# Witch Hazel Village South

# Forest Resources Inventory & Assessment

*Prepared for*

**City of Hillsboro**

**150 E Main Street**

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# *TABLE OF CONTENTS*



# *Tables*

# 1. EXECUTIVE SUMMARY

This Forest Resources Inventory & Assessment (FRI) has been conducted for the City of Hillsboro Witch Hazel Village South (WHVS) area. The FRI study area is shown in Appendix A, Figure 1. The current tax lots in the FRI study area are shown in Figure 2, and they are color coded by whether site access was available (having site access allowed DEA to use on-site delineation methods, which are more accurate than offsite methods). Figure 3 provides an aerial photo, and Figure 4 shows the soil types mapped within the study area.

The WHVS study area is located directly south of the current Hillsboro City limits. The study area includes the entire WHVS urban growth boundary (UGB) expansion from 2018. It is bound by SW River Road to the west, residential development within current Hillsboro city limits to the north, and the Reserve Golf Club to the east. The entire study area is located within the Tualatin River drainage basin, and all creek and tributaries drain to the Tualatin River, located less than 500 feet west of SW River Road in places.

The study area contains scattered rural residences spread across a relatively flat landscape that is used primarily for farming, forestry, and small-scale livestock grazing. The study area drains to the west-southwest, ranging from 172 feet elevation in the northeast corner to 134 feet elevation where Gordon Creek flows off site through a culvert under SW River Road. Gordon Creek flows east to west through the middle of the study area, within a steep, primarily forested riparian area down to a relatively wide floodplain.

Agriculture and scattered residences are the dominant land uses in the northern portion of the study area. The majority of the southern portion of the study area was cleared of coniferous forest within the past few years, resulting in low vegetation and slash piles surrounding relatively narrow riparian areas. The dominant land use in the watershed upstream from the study area is the Reserve Golf Course and Witch Hazel Elementary, and rapidly urbanizing previously agricultural, forested, and rural residential areas. Habitats to the south of the study area consist of farm and forest.

This report is built upon a Local Wetlands Inventory (LWI) that is currently under review by the Oregon Department of State Lands (DSL), and the study area is the same as that used for the LWI. This report, combined with the LWI, comprise the Natural Resources Inventory (NRI) for the WHVS UGB expansion area, and it will inform the Economic, Social, Environmental, and Energy (ESEE) Analysis that is part of the Oregon Statewide Goal 5 planning process.

Figure 5 in Appendix A shows the Wetland Resources and Forest Resources identified within the study area. In total, eight forested areas were identified in the field as potential Goal 5 natural resources. Of these, six were identified as Significant, and will be appended to the City's List of Significant Natural Resources. All significant resources were contiguous with riparian habitats, and no isolated forest resources were identified as significant. The resource characteristics and rationale for Significance are described in the following sections.

# 2. GOAL 5 CONTEXT

This FRI is intended to support Goal 5 decision making, especially in regard to wildlife habitat. Goal 5 states that "The following resources shall be inventoried: a. Riparian corridors, including water and riparian areas and fish habitat; b. Wetlands; *c. Wildlife Habitat*; d. Federal Wild and Scenic Rivers; e. State Scenic Waterways; f. Groundwater Resources; g. Approved Oregon Recreation Trails; h. Natural Areas; i. Wilderness Areas; j. Mineral and Aggregate Resources; k. Energy sources; l. Cultural areas."

The Tualatin Basin Natural Resources Coordinating Committee's January 2007 "Tualatin Basin Goal 5 Program Implementation Report: Encouraging Habitat Friendly Development Practices, Final Report on Functional Plan Title 13 Compliance" summarizes the City of Hillsboro Goal 5 framework as follows:

> "Oregon's nineteen statewide planning goals are the framework for local planning programs in the State. The purpose of Goal 5, Oregon Administrative Rule (OAR) 660-015-0000(5) is to protect natural resources and conserve scenic and historic areas and open spaces. Local governments, both counties and cities, must address Goal 5. In addition, the Goal 5 rule provides for a "Regional" Goal 5 process to be conducted by the Metropolitan Service District (Metro). The Tualatin Basin Goal 5 program addresses Riparian Corridors (OAR 660-023-0090), and Wildlife Habitat (OAR 660-023- 110). The steps necessary for compliance with Goal 5 are described in OAR 660, Division 23 Procedures and Requirements for Complying with Goal 5. However, in general, the basic steps include: Step 1: Mapping Significant Regional Resources (Inventory). Step 2: Preparing an analysis of the Economic, Social, Environmental, and Energy (ESEE) consequences of allowing, limiting or prohibiting conflicting uses in resource and impact areas. Step 3. Develop a Program to implement the ESEE decision.
>
> The City of Hillsboro adopted its Natural Resources Management program in 2003 to comply with state Goal 5. The City conducted the required inventory of potential Goal 5 resources within the City in the summer and fall of 2000 in accordance with OAR 141-86-180 through 141-86-240 and OAR 660-023-0090 through 660-023-0110. The results of this inventory are contained in the "City of Hillsboro Goal 5 Natural Resource Inventory and Assessment Report" which includes a Local Wetlands Inventory and Assessment, and Riparian Corridor and Upland Wildlife Habitat Inventories and Assessments. The inventory of Significant riparian and upland resources was completed incorporated into the Hillsboro Comprehensive Plan in 2001, and subsequently, a Significant Natural Resources Overlay District (SNRO) was created indicating the appropriate levels of resource protection as determined through the ESEE analysis to implement goals and policies of the program. A new Section 131A was added to the Hillsboro Zoning Ordinance (HZO) in 2003 which regulates development activities within the SNRO and specifies mitigation requirements. The SNRO code specifies permitted uses that are allowed within the district to the extent that they are not prohibited by the provisions of the underlying zone or any applicable conditions of approval, and are otherwise in compliance with applicable Federal, State and local requirements. Uses requiring a Significant Natural Resources Permit (SNRP) are also identified, with different levels of permitting requirements and review procedures required dependent on proposed uses and scale of impact. In addition, certain uses are designated "Prohibited" throughout the district."

# 3. METHODS

Methods included a review of background materials and field reconnaissance visits. Forest Resources Inventory field work was conducted by three biologists on February 23, 2021 in conjunction with the WHVS Local Wetlands Inventory (LWI). Wetland delineation for the LWI was conducted at a reconnaissance level of accuracy suitable for LWI documentation and City planning purposes and results are described in the WHVS Local Wetlands Inventory (DEA 2021). A brief discussion of LWI methods is included here to describe how the wetland boundaries used for this FRI report were derived.

The LWI followed the DSL rules, specifically OAR 141-086. All wetlands one-half acre in size or larger were mapped as wetlands, while smaller wetlands were generally mapped as "probable wetlands." DSL only requires that probable wetlands be mapped as point features (meaning that a single point would represent the wetland). For this project, probable wetlands were mapped as polygons since site access was available. For the few tax lots where small portions of larger wetlands were not accessible due to access restrictions, Light Detection and Ranging (LIDAR) contours were used and appeared to follow aerial photo signatures quite closely. Mapping of probable wetlands as polygons was done to aid the City planning process, as these features will likely need to be avoided or encroachment minimized. A single sample plot documenting typical conditions for each wetland was completed and boundaries were mapped using global positioning system (GPS).

Data collection and wetland boundary delineation followed the Level 2 Routine Delineation Method described in the U.S. Army Corps of Engineers (Corps) Wetlands Delineation Manual (Environmental Laboratory 1987) and further supported by the Western Mountains, Valleys, and Coast Region (Corps 2010) regional supplement (Supplement). This method requires the simultaneous presence of hydrophytic vegetation, hydric soils, and positive wetland hydrology in wetland delineations. Watershed boundaries are from Clean Water Services (CWS) watersheds data layer (CWS date unknown). This dataset represents the 6th level (12-digit) hydrologic unit boundaries from the Watershed Boundary Dataset (WBD) layer for Oregon. Hydrologic units within the WBD_OR_HUC_12 represent drainage areas delineated to the 6th level drainage systems.

There are two types of forest resources according to the 2001 City of Hillsboro Goal 5 Natural Resource Inventory and Assessment (Fishman 2001) methodology: isolated upland and riparian/upland (forests contiguous with a wetland or stream). Isolated upland forests must be at least one acre in size to meet the threshold for local Significance, and one isolated upland forest was found to meet this criterion. Forest units of the riparian/upland type are indicated by the code "R/U" in mapping and Geographic Information Systems (GIS) data developed by this project, consistent with City methodologies. Isolated upland forests were mapped using the driplines of forested patches, and riparian/upland forests were delineated using driplines and wetland boundaries. The wetland boundaries were mapped with a combination of roughly 60 percent GPS and 50 percent aerial photograph and two-foot contour interpretation, while forested patches were mapped primarily using aerial photograph interpretation, with a few GPS points for ground verification.

The following resource naming conventions are used to develop the "assessment unit code" nomenclature for the FRI: forests connected to a waterway are referred to as Riparian/Upland Forests and each resource's assessment unit code includes the term "R/U" along with a watershed/tributary signifier and an assessment unit number, usually only one digit. Forests not connected to a waterway are referred to as Isolated Upland

Forests and each resource's assessment unit code includes the term "UFO" along with an assessment unit number, usually only one digit.

Regarding significance, "Riparian Corridor resource areas were determined to be Significant if they rated high in one of the following five categories: wildlife habitat, water quality protection, ecological integrity, connectivity, and uniqueness (Fishman 2001)". The same method and definitions for these categories was used in WHVS in 2021 as well. The following assessment criteria (Fishman 2001, in italics) were used to assess WHVS wildlife habitat areas.

"*Wildlife Habitat – evaluates habitat diversity. Areas with permanent or seasonal water, diverse vegetation and structure (canopy, understory, groundcover), and interspersion of plant communities rate high compared to areas without water, low structural diversity, and/or single type plant communities. Wildlife habitat value also increases with the size of the site and linkage to other open space habitat. Snags and large woody debris increase the value of the habitat.*

*Water Quality Protection – evaluates the potential of the resource to protect contiguous streams and wetlands. Uplands adjacent to streams maximize water quality protection from surface water runoff if the upland area is greater than 50 feet wide, well-vegetated, and has a well-established duff layer. Well-vegetated slopes also minimize erosion. Water quality protection rates high on moderate and steep slopes adjacent to a stream if well-vegetated; medium if duff is patchy; low if hillslopes are eroding or not well-vegetated.*

*Ecological Integrity – evaluates the conditions of native site vegetation. If vegetation is dominated by a mixture of native species with limited invasive species influence, it rates high. Sites with mostly native species and with invasive species that could be removed rate medium. Sites strongly impacted by invasive species (Himalayan blackberry, English ivy, bittersweet nightshade) rate low.*

*Connectivity – evaluates the importance of linkage or continuity of a resource site to allow wildlife passage between larger habitat units or genetic flow between plant populations. Connectivity rates high if sites are large and connected to Goal 5 resource corridors and low if isolated.*

*Uniqueness – evaluates the uniqueness of the resource. Uniqueness rates high if the site contains a federal or state categorized species or critical habitat, unique plant community (age, species composition, etc.), or geologic feature; medium for high quality common habitat; low for none of the above."*

The Oregon Conservation Strategy (OCS) was used to help determine uniqueness in regard to unique plant communities. For example, riparian areas containing mature Oregon white oak habitat were considered unique, regardless of the existing riparian width or condition, because the Oak Forest is an OCS strategy habitat; it has become scarce and unique in the landscape.

This Significant Natural Resource (SNR) determination was completed to identify potential SNRs areas as required under Hillsboro Community Development Code (12.27.210.C.1), Oregon Goal 5, and Metro Titles 3 and 13 resource mapping requirements. A preliminary Natural Resources identification was completed in November 2017 by Environmental Science & Assessment, LLC (ESA) as part of the UGB expansion request (ESA 2017). ESA was contracted by the City in 2020 to conduct additional mapping and resource assessment to determine the Significance and refine the boundaries of each potential resource in the study area for the above-listed programs and comprehensive planning purposes. ESA's 2017 and 2021 "Witch

Hazel Village South Natural Resources Inventory and SNR Assessment" technical memoranda were used as background for the David Evans and Associates, Inc. (DEA) investigations documented in this report. These reports and other reference materials used for the analysis are listed below.

## 3.1 PRELIMINARY RESOURCE REVIEW

Reference materials were reviewed prior to the field investigation to provide information regarding the possible presence of wetlands, water features, hydric soils, wetland hydrology, site topography and wildlife habitat conditions. The materials reviewed included:

- City of Hillsboro Witch Hazel Village Community Plan (2004)
- Clean Water Services (CWS) watersheds data layer (date unknown).
- Environmental Science & Assessment, LLC Witch Hazel Village South Natural Resources Inventory. (2017)
- Environmental Science & Assessment, LLC Witch Hazel Village South SNR Assessment. (2021)
- ESRI ArcGIS Online World Imagery aerial photo imagery for ArcGIS (2020)
- Fishman Environmental Services, LLC (Fishman). City of Hillsboro Goal 5 Natural Resource Inventory and Assessment (2001)
- Metro Regional Land Information System (RLIS) Geographic Information System (GIS) wetlands layer, tax lots layer, and GIS streams layer (2020)
- Oregon Department of Fish and Wildlife (ODFW) Oregon Fish Habitat Distribution and Barriers (2021)
- Oregon Department of Geology and Mineral Industries (DOGAMI). LIDAR-derived contours (2014)
- Oregon Explorer Stream Function Assessment Method (SFAM) Map Viewer: an internet tool for SFAM support
- U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) for Washington County, Oregon (2020)
- U.S. Fish and Wildlife Service. National Wetland Inventory Wetland Mapper (2020)
- U.S. Geological Survey (USGS) National Hydrographic Database (NHD) high resolution GIS streams layer, https://www.usgs.gov/core-science-systems/ngp/national-hydrography/nhdplus-high-resolution (2021)

## 3.2 MAPPING PROCEDURES

Mapping of FRI features was supported through use of high-resolution color aerial photography (ESRI 2020). Ground truthing occurred on tax lots where access was available and from publicly accessible viewing areas (i.e., roadway right of way). In-office review using aerial and LIDAR contours was conducted using GIS technology, which allowed for viewing information at various scales. GIS data produced by DEA was originally created using the state plane, Oregon north coordinate system, North American Datum of 1983 (NAD83) horizontal datum, HARN, International Feet, per the City of Hillsboro specifications to maintain consistency with other Community Plan mapping efforts.

## 3.3 PUBLIC INVOLVEMENT PROCESS

Landowners within the study area with the potential to have wetlands or waterways on their property (e.g., situated along known riparian corridors and/or mapped hydric soils) were contacted by the City to inform them of the LWI project. The City requested that property owners grant access to allow DEA to perform on-site wetland determination work. As shown on Figure 2 of Appendix A, access was granted to eleven

out of fifteen tax lots, which constitutes the vast majority of acreage within the study area. Table 1 provides a list of tax lots, acreages, and access permissions within the WHVS study area.

***Table 1: List of Tax Lots and Access Permission within the WHVS Study Area***

| Tax Lot | Acreage | Access Granted? Yes/ No |
|---|---|---|
| 1S216A000100 | 18.3 | Yes |
| 1S216A000200 | 31.5 | Yes |
| 1S216A000300 | 2.5 | No |
| 1S216A000400 | 2 | No |
| 1S216A000500 | 0.7 | No |
| 1S216A000600 | 2 | Yes |
| 1S216A000700 | 3.4 | No |
| 1S216A000800 | 1.4 | No |
| 1S216A000801 | 7.6 | Yes |
| 1S216A000804 | 7.7 | Yes |
| 1S216A000806 | 19.4 | Yes |
| 1S216A000809 | 3.7 | Yes |
| 1S216A000810 | 1.5 | Yes |
| 1S216D000100 | 24.5 | Yes |
| 1S216D000101 | 18 | Yes |
| 1S216D000199 | 0.2 | Yes |

City of Hillsboro Planning held a WHVS Community Meeting #1 on March 30, 2021 to provide a project overview and discuss next steps. Approximately 40 participants joined this virtual meeting. During Community Meeting #1, participants were encouraged to check the WHVS Comprehensive Planning project webpage (www.hillsboro-oregon.gov/WHVS) in approximately two weeks' time to review the draft FRI to be posted there. The draft FRI was posted to this project webpage on April 16, 2021. The webpage's Next Steps section encouraged the public to provide input on the draft FRI by May 14, 2021.

On April 16, 2021, a letter was mailed to the twelve WHVS property owners letting them know the draft FRI had been posted to the project webpage for their comment. The letter let property owners know they could request a mailed paper copy of the draft FRI rather than reviewing an electronic version. City staff mailed a color paper version of the draft FRI to one WHVS property owner following their request.

The April 16, 2021 letter also encouraged property owners to schedule a virtual or in-person socially distanced meeting with Hillsboro Planning staff to ask questions and share comments and concerns directly on the project, such as regarding the draft FRI. The City participated in meetings with two separate property owners who both asked staff to clarify the draft FRI but had no suggested edits. The largest property owner within WHVS, who owns or has options on over 80% of the plan area, emailed that their consultant had reviewed the draft FRI and had no suggested edits. City staff did not receive input on the draft FRI from the larger community during this time.

*A draft WHVS Community Plan and Implementation Strategy document will be shared during WHVS Community Meeting #2 to be held in October 2021, as well as posted on the project webpage. The draft WHVS Community Plan and Implementation Strategy document will include a section highlighting the presence of the identified forest resource areas, along with the forest resource areas determined to be locally significant, for input from the public.*

*A final draft WHVS Community Plan and Implementation Strategy document will be shared during WHVS Community Meeting #3 to be held in February 2022, as well as posted on the project webpage. The final draft WHVS Community Plan and Implementation Strategy document will include a section highlighting the presence of the identified forest resource areas, along with the forest resource areas determined to be locally significant, for input from the public. Following public input, including comments from project partners and stakeholders, the City will update the FRI report with a summary of the outreach process, finalize the FRI, and adopt the FRI. Adoption is scheduled for June 2022.*

# 4. RESULTS

In total, eight forested areas were identified in the field as potential Significant resources. Of these, seven scored as Significant and will be appended to the City's List of Significant Natural Resources. As illustrated with crosshatching in Figure 5, the Isolated Upland forest, GN-UFO1 did not score as Significant because no ecological functions scored as "High" (see Summary Sheet for GN-UFO1). SNRs within the WHVS study area were all connected with streams and wetlands and are described by watershed. Table 2 and Figure 5 (Appendix A) show Clean Water Services (CWS) watersheds and associated drainages and Forest Resources that occur within the study area. Summary sheets describing each resource are provided in Appendix B.

***Table 2: Drainage Basins, Streams, and Forest Resources in the Study Area***

| Clean Water Services Watershed[1] | Clean Water Services Basin ID[2] | Water Bodies[3] | Water Body ID[3] | Associated Forest Resources[4] |
|---|---|---|---|---|
| Gordon Creek | GN1 | Gordon Creek | GN1 | GN1-R/U1 and GN1-R/U2 |
| | GN1 | Unnamed tributary to Gordon Creek | GN2 | GN2-R/U1 and GN2-R/U2 |
| Unnamed Tributaries to the Tualatin River | TR10 | Unnamed tributary to Tualatin River | TR10 | TR10-R/U1, TR10-R/U2, and TR10-R/U3 |
| | TR11 | Unnamed tributary to Tualatin River | TR11 | None present |

[1] Data from "CWS_SmallSubBasins" GIS shapefile, "STREAMSHED" data field
[2] Data from "CWS_SmallSubBasins" GIS shapefile, "IDALL" data field
[3] Water body ID assigned by DEA for the WHVS LWI project
[4] Forest Resources ID assigned by DEA for the WHVS FRI project

Three Clean Water Services (CWS) small subbasins drain the study area (approximately 147 acres), with the Gordon Creek subbasin draining the greatest area (76.4 acres) followed by the Tualatin River tributary subbasin TR10 to the south (54.9 acres) and the Tualatin River tributary subbasin TR11 to the northwest (15.5 acres). In regard to watershed boundaries, this geospatial dataset represents the 6$^{th}$-level (12-digit) hydrologic unit boundaries from the Watershed Boundary Dataset (WBD) layer for Oregon.

The average slope of the watersheds is approximately 3 percent, with lower-gradient slopes occurring in the southern/lower portion and steeper slopes occurring in the northern/upper portion. Streams in the watershed have been relatively unmodified by incision, channelization, or other manipulations for agriculture, although relatively recent reduction in riparian habitat through timber harvest has occurred. No streams within the study area (or upstream) are listed as water quality limited according to DEQ 303(d) databases. For the most part, water is not being taken out of the streams through diking, drainage, or irrigation districts in the watershed upstream of the study area, but most of the area to the north and east is in the UGB and is rapidly being annexed and urbanized, with associated increase in impervious cover. The Reserve Golf Course immediately to the east has also altered upstream habitats greatly.

As discussed in the WHVS LWI in detail, two small, primarily non-native herbaceous wetlands less than 0.5 acres occur in the northern portion of the study area. Six wetlands greater than 0.5 acres occur in the study area. They consist of relatively long and linear wetlands that follow Gordon Creek and other tributaries and headwaters to the Tualatin River. The majority of wetland acreage supports relatively intact forested and scrub-shrub wetlands typically dominated by native plant species.

The study area contains approximately 17.10 acres of Significant Forest Resources, which are displayed in Figure 5 (Appendix A). The most extensive Forest Resources were within the Gordon Creek (GN) subbasin. Riparian forest extends along the main Gordon Creek segment (GN1) and portions of the northern tributary to Gordon Creek (GN2). Other riparian forest habitat is located along the edges of linear wetlands in the central portion of the site (Wetlands TR10-1 and TR10-2) and along Tributary 10 in the southeastern portion of the site (Wetland TR10-3).

No Forest Resources were found to occur within the northernmost small subbasin (TR11). A small, planted tree farm grove that likely would likely not have met significance criteria was located in the north end of the study area, but was cut down in 2020 or early 2021 (Figure 3's aerial imagery is from 2018, so this forest is shown there). An Isolated Upland Forest occurs in the center of the study area, south of the Gordon Creek riparian area, in the western portion of tax lot 1S216A000200. This is the only potential resource that was not identified as Significant, as described below, and is labeled GN1-UFO1.

Although large trees are present (primarily Douglas fir) in GN1-UFO1, the shrub layer has been removed mechanically or by grazing and replaced with Himalayan blackberry in many places, and the herb layer is dominated by non-native species such as dovefoot geranium and non-native pasture grasses, with weeds such as Canada thistle. It is separated from the riparian forest to the north by agricultural structures and frequently used farming equipment, which indicates a frequent and relatively high level of human disturbance to wildlife, especially wildlife seeking escape cover or forage. Since no criteria were rated as high this stand does not meet Significant upland forest habitat criteria as it currently exists (although enhancement potential is high within this area).

Finally, as shown in Figure 3, the majority of the southern portion of the study area was cleared of coniferous forest prior to 2018, resulting in low vegetation and slash piles surrounding relatively narrow riparian areas. Table 3 provides a list of individual Forest Resources, their sizes, individual ecological function scores (Low, Medium, or High), and significance. Summary sheets describing each Forest Resource are provided in Appendix B. Following the 2001 City of Hillsboro Goal 5 Natural Resource Inventory and Assessment (Fishman 2001), Riparian/Upland resource areas were determined to be Significant if they rated "High" for at least one of the five ecological functions listed in Table 3.

***Table 3: Forest Resource Inventory Assessment Results***

| Resource ID[1] | Acres | Wildlife Habitat | WQ Protection | Ecological Integrity | Connectivity | Uniqueness | Meets Significance Criteria? |
|---|---|---|---|---|---|---|---|
| **GN1-R/U1** | 2.92 | High | High | High | High | High | Yes |
| **GN1-R/U2** | 1.58 | High | Medium | Medium | High | Medium | Yes |
| **GN1-UFO1** | 1.27 | Medium | Medium | Medium | Medium | Medium | No |
| **GN2-R/U1** | 6.26 | High | High | High | Medium | High | Yes |
| **GN2-R/U2** | 1.84 | Medium | Medium | Low | Low | High | Yes |
| **TR10-R/U1** | 1.17 | High | High | High | Medium | High | Yes |
| **TR10-R/U2** | 2.33 | High | High | High | Medium | High | Yes |
| **TR10-R/U3** | 1.00 | High | High | High | Medium | High | Yes |
| | **18.37** | **Total Acres** | | | | | |
| | **17.10** | **Total Significant Acres** | | | | | |

As shown in Table 3, all Forest Resources met significance criteria (at least one of the five functions evaluated rated highly) except the isolated forest area GN1-UFO1. Riparian forest unit GN2-R/U2 met the next fewest significance criteria due to extensive weed cover combined with heavy cattle grazing in the northern portions of the unit. However, the presence of larger Oregon white oak trees provides relatively unique habitat in a landscape context, which resulted in a high rating for uniqueness, and elevated the habitat to significance.

During the adoption of the WHVS area into the UGB, there are many opportunities to protect and enhance the existing forest resources and other resources present within the study area. Some of the most easily implemented and effective measures are:

- Design any new crossings of Gordon Creek that may be needed to allow for passage of all suites of wildlife (large mammals, small mammals, amphibians, reptiles, etc.).
- Prioritize the protection of oak woodland and remnant large oak trees.
- Minimize unavoidable impacts to streams and riparian corridors, and, where they can't be avoided, locate them in low-quality riparian corridors (e.g., GN1-R/U2) rather than locating them in higher quality corridors (GN1-R/U1), in order to protect both higher value riparian areas as well as the stream itself.
- Integrate stormwater management with natural systems. For example, place wildlife-friendly detention ponds adjacent to natural areas and acknowledge importance of tree canopy to stormwater detention and delay.
- Protect and improve connections between high-quality habitats by focusing areas of consistent human disturbance outside wildlife travel corridors and by planting of native cover and removing weed barriers (such as Himalayan blackberry).

# 5. PREPARERS AND CONTRIBUTORS

Phil Rickus, DEA Ecologist, and Valerie Thompson, DEA Environmental Specialist, performed the field work. Mr. Rickus is the primary author of this report, and Ethan Rosenthal, DEA Ecologist, and Sarah Bruce, Senior Planner, City of Hillsboro, provided quality control review. Corie Peters, DEA Project Assistant, provided editing assistance. Sara Gilbert, DEA GIS Specialist, conducted GIS analysis and prepared report figures.

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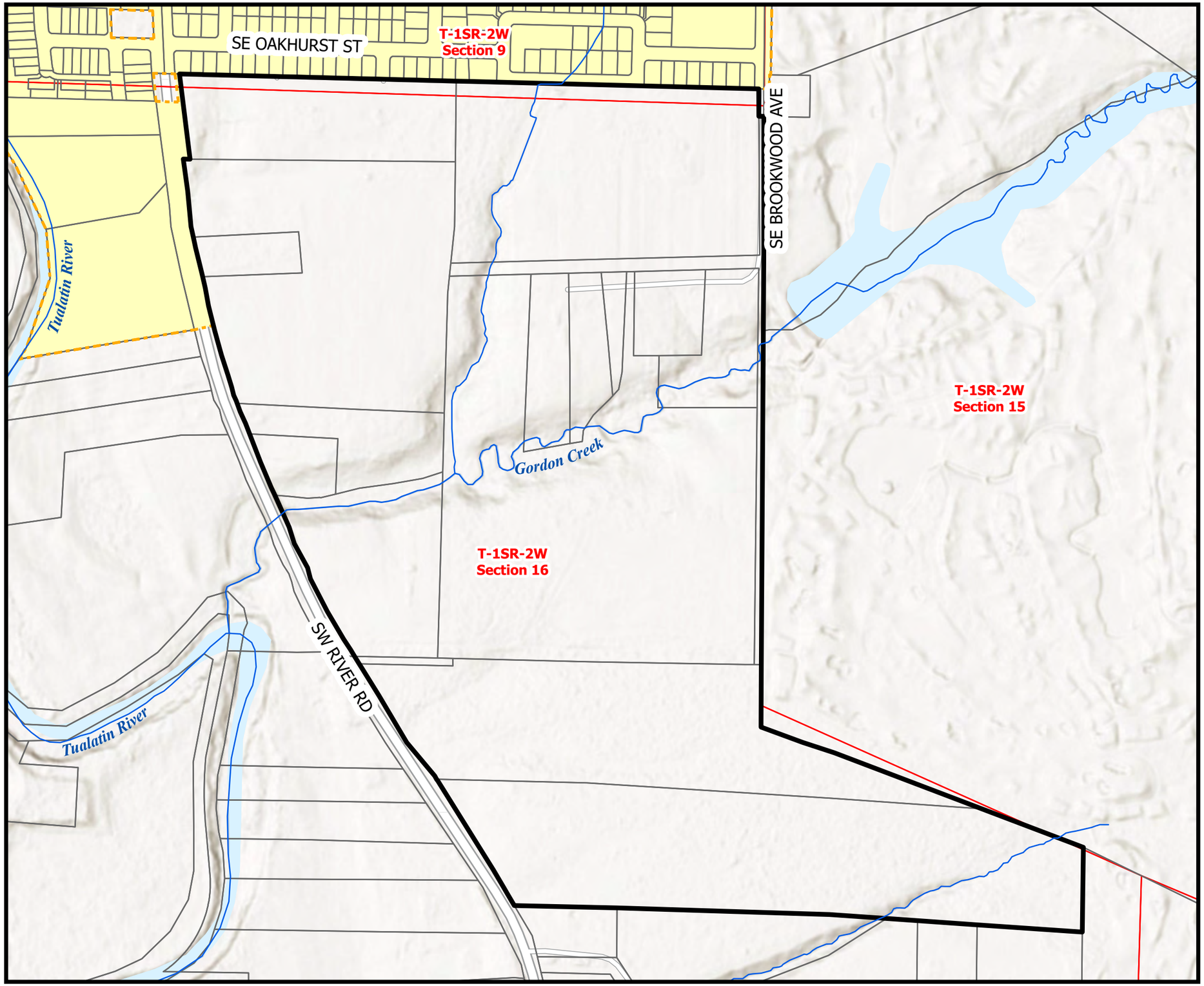
# APPENDICES

# *APPENDIX A: Figures*




# Figure 1
# Vicinity Map

## City of Hillsboro
## Witch Hazel Village South
## Plan Area

## FOREST RESOURCES INVENTORY

- WHVS Study Area
- Hillsboro City Limits
- Washington County Tax Lot
- Intermittent/Perennial Waterway
- PLSS Section

0 250 500 Feet

Data Sources:
WHVS Study Area: City of Hillsboro, 2021
City Limits, Streets: Metro RLIS 2021
Waterways: USGS NHD High Resolution, 2021
Tax Lots: Washington County (via Metro RLIS)

Disclaimer: Information shown on this map is for planning purposes, represents the conditions that exist at the map date, and is subject to change. The location and extent of wetlands and other waters is approximate. There may be unmapped wetlands and other waters present that are subject to regulation. A current Oregon Department of State Lands-approved wetland delineation is required for state removal-fill permits. You are advised to contact the Department of State Lands and the U.S. Army Corps of Engineers with any regulatory questions.

North

Information Current as of:
***April 2021***

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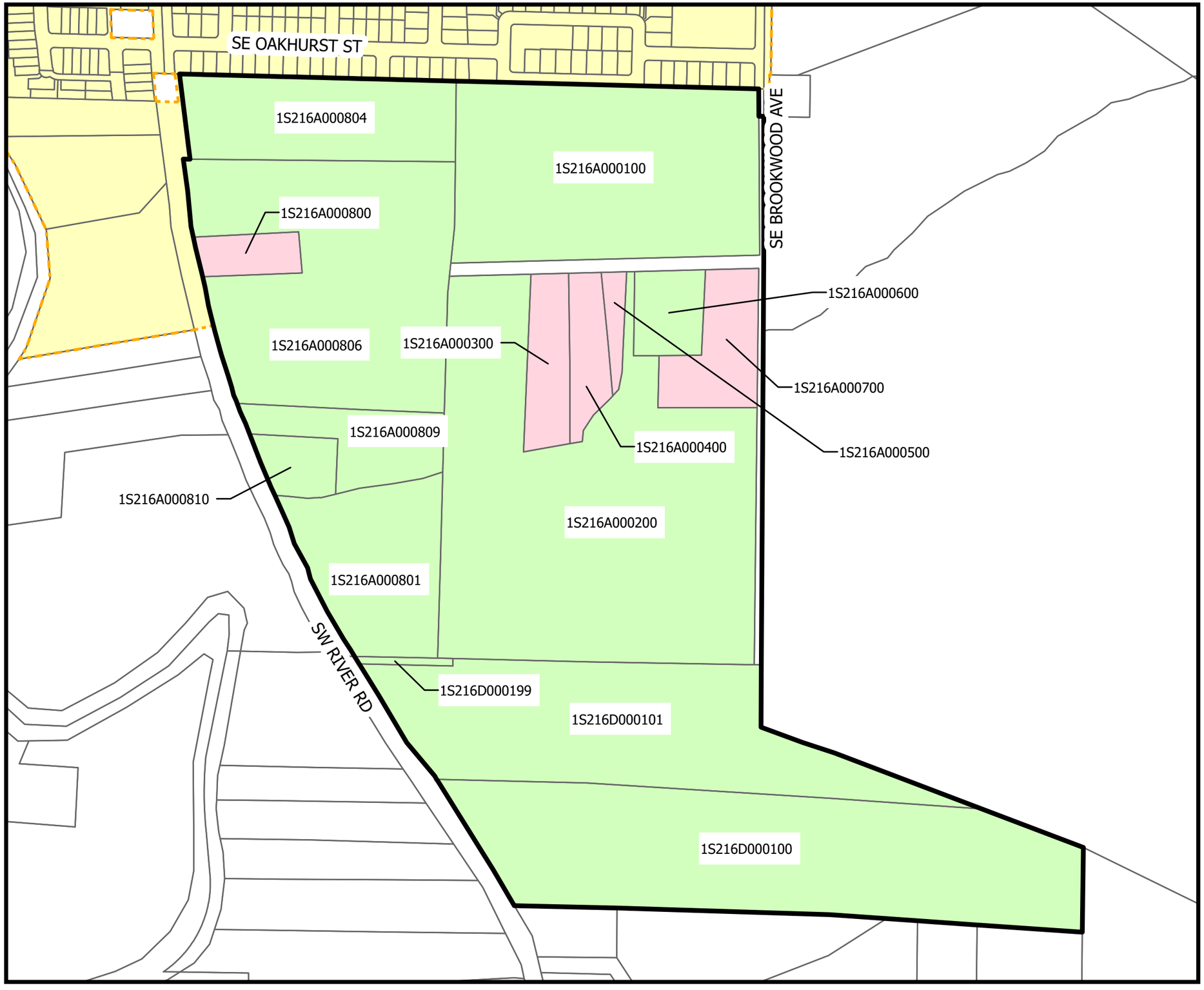


# Figure 2
# Tax Lots and Property Access Map

## City of Hillsboro
## Witch Hazel Village South
## Plan Area

## FOREST RESOURCES INVENTORY

- WHVS Study Area
- Hillsboro City Limits
- Washington County Tax Lot
- Property with Site Access
- Access not granted (as of March 8, 2021)

0 250 500 Feet

Data Sources:
WHVS Study Area: City of Hillsboro, 2021
City Limits, Streets: Metro RLIS 2021
Tax Lots: Washington County (via Metro RLIS)

Disclaimer: Information shown on this map is for planning purposes, represents the conditions that exist at the map date, and is subject to change. The location and extent of wetlands and other waters is approximate. There may be unmapped wetlands and other waters present that are subject to regulation. A current Oregon Department of State Lands-approved wetland delineation is required for state removal-fill permits. You are advised to contact the Department of State Lands and the U.S. Army Corps of Engineers with any regulatory questions.

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# Figure 3
# Aerial Photo

## City of Hillsboro
## Witch Hazel Village South
## Plan Area

## FOREST RESOURCES INVENTORY

**Legend**

WHVS Study Area

0 250 500 Feet

Data Sources:
WHVS Study Area: City of Hillsboro, 2021
Aerial: Portland Metro June 2018

Disclaimer: Information shown on this map is for planning purposes, represents the conditions that exist at the map date, and is subject to change. The location and extent of wetlands and other waters is approximate. There may be unmapped wetlands and other waters present that are subject to regulation. A current Oregon Department of State Lands-approved wetland delineation is required for state removal-fill permits. You are advised to contact the Department of State Lands and the U.S. Army Corps of Engineers with any regulatory questions.

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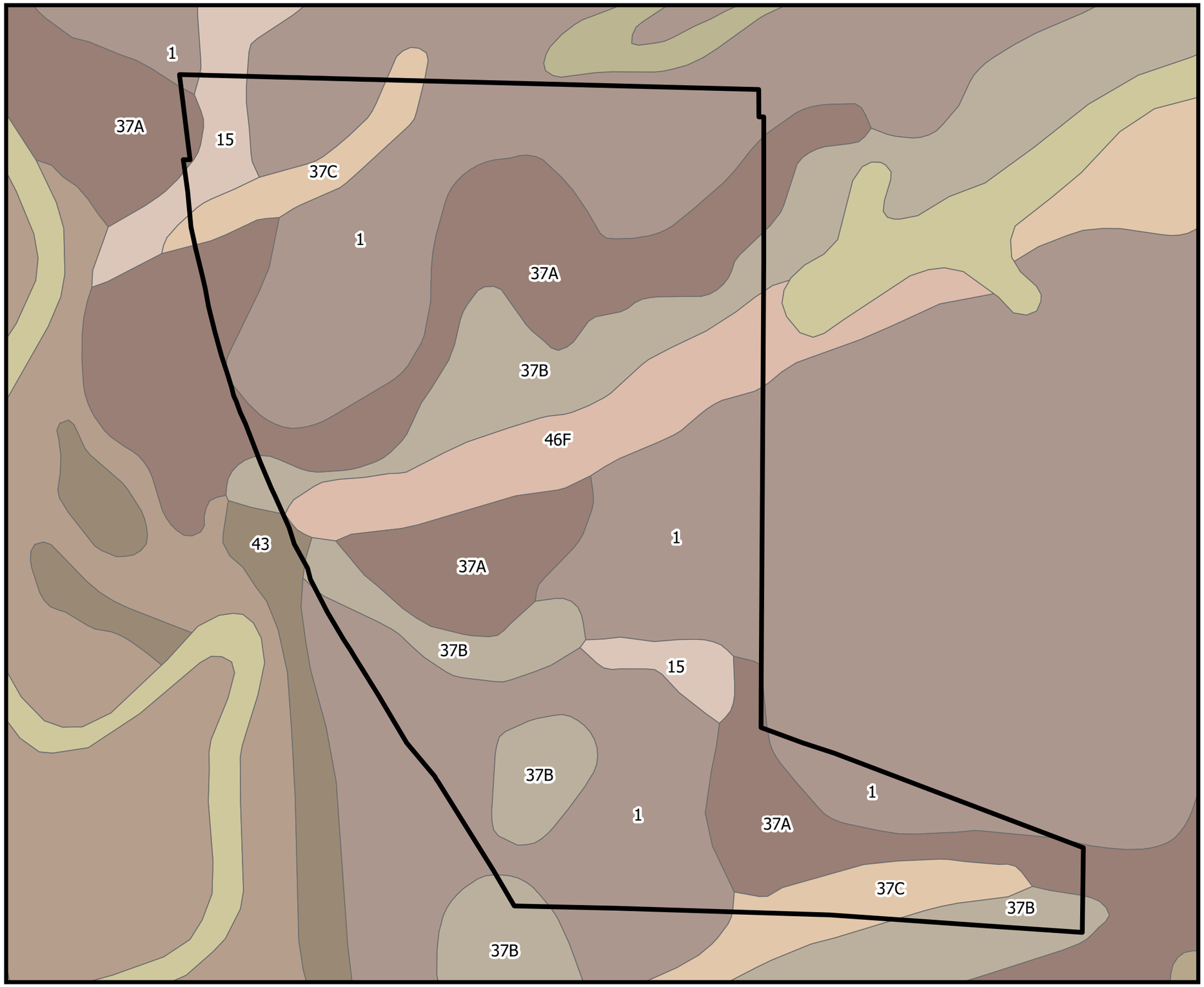


# Figure 4
# NRCS Soils Map

## City of Hillsboro
## Witch Hazel Village South
## Plan Area

## FOREST RESOURCES INVENTORY

WHVS Study Area

NRCS Soil Unit

| Soil ID | Soil Type within Study Area |
|---|---|
| 1 | Aloha silt loam |
| 15 | Dayton silt loam |
| 37A | Quatama loam, 0 to 3 percent slopes |
| 37B | Quatama loam, 3 to 7 percent slopes |
| 37C | Quatama loam, 7 to 12 percent slopes |
| 43 | Wapato silty clay loam |
| 46F | Xerochrepts and Haploxerolls, very steep |

0 250 500 Feet

Data Sources:
WHVS Study Area: City of Hillsboro, 2021
Soils: USDA NRCS, 2021

Disclaimer: Information shown on this map is for planning purposes, represents the conditions that exist at the map date, and is subject to change. The location and extent of wetlands and other waters is approximate. There may be unmapped wetlands and other waters present that are subject to regulation. A current Oregon Department of State Lands-approved wetland delineation is required for state removal-fill permits. You are advised to contact the Department of State Lands and the U.S. Army Corps of Engineers with any regulatory questions.

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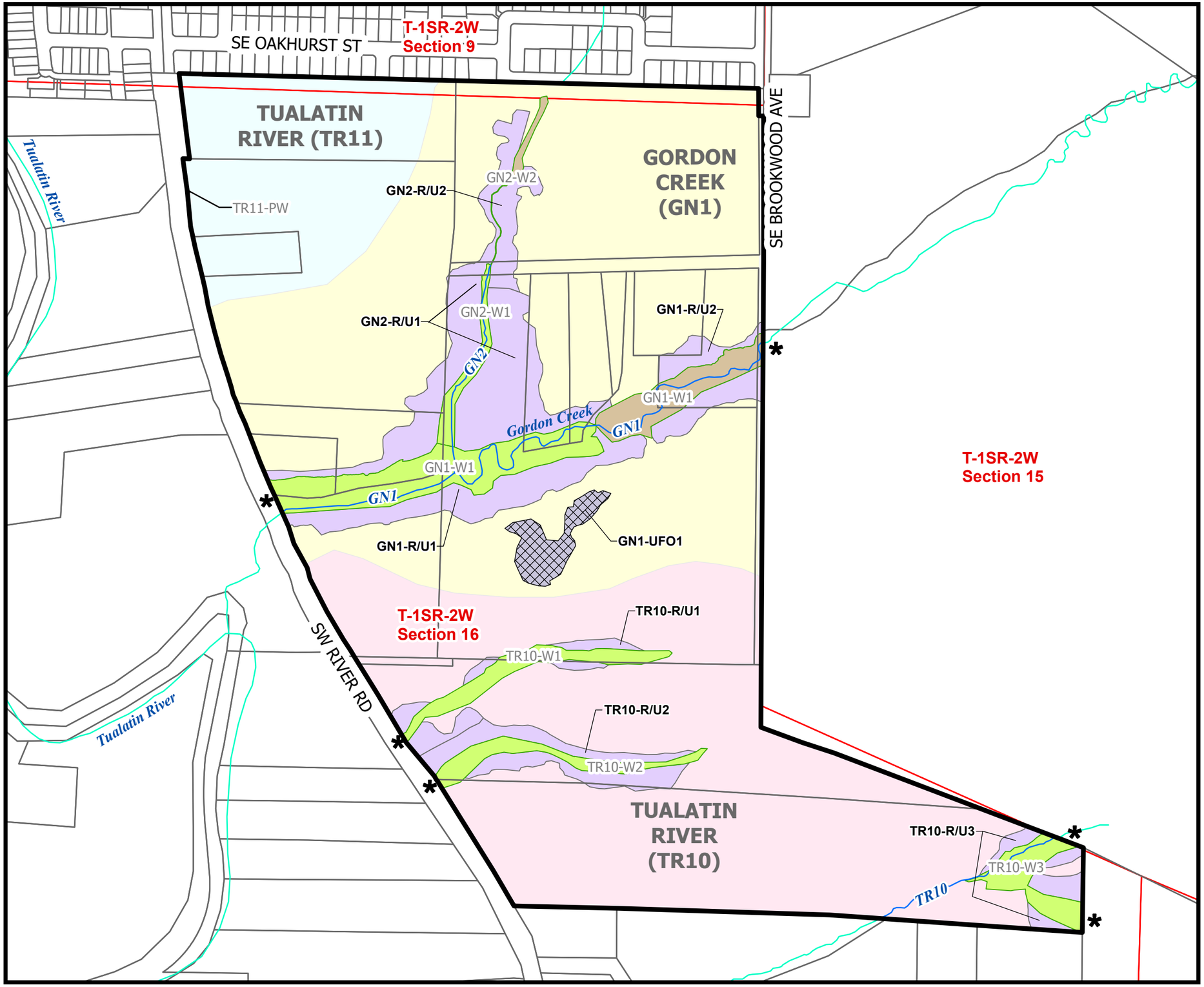
# Figure 5, Overview Map
# Riparian/Upland Forest

## City of Hillsboro
## Witch Hazel Village South
## Plan Inventory




## FOREST RESOURCES INVENTORY

- WHVS Study Area
- Riparian/Upland Forest
- Isolated Upland Forest
- NON Significant Resource
- Wetland extends outside Study Area
- LWI Stream
- Intermittent/Perennial Waterway
- PLSS Section
- Washington County Tax Lot

**LWI Wetlands** (see Note)

- Palustrine Emergent (PEM1B)
- Palustrine Forested (PFO1B)

Note:
W = Wetland
PW = Probable Wetland

**12-Digit/6th-Level Watershed Boundaries**

- Gordon Creek (GN1)
- Tualatin River (TR10)
- Tualatin River (TR11)

0 500 1,000 Feet

Data Sources:
WHVS Study Area: City of Hillsboro, 2021
Riparian/Upland Forest: DEA, 2021
LWI Wetlands: USFWS NWI Wetlands adjusted by DEA within WHVS Study Area in 2021 for WHVS LWI
LWI Streams: USGS NHD Streams adjusted by DEA within WHVS Study Area in 2021 for WHVS LWI
Waterways: USGS NHD High Resolution, 2021
Watershed Boundaries: Clean Water Services Stream Sheds (WBD OR HUC 12), 2021
Tax Lots: Washington County (via Metro RLIS), 2021
PLSS: Metro RLIS, 2021



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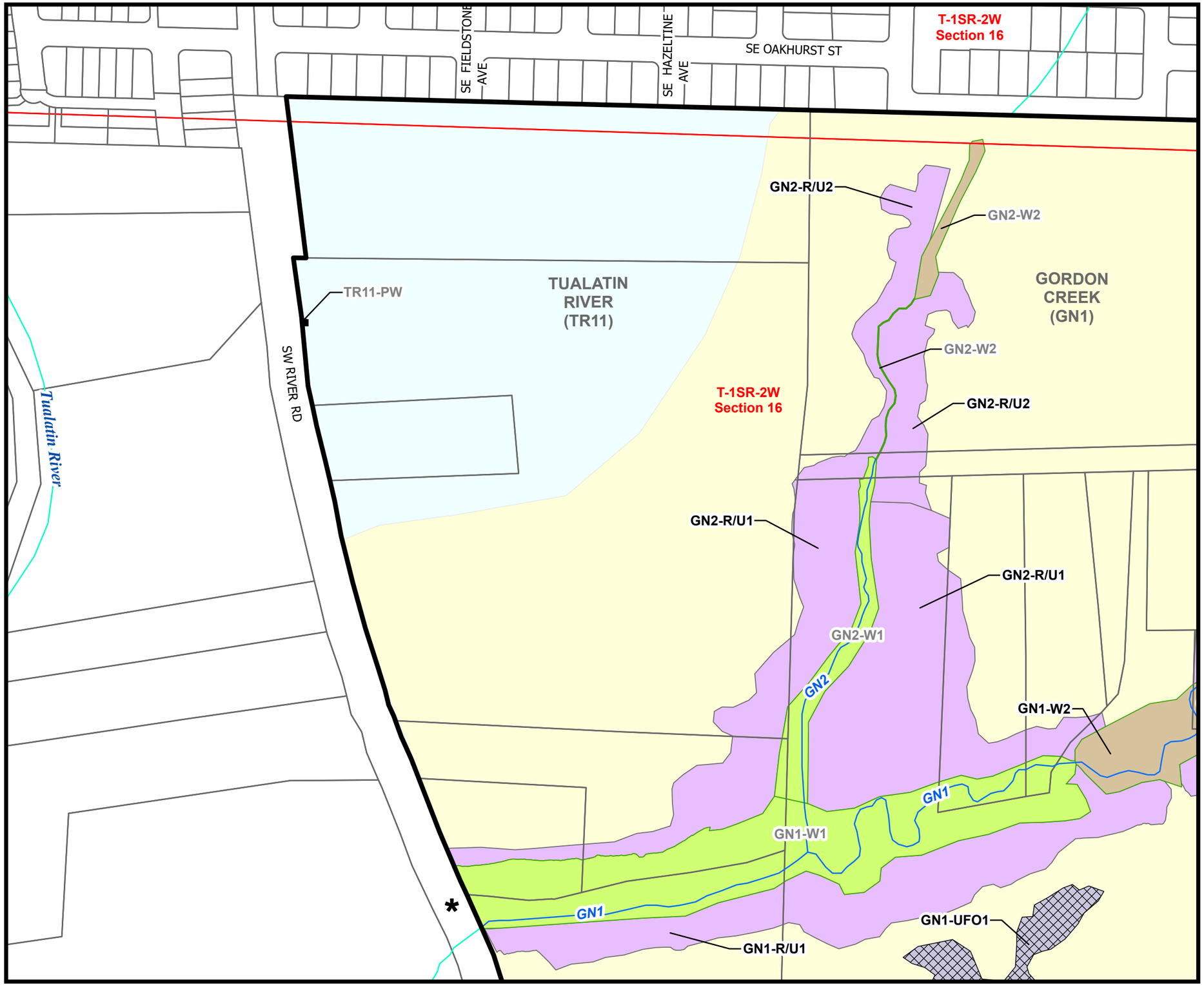
# Figure 5, Sheet 2 of 5
# Riparian/Upland Forests

## City of Hillsboro
## Witch Hazel Village South
## Plan Area




## FOREST RESOURCES INVENTORY

- WHVS Study Area
- NON Significant Resource
- Riparian/Upland Forest
- Isolated Upland Forest
- LWI Stream
- Intermittent/Perennial Waterway
- Culvert
- ✱ Wetland extends outside Study Area
- PLSS Section
- Washington County Tax Lot

**LWI Wetlands** (see Note)

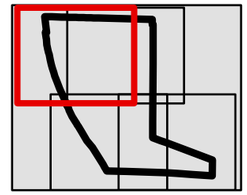
- Palustrine Emergent (PEM1B)
- Palustrine Forested (PFO1B)

Note:
W = Wetland
PW = Probable Wetland

**12-Digit/6th-Level Watershed Boundaries**

- Gordon Creek (GN1)
- Tualatin River (TR10)
- Tualatin River (TR11)

0 125 250 Feet



Data Sources:
WHVS Study Area: City of Hillsboro, 2021
Riparian/Upland Forest: DEA, 2021
LWI Wetlands: USFWS NWI Wetlands adjusted by DEA within WHVS Study Area in 2021 for WHVS LWI
LWI Streams: USGS NHD Streams adjusted by DEA within WHVS Study Area in 2021 for WHVS LWI
Waterways: USGS NHD High Resolution, 2021
Watershed Boundaries: Clean Water Services Stream Sheds (WBD OR HUC 12), 2021
Tax Lots: Washington County (via Metro RLIS), 2021
PLSS: Metro RLIS, 2021



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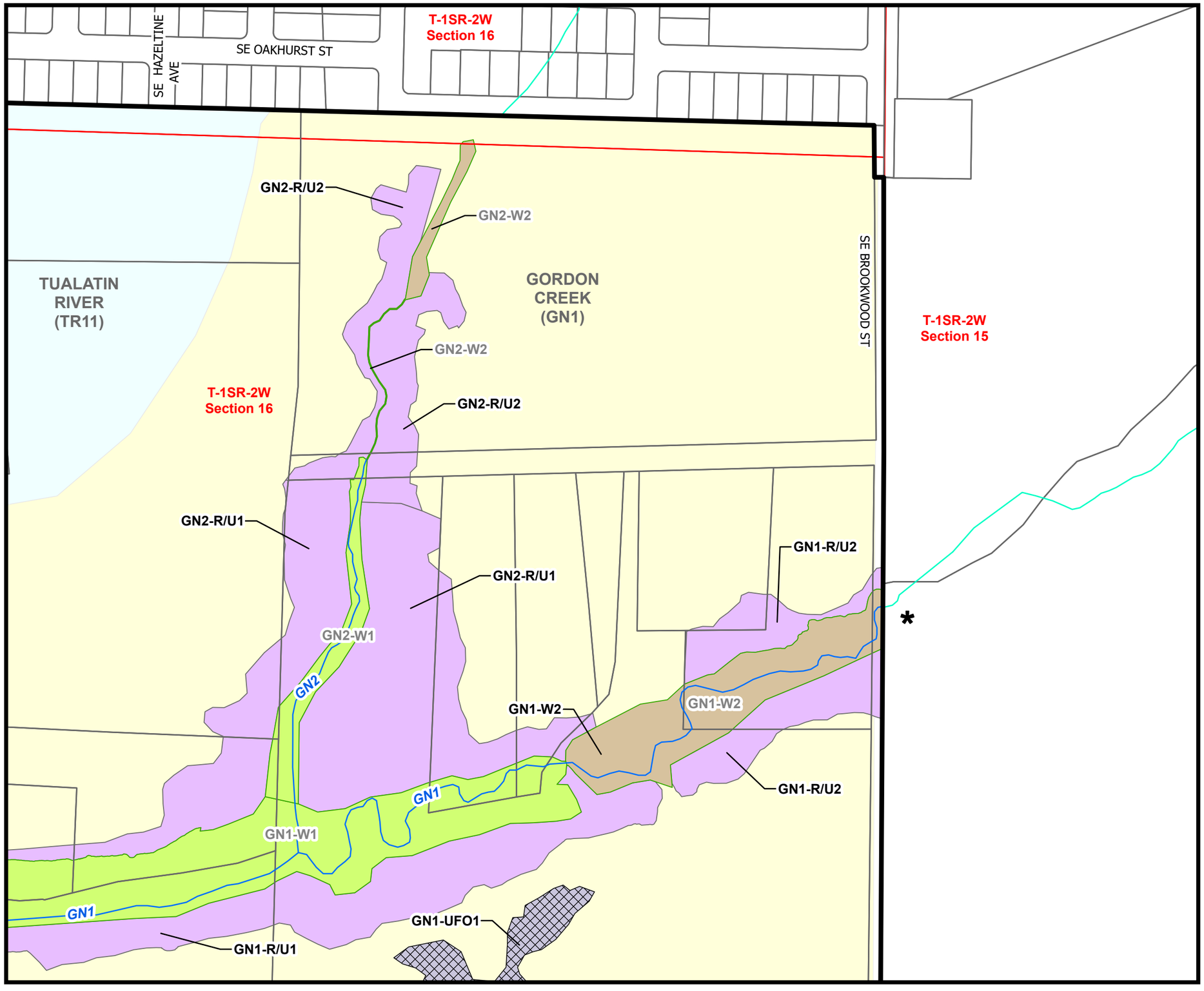



# Figure 5, Sheet 3 of 5
# Riparian/Upland Forests

## City of Hillsboro
## Witch Hazel Village South
## Plan Area

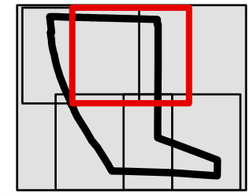
## FOREST RESOURCES INVENTORY

- WHVS Study Area
- NON Significant Resource
- Riparian/Upland Forest
- Isolated Upland Forest
- LWI Stream
- Intermittent/Perennial Waterway
- Culvert
- Wetland extends outside Study Area
- PLSS Section
- Washington County Tax Lot

**LWI Wetlands** (see Note)
- Palustrine Emergent (PEM1B)
- Palustrine Forested (PFO1B)

Note:
W = Wetland
PW = Probable Wetland

**12-Digit/6th-Level Watershed Boundaries**
- Gordon Creek (GN1)
- Tualatin River (TR10)
- Tualatin River (TR11)



0 125 250 Feet

Data Sources:
WHVS Study Area: City of Hillsboro, 2021
Riparian/Upland Forest: DEA, 2021
LWI Wetlands: USFWS NWI Wetlands adjusted by DEA within WHVS Study Area in 2021 for WHVS LWI
LWI Streams: USGS NHD Streams adjusted by DEA within WHVS Study Area in 2021 for WHVS LWI
Waterways: USGS NHD High Resolution, 2021
Watershed Boundaries: Clean Water Services Stream Sheds (WBD OR HUC 12), 2021
Tax Lots: Washington County (via Metro RLIS), 2021
PLSS: Metro RLIS, 2021



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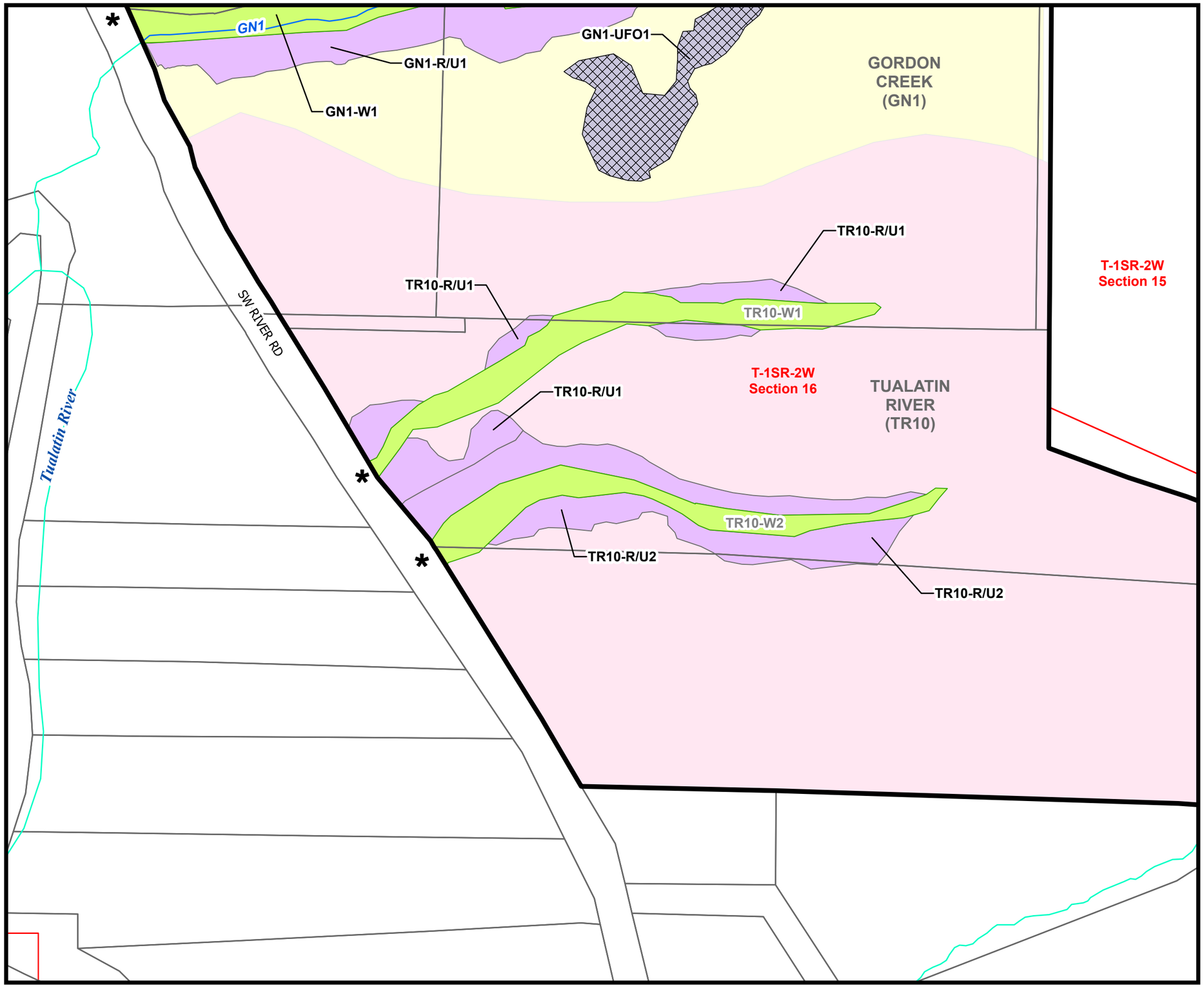


# Figure 5, Sheet 4 of 5
# Riparian/Upland Forests

## City of Hillsboro
## Witch Hazel Village South
## Plan Area

## FOREST RESOURCES INVENTORY

- WHVS Study Area
- NON Significant Resource
- Riparian/Upland Forest
- Isolated Upland Forest
- LWI Stream
- Intermittent/Perennial Waterway
- Culvert
- Wetland extends outside Study Area
- PLSS Section
- Washington County Tax Lot

**LWI Wetlands** (see Note)
- Palustrine Emergent (PEM1B)
- Palustrine Forested (PFO1B)

Note:
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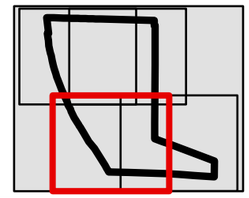
PW = Probable Wetland

**12-Digit/6th-Level Watershed Boundaries**
- Gordon Creek (GN1)
- Tualatin River (TR10)
- Tualatin River (TR11)

0 125 250 Feet



Data Sources:
WHVS Study Area: City of Hillsboro, 2021
Riparian/Upland Forest: DEA, 2021
LWI Wetlands: USFWS NWI Wetlands adjusted by DEA within WHVS Study Area in 2021 for WHVS LWI
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Watershed Boundaries: Clean Water Services Stream Sheds (WBD OR HUC 12), 2021
Tax Lots: Washington County (via Metro RLIS), 2021
PLSS: Metro RLIS, 2021



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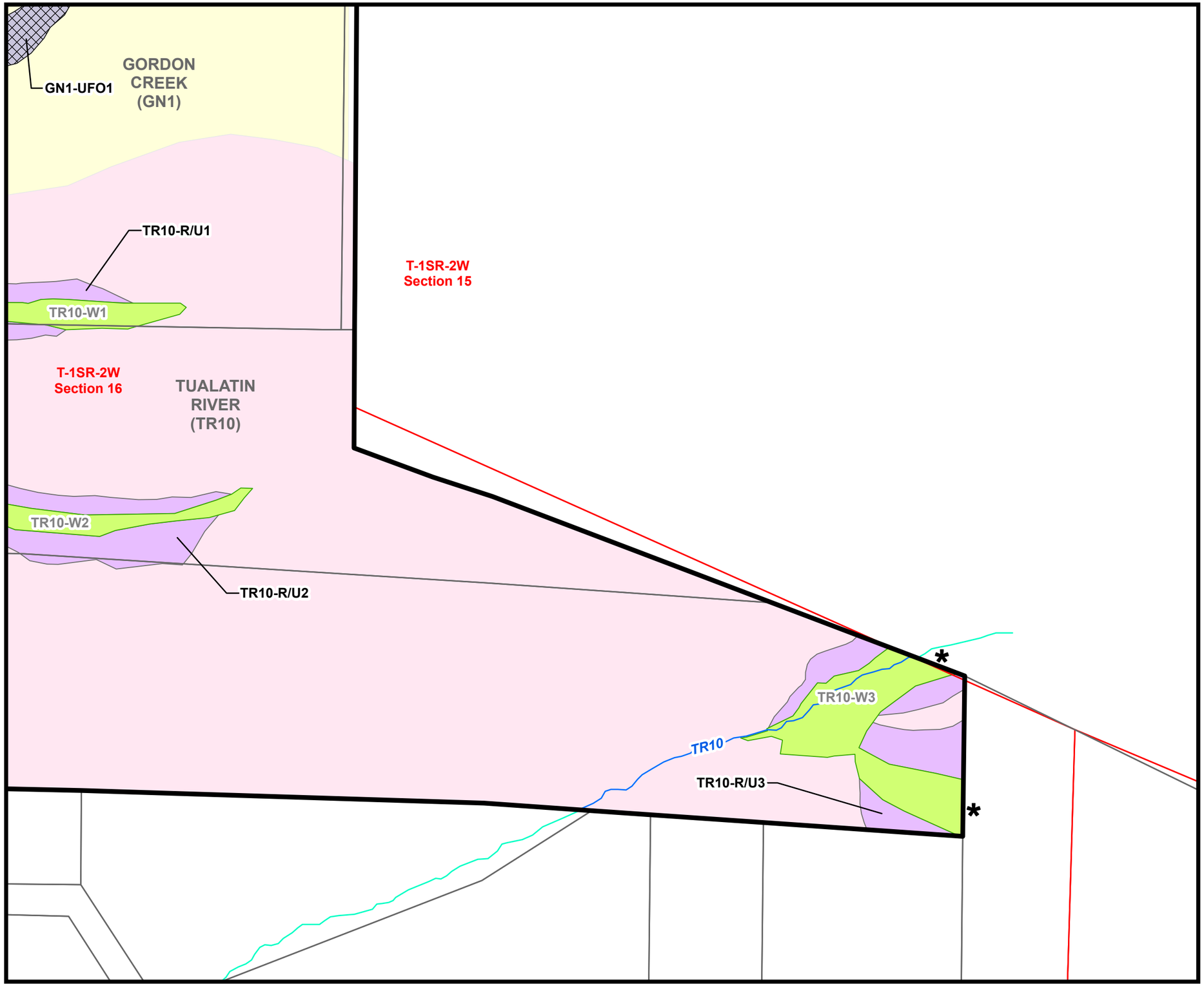


# Figure 5, Sheet 5 of 5
# Riparian/Upland Forests

## City of Hillsboro
## Witch Hazel Village South
## Plan Area

## FOREST RESOURCES INVENTORY

- WHVS Study Area
- NON Significant Resource
- Riparian/Upland Forest
- Isolated Upland Forest
- LWI Stream
- Intermittent/Perennial Waterway
- Culvert
- Wetland extends outside Study Area
- PLSS Section
- Washington County Tax Lot

**LWI Wetlands** (see Note)
- Palustrine Emergent (PEM1B)
- Palustrine Forested (PFO1B)

Note:
W = Wetland
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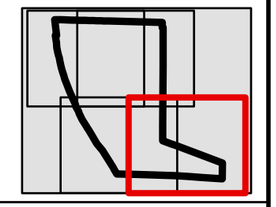
**12-Digit/6th-Level Watershed Boundaries**
- Gordon Creek (GN1)
- Tualatin River (TR10)
- Tualatin River (TR11)



0 125 250 Feet

Data Sources:
WHVS Study Area: City of Hillsboro, 2021
Riparian/Upland Forest: DEA, 2021
LWI Wetlands: USFWS NWI Wetlands adjusted by DEA within WHVS Study Area in 2021 for WHVS LWI
LWI Streams: USGS NHD Streams adjusted by DEA within WHVS Study Area in 2021 for WHVS LWI
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Tax Lots: Washington County (via Metro RLIS), 2021
PLSS: Metro RLIS, 2021



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# *APPENDIX B: Forest Resource Summary Sheets*

# City of Hillsboro
# WITCH HAZEL VILLAGE SOUTH FOREST RESOURCES INVENTORY
## Natural Resources Summary Sheet - Riparian/Upland Forest

**Assessment Unit Code:** GN1-R/U1 **Report Map Sheet: 1, 2, 3**

**Location:** Forest on south side of Gordon Creek, western portion.

**Field Date:** 2/23/2021

**Assessed By:** Phil Rickus, Valerie Thompson, Sarah Bruce

**Adjacent Land Use:** Reserve Golf Course to the east, pasture and homesteads adjacent to Gordon Creek.

**Tax Lot ID(s):** 1S216A 801, 200

**Assessment Unit Size:** 2.92 acre(s)

**General Description:** This resource is the riparian corridor along the south bank of the western portion of Gordon Creek. It consists of steep, forested slopes that are grazed by cattle, resulting in decreased density of native shrubs and herbs, although weed cover is relatively minor. The plant community is typical of a mixed Douglas fir–western redcedar forest, and it borders the wetland Oregon ash forest community. It is extremely narrow in most places, slightly wider in between the wetlands on the west side.

**Mapped Soils:** Aloha silt loam (Map Unit 1), Wapato silty clay loam (Map Unit 43), Xerochrepts and Haploxerolls, very steep (Map Unit 46F), Quatama loam (Map Unit 37A & 37B)

**Dominant Vegetation:** (* = major dominant)

| Trees | Shrubs | Herbs |
|---|---|---|
| Douglas fir* | beaked hazelnut* | western swordfern* |
| western red cedar* | trailing blackberry* | |
| Big-leaf maple | dwarf Oregon grape | |
| red alder | snowberry* | |

**Tallest Tree Species:** Douglas fir (*Pseudotsuga menziesii*), approximately 150 feet tall.

## Riparian/Upland Habitat Functional Assessment

| Function | Rating | Comments/Explanation |
|---|---|---|
| Wildlife Habitat | High | Relatively mature, native forest provides good habitat in spite of grazing effects. |
| Water Quality Protection | High | Relatively wide and intact riparian buffer provides valuable protection to Gordon Creek and associated wetlands (GN1-W1). |
| Ecological Integrity | High | Although grazed by cattle, the understory is largely intact and mostly native species. |

| | | |
|---|---|---|
| Connectivity | High | This is the primary wildlife corridor through the area, which is intact in this reach. |
| Uniqueness | High | Mature, native forest provides unique habitat in a landscape context. |

## Significant? Yes

**Comments/Recommendations:** There are many opportunities to expand riparian buffers around the wetlands to improve wildlife habitat and water quality. Beaver use will be a minor obstacle to plantings. Possible to improve and expand riparian area into the existing disturbed forested area to the south that did not meet significance criteria due to human disturbance and lack of structure. Weeds present include English holly, Himalayan blackberry, Canada thistle, St. John's-wort, and hairy cats-ear, among others. Although weeds are currently a minor component and are of the common variety (primarily lower-priority on the Oregon Department of Agriculture list), the recent forest clearing could contribute to their spread, and ongoing weed control and native plantings would reduce this threat.

# City of Hillsboro
# WITCH HAZEL VILLAGE SOUTH FOREST RESOURCES INVENTORY
## Natural Resources Summary Sheet - Riparian/Upland Forest

**Assessment Unit Code:** GN1-R/U2 **Report Map Sheet: 2**

**Location:** Forest on both sides of Gordon Creek, eastern portion.

**Field Date:** 2/23/2021

**Assessed By:** Phil Rickus, Valerie Thompson, Sarah Bruce

**Adjacent Land Use:** Reserve Golf Course to the east, pasture and homesteads upslope of both banks of Gordon Creek.

**Tax Lot ID(s):** 1S216A 200, 600, 700* (* = assessed offsite)

**Assessment Unit Size:** 1.58 acre(s)

**General Description:** This resource is the riparian corridor along both banks of the eastern portion of Gordon Creek and floodplain wetlands dominated by reed canarygrass (GN1-1). It consists of steep, forested slopes that are primarily ungrazed by cattle, and weed cover is relatively minor. The plant community is typical of a mixed Douglas fir–western redcedar forest, similar to GN2-R/U1, although narrower. Enhancement potential is high.

**Mapped Soils:** Aloha silt loam (Map Unit 1), Xerochrepts and Haploxerolls, very steep (Map Unit 46F), Quatama loam (Map Unit 37A & 37B)

**Dominant Vegetation:** (* = major dominant)

| Trees | Shrubs | Herbs |
|---|---|---|
| Douglas fir* | beaked hazelnut* | western swordfern* |
| western red cedar | trailing blackberry* | |
| Big-leaf maple* | dwarf Oregon grape | |
| red alder* | snowberry* | |

**Tallest Tree Species:** Douglas fir (*Pseudotsuga menziesii*), approximately 140 feet tall.

## Riparian/Upland Habitat Functional Assessment

| Function | Rating | Comments/Explanation |
|---|---|---|
| Wildlife Habitat | High | Relatively mature, native forest provides good habitat. Although somewhat disturbed and lacking structure, connected to the larger Gordon Creek corridor. |
| Water Quality Protection | Medium | Somewhat degraded and narrowed riparian buffer still provides valuable protection to Gordon Creek and associated wetlands (GN1-W2). |

| | | |
|---|---|---|
| Ecological Integrity | Medium | The understory consists of primarily lawn on the north bank. |
| Connectivity | High | This is the primary wildlife corridor through the area, which is relatively intact in this reach and connected to the larger Gordon Creek corridor. |
| Uniqueness | Medium | Somewhat disturbed native forest provides habitat that is not terribly limited in a landscape context. |

## Significant? Yes

**Comments/Recommendations:** There are many opportunities to expand riparian buffers around the wetlands to improve wildlife habitat and water quality. Beaver use will be a minor obstacle to plantings. Possible to improve and expand riparian area into the existing agricultural pasture lands. Powerlines will limit ability to plant beneath them. Weeds present include primarily Himalayan blackberry and common pasture weeds. Although weeds are currently a minor component and are of the common variety (primarily lower-priority on the Oregon Department of Agriculture list), ongoing weed control and native plantings would reduce this threat.

# City of Hillsboro
# WITCH HAZEL VILLAGE SOUTH FOREST RESOURCES INVENTORY
## Natural Resources Summary Sheet - Isolated Upland Forest

**Assessment Unit Code:** GN1-UFO1 **Report Map Sheet: 1, 2, 3, 4**

**Location:** Isolated upland forest on south side of Gordon Creek, central portion.

**Field Date:** 2/23/2021

**Assessed By:** Phil Rickus, Valerie Thompson, Sarah Bruce

**Adjacent Land Use:** Pasture and homesteads lie upslope of the riparian area, with Gordon Creek to the north.

**Tax Lot ID(s):** 1S216A 200

**Assessment Unit Size:** 1.27 acre(s)

**General Description:** This resource consists of a stand of trees that is separated from the riparian forest to the north by agricultural structures and a parking area for farming equipment The shrub layer has been removed mechanically or by grazing, and the herb layer is dominated by non-native species such as dovefoot geranium and non-native pasture grasses.

**Mapped Soils:** Quatama loam (Map Unit 37A), Aloha silt loam (Map Unit 1)

**Dominant Vegetation:** (* = major dominant)

| Trees | Shrubs | Herbs |
|---|---|---|
| Douglas fir* | Himalayan blackberry* | dovefoot geranium * |
| Big-leaf maple* | trailing blackberry | Kentucky bluegrass* |
| | English holly | velvetgrass* |
| | | Canada thistle |

**Tallest Tree Species:** Douglas Fir (*Pseudotsuga menziesii*), approximately 110 feet tall.

## Isolated Upland Forest Habitat Functional Assessment

| Function | Rating | Comments/Explanation |
|---|---|---|
| Wildlife Habitat | Medium | Agricultural structures and farming equipment indicate a frequent and relatively high level of human disturbance. |
| Water Quality Protection | Medium | Separation from adjacent forest and presence of structures and disturbance decreases protection. |
| Ecological Integrity | Medium | The shrub layer is primarily Himalayan blackberry, and herb layer is mostly non-native species. |

| | | |
|---|---|---|
| Connectivity | Medium | The evidence of frequent use by humans and lack of understory decreases connectivity. |
| Uniqueness | Medium | Degraded patches of upland forest are not unique in the area. |

## Significant? No

**Comments/Recommendations:** There is excellent enhancement potential within this stand of trees. Removal of human disturbance and weeds, combined with native herb and shrub plantings, would help connect it to the riparian habitat to the north. Weeds present include Himalayan blackberry, Canada thistle, and St. John's-wort, among others. Oregon white oak plantings could increase the uniqueness of the habitat within the region.

# City of Hillsboro
# WITCH HAZEL VILLAGE SOUTH FOREST RESOURCES INVENTORY
## Natural Resources Summary Sheet - Riparian/Upland Forest

**Assessment Unit Code:** GN2-R/U1 **Report Map Sheet: 1, 2**

**Location:** Forest on north side of Gordon Creek, western portion. Extends north along a portion of the Gordon Creek Tributary.

**Field Date:** 2/23/2021

**Assessed By:** Phil Rickus, Valerie Thompson, Sarah Bruce

**Adjacent Land Use:** Pasture and homesteads lie upslope of the riparian area, with Gordon Creek to the south.

**Tax Lot ID(s):** 1S216A 806, 809, 810, 200, 300*, 400** (* = assessed offsite)

**Assessment Unit Size:** 6.26 acre(s)

**General Description:** This resource is the riparian corridor along the north bank of the western portion of Gordon Creek and the portion of the Gordon Creek Tributary (GN2-1) bisected by Wetland GN2-1. It differs from the south bank riparian area by being less steep, not grazed by cattle, and containing greater cover by deciduous trees rather than coniferous trees. Density of native shrubs and herbs is fair, although cover by English ivy is dense in portions of the eastern half of this community. The plant community is typical of a mixed Douglas fir– big-leaf maple forest, and borders the wetland Oregon ash forest community. Fairly large western red cedar trees lie along portions of the tributary. The west side is fairly narrow due to residential development. Enhancement potential is high.

**Mapped Soils:** Quatama loam (Map Unit 37A), Xerochrepts and Haploxerolls, very steep (Map Unit 46F)

**Dominant Vegetation:** (* = major dominant)

| Trees | Shrubs | Herbs |
|---|---|---|
| Douglas fir* | beaked hazelnut* | western swordfern* |
| Big-leaf maple* | trailing blackberry* | English ivy* |
| western red cedar | dwarf Oregon grape | |
| red alder | snowberry* | |
| Oregon white oak | | |

**Tallest Tree Species:** Western red cedar (*Thuja plicata*), approximately 130 feet tall.

## Riparian/Upland Habitat Functional Assessment

| Function | Rating | Comments/Explanation |
|---|---|---|
| Wildlife Habitat | High | Relatively mature, native forest provides good habitat. |

| | | |
|---|---|---|
| Water Quality Protection | High | Relatively wide and intact riparian buffer provides valuable protection to Gordon Creek and associated wetlands (GN2-W1). |
| Ecological Integrity | High | Although grazed, the understory is largely intact and mostly native species. |
| Connectivity | Medium | This wildlife corridor is intact in this reach, but has been blocked by dense blackberry, and fenced pasture within the unit, and by new residential areas to the north of the study area. |
| Uniqueness | High | Relatively mature, wide, native forest provides unique habitat in a landscape context. |

## Significant? Yes

**Comments/Recommendations:** There are many opportunities to expand riparian buffers around the wetlands to improve wildlife habitat and water quality. Beaver use will be a minor obstacle to plantings. Possible to improve and expand riparian area into the existing disturbed areas dominated by Himalayan blackberry, and incorporate and expand upon large scattered oaks in the upper portions of the riparian area. Weeds present include English holly, Himalayan blackberry, Canada thistle, St. John's-wort, and widespread English ivy, among others.

# City of Hillsboro
# WITCH HAZEL VILLAGE SOUTH FOREST RESOURCES INVENTORY
## Natural Resources Summary Sheet - Riparian/Upland Forest

**Assessment Unit Code:** GN2-R/U2 **Report Map Sheet: 1**

**Location:** Northern reach of tributary north of Gordon Creek.

**Field Date:** 2/23/2021

**Assessed By:** Phil Rickus, Valerie Thompson, Sarah Bruce

**Adjacent Land Use:** Pasture and homesteads lie upslope of the riparian area, with Gordon Creek to the south.

**Tax Lot ID(s):** Map 1S216A 100, 200, 806

**Assessment Unit Size:** 1.84 acre(s)

**General Description:** This resource lies upslope of the upper portion of the tributary (GN2) that drains south to Gordon Creek. The plant community is a mix of Oregon white oak and Oregon ash, with dense cover by Himalayan blackberry mixed with native shrubs in places. The swale above the stream consists of a wetland channel between 1 and 3 feet wide where groundwater is the primary source of water, though surface water may flow during large storm events. Much of the corridor not covered by Himalayan blackberry is impacted by the presence of grazing livestock, which results in large areas of bare ground and low native herbaceous cover. However, the presence of larger Oregon white oak trees provides relatively unique habitat in a landscape context, and enhancement potential is high.

**Mapped Soils:** Aloha silt loam (Map Unit 1), Quatama loam (Map Unit 37A)

**Dominant Vegetation:** (* = major dominant)

| Trees | Shrubs | Herbs |
|---|---|---|
| Oregon ash | Himalayan blackberry* | western swordfern* |
| Oregon white oak* | snowberry* | |
| | English hawthorn | |

**Tallest Tree Species:** Oregon white oak (*Quercus garryana*), approximately 100 feet tall.

## Riparian/Upland Habitat Functional Assessment

| Function | Rating | Comments/Explanation |
|---|---|---|
| Wildlife Habitat | Medium | Relatively mature, native forest provides good habitat in spite of weeds and grazing effects. |
| Water Quality Protection | Medium | Riparian buffer is degraded by weeds and grazing, but fairly wide in most places |
| Ecological Integrity | Low | The understory is degraded by weeds and grazing, with little native shrub structure. |

| | | |
|---|---|---|
| Connectivity | Low | The wildlife corridor has been degraded and cut off to the north. |
| Uniqueness | High | Presence of several mature Oregon white oak trees provides relatively unique habitat in a landscape context, in spite of weed cover. |

## Significant? Yes

**Comments/Recommendations:** Expansion of riparian buffers into the existing disturbed pasture and areas dominated by Himalayan blackberry would improve wildlife habitat and water quality. Weed removal is key to success and expansion of Oregon white oak habitat. Snag and downed wood generation would improve wildlife habitat.

# City of Hillsboro
# WITCH HAZEL VILLAGE SOUTH FOREST RESOURCES INVENTORY
## Natural Resources Summary Sheet - Riparian/Upland Forest

**Assessment Unit Code:** TR10-R/U1 and TR10-R/U2 **Report Map Sheet: 3**

**Location:** Upslope of two hydrologically connected forested wetlands in the southern half of the study area. Assessed together because they are identical in nature.

**Field Date:** 2/23/2021

**Assessed By:** Phil Rickus, Valerie Thompson, Sarah Bruce

**Adjacent Land Use:** Pasture and homesteads to the north and west, cleared forest and shrublands to east and south.

**Tax Lot ID(s):** 1S216A 100; 1S216D000100, 101

**Assessment Unit Size:** 3.50 acre(s): TR10-R/U1 (1.17 acres) and TR10-R/U2 (2.33 acres)

**General Description:** This resource is the riparian corridor along the two narrow, shallow forested wetlands (TR10-W1 and TR10-W2). According to historic air photos the riparian community was wider and historically part of a larger forested area, but the area was logged between 2016 and 2017. The plant community is typical of a mixed Douglas fir–Oregon white oak forest, and borders the wetland Oregon ash forest community. It is extremely narrow in most places, slightly wider in between the wetlands on the west side. Weed cover is relatively minor.

**Mapped Soils:** Dayton silt loam (Map Unit 15), Aloha silt loam (Map Unit 1), Quatama loam, 3 to 7 % slopes (Map Unit 37B)

**Dominant Vegetation:** (* = major dominant)

| Trees | Shrubs | Herbs |
|---|---|---|
| Douglas fir | salal* | western swordfern* |
| Oregon white oak* | dwarf Oregon grape | |
| Big-leaf maple | snowberry* | |
| Black cottonwood | beaked hazelnut | |
| | trailing blackberry* | |

**Tallest Tree Species:** Oregon white oak (*Quercus garryana*), approximately 110 feet tall.

## Riparian/Upland Habitat Functional Assessment

| Function | Rating | Comments/Explanation |
|---|---|---|
| Wildlife Habitat | High | Oaks provide habitat for Oregon Conservation Strategy (OCS) species. |
| Water Quality Protection | High | Although narrow, the riparian buffer provides valuable protection to the wetlands (TR10-W1 and TR10-W2). |

| | | |
|---|---|---|
| Ecological Integrity | High | In the remaining forested habitat, the understory is largely intact and mostly native species. |
| Connectivity | Medium | Forest clearing and pasture in all directions has reduced connectivity. |
| Uniqueness | High | Presence of larger oaks provides unique habitat in a landscape context. |

## Significant? Yes

**Comments/Recommendations:** If the landowners are amenable, there are many opportunities to expand riparian buffers around the wetlands to improve wildlife habitat and water quality. Reconnecting to the forested habitats around The Reserve Golf Course to the east would be especially valuable. The Reserve Golf Course maintains an easement along the north side of TR10-R/U1 that may limit opportunities for restoration somewhat in that area. Weeds present include English holly, Himalayan blackberry, Canada thistle, St. John's-wort, and hairy cats-ear, among others. Although weeds are currently a minor component and are of the common variety (primarily lower-priority on the Oregon Department of Agriculture list), the recent forest clearing could contribute to their spread, and ongoing weed control and native plantings would reduce this threat.

# City of Hillsboro
# WITCH HAZEL VILLAGE SOUTH FOREST RESOURCES INVENTORY
## Natural Resources Summary Sheet - Riparian/Upland Forest

**Assessment Unit Code:** TR10-R/U3 **Report Map Sheet: 3**

**Location:** Southeast corner of the study area.

**Field Date:** 2/23/2021

**Assessed By:** Phil Rickus, Valerie Thompson, Sarah Bruce

**Adjacent Land Use:** Forest and homesteads to the south, cleared forest and shrublands to the north and west, and golf course to the east.

**Tax Lot ID(s):** 1S216D 100

**Assessment Unit Size:** 1.00 acre(s)

**General Description:** This resource is the riparian corridor along the narrow forested wetland headwaters and stream corridor (TR10-W3). According to historic air photos the riparian community was wider and historically part of a larger forested area, but the area was logged between 2016 and 2017. The plant community is now very narrow, but contains larger Oregon white oak, and weed cover is relatively minor except for Himalayan blackberry.

**Mapped Soils:** Aloha silt loam (Map Unit 1), Quatama loam, 0 to 3, 3 to 7 % slopes (Map Unit37A & 37B)

**Dominant Vegetation:** (* = major dominant)

| Trees | Shrubs | Herbs |
|---|---|---|
| Douglas fir* | salal* | western swordfern* |
| Oregon white oak* | snowberry* | |
| Big-leaf maple | beaked hazelnut | |
| Black cottonwood | trailing blackberry* | |
| | Himalayan blackberry* | |

**Tallest Tree Species:** Douglas fir (*Pseudotsuga menziesii*), approximately 110 feet tall.

## Riparian/Upland Habitat Functional Assessment

| Function | Rating | Comments/Explanation |
|---|---|---|
| Wildlife Habitat | High | Oaks provide habitat for Oregon Conservation Strategy (OCS) species. |
| Water Quality Protection | High | Although narrow, the riparian buffer provides valuable protection to the wetlands (TR10-W3). |
| Ecological Integrity | High | In the remaining forested habitat, the understory is largely intact and mostly native species. |

| | | |
|---|---|---|
| Connectivity | Medium | Forest clearing and pasture in all directions has reduced connectivity. |
| Uniqueness | High | Presence of larger oaks provides unique habitat in a landscape context. |

## Significant? Yes

**Comments/Recommendations:** If the landowners are amenable, there are many opportunities to expand riparian buffers around the wetlands to improve wildlife habitat and water quality. Reconnecting to the forested habitats around The Reserve Golf Course to the east would be especially valuable. Although weeds are currently a minor component and are of the common variety (primarily lower-priority on the Oregon Department of Agriculture list), the recent forest clearing could contribute to their spread, and ongoing weed control and native plantings would reduce this threat.

# *APPENDIX C: List of Significant Forest Resources*

| Resource ID[1] | Acres | Wildlife Habitat | WQ Protection | Ecological Integrity | Connectivity | Uniqueness | Meets Significant Criteria? |
|---|---|---|---|---|---|---|---|
| **GN1-R/U1** | 2.92 | High | High | High | High | High | Yes |
| **GN1-R/U2** | 1.58 | High | Medium | Medium | High | Medium | Yes |
| **GN2-R/U1** | 6.26 | High | High | High | Medium | High | Yes |
| **GN2-R/U2** | 1.84 | Medium | Medium | Low | Low | High | Yes |
| **TR10-R/U1** | 1.17 | High | High | High | Medium | High | Yes |
| **TR10-R/U2** | 2.33 | High | High | High | Medium | High | Yes |
| **TR10-R/U3** | 1.00 | High | High | High | Medium | High | Yes |
| | **17.10** | **Total Significant Acres** | | | | | |

# *APPENDIX D: Geodatabase Description with Key Metadata*

Forest Resource Inventory (FRI) Metadata

The Study Area boundary (146.92 acres) was defined by the City of Hillsboro and digitized by David Evans and Associates, Inc. (DEA) by tracing the taxlot boundaries, excluding the ROW.

Wetland delineation was conducted at a reconnaissance level of accuracy suitable for LWI documentation and City planning purposes. DEA biologists conducted field work within the Study Area boundary on February 23, 2021.

Mapping of LWI features was supported through use of high-resolution color aerial photography (ESRI 2020), the USGS NHD high resolution streams layer (USGS 2020), and two-foot LIDAR contour data provided by DOGAMI (2014). Metadata for the LIDAR is as follows:

> *The DOGAMI Lidar Viewer was used to download the standardized set of lidar data in ESRI grid format, tiled to USGS 7.5-minute quadrangles (Hillsboro) and referenced to Ohio Code (45122-E8). Acquisition dates were 2005-2014. Contours were created from the LiDAR grid using ESRI's ArcGIS Pro software.*

Ground truthing occurred on tax lots where access was available and from publicly accessible viewing areas (i.e., roadway right of way). In office review using aerial and LIDAR contours was conducted using GIS technology, which allowed for viewing information at various scales. This included the minimum photo scale of 1 inch = 200 feet required by OAR 141-086-0210(2)(g).

The Metro-RLIS wetlands layer was used as a starting point for mapping wetland resources within the study area. Obvious wetland boundary adjustments were made based on review of the ESRI (2020) aerial photography and roadside reconnaissance. All wetlands were assigned a Cowardin class (i.e., vegetation type such as forested, emergent, etc.) and a hydrogeomorphic (HGM) class (i.e., slope, depression, etc.). Assigning of Cowardin and HGM classes was typically based on field verification where possible, or review of aerial photo and LIDAR contours.

For properties in which site access was available (see Appendix A, Figure 2), wetland and waterway mapping was supported through use of ESRI ArcCollector mapping software linked to a Trimble R1 GPS unit with typical accuracy of one meter or better. Representative boundary and sample plot locations were collected and then exported to GIS format (i.e., Esri shapefile format). Although typical GPS accuracy is considered one meter or better, the mapping accuracy of field verified wetlands should be considered to be five meters (16.4 feet) or better, since the wetland boundary were mapped using lidar where access was blocked by blackberry or poison oak.

Streams and other waters were mapped in accordance with OAR 141-086-0210(19), which states that "Streams and other waters must be mapped, but no further documentation such as wetland summary sheets or OFWAM assessment is required. If an existing stream geospatial dataset is used, it may be necessary to adjust the layer to align with riparian or other linear wetlands." Such adjustments were not found to be necessary.

Mapping of streams started with use of the USGS NHD high resolution streams GIS layer, which matched very closely with LIDAR contours (DOGAMI 2014). Stream lines were modified based on field observations where access was available. In other areas, stream lines were adjusted to better match topographic contours and aerial photo interpretation, although the NHD linework appeared to be highly accurate and few adjustments were needed.

GIS data produced by DEA was originally created using the state plane, Oregon north coordinate system, North American Datum of 1983 (NAD83) horizontal datum, HARN, International Feet, per the City of Hillsboro specifications to maintain consistency with other Community Plan mapping efforts. A version of this data was then reprojected into the Lambert system to comply with Oregon statewide wetland mapping standards required by DSL.

The following resource naming conventions (assessment unit codes) are used to describe forest habitats: those connected to a waterway, referred to as Riparian/Upland Forests (each resource's assessment unit code includes the term "R/U" along with a watershed/tributary signifier and an assessment unit number, usually only one digit); and Isolated Upland Forests (each resource's assessment unit code includes the term "UFO" along with an assessment unit number, usually only one digit). No isolated forests were mapped within the study area.

Baselayers:

DEA maintains a subscription to the Metro RLIS data. The Metro RLIS roads layer was clipped and used to populate the TRANSPORTATION feature class. The TAX_LOTS layer, dated February 2021, includes only the Metro RLIS taxlots which are included in the Study Area; the TAX_LOTS_Vicinity layer includes taxlots in the greater vicinity.

The Hillsboro_City_Limits and PLSS feature classes were downloaded from Oregon Geospatial Clearinghouse. The PLSS layer contains Township, Range, and Section location data.

Watershed boundaries are from Clean Water Services (CWS) stream sheds data layer. This dataset represents the 6th level (12-digit) hydrologic unit boundaries from the Watershed Boundary Dataset (WBD) layer for Oregon. Hydrologic units within the WBD_OR_HUC_12 represent drainage areas delineated to the 6th level drainage systems.

The high-resolution stream layer was downloaded from the USGS website in March 2021. The NHD_Stream feature classes include data that is clipped to the Study Area while the NHD_STREAM_outside_Study_Area feature class contains only data outside the Study Area boundary. The LWI_STREAM linework is the same as the NHD stream layer except where DEA wetland biologists have altered it due to field verification. There are three streams in the feature class: Gordon Creek (GN1 and GN2) and Tualatin River (TR10).

The following feature classes are from the DSL Wetlands Data template and were not populated with data for this project: ARTIFICIAL_FEAT_LINE, ARTIFICIAL_FEAT_LINE, NATURAL_BODY, PROBABLE_WETLAND_POINTS

USGS website: https://www.usgs.gov/core-science-systems/ngp/national-hydrography/watershed-boundary-dataset?qt-science_support_page_related_con=4#qt-science_support_page_related_con