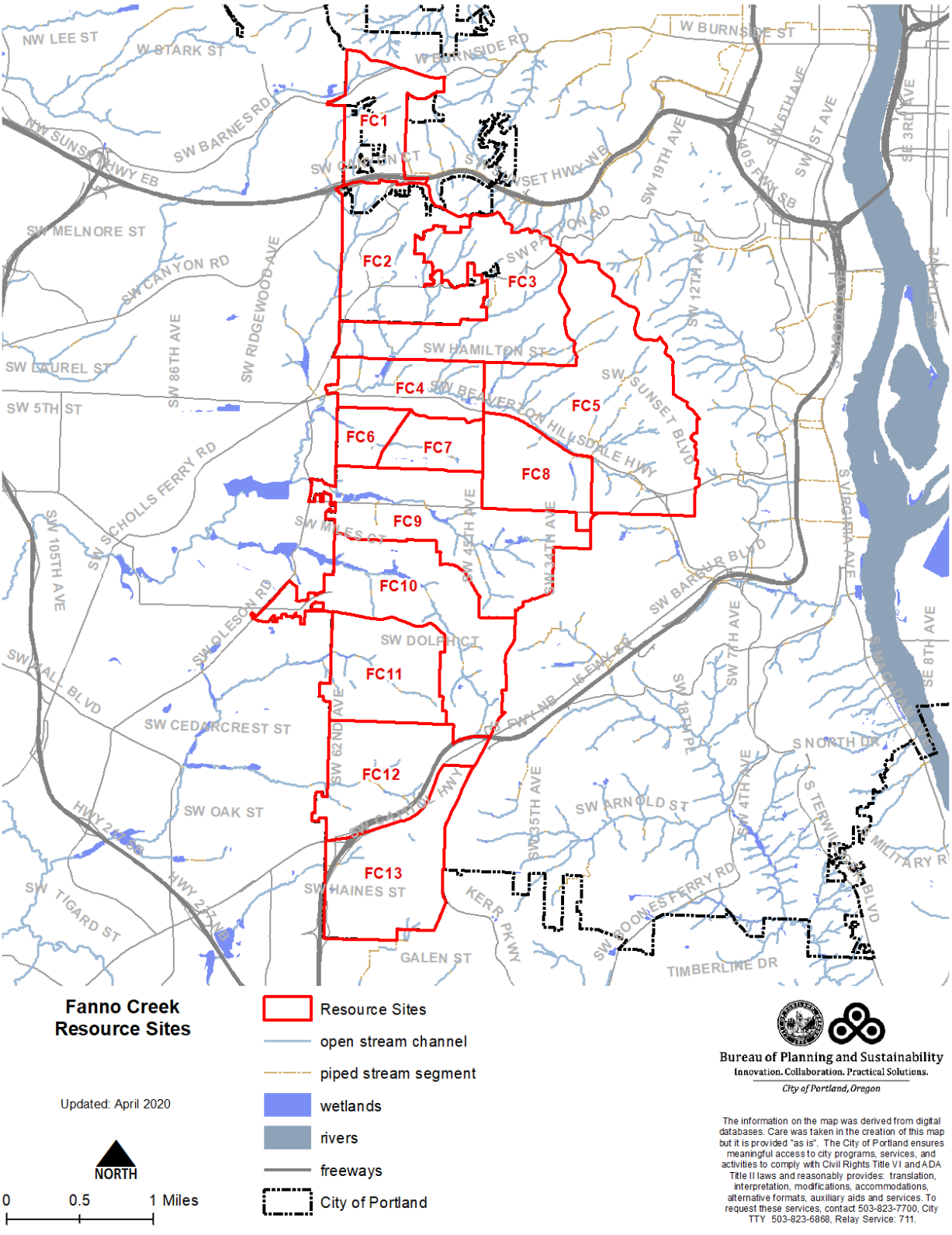
Area Descriptions

Volume 2, Part D, 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 document in in Volume 3, Natural Resources Inventory. The methodology to verify the classifications is documented in Volume 4, 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.



Map 1: Fanno Creek Watershed Resource Geography

Habitat Conservation Area and ESEE Decision Maps

Metro Title 13 requires confirmation of Habitat Conservation Areas. The methodology used to determine Habitat Conservation Areas is documented in Volume 4, 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 4, 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 4. The natural resource protection requirements are summarized, and recommendations are made for each Resource site. For natural resources that are not a Title 13 Habitat Conservation Area, the general ESEE analysis and recommendations are affirmed, clarified or modified based on resource site-specific information. An ESEE decisions is made and describes the significant natural resource features and functions to 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 Fanno Creek 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 4 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 4) 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 is 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. Fanno Creek Natural Resources

Fanno Creek drains 20,259 acres of land including parts of west Portland, Beaverton, Tigard, and portions of Washington and Clackamas Counties. 22% of the watershed is within the City of Portland, including the Bridlemile, Hayhurst, and Hillsdale Neighborhoods. Smaller tributary streams such as Ash, Pendleton, Restoration, Ivey, Vermont, Ball, Woods, Sylvan, and Red Rock Creeks all flow into Fanno Creek before it empties into the Tualatin River at Durham City Park in Tualatin.

Within Portland, the primary land use in the watershed is single-family residential housing, with some parks and open space. Historically, the watershed was heavily wooded in its upper reaches with a mixture of woods and wet meadows in its lower sections. Since the 1940s it has become increasingly developed.

The Fanno Creek mainstem runs adjacent to the Beaverton Hillsdale Highway, where commercial development and transportation routes create a high amount of impervious surfaces (roads, roofs and parking lots). These surfaces contribute to increased stormwater runoff volumes and velocities that can cause stream bank instability, erosion, in-stream sedimentation, and channel incision.

E.1.a. Geology

The Fanno Creek Watershed is on the southeast slope of the Tualatin Mountains. In Portland these mountains are commonly known as the West Hills. Portland's West Hills are composed mostly of three primary geologic units: 1) Columbia River Basalt, 2) Boring Lava, and 3) Portland Sands. Within the Tualatin Mountain range there are remnant volcanoes with igneous rock that began as lava, and then fractured as it cooled. It usually has a medium gray to black color, and as it weathers its surface can turn brown and red (a crust of iron and manganese oxides) while the inside of the rock may remain black. In a tropical climate basalt can break down into a red clay called laterite. Portland enjoyed a tropical-like climate about 50,000 years ago, and much of the Columbia River Basalt was exposed during that time. This explains why patches of brown and red clay are so common in the West Hills and why Columbia River Basalt is the most common geologic unit in the Portland area. Its formation began during the Miocene period (10+ million years ago) when lava poured from fissures in the earth's crust.

Boring Lava occurs on the west flank of the Portland Hills, and Portland Sands are found in the lower Fanno Creek Watershed and the Tualatin River floodplain. Another geologic unit, Portland Hills Silt, occurs primarily above the 600 feet-foot elevation level.

Red, brown, and black basalt flows are exposed in many of the watershed's ravines. In other places the basalt is covered by about 25 feet of wind deposited silt. Since basalt fractures when

it cools, it stores water in honey-combed shaped spaces between the rock. Underground streams flowing through these cracks are called aquifers and is the reason why springs are common in areas of exposed basalt. Fractures and faults in the West Hills are also associated with severe landslide hazards because soil that is saturated, but not consolidated, amplifies the motion of any movements within the earth's crust.

E.1.b. Soils

Fanno Creek watershed soils are composed mostly of silts and clays. The USDA Natural Resources Conservation Service (NRCS) has identified five soil types (Cascade, Cornelius, Delena, Goble, and Saum) in the watershed. Prior to urban development, almost 95 percent of Portland's portion of the Fanno Creek Watershed was composed of Cascade Silt-loam. This is a wind-deposited soil that is highly erodible and does not easily absorb storm water. This topsoil is over a harder layer of soil called a "fragipan." Water does not readily soak down through the fragipan layer, and plant roots have a hard time growing through it. As a result, the top two to five feet of soil become saturated during periods of consistent rainfall, causing aquifers to perch on fragipans during the winter. Erosion potential is high, large volumes of storm water run-off are produced, and landslides can result if hillsides are not adequately vegetated. In the steep headwaters of Fanno Creek forested areas can hold soil in place, but even in well vegetated sites there is still a high natural rate of soil erosion. This rate is about three tons, per acre, per year.

E.1.c. Topography and Surface Water

The Fanno Creek Watershed is generally characterized by steep slopes and steep stream gradients. Fanno Creek drains the southwest portion of the Tualatin Mountains, and the highest portion of the watershed is 1,060 feet above sea level at Council Crest. The upper portion of the watershed contains streams in deep ravines, with some of the upper streams dropping more than 400 feet in elevation per mile traveled. The physiographic characteristics of the watershed and its soil types affect the stream systems in terms of channel incision, undercutting of stream banks, landslides, and exposed sewer pipes.

Urbanization in the Fanno Creek Watershed has caused increased runoff from impervious surfaces, resulting in higher flow velocities in stream channels and a more rapid rise in streamflow during storm events. This "flashiness" in hydrology weakens bank stability, resulting in erosion and loss of riparian vegetation (Booth 1991). Channelization of many reaches of Fanno Creek and its tributaries, such as the reach adjacent to SW Beaverton-Hillsdale Highway, places greater erosive force on areas immediately downstream. This causes a much higher velocity than would have occurred in the natural meandering pattern of the creek. Confinement of the creeks also causes downcutting, resulting in deeply incised channels and sediment loss from undercut banks.

Significant flooding in the Fanno Creek Watershed occurred in December of 1977, putting portions of SW 56th, SW 60th, SW Olsen Road, and SW Beaverton-Hillsdale Highway under water. Increased urbanization makes severe flooding more likely, and some stream segments flow to culverts and pipes that are too small to pass large storm events. Modeling of surveyed sections of Fanno Creek and limited portions of Vermont Creek and Columbia Creek (a small tributary to Fanno Creek) confirmed that a number of culverts are undersized for the design storms.

There are approximately 23 miles of open stream channel in the Fanno Creek Watershed, with an approximate 5 additional miles of streams in culverts or pipes. Fanno Creek and many of its tributaries originate in southwest Portland and flow west as they leave the Portland City limits. The main-stem begins near the intersection of SW 25th Avenue and SW Beaverton-Hillsdale Highway and flows in a westerly direction along the north side of SW Beaverton-Hillsdale Highway. This mainstem is supplemented by several small streams in deep ravines flowing from the north and east. Small creeks flow in underground culverts through fills in SW Hewett, Patton, Hamilton, Scholls Ferry, Shattuck, and Dosch Roads. Four other small streams, all east of SW Forty-fifth Avenue and north of SW Multnomah Boulevard, flow to the north, disappear in culverts under SW Beaverton Hillsdale Highway, then reappear and join the mainstem slightly north of the highway. The mainstem of Fanno Creek drains 1,830 acres within Portland's City limits.

Another set of Fanno Creek tributaries south of SW Beaverton-Hillsdale Highway flow in a westerly direction where they join the mainstem of Fanno Creek beyond the Portland City limits. Some of these tributaries flow parallel to SW Pendelton, Vermont, and Canby Streets. These tributaries flow through culverts crossing under SW Taylor's Ferry Road, SW Multnomah Boulevard, and SW Forty-fifth Avenue. The Woods Creek and South Fork Ash Creek subwatersheds include some land south and east of Interstate 5. Another small watershed (Rock Creek) is south of Interstate 5 and west of Portland Community College's Sylvania Campus. The 515-acre area between the Community College and Interstate-5 appears to be the only part of the Fanno Creek Watershed that does not have a creek that flows year-round.

TABLE 1: Fanno Creek Subwatersheds

Subwatershed	Acres
Fanno Creek Mainstem	1,830.5
Pendleton Creek	230.4
Vermont Creek	758.1
Woods Creek	575.1
North Ash Creek	282.5
South Ash Creek	359.0
Rock Creek	413.1
Sylvan Creek	79.1
Total (Watershed)	**4,528.4**

Pendleton Creek originates near SW Fairvale Court and SW Kanan Street and drains approximately 230 acres within the City's jurisdiction. Pendleton Creek flows west for approximately 0.8 miles and exits the urban services boundary south of SW Beaverton-Hillsdale Highway around SW 65th Avenue. It then continues west until it joins the mainstem of Fanno Creek near the intersection of SW Beaverton-Hillsdale Highway and SW Oleson Road. The upper reaches of the creek are flat or moderately sloped and become steeper at the base of the subwatershed.

Vermont Creek originates east of Gabriel Park and drains an area of approximately 758 acres within the City's jurisdiction. A southern tributary of Fanno Creek, it flows north paralleling SW 45th Avenue, and joins the mainstem near SW 45th Avenue and SW Caldew Street. Vermont Creek then flows west from this confluence for approximately 1.4 miles, exits the City of Portland's urban services boundary west of SW Shattuck Road north of SW Vermont Street, and continues west until it joins the mainstem of Fanno Creek west of SW Oleson Road. The upper portion of the creek, especially the wooded area of Gabriel Park, is characterized by a moderate to steep steam corridor and unstable stream banks. From SW 37th to nearly SW 45th Avenue, the creek was stabilized as part of the Gabriel Park Wet Meadows Project completed in 1993-4. In general, stream segments in the lower portion of the creek below SW 45th are slightly to moderately entrenched and have low sinuosity.

Woods Creek originates near SW Taylors Ferry Road and SW Capital Highway and drains an area of approximately 575 acres within the City's jurisdiction (784 acres total). The creek flows northwest for approximately 1.8 miles, crossing SW Multnomah Boulevard near SW 51st Avenue. It then flows in a westerly direction, exiting Portland approximately 350 feet north of SW Canby Street near SW 64th Place. Woods Creek continues west until it joins the mainstem of Fanno Creek west of SW Oleson Road near The Oregon Episcopal School. The morphology of the stream varies from steep, highly entrenched channels in the upper reaches to moderately entrenched channels with moderate-to-low gradients in the lower segments. Streambank material consists primarily of silty loam and silty clay loam soils. Areas along the stream corridor are relatively undeveloped, with a well-vegetated riparian buffer and a multi-layer tree/shrub canopy. Woods Memorial Park, located within the Woods Creek subwatershed, provides about 33 acres of open space.

North Ash Creek originates near SW Bruegger Street and SW 50th Avenue and drains an area of approximately 282 acres within the City's jurisdiction. The creek flows west for approximately a tenth of a mile until exiting the urban services boundary at SW Dolph Road. Steep or moderate slopes characterize much of the subwatershed.

South Ash Creek originates just west of I-5 near SW 52nd Avenue and drains an area of approximately 359 acres within the City's jurisdiction. Stormwater from sections of I-5 drain into South Ash Creek. The creek flows in a westerly direction and exits the urban services boundary

north of SW Dickson Place before joining Fanno Creek. Steep slopes characterize much of the upper reaches of the subwatershed, especially areas around mainstem tributaries. In general, vegetation along the stream corridor is high (i.e., greater than 25 percent).

Rock Creek originates just south of I-5 near SW Capitol Highway and drains approximately 413 acres within the City's jurisdiction. Stormwater from sections of I-5 drain into Rock Creek. The creek flows in a westerly direction and exits the urban services boundary near SW 64th Avenue before joining Fanno Creek. The subwatershed is relatively flat, however, steep and moderate slopes dominate the western portion around the Creek and its tributaries.

Only a small portion of the overall Sylvan Creek drainage area is within the City of Portland and is generally addressed with the Fanno Creek mainstem.

E.1.e. Vegetation

Extending from the Tualatin Mountains into the Willamette Valley, the Fanno Creek watershed spans two distinct vegetation zones, resulting in a variety of vegetation community types throughout the watershed. The headwaters of the Fanno Creek watershed are in the western hemlock vegetation Zone, with the lower part of the basin extending into the oak-fir zone (Franklin and Dyrness 1988). The western hemlock zone extends throughout the wet, maritime climate of western Oregon, Washington, and British Columbia, and is characterized by the climax species western hemlock (*Tsuga heterophylla*) and western red cedar (*Thuja plicata*), with Douglas fir (*Pseudotsuga menziesii*) as a prominent sub-climax species. The Willamette Valley Province contains grassland as well as oak woodland, dominated by Oregon white oak (*Quercus garryana*) in the canopy. Coniferous forests, riparian forests, shrublands, and wetlands are also found throughout the Willamette Valley Province (Franklin and Dyrness 1988).
As an urban watershed, the vegetation composition of Fanno Creek has been heavily influenced by a history of history of disturbances, primarily from logging and development. In the upper part of the basin in the western hemlock vegetation Zone, the canopy is dominated by Douglas fir, as well as two hardwood species, bigleaf maple (*Acer macrophyllum*) and red alder (*Alnus rubra*). These hardwood trees are early seral species that thrive in riparian areas and other disturbed landscapes and their prominence reflects the history of logging and urbanization in the Fanno Creek watershed. Oregon ash (*Fraxinus latifolia*) can also be found in riparian areas throughout the watershed. Western hemlock and western red cedar do occur throughout the watershed but are not as common as is typical of undisturbed forests in the western hemlock vegetation zone, both because of the disturbance history of the watershed, and its location at the extreme edge of the zone. Other tree species typical to urban landscapes are common in the Fanno Creek watershed forests, including sweet cherry (*Prunus avium*) and European hawthorn (*Crataegus monogyna*).

Forest understories in the Fanno Creek watershed are characterized by a mix of shrub and herbaceous species typical of western hemlock forests and those common in urban landscapes. Common shrub species include oso berry (*Oemleria cerasiformis*), snowberry (*Symphoricarpos albus*), vine maple (*Acer circinatum*), Oregon grape (*Berberis nervosa* and *aquifolium*), and red-osier dogwood (*Cornus sericea*). English and Irish ivies (*Hedera Hibernica* and *helix*), English holly (*Ilex aquifolium*), old man's beard (*Clematis vitalba*), and Himalayan blackberry (*Rubus armeniacus* and *praecox*) are also found. The herbaceous layer often includes sword fern (*Polysticum munitum*) and other fern species, Pacific trillium (*Trillium ovatum*), miner's candyflower (*Claytonia sibirica*), Pacific waterleaf (*Hydrophyllum tenuipes*), fringecup (*Tellima grandiflora*), and cleavers (*Galium* spp.), as well as the common urban species herb Robert (*Geranium robertianum*), nipplewort (*Lapsana communis*), and prickly lettuce (*Lactuca serriola*).

The mixed deciduous/coniferous forest that characterizes the headwaters of the Fanno Creek watershed can be found in the lower portions of the basin as well. Additionally, this lower part of the watershed that extends into the Willamette Valley Province has low-gradient streams with riparian areas characterized by black cottonwood (*Populus trichocarpa*) and Oregon ash canopy. Wetlands and riparian areas dominated by shrubs and small trees are also common in this region. Woody species found in these habitats include willows (*Salix* spp.), Pacific ninebark (*Physocarpus capitatus*), and Douglas spiraea (*Spiraea douglasii*). Slough sedge (*Carex obnupta*), soft rush (*Juncus effusus*), stinging nettle (*Urtica dioica*), American brooklime (*Veronica americana*), and numerous grass species are common in the herbaceous layer. Himalayan blackberry, common teasel (*Dipsacus fullonum*), and reed canary grass (*Phalaris arundinacea*) are also common.

E.1.f. Aquatic Species

BES sampled fish populations in the upper Fanno Creek Watershed in 1993 (Harza Northwest 1994). Fish sampling was conducted along 680 feet of Fanno Creek mainstem, upstream of SW Shattuck Road, during both high and low runoff periods. The objective of the high-flow survey, conducted in June 1993, was to determine the relative abundance and species composition of fish inhabiting the upper portion of the creek. Sampling during September was conducted to determine whether cutthroat trout used the creek during the low-flow period. Presence during the fall would indicate a resident cutthroat population, in contrast to a proto-anadromous population, which would spawn in the upper creek during high flows and return to the Tualatin River or lower creek during low flows. Both populations are thought to exist in middle and upper Fanno Creek.

In order of dominance for both biomass and numbers, four fish species were identified in the June 1993 sampling: reticulate sculpin (*Cottus perplexus*), redside shiner (*Richardsonius balteatus*), cutthroat trout (*Oncorhyncus clarki*), and peamouth (*Mylocheilus caurinus*). Each is

native to Oregon and commonly found in small headwater streams. Hughes and Gammon (1987) classified fish species in the Willamette River based on their tolerance to organic pollution, temperature, and warm water. These authors assigned ratings of tolerant to reticulate sculpin, intermediate to redside shiner, and intolerant to cutthroat trout.

Cutthroat trout were also captured during the fall survey, and juveniles were captured during both surveys. These studies indicate that salmonid spawning does occur in the upper portion of Fanno Creek where the faster moving, gravel-bottomed headwater areas are located. As the topography flattens out, Fanno Creek and its tributaries develop mud bottoms that are not suitable for spawning, but are important for rearing and feeding, especially during seasonal low water and droughts. Fanno Creek appears to support a year-round (although small) trout population, and these fish may only migrate a few hundred yards throughout their entire life cycle (City of Portland Bureau of Planning and Harza Northwest 1994).

The presence of juvenile and adult cutthroat trout in the upper reaches of Fanno Creek indicates that temperature and water quality are not entirely preventing production. However, the low numbers of fish suggest that other factors, such as low summer flows, sedimentation, and lack of suitable substrate for prey organisms, may also be limiting population size. Small populations are more vulnerable to competition, predation, disease, and catastrophic events, and they would not be expected to persist in the upper watershed unless overall habitat conditions can be improved. No data currently exists for other Fanno Creek tributaries.

BES also collected benthic macroinvertebrates during in 1993 (City of Portland Bureau of Planning and Harza Northwest 1994). Modified Rapid Bioassessment Protocols (Plafkin 1989; Wisseman 1996) were used to "score" the Fanno Creek samples. Results of this analysis indicated a benthic community low in diversity and number of organisms. Lack of suitable substrate, particularly cobble and gravel size particles, was the primary reason for the poor macroinvertebrate scores. The predominantly silt substrate in Fanno Creek limits periphyton growth, which in turn limits the food base for "scraper" organisms such as snails and caddisflies.

During the summers of 2019 and 2020, staff from the Oregon Department of Fish and Wildlife (ODFW) conducted stream habitat surveys in the Portland area using ODFW's wadeable stream survey protocol.[1] As part of the surveys, ODFW staff walked each stream, measuring and characterizing each individual habitat unit (e.g. riffles, pools, glides, culverts) they observed. At each unit, staff measured the size (wetted length, width, and water depth), slope, streambank condition, large wood volume, canopy cover, and substrate composition. Along each stream

[1] Kelly Moore, Kim Jones, Jeff Dambacher, Charlie Stein, et al. May 2021. Methods for Stream Habitat and Snorkel Surveys. Version 31.1. Oregon Department of Fish and Wildlife, Aquatic Inventories Project, Conservation and Recovery Program, Corvallis, OR.
https://odfw.forestry.oregonstate.edu/freshwater/inventory/pdffiles/hmethd21.pdf
https://odfw.forestry.oregonstate.edu/freshwater/inventory/basin_portland_reports.html

reach, staff measured the bankfull width, terrace height, floodprone width, and valley width. The surveys also included a riparian assessment, where staff assessed a 30-meter (approx. 100 feet) transect perpendicular to the stream and characterized canopy closure, ground cover, and tree abundance.

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

Grouping	Metric	Metric Description
Bank Condition	Percent artificial bank stabilization	Percent of the reach with artificial bank stabilization or riprap
Floodplain Condition	Floodplain connection	Vertical containment of the stream channel, calculated as floodprone width/bankfull width
	Floodplain development	Percentage of the current floodplain with vegetation
Habitat Connectivity	Percent Piped	Percentage of the stream flowing through pipes or culverts
	Road crossings	Number of road crossings per kilometer
Large Wood	Large wood volume	Volume of wood with diameter ≥ 15cm & length ≥ 3m, normalized by stream length
Pool Habitat	Pool frequency	The number of channel widths (active channel width) between pools in the reach
	Pool habitat cover	Cover includes a combination of residual pool depth, wood pieces per 100m, boulder count per $100m^2$, undercut banks, debris jams
Riffle Habitat	Percent gravel	Percent of riffle area composed of gravel-sized substrate
	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 benchmarks[2] and the City's Watershed Health Index[3] were used to establish the stream conditions that correspond to high quality habitat and which correspond to poor quality habitat for each metric.

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

Figure 1 shows the results of the streams survey within the Fanno Creek area.

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

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

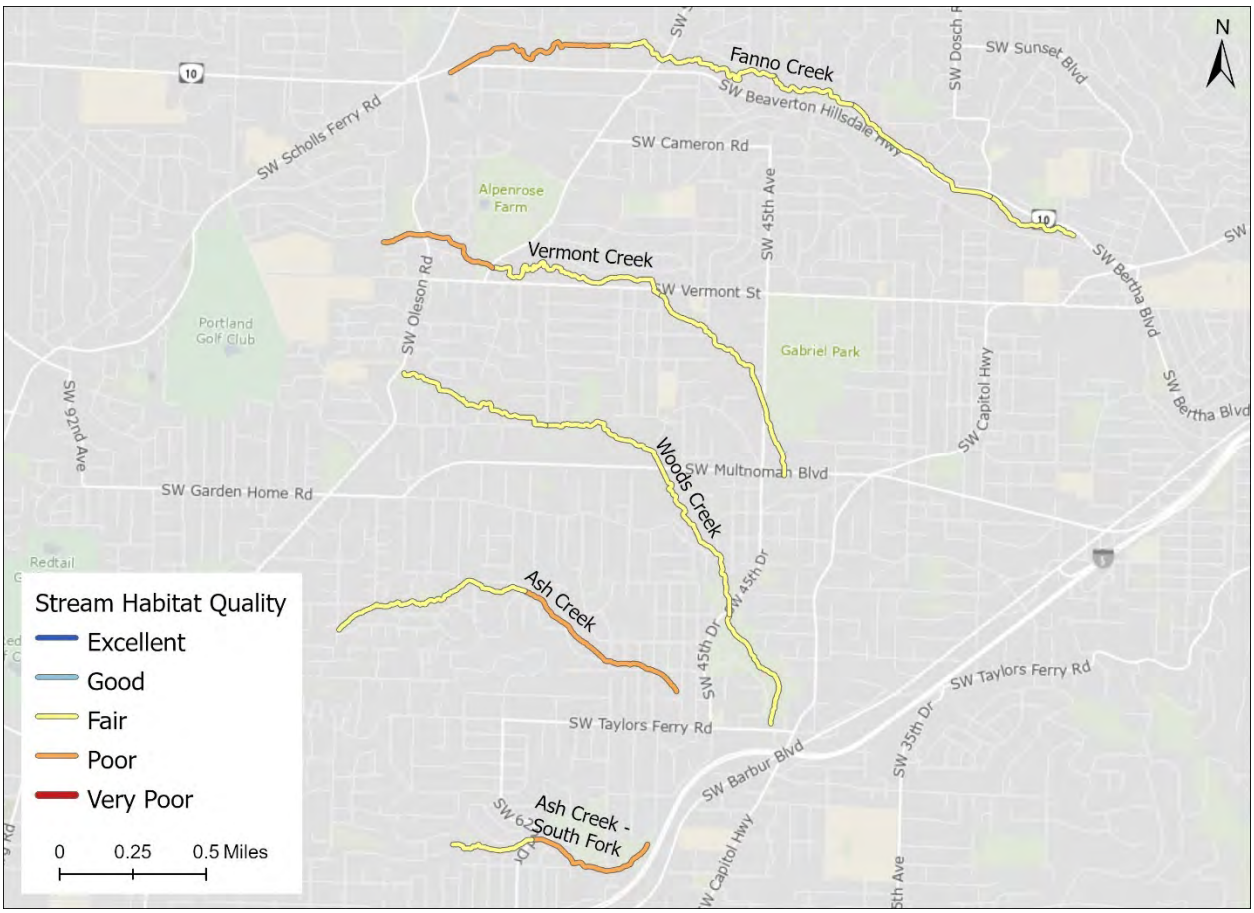


Figure 1: Stream Survey Results

E.1.f. Wildlife

The wildlife species most commonly observed in the Fanno Creek Watershed are those that can tolerate a wide variety of habitats and the disturbance usually associated with residential and commercial development. Based on the geographic location of the watershed, amphibians that may be present include the northwestern salamander (*Ambystoma gracile*), long-toed salamander (*A. macrodactylum*), ensatina (*Ensatina eschscholtzii*), and Pacific chorus frog (*Hyla regilla*). Garter snakes (*Thamnophis* species) are common. At least 100 bird species are thought to use the Fanno Creek watershed, and they include Black-capped chickadees (*Parus atricapillus*), American robins (*Turdus migratorius*), song sparrows (*Melospiza melodia*), Steller's jays (*Cyanocitta stelleri*), American crows (*Corvus brachyrhynchos*), and northern flickers (*Colaptes auratus*). Great blue herons (*Ardea herodias*) and mallards (*Anas platyrhynchos*) can also be observed occasionally. Mammals typical of the Fanno Creek watershed include raccoons (*Procyon lotor*), opossums (*Didelphis virginiana*), skunks (*Mephitis mephitis*), muskrats (*Ondatra zibethicus*), and fox squirrels (*Sciurus niger*). Occasional visitors include black-tailed deer and coyote. Several species of mice, shrews, moles, and voles are also likely to occur.

Different species utilize different habitat during the various stages of their life cycle. These stages include mating, feeding, and the rearing of young. The vegetative structure of the habitat (downed logs, standing snags, and live herbs, shrubs, and trees) is a key factor in determining the distribution and abundance of wildlife (Thomas 1979). Each stage of forest succession in the Fanno Creek Watershed has its own specific structure. Most species have known preferences for structural components found in distinct successional stages and use these vegetative types to meet all or part of their life cycle requirements (Maser and Thomas 1978; Harris 1984).

The balanced relationship between the Fanno Creek Watershed's geologic formations, soils, groundwater, and surface water is perpetuated by the extensive canopy cover and root system of the forest which shelters and stabilizes the hillside slopes. Activities that disturb this fragile relationship can substantially degrade resource values by causing landslides, flooding, erosion, and sedimentation. Groundwater and precipitation feed the many creeks within the Fanno Creek Watershed, and these creeks provide habitat for fish, amphibians, and other aquatic organisms and, which in turn, provide a source of food for terrestrial wildlife. These creeks are also the most important source of water for terrestrial wildlife. The mosaic of Fanno Creek Watershed forest types provides a range of habitat for a diverse population of indigenous wildlife. These interacting and interdependent elements play vital roles in protecting the balance, health, and vitality of the Fanno Creek Watershed.

E.1.g. Special Habitat Areas

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

E.1.h. Stormwater Management

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

BES maintains a system of rain gages as part of its Hydrologic Data Retrieval and Acquisition (HYDRA) system. Rain data from a HYDRA gage at the Portland Community College (PCC) Sylvania campus was used to develop rainfall characteristics in the Fanno Creek Watershed, and design storms were defined for modeling future conditions and testing conveyance system capacity.

Fanno Creek does not flow directly to the Willamette River, but rather flows west and south through Tigard before joining the Tualatin River near the Unified Sewage Agency's treatment plant outfall at Durham.

Table 2: Miles of Stream in the Fanno Creek Watershed

Subwatershed	Open Channel	Pipe or Culvert	Other
Fanno Creek mainstem	12.2	2.7	0.02
Pendleton Creek	0.9	0.2	0
Vermont Creek	3.5	0.6	0
Woods Creek	2.9	0.4	0
North Ash Creek	1.3	0.3	0
South Ash Creek	1.2	0.3	0
Rock Creek	0.4	0.1	0
Sylvan Creek	0.3	0.0	0
Total	22.6	4.6	0.02

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

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.

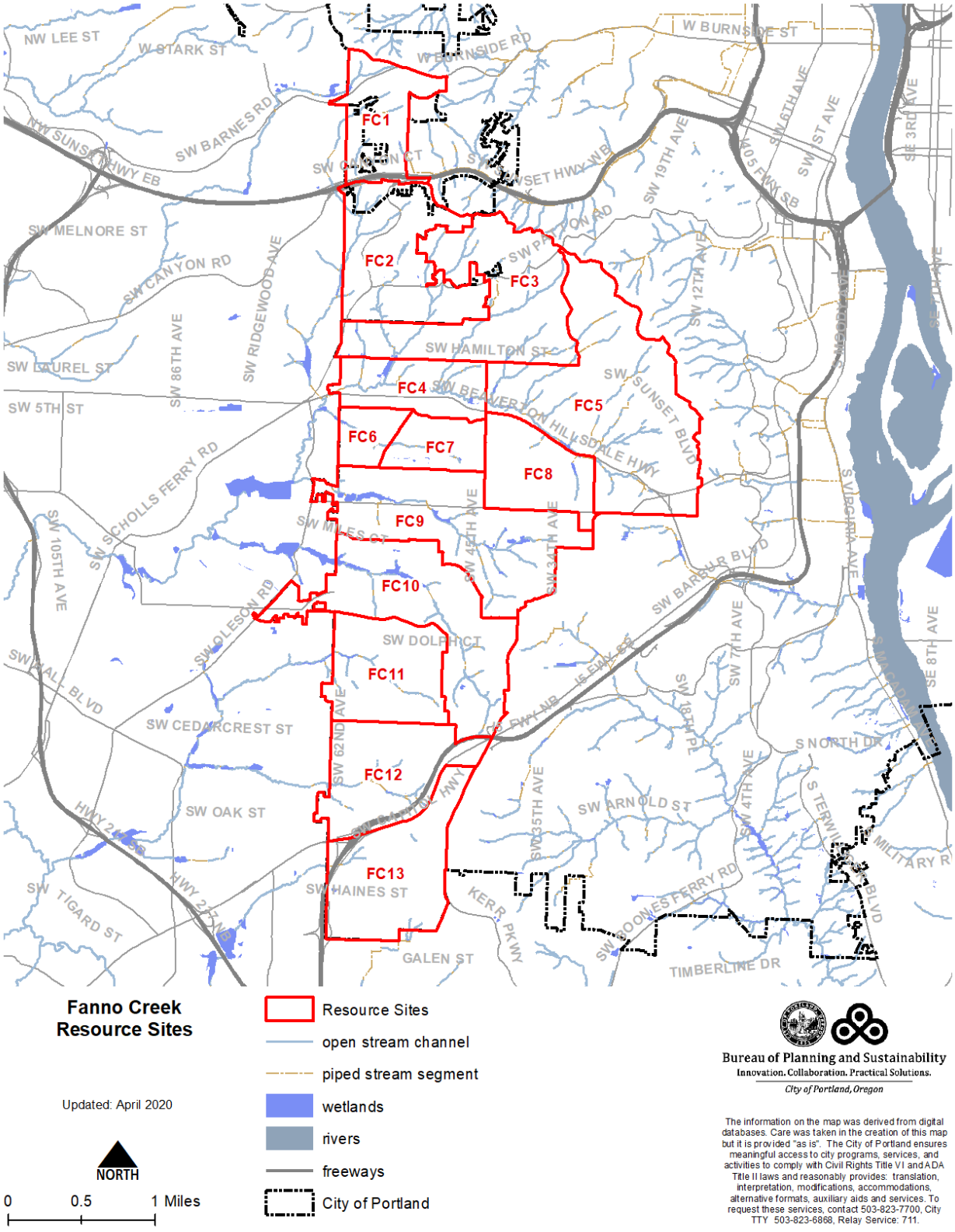
Within the City of Portland there are three methods of conveying stormwater runoff from impervious areas. When soils allow infiltration, stormwater runoff may be directed to sumps or other stormwater facilities to be infiltrated into the ground, after being treated to protect groundwater. Some portions 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 Endangered Species Act-listed salmon, other native fish and aquatic species.
- Increased in-stream erosion and decreased groundwater recharge occurs due to changes in the timing, routing and amount of runoff. As a result, streambanks can be undercut, impacting stream health and potentially damaging buildings, roads and bridges. Streams become "flashy" – rising and falling very quickly – increasing flood risks during wet weather and resulting in very low stream flows in the summer.
- Landslide risks can be exacerbated by deficient or inadequate stormwater management.
- Problems with incomplete or ineffective stormwater system could be made worse with climate change due to increases in temperature and changes in precipitation patterns. This could further impact water temperatures in rivers and streams, a serious problem in Portland streams, which exceed temperature standards in the summer. More intense storm patterns can also increase the risks of erosion, landslides and flooding.
- Reduced groundwater and aquifer recharge due to impervious surfaces also negatively impacts water availability during dry periods, which are expected to increase with climate change.

E.2. Resource Sites



Map 2: Fanno Creek Resource Sites

Resource Site No.: FC1 **Resource Site Name:** Sylvan G

Previous Plan: Multnomah County Urban Lands
Previous Resource Site No.: 111

The results of the analysis found in Volume 3, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

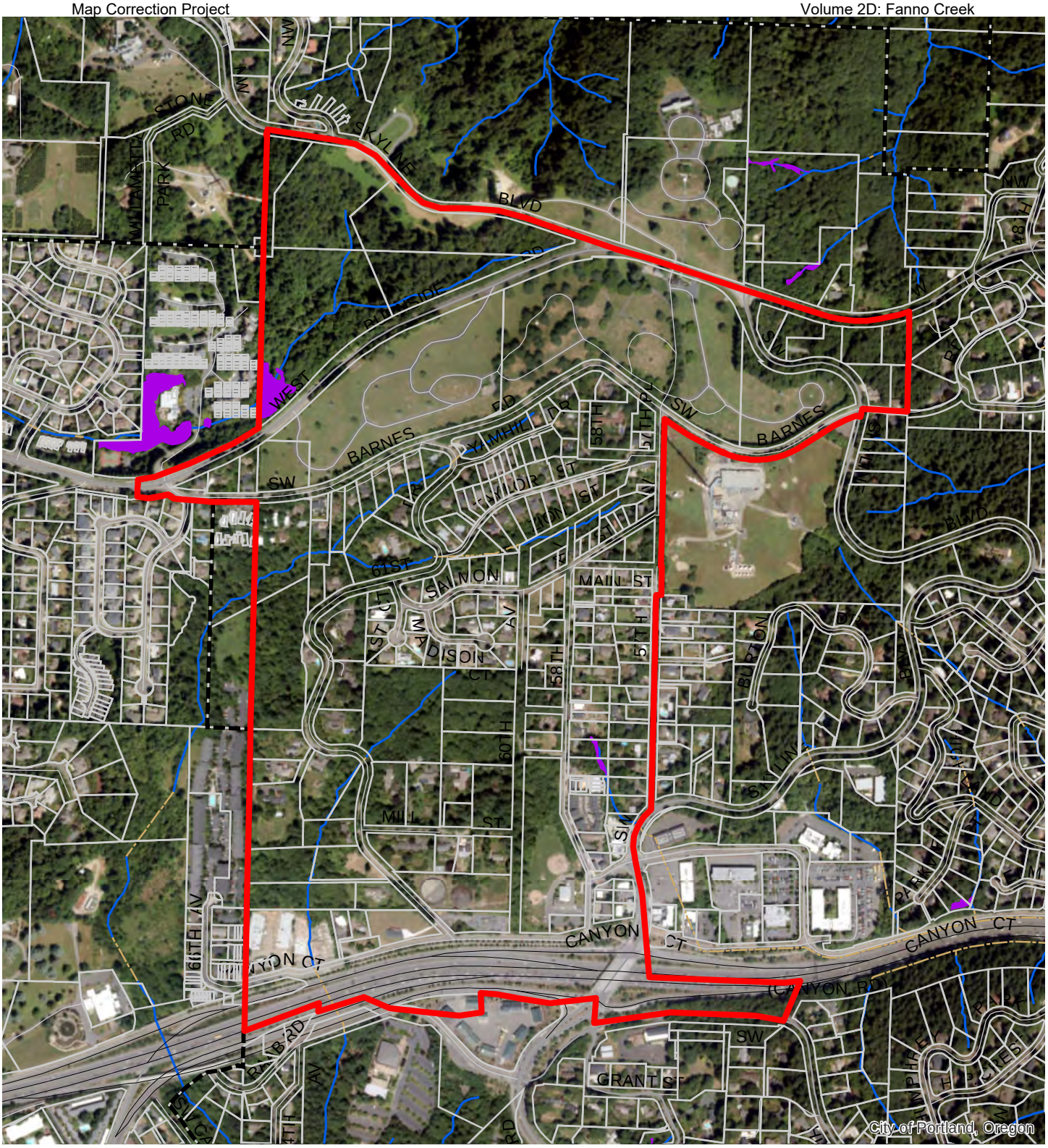
A. Water Features – rivers, streams, wetlands and flood areas
B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
C. Special Habitat Areas
D. Riparian Corridor Classifications
E. Wildlife Habitat Classifications
F. Urban Development Value
G. Metro Title 13 Habitat Conservation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

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

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

Resource site FC1 includes the following:

Site (acres)	253.5
Base zones (acres)	
CE	3.4
CM1	8.9
OS	51.5
R10	58.7
R20	81.1
R5	3.3
R7	10.4
RF	29.2
RM1	5.2
RM2	1.7



Map A: Water Features

Resource Site: FC1

Updated: July 2021

NORTH

0 395 790 Feet

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

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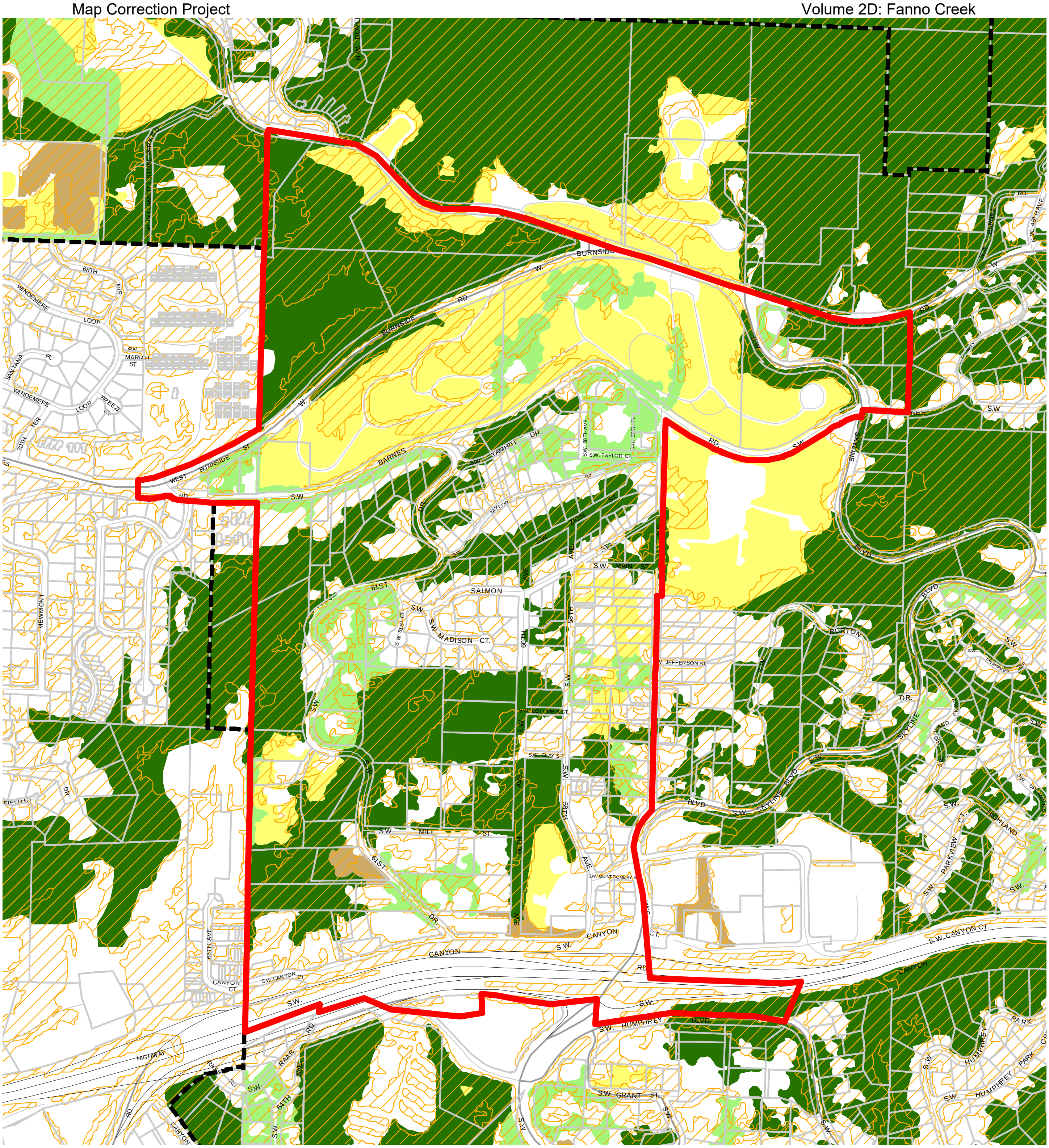
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: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

Resource Site: FC1

Updated: July 2021

NORTH

0 500 1,000 Feet

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

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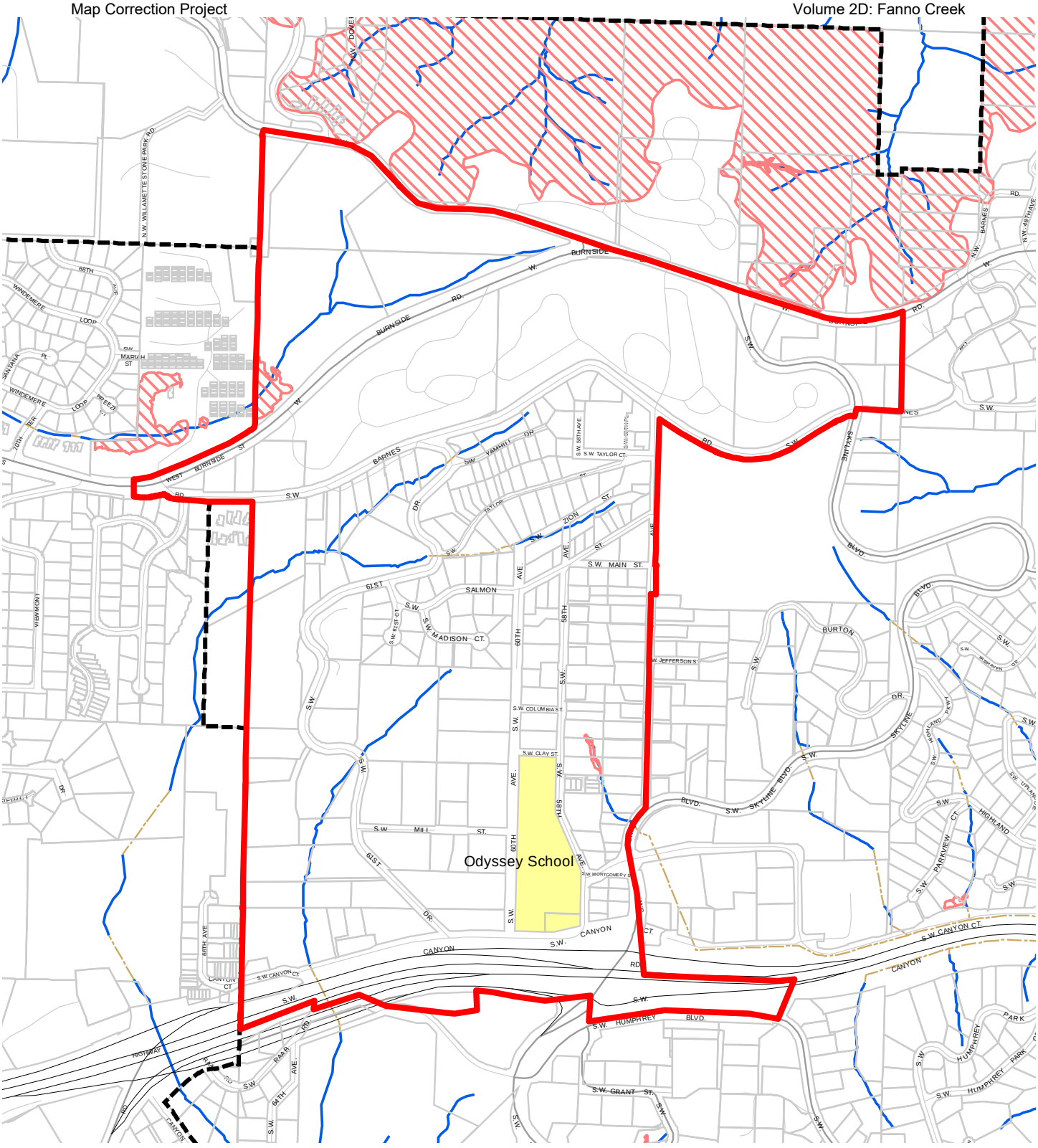

Map C: Special Habitat Areas

Resource Site: FC1

Updated: June 2021

NORTH

0 425 850 Feet

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

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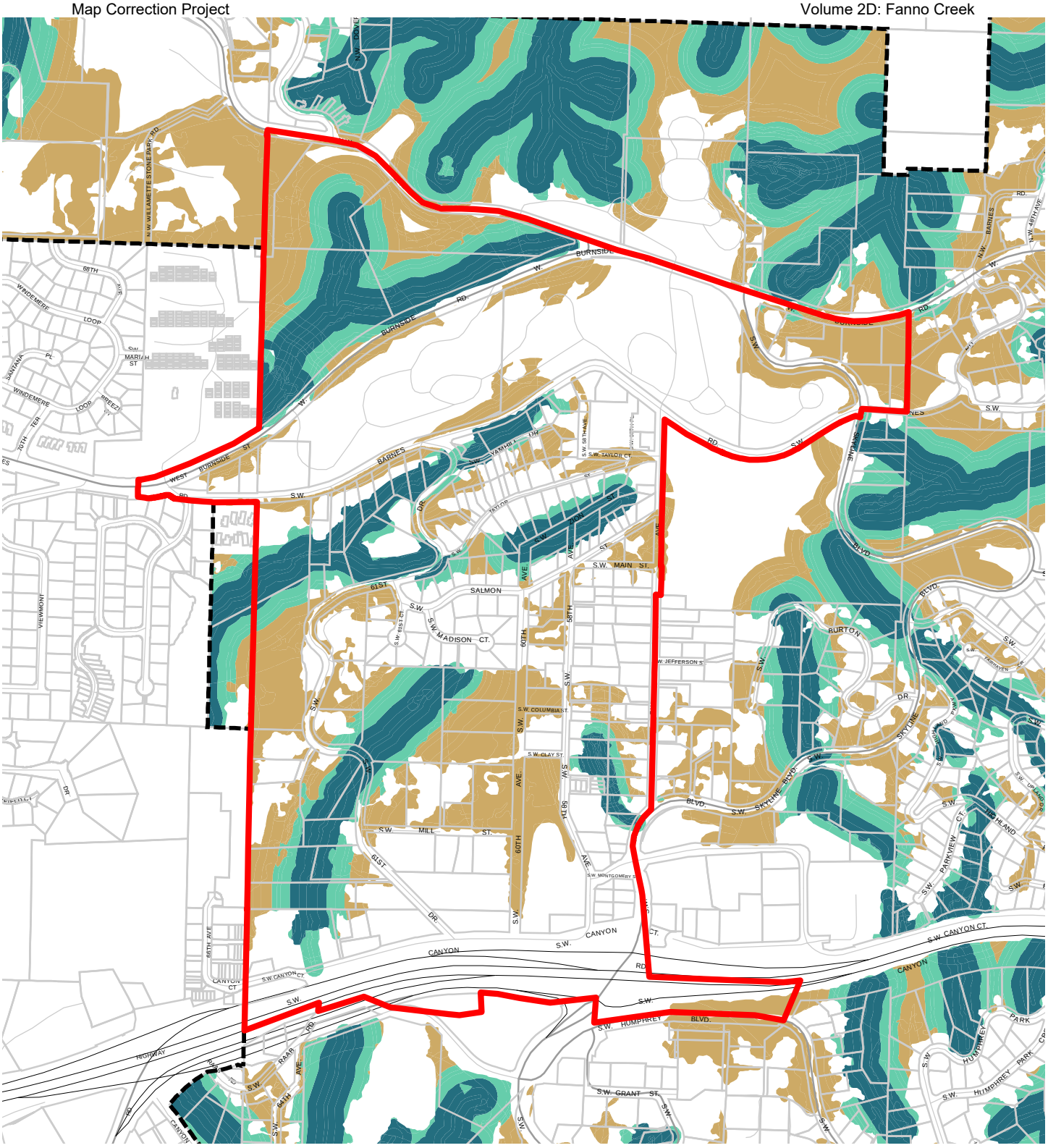

Map D: Riparian Corridors Habitat Classification

Resource Site: FC1

Updated: July 2021

Resource Sites

Class I (high rank)

Class II (medium rank)

Class III (low rank)

Urban Service Boundary

Taxlots

NORTH

0 395 790 Feet

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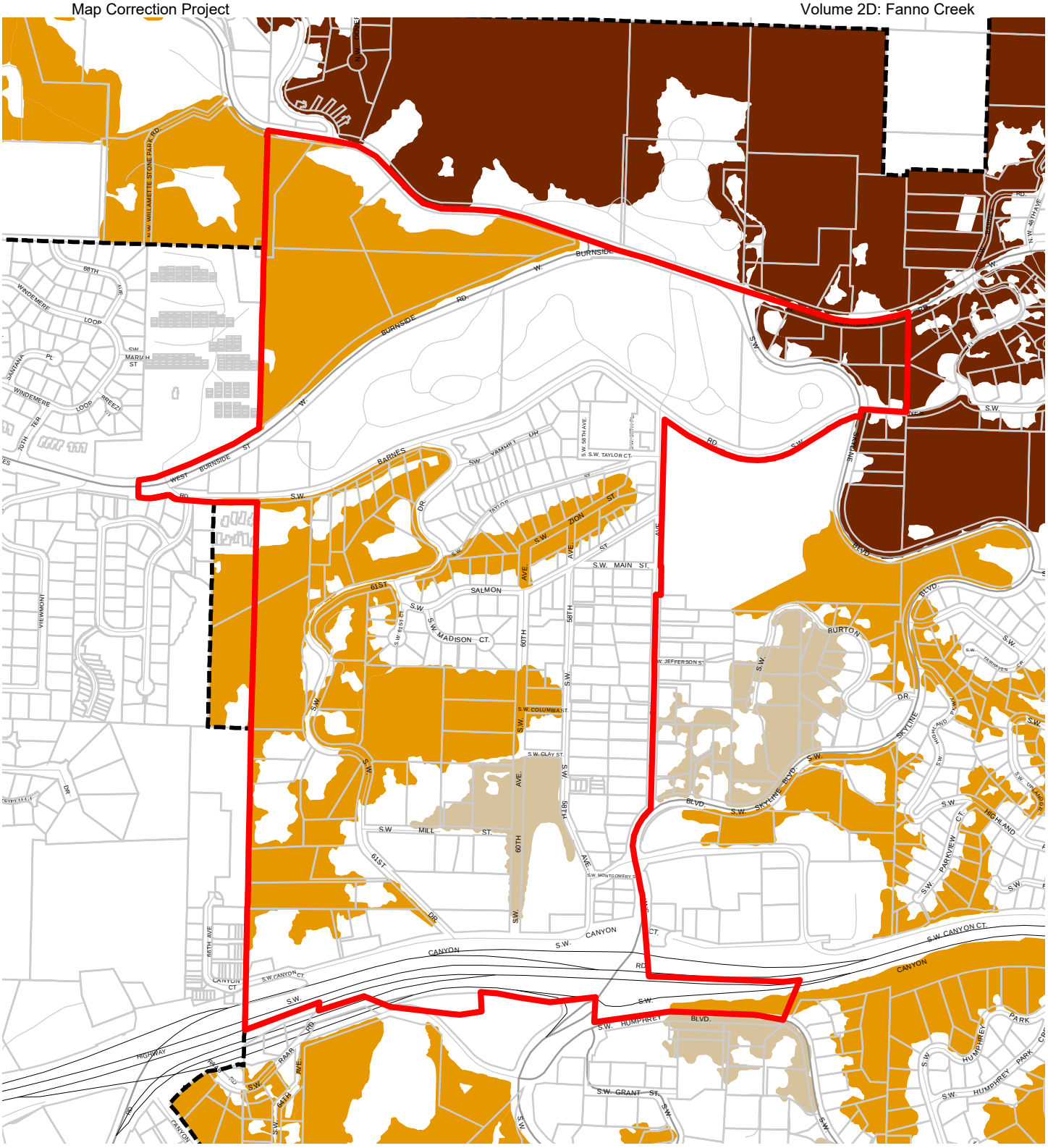

Map E: Wildlife Habitat Classification

Resource Site: FC1

Updated: July 2021

NORTH

0 320 640 Feet

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

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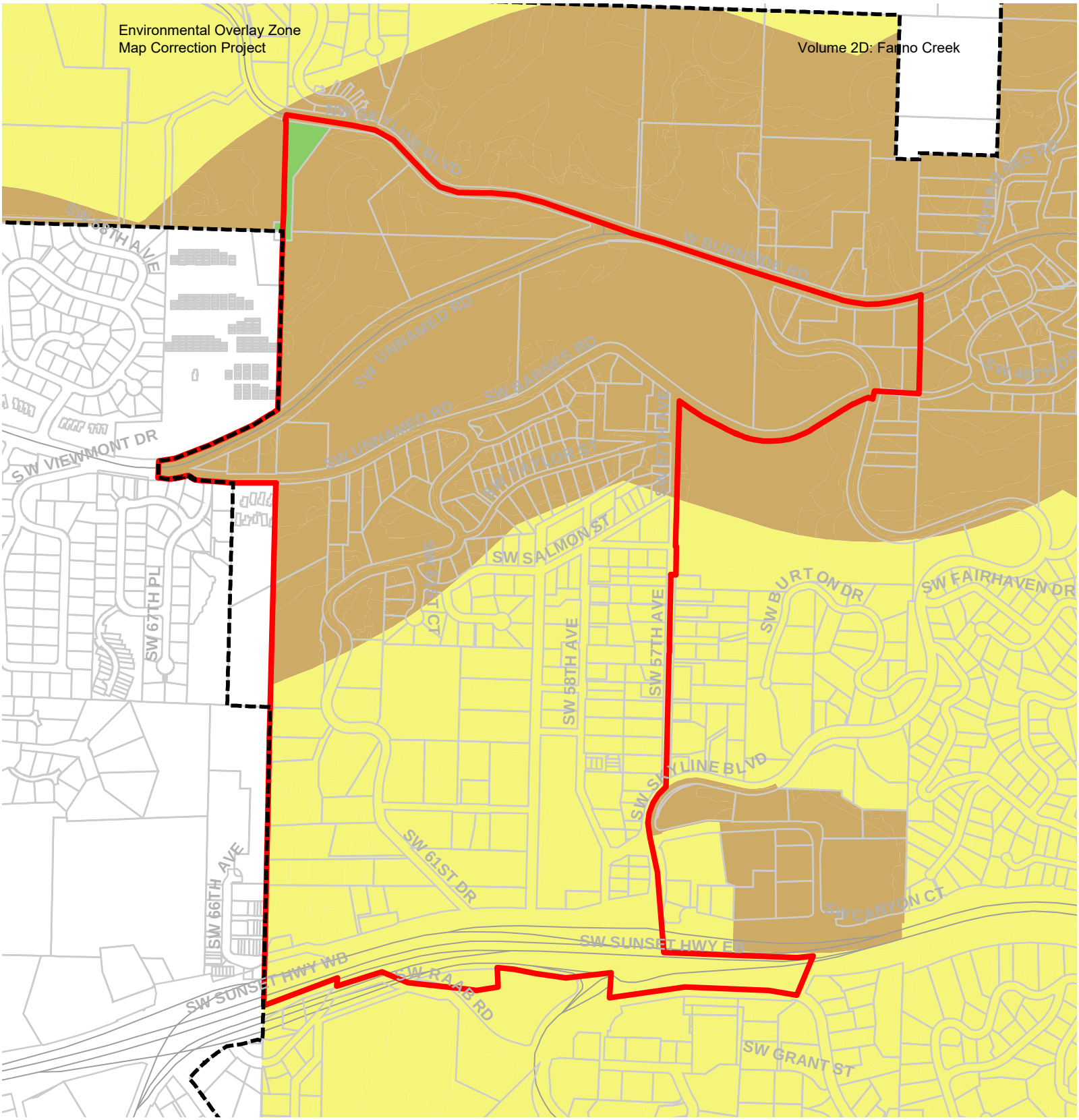
July 2021



Map F: Urban Development Value (Title 13)
Resource Site: FC1

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

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Updated: July 2021

NORTH

0 500 1,000 Feet

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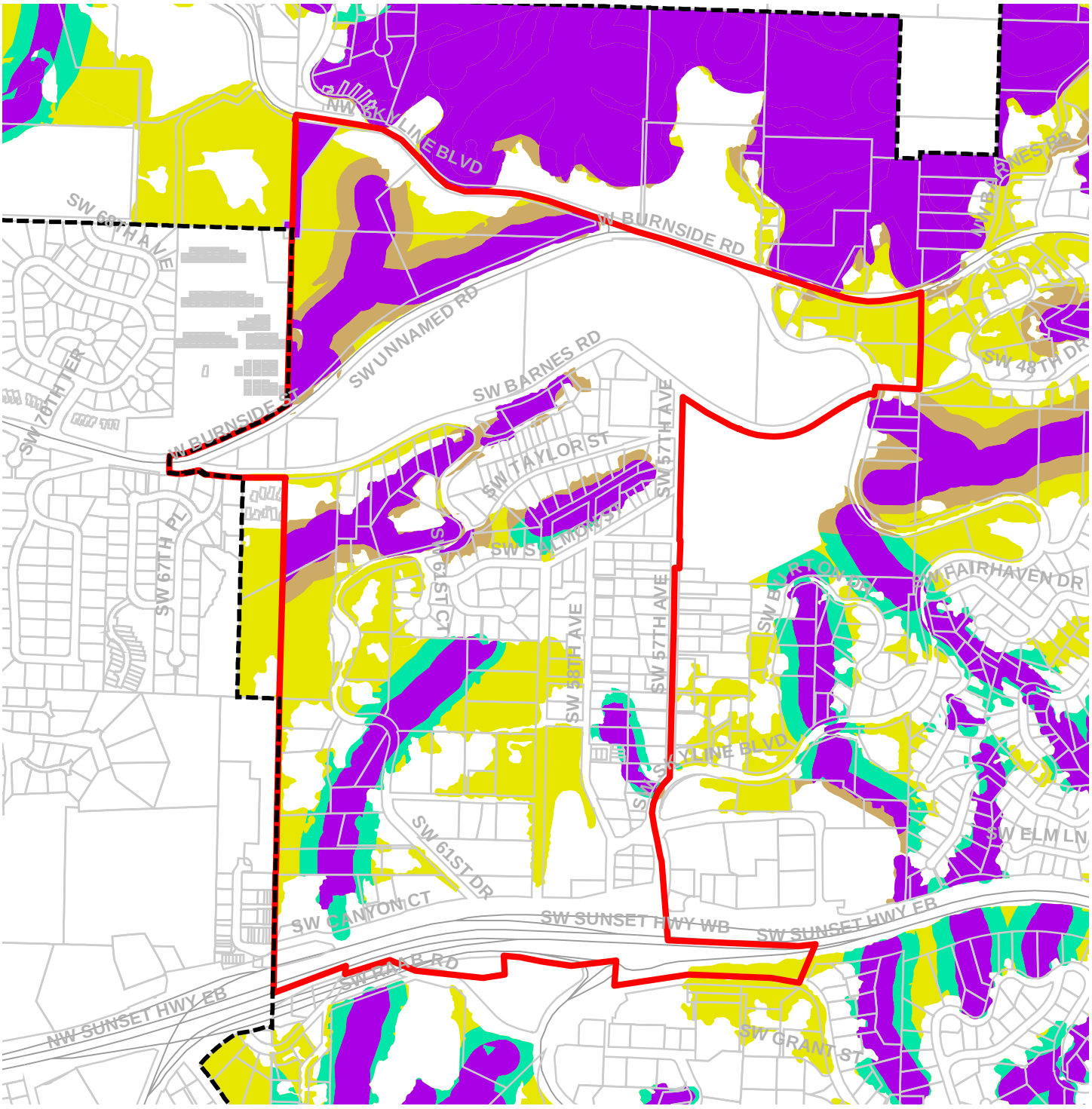

Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: FC1

Updated: July 2021

NORTH

0 550 1,100 Feet

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

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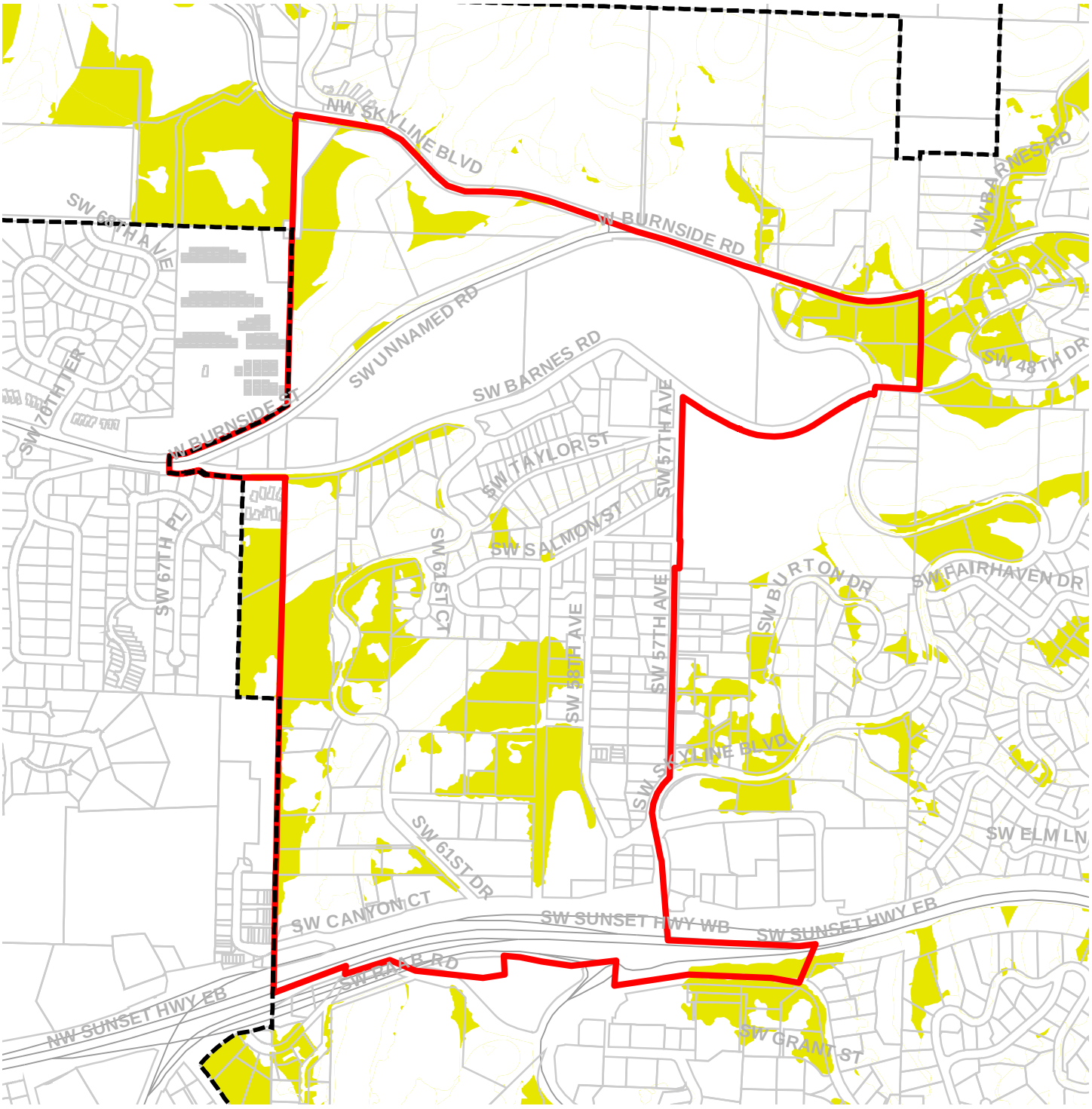

Map H: Goal 5 Resources

Resource Site: FC1

Updated: July 2021

NORTH

0 550 1,100 Feet

Proposed Draft - As Amended

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

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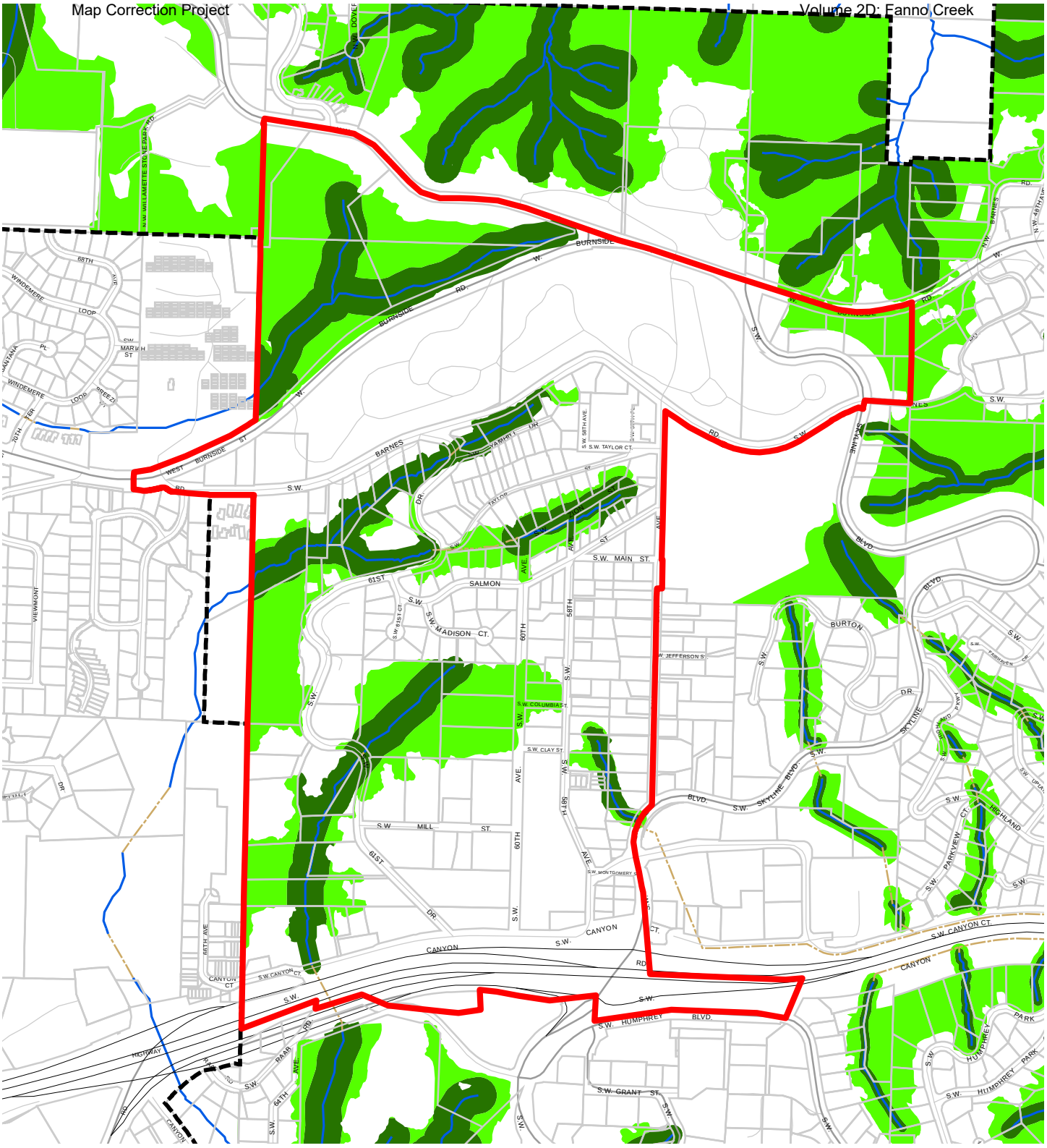

Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site:

FC1

Updated: July 2021

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

NORTH

0 425 850 Feet

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Natural Resource Description

Within resource site FC1 the following significant natural resource features and functions are present:

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

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

Special Habitat Areas: Wetlands (W)

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

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

Table A: Quantity of Natural Resource Features in Resource Site	**FC1**
	Study Area
Stream (Miles)	1.5
Wetlands (acres)	0.9
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	90.8
Woodland (acres)	23.3
Shrubland (acres)	1.6
Herbaceous (acres)	44.2
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	142.5

* 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 predominant trees in the site are Douglas fir and bigleaf maple. The forest is 75 to 85 years old as indicated by tree sizes and the predominant forest composition of conifer topping hardwood. The representative forest composition is 60 percent deciduous and 40 percent coniferous. One 20-acre area is 90 percent deciduous with some bigleaf maple up to 40-inch dbh. There is another 20- acre parcel that has primarily coniferous cover with dbh sizes ranging from eight to 40 inches. There are springs and eleven or so intermittent creeks located along the canyon walls throughout the site. At least a half-dozen of the uncommon but native pacific dogwoods are located within the canyon.

On the southeast corner of the site is an established neighborhood. The deeply cut V-shaped ravines and curving streets divide the neighborhood into small neighborhood units containing five to seven homes. The steepness of the ravines limits pedestrian access and allow the natural areas to remain largely undisturbed. The physical conditions of the area contribute to the neighborhood character, provide water resources, storm drainage, and provide visual and physical buffers from noise generated
by traffic on Highway 26.

Highway 26 bisects the site across the southern portion of the site and creates a barrier for terrestrial wildlife. The north side of the site is comprised largely of the Mount Calvary Cemetery but also connects to the habitat areas of Hoyt Arboretum, Pittock Mansion Acres and northern points of Washington Park. Farther north these habitats connect to the Balch Creek Watershed and Forest Park. There are about 220 acres of contiguous forest covering the south wall of Canyon Road.

Within the site there are forested Sylvan and Golf Creek headwater streams that flow into Fanno Creek, which is designated as critical habitat for Endangered Species Act-listed upper Willamette River steelhead trout.

Special status bird species observed in or adjacent to this site include: bald eagle, band-tailed pigeon, black-throated gray warbler, brown creeper, bushtit, downy woodpecker, orange-crowned warbler, pacific wren, pacific-slope flycatcher, purple finch, rufous hummingbird, Swainson’s thrush, Vaux’s swift, and Wilson’s warbler.

Table B: Quality of Natural Resource Functions in Resource Site FC1				
Resource Site (acres) = 253				
	Class 1/A	**Class 2/B**	**Class 3/C**	**Total**
Riparian Corridors*				
acres	32.5	18.8	61.2	112.5
percent total inventory site area	12.8%	7.4%	24.1%	44.4%
Wildlife Habitat*				
acres	5.3	74.6	6.5	86.5
percent total inventory site area	2.1%	29.4%	2.6%	34.1%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total+				
acres	37.9	48.5	28.5	114.8
percent total inventory site area	14.9%	19.1%	11.2%	45.3%

* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.

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

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

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

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

For Resource Area FC1, 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 FC1

Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
253.5	0.3	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 4 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 FC1. Natural resources should be protected within HCA as follows:

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

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 FC1 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 4, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the

[4] Metro Title 13 rule 3.07.1330(a)(2) states that any city that had an acknowledge Goal 5 program prior to December 28, 2005, that applies to upland wildlife habitat shall not repeal or amend such regulations in a manner that would allow more than a de minimis increase in development that could occur in those upland habitat areas.

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, R10, R5, R2 and R1 base zones. Commercial uses are allowed in the CE and CM1 base zones. Open space uses are allowed in 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 4 is confirmed for resource site FC1, 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, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation for FC1, 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 a wetland.
2. Apply a protection overlay zone ('p' zone) to areas of forest vegetation contagious that are to but more than 50 feet from stream top-of-bank extending to 100 feet from top-of-bank.
3. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands; and within areas of forest vegetation that are contiguous to but more than 100 feet from stream top-of-bank.
4. Allow conflicting uses within all other areas containing significant natural resources.

There is a large contiguous upland forest, located on steep slopes, in the northeast corner that spans between the resource site FC1 and SW3. Applying a conservation overlay zone to the forest will maintain the functions associated with slope stability, hydrology, water quality, microclimate and wildlife habitat.

Resource Site No.: FC2 **Resource Site Name:** Columbia and Sylvan Creek Headwaters NE

Previous Plan: Fanno Creek and Tributaries Conservation Plan
Previous Resource Site No.: 124

The results of the analysis found in Volume 3, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

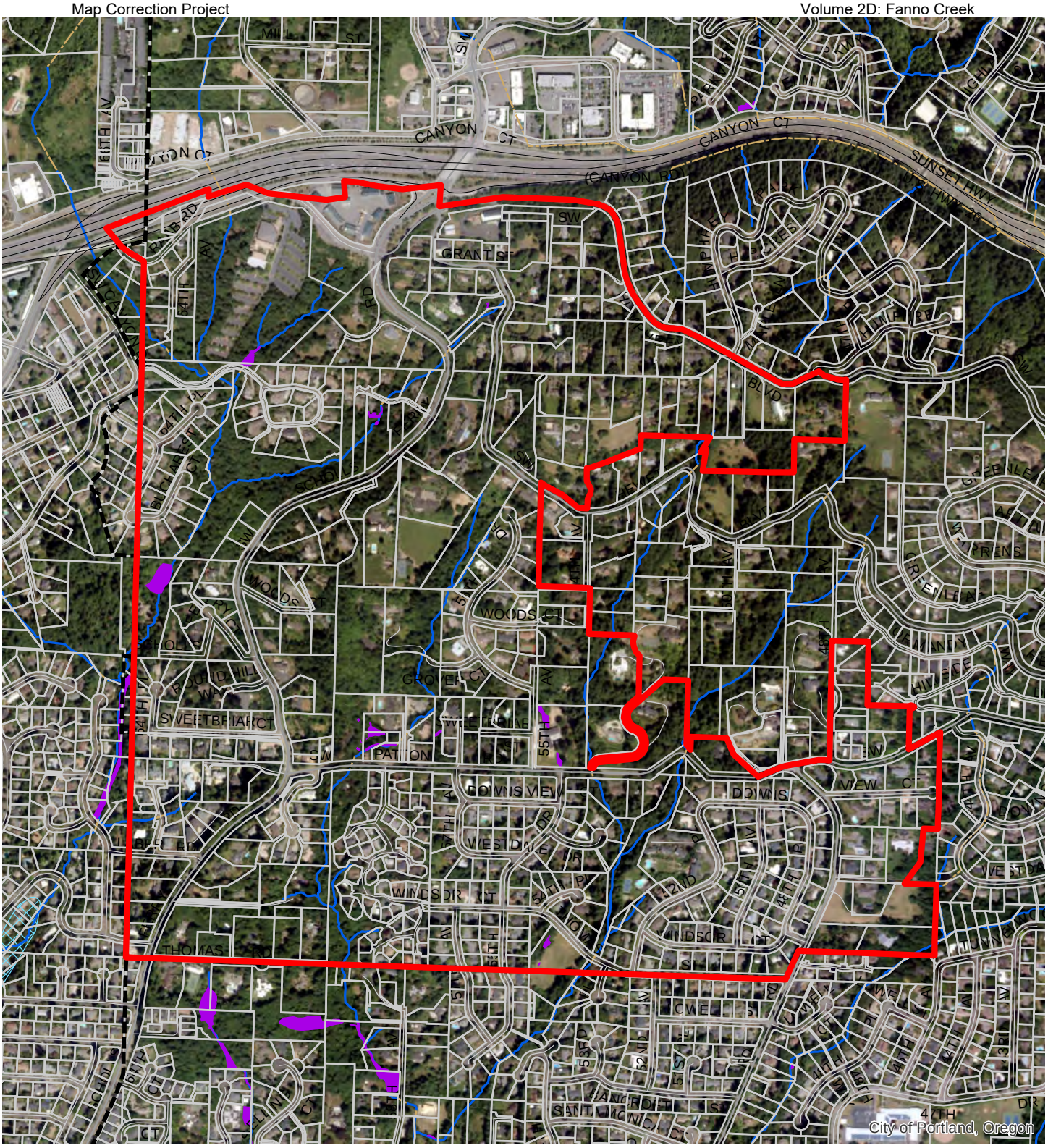
A. Water Features – rivers, streams, wetlands and flood areas
B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
C. Special Habitat Areas
D. Riparian Corridor Classifications
E. Wildlife Habitat Classifications
F. Urban Development Value
G. Metro Title 13 Habitat Conservation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

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

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

Resource site FC2 includes the following:

Site (acres)	454.1
Base zones (acres)	
CE	1.3
OS	2.3
R10	121.7
R20	328.3
R5	0.5
R7	<1



Map A: Water Features

Resource Site: FC2

Updated: July 2021

NORTH

0 470 940 Feet

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

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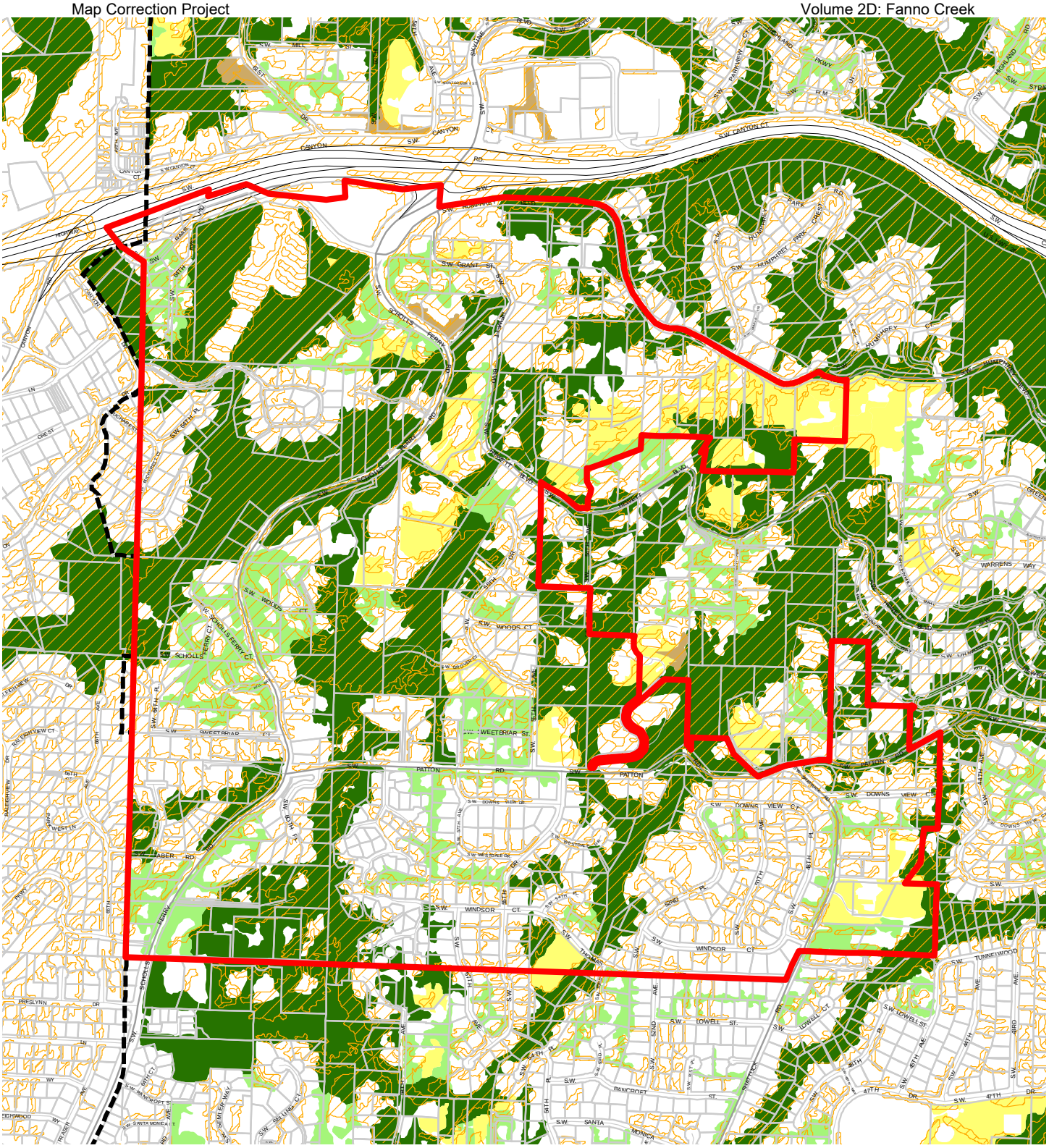
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: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

Resource Site: FC2

Updated: July 2021

NORTH

0 600 1,200 Feet

Proposed Draft - As Amended

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

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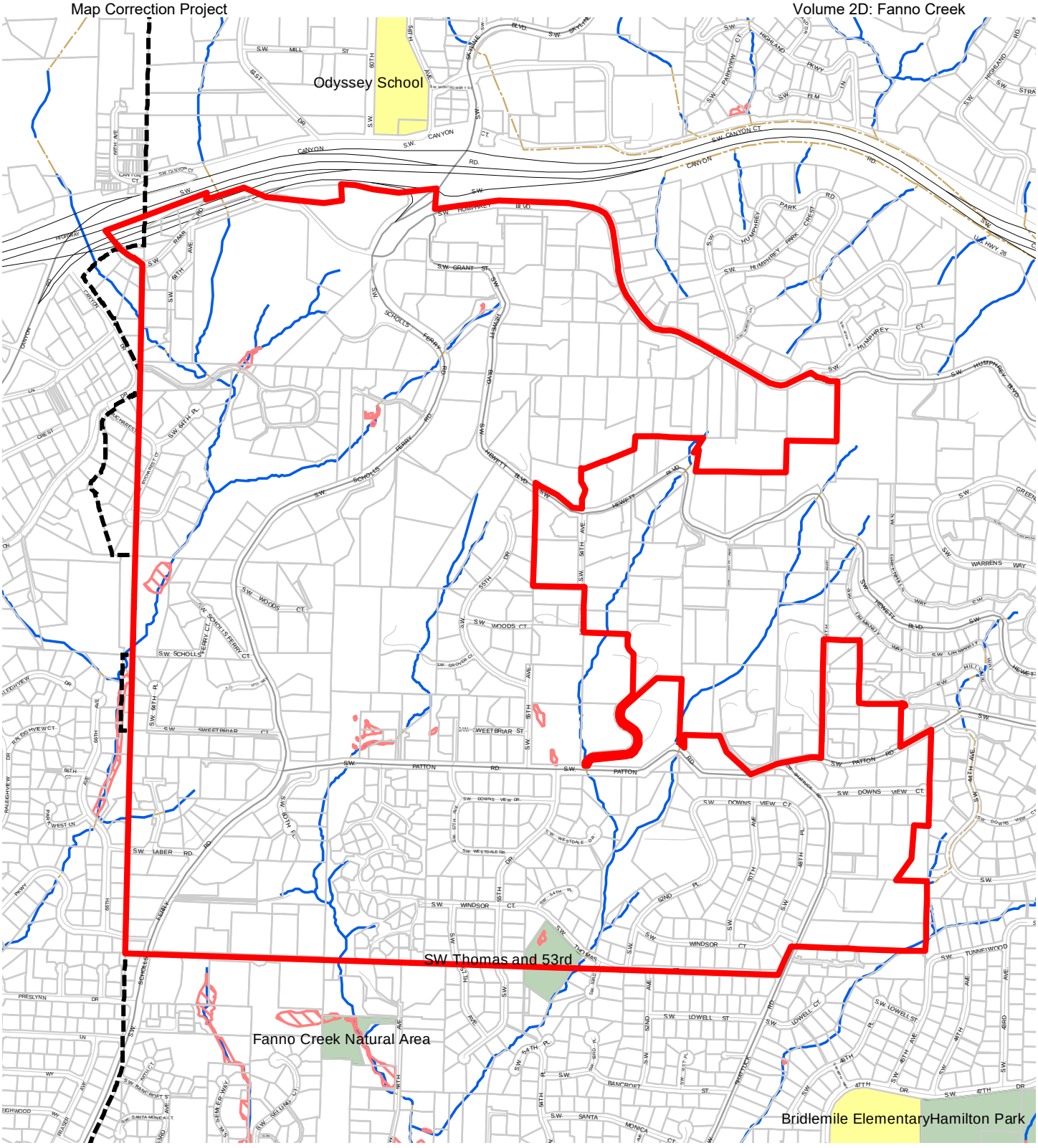

Map C: Special Habitat Areas

Resource Site: FC2

Updated: June 2021

NORTH

0 500 1,000 Feet

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

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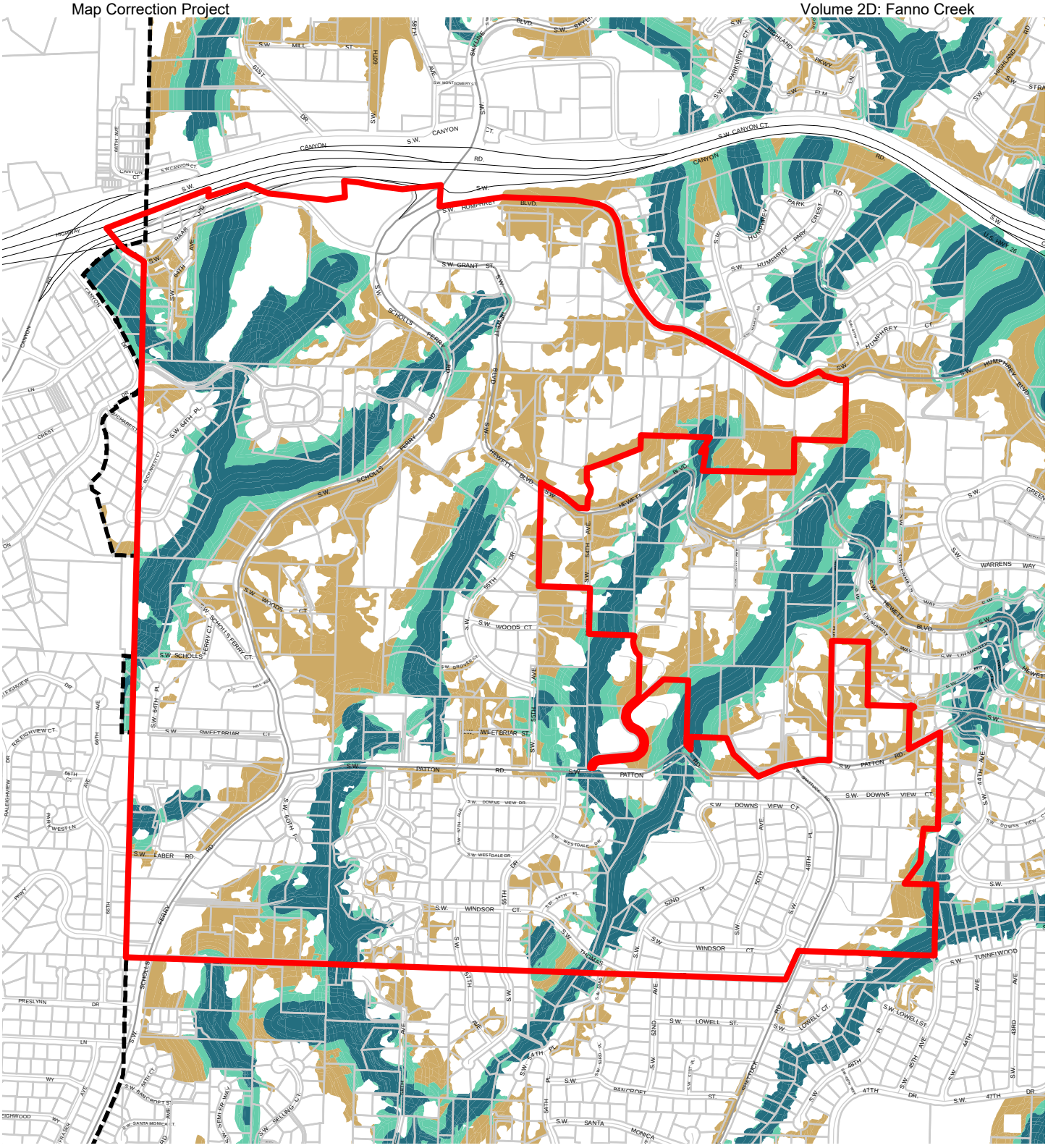

Map D: Riparian Corridors Habitat Classification

Resource Site: FC2

Updated: July 2021

Resource Sites

Urban Service Boundary

Class I (high rank)

Taxlots

Class II (medium rank)

Class III (low rank)

NORTH

0 470 940 Feet

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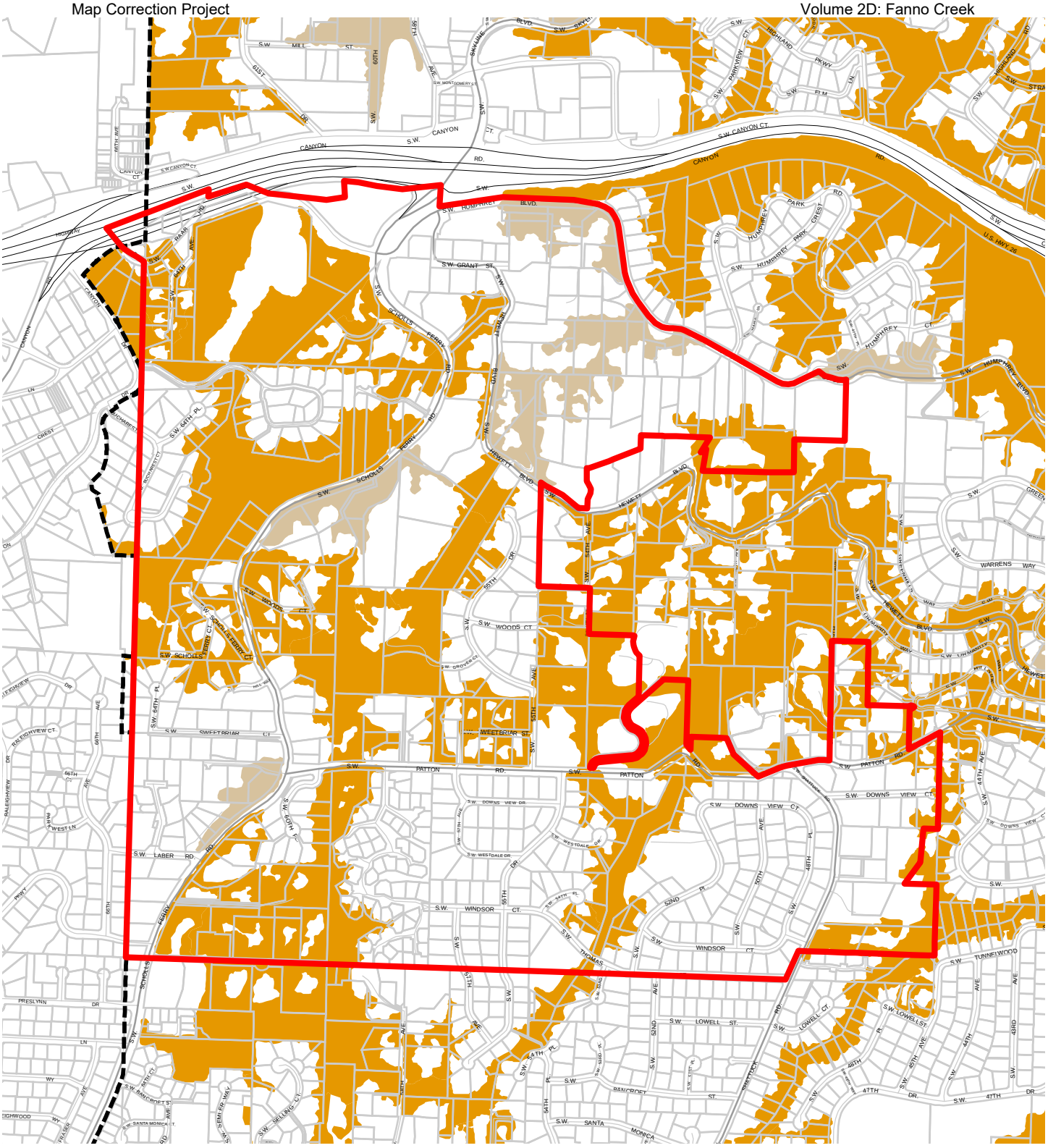

Map E: Wildlife Habitat Classification

Resource Site: FC2

Updated: July 2021

NORTH

0 380 760 Feet

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

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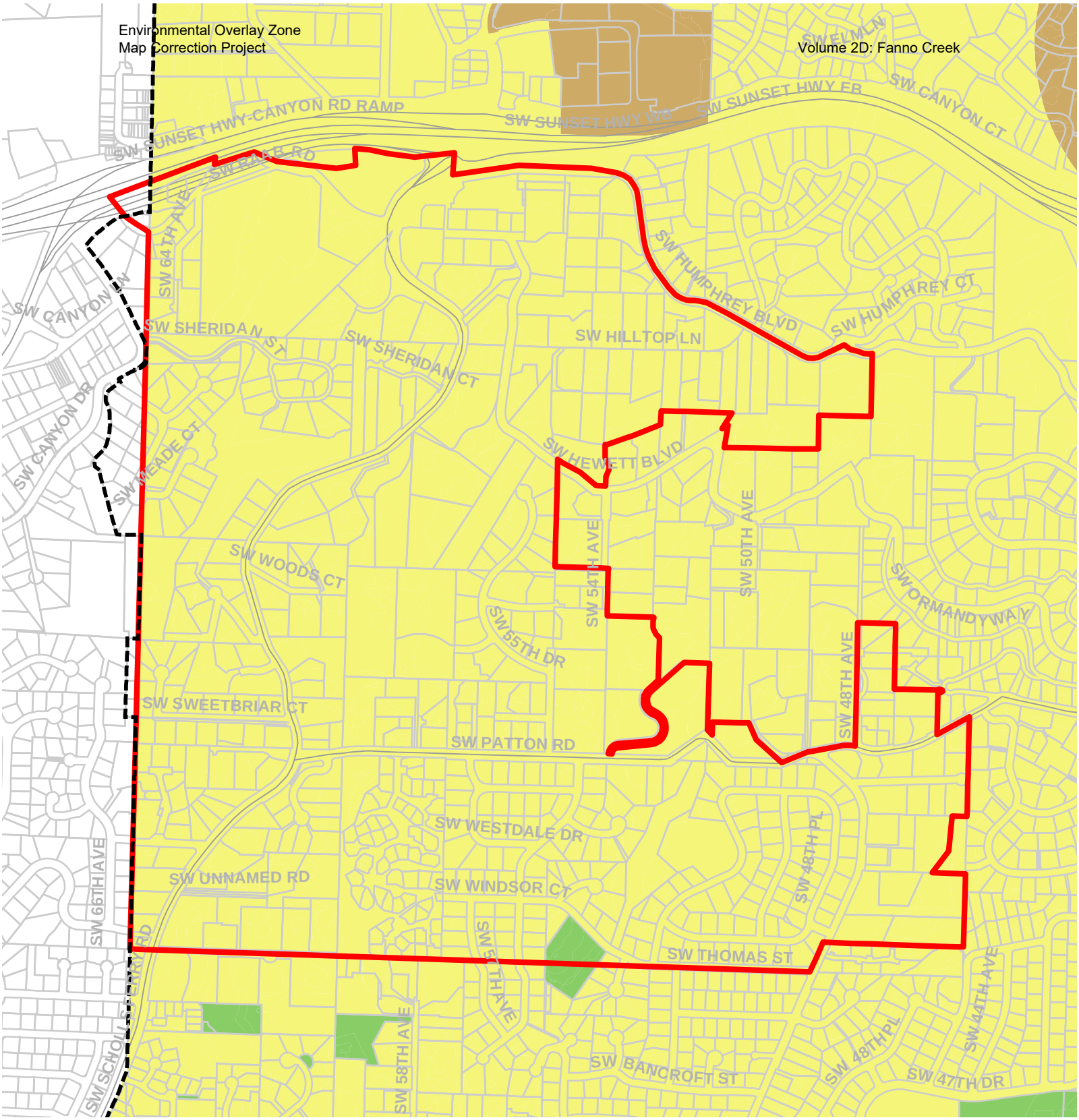

Map F: Urban Development Value (Title 13)
Resource Site: FC2

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

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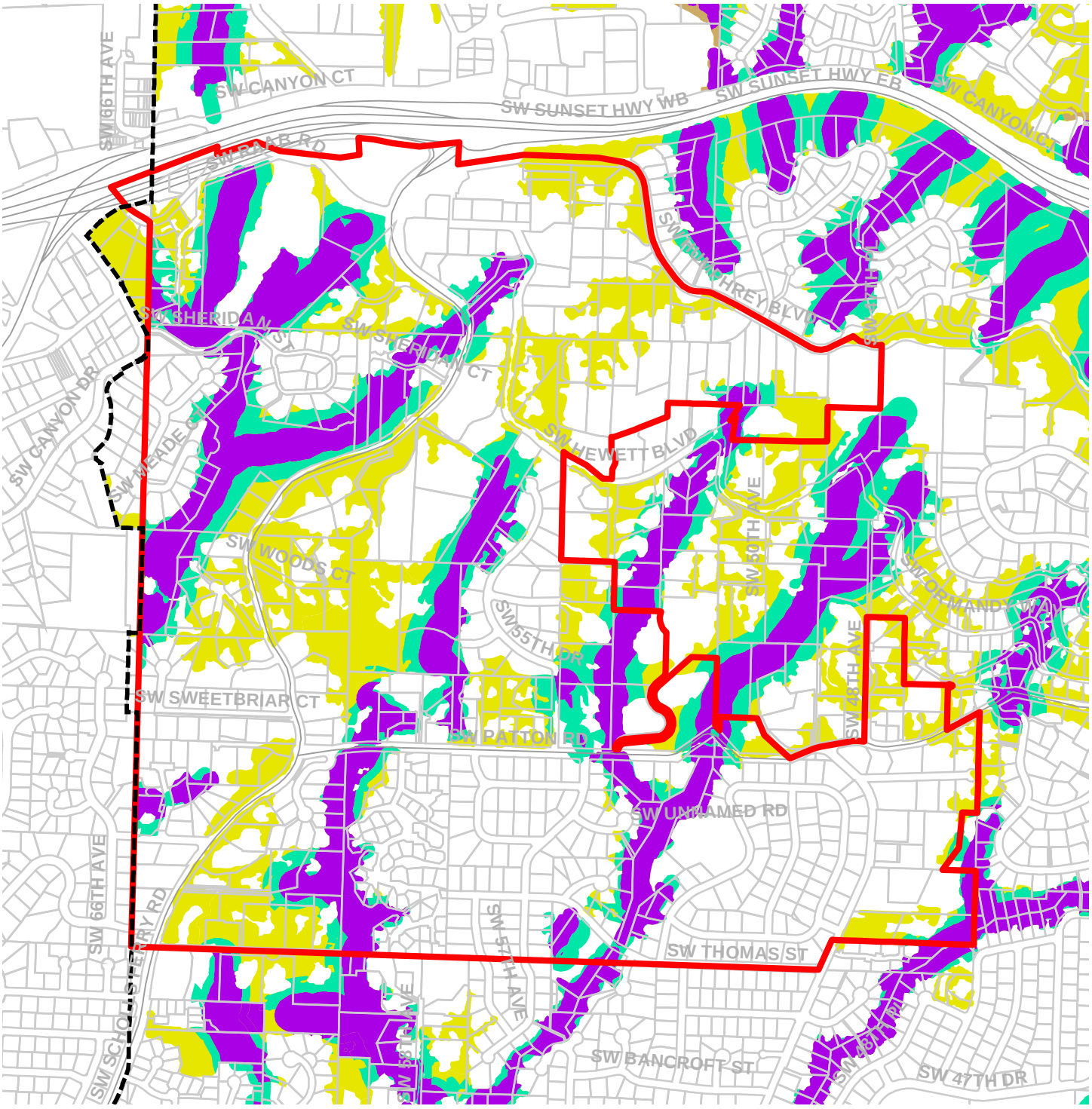
Updated: July 2021

NORTH

0 550 1,100 Feet



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

Resource Site: FC2

Updated: July 2021

NORTH

0 600 1,200 Feet

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

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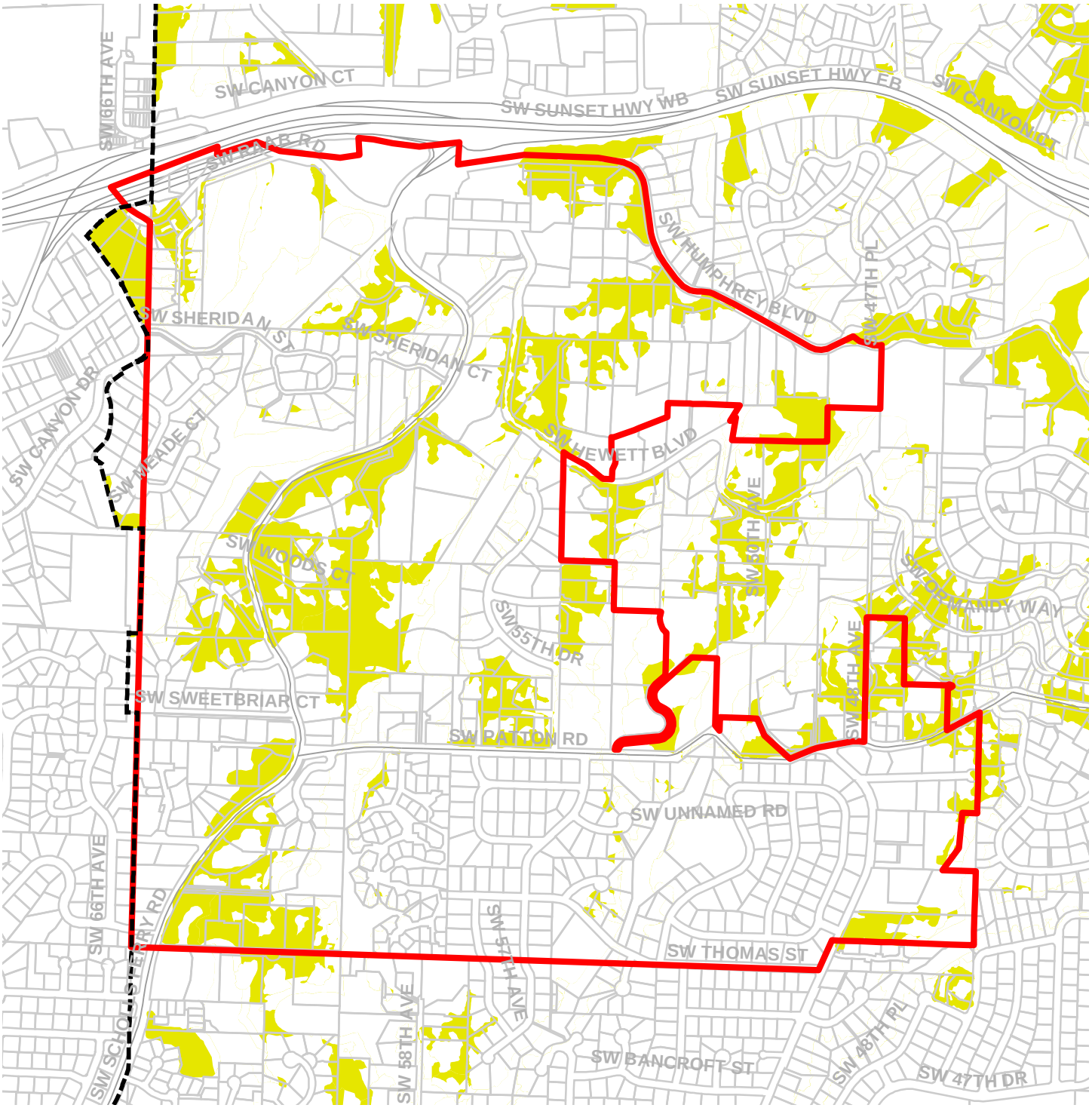

Map H: Goal 5 Resources

Resource Site: FC2

Updated: July 2021

NORTH

0 600 1,200 Feet

Urban Service Boundary

Resource Sites

Goal 5 Significant Natural Resources

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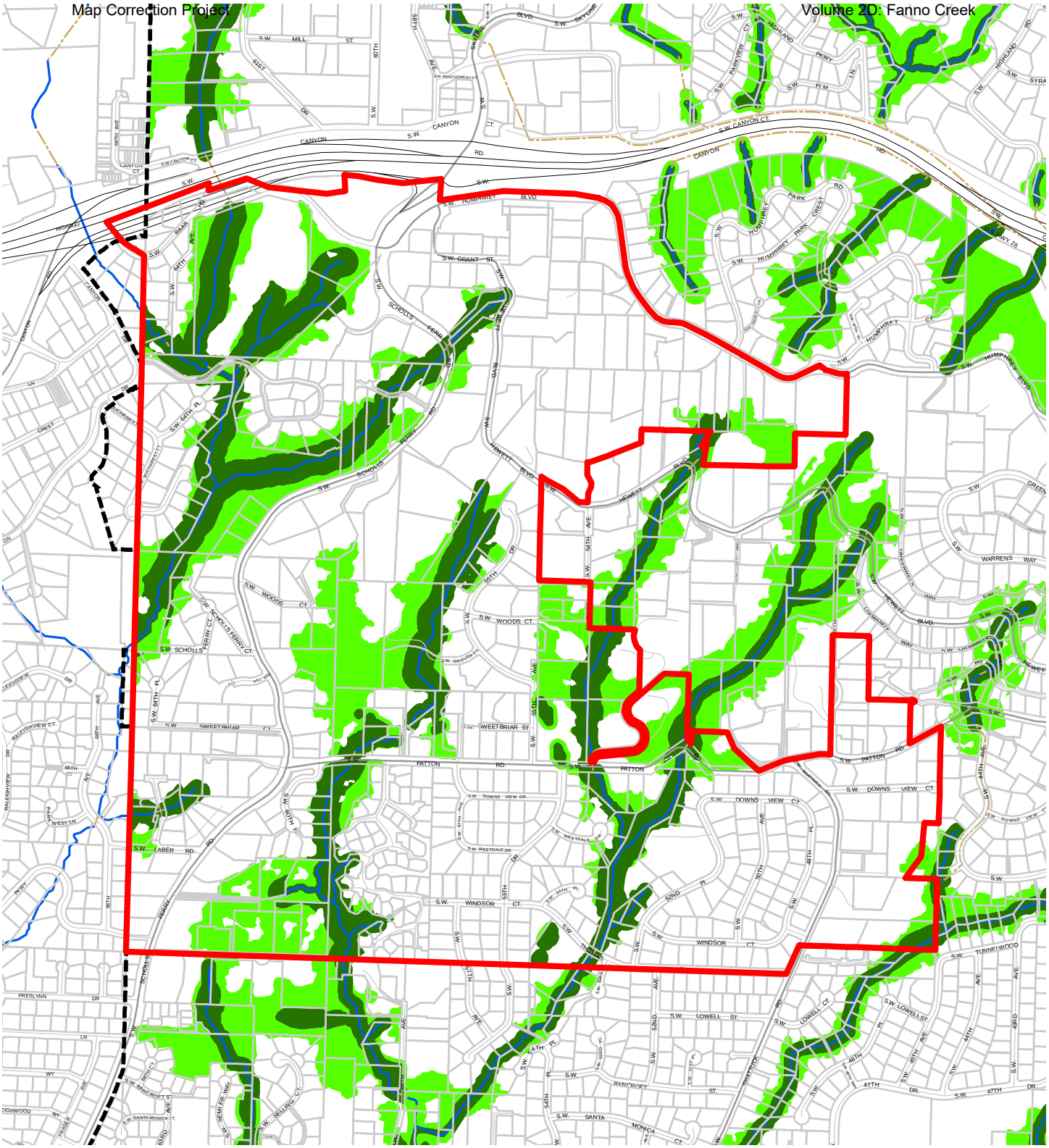

Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site: FC2

Updated: July 2021

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

NORTH

0 487.5 975 Feet

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Natural Resource Description

Within resource site FC2 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: 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 FC2	
	Study Area
Stream (Miles)	3.2
Wetlands (acres)	1.2
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	155.0
Woodland (acres)	46.8
Shrubland (acres)	0.7
Herbaceous (acres)	26.4
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	260.5
* The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area. **Slopes are derived from LiDAR. Steep slopes are areas with a slope greater than 25%.	

This resource site includes Hamilton Park and is largely developed with single-family residential homes. Sylvan and Columbia Creek headwater and mainstem streams flow through the site and into Fanno Creek, which is designated as critical habitat for Endangered Species Act-listed upper Willamette River steelhead trout. Coastal cutthroat trout have also been observed in this resource site.

Special status bird species observed within or adjacent to this site include bald eagle, band-tailed pigeon, black-throated gray warbler, brown creeper, bushtit, downy woodpecker, pacific wren, pacific-slope flycatcher, purple finch, rufous hummingbird, Swainson's thrush, varied thrush, white-breasted nuthatch, vaux's swift, and Wilson's warbler.

Table B: Quality of Natural Resource Functions in Resource Site FC2				
Resource Site (acres) = 454				
	Class 1/A	**Class 2/B**	**Class 3/C**	**Total**
Riparian Corridors*				
acres	67.4	36.1	89.4	193.0
percent total inventory site area	14.9%	8.0%	19.7%	42.5%
Wildlife Habitat*				
acres	0.0	150.3	23.7	174.0
percent total inventory site area	0.0%	33.1%	5.2%	38.3%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total+				
acres	67.4	92.7	42.7	202.9
percent total inventory site area	14.9%	20.4%	9.4%	44.7%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water. ** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors. +Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

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

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

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

For Resource Area FC2, 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 FC2

Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
458	100	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 4 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 FC2. Natural resources should be protected within HCA as follows:

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

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 FC2 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 4, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the

[5] Metro Title 13 rule 3.07.1330(a)(2) states that any city that had an acknowledge Goal 5 program prior to December 28, 2005, that applies to upland wildlife habitat shall not repeal or amend such regulations in a manner that would allow more than a de minimis increase in development that could occur in those upland habitat areas.

conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

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

Within the resource site residential uses are allowed outright or conditionally in the R20 and R10 base zones. Commercial uses are allowed in the CE base zone. Open space uses are allowed in the OS base zone. Development of new uses may involve vegetation clearing, grading, filling, 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 4 is confirmed for resource site FC2, 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, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation for FC2, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

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

Resource Site No.: FC3 **Resource Site Name:** Lowell Creek

Previous Plan: Fanno Creek and Tributaries Conservation Plan
Previous Resource Site No.: 124

The results of the analysis found in Volume 3, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

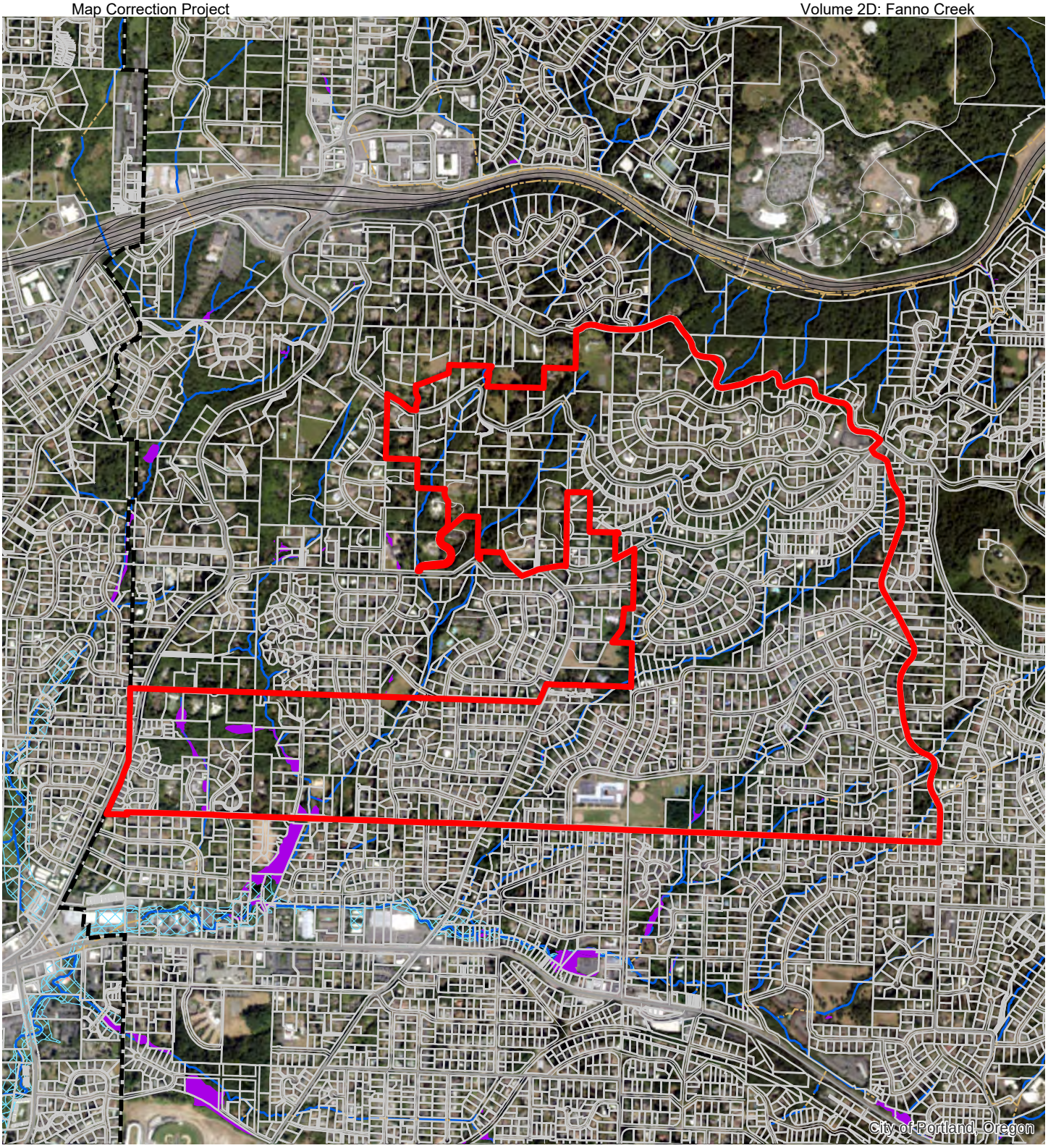
A. Water Features – rivers, streams, wetlands and flood areas
B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
C. Special Habitat Areas
D. Riparian Corridor Classifications
E. Wildlife Habitat Classifications
F. Urban Development Value
G. Metro Title 13 Habitat Conservation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

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

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

Resource site FC3 includes the following:

Site (acres)	583.4
Base zones (acres)	
OS	14.5
R10	383.5
R20	125.2
R5	9.3
R7	50.9



Map A: Water Features

Resource Site: FC3

Updated: July 2021

NORTH

0 700 1,400 Feet

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

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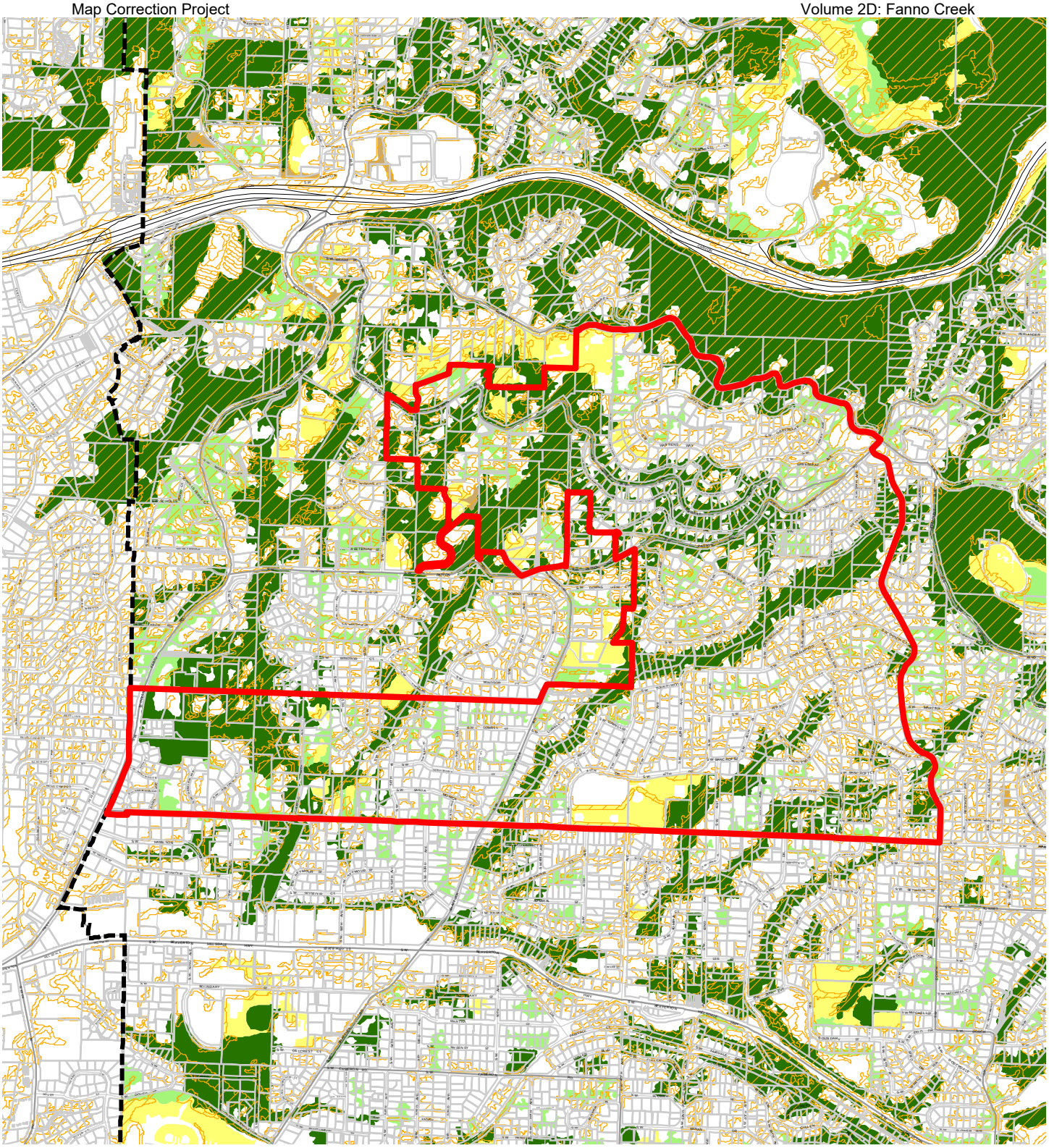

Map B: Vegetation and Steep Slopes

Resource Site: FC3

Updated: July 2021

NORTH

0 1,000 2,000 Feet

Proposed Draft - As Amended

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

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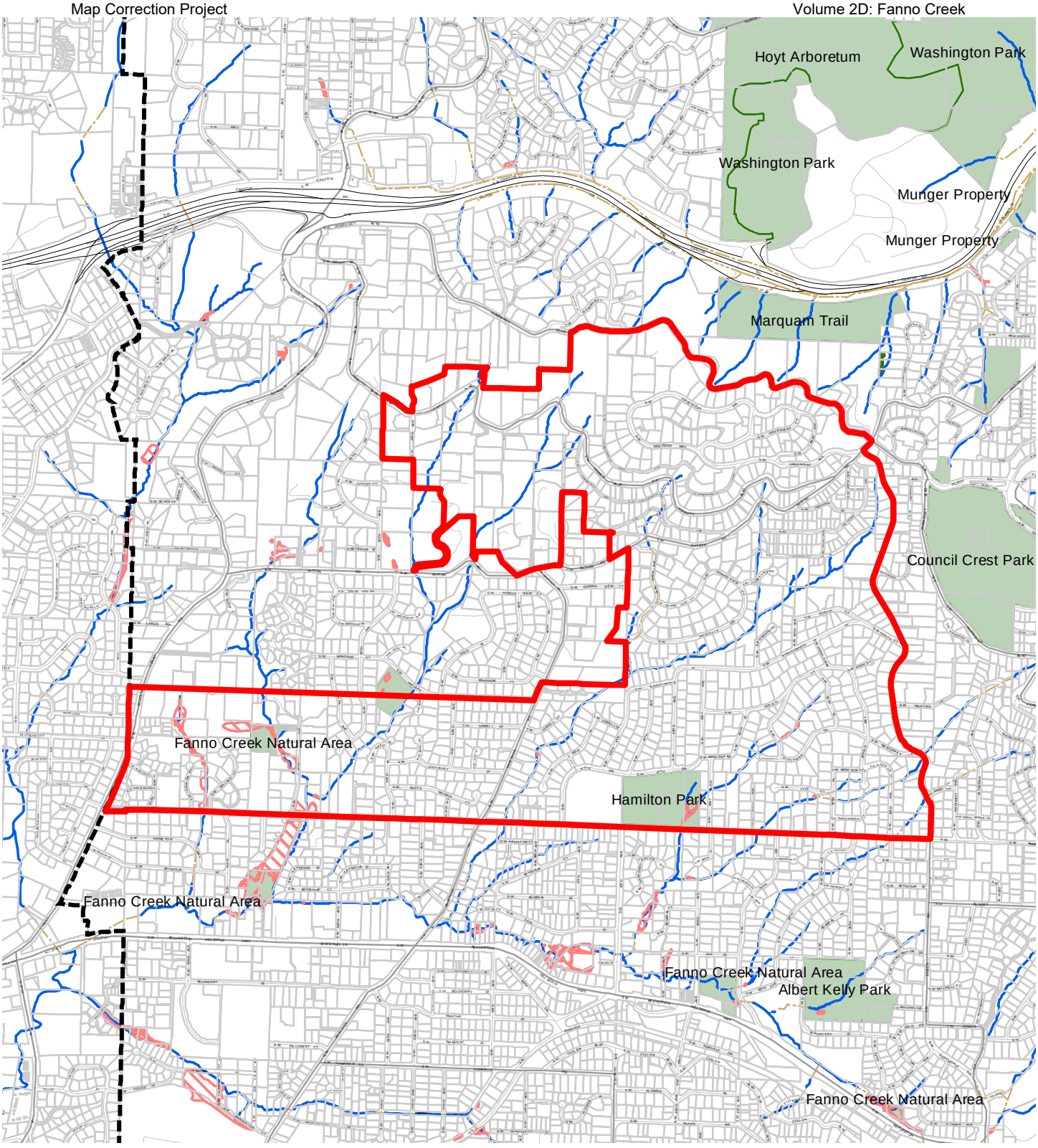
July 2021



Map C: Special Habitat Areas

Resource Site: FC3

Updated: June 2021

NORTH

0 750 1,500 Feet

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

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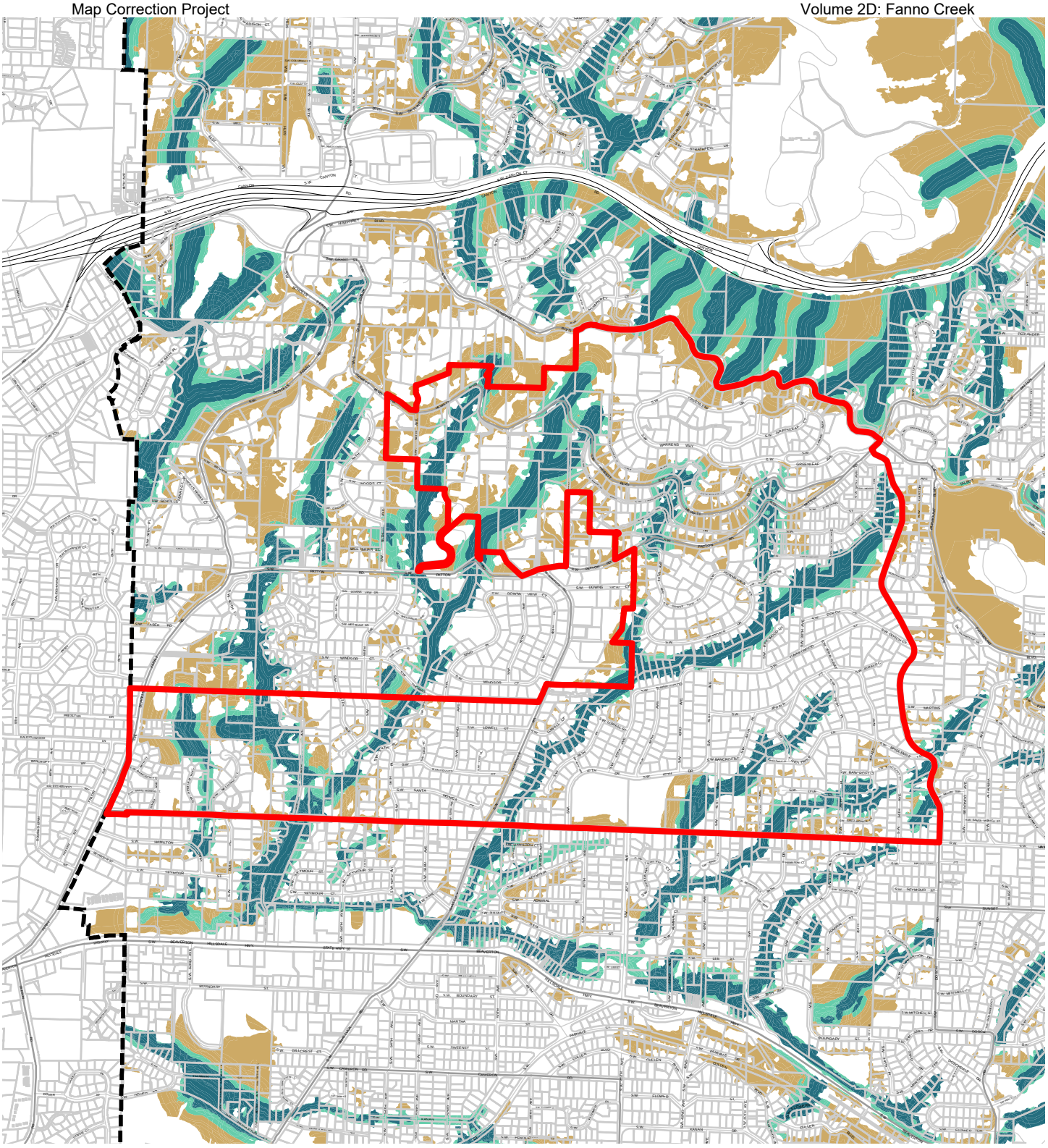

Map D: Riparian Corridors Habitat Classification

Resource Site: FC3

Updated: July 2021

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

NORTH

0 700 1,400 Feet

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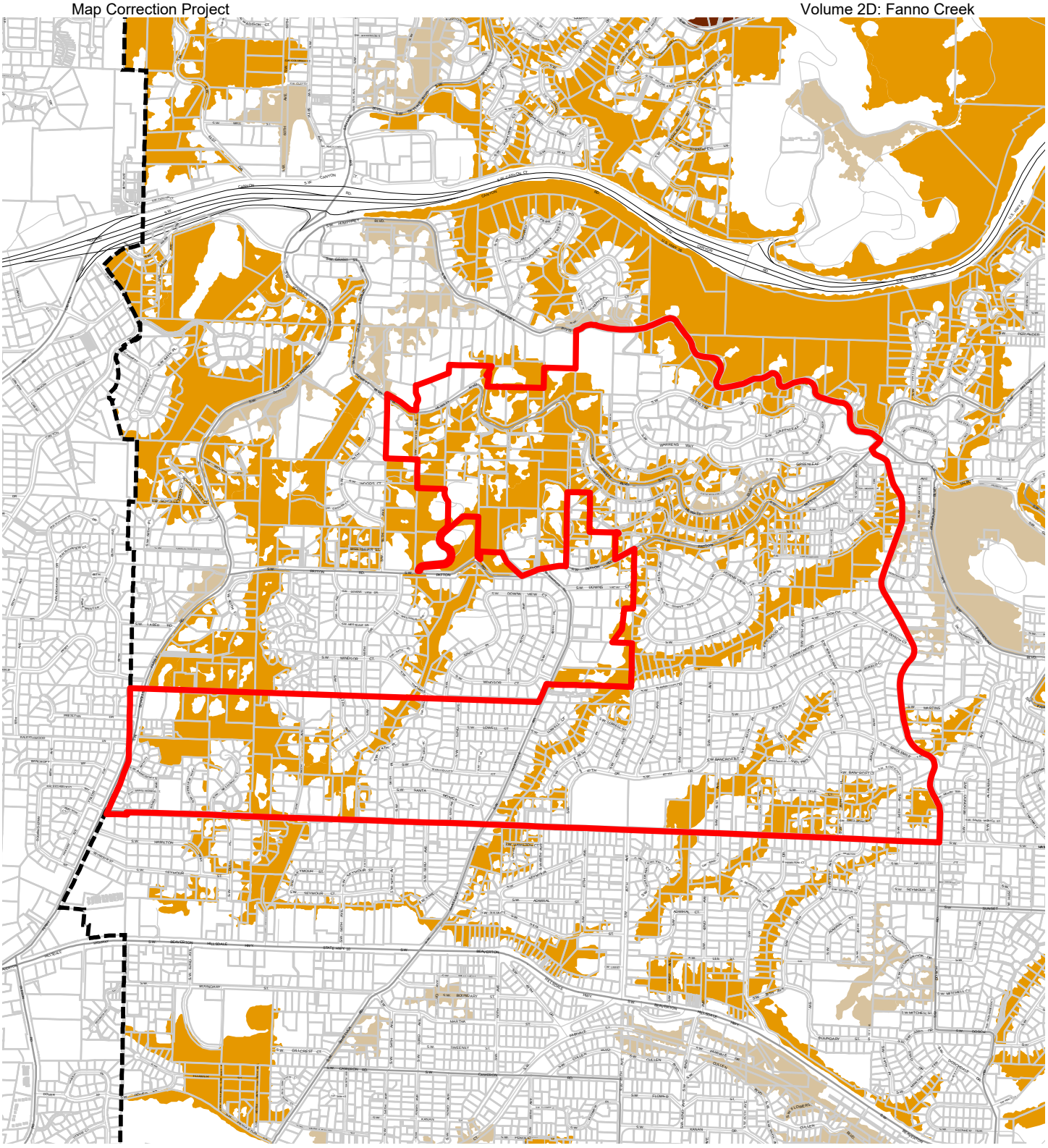

Map E: Wildlife Habitat Classification

Resource Site: FC3

Updated: July 2021

NORTH

0 550 1,100 Feet

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

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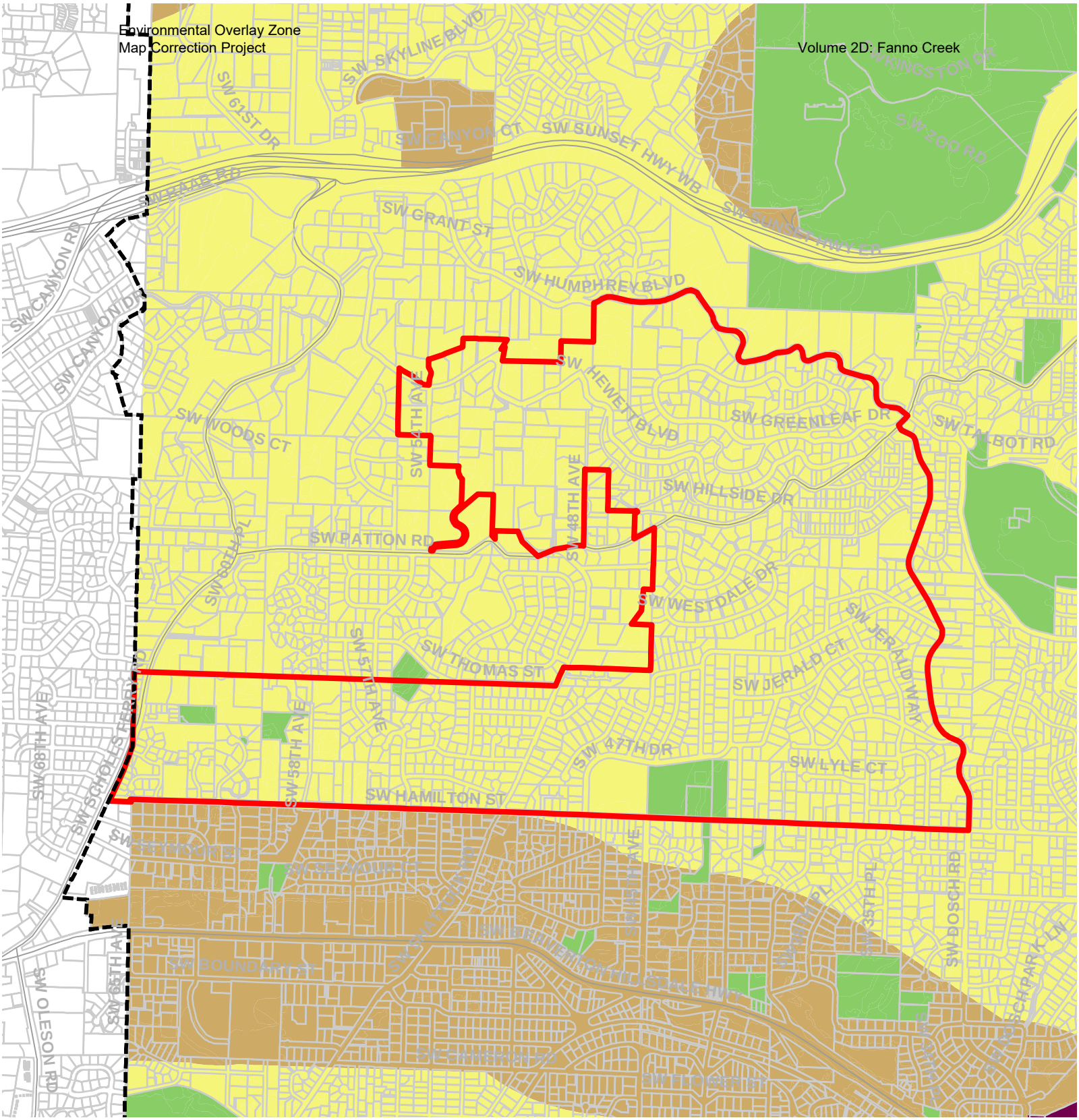
July 2021



Map F: Urban Development Value (Title 13)
Resource Site: FC3

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

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Updated: July 2021

NORTH

0 900 1,800 Feet

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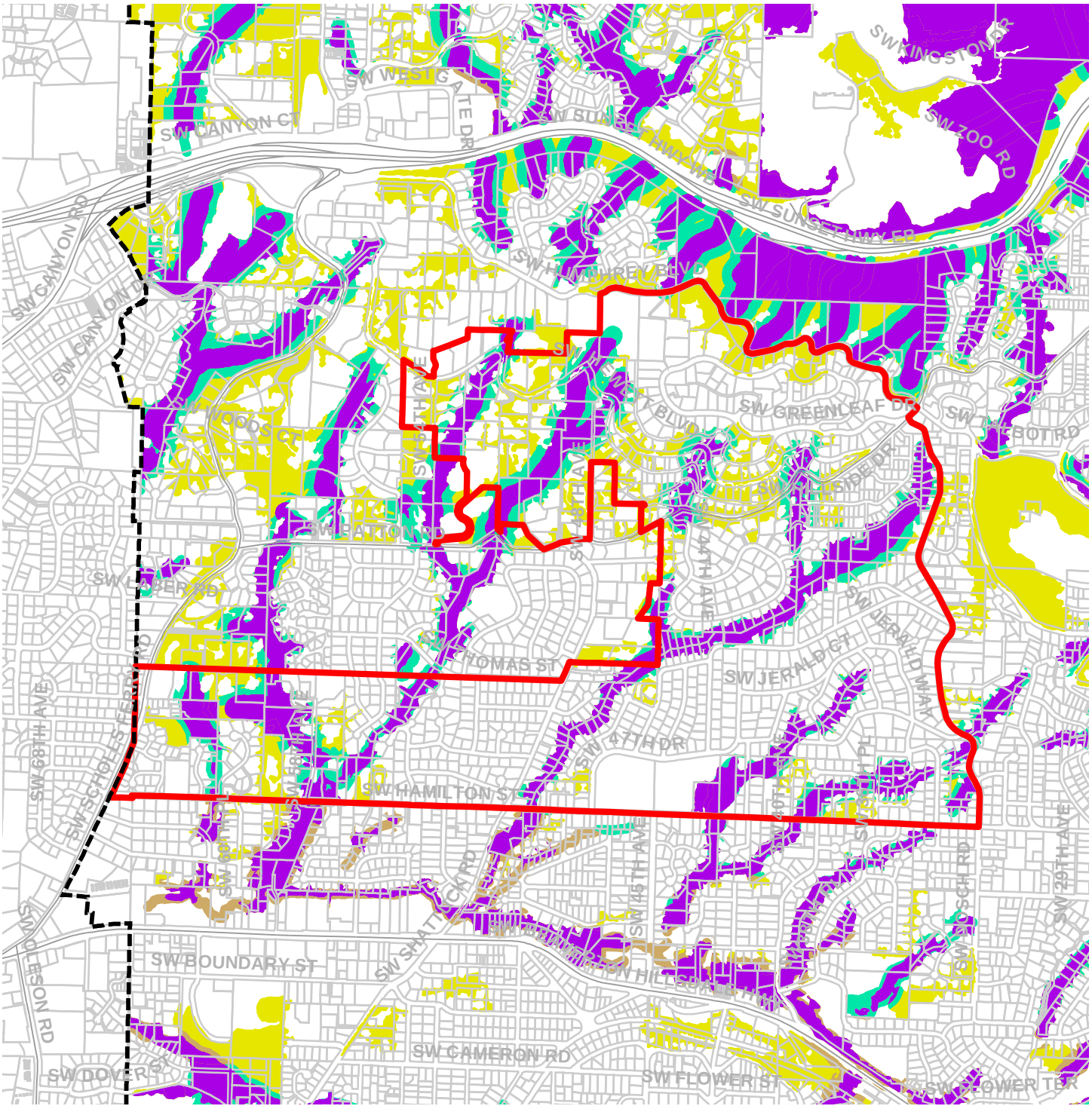

Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: FC3

Updated: July 2021

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

NORTH

0 1,000 2,000 Feet

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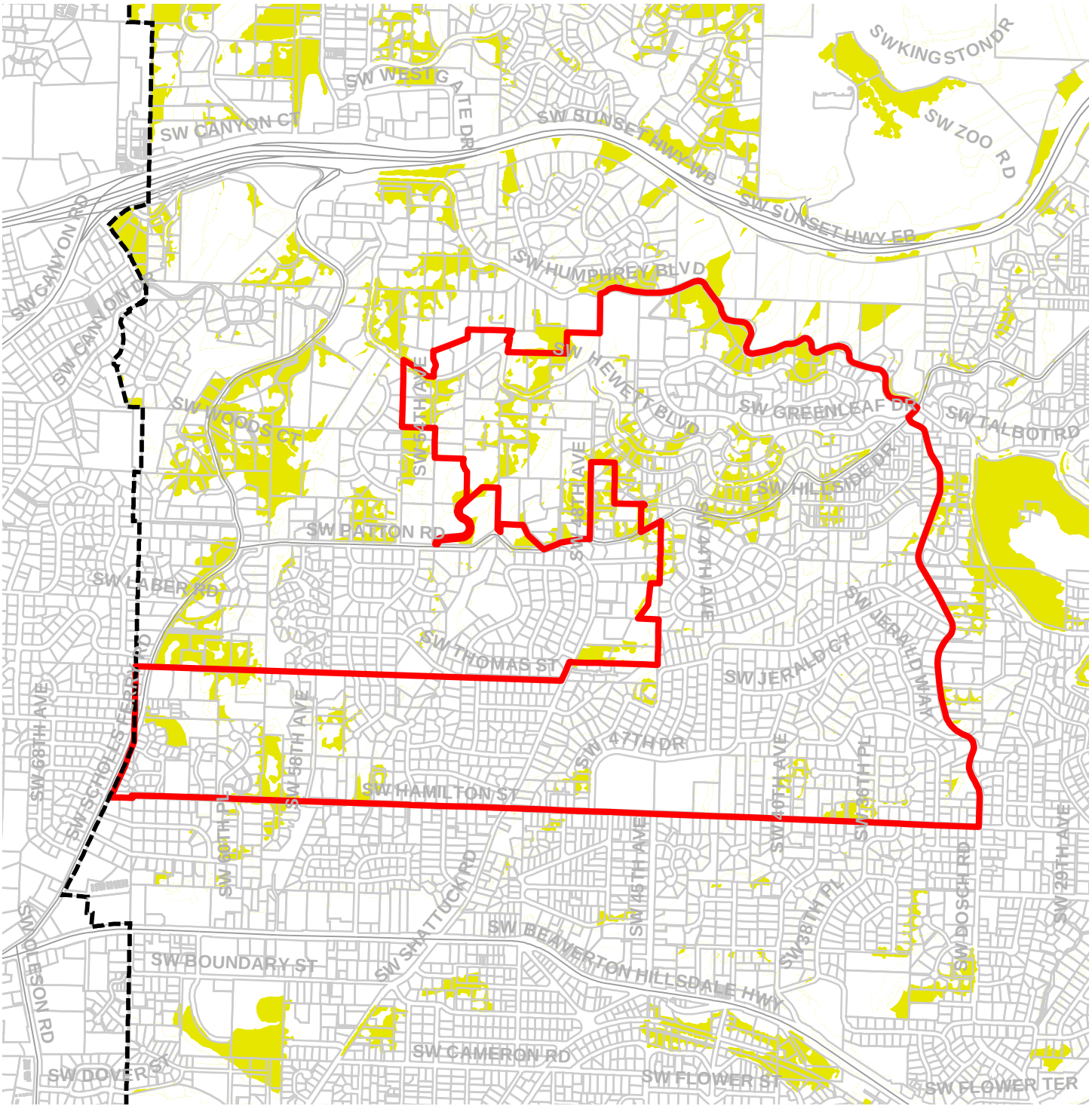

Map H: Goal 5 Resources

Resource Site: FC3

Updated: July 2021

NORTH

0 1,000 2,000 Feet

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

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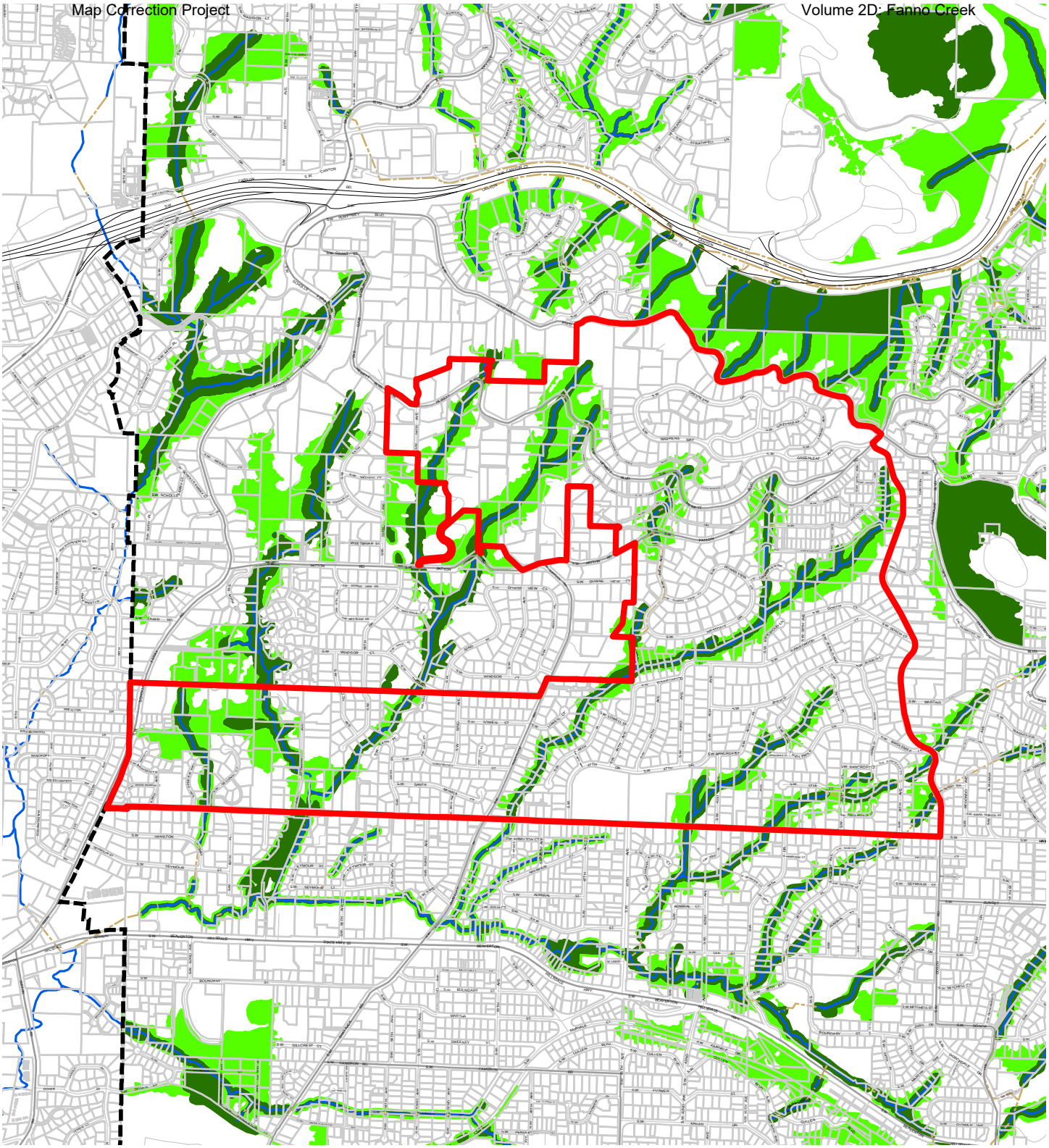

Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site:

FC3

Updated: July 2021

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

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NORTH

0 750 1,500 Feet

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Natural Resource Description

Within resource site FC3 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: Johnson Creek (S, C); wetlands (W) Forest Park (O, B, M, C, S, P, E); Balch Creek Watershed (O, B, M, C, E) Tryon Creek State Natural Area (S, M, C)

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	**FC3**
	Study Area
Stream (Miles)	4.5
Wetlands (acres)	2.7
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	179.1
Woodland (acres)	49.3
Shrubland (acres)	0.4
Herbaceous (acres)	22.3
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	320.8

* The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area.
**Slopes are derived from LiDAR. Steep slopes are areas with a slope greater than 25%.

This resource site is largely developed with residential homes but also includes Fanno Creek Natural Area and Hamilton Park. Forested headwater (Lowell Creek) and mainstem Fanno Creek streams cross the site. Fanno Creek is designated critical habitat for Endangered Species Act-listed upper Willamette River steelhead trout and has mapped 100-year floodplain (Special Flood Hazard Area)

Special status bird species observed within or adjacent to this site include: bald eagle, band-tailed pigeon, black-throated gray warbler, brown creeper, bushtit, downy woodpecker, great blue heron, Hammond's flycatcher, Hutton's vireo, merlin, olive-sided flycatcher, orange-crowned warbler, pacific-slope flycatcher, pacific wren, purple finch, red crossbill, rufous hummingbird, Swainson's thrush, varied thrush, Vaux's swift, western wood-pewee, white-breasted nuthatch, and Wilson's warbler.

Table B: Quality of Natural Resource Functions in Resource Site FC3				
Resource Site (acres) =	583			
	Class 1/A	**Class 2/B**	**Class 3/C**	**Total**
Riparian Corridors*				
acres	89.5	41.4	87.8	218.7
percent total inventory site area	15.3%	7.1%	15.1%	37.5%
Wildlife Habitat*				
acres	0.0	183.2	2.7	185.9
percent total inventory site area	0.0%	31.4%	0.5%	31.9%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total+				
acres	89.5	105.8	29.2	224.5
percent total inventory site area	15.3%	18.1%	5.0%	38.5%
* 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 FC3, 13% of the total area is effectively impervious, indicating a critical level of vulnerability, with negative impacts beginning to impact natural functions, but natural processes still in place and providing support to biologic systems.

Table C. Impervious Area within Resource Site FC3

Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
581	119	77	13%

*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 4 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 FC3. Natural resources should be protected within HCA as follows:

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

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 FC3 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 4, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

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

Within the resource site residential uses are allowed outright or conditionally in the R20, R10, R7 and R5 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 4 is confirmed for resource site FC3, 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, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation for FC3, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or 25 feet of wetlands.
2. Within public parks, apply a protection overlay zone ('p' zone) to land between 25 and 50 feet of wetlands.
3. Outside of public parks, apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands.

4. Apply a conservation overlay zone ('c' zone) and within areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank extending to 200 feet from streams.
5. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: FC4 **Resource Site Name:** Fanno Creek West

Previous Plan: Fanno Creek and Tributaries Conservation Plan
Previous Resource Site No.: 125

The results of the analysis found in Volume 3, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

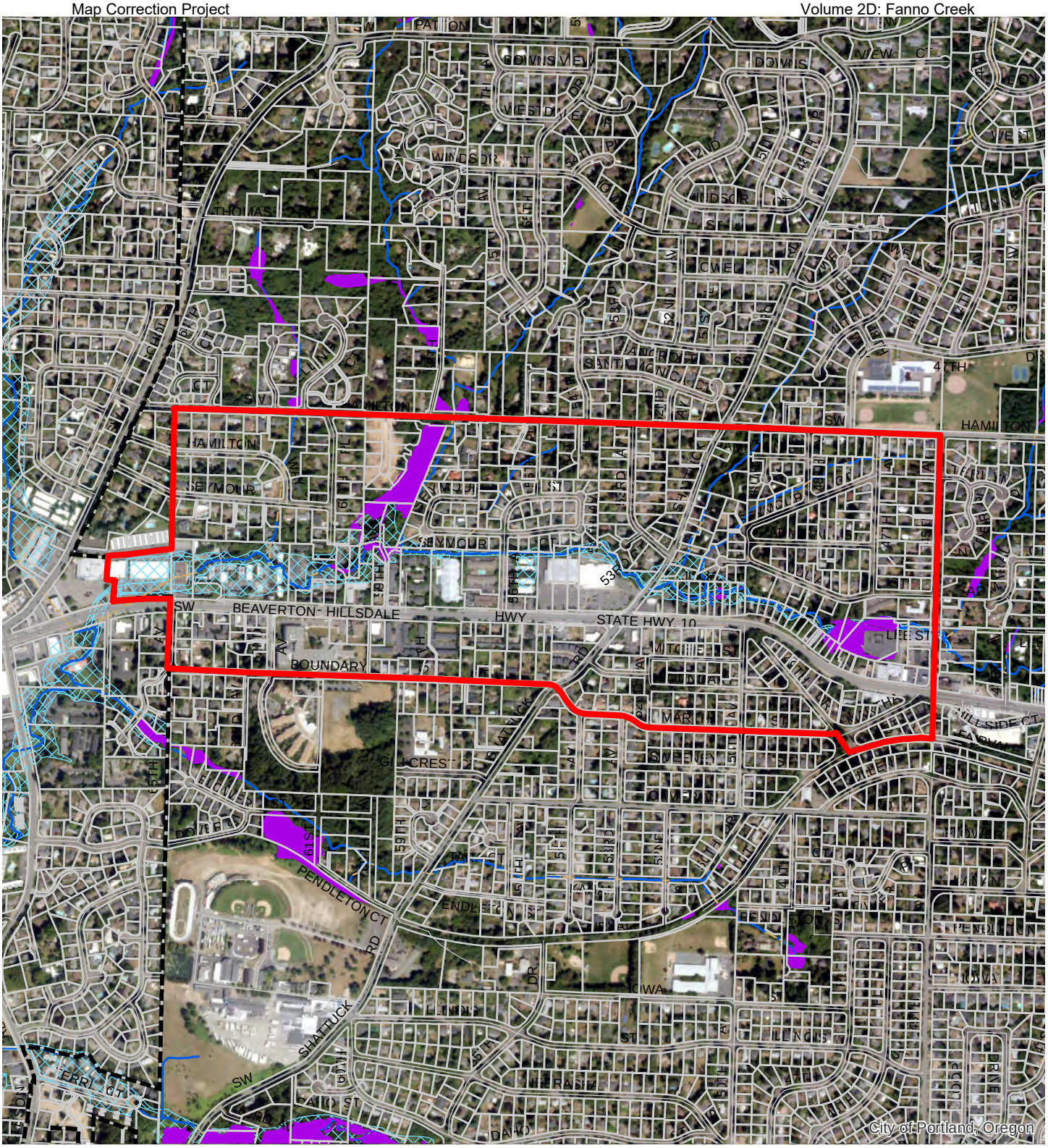
A. Water Features – rivers, streams, wetlands and flood areas
B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
C. Special Habitat Areas
D. Riparian Corridor Classifications
E. Wildlife Habitat Classifications
F. Urban Development Value
G. Metro Title 13 Habitat Conservation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

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

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

Resource site FC4 includes the following:

Site (acres)	237.3
Base zones (acres)	
CE	17.4
CM1	1.4
CM2	8.4
OS	3.7
R10	45.8
R2.5	0.4
R5	8.3
R7	91.5
RM1	38.2
RM2	22.1



Map A: Water Features

Resource Site: FC4

Updated: July 2021

NORTH

0 495 990 Feet

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

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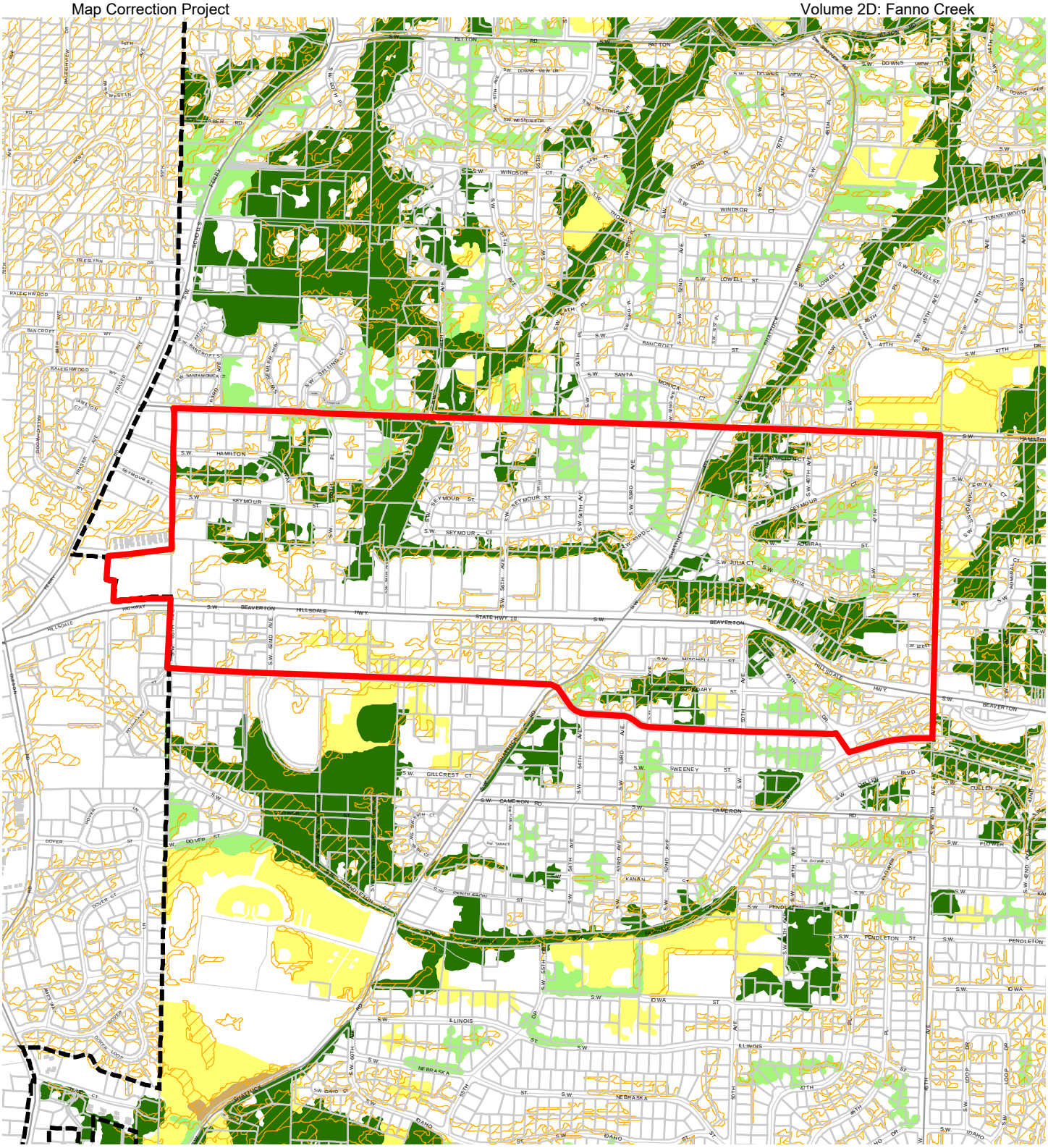

Map B: Vegetation and Steep Slopes

Resource Site: FC4

Updated: July 2021

NORTH

0 650 1,300 Feet

Proposed Draft - As Amended

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

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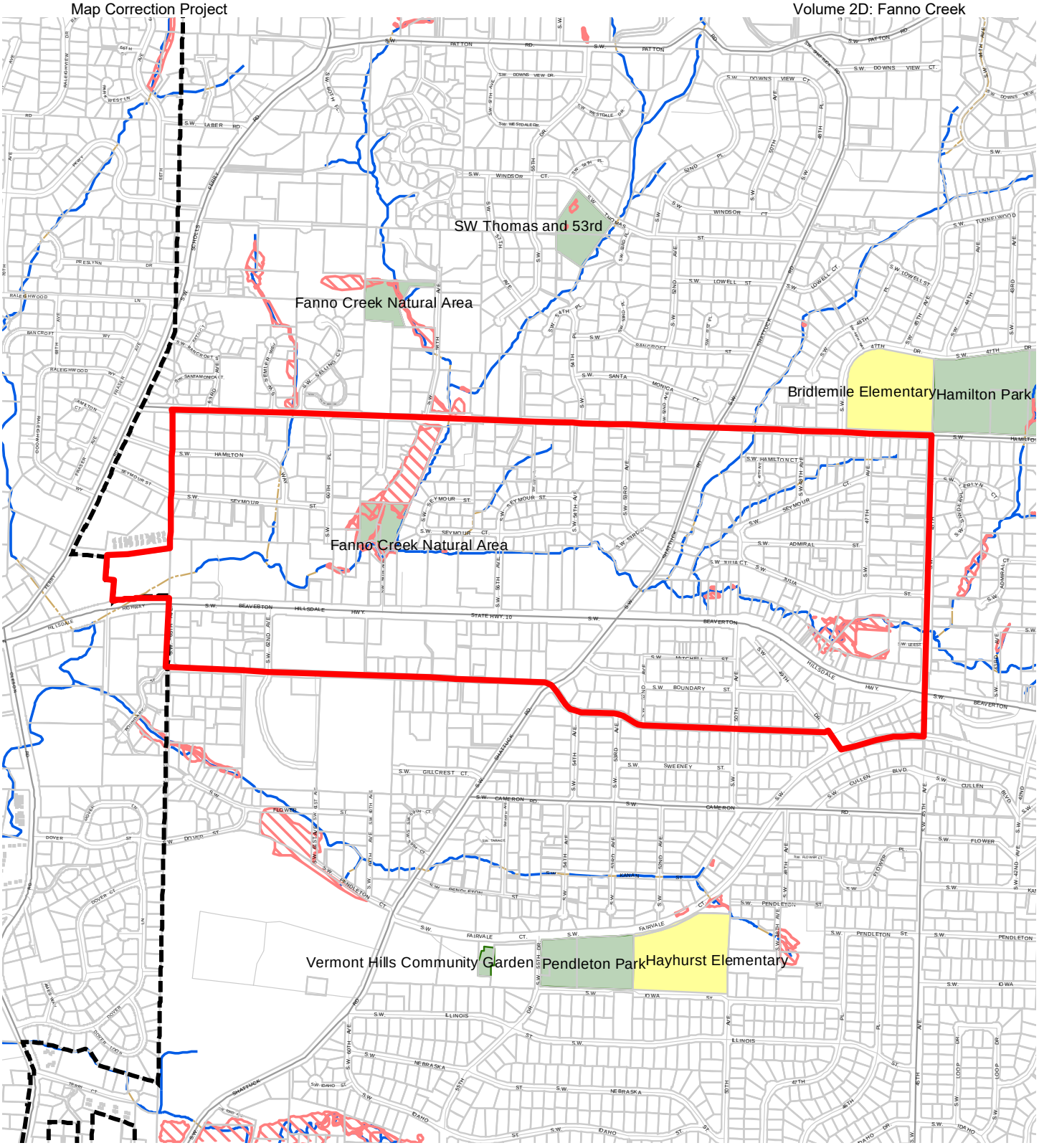

Map C: Special Habitat Areas

Resource Site: FC4

Updated: June 2021

NORTH

0 500 1,000 Feet

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

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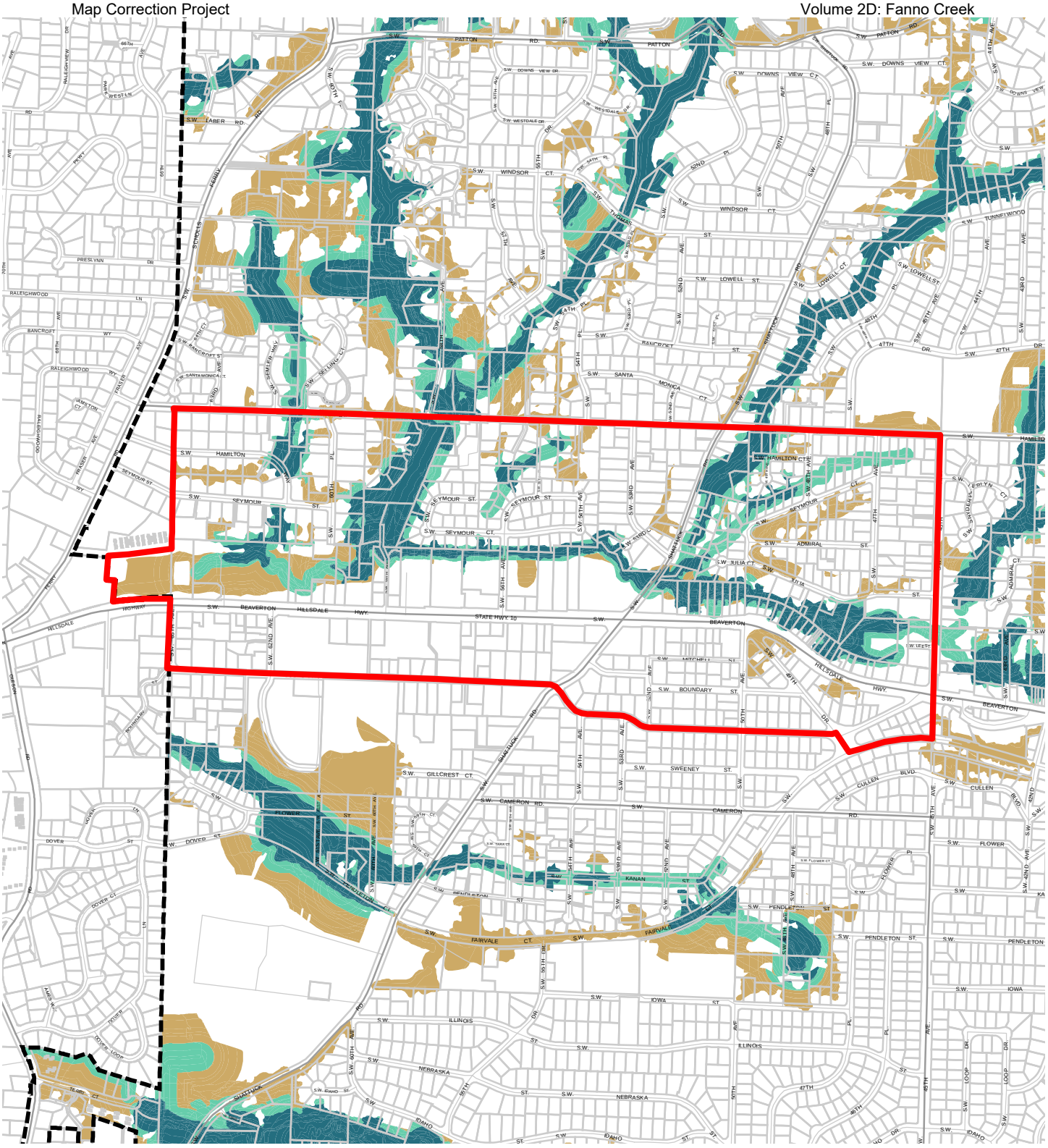

Map D: Riparian Corridors Habitat Classification

Resource Site: FC4

Updated: July 2021

Resource Sites

Urban Service Boundary

Class I (high rank)

Taxlots

Class II (medium rank)

Class III (low rank)

NORTH

0 495 990 Feet

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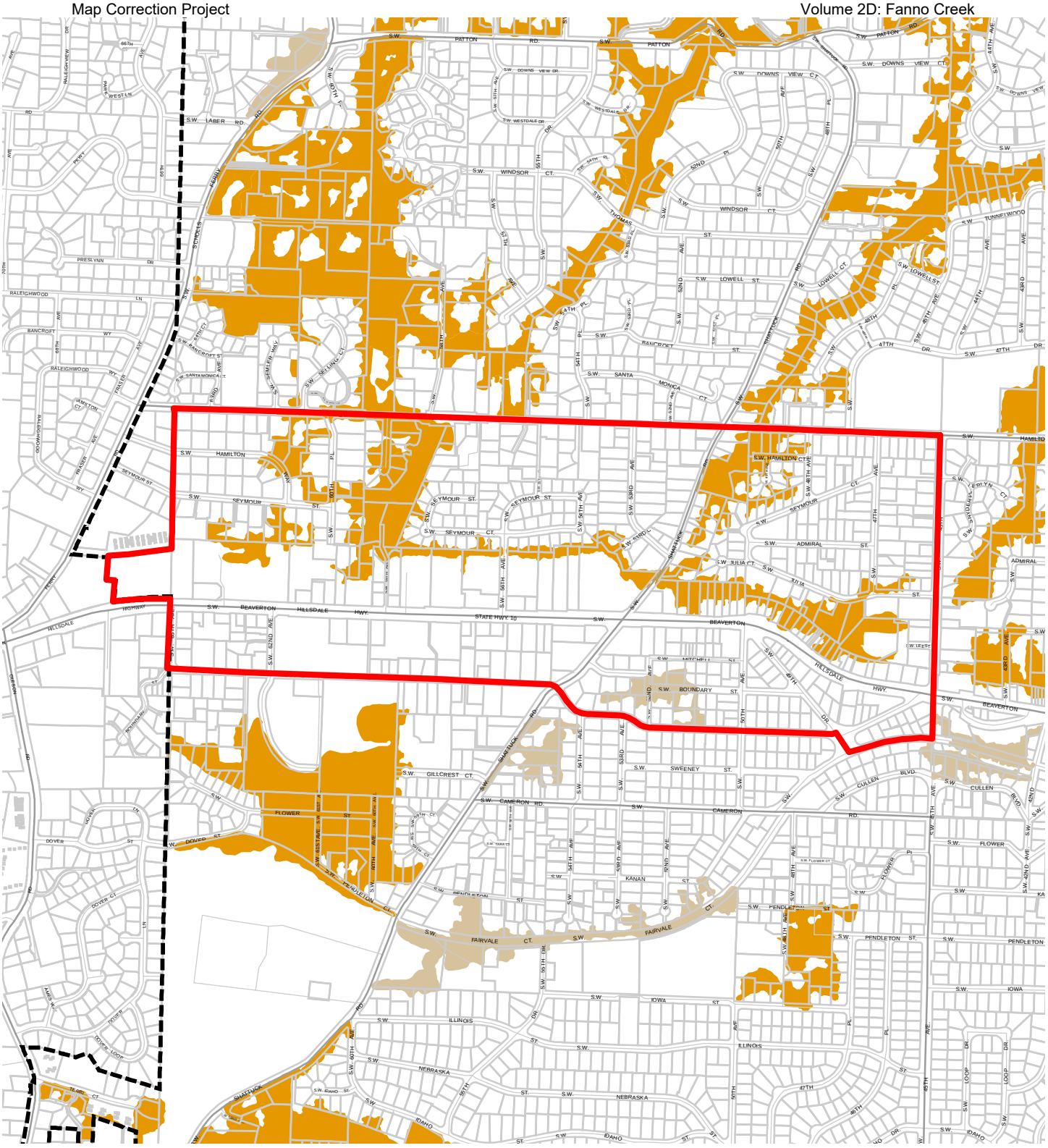

Map E: Wildlife Habitat Classification

Resource Site: FC4

Updated: July 2021

NORTH

0 400 800 Feet

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

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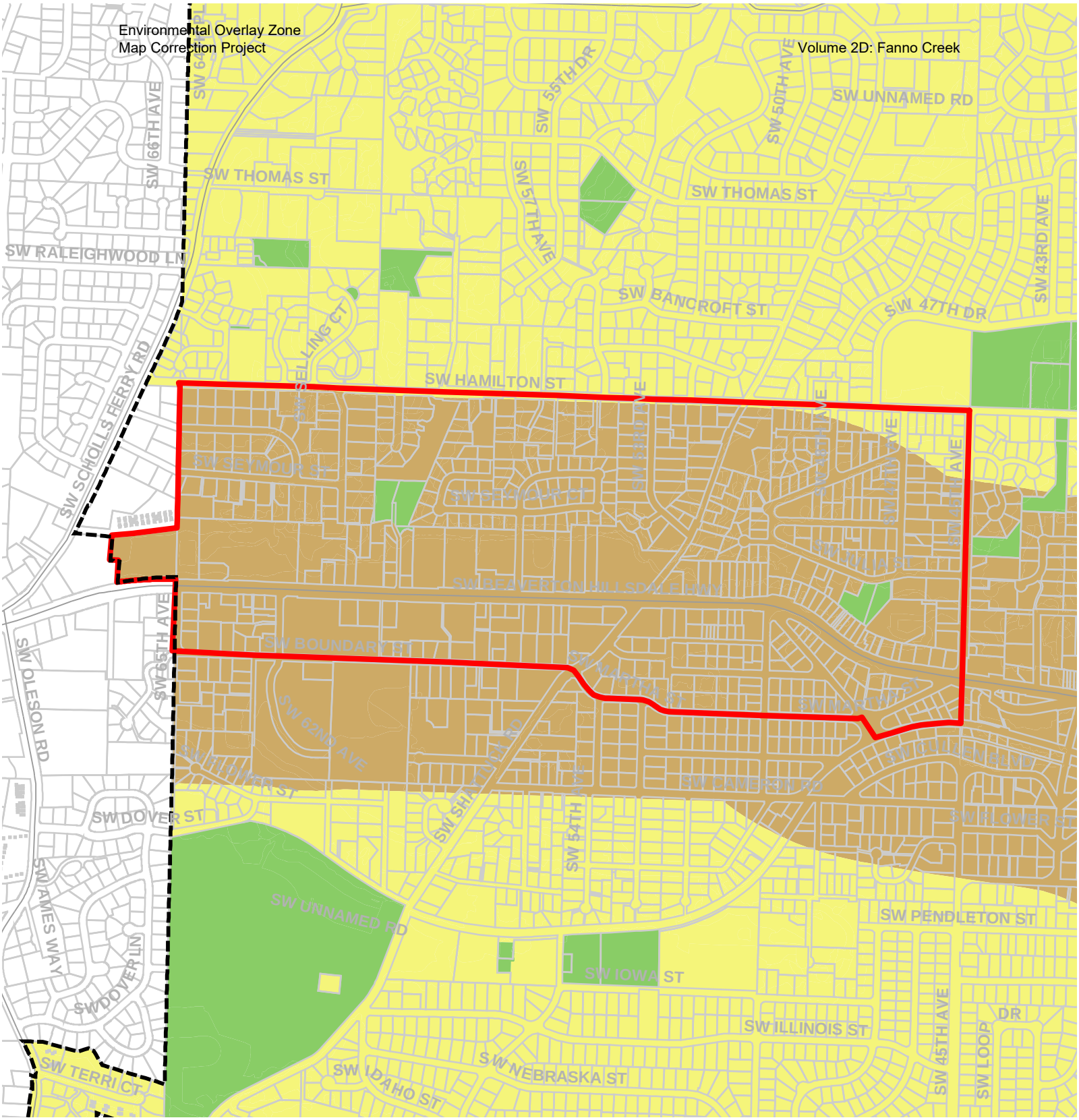

Map F: Urban Development Value (Title 13)
Resource Site: FC4

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

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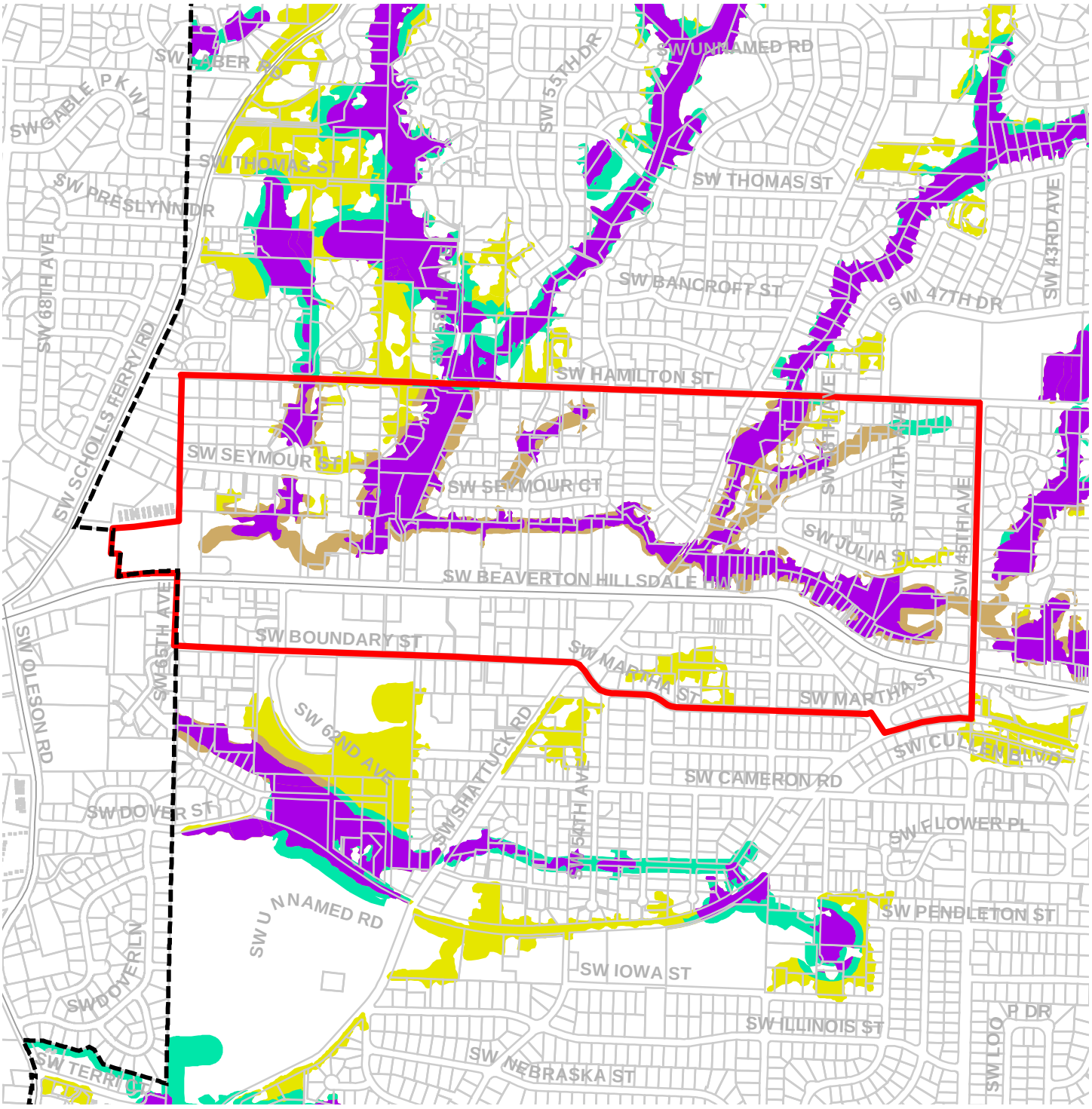
Updated: July 2021

NORTH

0 550 1,100 Feet



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

Resource Site: FC4

Updated: July 2021

NORTH

0 650 1,300 Feet

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

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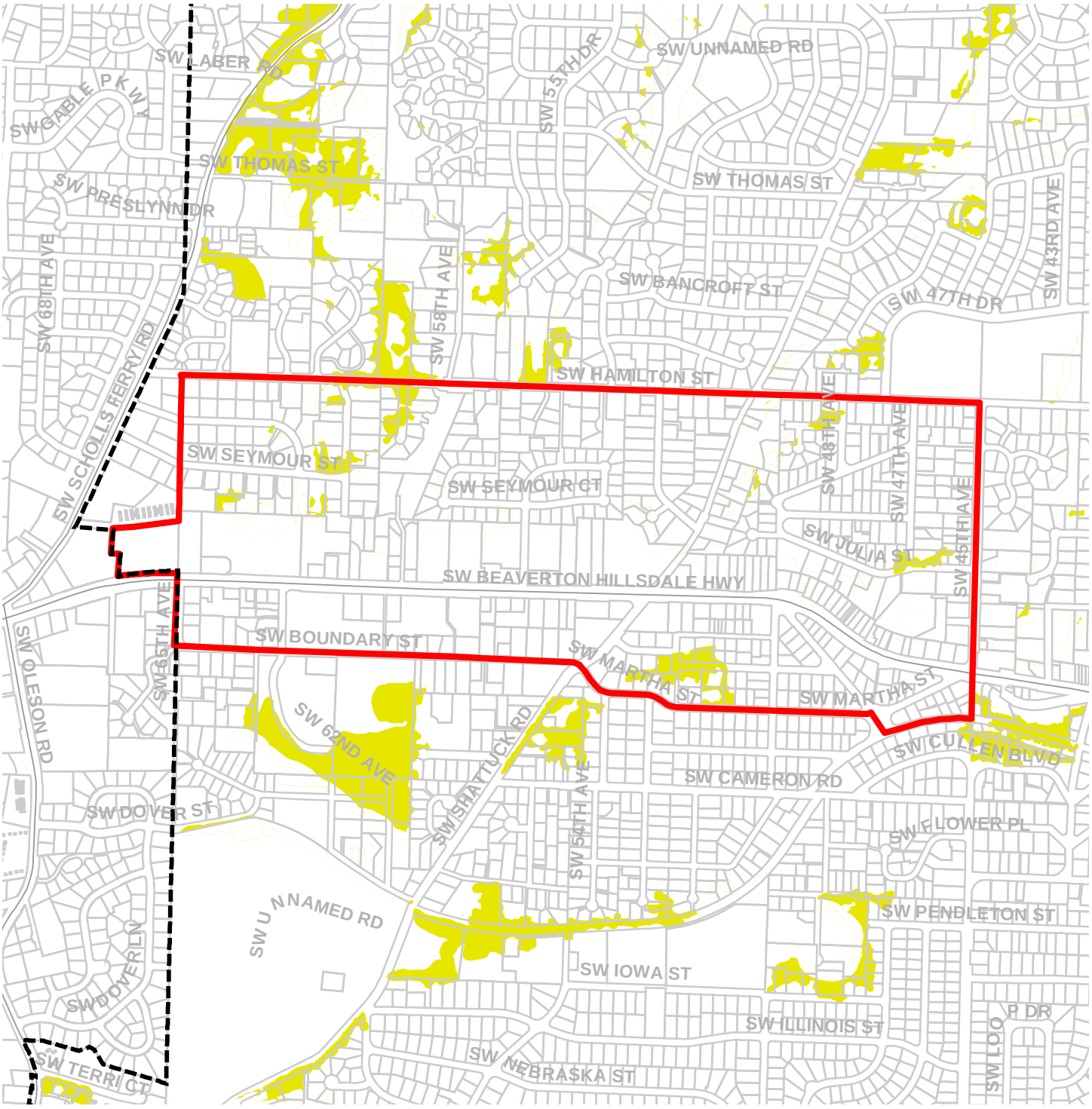

Map H: Goal 5 Resources

Resource Site: FC4

Updated: July 2021

NORTH

0 650 1,300 Feet

Urban Service Boundary

Resource Sites

Goal 5 Significant Natural Resources

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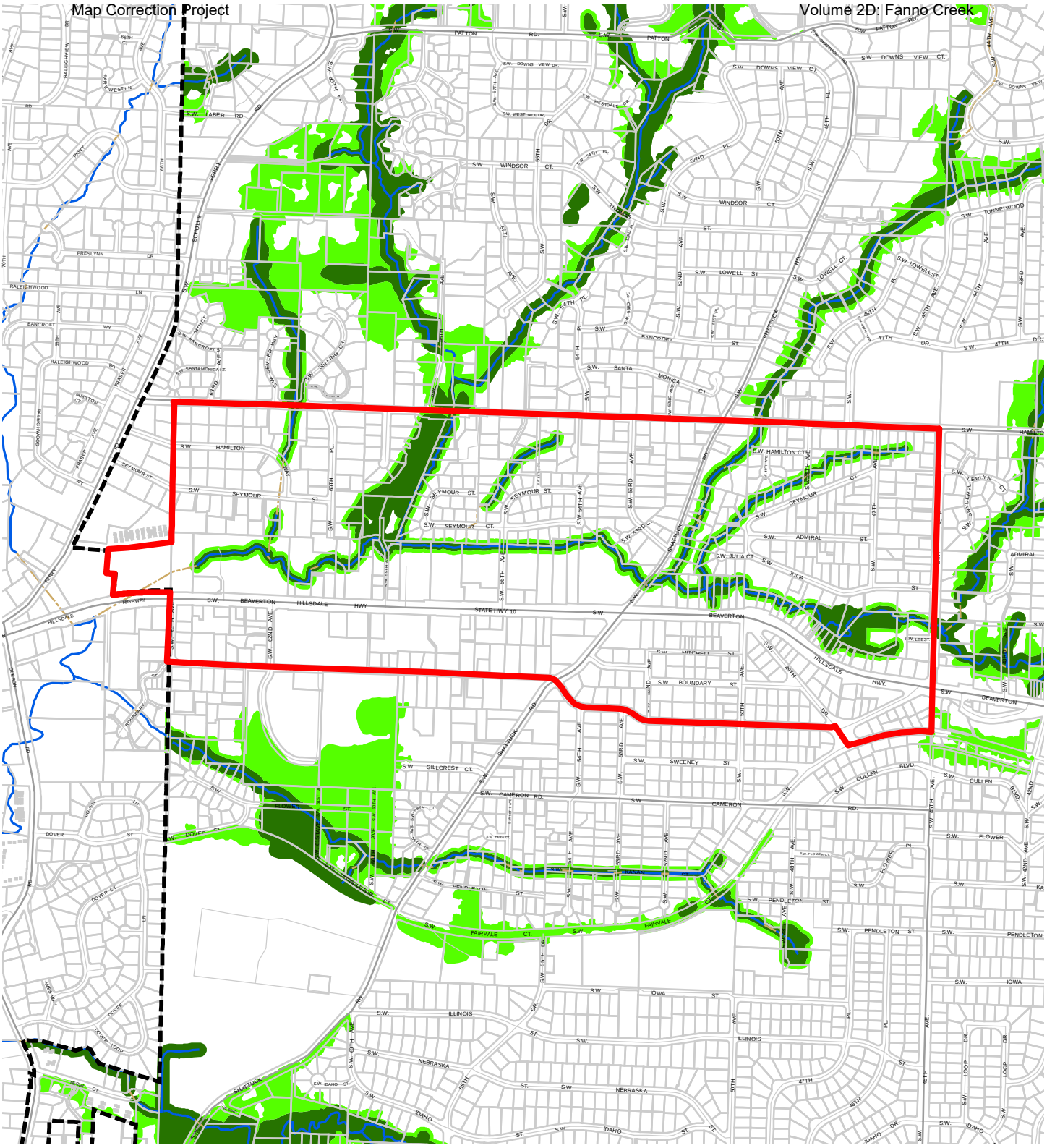

Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site:

FC4

Updated: July 2021

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

NORTH

0 500 1,000 Feet

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Natural Resource Description

Within resource site FC4 the following significant natural resource features and functions are present:

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

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

Special Habitat Areas: Wetlands (W)

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

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

Table A: Quantity of Natural Resource Features in Resource Site	**FC4**
	Study Area
Stream (Miles)	2.2
Wetlands (acres)	5.3
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	40.5
Woodland (acres)	13.0
Shrubland (acres)	0.0
Herbaceous (acres)	2.6
Flood Area*	
Vegetated (acres)	9.1
Non-vegetated (acres)	11.1
Steep Slopes (acres)**	58.9
* 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%.	

This resource site includes a significant section of mainstem Fanno Creek as it flows across the highly developed area along SW Beaverton Hillsdale Highway. This section of Fanno Creek has been mapped in the 100-year floodplain and also the 10-year flood interval. However, most of the floodplain associated with Fanno Creek in this site is fully developed and is not actively functioning as natural floodplain.

This resource site includes the Fanno Creek Natural Area and coastal cutthroat trout have been observed in the site. In addition, Fanno Creek is designated as critical habitat for upper Willamette River steelhead trout.

Special status bird species observed within or adjacent to this site include: bald eagle, band-tailed pigeon, black-throated gray warbler, brown creeper, bushtit, common yellowthroat, downy woodpecker, great blue heron, hooded merganser, Hutton's vireo, merlin, orange-crowned warbler, pacific-slope flycatcher, pacific wren, pileated woodpecker, purple finch, rufous hummingbird, Swainson's thrush, varied thrush, Vaux's swift, western wood-pewee, white-breasted nuthatch, willow flycatcher, Wilson's warbler, wood duck, and yellow warbler.

Table B: Quality of Natural Resource Functions in Resource Site FC4				
Resource Site (acres) = 237				
	Class 1/A	**Class 2/B**	**Class 3/C**	**Total**
Riparian Corridors*				
acres	28.7	17.8	20.7	67.3
percent total inventory site area	12.1%	7.5%	8.7%	28.3%
Wildlife Habitat*				
acres	0.0	36.2	2.7	38.9
percent total inventory site area	0.0%	15.2%	1.1%	16.4%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total+				
acres	28.7	22.2	19.3	70.2
percent total inventory site area	12.1%	9.3%	8.1%	29.6%

* 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 FC4, 27% 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 FC4

Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
238	78	64	27%

*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 4 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 FC4. Natural resources should be protected within HCA as follows:

1. *Strictly limit* or *limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit* or *limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit* or *limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, expect parks and open space. [6]

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 FC4 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 4, describes the conflicting uses and provides an overarching analysis of the economic,

[6] Metro Title 13 rule 3.07.1330(a)(2) states that any city that had an acknowledge Goal 5 program prior to December 28, 2005, that applies to upland wildlife habitat shall not repeal or amend such regulations in a manner that would allow more than a de minimis increase in development that could occur in those upland habitat areas.

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

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

Within the resource site residential uses are allowed outright or conditionally in the R10, R7, R5, R2.5, R2 and R1 base zones. Commercial uses are allowed in the CE, CM2 and CM1 base zone. Open space uses are allowed in the OS base zone. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

The analysis of economic, social, environmental and energy consequences provided in Volume 4 is confirmed for resource site FC4, 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, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation for FC4, 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 within 25 and 50 feet of stream top-of-bank or wetlands.
3. Outside of public parks, apply a conservation overlay zone ('c' zone) to land within 25 and 50 feet of stream top-of-bank or wetlands.
4. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: FC5 **Resource Site Name:** Fanno Creek & Tributaries

Previous Plan: Fanno Creek and Tributaries Conservation Plan
Previous Resource Site No.: 125

The results of the analysis found in Volume 3, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

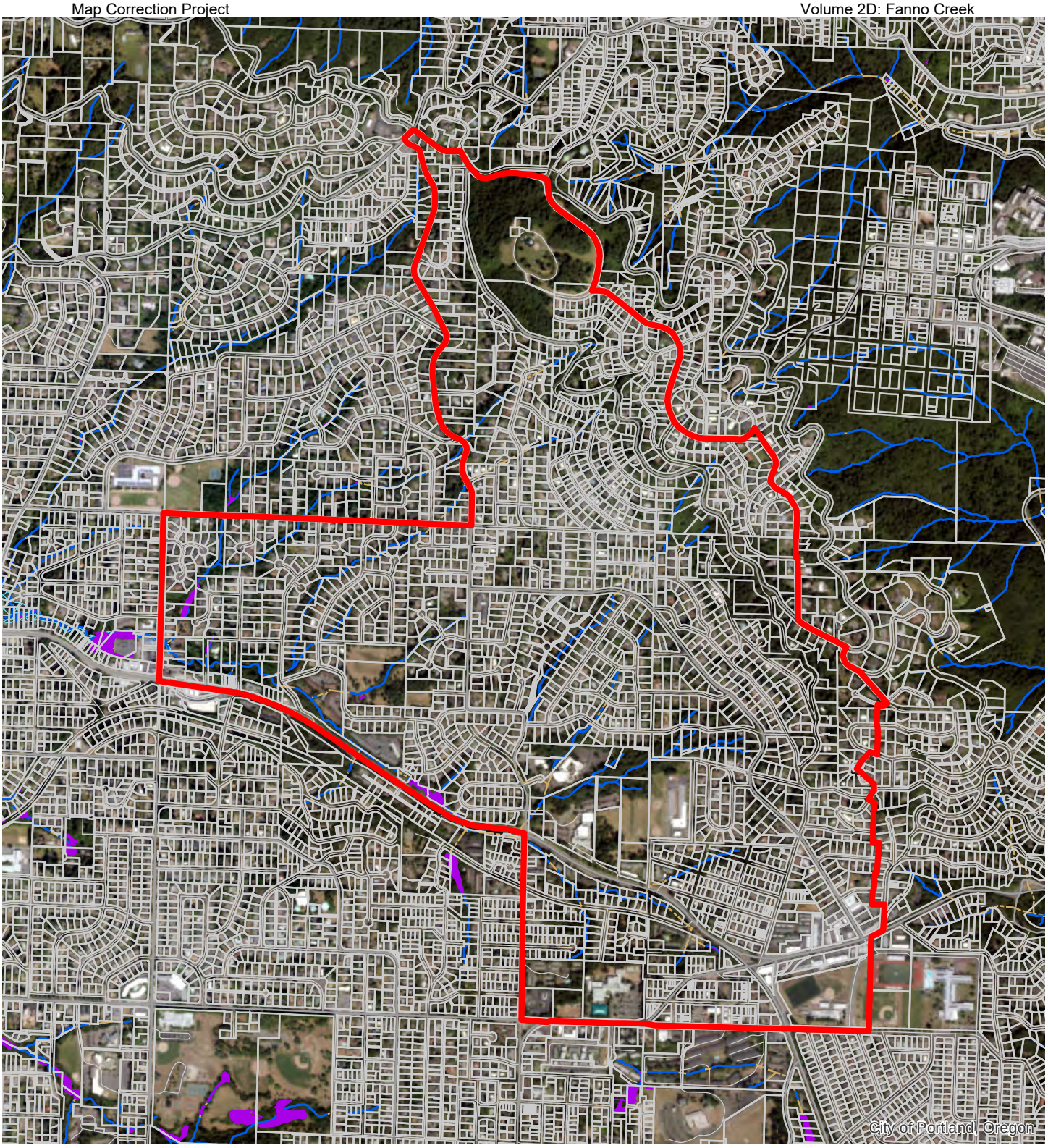
A. Water Features – rivers, streams, wetlands and flood areas
B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
C. Special Habitat Areas
D. Riparian Corridor Classifications
E. Wildlife Habitat Classifications
F. Urban Development Value
G. Metro Title 13 Habitat Conservation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

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

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

Resource site FC5 includes the following:

Site (acres)	869.9
Base zones (acres)	
CE	1.1
CM1	0.0
CM2	22.3
IR	0.1
OS	75.4
R10	304.5
R2.5	15.2
R20	26.0
R5	24.0
R7	317.0
RM1	65.2
RM2	19.0



Map A: Water Features

Resource Site: FC5

Updated: July 2021

NORTH

0 700 1,400 Feet

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

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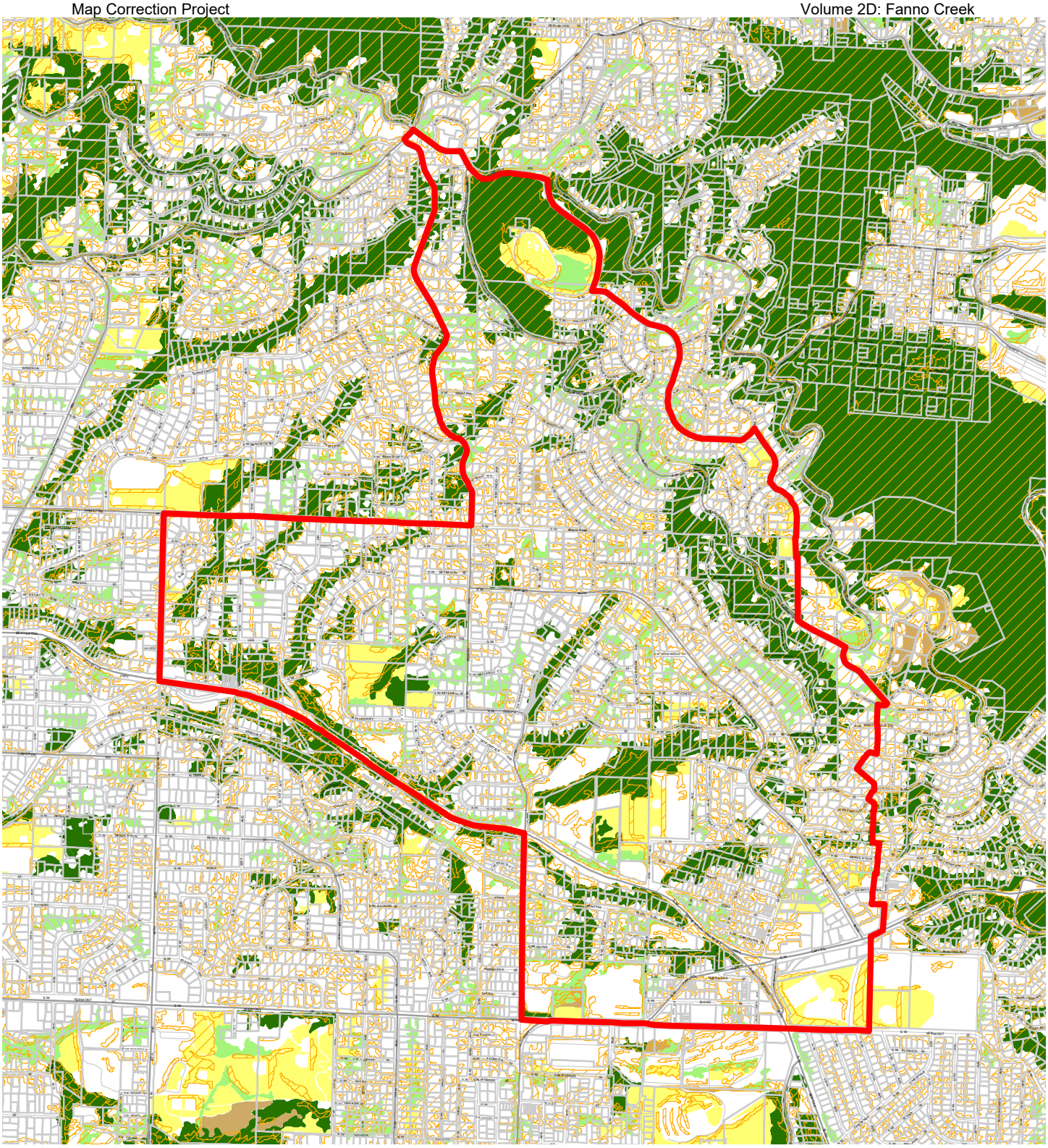

Map B: Vegetation and Steep Slopes

Resource Site: FC5

Updated: July 2021

NORTH

0 1,000 2,000 Feet

Proposed Draft - As Amended

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

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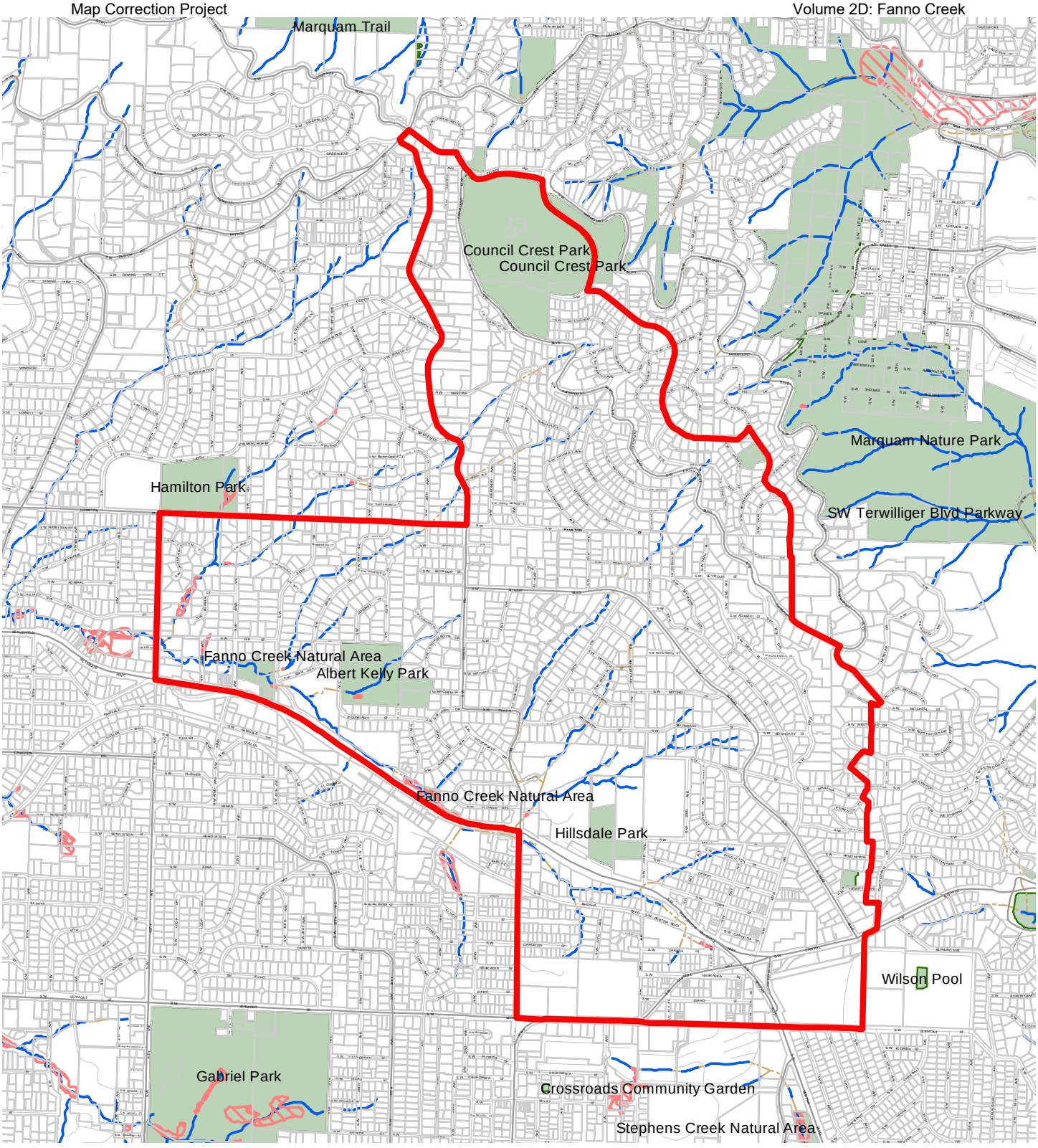
July 2021



Map C: Special Habitat Areas

Resource Site: FC5

Updated: June 2021

NORTH

0 800 1,600 Feet

Resource Sites

Special Habitat Areas (SHAs)

Open Stream Channel

Piped Stream Segment

Parks

Urban Service Boundary

Taxlots

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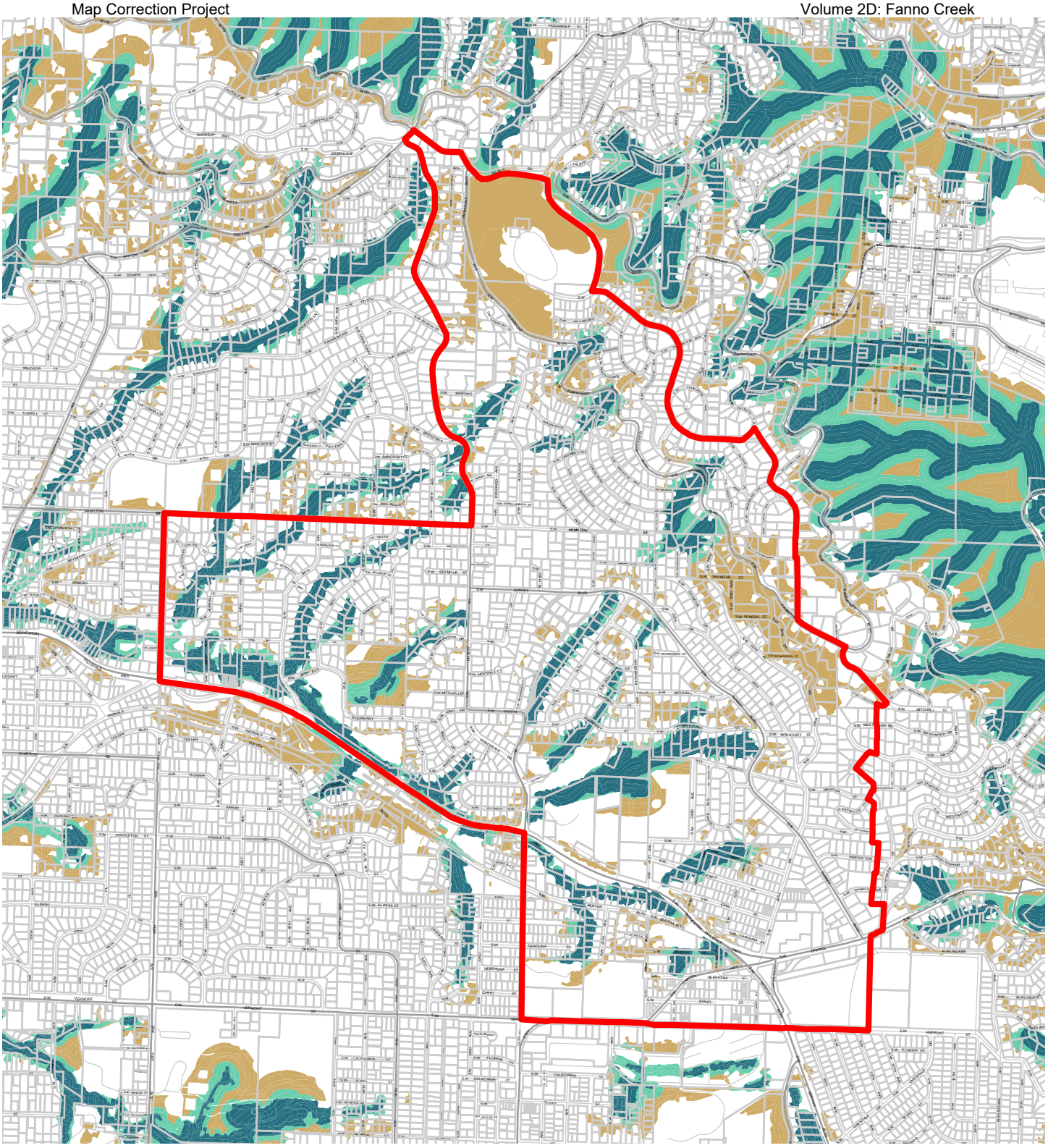

Map D: Riparian Corridors Habitat Classification

Resource Site: FC5

Updated: July 2021

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

NORTH

0 700 1,400 Feet

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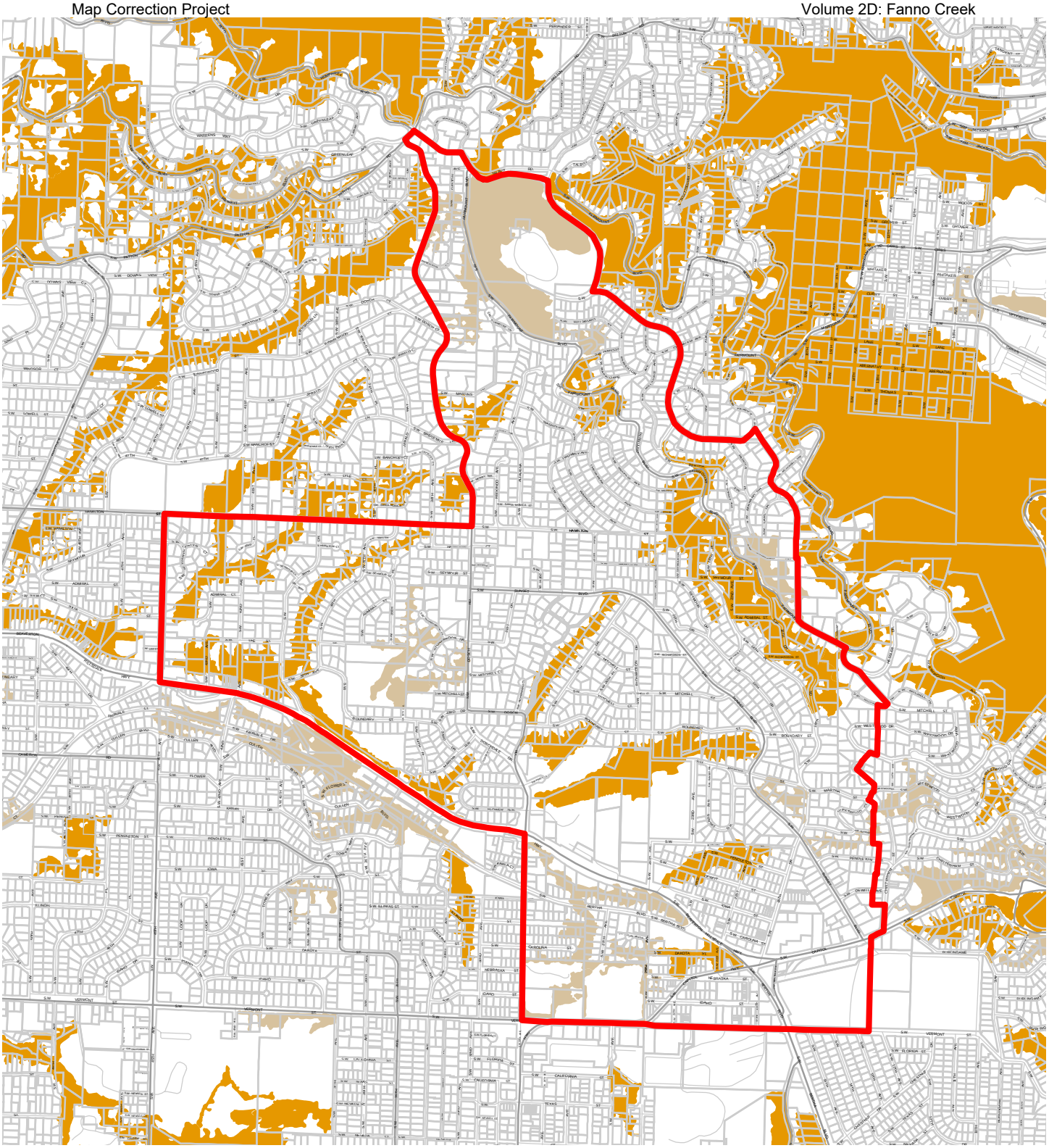

Map E: Wildlife Habitat Classification

Resource Site: FC5

Updated: July 2021

NORTH

0 550 1,100 Feet

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

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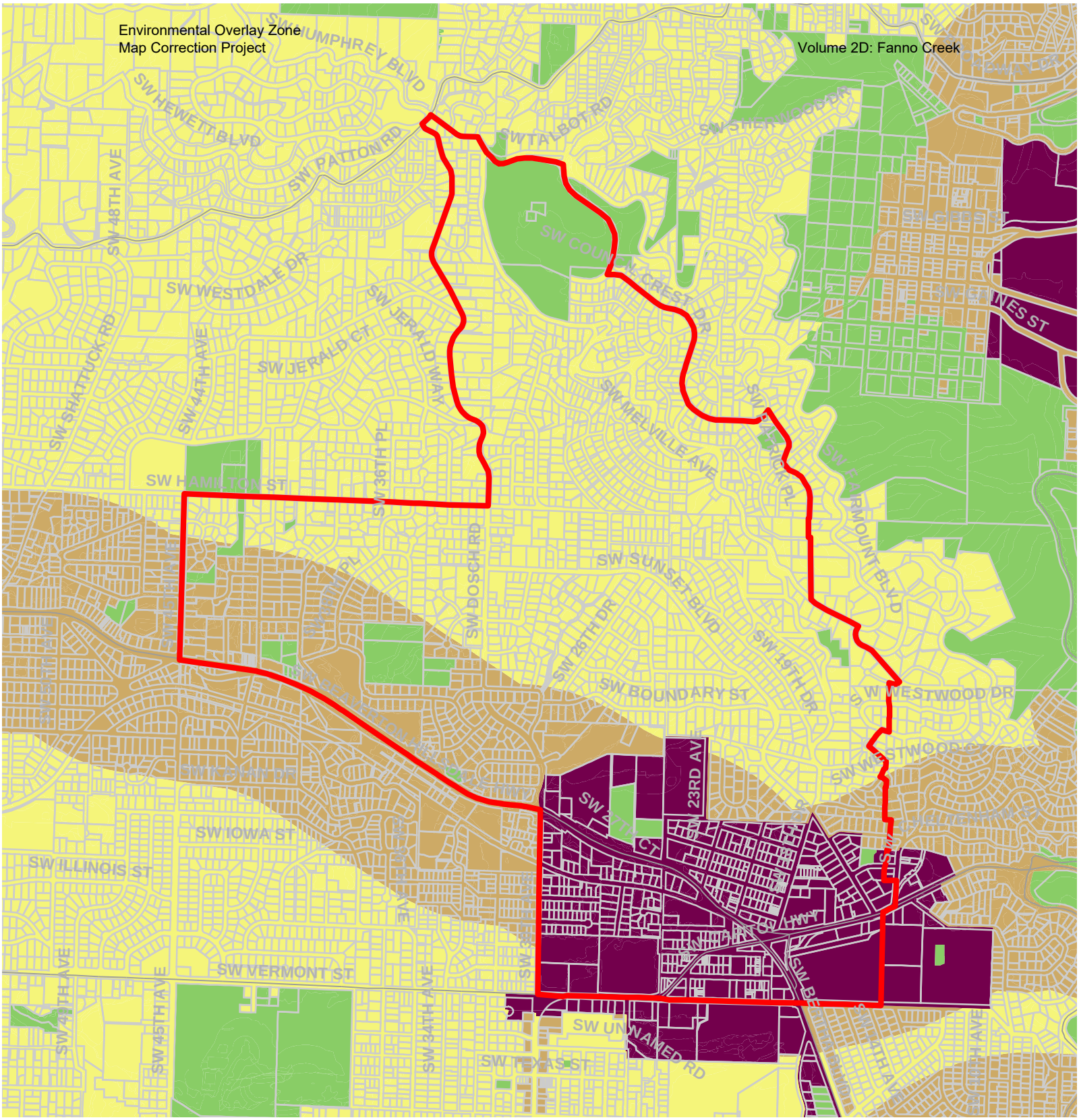

Map F: Urban Development Value (Title 13)
Resource Site: FC5

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

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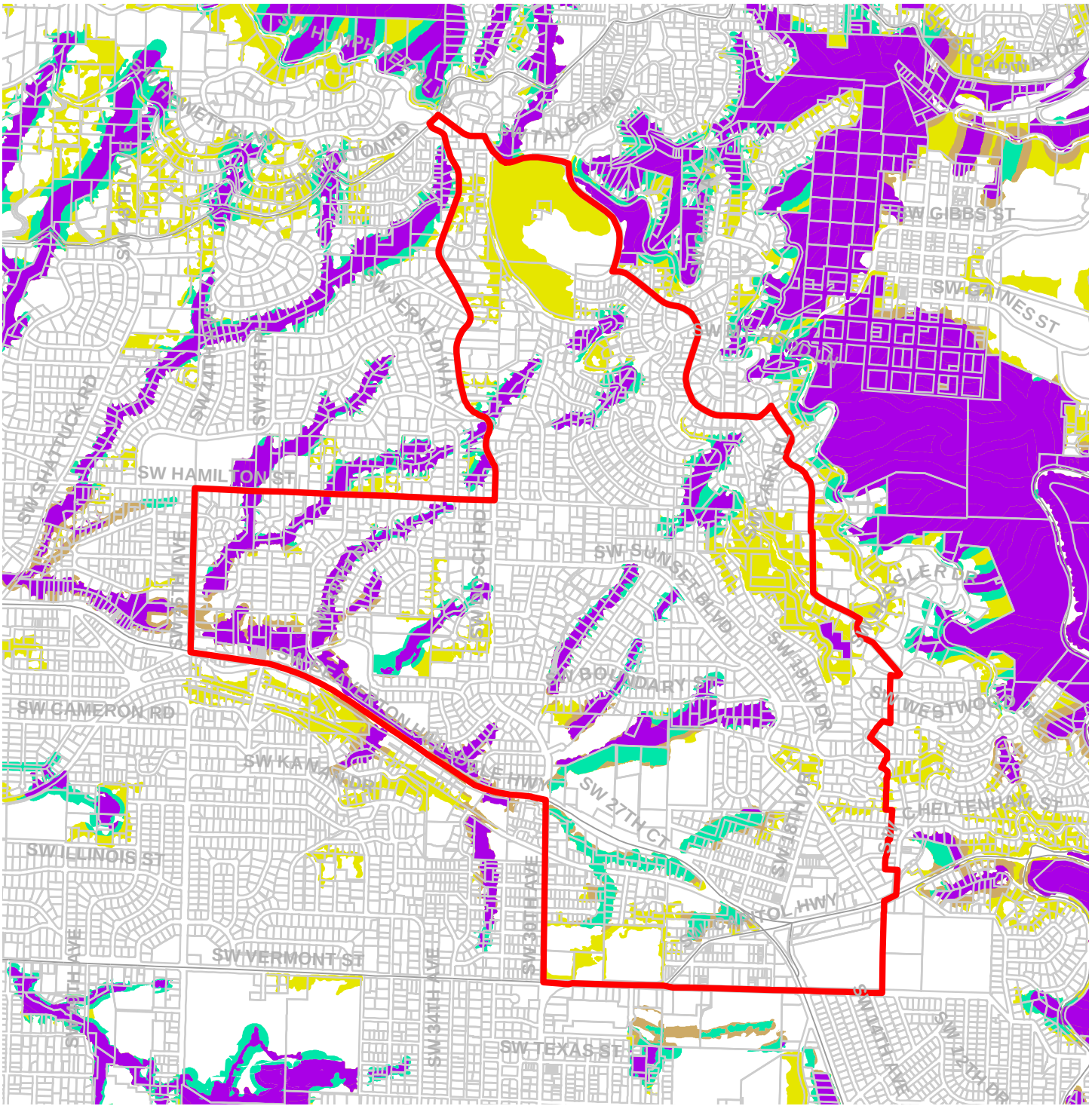
Updated: July 2021

NORTH

0 950 1,900 Feet



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

Resource Site: FC5

Updated: July 2021

NORTH

0 1,050 2,100 Feet

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

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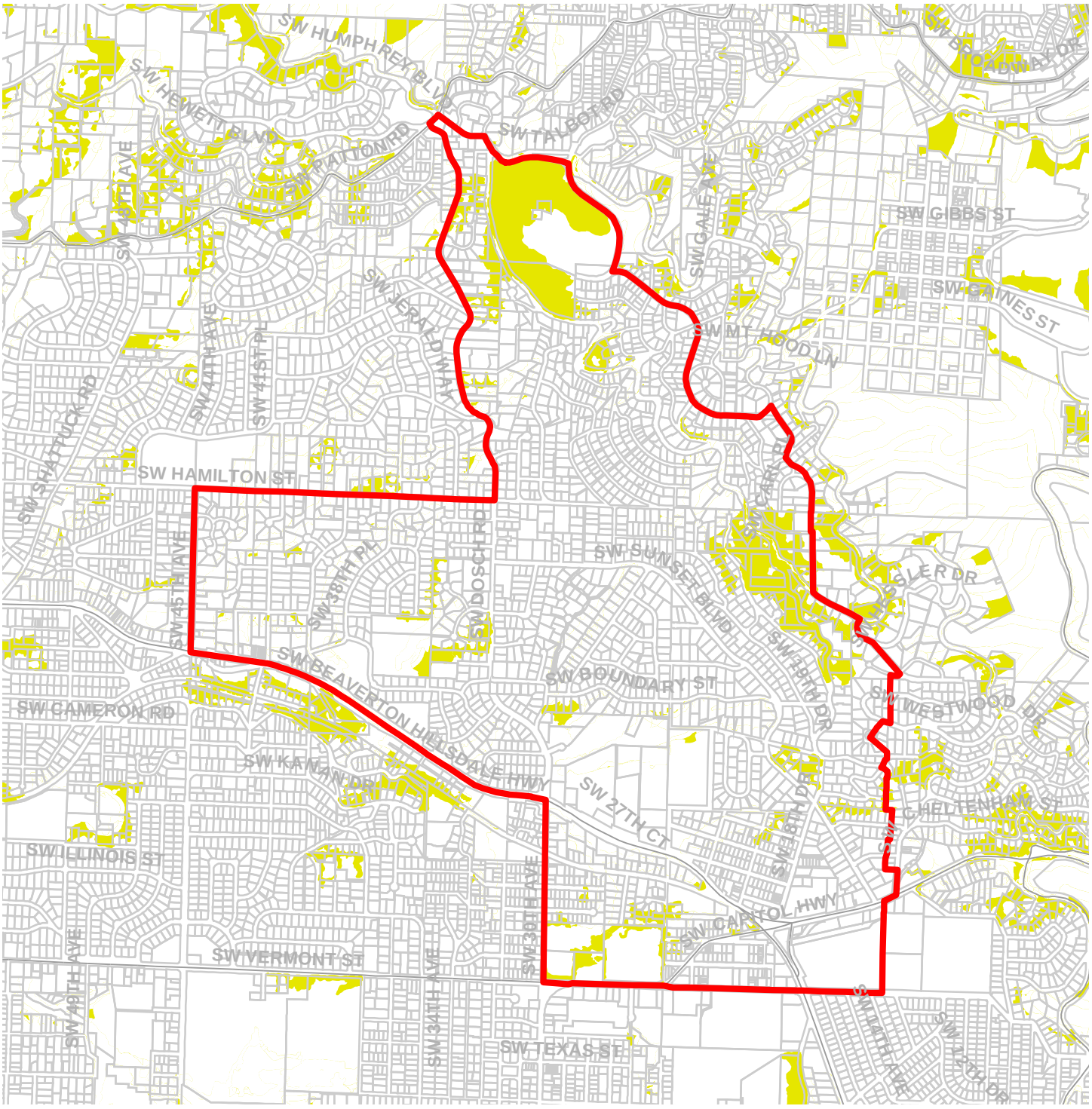

Map H: Goal 5 Resources

Resource Site: FC5

Updated: July 2021

NORTH

0 1,050 2,100 Feet

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

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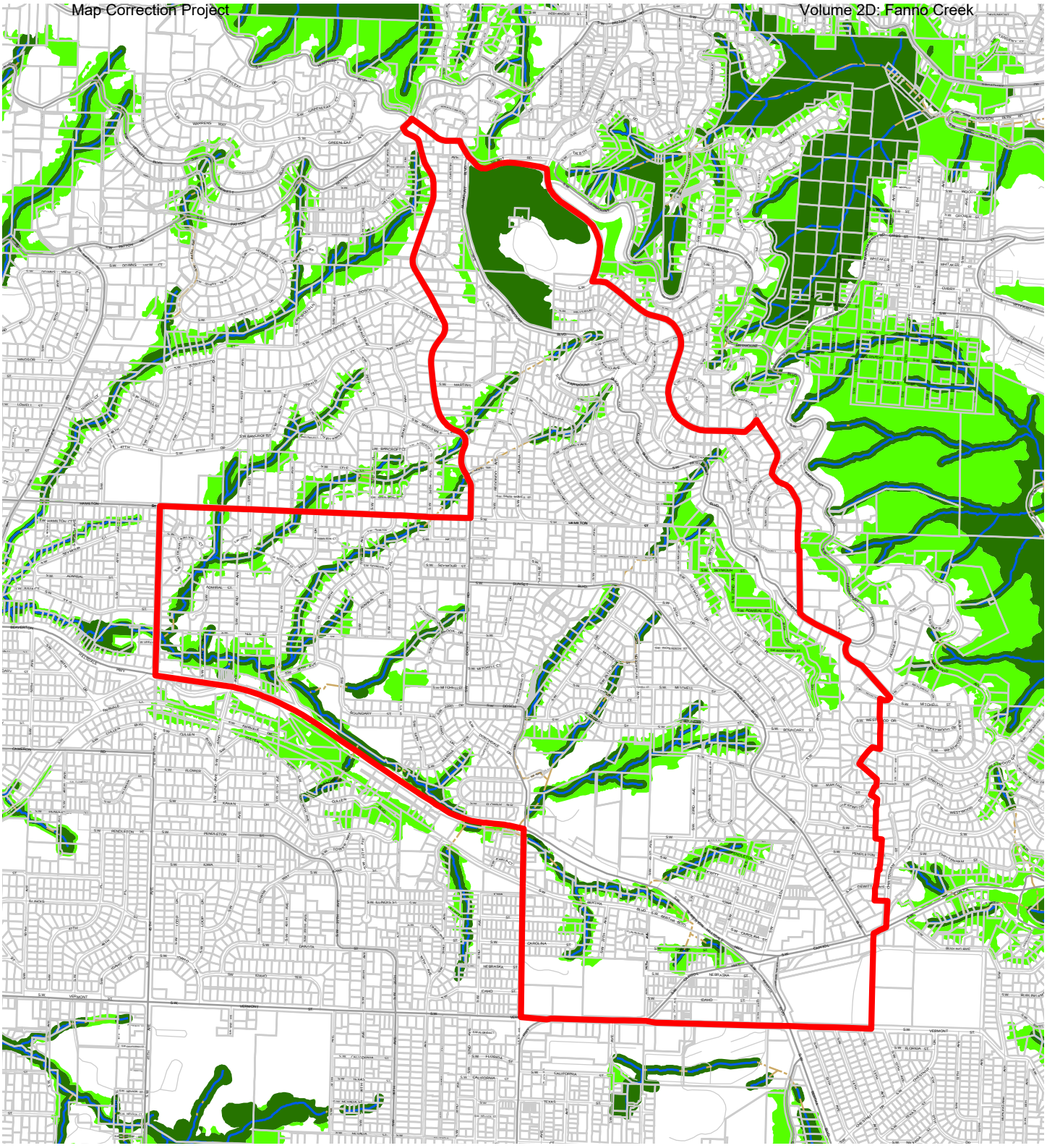

Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site:

FC5

Updated: July 2021

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

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NORTH

0 800 1,600 Feet

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Natural Resource Description

Within resource site FC5 the following significant natural resource features and functions are present:

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

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

Special Habitat Areas: Wetlands (W)

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

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

Table A: Quantity of Natural Resource Features in Resource Site	**FC5**
	Study Area
Stream (Miles)	5.3
Wetlands (acres)	1.4
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	202.0
Woodland (acres)	75.5
Shrubland (acres)	1.2
Herbaceous (acres)	44.3
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.1
Steep Slopes (acres)**	449.1
* 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%.	

The resource site includes forested tributary and mainstem Fanno Creek streams, the latter of which is designated as critical habitat for Endangered Species Act-listed upper Willamette River steelhead trout. In addition, coastal cutthroat trout have been observed in this resource site. This resource site also includes Albert Kelly Park, Council Crest Park, Fanno Creek Natural Area, and Hillsdale Park. While surface water across most of the site drains to Fanno Creek, a small northeastern portion of the site on Council Crest drains directly to the Willamette River and a portion in the southeastern corner of the site drains to Stephens Creek. Special status bird species observed within or adjacent to this site include: bald eagle, band-tailed pigeon, black-throated gray warbler, brown creeper, bushtit, chipping sparrow, downy woodpecker, great blue heron, Hammond's flycatcher, hermit warbler, Hutton's vireo, merlin, Nashville warbler, olive-sided flycatcher, orange-crowned warbler, pacific-slope flycatcher, pacific wren, pileated woodpecker, purple finch, red crossbill, rufous hummingbird, Swainson's thrush, varied thrush, Vaux's swift, Western wood-pewee, white-breasted nuthatch, Wilson's warbler, wood duck, and yellow warbler.

Table B: Quality of Natural Resource Functions in Resource Site FC5				
Resource Site (acres) = 870				
	Class 1/A	**Class 2/B**	**Class 3/C**	**Total**
Riparian Corridors*				
acres	93.3	31.9	113.9	239.1
percent total inventory site area	10.7%	3.7%	13.1%	27.5%
Wildlife Habitat*				
acres	0.0	116.8	73.7	190.6
percent total inventory site area	0.0%	13.4%	8.5%	21.9%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total+				
acres	93.3	61.6	97.7	252.6
percent total inventory site area	10.7%	7.1%	11.2%	29.0%

* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.

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

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

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

For Resource Area FC5, 20% 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 FC5

Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
870	238	172	20%

*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 4 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 FC4. Natural resources should be protected within HCA as follows:

1. *Strictly limit* or *limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit* or *limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit* or *limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, expect parks and open space. [7]

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 FC4 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 4, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the

[7] Metro Title 13 rule 3.07.1330(a)(2) states that any city that had an acknowledge Goal 5 program prior to December 28, 2005, that applies to upland wildlife habitat shall not repeal or amend such regulations in a manner that would allow more than a de minimis increase in development that could occur in those upland habitat areas.

conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

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

Within the resource site residential uses are allowed outright or conditionally in the R20, R10, R7, R5, R2.5, R2 and R1 base zones. Commercial uses are allowed in the CE and CM2 base zone. Open space uses are allowed in the OS base zone. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

The analysis of economic, social, environmental and energy consequences provided in Volume 4 is confirmed for resource site FC5, 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, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation for FC5, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or 25 feet of wetlands.
2. Inside Council Crest Park, apply a protection overlay zone ('p' zone) to land between 25 and 50 feet of wetlands and within areas of forest vegetation.
3. Outside Council Crest Park, apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands, areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank and areas of forest vegetation on steep slopes between SW Fairmount Blvd and SW 18th Pl.
4. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: FC6 **Resource Site Name:** Lower Pendleton Creek

Previous Plan: Fanno Creek and Tributaries Conservation Plan
Previous Resource Site No.: 126

The results of the analysis found in Volume 3, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

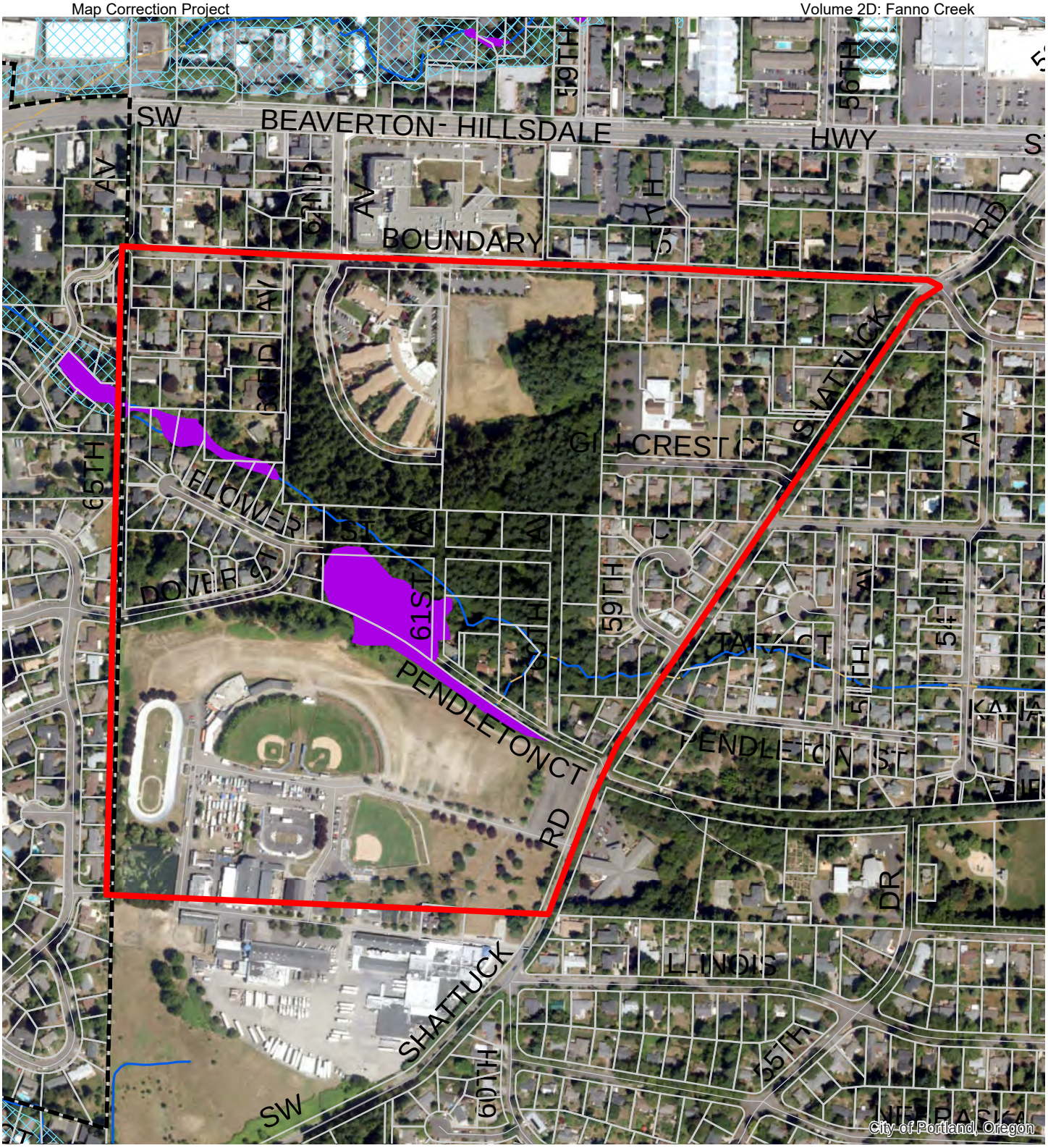
A. Water Features – rivers, streams, wetlands and flood areas
B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
C. Special Habitat Areas
D. Riparian Corridor Classifications
E. Wildlife Habitat Classifications
F. Urban Development Value
G. Metro Title 13 Habitat Conservation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

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

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

Resource site FC6 includes the following:

Site (acres)	96.8
Base zones (acres)	
R10	55.8
R5	2.3
R7	38.6



Map A: Water Features

Resource Site: FC6

Updated: July 2021

NORTH

0 235 470 Feet

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

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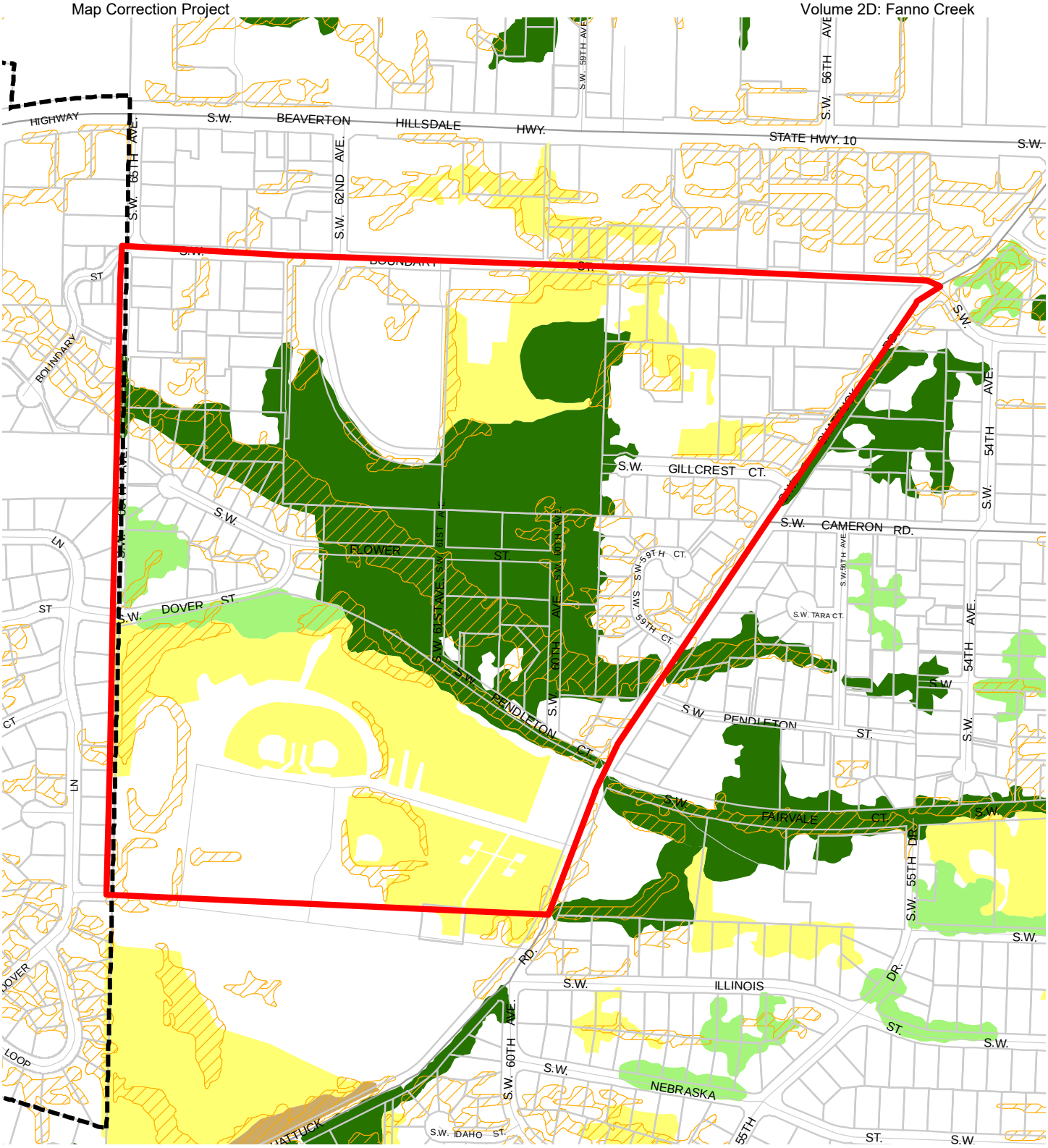

Map B: Vegetation and Steep Slopes

Resource Site: FC6

Updated: July 2021

NORTH

0 320 640 Feet

Proposed Draft - As Amended

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

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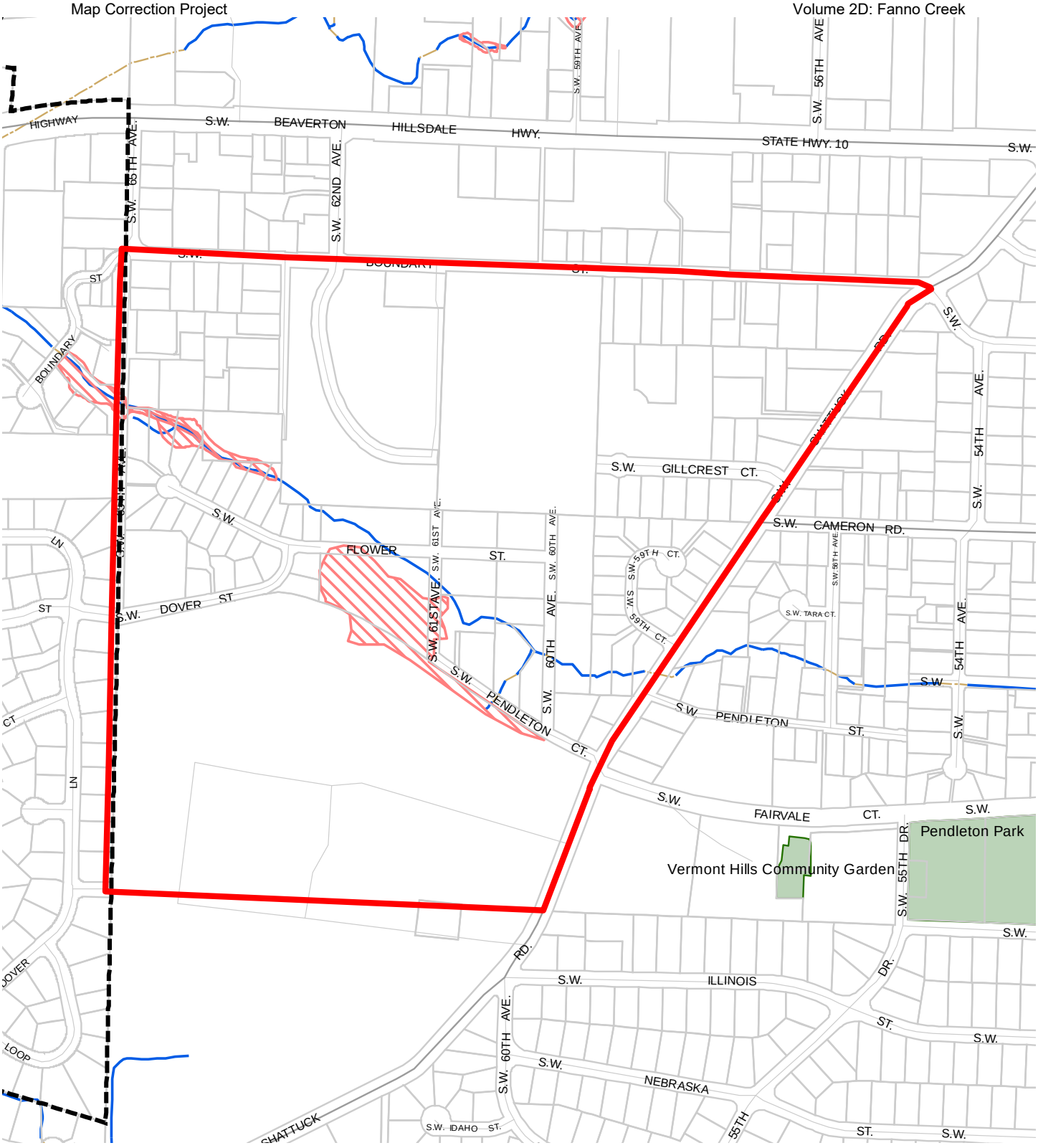
July 2021



Map C: Special Habitat Areas

Resource Site: FC6

Updated: June 2021

NORTH

0 255 510 Feet

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

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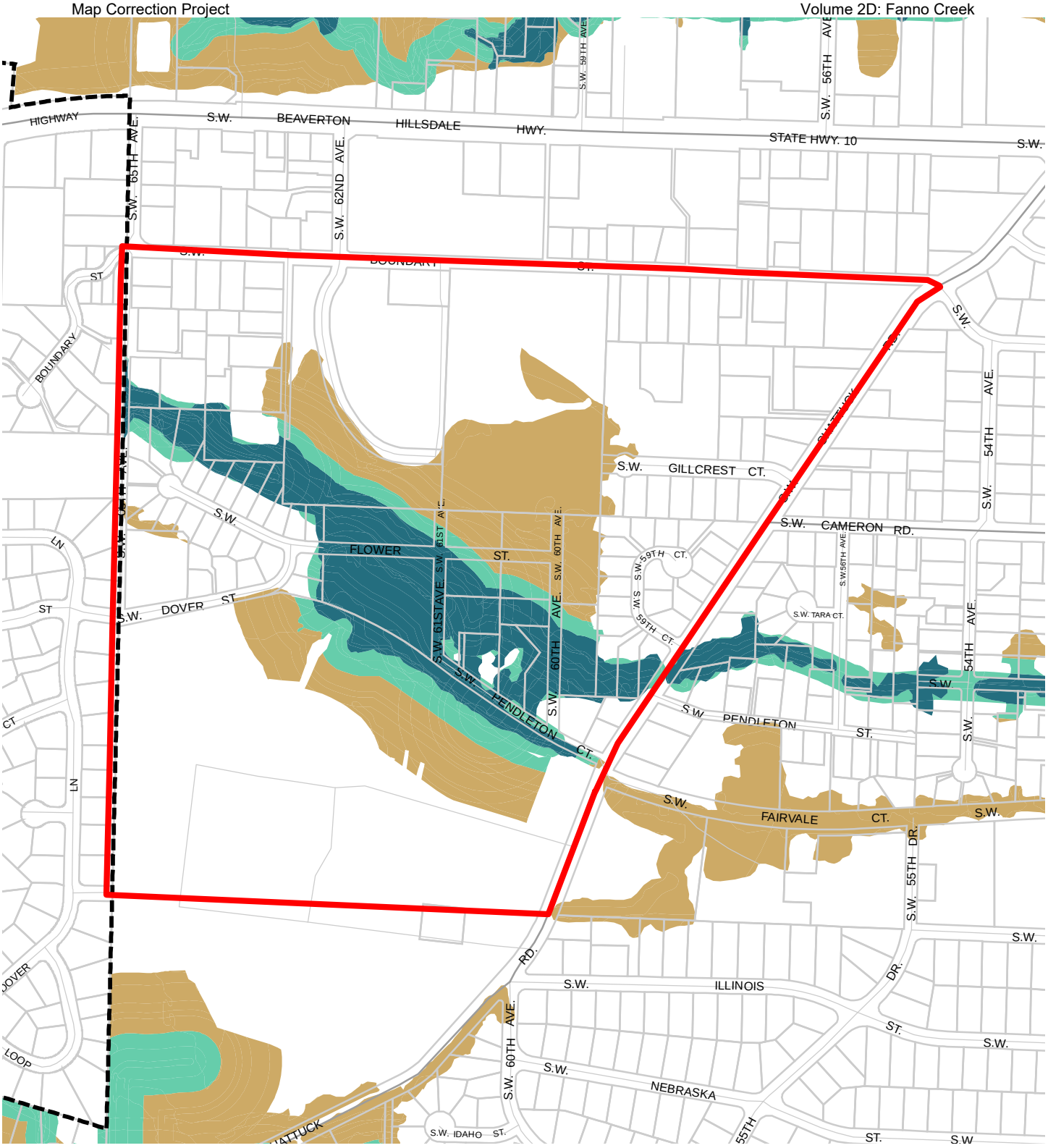

Map D: Riparian Corridors Habitat Classification

Resource Site: FC6

Updated: July 2021

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

NORTH

0 235 470 Feet

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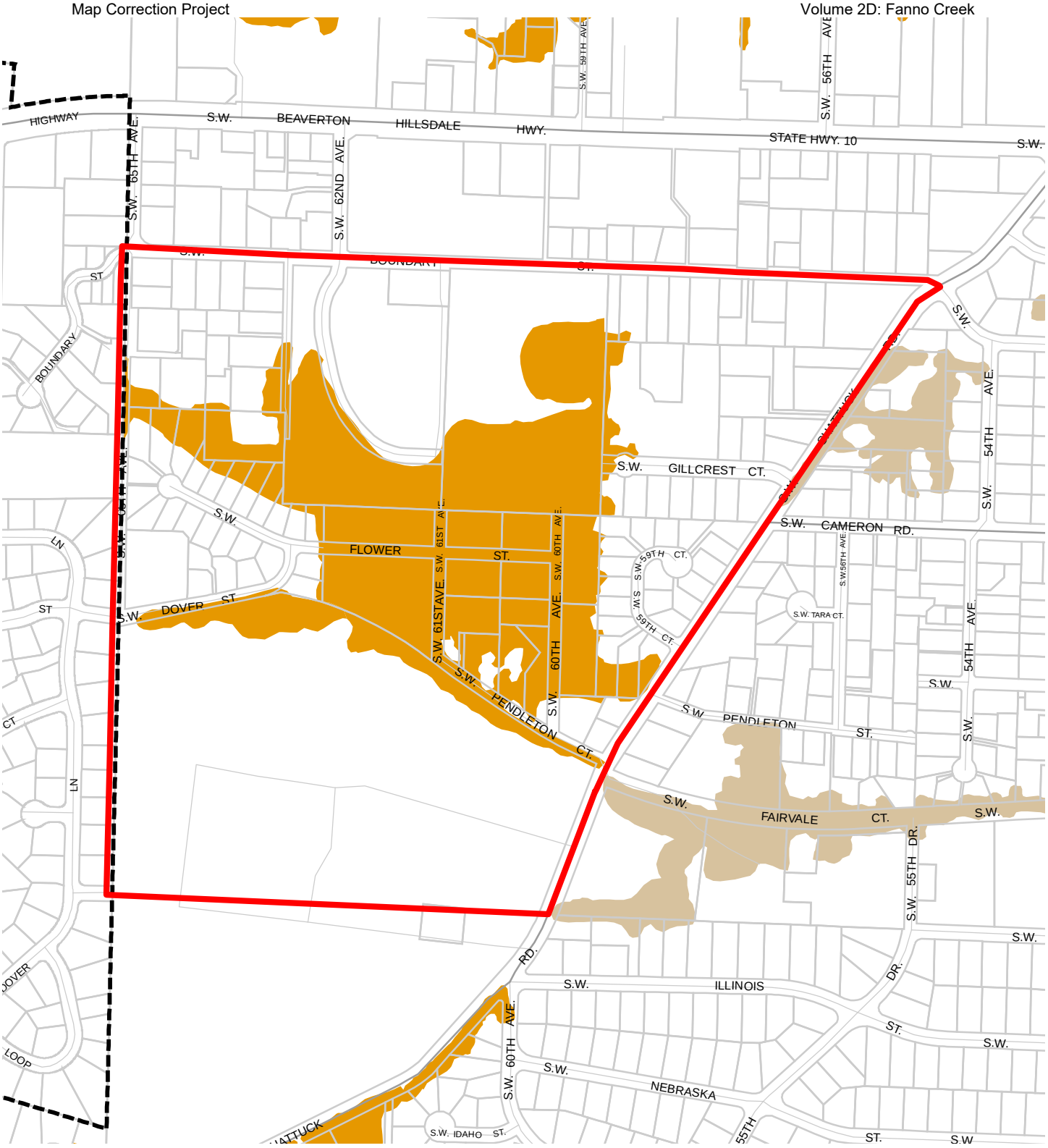

Map E: Wildlife Habitat Classification

Resource Site: FC6

Updated: July 2021

NORTH

0 190 380 Feet

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

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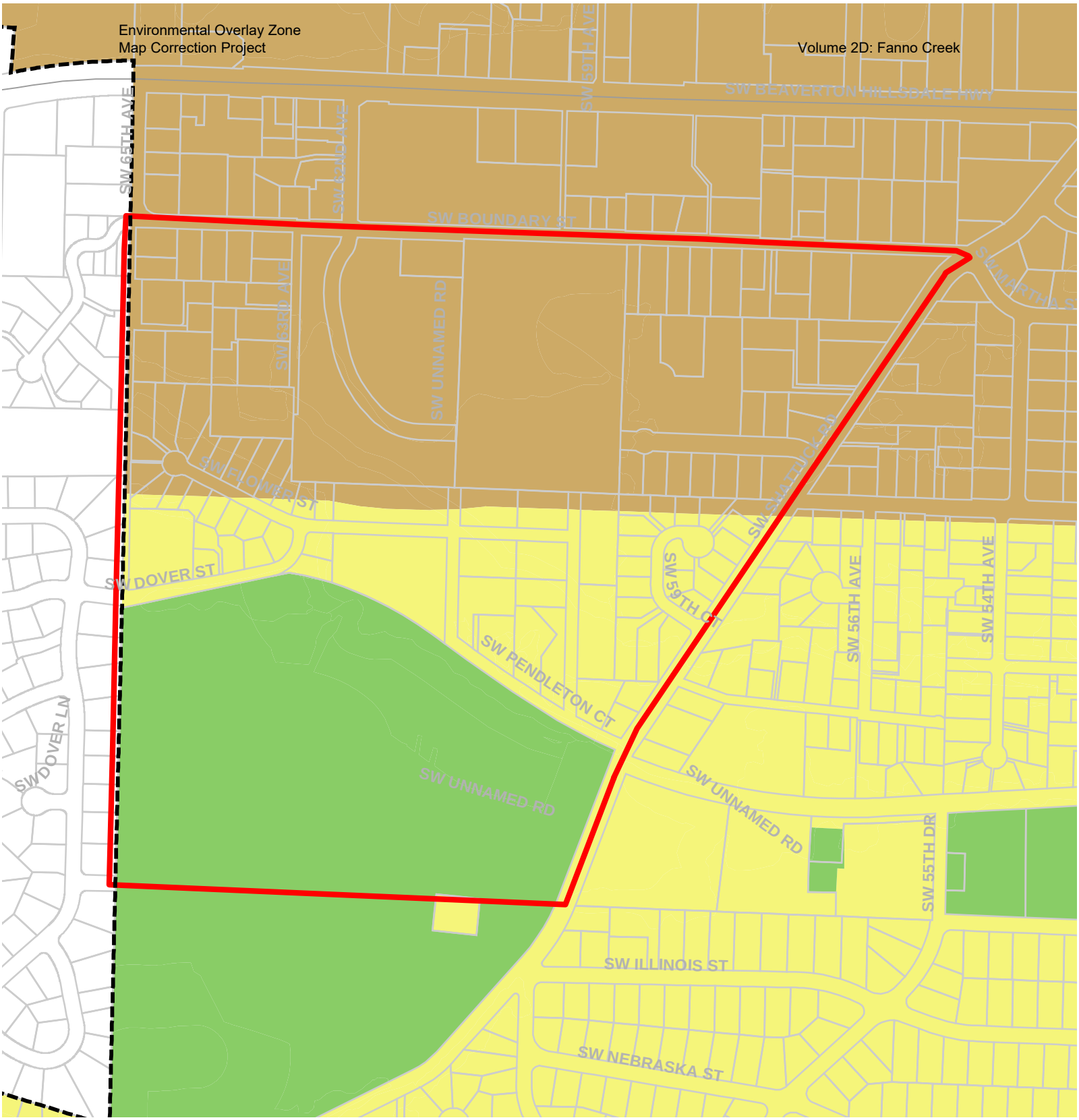
July 2021



Map F: Urban Development Value (Title 13)
Resource Site: FC6

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

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Updated: July 2021

NORTH

0 290 580 Feet

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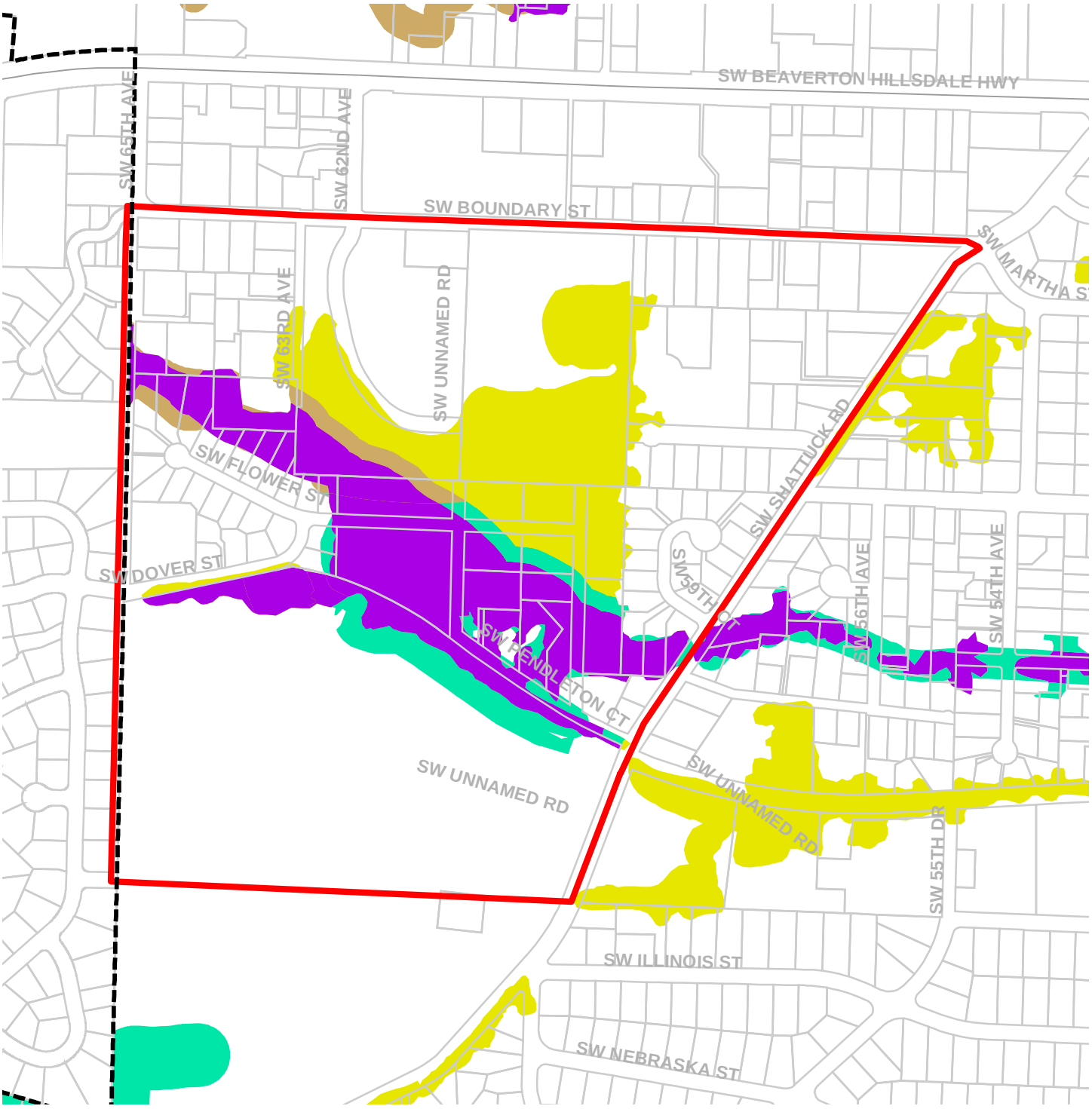

Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: FC6

Updated: July 2021

NORTH

0 320 640 Feet

Proposed Draft - As Amended

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

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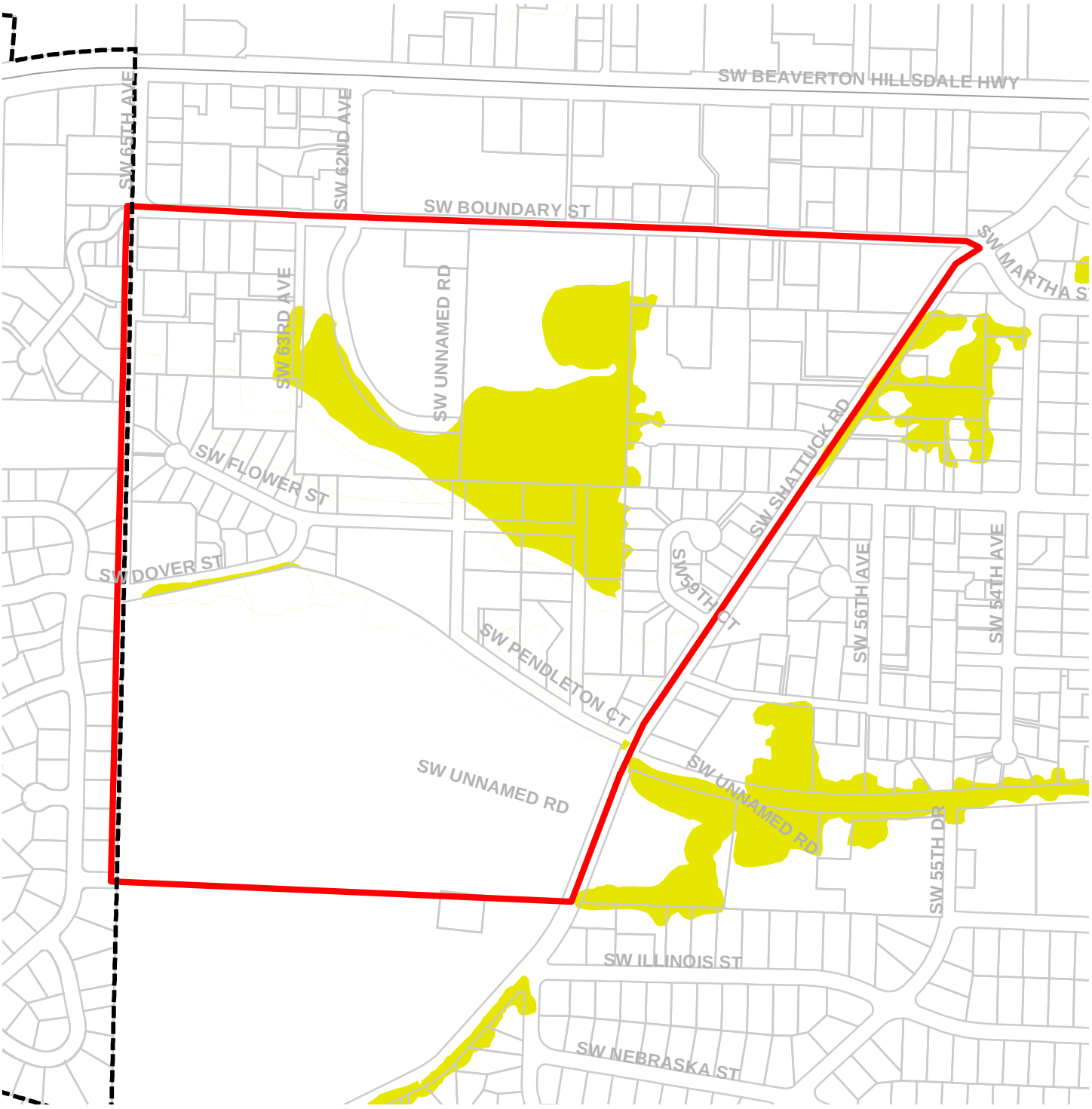

Map H: Goal 5 Resources

Resource Site: FC6

Updated: July 2021

NORTH

0 320 640 Feet

Proposed Draft - As Amended

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

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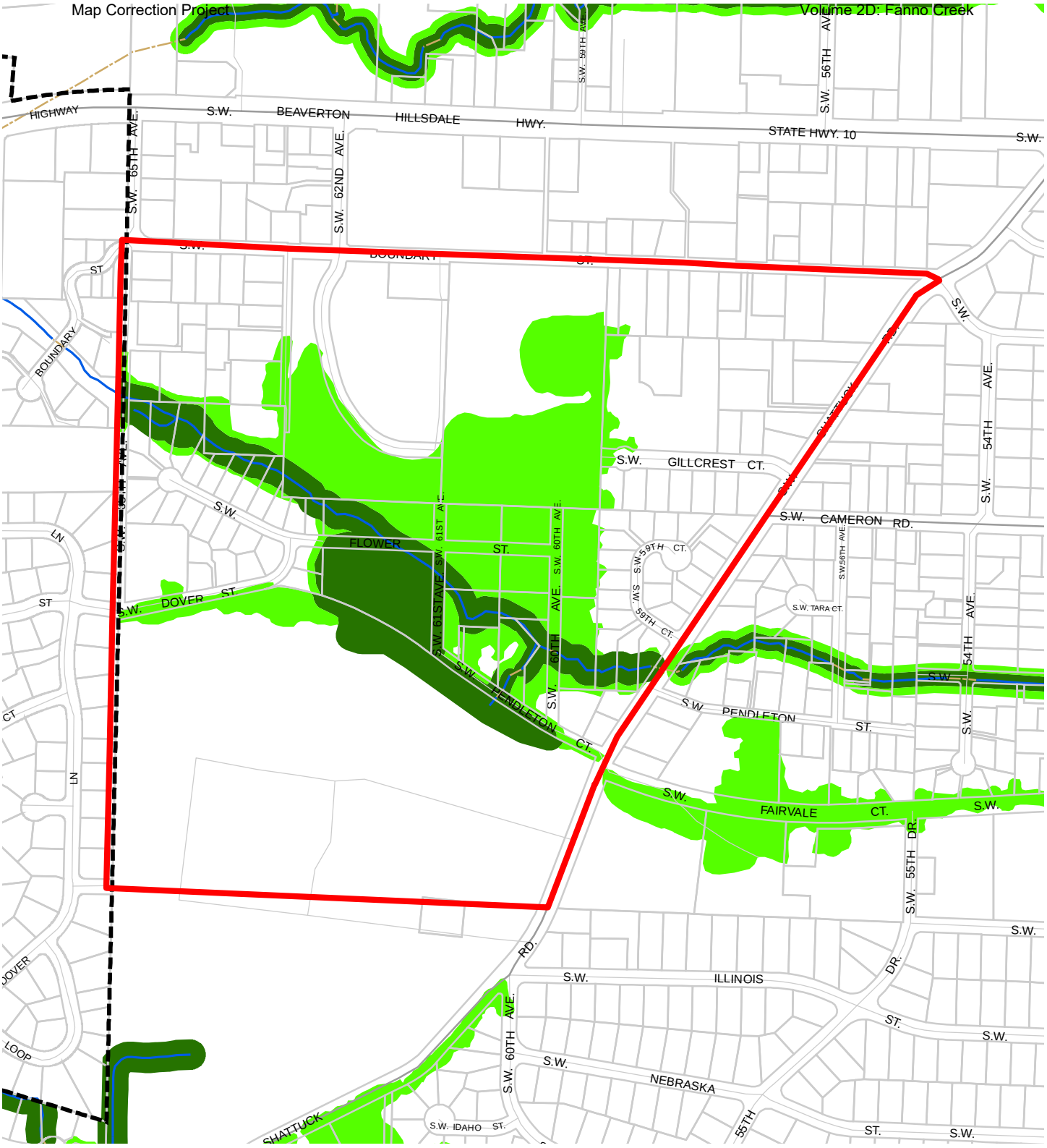

Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site:

FC6

Updated: July 2021

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

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NORTH

0 255 510 Feet

Natural Resource Description

Within resource site FC6 the following significant natural resource features and functions are present:

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

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

Special Habitat Areas: Wetlands (W)

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

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

Table A: Quantity of Natural Resource Features in Resource Site	**FC6**
	Study Area
Stream (Miles)	0.5
Wetlands (acres)	3.1
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	23.9
Woodland (acres)	2.5
Shrubland (acres)	0.0
Herbaceous (acres)	18.5
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	18.5
* The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area. **Slopes are derived from LiDAR. Steep slopes are areas with a slope greater than 25%.	

This resource site contains a forested Fanno Creek tributary stream flowing across the site into designated critical habitat for Endangered Species Act-listed upper Willamette River steelhead trout. A wetland is located along the tributary on the western edge of the resource site.

Special status bird species observed within or adjacent to this site include bald eagle, band-tailed pigeon, black-throated gray warbler, brown creeper, bushtit, common yellowthroat, downy woodpecker, great blue heron, green heron, hooded merganser, Hutton's vireo, merlin, olive-sided flycatcher, orange-crowned warbler, pacific-slope flycatcher, pacific wren, pileated woodpecker, purple finch, red crossbill, rufous hummingbird, Swainson's thrush, varied thrush, Vaux's swift, Western wood-pewee, white-breasted nuthatch, willow flycatcher, Wilson's warbler, wood duck, and yellow warbler.

Table B: Quality of Natural Resource Functions in Resource Site FC6				
Resource Site (acres) = 97				
	Class 1/A	**Class 2/B**	**Class 3/C**	**Total**
Riparian Corridors*				
acres	11.5	4.3	14.3	30.1
percent total inventory site area	11.9%	4.5%	14.7%	31.1%
Wildlife Habitat*				
acres	0.0	25.3	0.1	25.4
percent total inventory site area	0.0%	26.1%	0.1%	26.2%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total+				
acres	11.5	16.3	4.2	32.0
percent total inventory site area	11.9%	16.9%	4.3%	33.1%

* 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 FC6, 15% 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 FC6

Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
98	20	14	15%

*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 4 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 FC6. Natural resources should be protected within HCA as follows:

1. *Strictly limit* or *limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit* or *limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit* or *limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, expect parks and open space. [8]

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 FC6 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 4, describes the conflicting uses and provides an overarching analysis of the economic,

[8] Metro Title 13 rule 3.07.1330(a)(2) states that any city that had an acknowledge Goal 5 program prior to December 28, 2005, that applies to upland wildlife habitat shall not repeal or amend such regulations in a manner that would allow more than a de minimis increase in development that could occur in those upland habitat areas.

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, R10 and R5 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 4 is confirmed for resource site FC6, 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*.

The abandoned rail corridor provides a wildlife movement corridor, particularly where there is tree canopy and understory that provides habitat for a range of wildlife. Additional structures that impede or degrade wildlife habitat and removal of trees and native vegetation should be limited.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation for FC6, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or 25 feet of wetlands.
2. Within parks, apply a protection overlay zone ('p' zone) to land between 25 and 50 feet of wetlands
3. Outside of parks, 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 or woodland vegetation that are contiguous to but more than 50 feet from stream top-of-bank or wetlands.
5. Apply a conservation overlay zone ('c' zone) to areas of forest or woodland vegetation located along the abandoned rail corridor.
6. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: FC7 **Resource Site Name:** Upper Pendleton Creek

Previous Plan: Fanno Creek and Tributaries Conservation Plan
Previous Resource Site No.: 126

The results of the analysis found in Volume 3, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

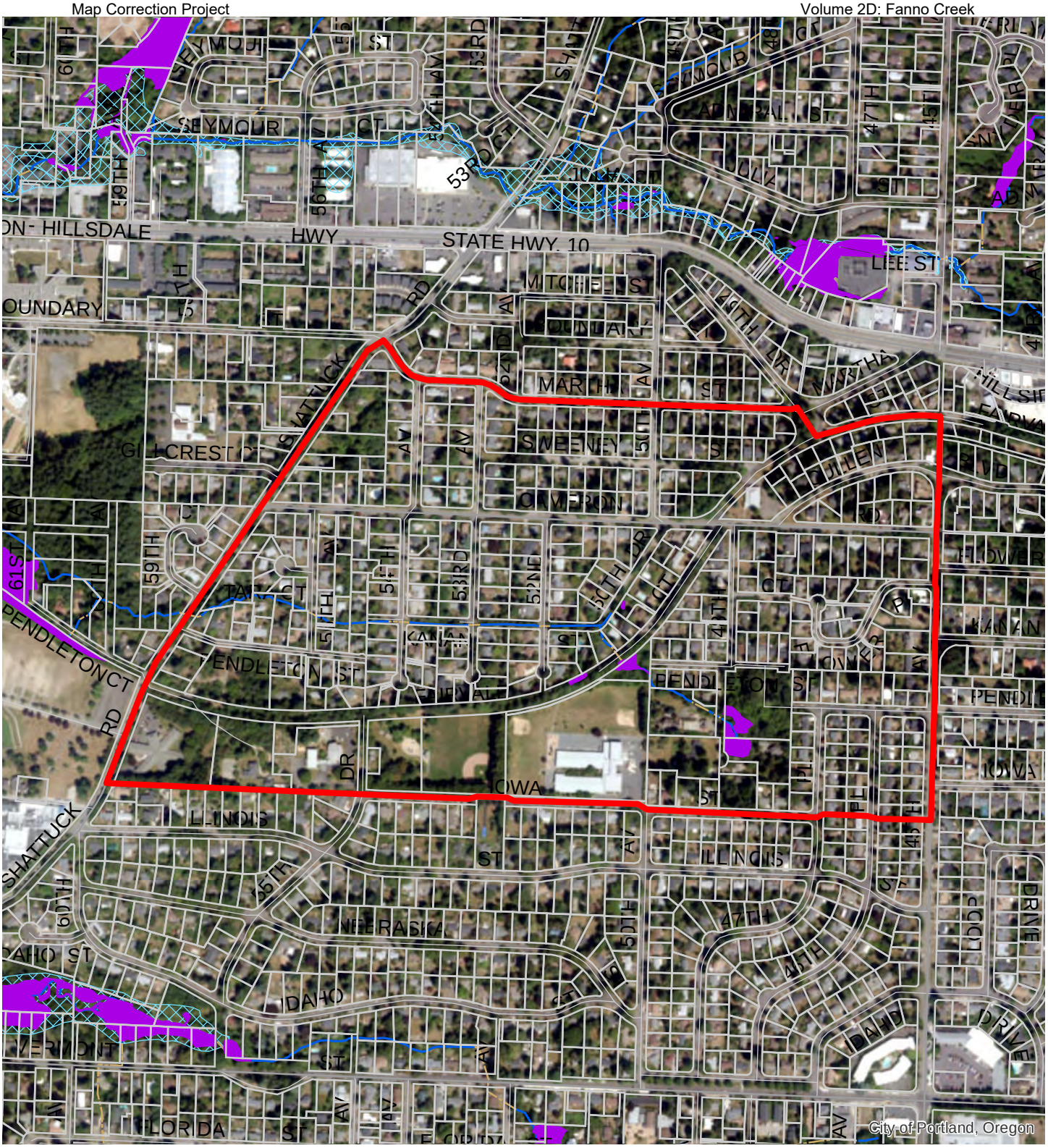
A. Water Features – rivers, streams, wetlands and flood areas
B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
C. Special Habitat Areas
D. Riparian Corridor Classifications
E. Wildlife Habitat Classifications
F. Urban Development Value
G. Metro Title 13 Habitat Conservation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

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

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

Resource site FC7 includes the following:

Site (acres)	145.9
Base zones (acres)	
OS	6.1
R10	3.2
R7	136.5



Map A: Water Features

Resource Site: FC7

Updated: July 2021

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

NORTH

0 335 670 Feet

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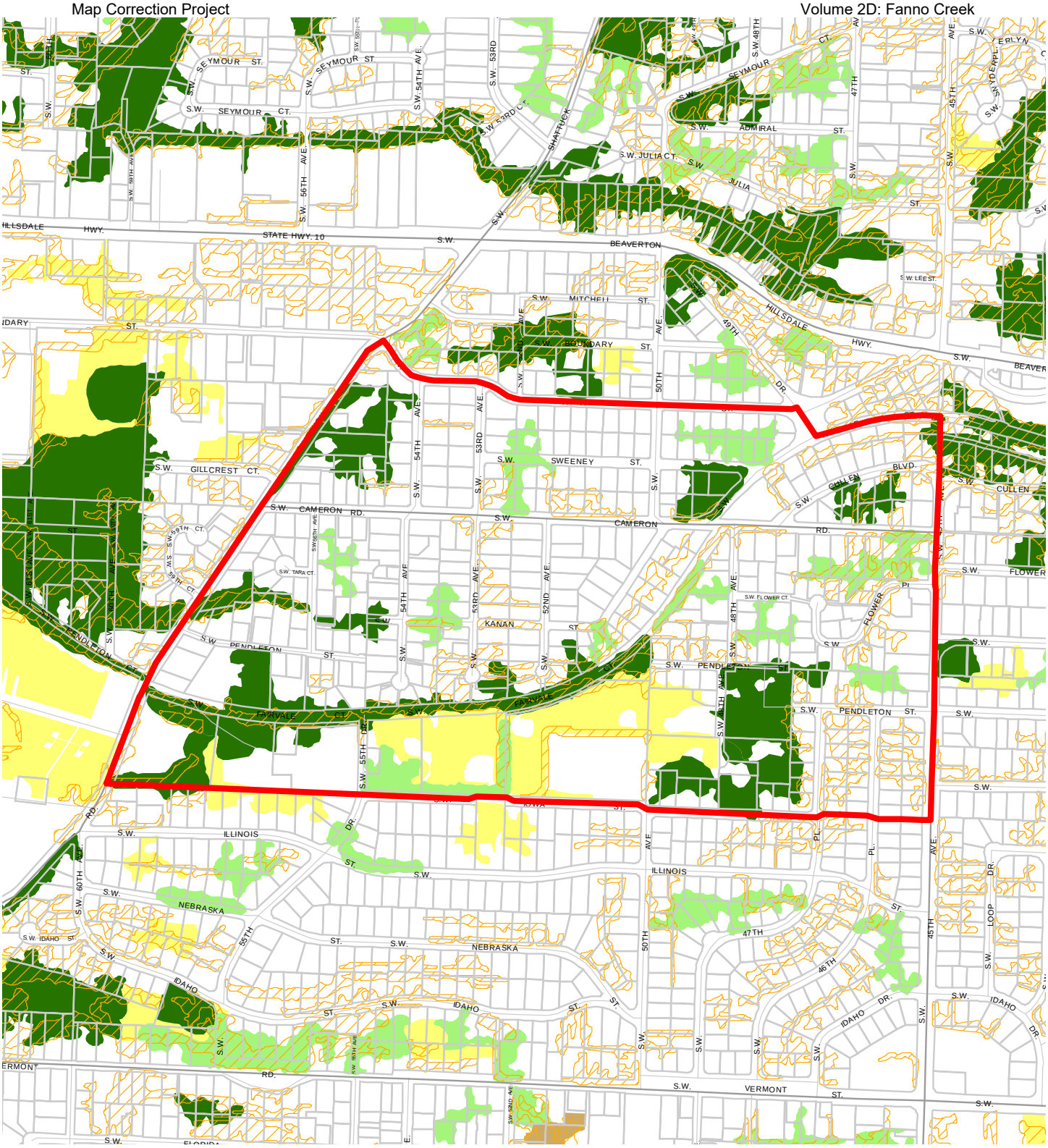

Map B: Vegetation and Steep Slopes

Resource Site: FC7

Updated: July 2021

NORTH

0 460 920 Feet

Proposed Draft - As Amended

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

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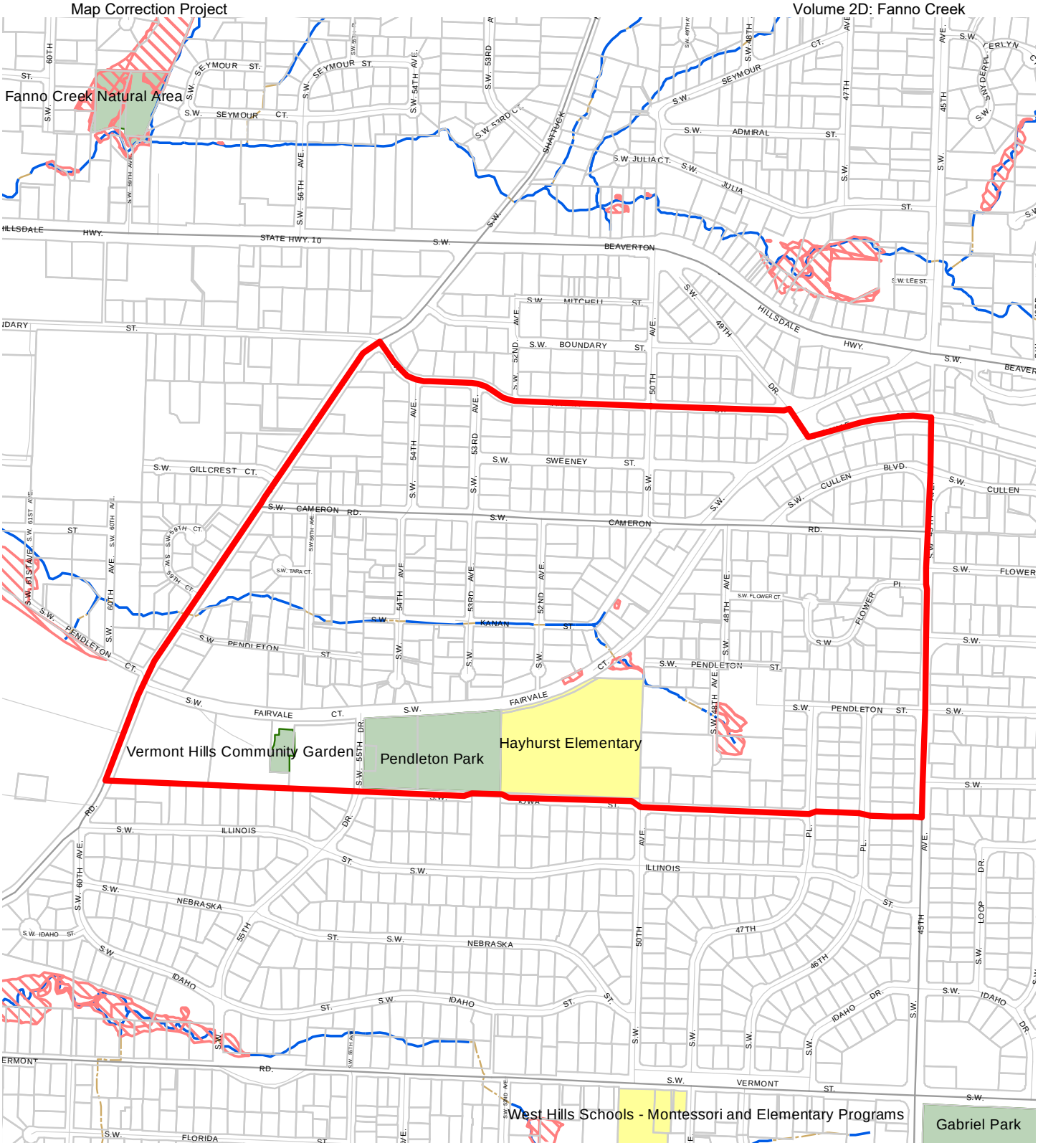

Map C: Special Habitat Areas

Resource Site: FC7

Updated: June 2021

NORTH

0 362.5 725 Feet

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

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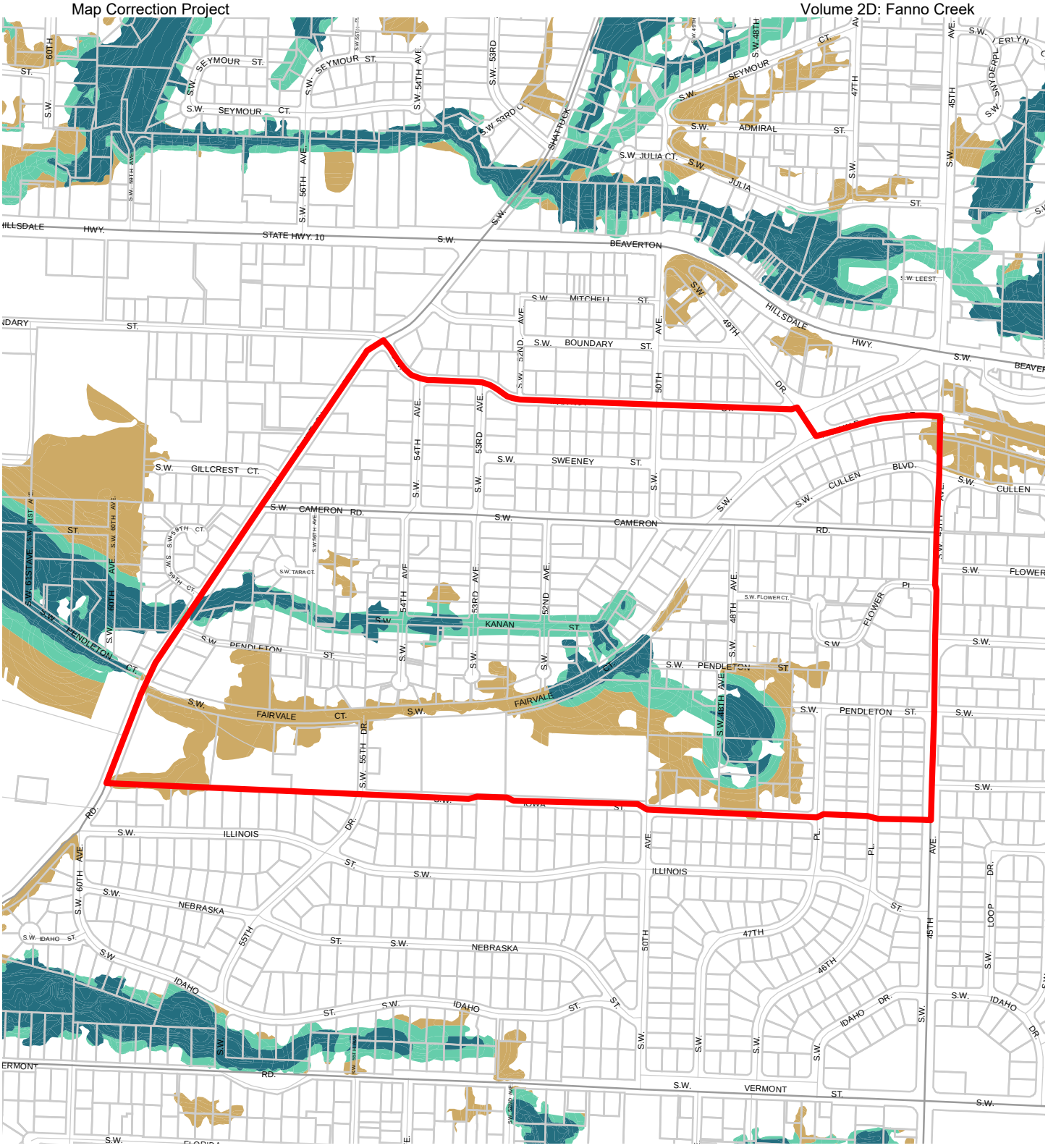

Map D: Riparian Corridors Habitat Classification

Resource Site: FC7

Updated: July 2021

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

NORTH

0 335 670 Feet

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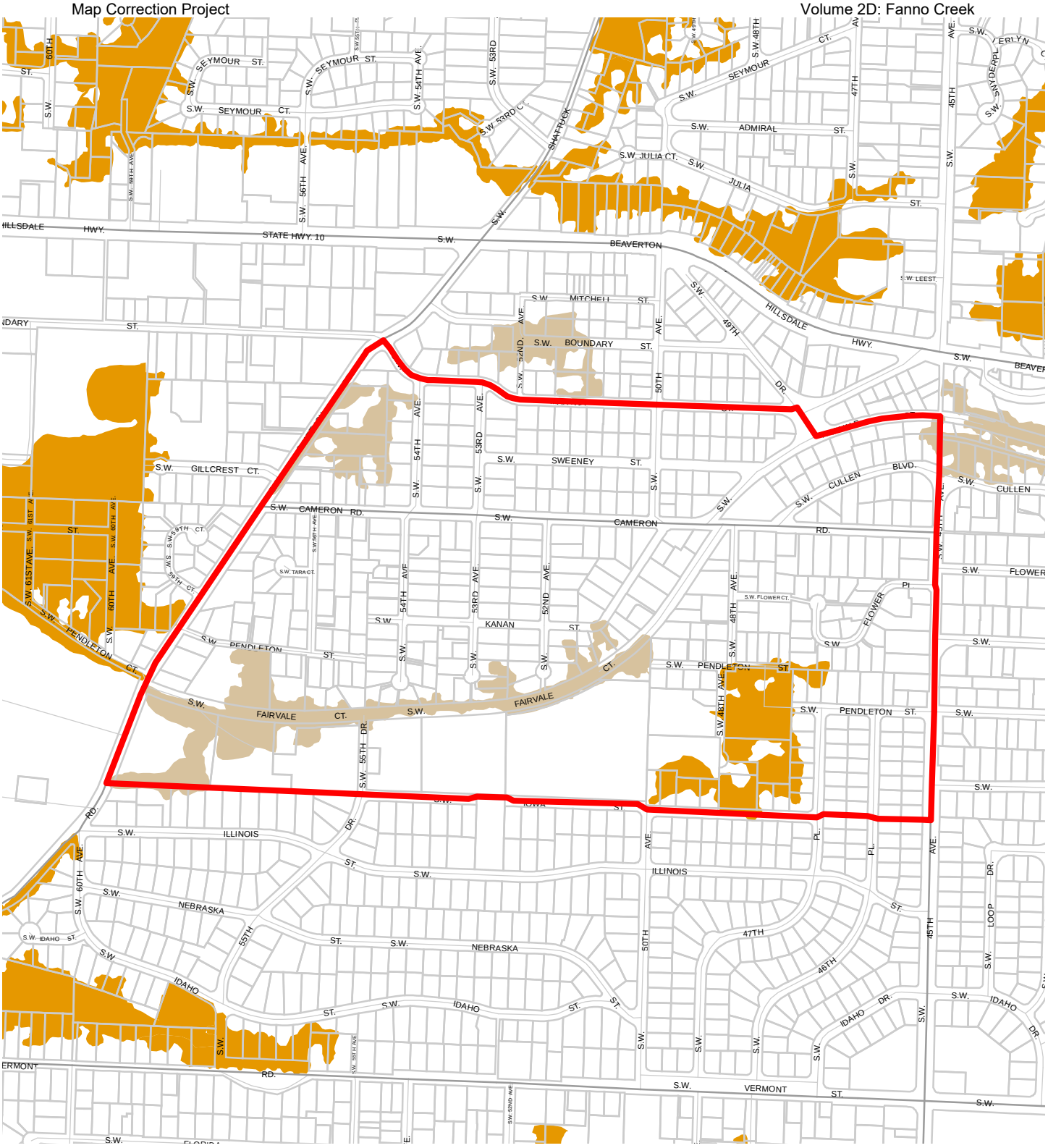

Map E: Wildlife Habitat Classification

Resource Site: FC7

Updated: July 2021

NORTH

0 270 540 Feet

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

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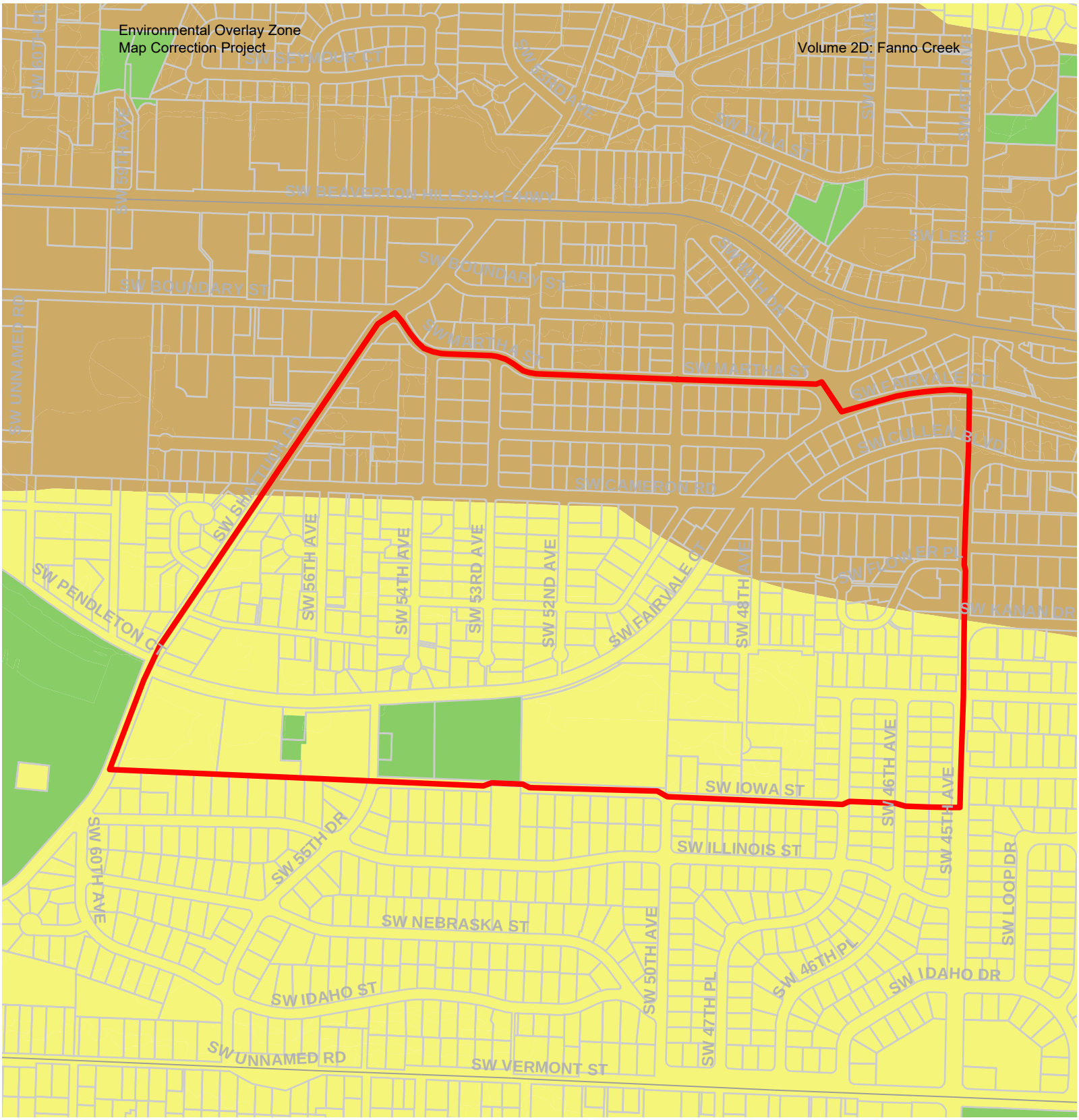

Map F: Urban Development Value (Title 13)
Resource Site: FC7

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

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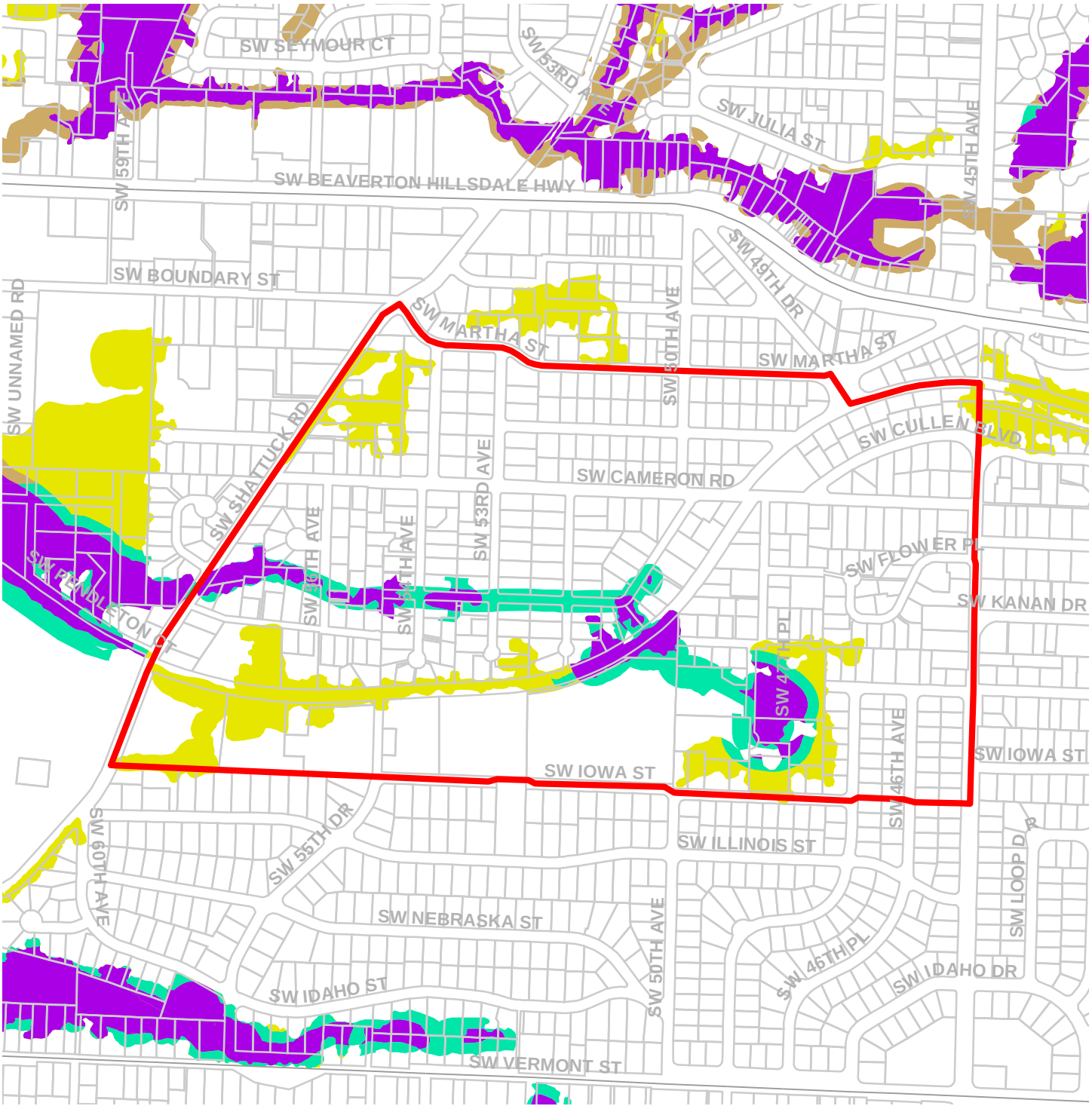
Updated: July 2021

NORTH

0 412.5 825 Feet

Proposed Draft - As Amended



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

Resource Site: FC7

Updated: July 2021

NORTH

0 460 920 Feet

Proposed Draft - As Amended

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

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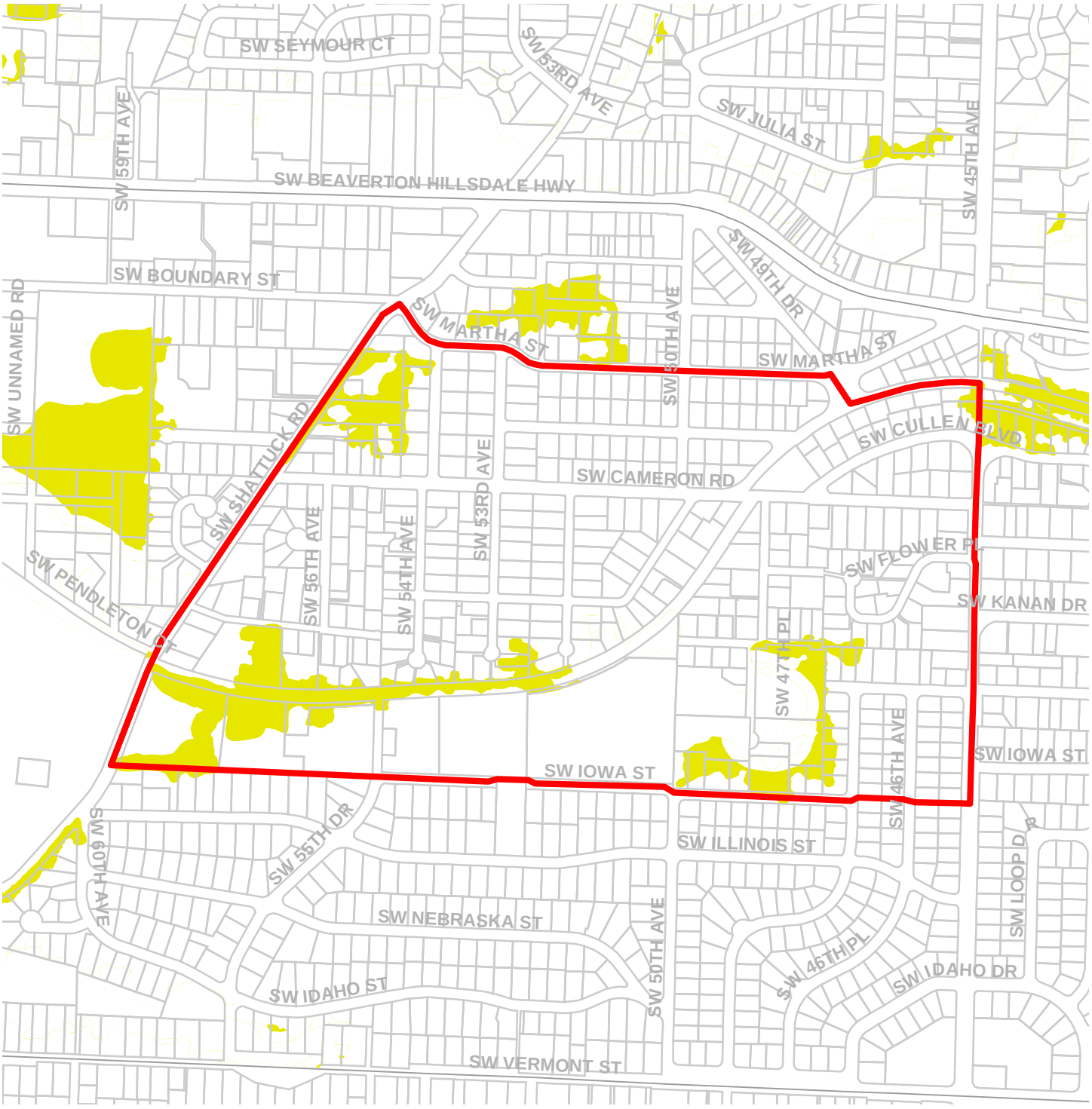

Map H: Goal 5 Resources

Resource Site: FC7

Updated: July 2021

NORTH

0 460 920 Feet

Urban Service Boundary

Resource Sites

Goal 5 Significant Natural Resources

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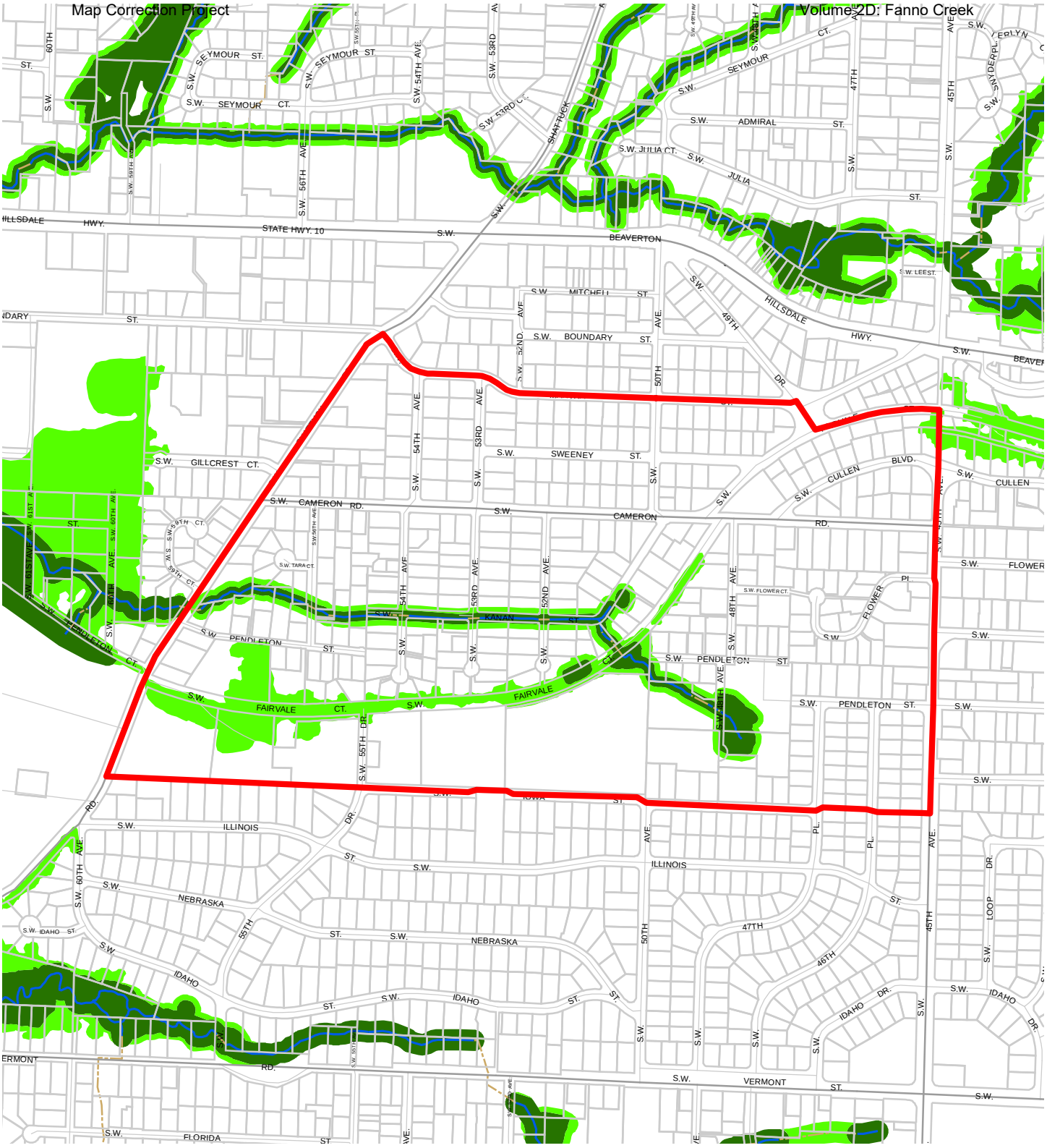

Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site: FC7

Updated: July 2021

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

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NORTH

0 362.5 725 Feet

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Natural Resource Description

Within resource site FC7 the following significant natural resource features and functions are present:

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

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

Special Habitat Areas: Wetlands (W)

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

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

Table A: Quantity of Natural Resource Features in Resource Site	**FC7**
	Study Area
Stream (Miles)	0.5
Wetlands (acres)	0.7
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	22.8
Woodland (acres)	10.1
Shrubland (acres)	0.0
Herbaceous (acres)	9.1
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	19.9
* 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%.	

This resource site contains a forested Fanno Creek tributary stream flowing across the site into designated critical habitat for Endangered Species Act-listed upper Willamette River steelhead trout. Various wetlands have been mapped along the southern portion of the resource site. This resource site includes Pendleton Park and Vermont Hills Community Garden.

Special status bird species observed within or adjacent to this site include: bald eagle, band-tailed pigeon, black-throated gray warbler, brown creeper, bushtit, common yellowthroat, downy woodpecker, great blue heron, green heron, hooded merganser, Hutton's vireo, merlin, olive-sided flycatcher, orange-crowned warbler, pacific-slope flycatcher, pacific wren, pileated woodpecker, purple finch, red crossbill, rufous hummingbird, Swainson's thrush, varied thrush, Vaux's swift, Western wood-pewee, white-breasted nuthatch, willow flycatcher, Wilson's warbler, wood duck, and yellow warbler.

Table B: Quality of Natural Resource Functions in Resource Site FC7				
Resource Site (acres) = 146				
	Class 1/A	**Class 2/B**	**Class 3/C**	**Total**
Riparian Corridors*				
acres	5.5	6.9	15.1	27.5
percent total inventory site area	3.7%	4.7%	10.4%	18.8%
Wildlife Habitat*				
acres	0.0	6.0	12.8	18.8
percent total inventory site area	0.0%	4.1%	8.8%	12.9%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total+				
acres	5.5	10.3	14.6	30.4
percent total inventory site area	3.7%	7.1%	10.0%	20.8%
* 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 Area FC7, 19% 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 FC7

Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
146	35	27	19%

*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 4 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 FC7. Natural resources should be protected within HCA as follows:

1. *Strictly limit* or *limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit* or *limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit* or *limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, expect parks and open space. [9]

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 FC7 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 4, describes the conflicting uses and provides an overarching analysis of the economic,

[9] Metro Title 13 rule 3.07.1330(a)(2) states that any city that had an acknowledge Goal 5 program prior to December 28, 2005, that applies to upland wildlife habitat shall not repeal or amend such regulations in a manner that would allow more than a de minimis increase in development that could occur in those upland habitat areas.

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 and 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 4 is confirmed for resource site FC7, 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*.

The abandoned rail corridor provides a wildlife movement corridor, particularly where there is tree canopy and understory that provides habitat for a range of wildlife. Additional structures that impede or degrade wildlife habitat and removal of trees and native vegetation should be limited.

Natural Resources Protection Decisions

Based on the analysis presented in Volume 3, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation for FC7, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 25 feet of stream top-of-bank or wetlands.
2. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of stream top-of-bank or wetland; and within areas of forest or woodland vegetation located along the abandoned rail corridor.
3. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: FC8 **Resource Site Name:** SW Kanan Drainages

Previous Plan: Fanno Creek and Tributaries Conservation Plan
Previous Resource Site No.:125

The results of the analysis found in Volume 3, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

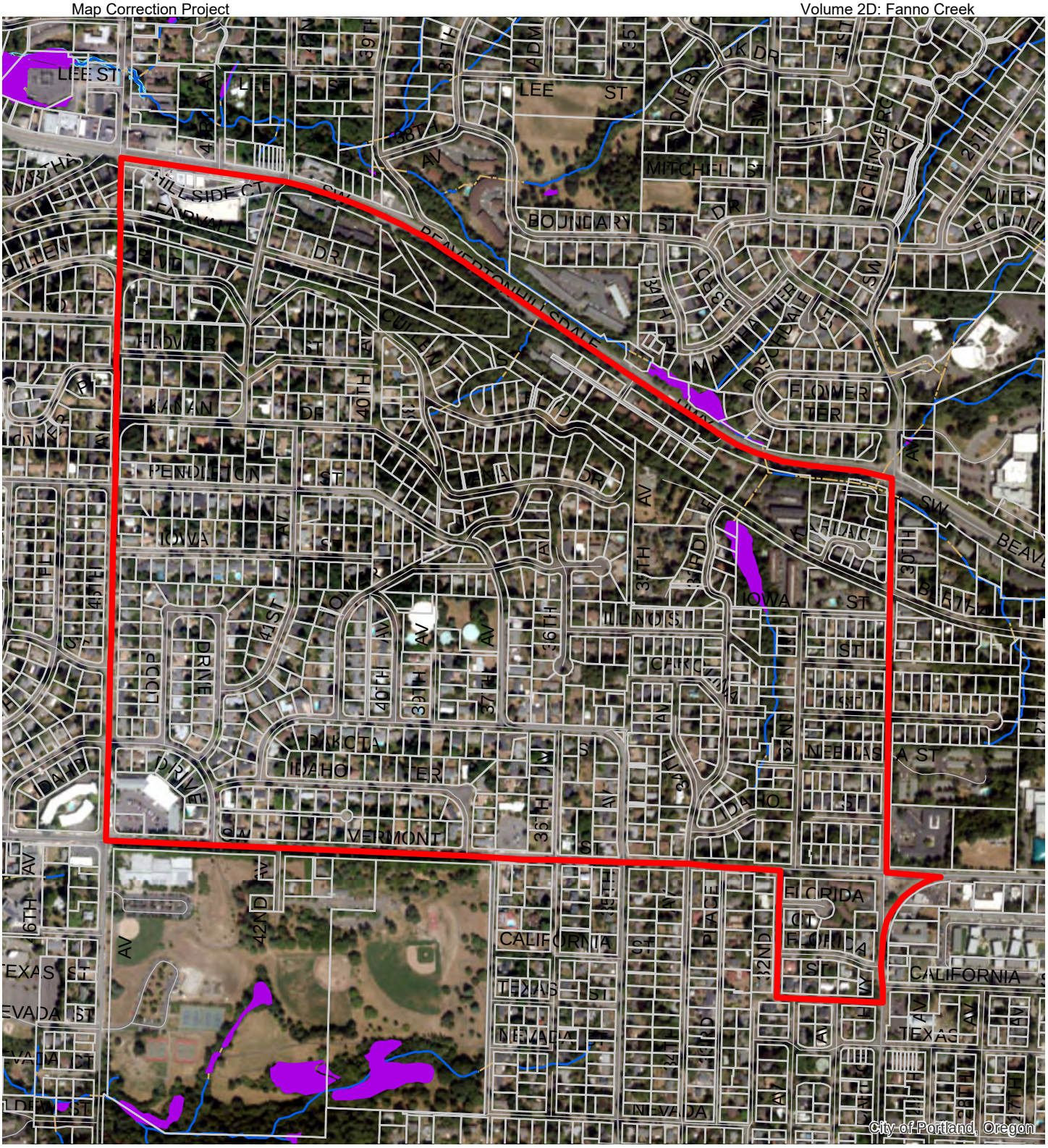
A. Water Features – rivers, streams, wetlands and flood areas
B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
C. Special Habitat Areas
D. Riparian Corridor Classifications
E. Wildlife Habitat Classifications
F. Urban Development Value
G. Metro Title 13 Habitat Conservation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

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

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

Resource site FC8 includes the following:

Site (acres)	263.0
Base zones (acres)	
CE	5.2
CM1	3.0
OS	0.1
R2.5	0.9
R5	28.1
R7	195.8
RM1	27.1
RM2	2.8



Map A: Water Features

Resource Site: FC8

Updated: July 2021

NORTH

0 365 730 Feet

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

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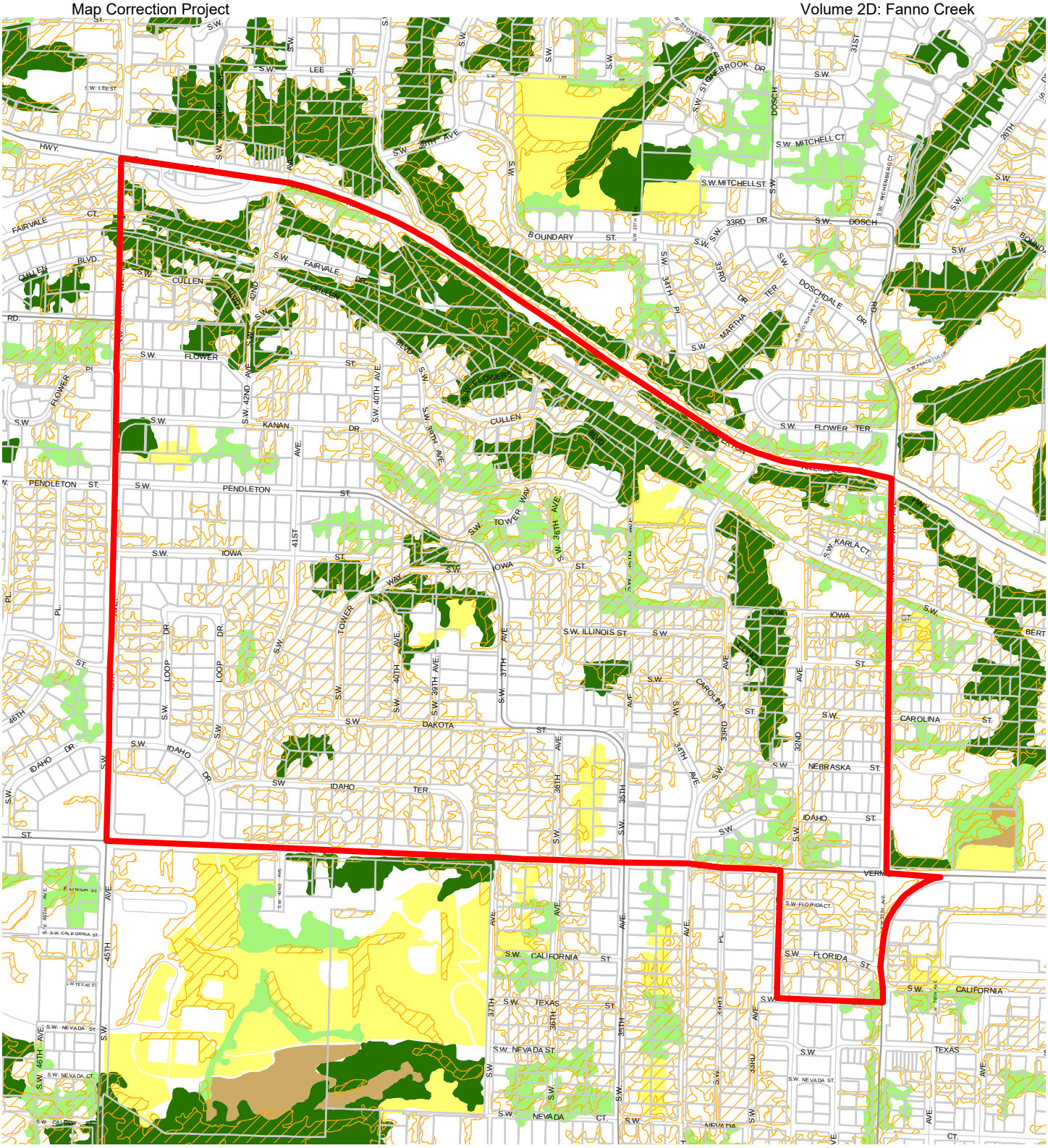
The information on the map was derived from digital databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland ensures meaningful access to city programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: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

Resource Site: FC8

Updated: July 2021

NORTH

0 500 1,000 Feet

Proposed Draft - As Amended

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

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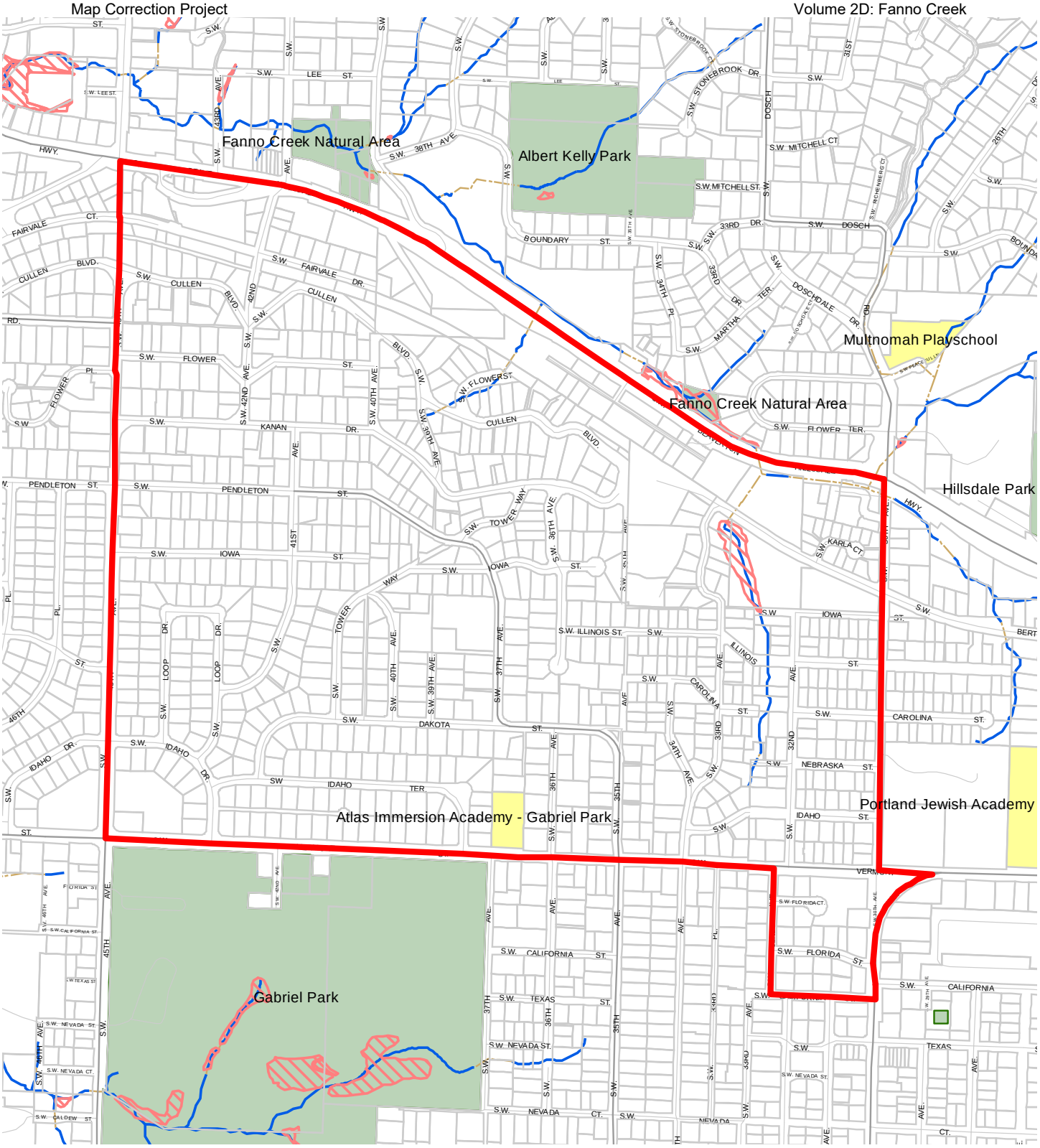

Map C: Special Habitat Areas

Resource Site: FC8

Updated: June 2021

NORTH

0 395 790 Feet

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

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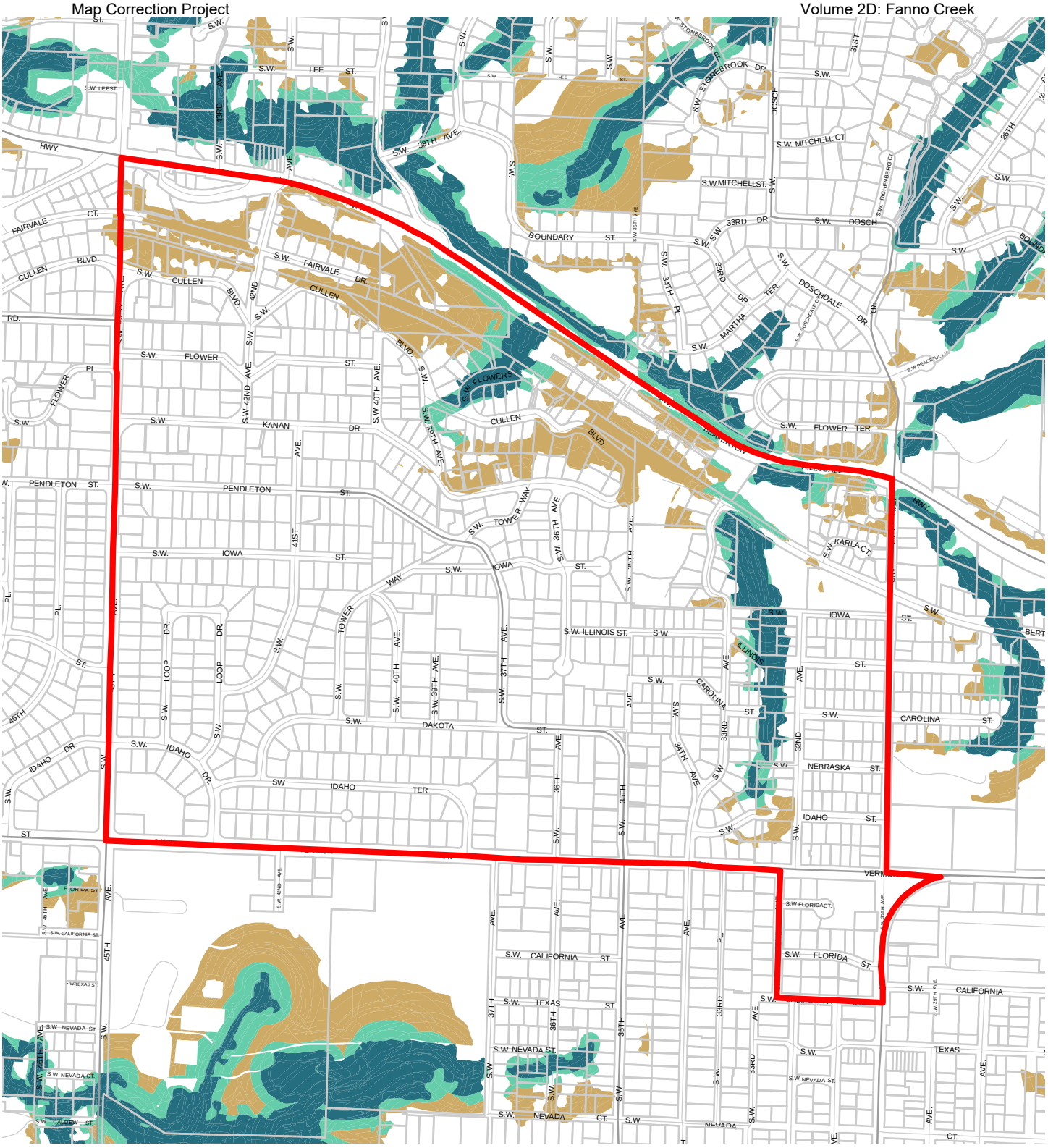

Map D: Riparian Corridors Habitat Classification

Resource Site: FC8

Updated: July 2021

Resource Sites

Class I (high rank)

Class II (medium rank)

Class III (low rank)

Urban Service Boundary

Taxlots

NORTH

0 362.5 725 Feet

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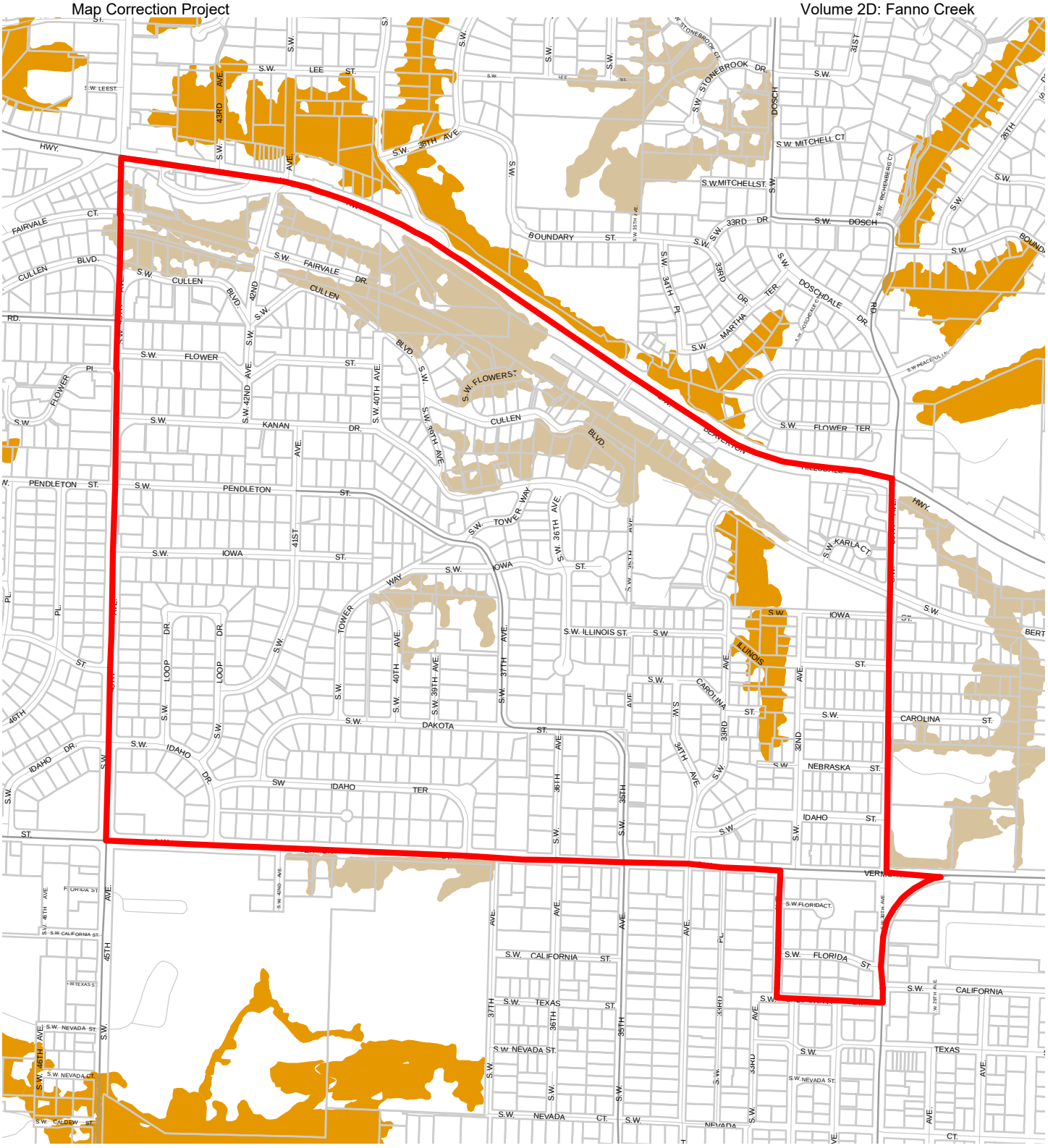

Map E: Wildlife Habitat Classification

Resource Site: FC8

Updated: July 2021

NORTH

0 295 590 Feet

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

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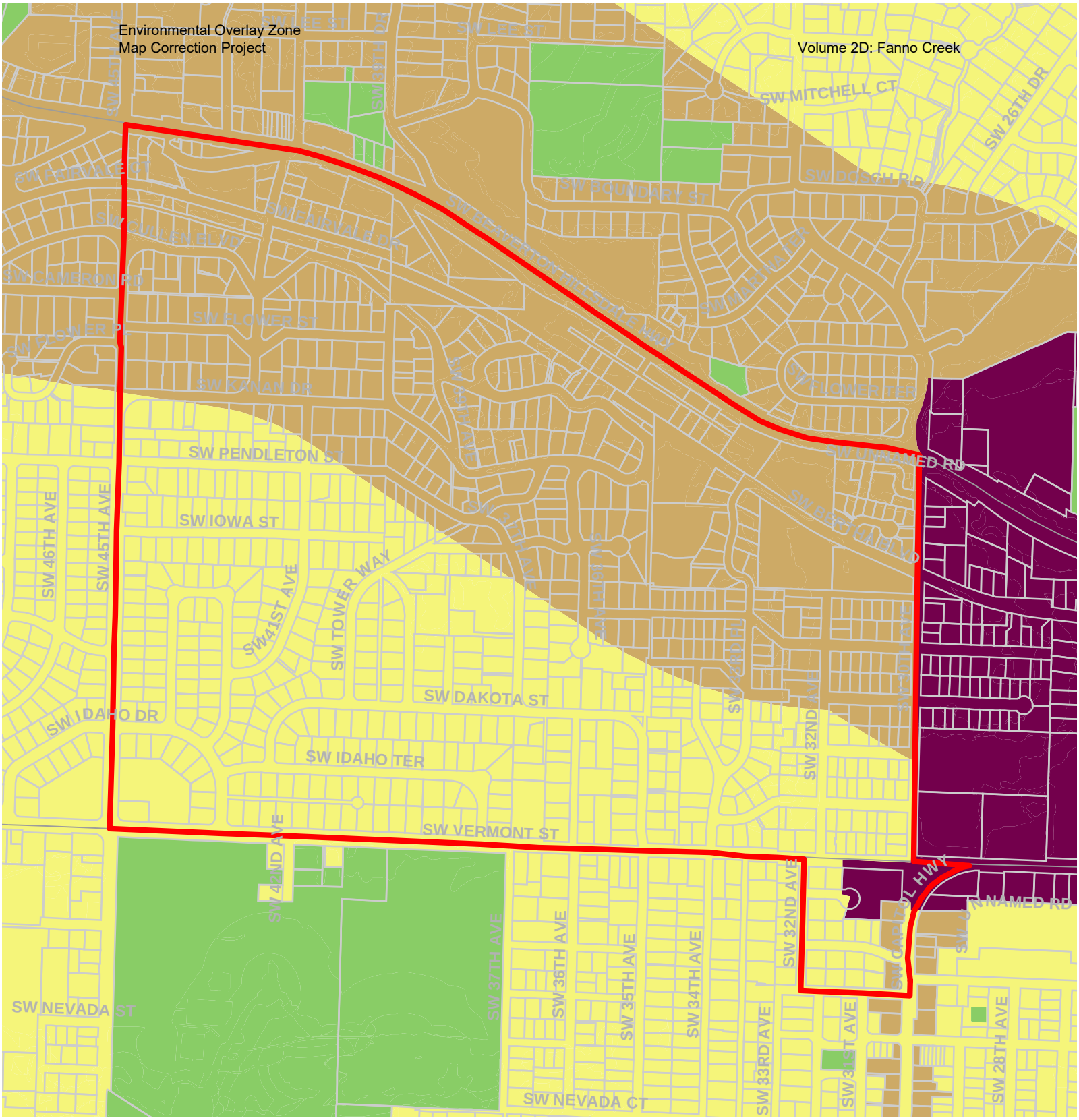

Map F: Urban Development Value (Title 13)
Resource Site: FC8

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

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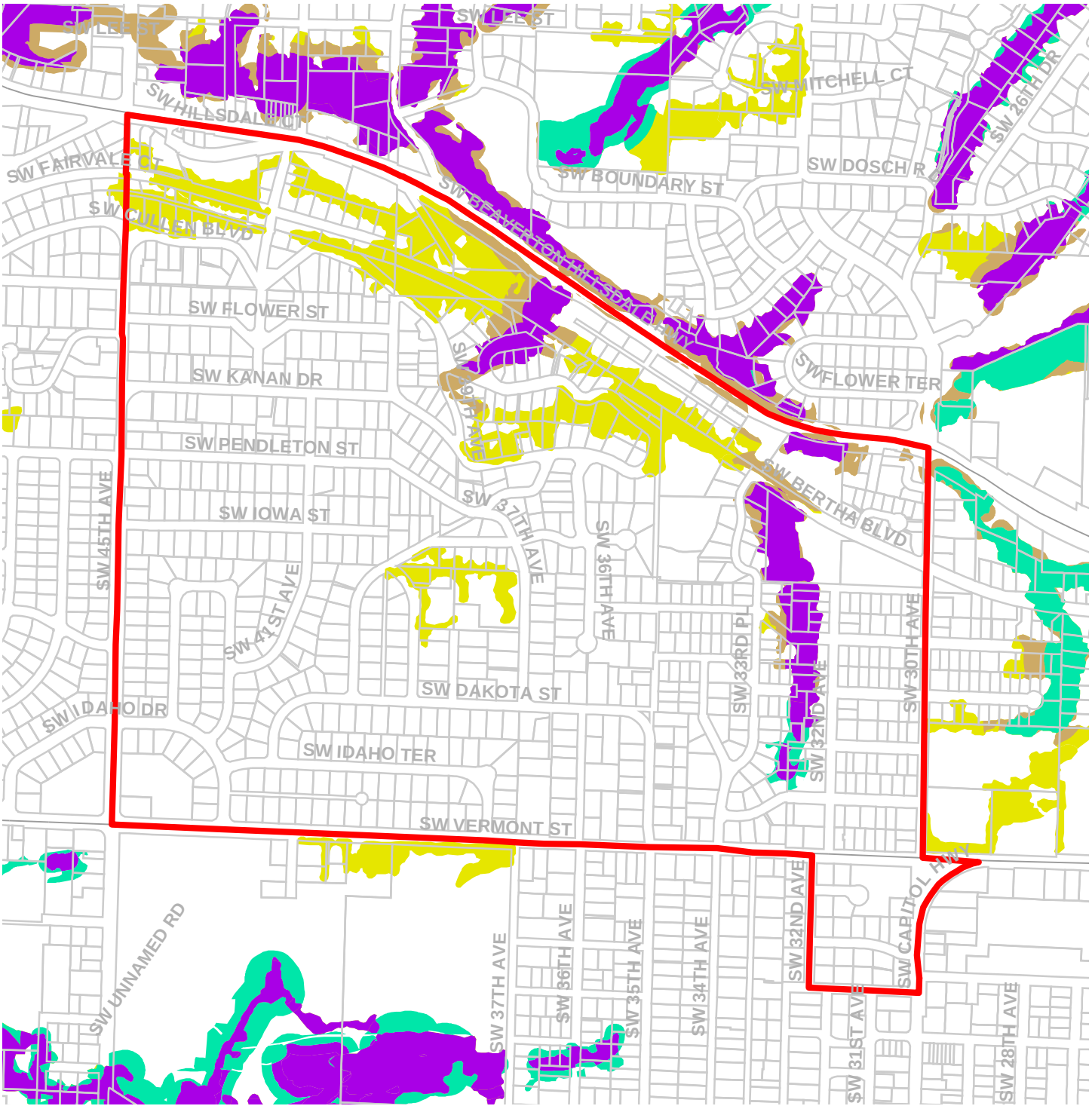
Updated: July 2021

NORTH

0 450 900 Feet



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

Resource Site: FC8

Updated: July 2021

NORTH

0 500 1,000 Feet

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

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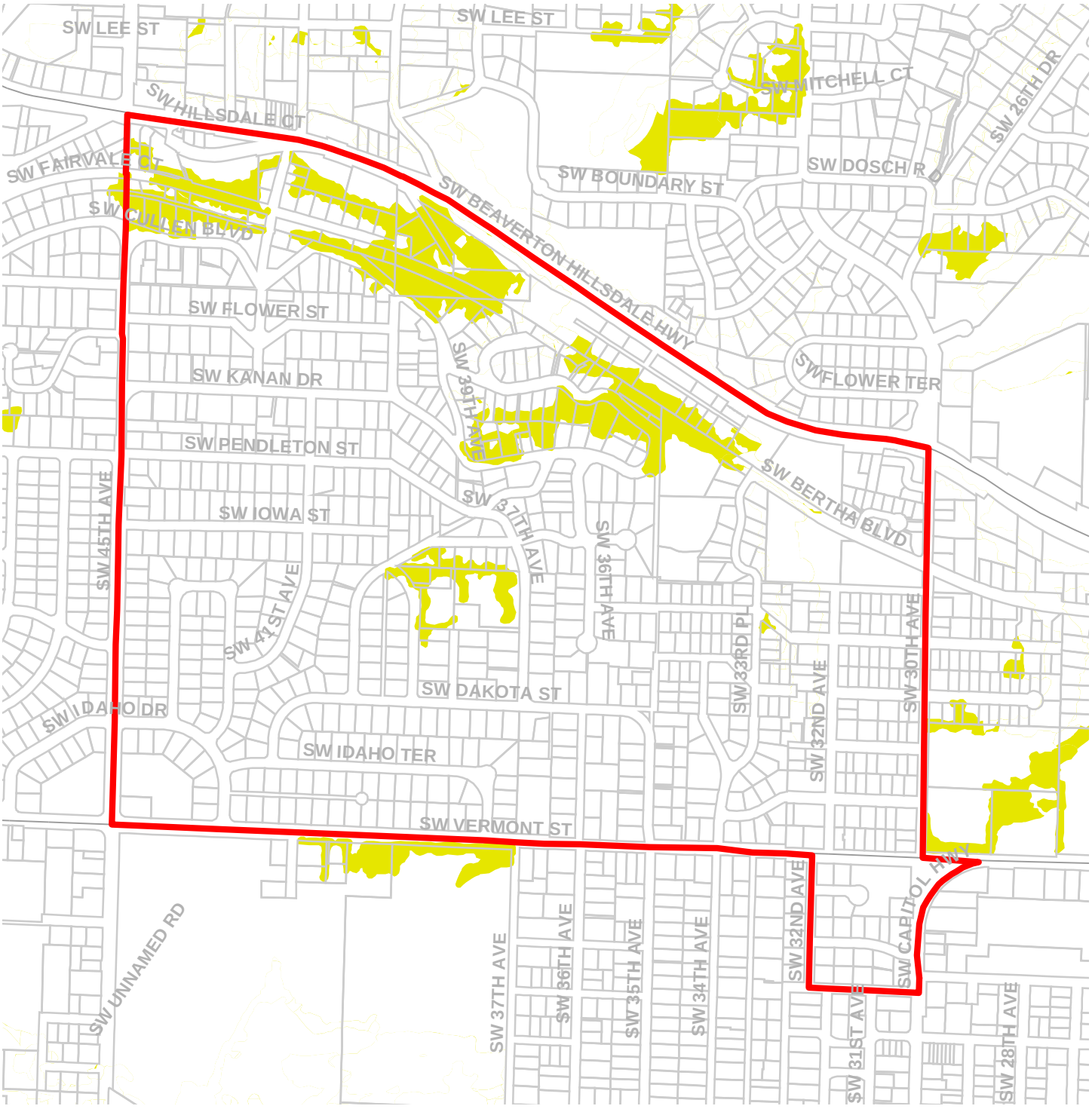

Map H: Goal 5 Resources

Resource Site: FC8

Updated: July 2021

NORTH

0 500 1,000 Feet

Urban Service Boundary

Resource Sites

Goal 5 Significant Natural Resources

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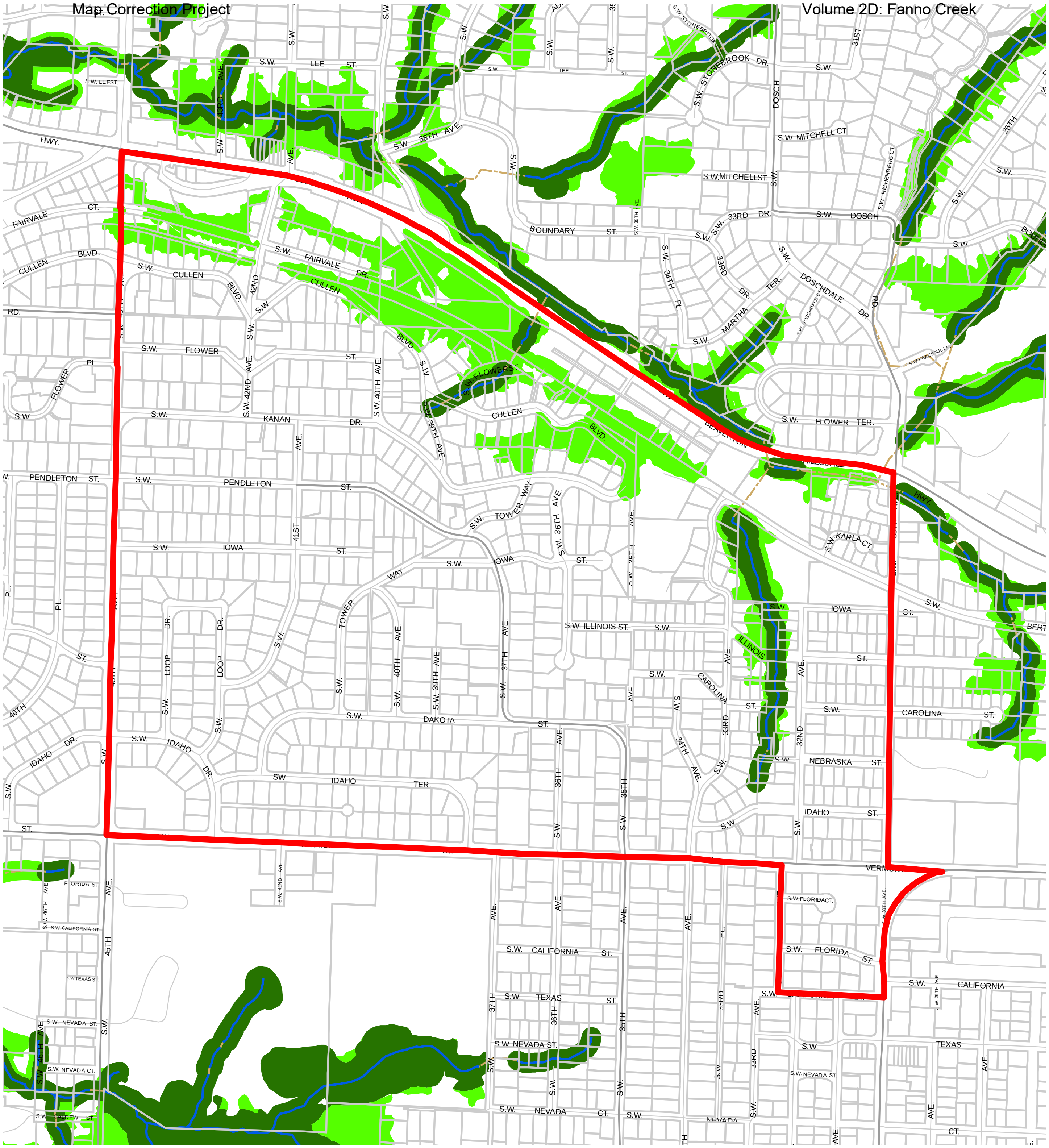

Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site:

FC8

Updated: July 2021

NORTH

0 400 800 Feet

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

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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.

Natural Resource Description

Within resource site FC8 the following significant natural resource features and functions are present:

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

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

Special Habitat Areas: Wetlands (W)

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

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

Table A: Quantity of Natural Resource Features in Resource Site	**FC8**
	Study Area
Stream (Miles)	0.4
Wetlands (acres)	0.9
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	39.3
Woodland (acres)	15.7
Shrubland (acres)	0.0
Herbaceous (acres)	4.1
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	116.9
* 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%.	

Small Fanno Creek headwater streams cross the resource site and flow into designated critical habitat for Endangered Species Act-listed upper Willamette River steelhead trout. A wetland is mapped along one of the headwater streams.

Special status bird species observed within or adjacent to this site include: bald eagle, band-tailed pigeon, black-throated gray warbler, brown creeper, bushtit, chipping sparrow, common yellowthroat, downy woodpecker, great blue heron, green heron, Hammond's flycatcher, hermit warbler, hooded merganser, Hutton's vireo, merlin, Nashville warbler, olive-sided flycatcher, orange-crowned warbler, pacific-slope flycatcher, pacific wren, pileated woodpecker, purple finch, red crossbill, rufous hummingbird, Swainson's thrush, varied thrush, Vaux's swift, Western wood-pewee, white-breasted nuthatch, willow flycatcher, Wilson's warbler, wood duck, and yellow warbler.

Table B: Quality of Natural Resource Functions in Resource Site FC8				
Resource Site (acres) = 263				
	Class 1/A	**Class 2/B**	**Class 3/C**	**Total**
Riparian Corridors*				
acres	7.6	5.3	24.1	36.9
percent total inventory site area	2.9%	2.0%	9.2%	14.0%
Wildlife Habitat*				
acres	0.0	5.0	26.6	31.6
percent total inventory site area	0.0%	1.9%	10.1%	12.0%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total+				
acres	7.6	5.3	26.4	39.3
percent total inventory site area	2.9%	2.0%	10.0%	14.9%
* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water. ** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors. +Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.				

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

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

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

For Resource Area FC8, 24% 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 FC8

Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
263	74	63	24%

*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 4 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 FC8. Natural resources should be protected within HCA as follows:

1. *Strictly limit* or *limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit* or *limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit* or *limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, expect parks and open space. [10]

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 FC8 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 4, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the

[10] Metro Title 13 rule 3.07.1330(a)(2) states that any city that had an acknowledge Goal 5 program prior to December 28, 2005, that applies to upland wildlife habitat shall not repeal or amend such regulations in a manner that would allow more than a de minimis increase in development that could occur in those upland habitat areas.

conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

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

Within the resource site residential uses are allowed outright or conditionally in the R7, R5, R2.5, R2 and R1 base zones. Commercial uses are allowed in the CE and CM1 base zone. Open space uses are allowed in the OS base zone. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

The analysis of economic, social, environmental and energy consequences provided in Volume 4 is confirmed for resource site FC8, with the following additional information that clarifies the analysis.

Strictly limiting or *limiting* conflicting uses would retain the wildlife habitat functions provided by significant natural resource features including maintaining habitat for at risk plant, fish and wildlife species, maintaining vegetation on steep slopes, and maintaining the stormwater management and air-cooling functions of the tree canopy. Mitigation for negative consequences of additional development in areas of Class A or Class B wildlife habitat should be required.

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

Decisions

Based on the analysis presented in Volume 3, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation for FC8, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or 25 feet of wetlands.
2. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands; and within areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank.
3. Apply a conservation overlay zone ('c' zone) to areas of forest vegetation on steep slopes along SW Fairvale Dr west of SW 42 Ave.
4. Allow conflicting uses within all other areas containing significant natural resources.

The area of forest vegetation west of SW 42 Ave is located along the old railroad corridor and is protected to preserve a wildlife habitat corridor and to maintain trees for slope stability.

Resource Site No.: FC9 **Resource Site Name:** Vermont Tributary

Previous Plan: Fanno Creek and Tributaries Conservation Plan
Previous Resource Site No.: 127

The results of the analysis found in Volume 3, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

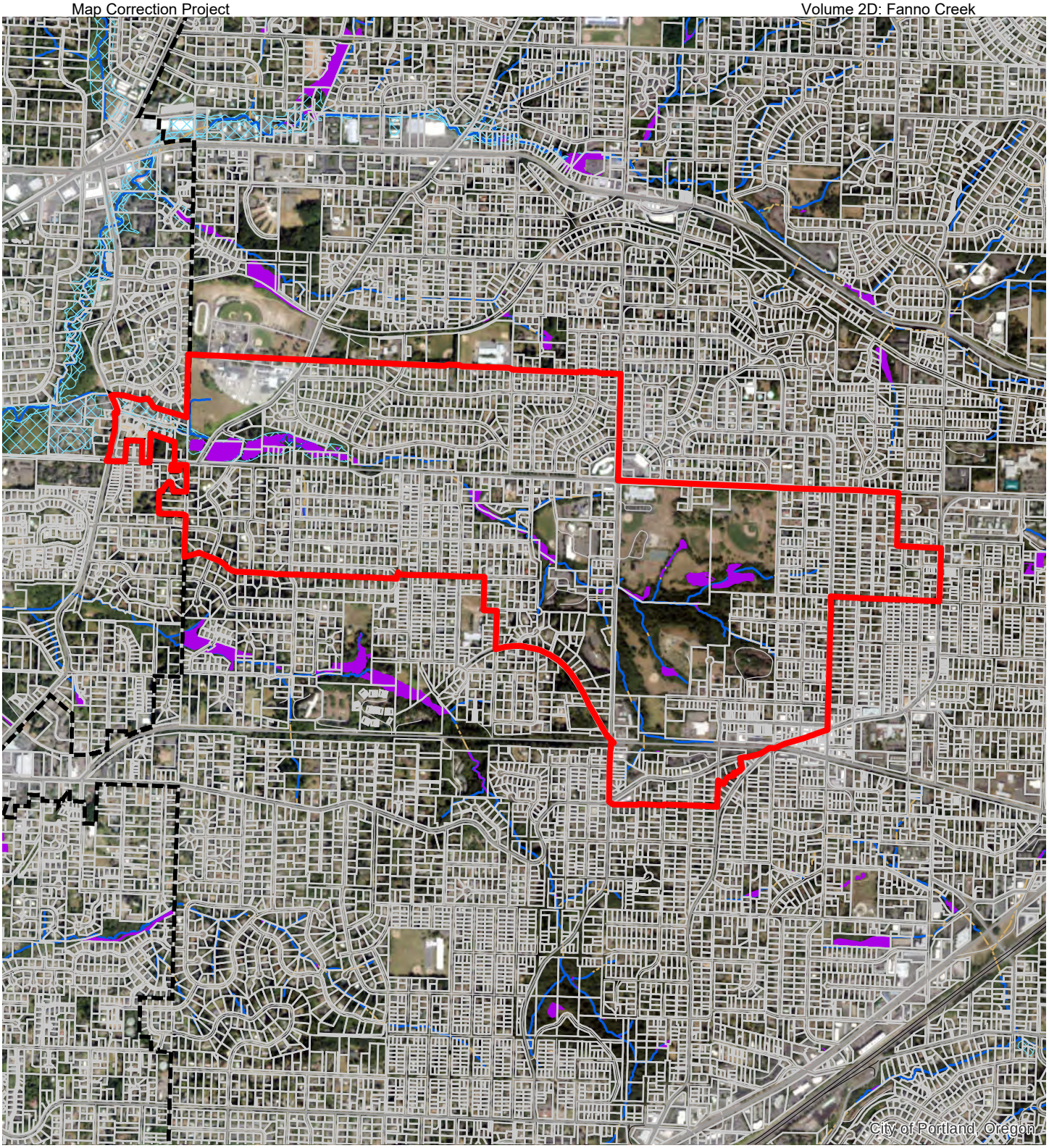
A. Water Features – rivers, streams, wetlands and flood areas
B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
C. Special Habitat Areas
D. Riparian Corridor Classifications
E. Wildlife Habitat Classifications
F. Urban Development Value
G. Metro Title 13 Habitat Conservation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

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

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

Resource site FC9 includes the following:

Site (acres)	612.0
Base zones (acres)	
CE	0.9
CM1	9.1
CM2	8.0
OS	97.5
R10	72.5
R2.5	5.6
R5	26.4
R7	358.1
RM1	21.8
RM2	12.0



Map A: Water Features

Resource Site: FC9

Updated: July 2021

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

NORTH

0 800 1,600 Feet

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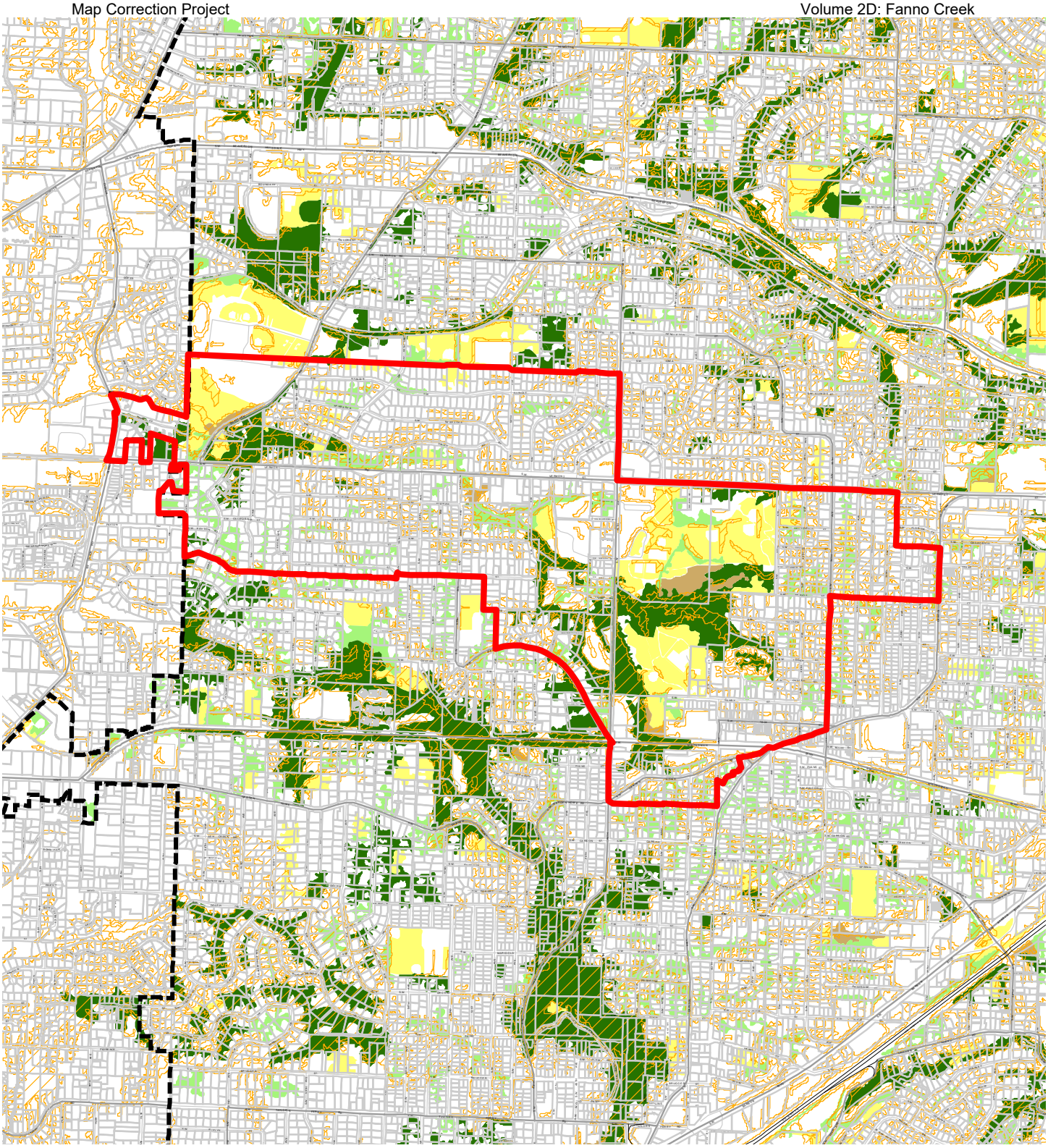

Map B: Vegetation and Steep Slopes

Resource Site: FC9

Updated: July 2021

NORTH

0 1,150 2,300 Feet

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

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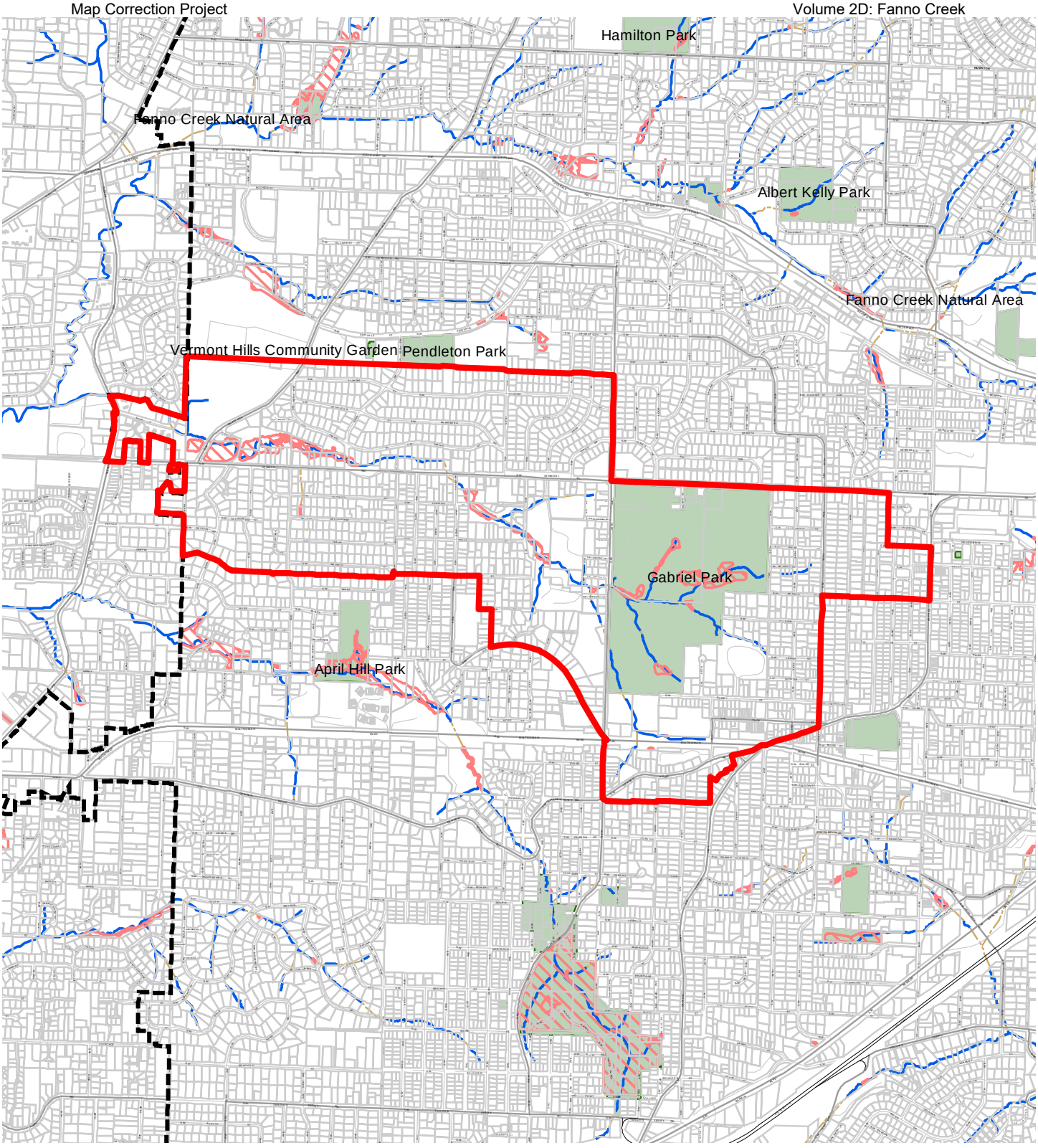
July 2021



Map C: Special Habitat Areas

Resource Site: FC9

Updated: June 2021

NORTH

0 900 1,800 Feet

Proposed Draft - As Amended

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

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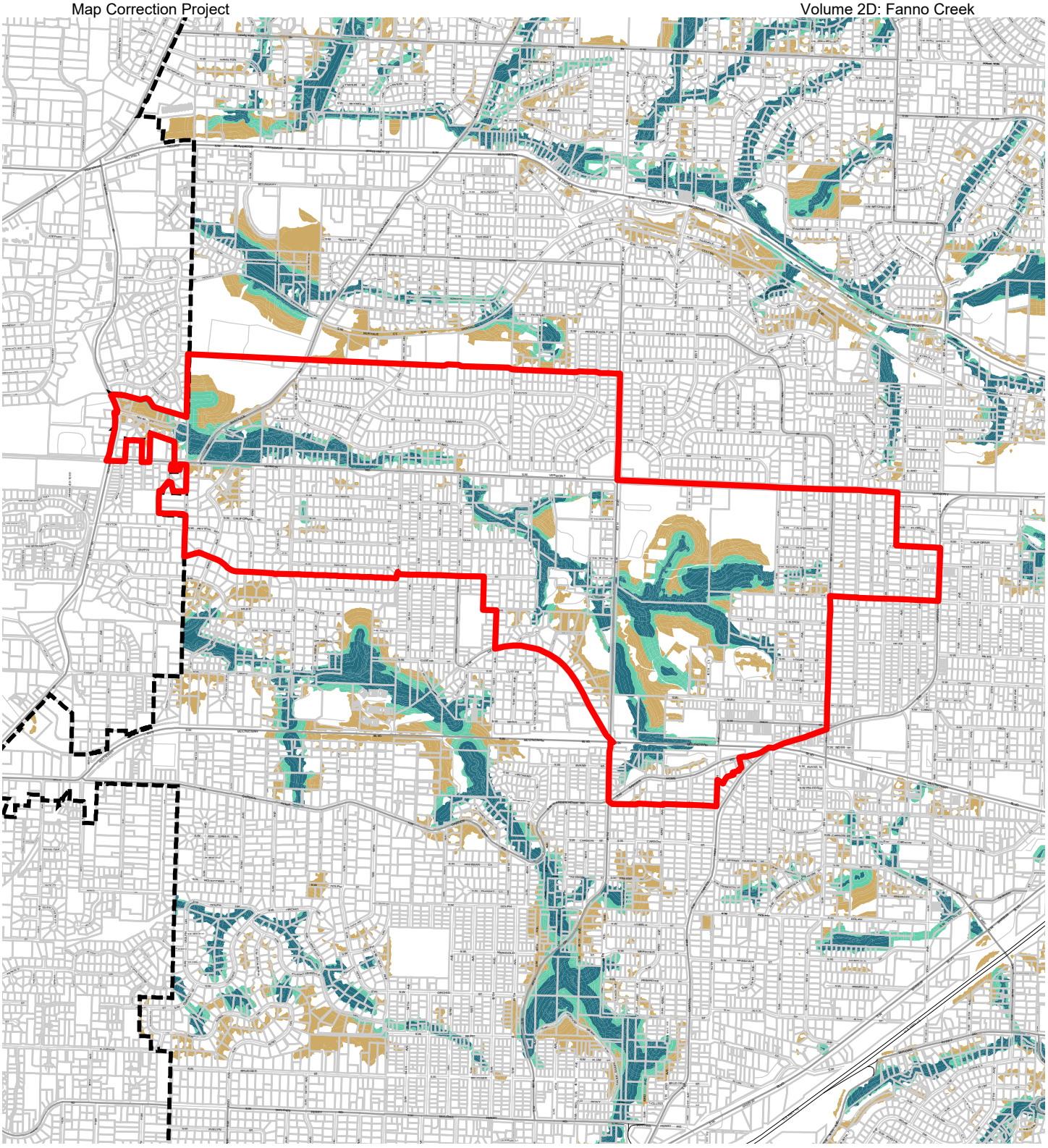

Map D: Riparian Corridors Habitat Classification

Resource Site: FC9

Updated: July 2021

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

NORTH

0 800 1,600 Feet

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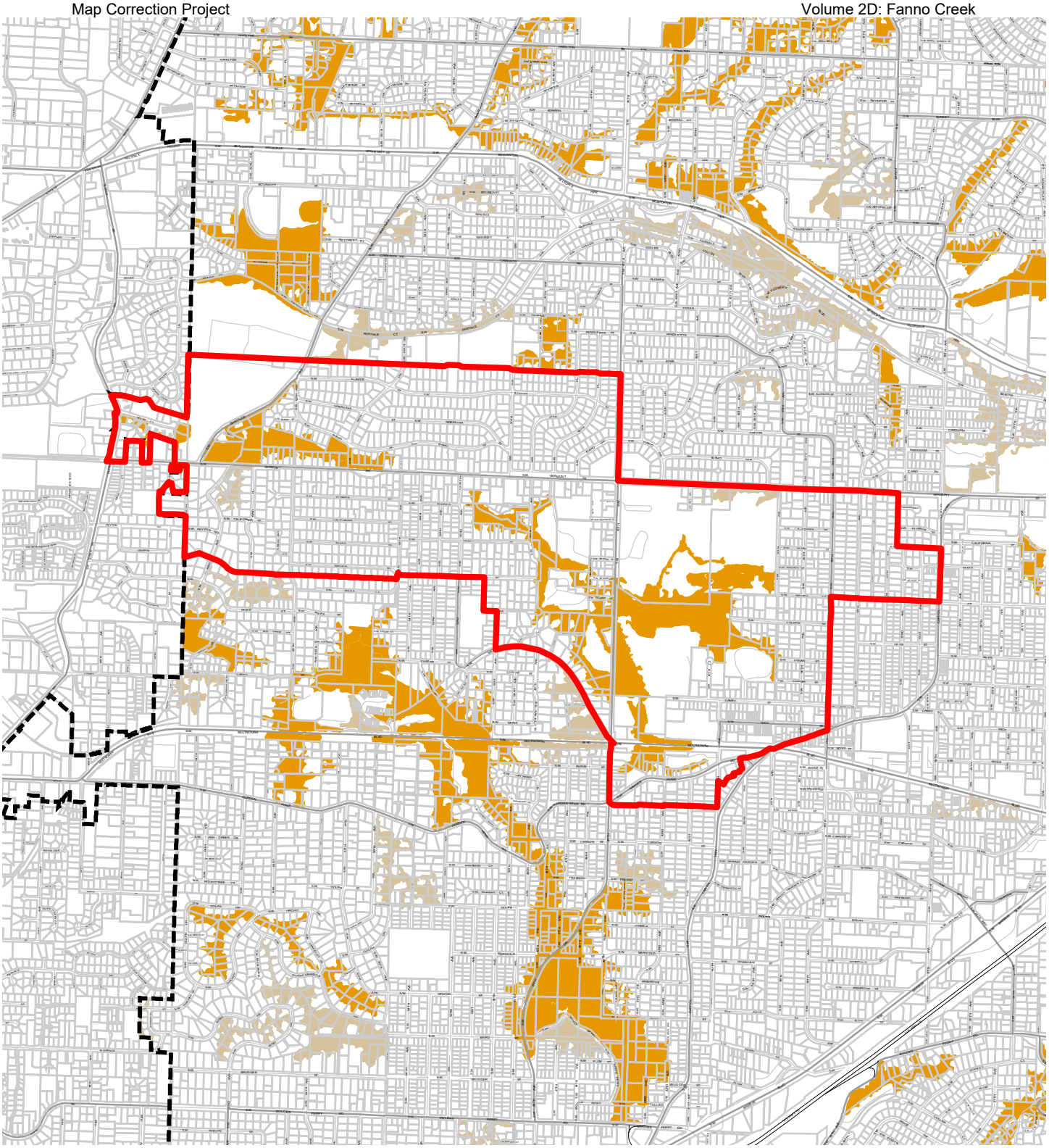

Map E: Wildlife Habitat Classification

Resource Site: FC9

Updated: July 2021

NORTH

0 625 1,250 Feet

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

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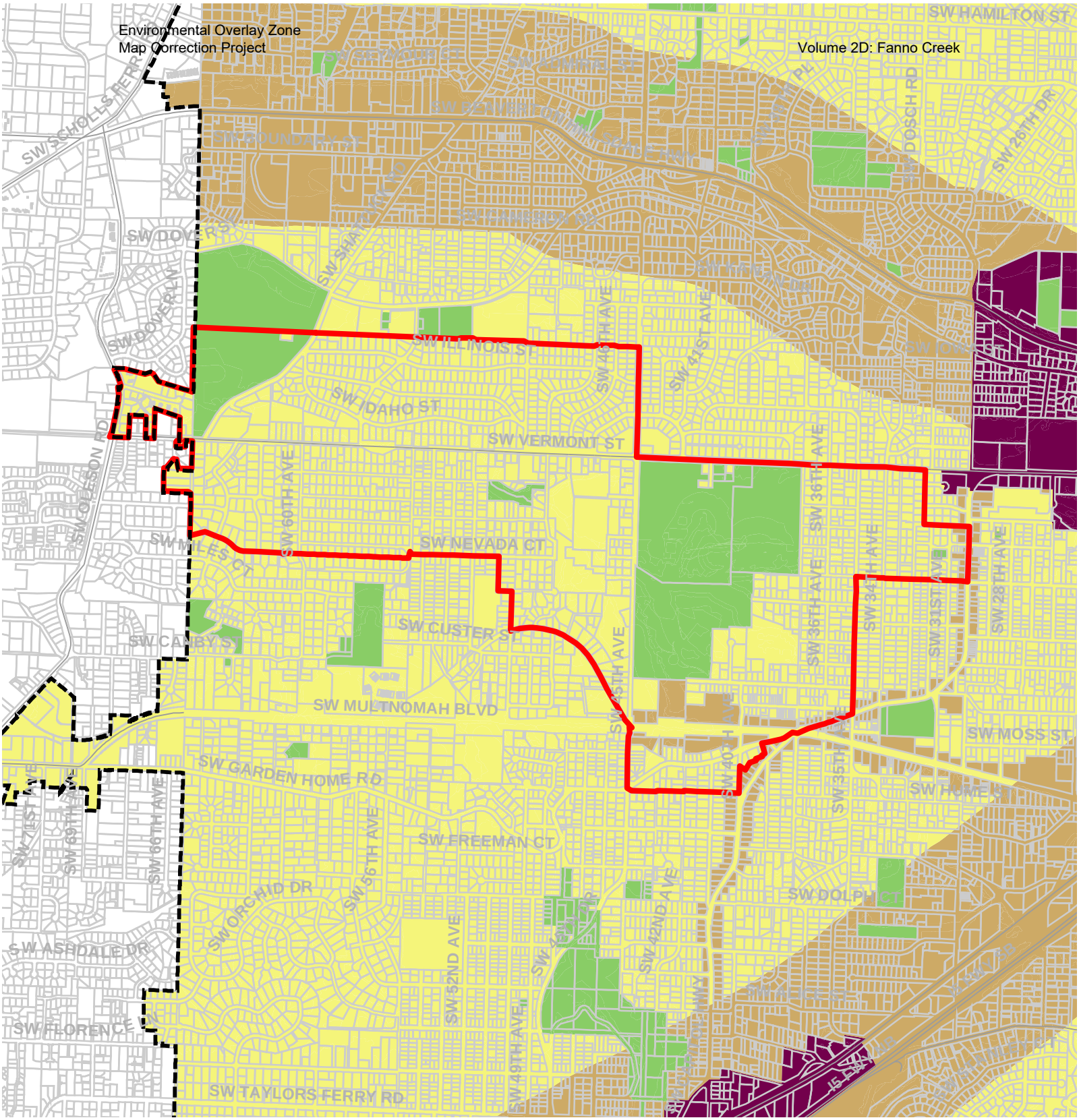
July 2021



Map F: Urban Development Value (Title 13)
Resource Site: FC9

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

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Updated: July 2021

NORTH

0 1,000 2,000 Feet

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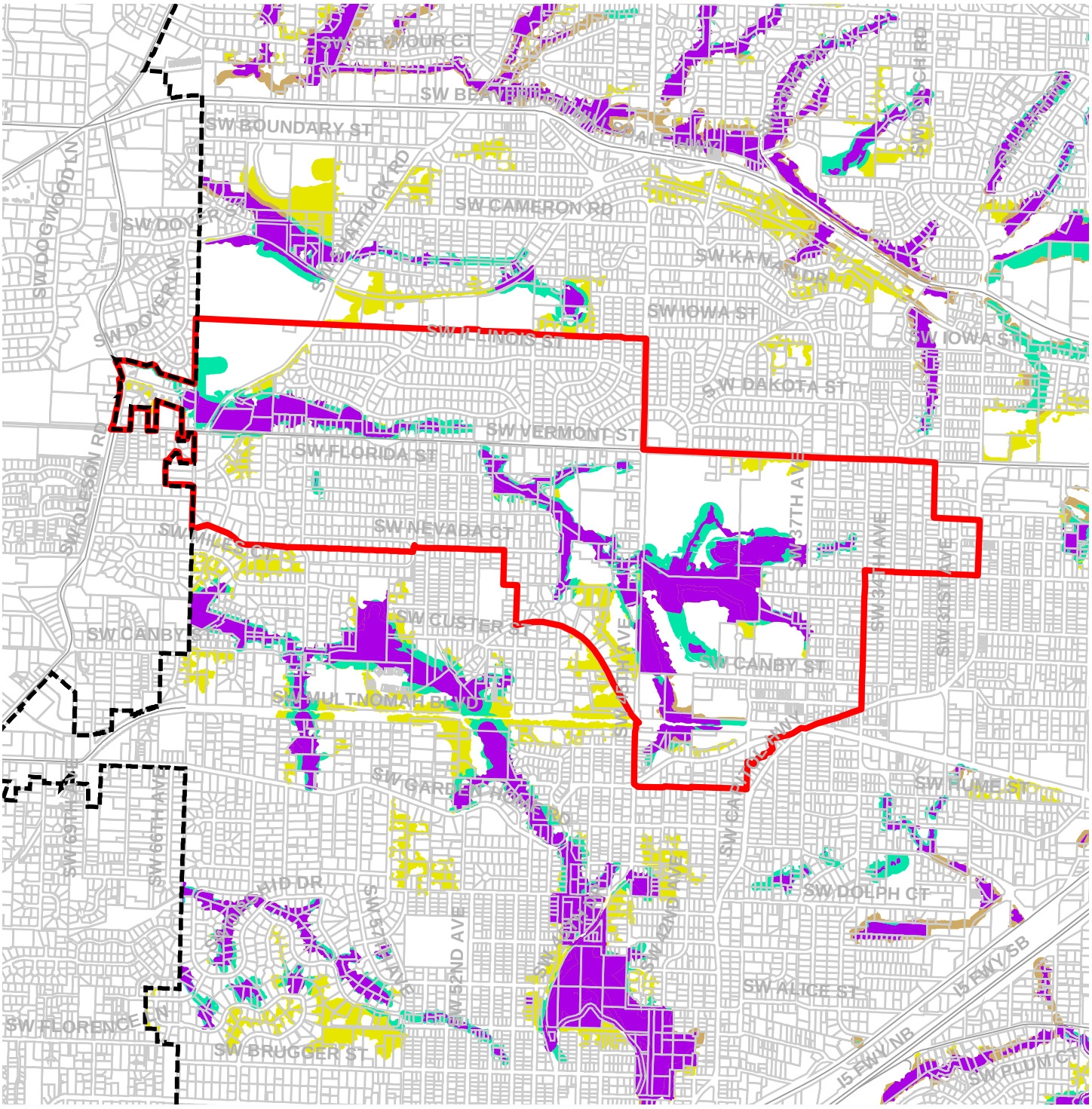

Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: FC9

Updated: July 2021

NORTH

0 1,150 2,300 Feet

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

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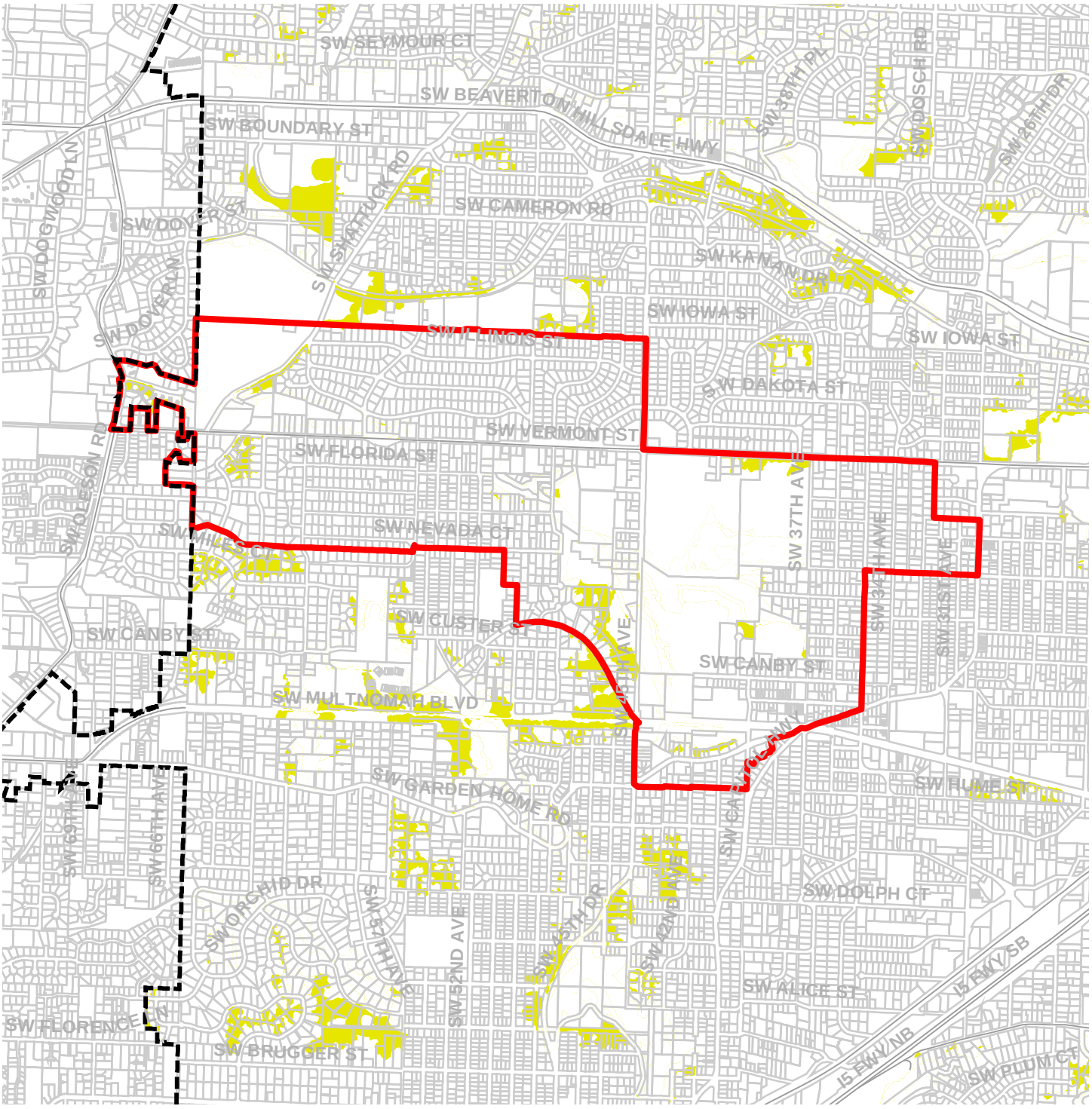

Map H: Goal 5 Resources

Resource Site: FC9

Updated: July 2021

NORTH

0 1,150 2,300 Feet

Urban Service Boundary

Resource Sites

Goal 5 Significant Natural Resources

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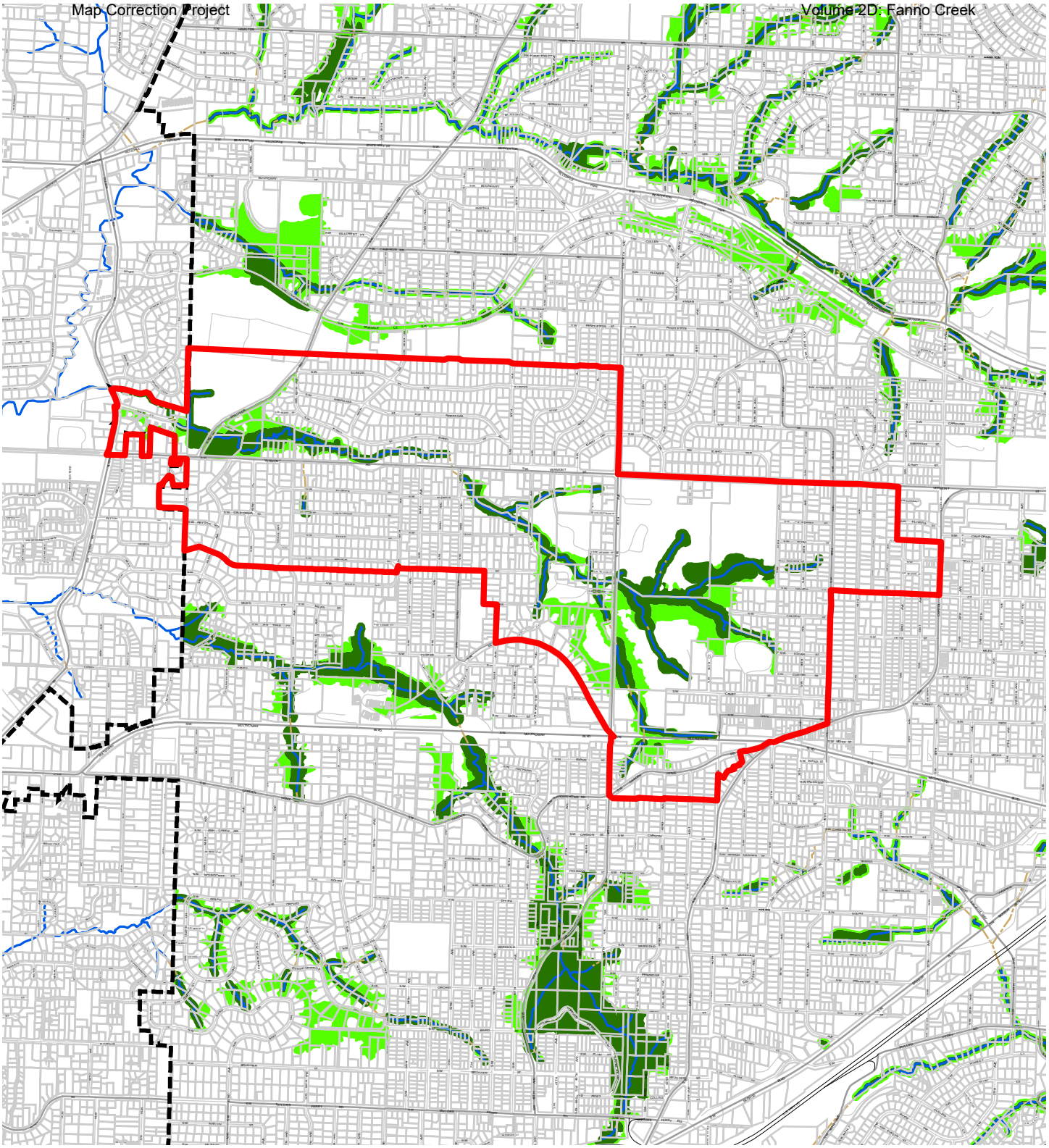

Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site:

FC9

Updated: July 2021

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

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NORTH

0 900 1,800 Feet

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Natural Resource Description

Within resource site FC9 the following significant natural resource features and functions are present:

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

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

Special Habitat Areas: Wetlands (W)

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

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

Table A: Quantity of Natural Resource Features in Resource Site	**FC9**
	Study Area
Stream (Miles)	3.6
Wetlands (acres)	12.5
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	76.1
Woodland (acres)	55.9
Shrubland (acres)	7.3
Herbaceous (acres)	61.1
Flood Area*	
Vegetated (acres)	10.4
Non-vegetated (acres)	3.8
Steep Slopes (acres)**	146.1
* 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%.	

Forested Fanno Creek headwater and tributary streams that flow into designated critical habitat for Endangered Species Act-listed upper Willamette River steelhead trout cross the resource site from east to west. Numerous wetlands are mapped along or adjacent to stream channels of these tributaries. Coast cutthroat troat have also been observed in the resource site. In addition, a BES natural area is located at the corner of SW 55th Drive and SW Idaho.

This resource site includes Gabriel Park.

Special status bird species observed within or adjacent to this site include: bald eagle, band-tailed pigeon, black-throated gray warbler, brown creeper, bushtit, chipping sparrow, common yellowthroat, downy woodpecker, great blue heron, green heron, Hammond's flycatcher, hermit warbler, hooded merganser, Hutton's vireo, merlin, Nashville warbler, olive-sided flycatcher, orange-crowned warbler, pacific-slope flycatcher, pacific wren, pileated woodpecker, purple finch, red crossbill, rufous hummingbird, Swainson's thrush, varied thrush, Vaux's swift, Western wood-pewee, white-breasted nuthatch, white-tailed kite, willow flycatcher, Wilson's warbler, wood duck, and yellow warbler.

Table B: Quality of Natural Resource Functions in Resource Site FC9				
Resource Site (acres) = 612				
	Class 1/A	**Class 2/B**	**Class 3/C**	**Total**
Riparian Corridors*				
acres	60.4	37.7	58.0	156.1
percent total inventory site area	9.9%	6.2%	9.5%	25.5%
Wildlife Habitat*				
acres	0.0	82.3	5.8	88.1
percent total inventory site area	0.0%	13.5%	1.0%	14.4%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total+				
acres	60.4	53.9	44.6	158.9
percent total inventory site area	9.9%	8.8%	7.3%	26.0%

* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.

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

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

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

For Resource Area FC9, 17% 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 FC9

Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
613	148	102	17%

*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 4 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 FC9. Natural resources should be protected within HCA as follows:

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

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 FC9 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 4, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

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

Within the resource site residential uses are allowed outright or conditionally in the R10, R7, R5, R2.5, R2 and R1 base zones. Commercial uses are allowed in the CE, CM2 and CM1 base zone. Open space uses are allowed in the OS base zone. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

The analysis of economic, social, environmental and energy consequences provided in Volume 4 is confirmed for resource site FC9, 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, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation for FC9, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

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

Resource Site No.: FC10 **Resource Site Name:** Woods Creek

Previous Plan: Fanno Creek and Tributaries Conservation Plan
Previous Resource Site No.: 128

The results of the analysis found in Volume 3, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

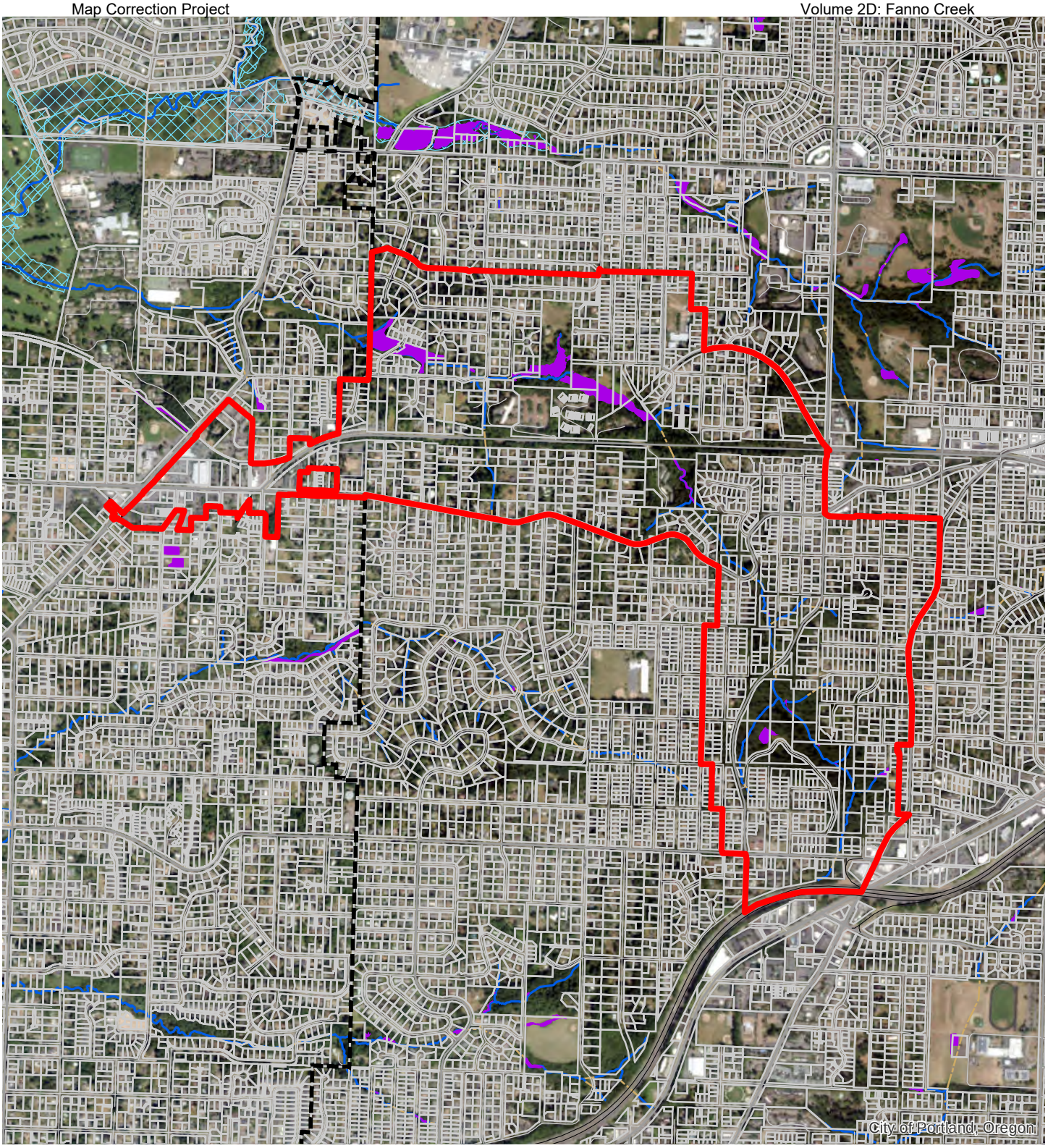
A. Water Features – rivers, streams, wetlands and flood areas
B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
C. Special Habitat Areas
D. Riparian Corridor Classifications
E. Wildlife Habitat Classifications
F. Urban Development Value
G. Metro Title 13 Habitat Conservation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

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

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

Resource site FC10 includes the following:

Site (acres)	578.1
Base zones (acres)	
CE	7.0
CM1	5.0
CM2	3.8
CR	0.4
OS	54.3
R10	140.3
R5	32.1
R7	308.3
RM1	2.1
RM2	24.8



Map A: Water Features

Resource Site: FC10

Updated: July 2021

NORTH

0 750 1,500 Feet

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

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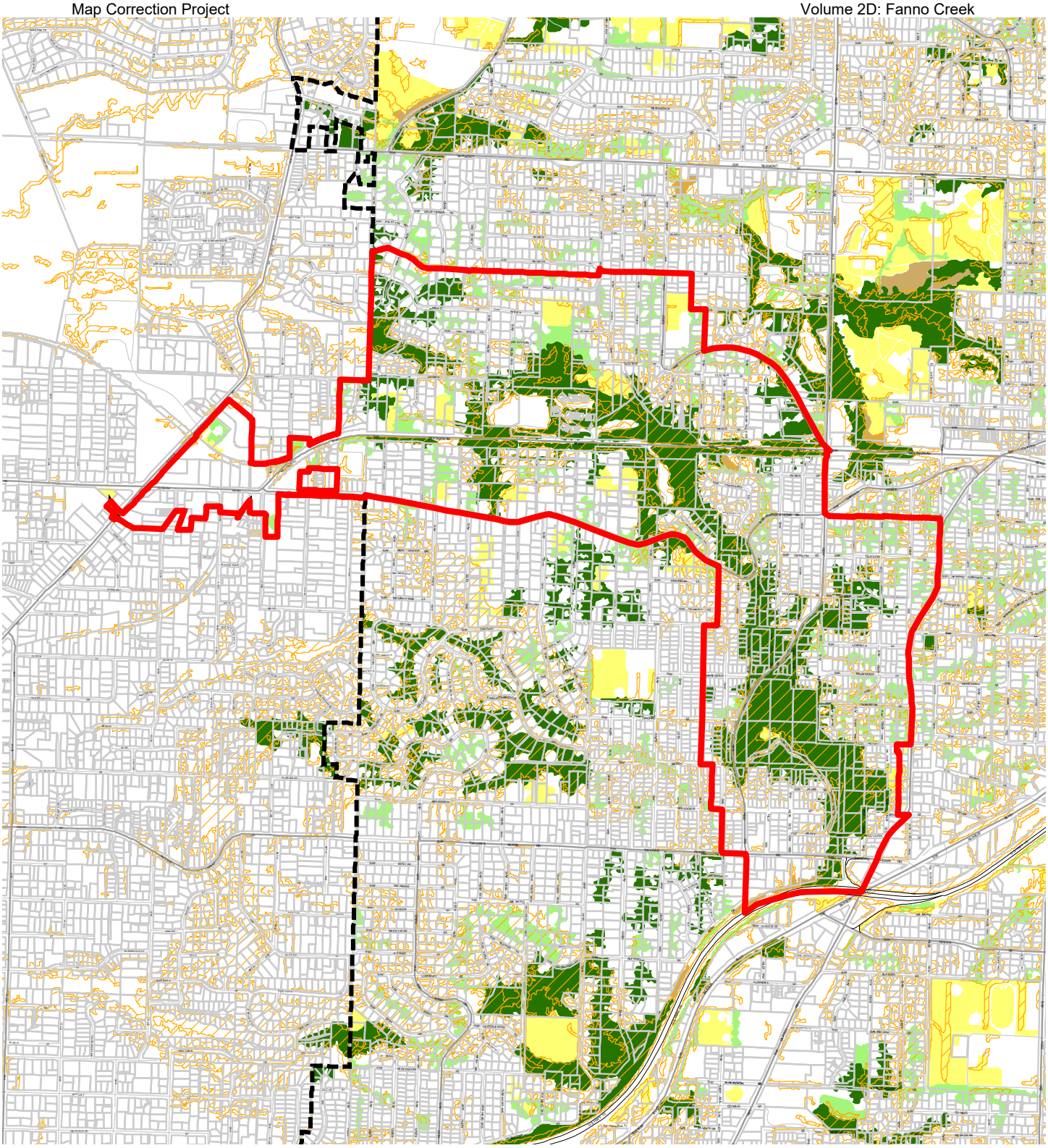

Map B: Vegetation and Steep Slopes

Resource Site: FC10

Updated: July 2021

NORTH

0 1,050 2,100 Feet

Proposed Draft - As Amended

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

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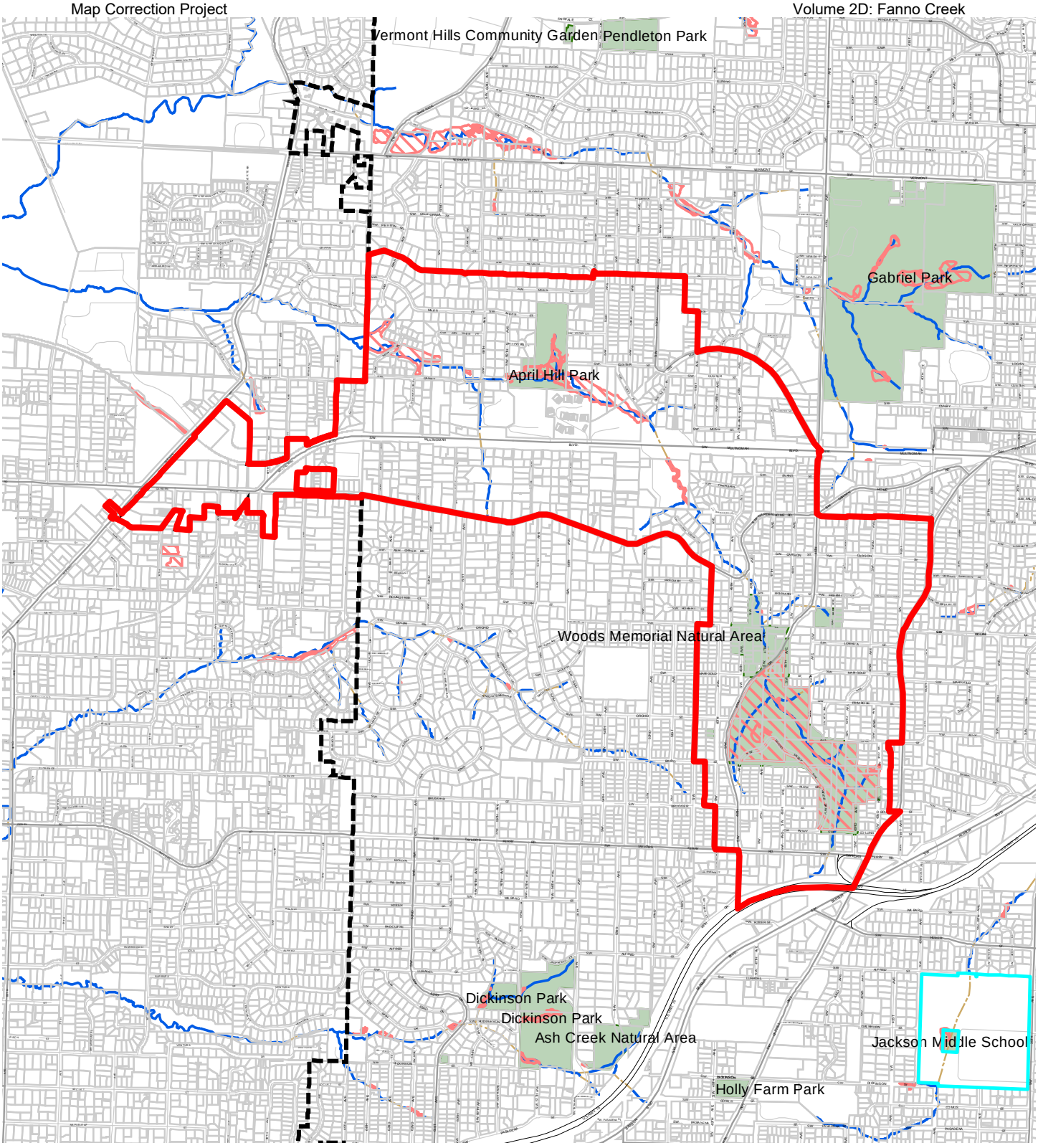

Map C: Special Habitat Areas

Resource Site: FC10

Updated: June 2021

NORTH

0 850 1,700 Feet

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

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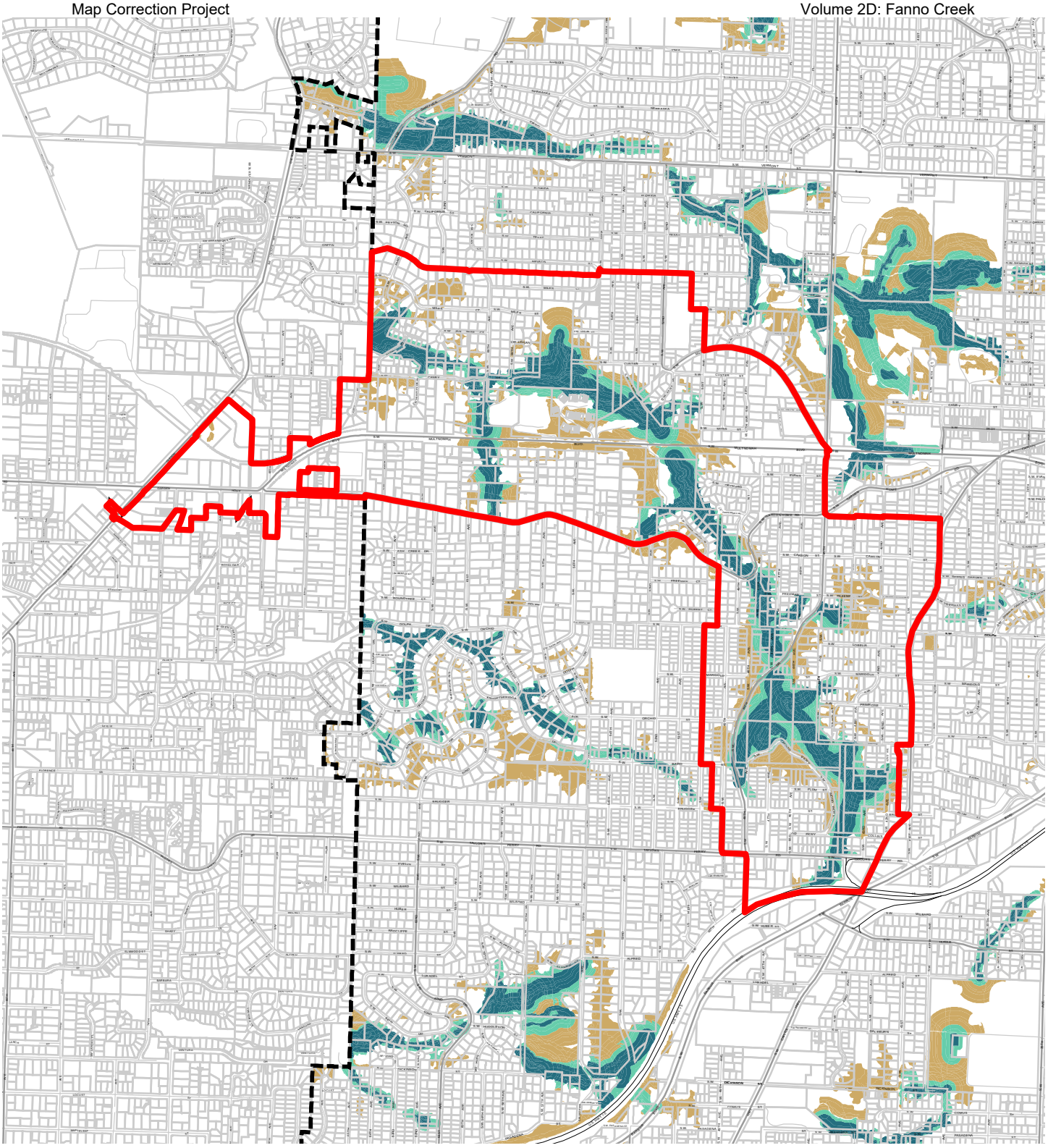

Map D: Riparian Corridors Habitat Classification

Resource Site: FC10

Updated: July 2021

Resource Sites

Urban Service Boundary

Class I (high rank)

Taxlots

Class II (medium rank)

Class III (low rank)

NORTH

0 750 1,500 Feet

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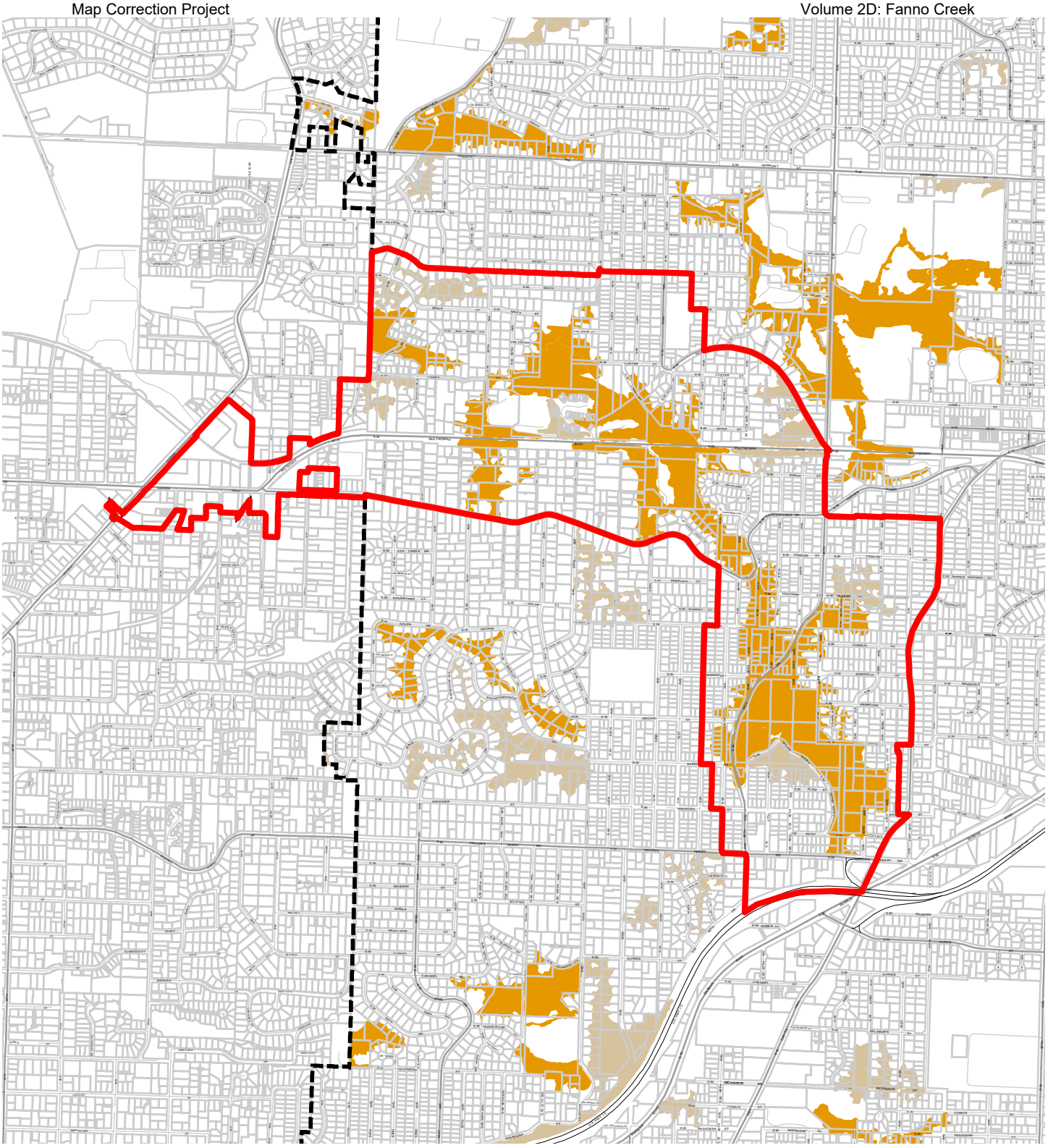

Map E: Wildlife Habitat Classification

Resource Site: FC10

Updated: July 2021

NORTH

0 600 1,200 Feet

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

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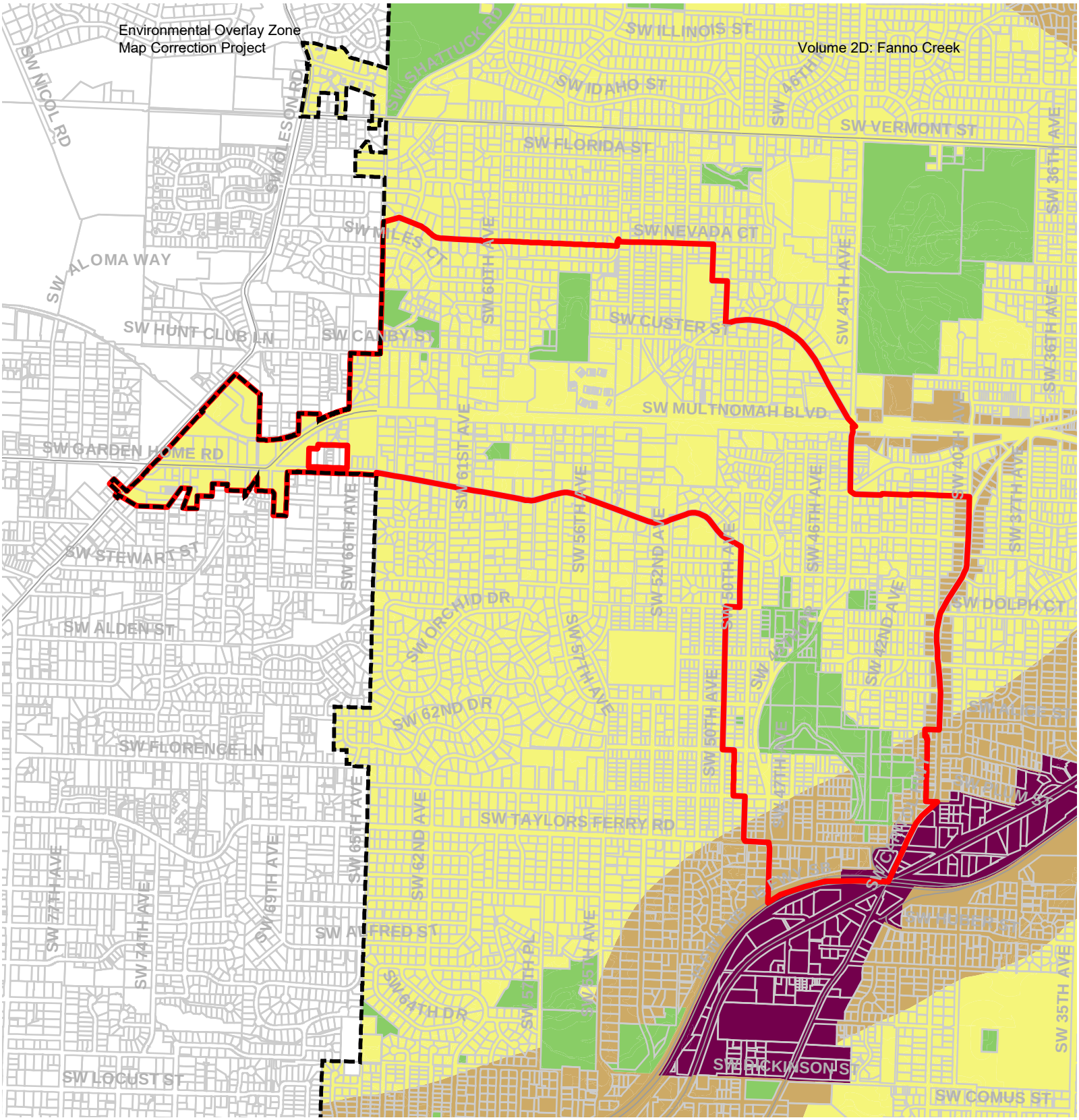

Map F: Urban Development Value (Title 13)
Resource Site: FC10

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

Updated: July 2021

NORTH

0 950 1,900 Feet

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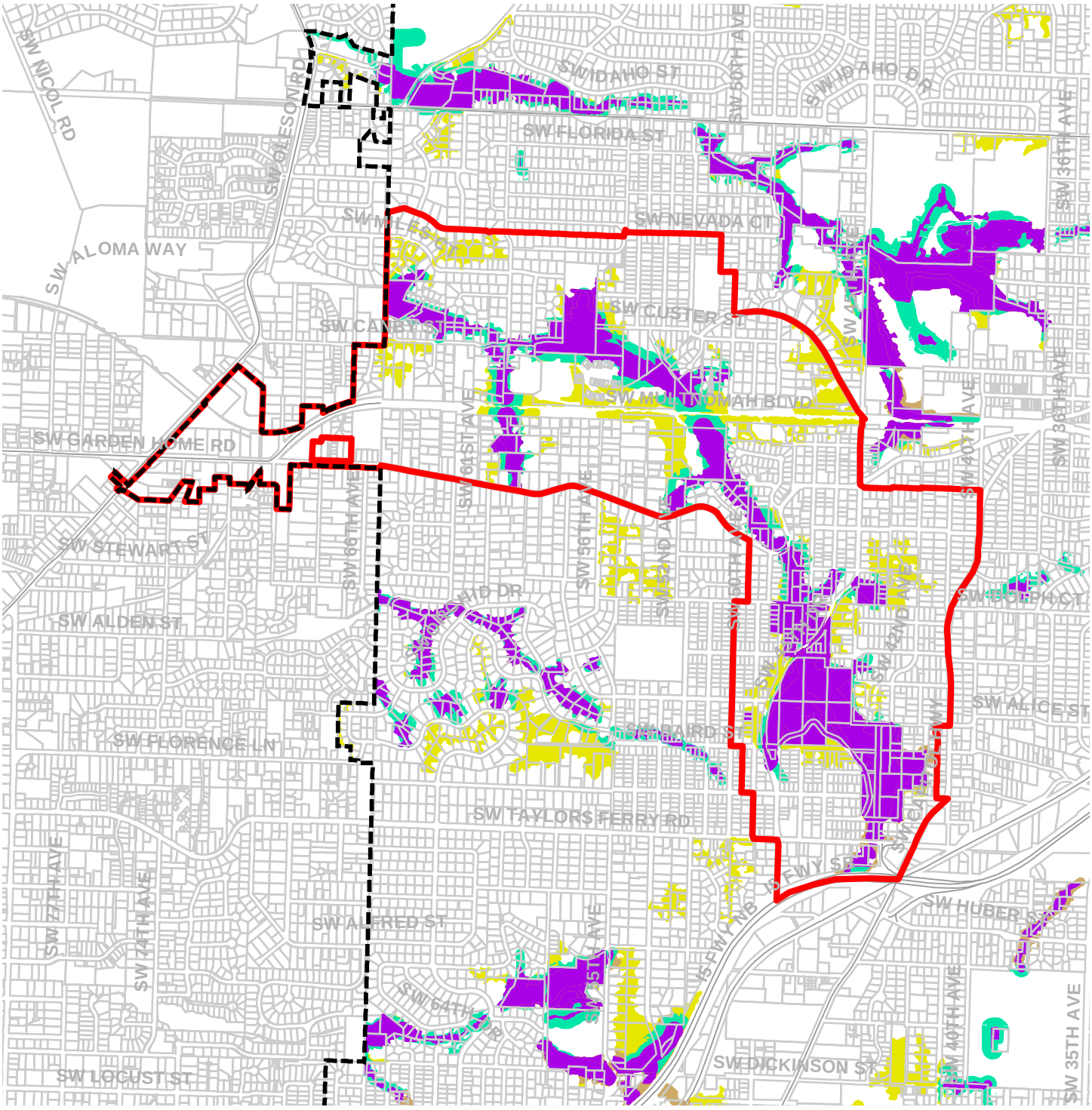

Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: FC10

Updated: July 2021

NORTH

0 1,050 2,100 Feet

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

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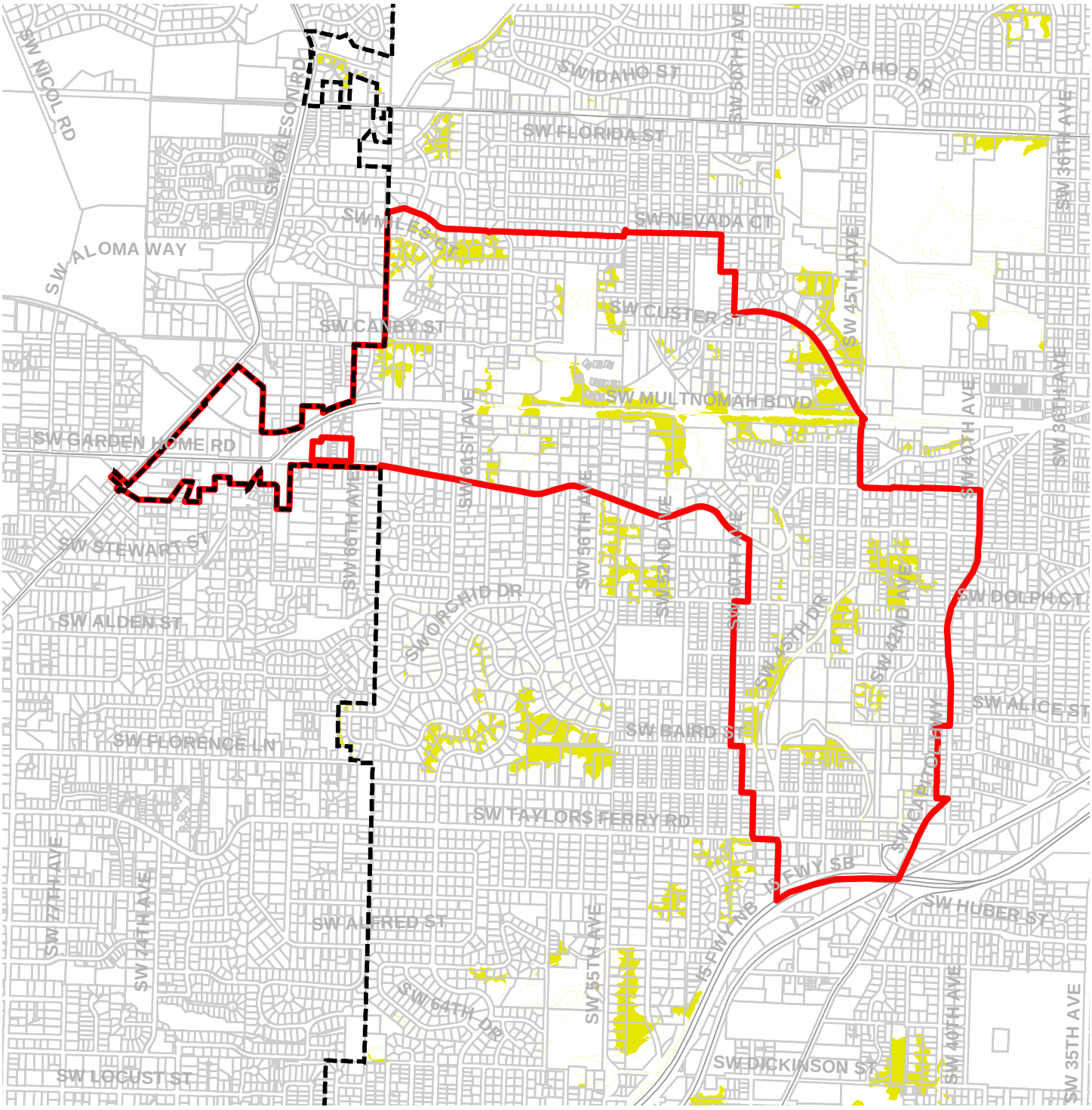

Map H: Goal 5 Resources

Resource Site: FC10

Updated: July 2021

NORTH

0 1,050 2,100 Feet

Urban Service Boundary

Resource Sites

Goal 5 Significant Natural Resources

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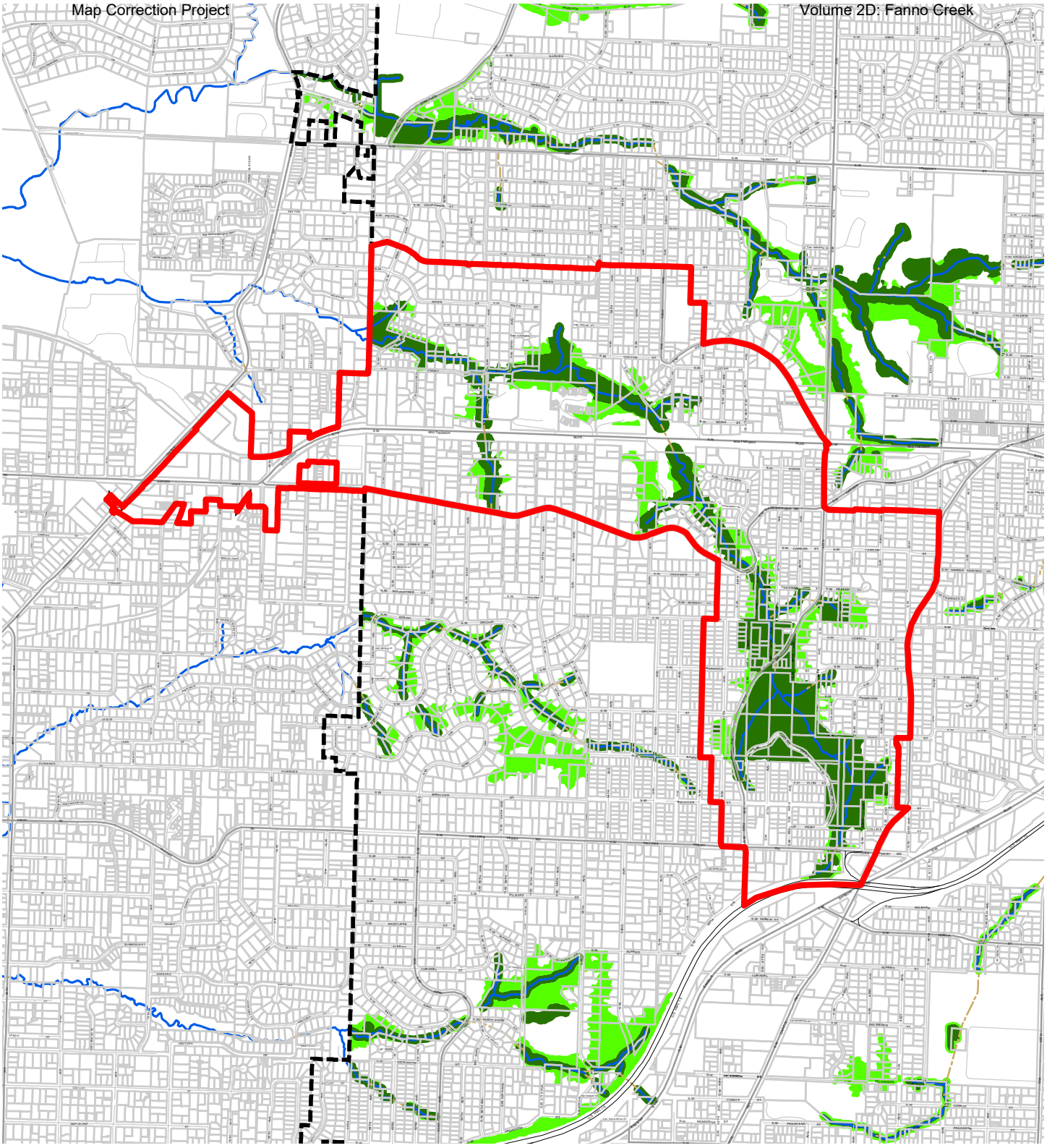

Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site:

FC10

Updated: July 2021

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

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NORTH

0 850 1,700 Feet

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Natural Resource Description

Within resource site FC10 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: Woods Memorial Park (M); 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	**FC10**
	Study Area
Stream (Miles)	3.1
Wetlands (acres)	9.4
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	162.6
Woodland (acres)	57.0
Shrubland (acres)	1.8
Herbaceous (acres)	17.0
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	192.5
* 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%.	

Woods Creek originates near SW Taylors Ferry Road and SW Capital Highway and drains an area of approximately 575 acres within the City's jurisdiction (784 acres total). The creek flows northwest for approximately 1.8 miles, crossing SW Multnomah Boulevard near SW 51st Avenue. It then flows in a westerly direction, exiting Portland approximately 350 feet north of SW Canby Street near SW 64th Place. Woods Creek continues west until it joins the mainstem of Fanno Creek west of SW Oleson Road near The Oregon Episcopal School. The morphology of the stream varies from steep, highly entrenched channels in the upper reaches to moderately entrenched channels with moderate-to-low gradients in the lower segments. Streambank material consists primarily of silty loam and silty clay loam soils. Areas along the stream corridor are relatively undeveloped, with a well-vegetated riparian buffer and a multi-layer tree/shrub canopy. Woods Memorial Park, located within the Woods Creek subwatershed, provides about 33 acres of open space.

Special status bird species observed within or adjacent to this site include: bald eagle, band-tailed pigeon, black-throated gray warbler, brown creeper, bufflehead, Bullock's oriole, bushtit, common yellowthroat, downy woodpecker, great blue heron, green heron, house wren, Hutton's vireo, merlin, orange-crowned warbler, pacific-slope flycatcher, pacific wren, pileated woodpecker, purple finch, purple martin, red crossbill, rufous hummingbird, Swainson's thrush, varied thrush, Vaux's swift, Western wood-pewee, white-breasted nuthatch, willow flycatcher, Wilson's warbler, and wood duck.

April Hill Park is a 9.79-acre hybrid park situated centrally in Fanno Creek Watershed in the Woods Creek subwatershed. The park is comprised of an ecologically rich 5-acre natural area and a 4-acre developed park. The natural area is surrounded by residential development and its location provides a unique habitat oasis for flora and fauna in the area. April Hill Park is composed of forested wetland, riparian, and upland habitats. Douglas fir, grand fir, bigleaf maple, western hemlock and Pacific yew are found in the park. Wood Creek, which flows west through the park, is connected to a larger vegetated corridor that is protected through environmental zoning. The creek is fed by a perennial spring that originates near the base of the soccer field in the park. This spring, along with runoff and precipitation, feeds a wetland in the interior of the park that remains saturated throughout the winter and early spring. The April Hill Habitat Management and Trail Plan results of two amphibian surveys in 2009 and 2010 recorded include long-toed salamanders, rough-skinned newts, and chorus frogs. The plan also documented observations of bald eagle and coyotes. Rare plant species found in the park include yellow monkey flower (*Mimulus gutattus)*, Pacific hellebore (*Veratrum californicum*), skunk cabbage (*Lysichiton americanum)*, and a variety of sedges and rushes. Significant investment has been made by Portland Parks and Recreation and Bureau of Environmental Services since 2010 to restore this resource area through invasive vegetation removal and revegetation with native plants.

Woods Memorial Park/Natural Area is a 39.5-acre park located in SW Portland north of Taylor's Ferry Road, east of 48th Avenue, west of SW Capitol Highway, and south of SW Dolph Court. About 98% of the landscape is native including oaks, Douglas fir, Western red cedar, willow species, red and blue elderberry, Oregon grape, trillium, thimbleberry, and other native plants. Although most of the park was logged about one hundred years ago, there are still some historic trees. The rare plant species black swamp gooseberry (*Ribes lacustre*) is found in the park. The park is part of the Fanno Creek Watershed, containing the headwaters of Woods Creek. It offers a natural setting that attracts wildlife in the quiet woods, along the creek, and in the meadow. Significant investment has been made by Portland Parks and Recreation and the Friends of Woods Park to restore this resource area through improvements to trails, bridges, and other amenities, as well as invasive vegetation removal and revegetation with native plants. In 2004, the Friends of Woods Park received a grant from the Oregon Watershed Enhancement Board for $9,975 for the Woods Creek Sediment Reduction Project to build recreational infrastructure, remove invasive plant species, and revegetate with native plants. For more description of this park, refer to "Addendum to the 2000 Functional Plan for Woods Park (November 2013)"

This resource site includes various forested Fanno Creek headwater and tributary streams (including Woods Creek, described above) that flow into designated critical habitat for Endangered Species Act-listed upper Willamette River steelhead trout.

Table B: Quality of Natural Resource Functions in Resource Site FC10				
Resource Site (acres) = 578				
	Class 1/A	**Class 2/B**	**Class 3/C**	**Total**
Riparian Corridors*				
acres	71.0	37.3	65.8	174.2
percent total inventory site area	12.3%	6.5%	11.4%	30.1%
Wildlife Habitat*				
acres	0.0	132.4	30.9	163.2
percent total inventory site area	0.0%	22.9%	5.3%	28.2%
Special Habitat Areas**				
acres	31.9			
percent total inventory site area	5.5%			
Combined Total+				
acres	71.0	72.6	44.6	188.3
percent total inventory site area	12.3%	12.6%	7.7%	32.6%

* 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 11.2% 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 FC10, 12% 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 FC10

Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
578.1	108.6	64.9	11.2%

*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 4 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 FC10. Natural resources should be protected within HCA as follows:

1. *Strictly limit* or *limit* conflicting uses within Class I/High Rank Riparian Areas in all Urban Development Areas.
2. *Strictly limit* or *limit* conflicting uses within Class II/Medium Rank Riparian Areas within Moderate and Low Value Urban Development Area as well as parks and open spaces.
3. *Strictly limit* or *limit* conflicting uses within Class A/High or B/Medium Rank Wildlife Habitat within parks and open spaces.
4. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class III/Low Rank Riparian Areas in all Urban Development Areas.
5. *Allow* conflicting uses or conducted a local Goal 5 ESEE for Class A/High, Class B/Medium or Class C/Low Rank Wildlife Habitat in all Urban Development Area, expect parks and open space. [11]

[11] Metro Title 13 rule 3.07.1330(a)(2) states that any city that had an acknowledge Goal 5 program prior to December 28, 2005, that applies to upland wildlife habitat shall not repeal or amend such regulations in a manner that would allow more than a de minimis increase in development that could occur in those upland habitat areas.

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 FC10 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 4, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

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

Within the resource site residential uses are allowed outright or conditionally in the R10, R7, R5, and R2 base zones. Commercial uses are allowed in the CE, CM2 and CM2 base zone. Open space uses are allowed in the OS base zone. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

The analysis of economic, social, environmental and energy consequences provided in Volume 4 is confirmed for resource site FC10, 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, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation for FC10, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or 25 feet of wetlands
2. Inside Woods Memorial Nature Area, apply a protection overlay zone ('p' zone) to areas of forest vegetation.
3. Inside Woods Memorial Nature Area, apply a protection overlay zone ('p' zone) to land between 25 and 50 feet of wetlands.
4. Outside Woods Memorial Nature Area, 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 streams.
5. Outside Woods Memorial Nature Area, apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands; and within areas of forest vegetation that are contiguous to but more than 100 feet from stream top-of-bank and within areas of forest vegetation on steep slopes that are contiguous to but more than 100 feet from top-of-bank streams.
6. Allow conflicting uses within all other areas containing significant natural resources.

Resource Site No.: FC11 **Resource Site Name:** Ash Creek

Previous Plan: Fanno Creek and Tributaries Conservation Plan
Previous Resource Site No.: 129

The results of the analysis found in Volume 3, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

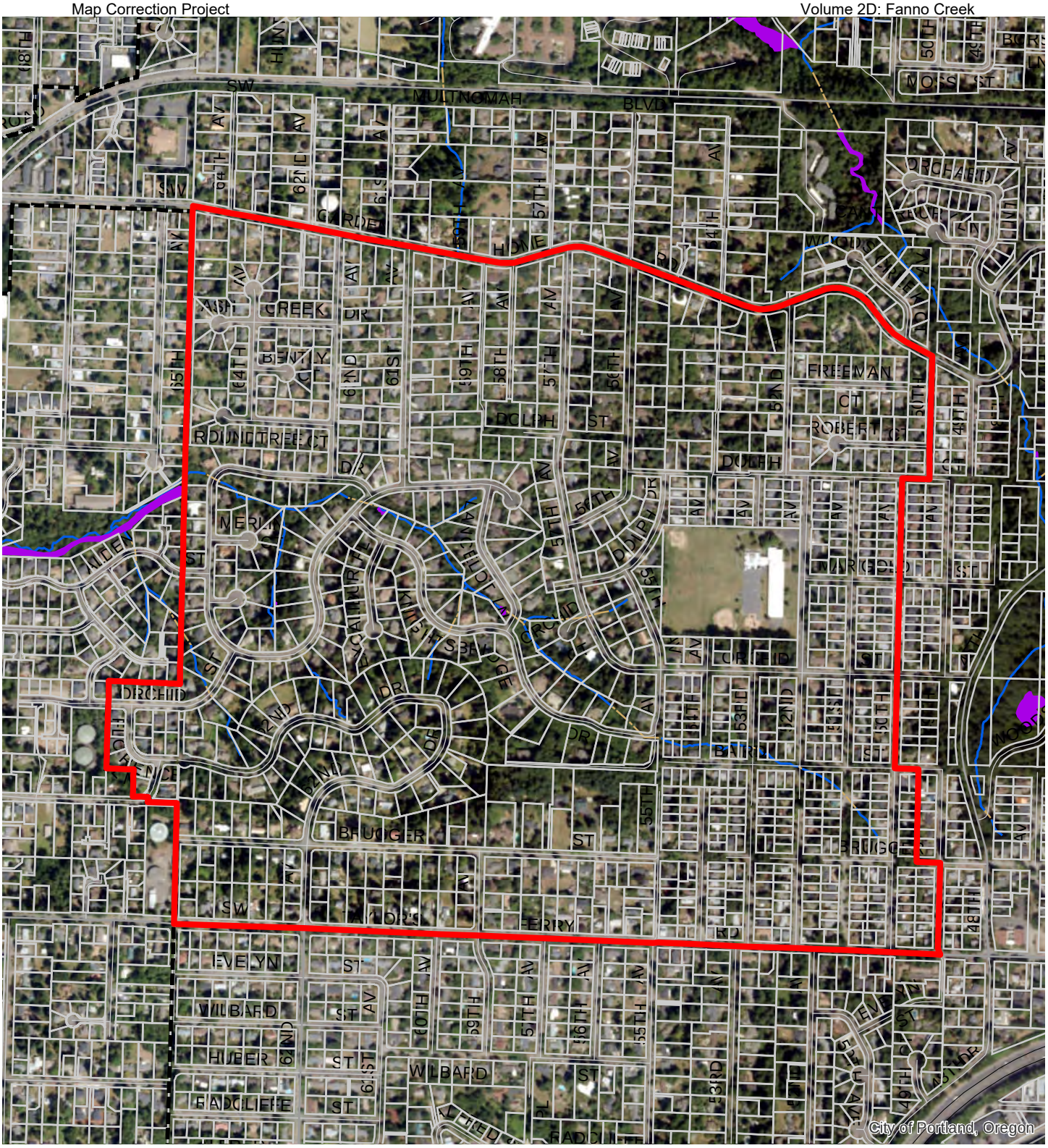
A. Water Features – rivers, streams, wetlands and flood areas
B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
C. Special Habitat Areas
D. Riparian Corridor Classifications
E. Wildlife Habitat Classifications
F. Urban Development Value
G. Metro Title 13 Habitat Conservation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

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

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

Resource site FC11 includes the following:

Site (acres)	345.5
Base zones (acres)	
CR	0.3
R10	124.6
R20	35.5
R5	54.9
R7	130.4



Map A: Water Features

Resource Site: FC11

Updated: July 2021

NORTH

0 395 790 Feet

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

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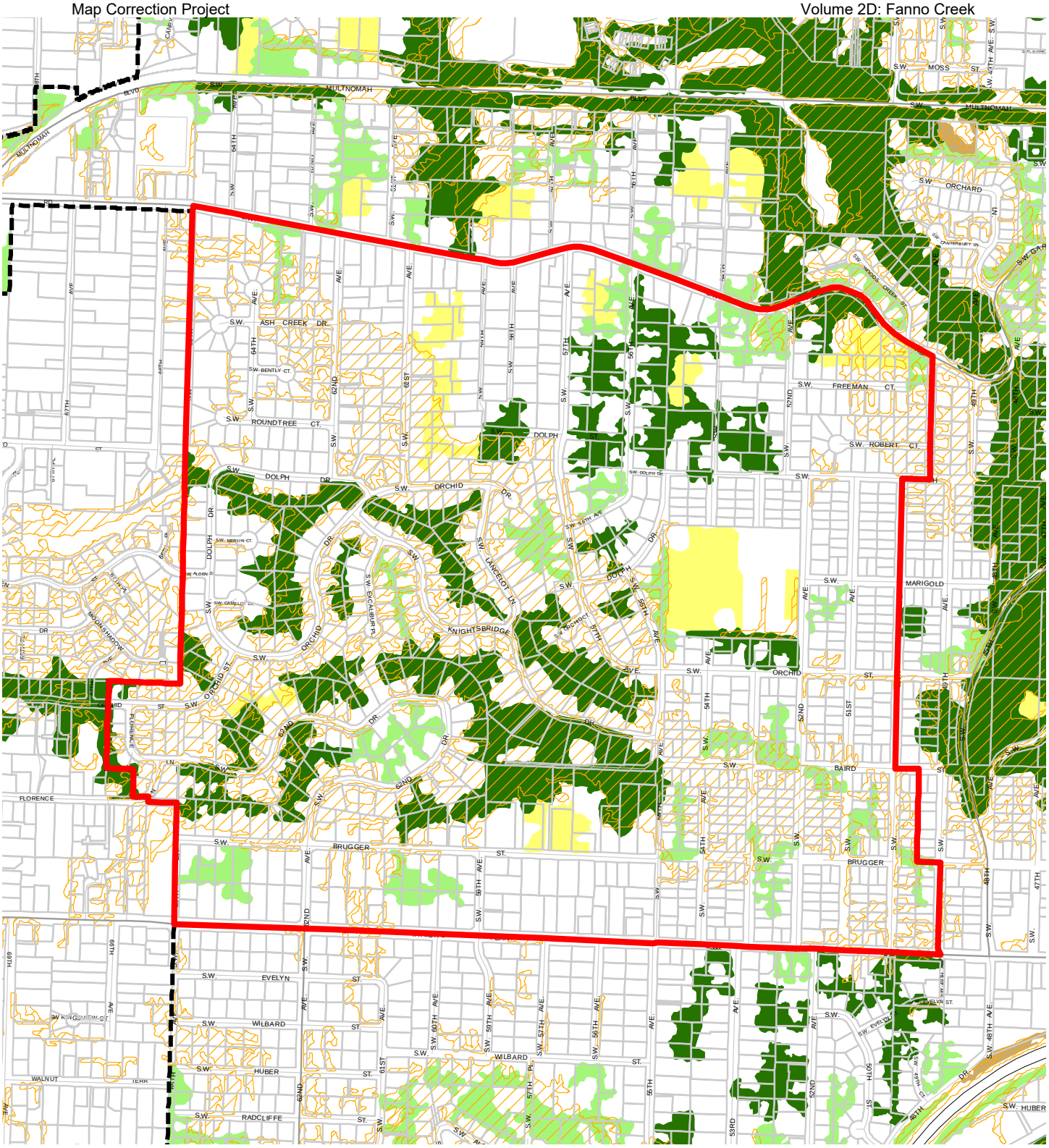

Map B: Vegetation and Steep Slopes

Resource Site: FC11

Updated: July 2021

NORTH

0 500 1,000 Feet

Proposed Draft - As Amended

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

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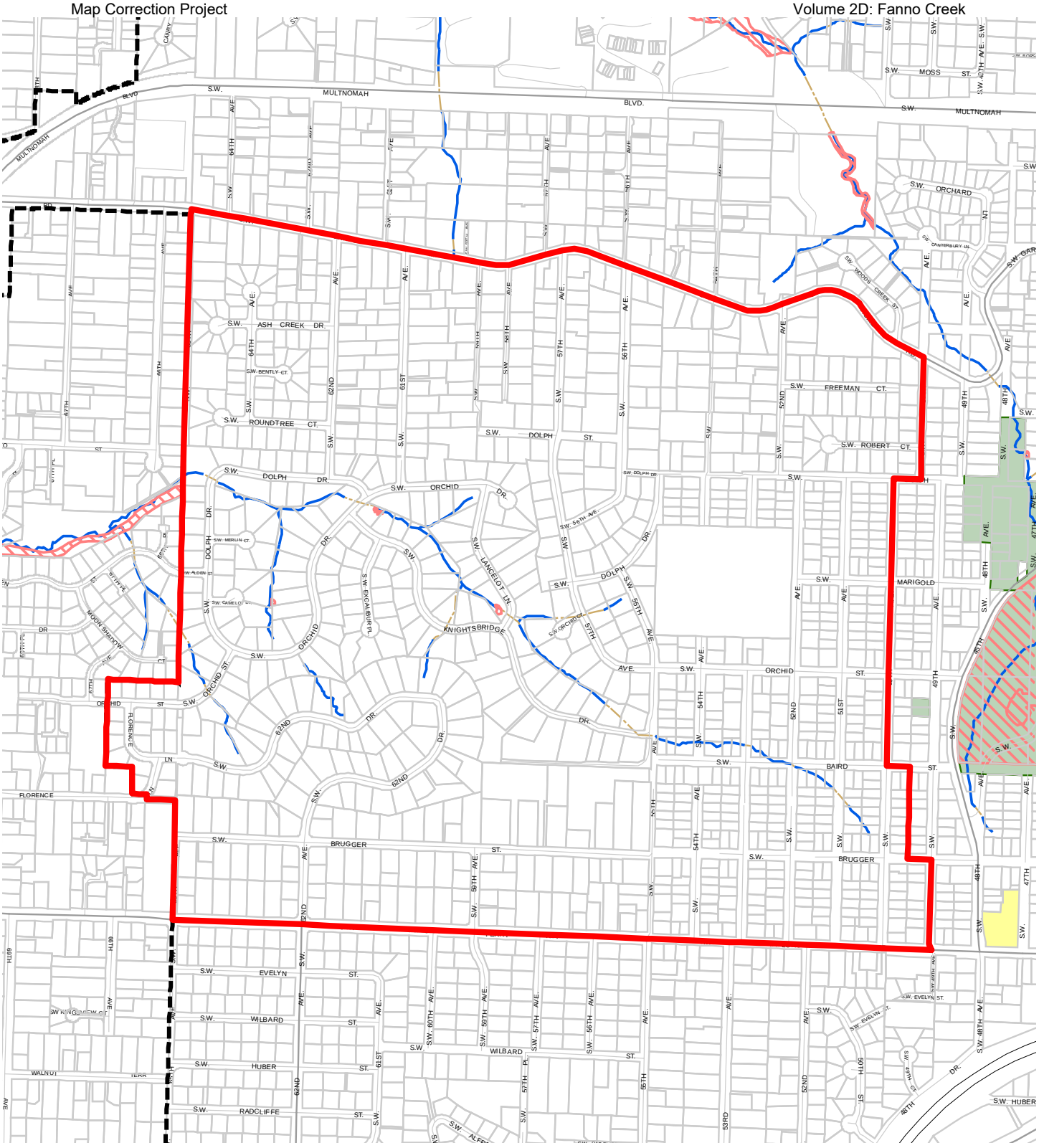
July 2021



Map C: Special Habitat Areas

Resource Site: FC11

Updated: June 2021

NORTH

0 425 850 Feet

Resource Sites

Special Habitat Areas (SHAs)

Open Stream Channel

Piped Stream Segment

Parks

Schools

Urban Service Boundary

Taxlots

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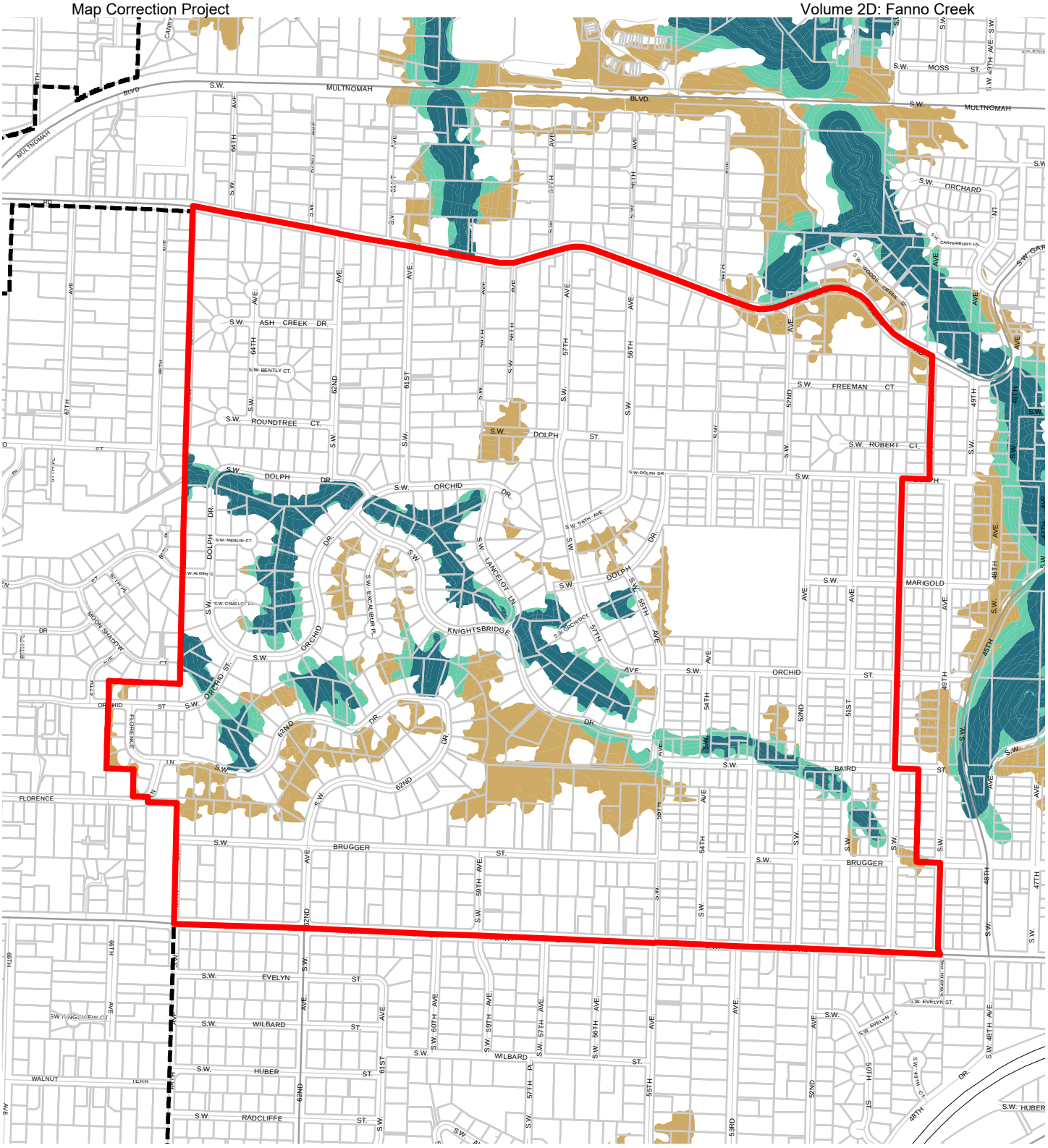

Map D: Riparian Corridors Habitat Classification

Resource Site: FC11

Updated: July 2021

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

NORTH

0 395 790 Feet

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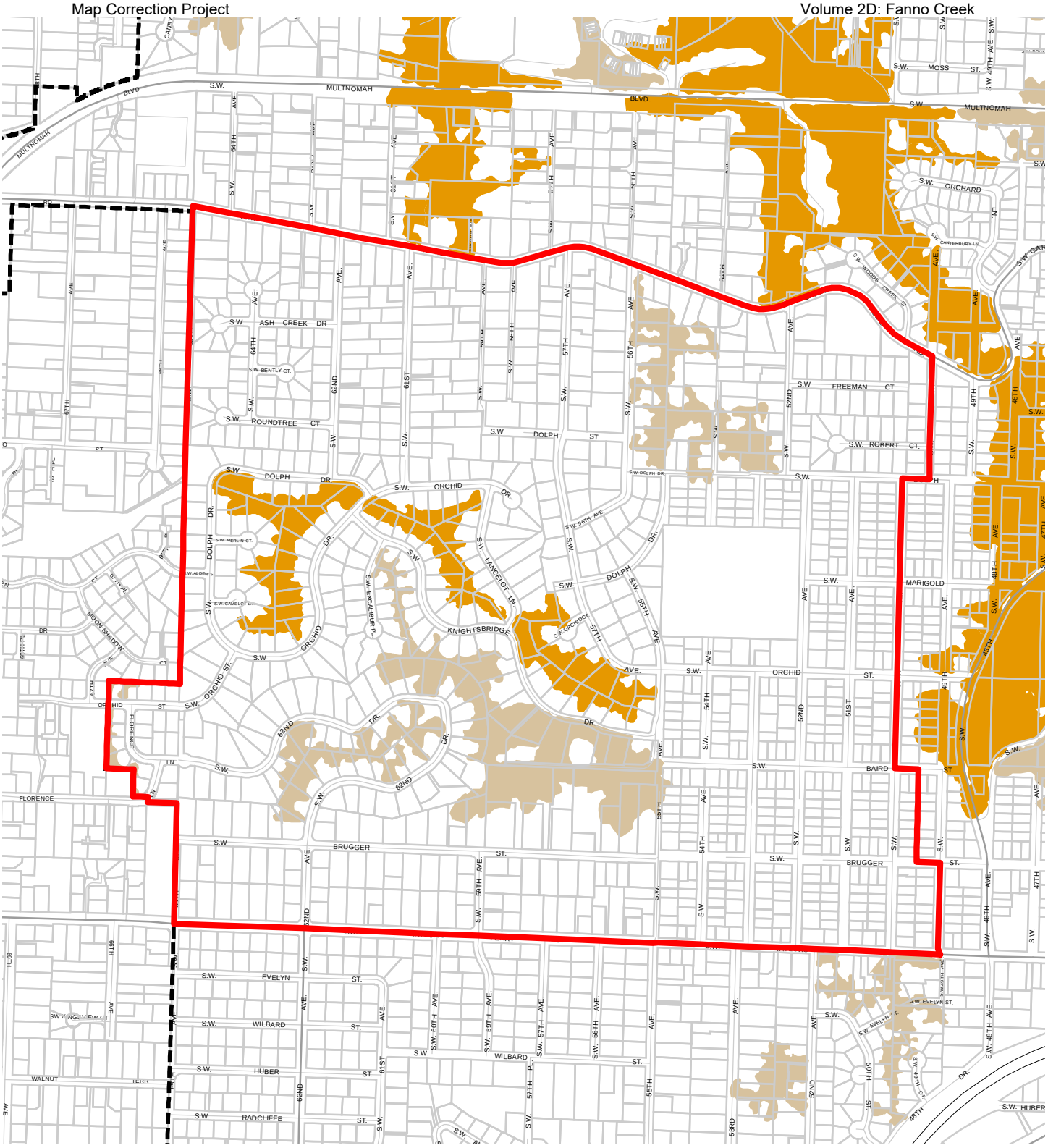

Map E: Wildlife Habitat Classification

Resource Site: FC11

Updated: July 2021

NORTH

0 320 640 Feet

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

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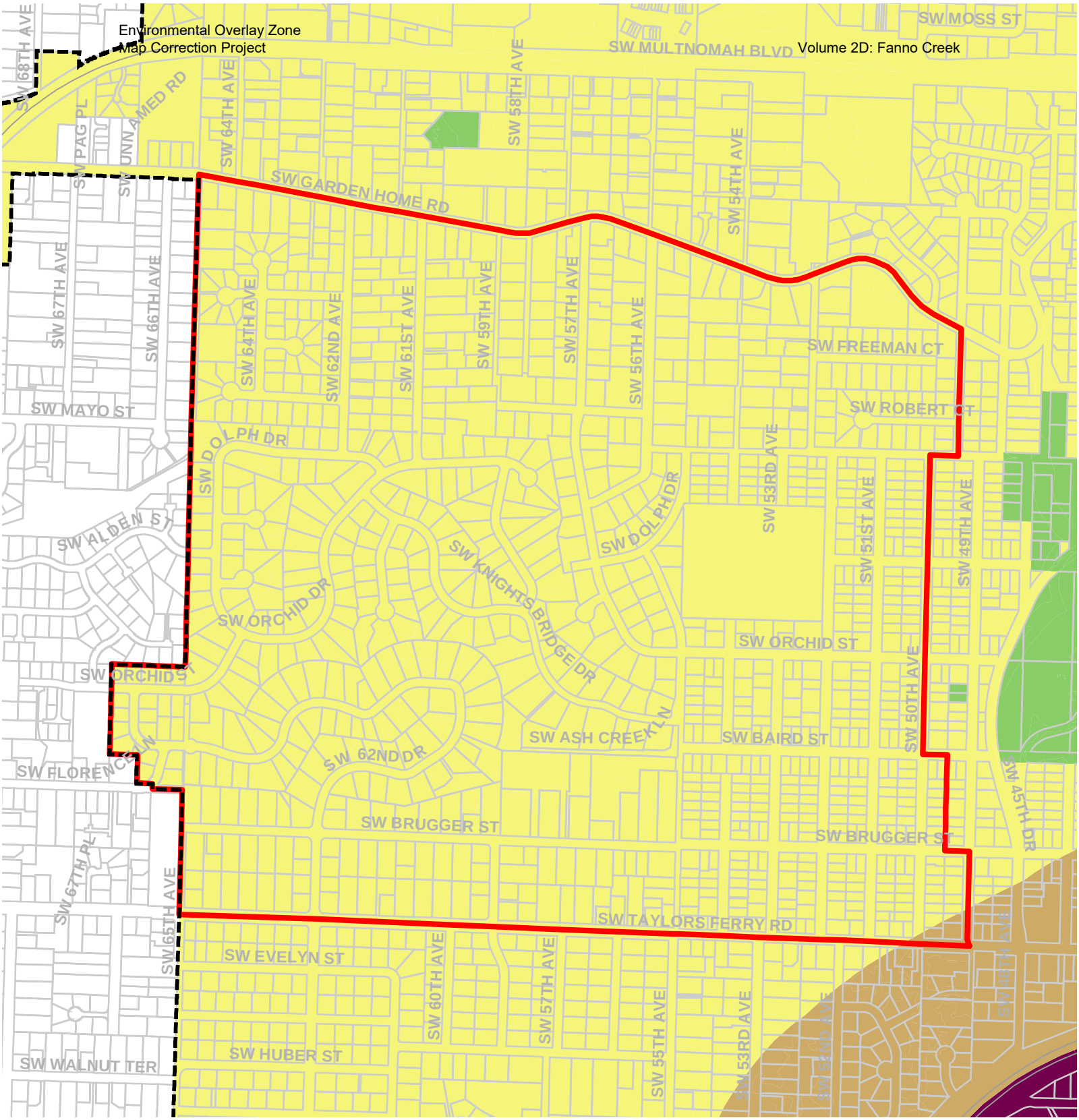

Map F: Urban Development Value (Title 13)
Resource Site: FC11

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

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Updated: July 2021

NORTH

0 485 970 Feet

Proposed Draft - As Amended

190

July 2021

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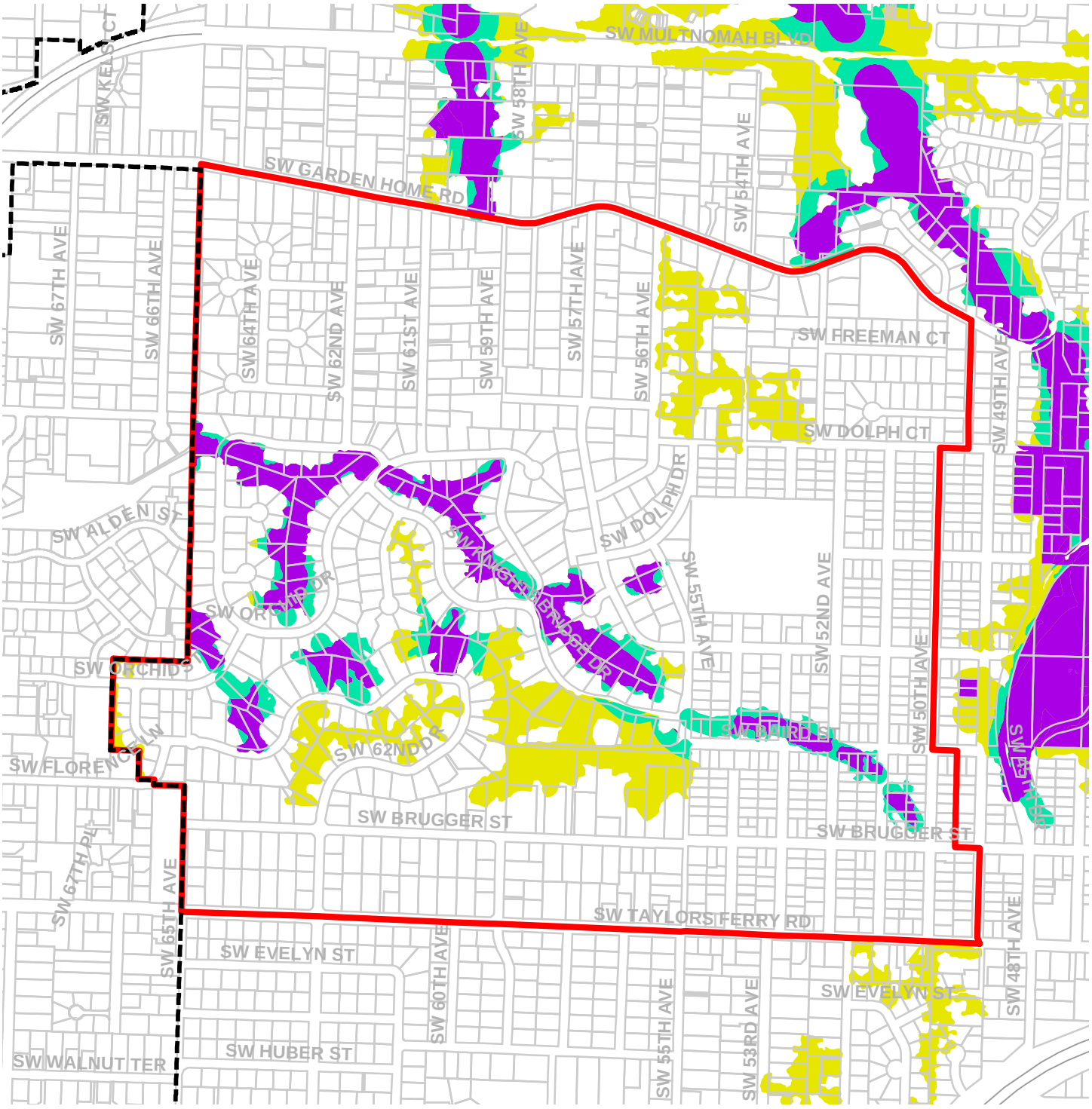

Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: FC11

Updated: July 2021

NORTH

0 500 1,000 Feet

Urban Service Boundary

Resource Sites

HCA High Value

HCA Moderate Value

HCA Low Value

Goal 5 Significant Natural Resources

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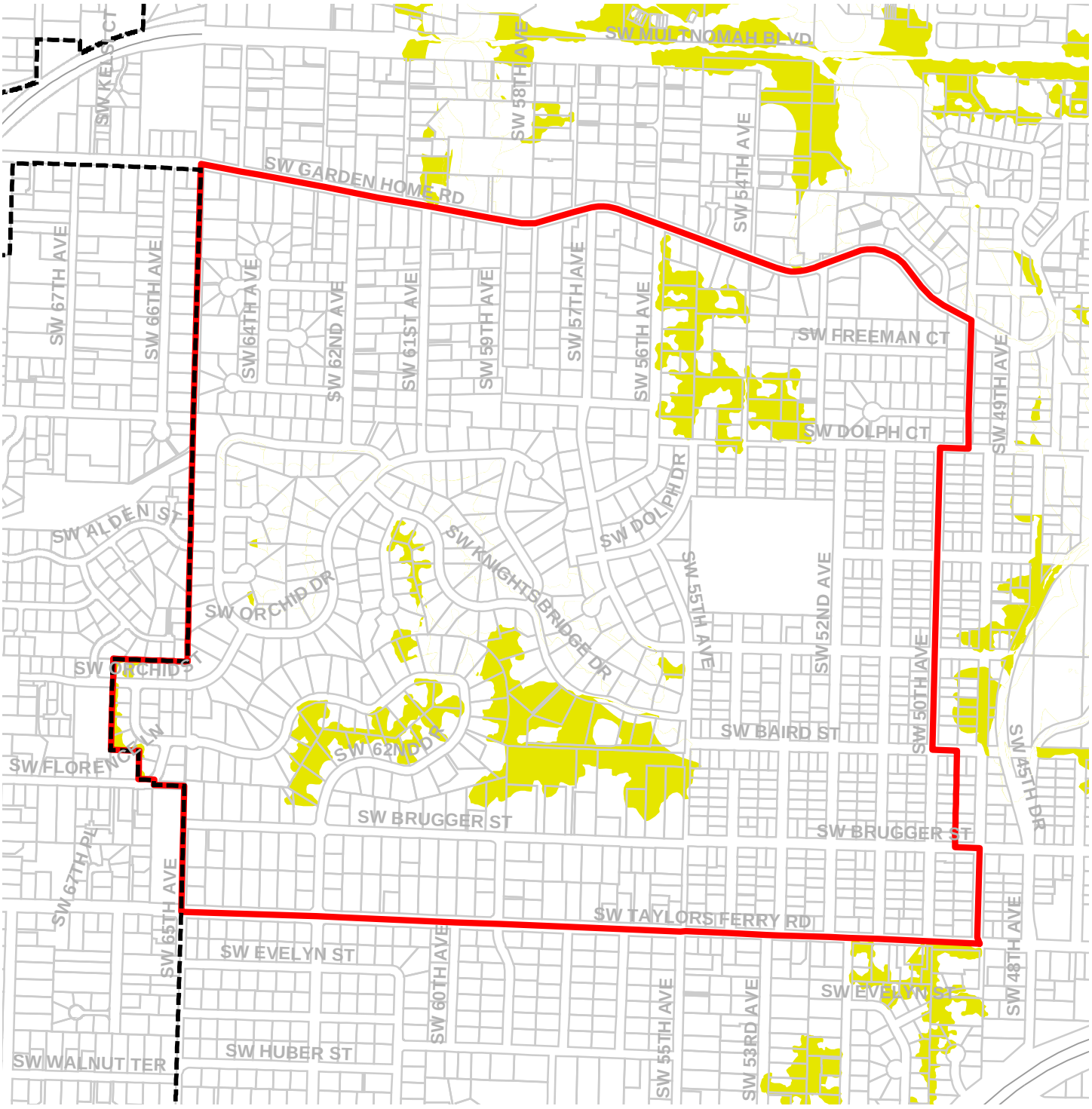

Map H: Goal 5 Resources

Resource Site: FC11

Updated: July 2021

NORTH

0 500 1,000 Feet

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

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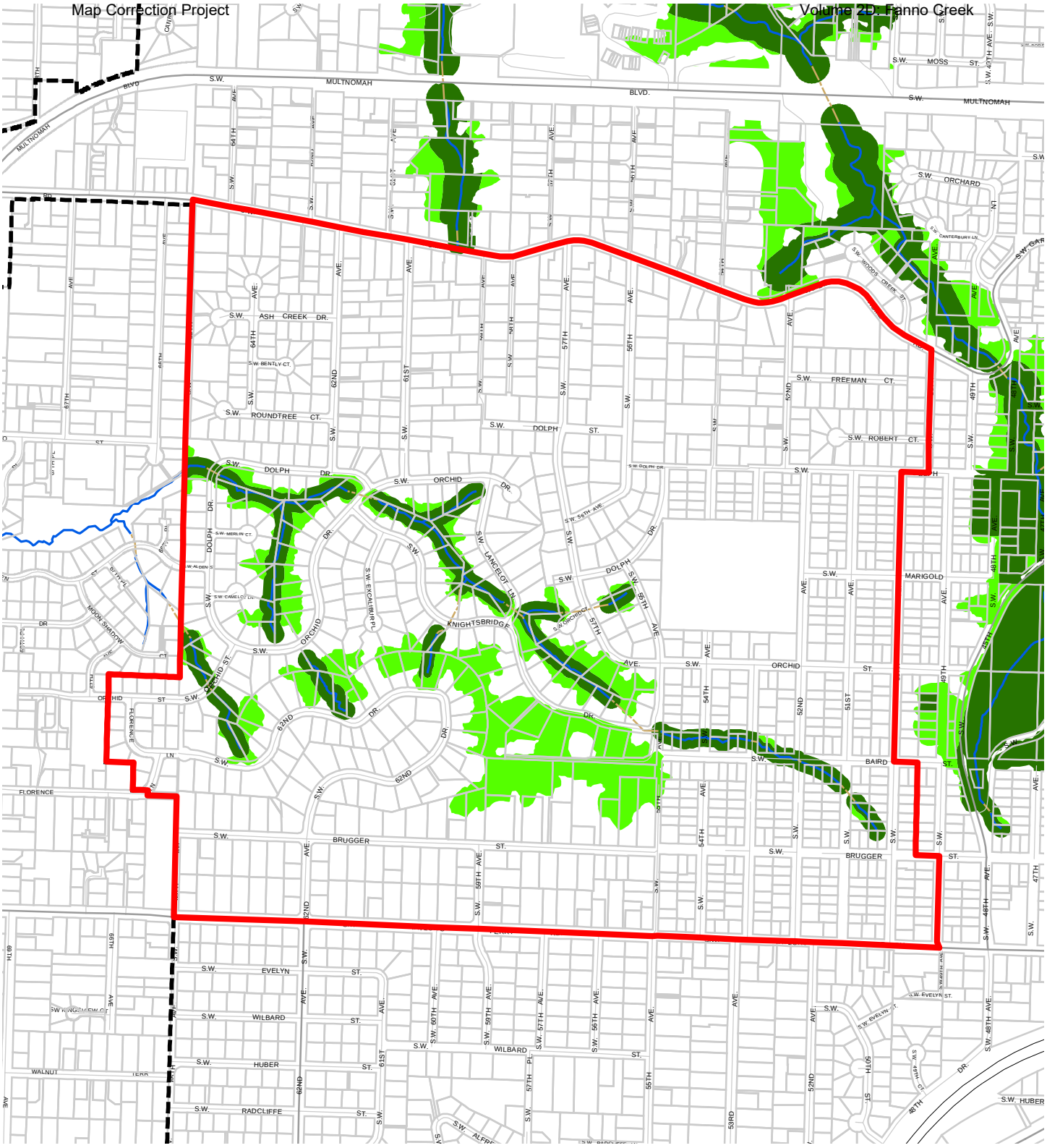

Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site: FC11

Updated: July 2021

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

NORTH

0 430 860 Feet

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Natural Resource Description

Within resource site FC11 the following significant natural resource features and functions are present:

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

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

Special Habitat Areas: Wetlands (W)

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

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

Table A: Quantity of Natural Resource Features in Resource Site	**FC11**
	Study Area
Stream (Miles)	1.2
Wetlands (acres)	0.1
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	56.6
Woodland (acres)	20.8
Shrubland (acres)	0.0
Herbaceous (acres)	14.1
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	119.5
* The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area. **Slopes are derived from LiDAR. Steep slopes are areas with a slope greater than 25%.	

This resource site contains North Ash Creek and other forested Fanno Creek headwater and tributary streams that flow into designated critical habitat for Endangered Species Act-listed upper Willamette River steelhead trout

North Ash Creek originates near SW Bruegger Street and SW 50th Avenue and drains an area of approximately 282 acres within the City's jurisdiction. The creek flows west for approximately a tenth of a mile until exiting the urban services boundary at SW Dolph Road. Steep or moderate slopes characterize much of the subwatershed.

Special status bird species observed within or adjacent to this site include and Bald eagle, band-tailed pigeon, black-throated gray warbler, brown creeper, bufflehead, Bullock's oriole, bushtit, common yellowthroat, downy woodpecker, great blue heron, green heron, house wren, Hutton's vireo, merlin, olive-sided flycatcher, orange-crowned warbler, pacific-slope flycatcher, pacific wren, pileated woodpecker, purple finch, purple martin, red crossbill, rufous hummingbird, Swainson's thrush, varied thrush, Vaux's swift, Western wood-pewee, white-breasted nuthatch, willow flycatcher, Wilson's warbler, and wood duck.

Table B: Quality of Natural Resource Functions in Resource Site FC11				
Resource Site (acres) = 346				
	Class 1/A	**Class 2/B**	**Class 3/C**	**Total**
Riparian Corridors*				
acres	18.9	9.4	27.9	56.1
percent total inventory site area	5.5%	2.7%	8.1%	16.2%
Wildlife Habitat*				
acres	0.0	13.9	27.8	41.7
percent total inventory site area	0.0%	4.0%	8.0%	12.1%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total+				
acres	18.9	9.7	36.1	64.6
percent total inventory site area	5.5%	2.8%	10.4%	18.7%

* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.

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

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

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

For Resource Area FC11, 19% 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 FC11

Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
346	81	640	19%

*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 4 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 FC11. Natural resources should be protected within HCA as follows:

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

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 FC11 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 4, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

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

Within the resource site residential uses are allowed outright or conditionally in the R20, R10, R7 and R5 base zones. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

ESEE Analysis

The analysis of economic, social, environmental and energy consequences provided in Volume 4 is confirmed for resource site FC11, 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, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation for FC11, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

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

Resource Site No.: FC12 **Resource Site Name:** Ash Creek Natural Area

Previous Plan: Fanno Creek and Tributaries Conservation Plan
Previous Resource site No.: 130

The results of the analysis found in Volume 3, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

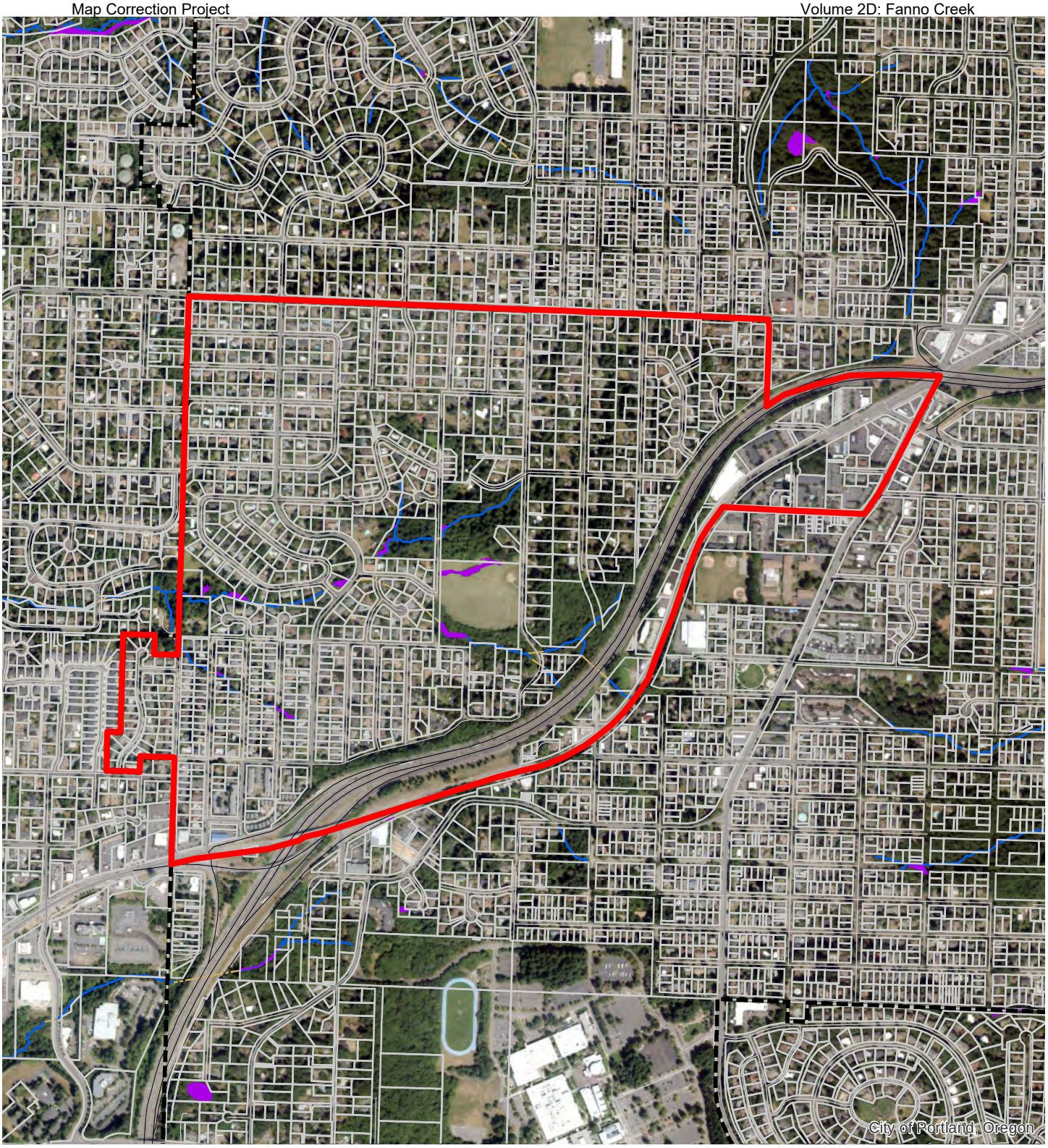
A. Water Features – rivers, streams, wetlands and flood areas
B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
C. Special Habitat Areas
D. Riparian Corridor Classifications
E. Wildlife Habitat Classifications
F. Urban Development Value
G. Metro Title 13 Habitat Conservation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

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

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

Resource site FC12 includes the following:

Site (acres)	386.9
Base zones (acres)	
CE	23.4
CM1	0.7
CM2	33.6
OS	26.7
R10	59.8
R7	223.9
RM1	18.8



Map A: Water Features

Resource Site: FC12

Updated: July 2021

NORTH

0 500 1,000 Feet

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

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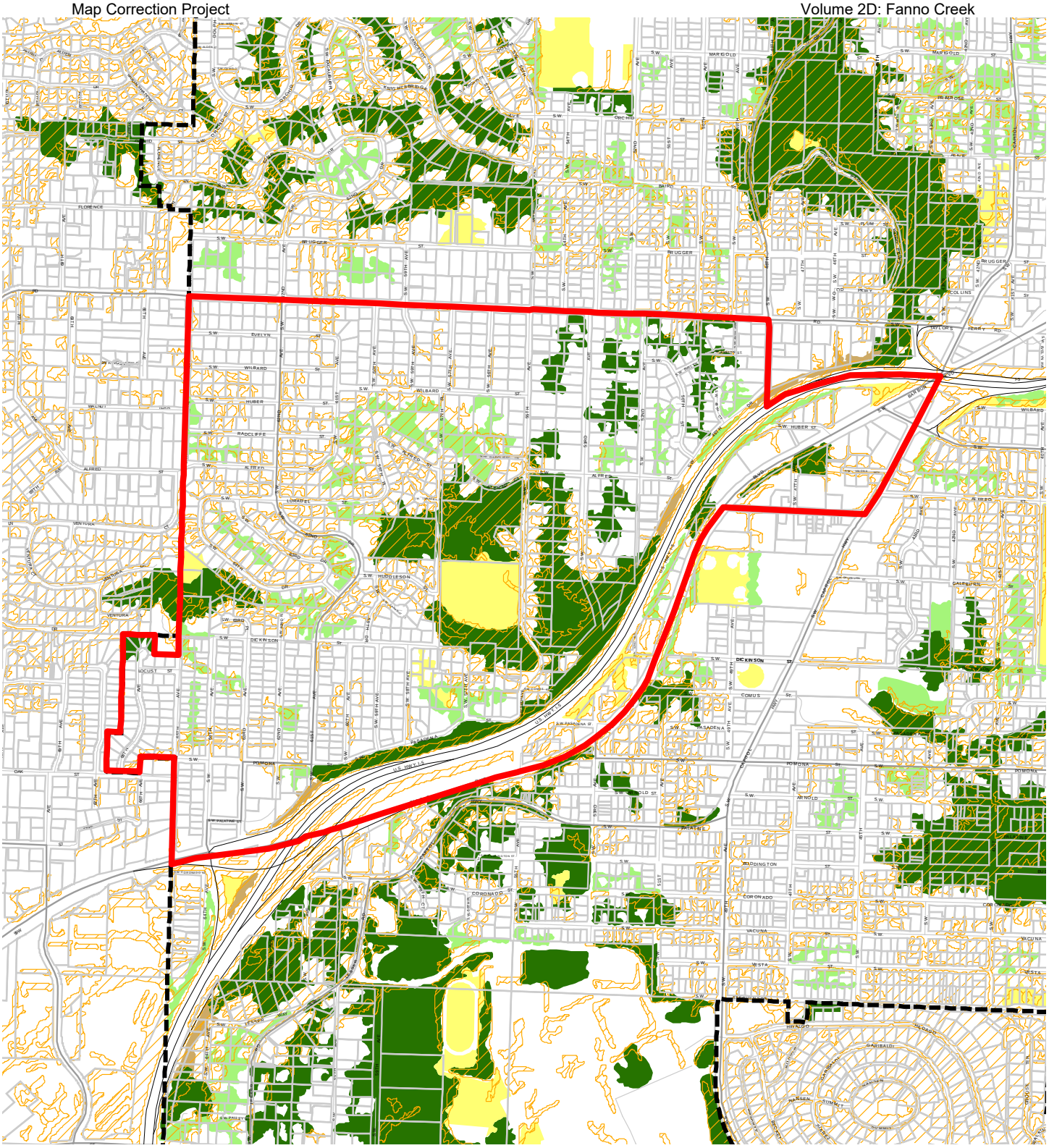

Map B: Vegetation and Steep Slopes

Resource Site: FC12

Updated: July 2021

NORTH

0 700 1,400 Feet

Proposed Draft - As Amended

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

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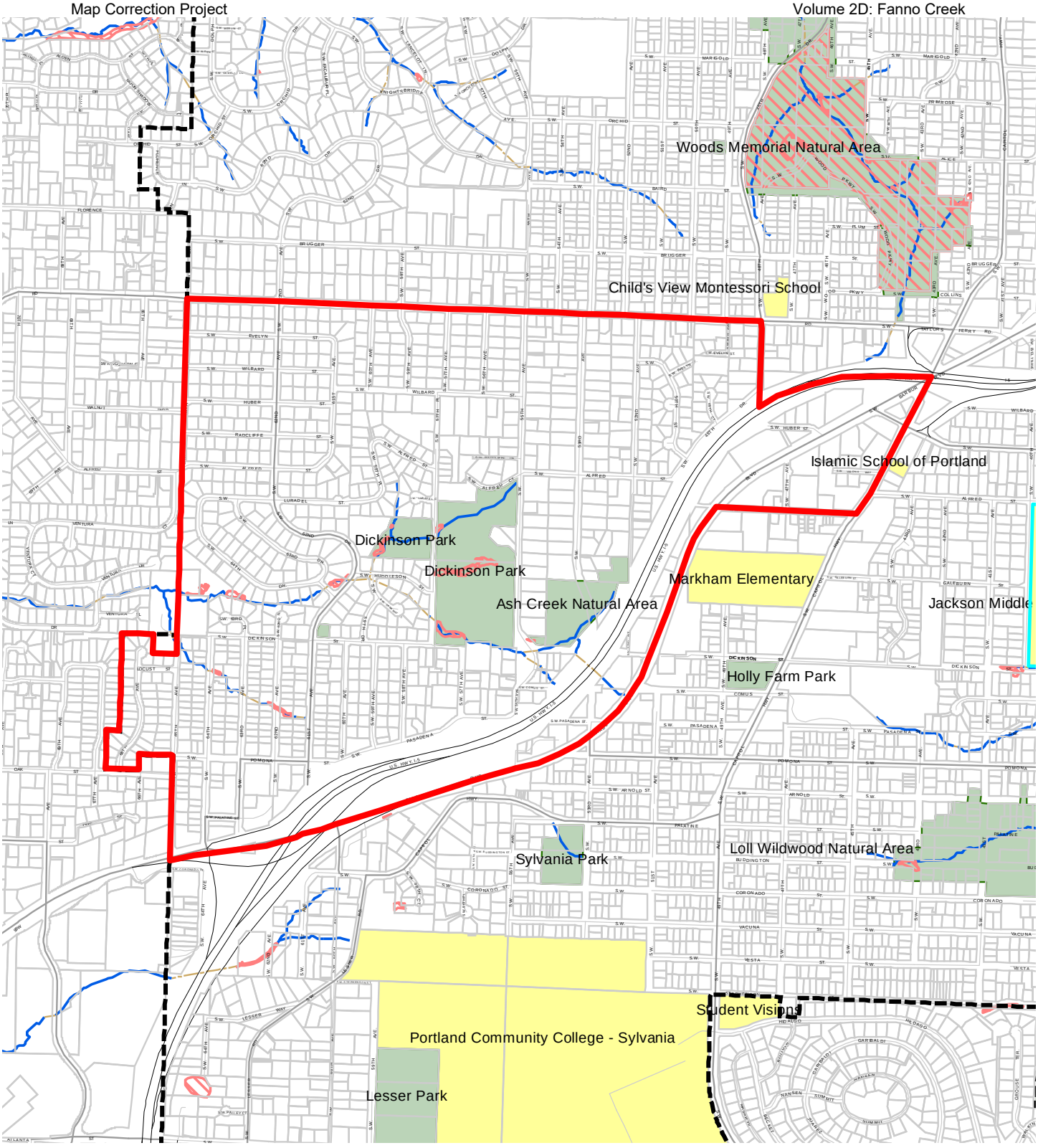
July 2021



Map C: Special Habitat Areas

Resource Site: FC12

Updated: June 2021

NORTH

0 550 1,100 Feet

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

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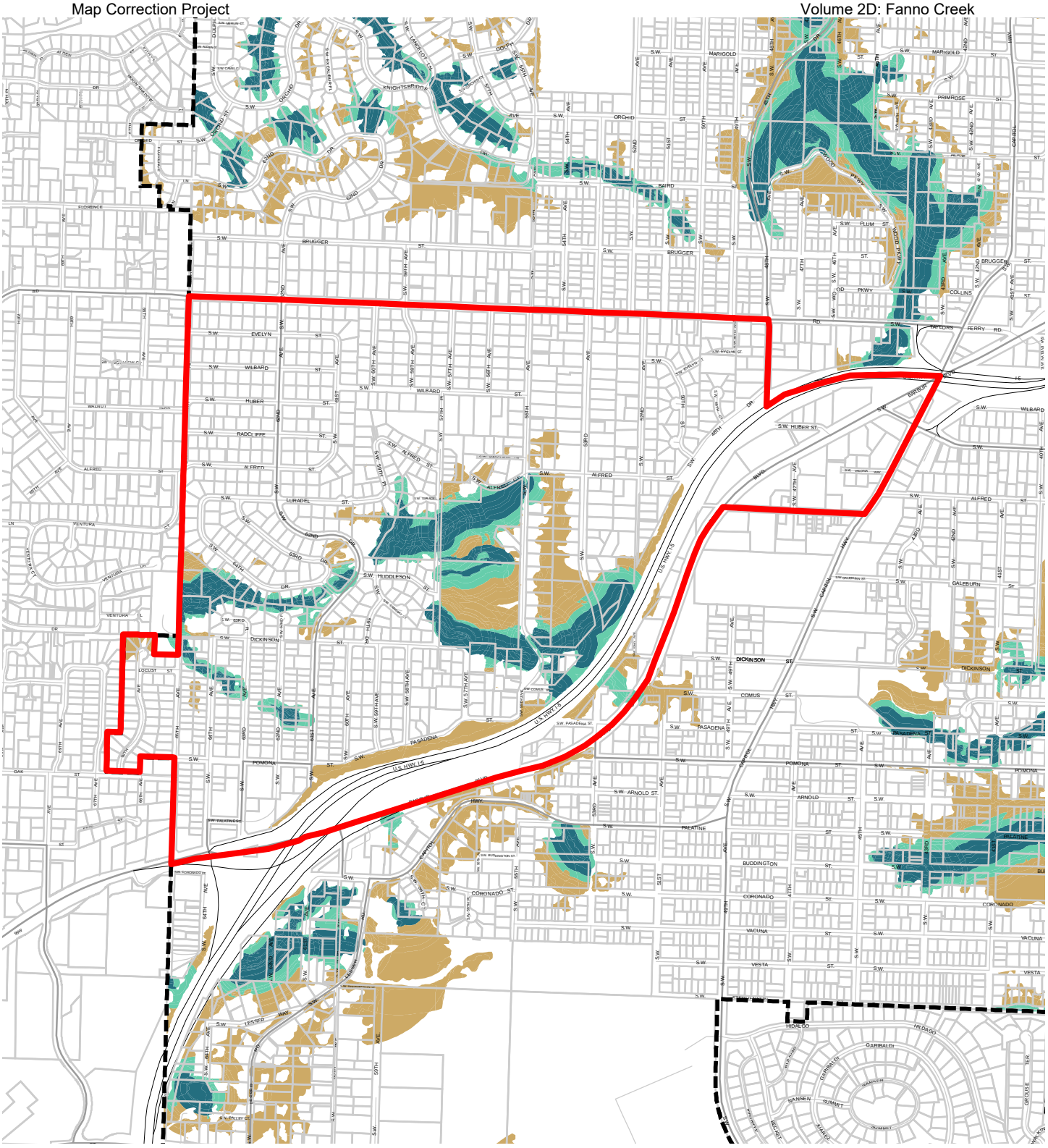

Map D: Riparian Corridors Habitat Classification

Resource Site: FC12

Updated: July 2021

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

NORTH

0 500 1,000 Feet

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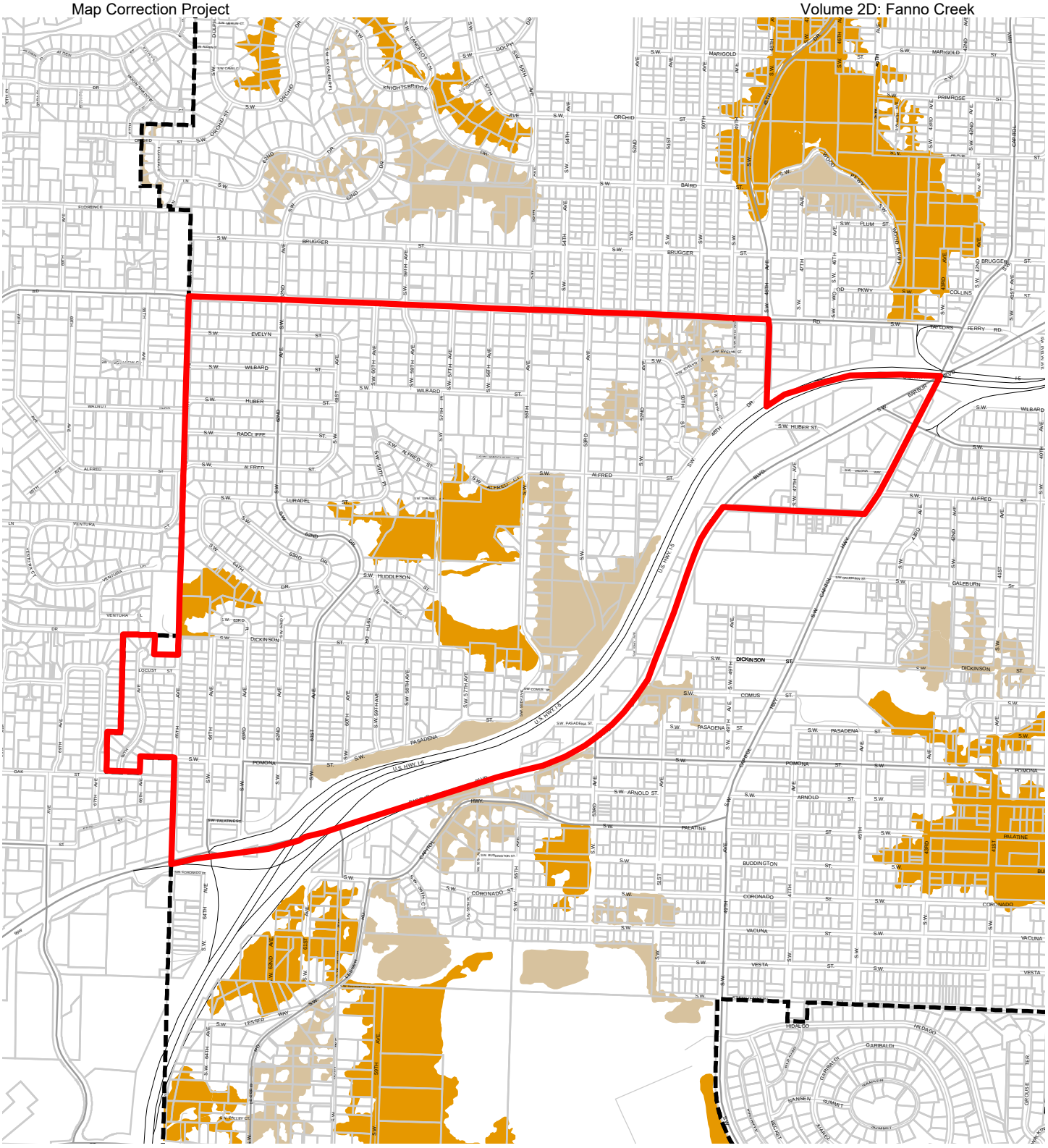

Map E: Wildlife Habitat Classification

Resource Site: FC12

Updated: July 2021

NORTH

0 450 900 Feet

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

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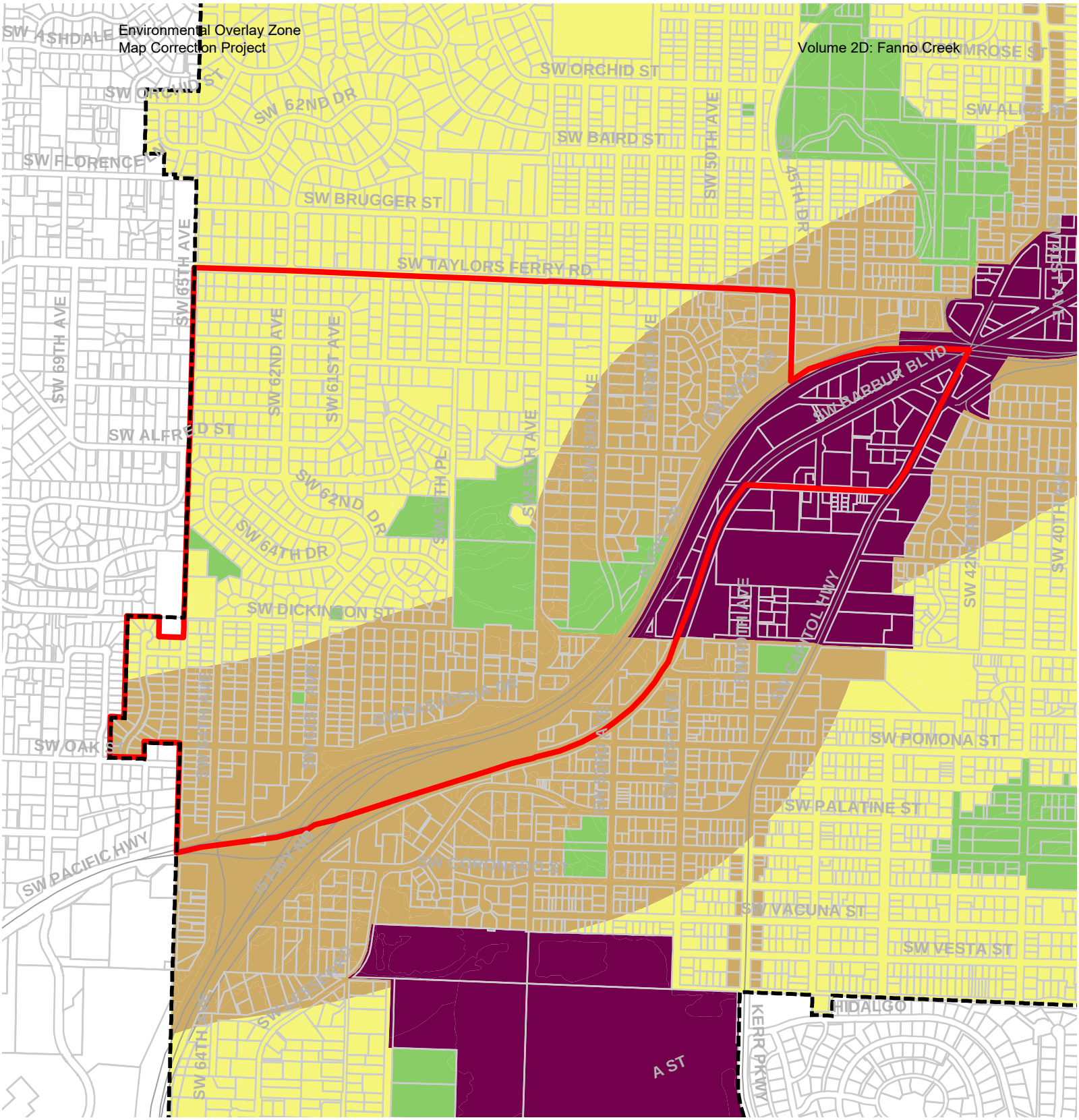

Map F: Urban Development Value (Title 13)
Resource Site: FC12

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

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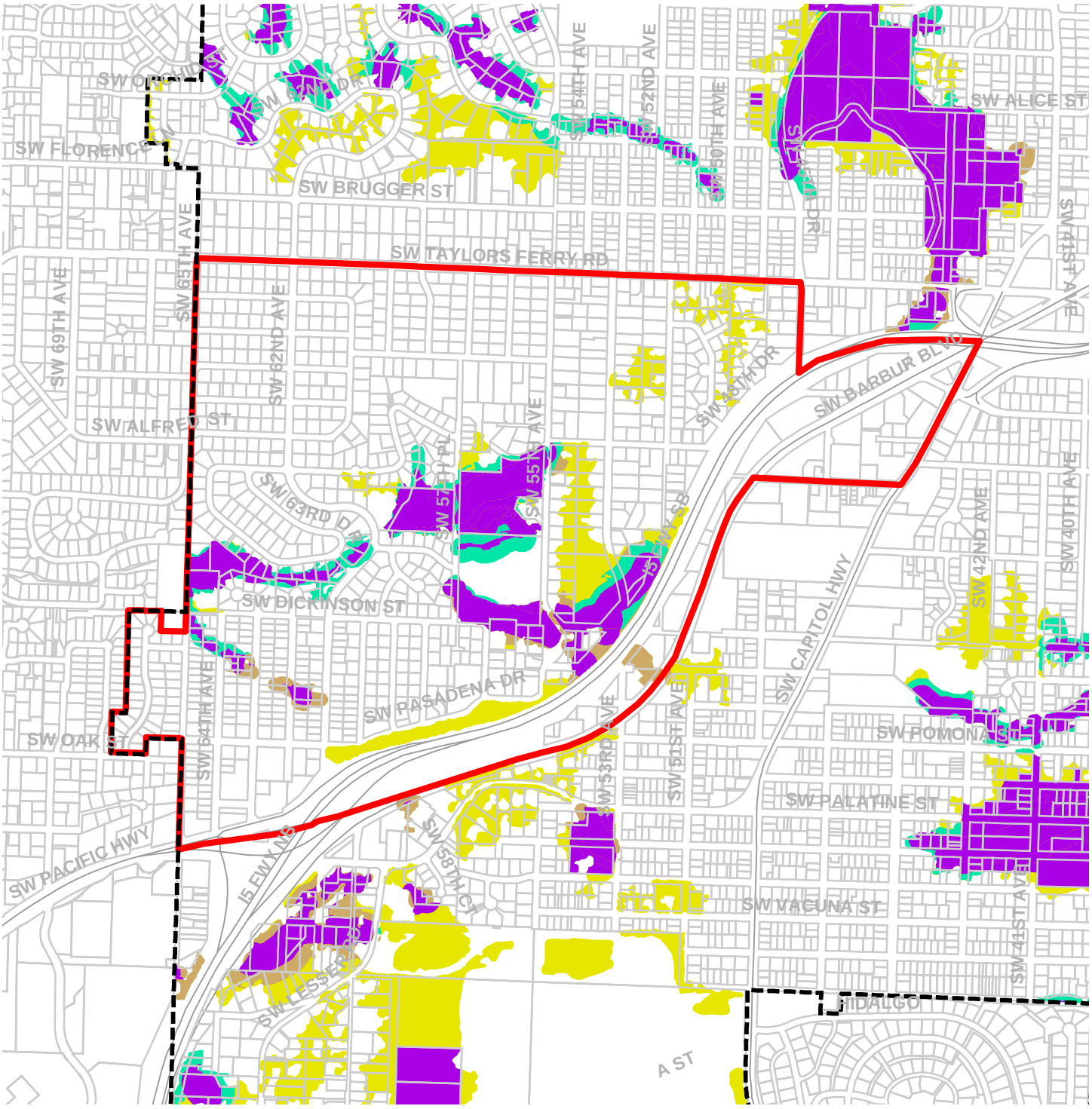
Updated: July 2021

NORTH

0 650 1,300 Feet



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

Resource Site: FC12

Updated: July 2021

NORTH

0 700 1,400 Feet

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

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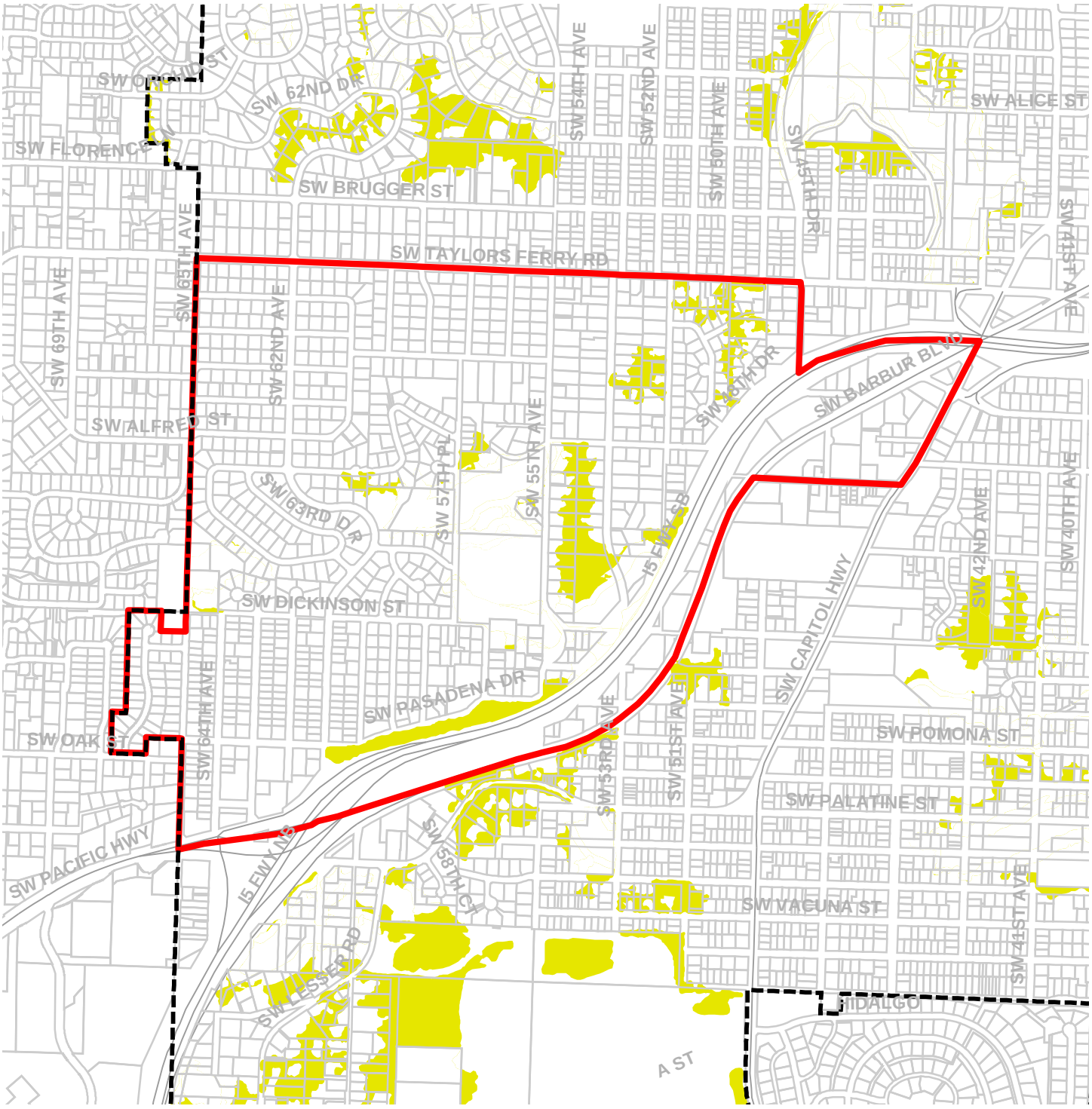

Map H: Goal 5 Resources

Resource Site: FC12

Updated: July 2021

NORTH

0 700 1,400 Feet

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

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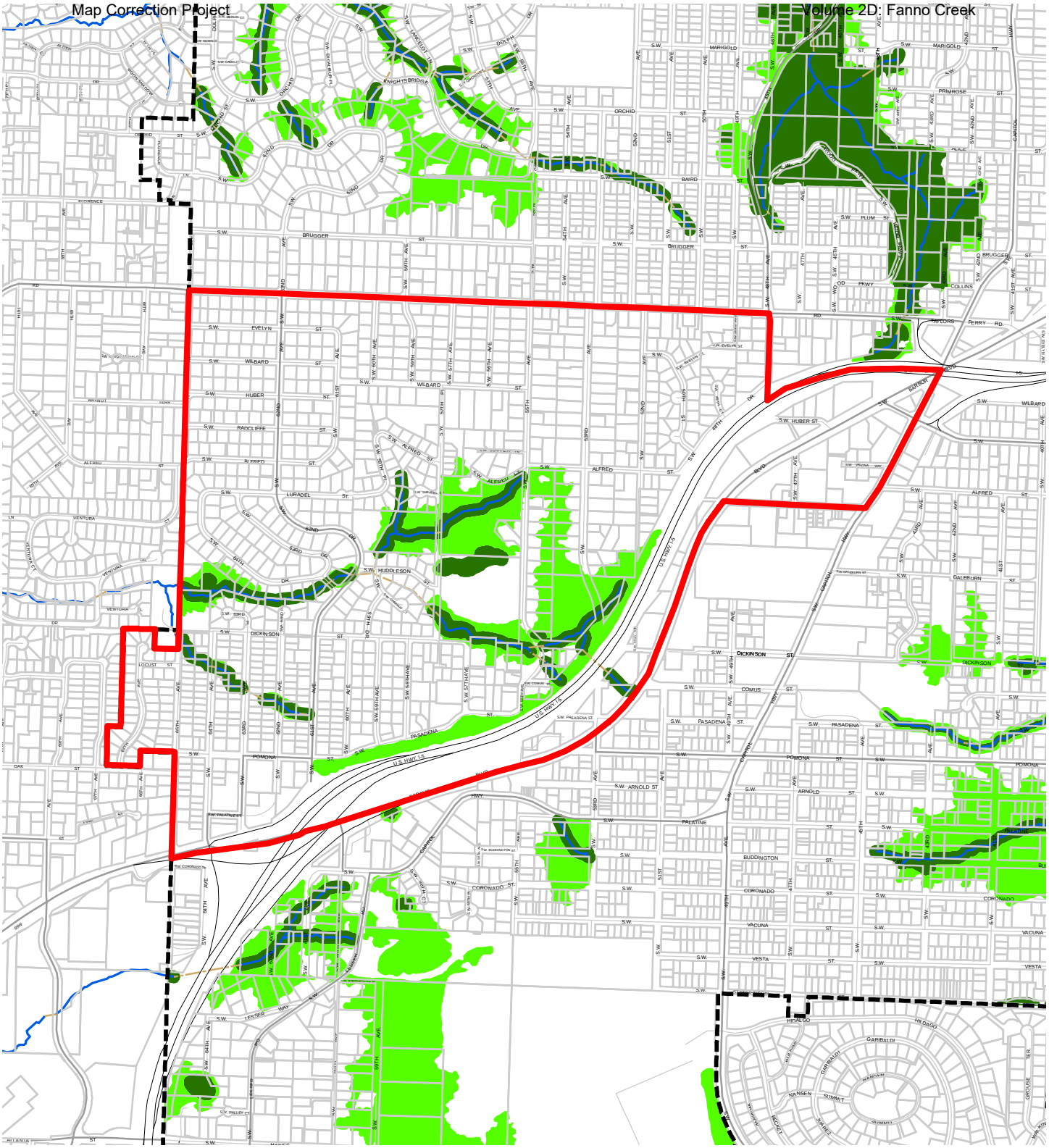

Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site:

FC12

Updated: July 2021

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

NORTH

0 550 1,100 Feet

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Natural Resource Description

Within resource site FC12 the following significant natural resource features and functions are present:

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

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

Special Habitat Areas: Wetlands (W)

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

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

Table A: Quantity of Natural Resource Features in Resource Site	**FC12**
	Study Area
Stream (Miles)	1.2
Wetlands (acres)	1.2
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	56.6
Woodland (acres)	27.8
Shrubland (acres)	1.4
Herbaceous (acres)	11.7
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	102.0
* The flood area includes the FEMA 100-year flood plain plus the adjusted 1996 flood inundation area. **Slopes are derived from LiDAR. Steep slopes are areas with a slope greater than 25%.	

This resource site includes forested Fanno Creek headwater and tributary streams that flow into designated critical habitat for Endangered Species Act-listed upper Willamette River steelhead trout.

South Ash Creek originates just west of I-5 near SW 52nd Avenue and drains an area of approximately 359 acres within the City's jurisdiction. Stormwater from sections of Interstate 5 drain into South Ash Creek. The creek flows in a westerly direction and exits the urban services boundary north of SW Dickson Place before joining Fanno Creek. Steep slopes characterize much of the upper reaches of the subwatershed, especially areas around mainstem tributaries. In general, vegetation along the stream corridor is high (i.e., greater than 25%).

Special status bird species observed within or adjacent to this site include American kestrel, bald eagle, band-tailed pigeon, black-throated gray warbler, brown creeper, bushtit, downy woodpecker, Hutton's vireo, merlin, orange-crowned warbler, pacific wren, pileated woodpecker, purple finch, varied thrush, Vaux's swift, western wood-pewee, and Wilson's warbler.

The rare plant corn lily (*Veratrum californicum)* and Oregon White Oak are found within the site.

Table B: Quality of Natural Resource Functions in Resource Site FC12				
Resource Site (acres) = 387				
	Class 1/A	**Class 2/B**	**Class 3/C**	**Total**
Riparian Corridors*				
acres	23.6	15.2	25.9	64.7
percent total inventory site area	6.1%	3.9%	6.7%	16.7%
Wildlife Habitat*				
acres	0.0	22.2	26.6	48.8
percent total inventory site area	0.0%	5.7%	6.9%	12.6%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total+				
acres	23.6	18.0	29.7	71.3
percent total inventory site area	6.1%	4.7%	7.7%	18.4%

* 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 Area FC12, 24.7% 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 FC12

Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
33.6	9.7	8.3	24.7%

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

Metro Title 13 and Oregon Goal 5 Compliance

The following information supplements evaluation of natural resource protections presented in Volume 4 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 FC12. Natural resources should be protected within HCA as follows:

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

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 FC12 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 4, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

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

Within the resource site residential uses are allowed outright or conditionally in the R10, R7, and R2 base zones. Commercial uses are allowed in the CE, CM2 and CM1 base zone. Open space uses are allowed in the OS base zone. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

The analysis of economic, social, environmental and energy consequences provided in Volume 4 is confirmed for resource site FC12, 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, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation for FC12, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

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

Resource Site No.: FC13 **Resource Site Name:** Rock Creek Watershed

Previous Plan: Fanno Creek and Tributaries Conservation Plan
Previous Resource Site No.: 131

The results of the analysis found in Volume 3, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation, are presented in the following maps:

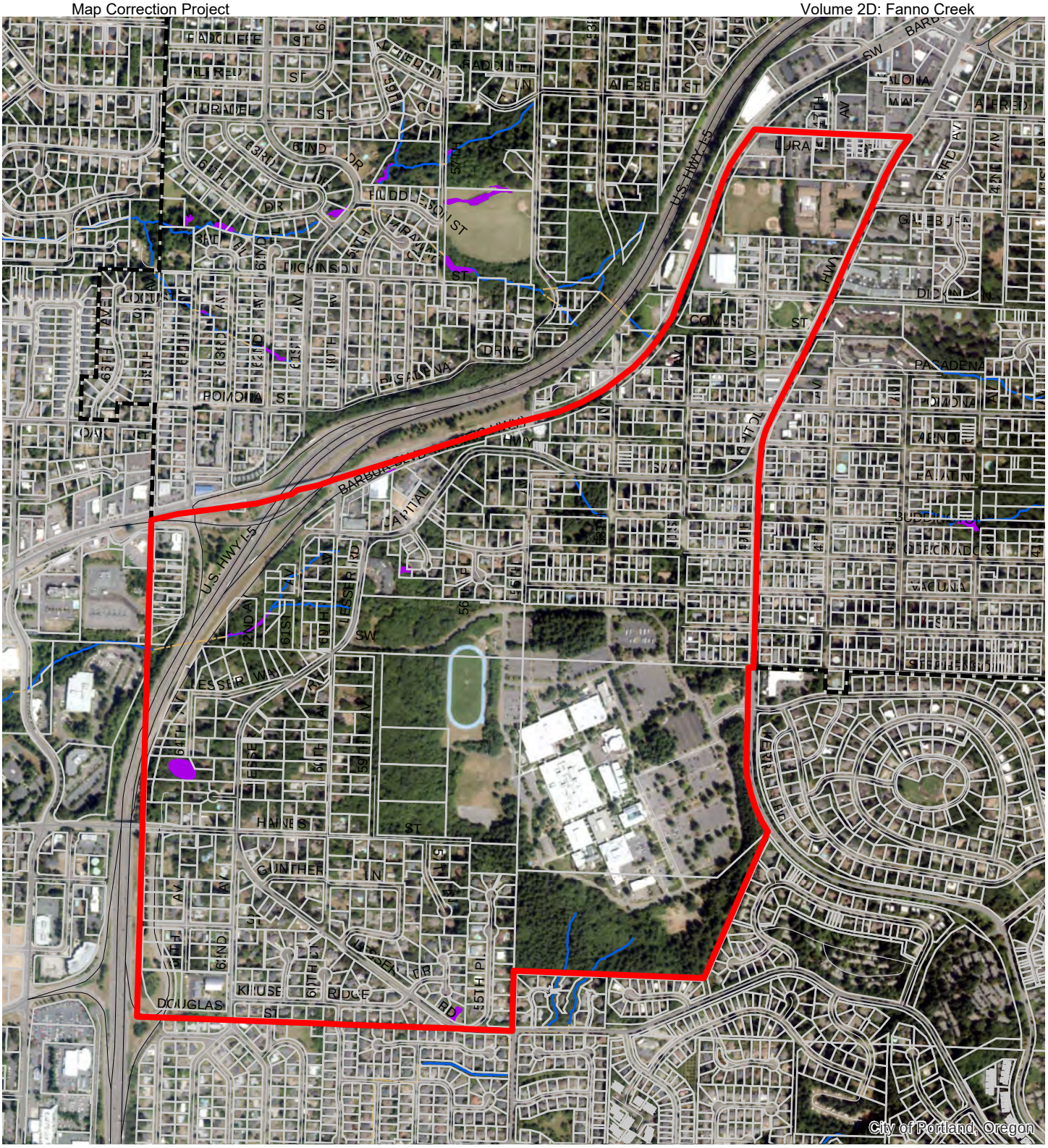
A. Water Features – rivers, streams, wetlands and flood areas
B. Land Features – forest, woodland, shrubland and herbaceous vegetation, steep slopes
C. Special Habitat Areas
D. Riparian Corridor Classifications
E. Wildlife Habitat Classifications
F. Urban Development Value
G. Metro Title 13 Habitat Conservation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

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

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

Resource site FC13 includes the following:

Site (acres)	431.4
Base zones (acres)	
CE	16.2
CI2	124.0
CM1	5.1
CM2	11.5
OS	15.7
R10	167.4
R2.5	4.9
R5	55.0
RM1	31.8



Map A: Water Features

Resource Site: FC13

Updated: July 2021

NORTH

0 500 1,000 Feet

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

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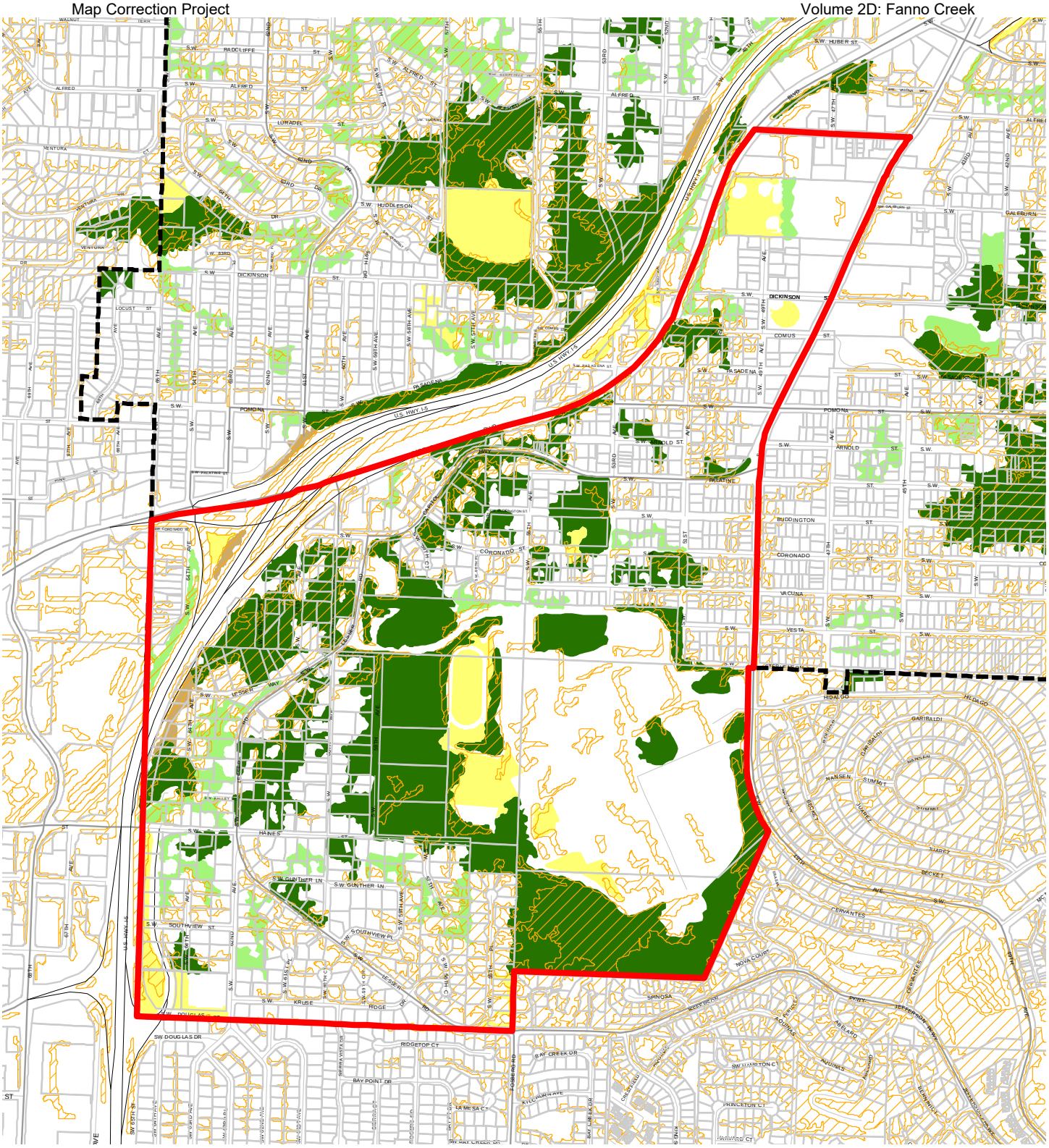

Map B: Vegetation and Steep Slopes

Resource Site: FC13

Updated: July 2021

NORTH

0 650 1,300 Feet

Proposed Draft - As Amended

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

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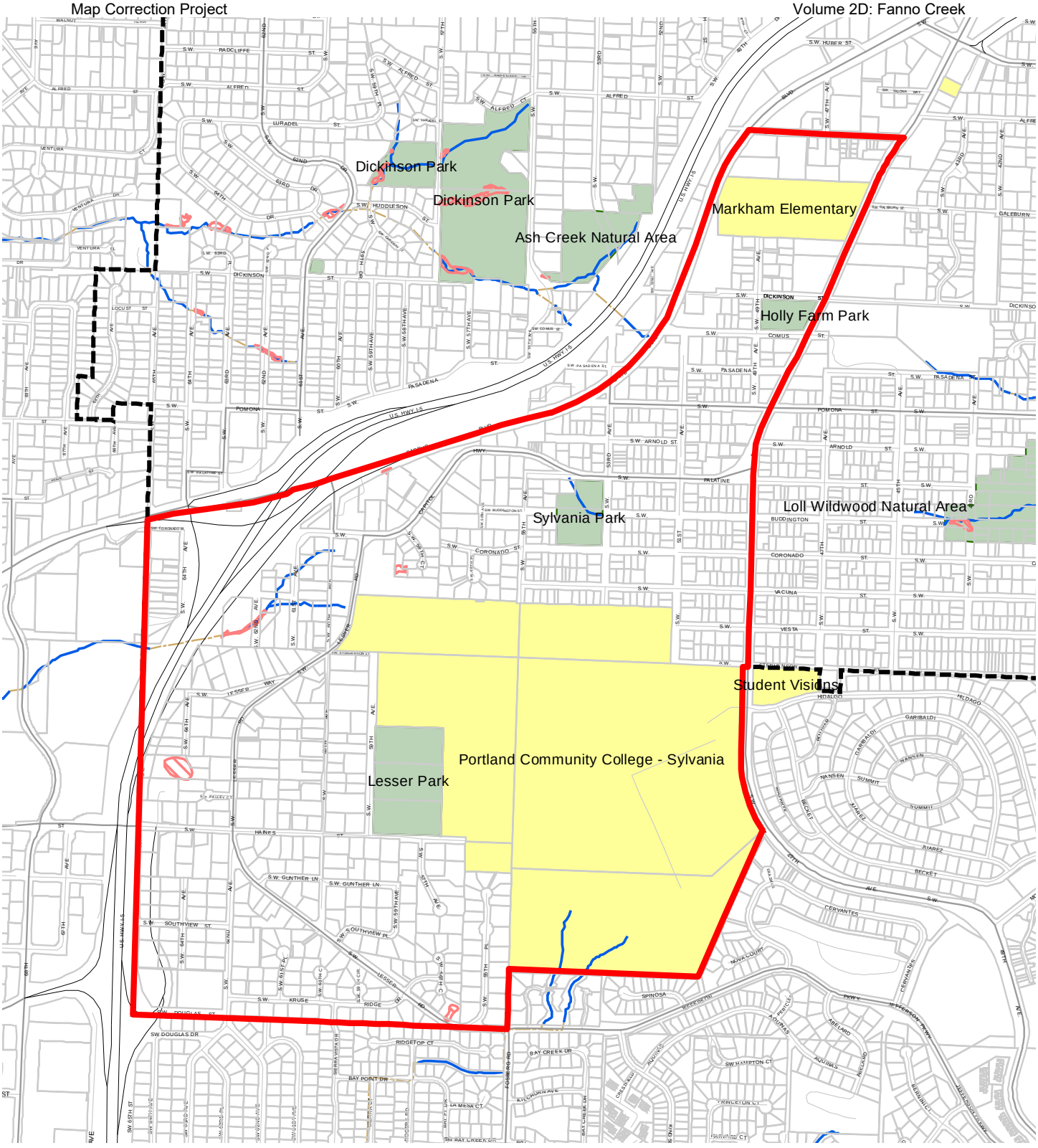

Map C: Special Habitat Areas

Resource Site: FC13

Updated: June 2021

NORTH

0 500 1,000 Feet

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

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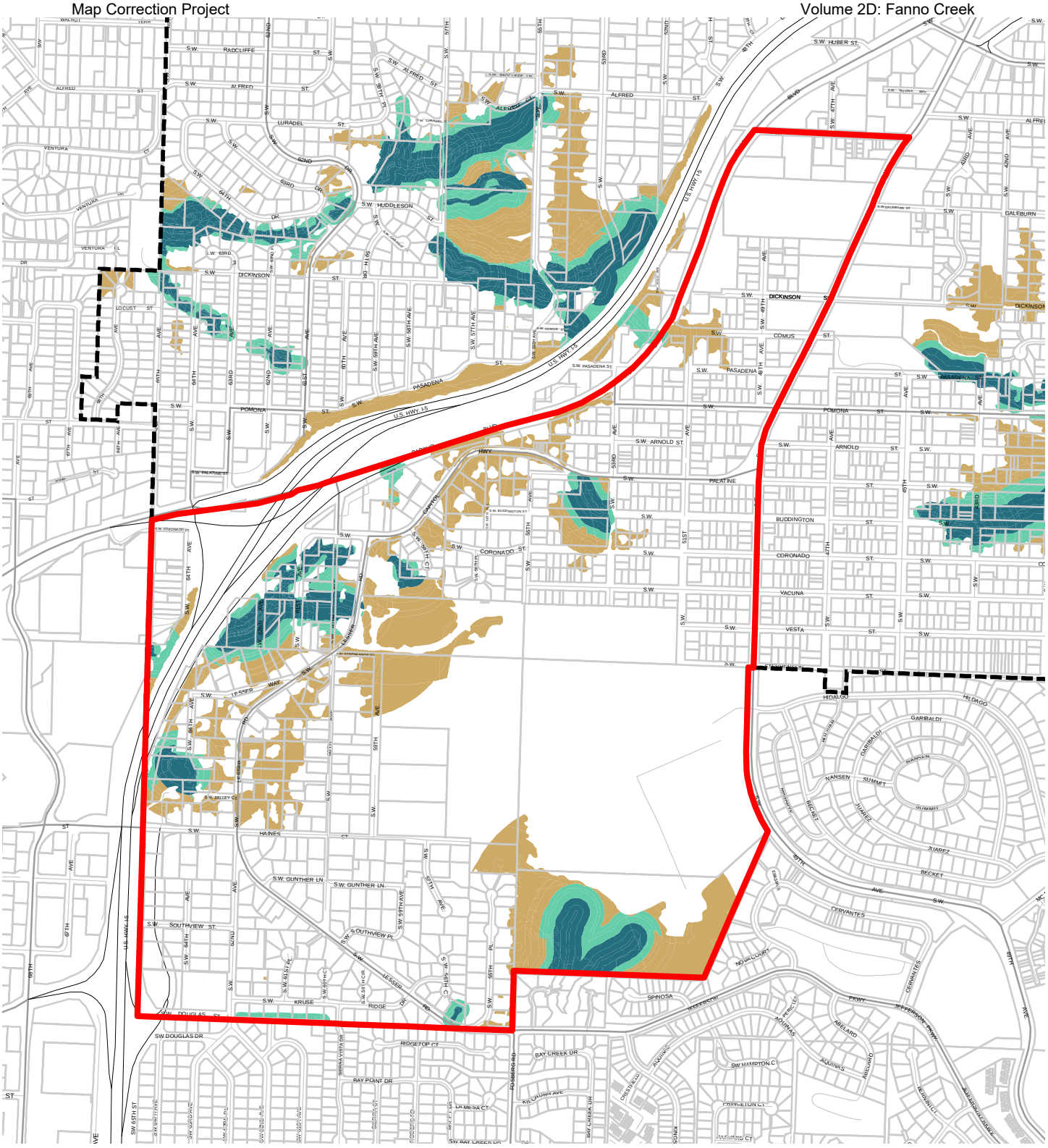

Map D: Riparian Corridors Habitat Classification

Resource Site: FC13

Updated: July 2021

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

NORTH

0 500 1,000 Feet

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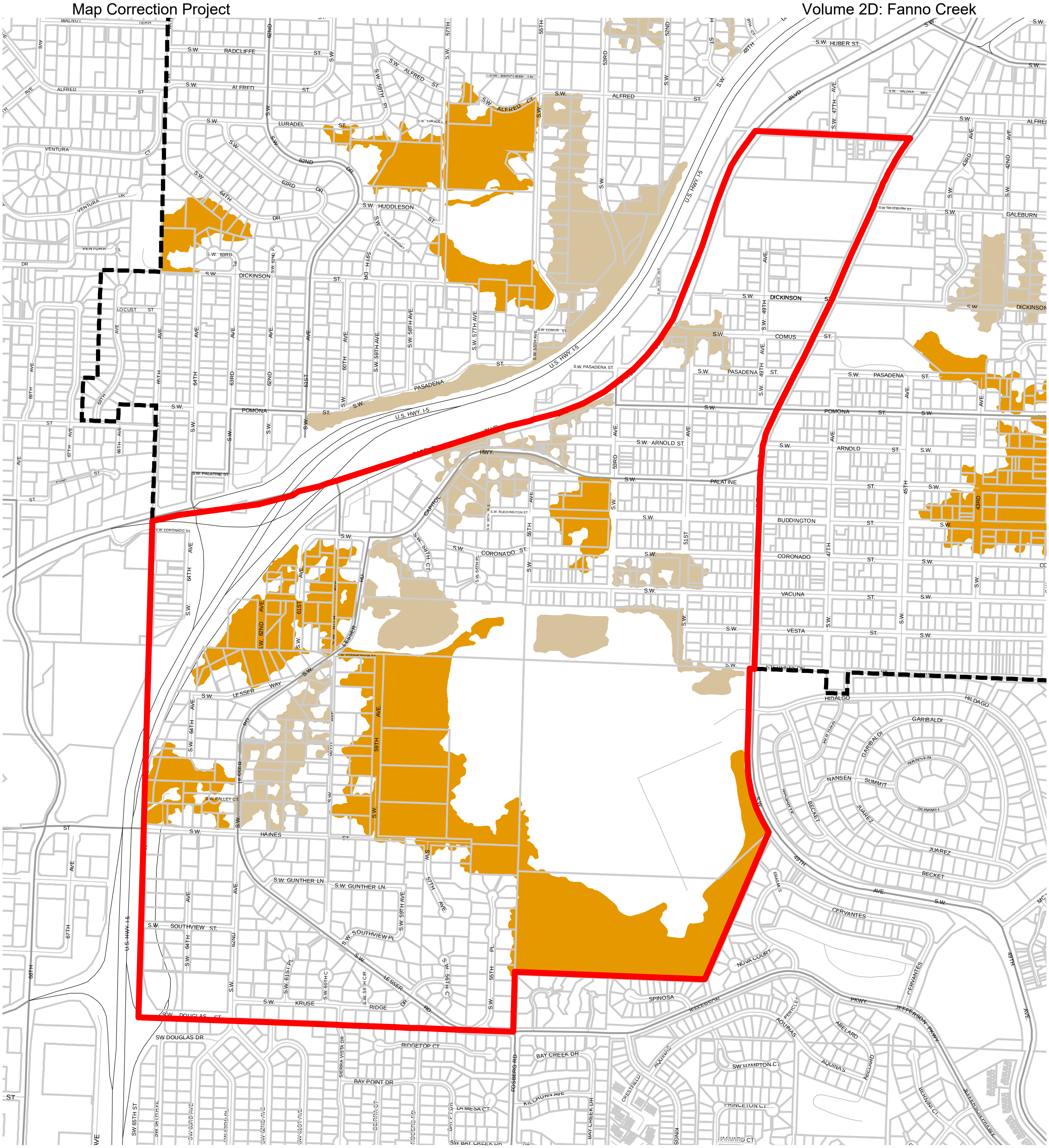

Map E: Wildlife Habitat Classification

Resource Site: FC13

Updated: July 2021

NORTH

0 412.5825 Feet

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

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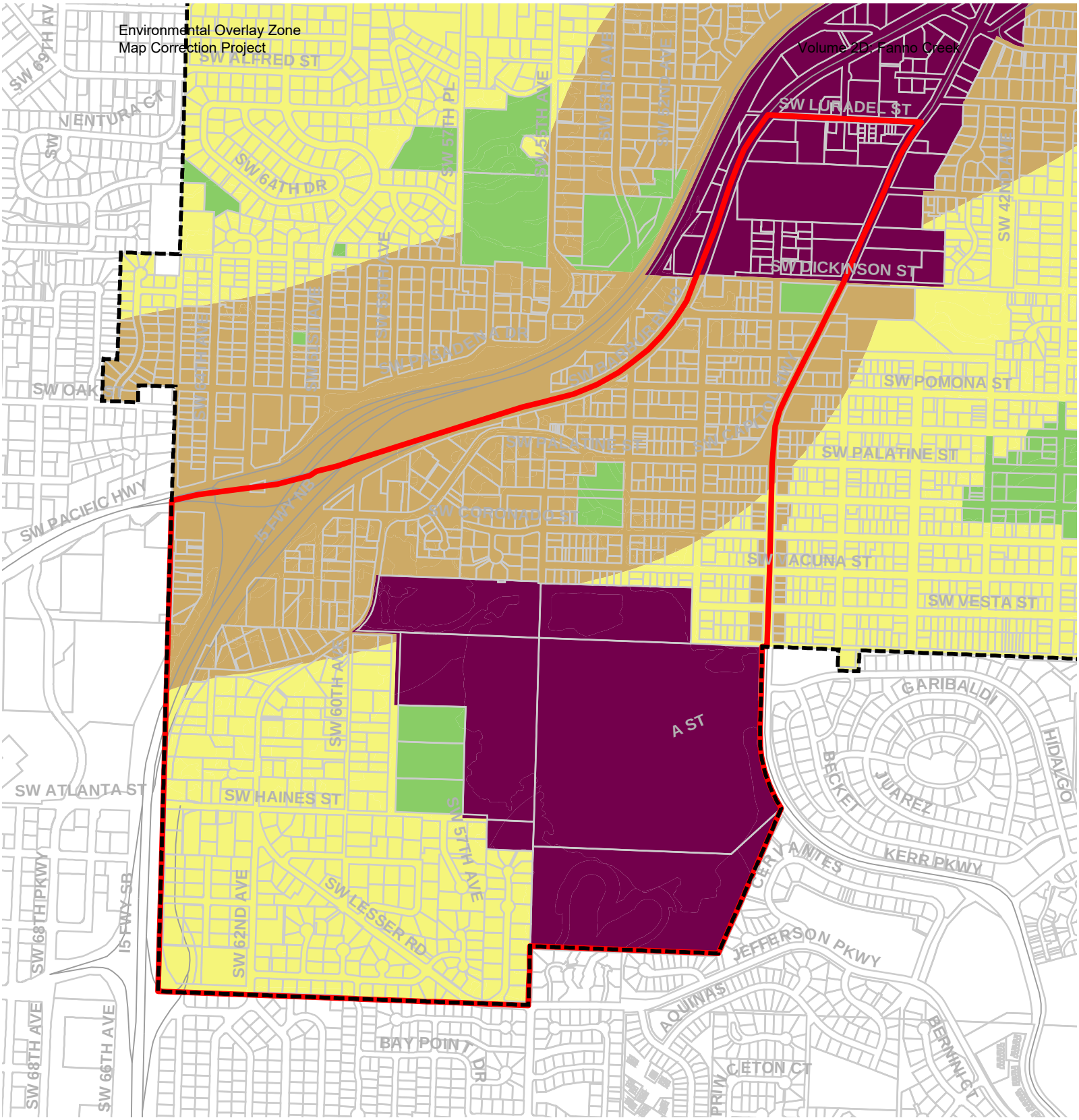

Map F: Urban Development Value (Title 13)
Resource Site: FC13

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

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Updated: July 2021

NORTH

0 625 1,250 Feet

Proposed Draft - As Amended

220

July 2021

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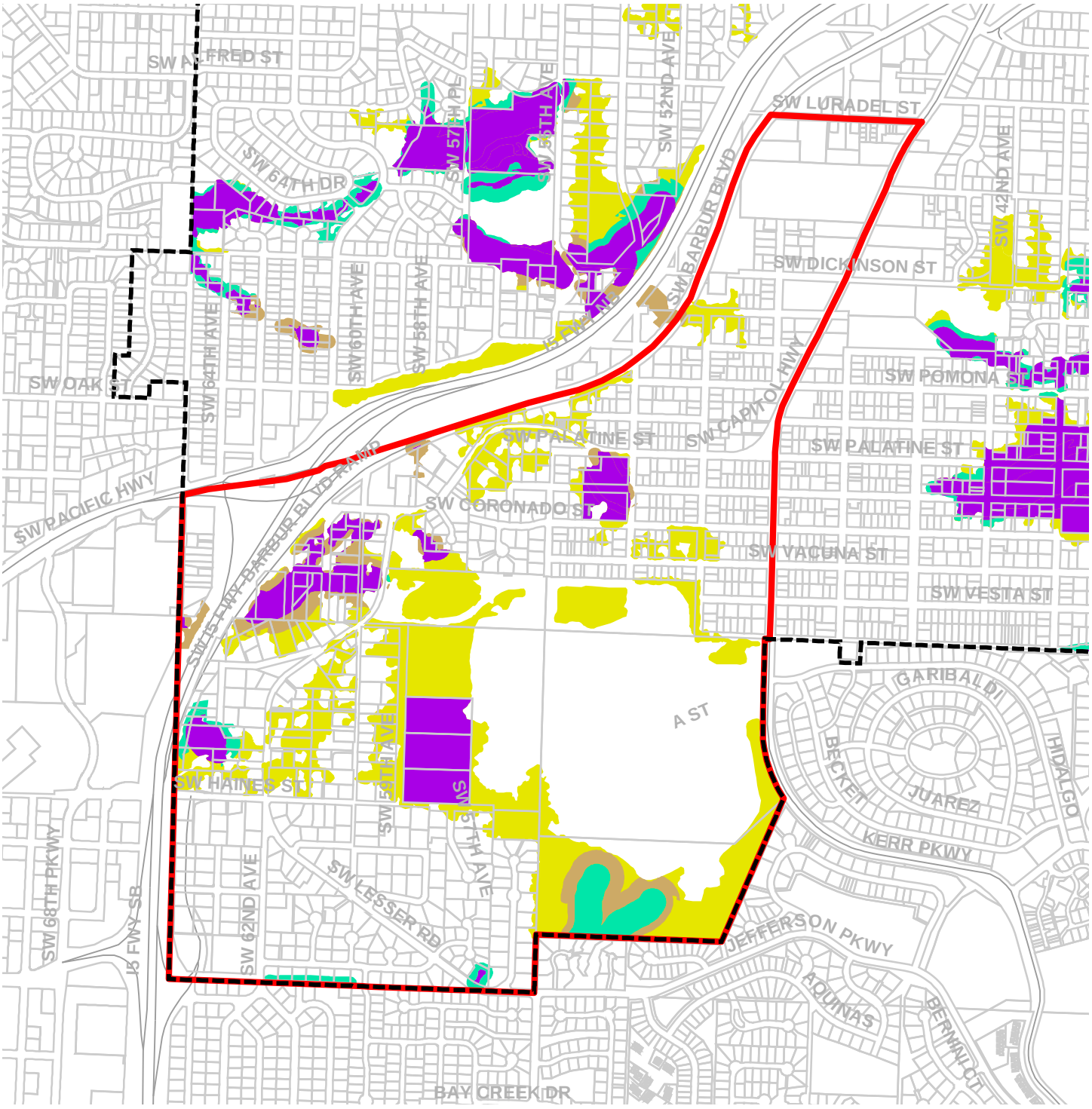

Map G: Title 13 Habitat Conservation Areas (HCA) and Goal 5 Areas

Resource Site: FC13

Updated: July 2021

NORTH

0 700 1,400 Feet

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

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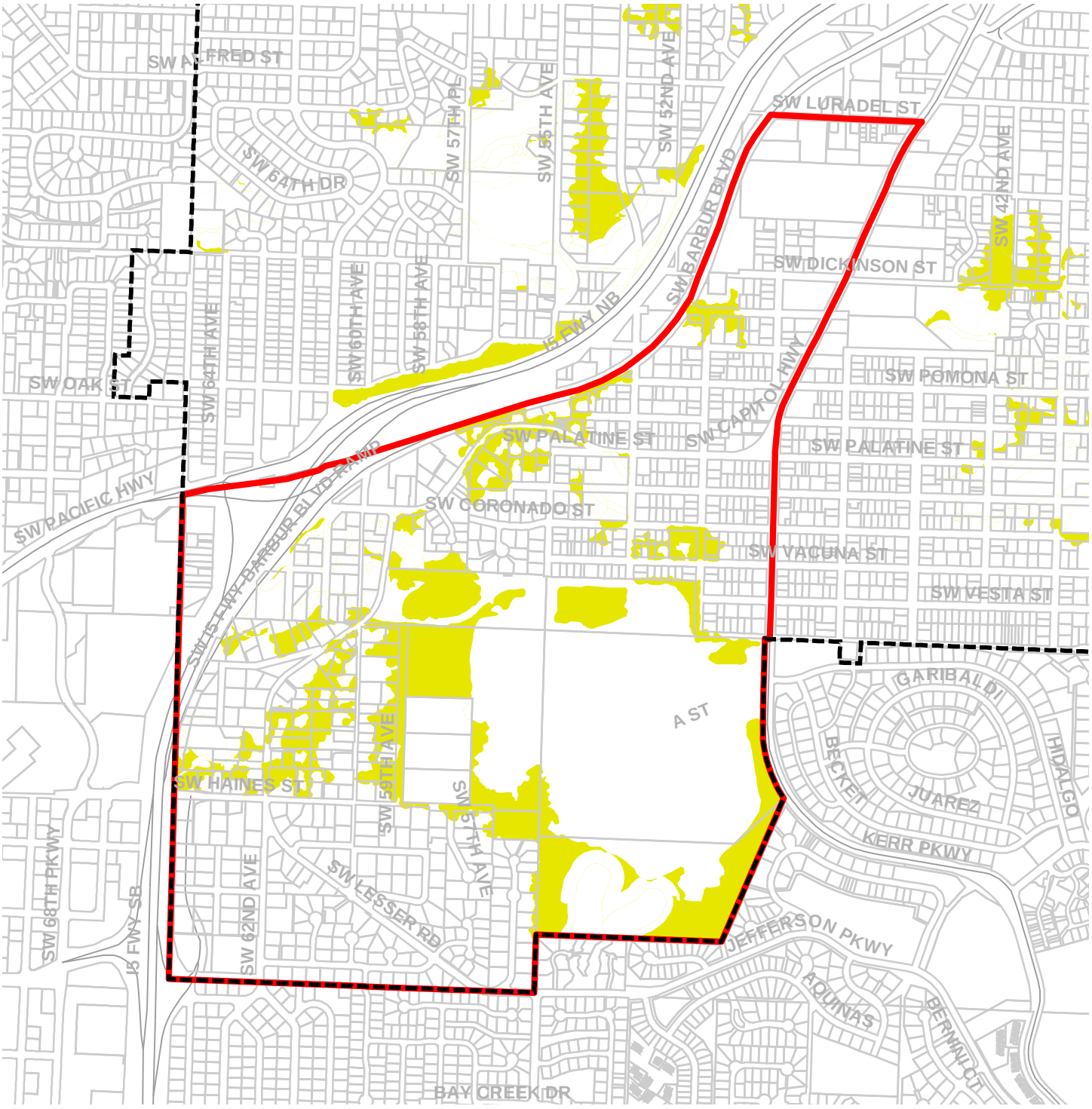

Map H: Goal 5 Resources

Resource Site: FC13

Updated: July 2021

NORTH

0 700 1,400 Feet

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

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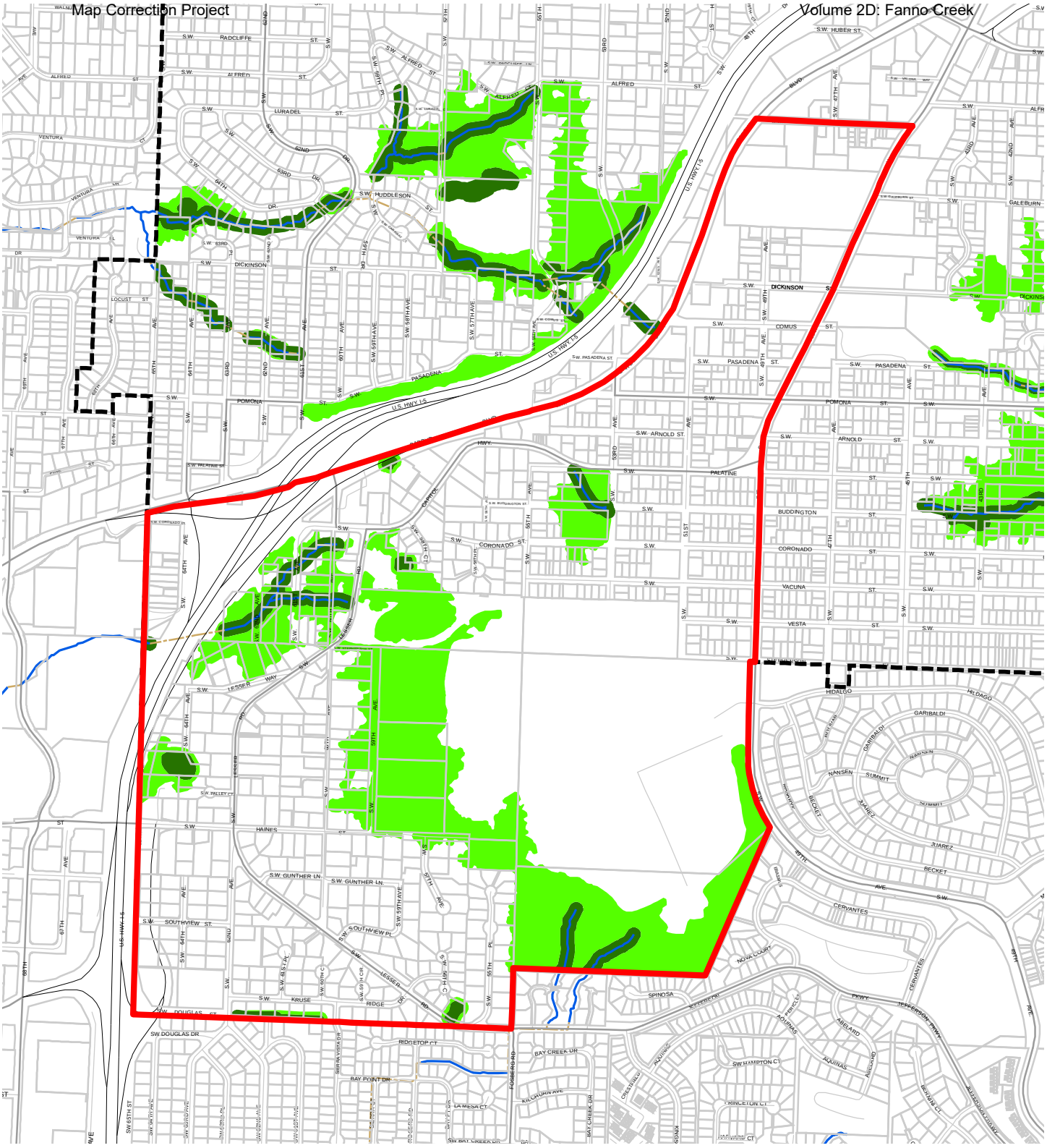

Map I: DRAFT Proposed Environmental Overlay Zones

Resource Site: FC13

Updated: July 2021

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

NORTH

0 500 1,000 Feet

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Natural Resource Description

Within resource site FC13 the following significant natural resource features and functions are present:

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

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

Special Habitat Areas: Wetlands (W)

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

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

Table A: Quantity of Natural Resource Features in Resource Site	**FC13**
	Study Area
Stream (Miles)	0.6
Wetlands (acres)	0.9
Vegetated Areas >= 1/2 acre (acres)	
Forest (acres)	112.1
Woodland (acres)	19.4
Shrubland (acres)	1.6
Herbaceous (acres)	19.1
Flood Area*	
Vegetated (acres)	0.0
Non-vegetated (acres)	0.0
Steep Slopes (acres)**	111.7
* 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%.	

This resource site includes forested Fanno Creek headwater and tributary streams that flow into designated critical habitat for Endangered Species Act-listed upper Willamette River steelhead trout.

Rock Creek originates just south of I-5 near SW Capitol Highway and drains approximately 413 acres within the City's jurisdiction. Stormwater from sections of I-5 drain into Rock Creek. The creek flows in a westerly direction and exits the urban services boundary near SW 64th Avenue before joining Fanno Creek. The subwatershed is relatively flat, however, steep and moderate slopes dominate the western portion around the Creek and its tributaries.

Special status bird species observed within or adjacent to this site include bald eagle, brown creeper, bushtit, Hutton's vireo, pacific wren, and rufous hummingbird. Rare plants species documented in the site include slender cinquefoil (*Potentilla gracilis)*, Blackcap raspberry (*Rubus leucodermis)* and Oregon white oak.

Table B: Quality of Natural Resource Functions in Resource Site FC13				
Resource Site (acres) = 431				
	Class 1/A	**Class 2/B**	**Class 3/C**	**Total**
Riparian Corridors*				
acres	15.1	13.1	53.2	81.4
percent total inventory site area	3.5%	3.0%	12.3%	18.9%
Wildlife Habitat*				
acres	0.0	69.8	31.6	101.4
percent total inventory site area	0.0%	16.2%	7.3%	23.5%
Special Habitat Areas**				
acres	0.0			
percent total inventory site area	0.0%			
Combined Total+				
acres	15.1	59.9	36.6	111.6
percent total inventory site area	3.5%	13.9%	8.5%	25.9%

* Class I riparian resources, Special Habitat Areas, and wildlife habitat include open water.
** Metro Title 13 designated all Special Habitat Areas as Class I riparian corridors.
+Because riparian resources, Special Habitat Areas, and wildlife Habitat overlap, the results cannot be added together to determine the combined results.

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

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

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

For Resource Area FC13, 1.8% of the total area is effectively impervious.

Table C. Impervious Area within Resource Site FC13

Total area (acres)	Total impervious Area (acres)	Total unmanaged impervious area* (acres)	Percent of resource site that is effectively impervious
248.9	5.2	4.5	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 4 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 FC13. Natural resources should be protected within HCA as follows:

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

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 FC13 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 4, describes the conflicting uses and provides an overarching analysis of the economic, social, environmental and energy consequences of prohibiting, limiting or allowing the conflicting uses within areas of significant natural resources. In addition to the General ESEE analysis, the following resource site-specific consequences are considered.

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

Within the resource site residential uses are allowed outright or conditionally in the R10, R5, R2.5 and R2 base zones. Commercial uses are allowed in the CE, CI2, CM2 and CM1 base zone. Open space uses are allowed in the OS base zone. Development of new uses may involve vegetation clearing, grading, filing, and soil compaction, as well as the addition of impervious surfaces and landscaping with non-native plants, with associated impacts on the natural resources. Basic utilities and other infrastructure are allowed in all base zones. New or upgraded utility corridors may be cleared of vegetation and may fragment wildlife habitat.

The analysis of economic, social, environmental and energy consequences provided in Volume 4 is confirmed for resource site FC13, 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, Natural Resources Inventory, Volume 4, Title 13 and Goal 5 Compliance, and the resource site-specific evaluation for FC13, the following decisions are applied to protect the significant riparian corridors and wildlife habitat:

1. Apply a protection overlay zone ('p' zone) to stream channels from top-of-bank to top-of-bank, wetlands and land within 50 feet of stream top-of-bank or 25 feet of wetlands.
2. Apply a conservation overlay zone ('c' zone) to land between 25 and 50 feet of wetlands, areas of forest vegetation that are contiguous to but more than 50 feet from stream top-of-bank, forest vegetation within and contiguous to Sylvania Park, the forest patch between SW Lesser Rd and Lesser Park and on lots to the northwest of the PCC Sylvania campus.
3. Allow conflicting uses within all other areas containing significant natural resources.

There is a roughly 9-acre patch of forest vegetation between the riparian forest to the west of SW Lesser Rd and the forested area of Lesser Park. This forest patch provides a wildlife habitat connectivity corridor. Impacts to the forest patch should be avoided and unavoidable impacts should be mitigated to maintain the wildlife connectivity.

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

Volume 1A – Project Report, Summary of Results and Implementation

The purpose of the Project Report is to document the overall project approach and methodology, summarize public engagement, and provide an at-a-glance summary of the results by resource site.

Volume 1B – Zoning Code and Map Amendments

Amendments to zoning code chapter 33.430, Environmental Zones, as well as other zoning code chapters, and the official zoning maps showing the existing and proposed conservation, protection and scenic overlay zones.

Volume 2 – Resource Site Inventory and ESEE 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

A summary of the approach and methodology used to produce the citywide Natural Resources Inventory. The results of the inventory are presented in Volume 2, Part A – G.

Volume 4 – Compliance Report

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. The results, recommendations and implementation are reported in Volume 2, Part A – G, and Volume 1, Part B.

Volume 5 – Appendices