



Forest Grove

Westside Planning Project

David Hill & Gales Creek Road Area
Purdin Road Area
Elm Street Area



Natural Resources Overview

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SCJ ALLIANCE
CONSULTING SERVICES

Forest Grove Westside Planning Project Natural Resources Overview

Project Information

Project: Forest Grove Westside Planning Project
Natural Resources Overview

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1. EXECUTIVE SUMMARY

This report provides a planning level assessment and description of natural resources within and near the City of Forest Grove – but specifically targeting three areas proposed for future urban development: the David Hill and Gales Creek Road area (DHG)¹, the Purdin Road UGB (PR), and the Elm Street UGB (ES). These three areas are being assessed to address and resolve land use and infrastructure needs to guide future development.

The DHG planning area is located northwest of the City, and includes steep slopes, seasonal drainage ravines and landslide hazard areas that create unique challenges for road building and development. PR planning area is located north of the City (east of the DHB planning area), and is relatively flat, but with fine-textured floodplain soils, and is bordered by riparian areas to the north and south. The ES planning area is located south of the City, and is also relatively flat, located on a low terrace, about 10 to 15 feet higher than the adjacent Tualatin River floodplain. Current land use in the DHG area is a combination of agriculture, forest land and single-family development. Current land use in the PR and ES areas is primarily agriculture.

This report is intended to provide project planners with a hydrological and ecological baseline assessment, which will inform and support planning and development decisions in the Westside Planning areas. The information gathered is based only on paper research – a compilation of information already documented, but organized to provide context and to support an informed decision-making and planning process for the City. The review focuses on State Planning Goal 5 resources including: Riparian corridors; Wetlands; Wildlife Habitat; Groundwater Resources; Oregon

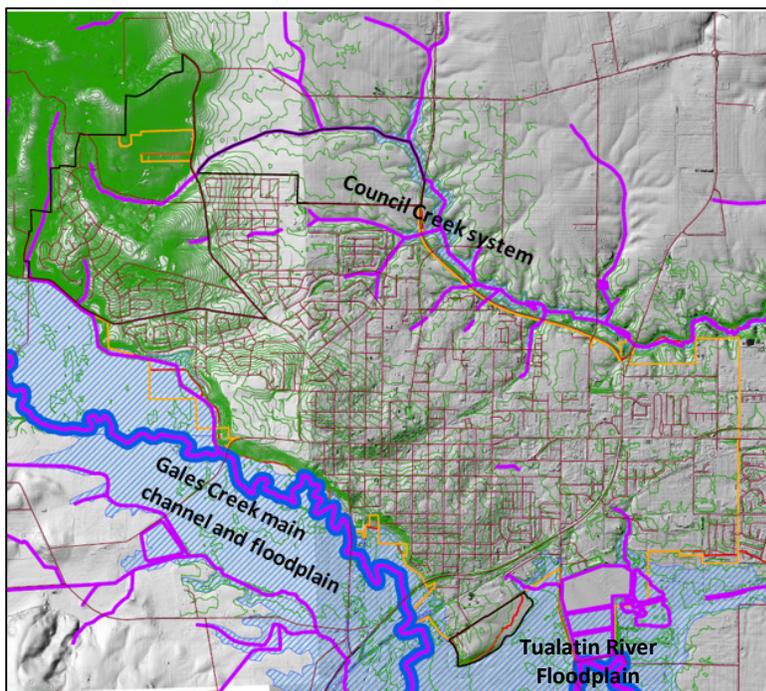


Figure 1. Gales Creek and Tualatin River Floodplains

Recreation Trails; Mineral and Aggregate Resources; Cultural areas. The following other Goal 5 resources do not occur in the Forest Grove study area, and therefore are not discussed in the report: Oregon Scenic Waterways and Federal Wild and Scenic Rivers; Designated Natural Areas; Wilderness Areas; Energy Sources.

The Gales Creek/ Tualatin River floodplain area (along the southwest perimeter of Forest Grove, see **Figure 1**) is a key natural resource feature within the greater Forest Grove study area, containing agriculture, riparian corridors, wetlands and critical salmonid habitat.

¹ It should be noted that the primary focus of this planning area is on David Hill in the area north of Watercrest Road – partially outside of the current City Limits but within the UGB. The Gales Creek area to the south of Watercrest is included primarily to address issues related to context and connectivity.

Headwater tributaries of Council Creek (**Figure 2**), run along and within the northern side of Forest Grove. The main channel of Council Creek runs north/south along the highway to the east, forming the eastern boundary of the Purdin Road Planning area. An unnamed tributary flows east/west along the north side of the PR planning area. The channel for this tributary has been physically modified. These headwater streams form a small, but locally important drainage system, flowing in ditches between and within farm fields and through neighborhoods, creating opportunities for interconnected walking trails and wildlife habitat corridors within the City. Council Creek and Gales Creek systems flow south and southeast respectively, eventually merging with the Tualatin River south and southeast of Forest Grove.



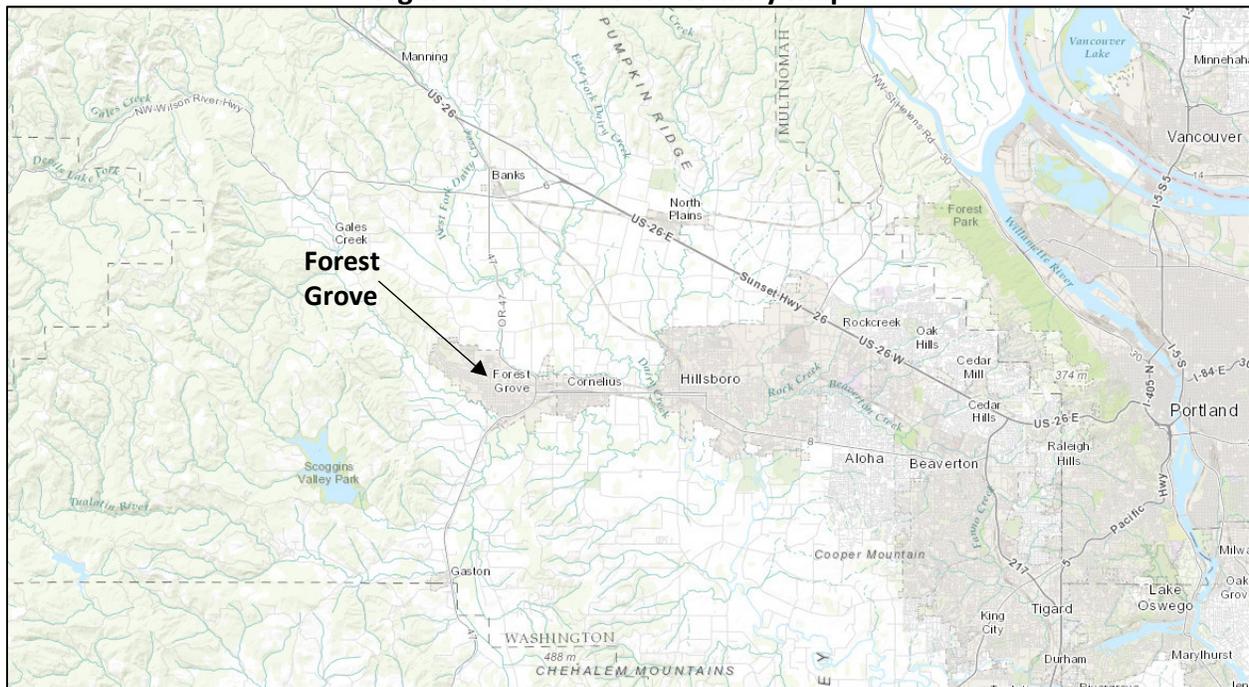
Figure 2. Portion of Northern Planning Areas (David Hill and Gales Creek Road; Purdin Road) and Side Tributary Headwaters of Council Creek

2. INTRODUCTION

2.1 Natural Resources Overview

This report provides a description of natural features and conditions in the Forest Grove area (see **Figure 3** for a vicinity map) that have potential to affect natural resource management as well as planning and design for infrastructure and land use. This is a summary report, and intended to provide a general context of existing conditions in three perimeter urban expansion areas north and south of Forest Grove.

Figure 3. Forest Grove Vicinity Map



The City of Forest Grove is situated in the Tualatin River Watershed, at the western edge of the Portland metropolitan area, where surface terrain transitions from broad, flat alluvial valley floors of the Willamette Valley Ecoregion to the basalt foothills of the Coast Range Ecoregion. It is bordered to the south by the Gales Creek sub-basin, and to the north by the Council Creek system – a tributary at the lower end of the greater Dairy Creek sub-basin. The three perimeter areas that Forest Grove has targeted for expansion and urban development are: the David Hill and Gales Creek Road planning area (DHG); the Purdin Road planning area (PR); and Elm Street planning area (ES).

The DHG planning area is northwest of the City, with the northern portion in the Council Creek sub-basin and the southwestern portion in the Gales Creek basin. DHG planning area includes steep slopes, seasonal drainage ravines and landslide hazard areas that create unique challenges for road building and development. PR planning area is located north of the City, in the Council Creek sub-basin, directly east of the DHG planning area. The PR planning area is relatively flat, but with fine-textured floodplain soils, and is bordered by riparian areas to the north and south. The ES planning area is located south of the City, in the Gales Creek basin. ES is relatively flat, on a low terrace adjacent to and 10 to 15 feet higher than the adjacent Tualatin River floodplain.

Under Oregon State Planning Goal 5 guidelines (OAR 660-015-0000[5]), local governments are encouraged to adopt programs designed to protect natural resources as well as to conserve scenic and historic areas and open space. Local governments and state agencies are also encouraged to maintain current inventories for Historic Resources, Open Spaces and Scenic Views and Sites. Forest Grove has already implemented several programs designed to carry out certain aspects of this work.

Goal 5 (adopted in 1982 and updated in 1996) provides a five-step planning process:

1. Inventory local occurrences of resources listed in Goal 5, and decide which ones are important.
2. Identify potential land uses on or near each resource site and any conflicts that might result.
3. Analyze economic, social, environmental, and energy (ESEE) consequences of such conflicts.
4. Decide whether the resource should be fully or partially protected, and justify the decision.
5. Adopt measures such as zoning to put that policy into effect

Under Goal 5 guidance, the following resources are to 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.

In addition, local governments and state agencies are encouraged to maintain current inventories of the following resources:

- a. Historic Resources;
- b. Open Space;
- c. Scenic Views and Sites.

GUIDELINES FOR GOAL 5 (<http://www.oregon.gov/LCD/docs/goals/goal5.pdf>)

A. PLANNING

1. *The need for open space in the planning area should be determined, and standards developed for the amount, distribution, and type of open space.*
2. *Criteria should be developed and utilized to determine what uses are consistent with open space values and to evaluate the effect of converting open space lands to inconsistent uses. The maintenance and development of open space in urban areas should be encouraged.*
3. *Natural resources and required sites for the generation of energy (i.e. natural gas, oil, coal, hydro, geothermal, uranium, solar and others) should be conserved and protected; reservoir sites should be identified and protected against irreversible loss.*
4. *Plans providing for open space, scenic and historic areas and natural resources should consider as a major determinant the carrying capacity of the air, land and water resources of the planning*

area. The land conservation and development actions provided for by such plans should not exceed the carrying capacity of such resources.

- 5. The National Register of Historic Places and the recommendations of the State Advisory Committee on Historic Preservation should be utilized in designating historic sites.*
- 6. In conjunction with the inventory of mineral and aggregate resources, sites for removal and processing of such resources should be identified and protected.*
- 7. As a general rule, plans should prohibit outdoor advertising signs except in commercial or industrial zones. Plans should not provide for the reclassification of land for the purpose of accommodating an outdoor advertising sign. The term "outdoor advertising sign" has the meaning set forth in ORS 377.710(23).*

3. METHODS

3.1 Resource Information and Mapping Resources Reviewed

The following resource information and data sources were consulted in the preparation of this report. Additional materials are listed in the attached List of References.

- [Oregon Department of Land Conservation and Development](http://www.oregon.gov/LCD/docs/goals/goal5.pdf) GOAL 5 regulations (OAR 660-015-0000(5) and guidelines were reviewed to ensure that this report provided adequate discussion on GOAL 5 resource assessment requirements.
<http://www.oregon.gov/LCD/docs/goals/goal5.pdf>
- Oregon Dept. of Fish & Wildlife (<http://www.dfw.state.or.us/>) Oregon Plan for Salmon & Watersheds (<http://www.oregon.gov/OPSW/pages/index.aspx>)
- GIS mapping layers provided by PBS Engineering and Environmental (who also provided the project Geological and Geotechnical Assessment Report)
- City of Forest Grove website (<http://www.forestgrove-or.gov/>) for information on various parks, trails and related systems.
- The Oregon State Department of Environmental Quality, Drinking Water Program, which provides information on the Forest Grove water supply system:
(<http://www.deq.state.or.us/wq/dwp/docs/swasummary/pws00305.pdf>)
- The Tualatin River Water Shed Council website provides several resource maps as well as excellent description of the Tualatin Basin watershed (<http://trwc.org/tualatin-basin-information/>)
- Washington County NRCS Soil Survey (online version: WEB Soil Survey (<http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>)
- National Wetland Inventory Mapper (<http://www.fws.gov/wetlands/data/mapper.HTML>)
- Google Earth historic timeline aerial photos of the project areas

4. FINDINGS

4.1 Goal 5 Summary

Goal 5 guidelines (OAR 660-015-0000[5]) encourage local governments to adopt natural resource protection programs and to conserve scenic and historic areas and open space. The following resources are to be inventoried: Riparian corridors; Wetlands; Wildlife Habitat; Federal Wild and Scenic Rivers; State Scenic Waterways; Groundwater Resources; Approved Oregon Recreation Trails; Natural Areas; Wilderness Areas; Mineral and Aggregate Resources; Energy sources; Cultural areas.

The following Goal 5 Resources **do not exist or are not currently designated** in the Forest Grove Planning Areas, and therefore, are not discussed below:

- **Oregon Scenic Waterways and Federal Wild and Scenic Rivers:** No local rivers are designated as wild and/or scenic in the Forest Grove area.
- **Natural Areas:** The nearest designated Natural Area, per the Oregon State Register is Banks Swamp, 5.5 miles north of Forest Grove.
- **Wilderness Areas:** No wilderness areas are located near Forest Grove Planning Area; they occur in the Cascade Range (about 80 miles east) and along the Oregon Coastline (about 40 mile west).
- **Energy Sources:** This is predominantly focused on large-scale wind, geothermal or water energy facilities, although may also control issues along powerline transmission corridors. No new energy facility sites are located in or near Forest Grove.

The following Goal 5 resources **do exist** in or near the Forest Grove Planning Areas, and will be characterized below:

- Riparian corridors;
- Wetlands;
- Wildlife Habitat;
- Groundwater Resources;
- Oregon Recreation Trails;
- Mineral and Aggregate Resources;
- Cultural areas.

4.2 Planning Areas: David Hill and Gales Creek Road; Purdin Road; and Elm Street

The City of Forest Grove is situated in the greater Tualatin River Drainage Basin (**Figure 4**), which forms the foundation for surface and subsurface hydrologic systems in the Westside Planning Areas. The basin headwaters emanate from the Coast Range foothills, dominated by a basalt bedrock foundation. Lower elevation portions of the basin flow through Willamette Valley floodplains. Forest Grove is situated at the transition between those two geologic and ecologic regional systems. The City is bordered to the south by the Gales Creek sub-basin, and to the north by the Council Creek system – a tributary at the lower end of the greater Dairy Creek sub-basin (described in more detail below). The confluence of these sub-basins with the main channel of the Tualatin River is located directly south of the City.

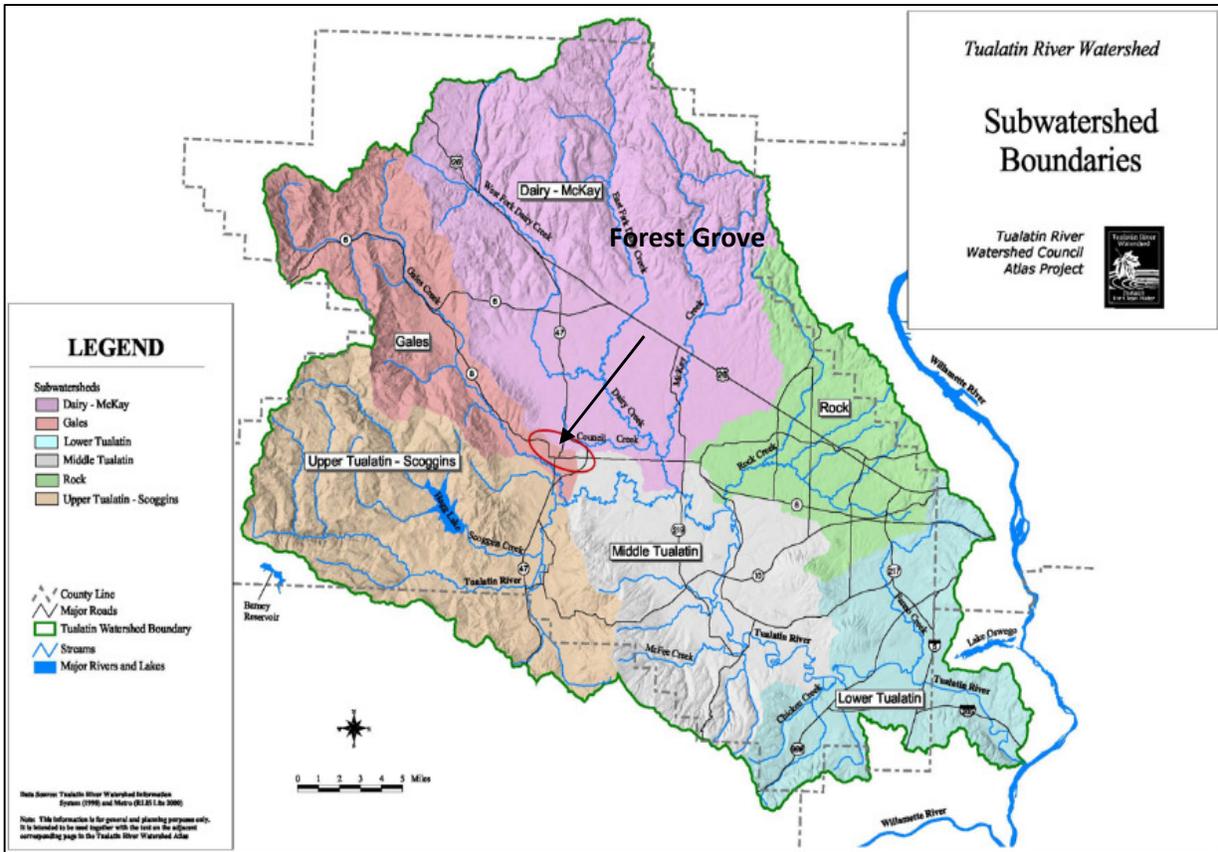


Figure 4. Tualatin Basin (Figure borrowed from Tualatin River Watershed Council map gallery) <http://trwc.org/tualatin-basin-information/>

4.2.1 Planning Areas Descriptions

As described previously, three perimeter areas are targeted for expansion and urban development: the David Hill planning area (including the Gales Creek area for context and connectivity); the Purdin Road planning area; and Elm Street planning area. The David Hills and Gales Creek Road (DHG) and Purdin Road (PR) planning areas are located northwest of the City (Figure 5).

The DHG planning area is located in foothills northwest of the City and includes areas with steep slopes, seasonal drainage ravines and landslide hazard slopes, which create unique challenges for road building and development. The southern majority of the DHG is within the Forest Grove City limit, and includes densely developed neighborhoods, as well as

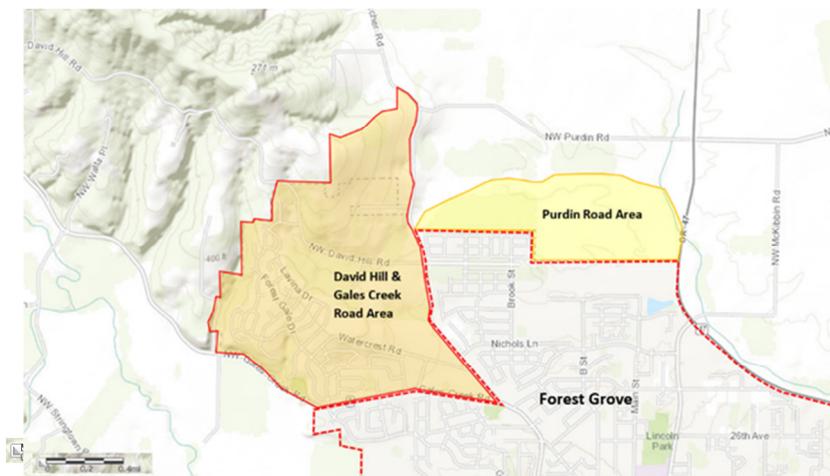


Figure 5. David Hill / Gales Creek Road Area and Purdin Road UGB Area

undeveloped agricultural lands and areas managed as forest land/ tree farms (**Figure 6**, Existing Vegetation). The northern end of DHG is outside of the City, bounded to the east by NW Thatcher Road, but within the Urban Growth boundary. It is currently managed as agricultural and forest land with scattered single-family homes. The southwestern portion of DHG (dense neighborhood area) drains to the Gales Creek basin floodplain; the northern portion of DHG drains to the Council Creek system.

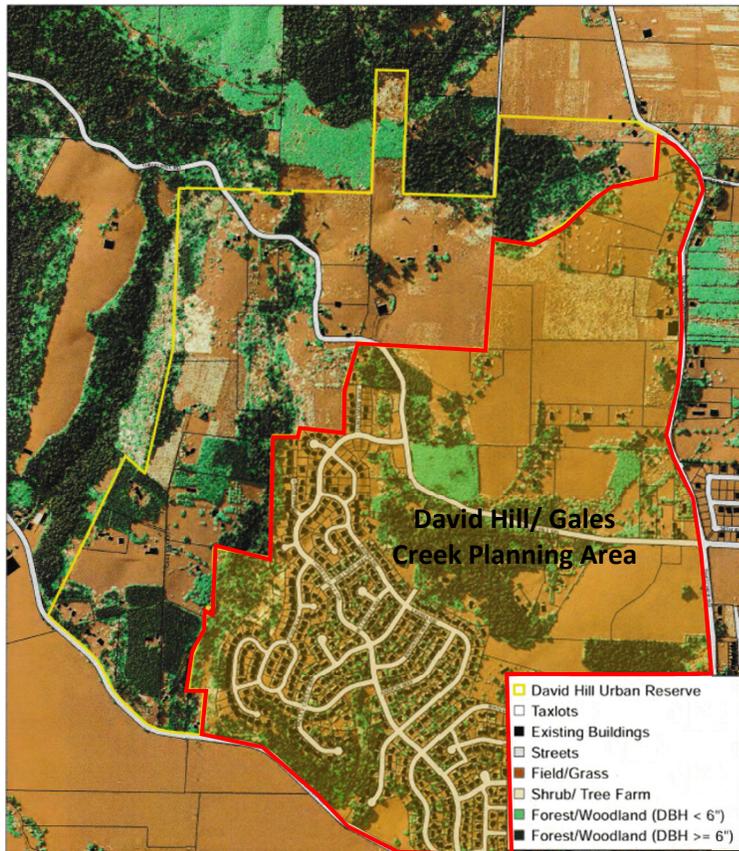


Figure 6. Existing Vegetation and Land Use in the David Creek and Gales Creek Planning Area (adapted from Vista Planning David Hill Study Base Map 12)

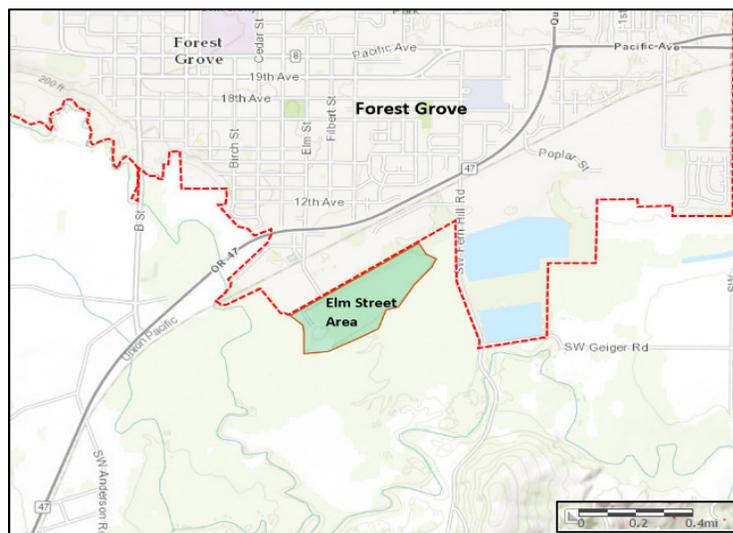


Figure 7. Elm Street UGB Area

The PR planning area, located east of DHG (**Figure 5**), lies entirely within the Council Creek sub-basin, in the headwaters of Council Creek. The PR is on a relatively flat valley floor that is currently farmed and has fine-textured floodplain soils, potentially shallow groundwater, and is bordered by riparian areas to the north and south – headwater tributaries of Council Creek. Lands adjacent to the south (within the City) are agricultural (including an incised ditch – tributary to Council Creek); lands to the southwest are residential, including the Forest Grove High School complex, and the east side of the parcel is bounded by the Nehalem Highway (Oregon Highway 47).

The ES planning area is located south of the City (**Figure 7**). It is relatively flat, situated on a low terrace adjacent to and approximately 10 to 15 feet higher than the adjacent Gales Creek/ Tualatin River floodplain. It is currently farmed, but is directly adjacent to industrial lands and a bus barn, as well as one of the City’s premiere Historic Landmarks (the Alvin T. Smith House), and is ¼ mile from the Fernhill Wetland Trail system.

4.3 Riparian Corridors, Wetlands, Wildlife Habitat Resources

Forest Grove lies in the central portion of the greater Tualatin River watershed, which covers over 700 miles and lays southwest of the Portland Metropolitan Area. The watershed initiates in the Oregon Coast Range and extends approximately 83 miles southeast where it merges into the Willamette River system. Forest Grove is situated between the Gales Creek Sub-basin and the Council Creek drainage system, a tributary in the lower portion of the Dairy-McKay sub-basin.

There are six major sub-basins in the Tualatin watershed. Gales Creek is the central drainage within the Gales Creek sub-basin (78 square miles) -- the smallest and central of the three headwater sub-basins forming the western portion of the watershed. Council Creek is a side tributary within the Dairy/ McKay sub-basin to the north – the largest of the three western headwater sub-basins.

Gales Creek System: The upper (western) portion of the Gales Creek sub-basin is mostly in private or state forest land ownership; the lower (eastern) portion of the basin is dominated by privately owned, irrigated croplands on the Gales Creek floodplain, but also includes some potentially active rock quarries and/or gravel mining areas. As shown in **Figure 8**, Gales Creek is a major riparian corridor system, containing floodplains, wetlands, wildlife habitat and critical salmonid (steelhead) habitat. In the lower

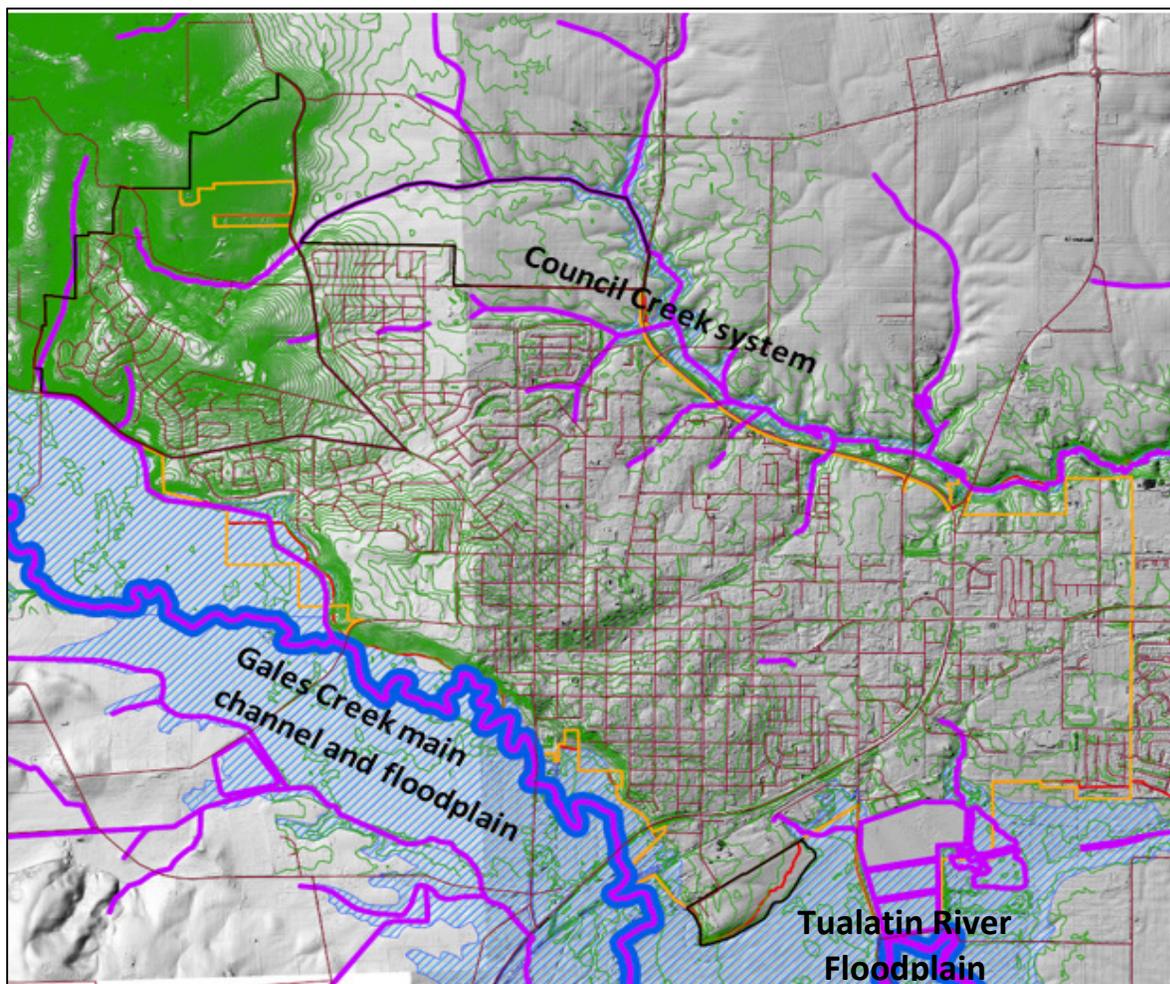


Figure 8. Gales Creek and Council Creek Drainage Systems and Tualatin/Gales Creek Floodplains

reaches near Forest Grove planning areas, the broad floodplain adjacent to the creek is densely farmed, greatly reducing riparian, wetland and wildlife habitat functions.

The riparian corridor in the area southwest of the DHG planning area meanders in an incised channel between farm fields. Total width of the vegetated (trees and shrubs) riparian corridor ranges between about 80 to 250 feet, with the Gales Creek main flow channel being about 30 feet in width. Wetlands in this area are mostly farmed, ditched, and drained to varying degrees. Farther downstream outside of City boundaries, the Gales Creek system merges with the Tualatin River, and associated wetland areas are more expansive. This is in the vicinity of the Fernhill Wetlands area, an important local wetland and wildlife open space area (discussed in more detail below).

In particular, anadromous and resident fish habitat in the farmed portions of Gales Creek is poor due to lack of large woody debris, lack of clean spawning gravels, lack of rearing and overwintering habitat (side channels) and high water temperatures (from lack of stream-side vegetation). In some areas, the creek bed is apparently dredged to reduce flooding or to mine gravel. Coho and steelhead, as well as other resident fish are documented as being present in this system, and Gales Creek is designated as Critical Steelhead Habitat by the State of Oregon.

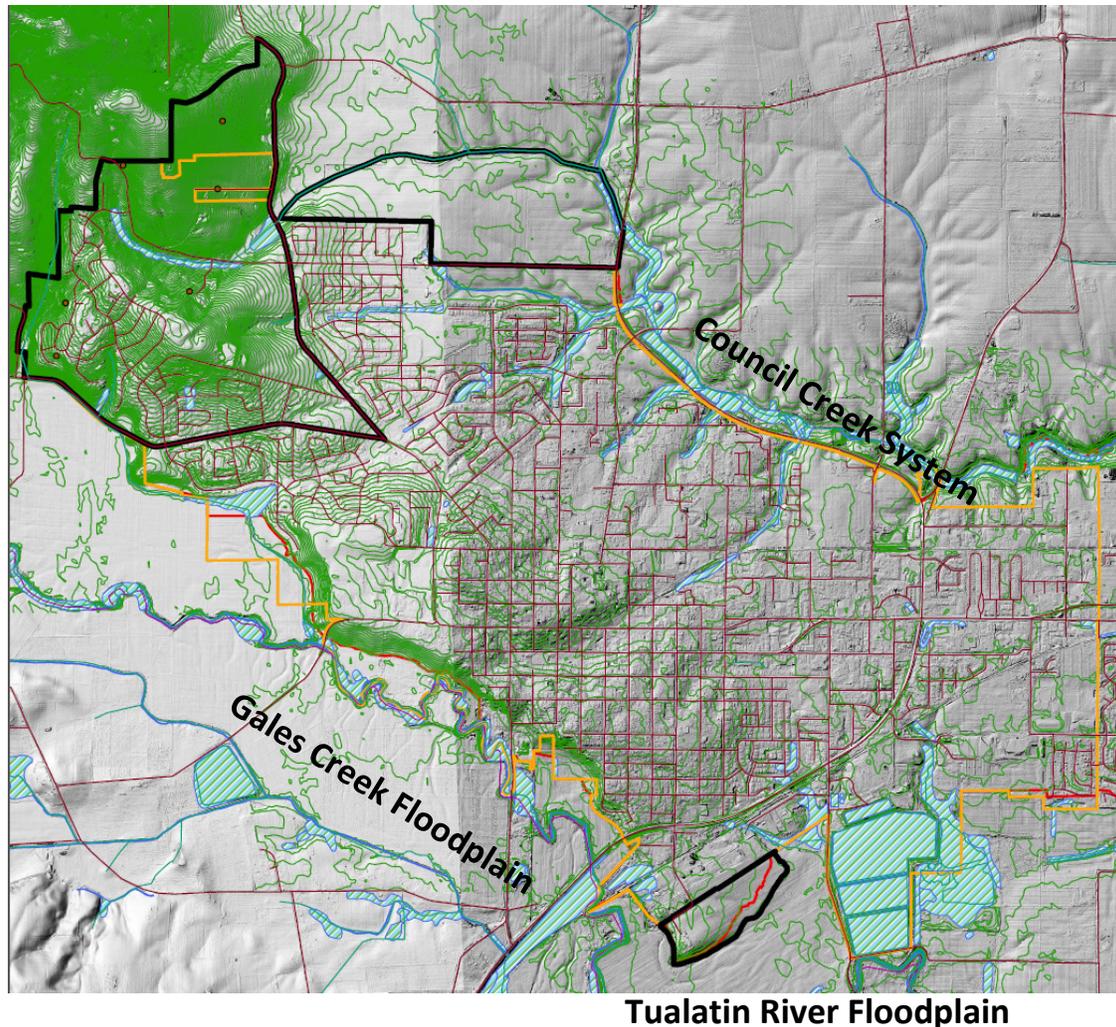
Council Creek System: The upper tributary reaches of Council Creek (also shown in **Figure 8**) which receive drainage from the DHG and PR planning areas are controlled headwater systems, either meandering through densely developed neighborhoods or flowing in linear ditches directly adjacent to or through farmed lands. There is no documentation of resident fish presence in these upper reaches of Council Creek, and minimal information is available documenting water quality in the system. However, streams that drain urban areas and roadways typically have comparatively poor water quality.

The headwater portions of the Council Creek drainage system are steep sided with minimal wetland acreage (in the foothills to the west) or flow in drainage ditches through flat farmland – narrow, linear and simple systems with grassed banks, less than 15 feet wide. A seasonal groundwater table is expected to persist within six feet of the surface during wet months in the flat farmland areas, although depth to water will be affected by the depth of the adjacent ditches, as well as presence of potential tile drain systems installed for farming. Farther downstream, near the east end of the PR planning area, the stream system widens and has associated floodplain and wetlands. In the lower elevation stream reaches that parallel the Nehalem Highway (SR 47), there are several large riparian wetland systems, ranging from 200 to 700 feet in width. These larger Council Creek riparian wetland systems are typically surrounded by farmland or roadways, but still provide a refuge for wildlife as well as provide for flood storage and water quality treatment.

Wetland Inventory: A Shapiro & Associates Wetland Inventory was carried out in the Forest Grove area in 1993. That mapping was intended to replace and update the National Wetlands Inventory mapping – the only wetland mapping information available at that time (aside from NRCS Soil Survey mapping). The **Figure 9** wetland map shows currently defined wetland areas that were identified during that inventory project. However, the Shapiro inventory did not cover urban portions of the proposed planning areas, as they were outside of the City boundary. In addition, hydrology may have changed over time with development, and regulations and guidance for delineating and classifying wetlands has been updated several times since 1993. For these reasons, additional, not yet identified, jurisdictional wetlands may exist in the planning areas.

Clean Water Services manages and operates the Forest Grove wastewater treatment facility, located about ¼ mile east of the ES planning area. While the primary mission of CWS is focused on water quality, it has a strong engagement with habitat preservation and enhancement. The facility uses an extensive constructed complex of wetlands to provide tertiary wastewater treatment prior to release

into the Tualatin River about one mile downstream of the confluence with Gales Creek. The Fernhill Wetlands area surrounding the CWS facility has an extensive public trail system and provides habitat and refuge for a wide variety of resident and migratory birds, as well as amphibians and small mammals.



**Figure 9. Wetlands Mapped in the Gales Creek and Council Creek Sub-basins
(adapted from PBS Environmental GIS maps)**

4.4 Regulations: Wetlands, Streams, Water Bodies, Wildlife Habitat

4.4.1 Federal Regulations

All mapped streams, wetlands and associated ponds are potentially regulated by the U.S. Army Corps of Engineers (ACOE) and U.S. Environmental Protection Agency (EPA) under Sections 404 and 401 of the Clean Water Act. Under certain circumstances, the ACOE may not take jurisdiction over isolated wetlands and small ponds (with no surface water connection to streams). All jurisdictional wetlands are also regulated by the Oregon Department of State Lands (DSL).

Some federal regulations defining wetland characteristics and delineation techniques have changed since 1993, but the changes should not significantly affect results of the original generalized inventory. Current state and federal laws provide an up-to-date definition of a wetland, as well as standard processes and methodology used to determine whether a wetland is present, and may be applied on a site specific basis if more detailed information is needed.

4.4.2 State and Local Regulations

The Goal 5 Administrative Rule requires local governments to conduct and adopt a local wetlands inventory, as well as adopt a list of locally significant wetlands (per rules described in ORS 197.279(3)(b)). The 1993 wetland inventory has been reviewed by DSL, and found to be adequate for planning purposes (personal communication, City of Forest Grove). However, as the inventory is generalized, a site specific assessment involving more detailed analysis may be needed when development is proposed. Jurisdictional wetlands not yet identified or inventoried would still be regulated under state and federal law. Under Goal 5, the city is also encouraged to develop land use codes protecting streams, water bodies, and wetland resources. Avoidance of impacts is first priority. Unavoidable impacts to these resources typically require mitigation.

Since 1990, Clean Water Services (CWS) has partnered with local jurisdictions to manage surface water systems -- such as streams, wetlands, floodplains, and their associated buffers -- in urbanized areas within the Tualatin River Basin. CWS implements county-wide regulations that define protection standards for these surface water systems (Design and Construction Standards, R&O 07-20, Chapter 3, Sensitive Areas and Vegetated Corridors). CWS is responsible for surface water management that will meet National Pollutant Discharge Elimination System (NPDES) stormwater permit requirements as well as implementation of stream and stream buffer protection strategies (design and construction standards) that are typically adopted and sometimes expanded by local jurisdictions, such as Forest Grove. A 2005 CWS program (Healthy Streams Plan) expanded CWS efforts to include surface water protection standards in non-urban areas.

Forest Grove implements the CWS surface water protection standards specific to protection of streams, wetlands and buffers, which include provisions for maintain and restoring vegetated corridors along streams and around wetlands. CWS regulations define standard buffer widths for wetlands and streams in Table 3.1 from Section 3.03 in R&O 07-20 (**Figure 10**), but also provide additional guidance describing when those standard buffer widths may be reduced or expanded. The purpose of these regulations is to protect water quality, but they correlate greatly with habitat preservation and enhancement benefits.

The City of Forest Grove Development Code (Chapter 10, Article 5, Section 10.5.000-10.5.515) references the CWS Design and Construction Standards, Chapter 3 regulations, but also provides additional guidance regarding local Natural Resource Areas (NRAs) protections standards, including allowable disturbance areas in relation to the Class of the defined Natural Resource Area and mitigation required if NRAs are impacted.

TABLE 3-1
Vegetated Corridor Widths Adjacent to the Sensitive Area
Where Activity is Not Redevelopment

Sensitive Area Type	Width Slope <25%	Width Slope ≥25%
Existing or created wetlands:		
< 0.5 acres and isolated*	25 ft	Variable from 25-200 ft.
<0.5 acres and not isolated*	50 ft.	Variable from 50-200 ft.
≥ 0.5 acres	50 ft.	Variable from 50-200 ft.
Natural lakes, ponds, and in-stream impoundments	50 ft.	Variable from 50-200 ft.
Springs:		
Intermittent flow	0	15 ft.
Perennial flow	50 ft.	Variable from 50-200 ft.
Intermittent Streams draining:		
< 10 acres	0	0
≥10 to <50 acres	15 ft.	Variable from 50-200 ft.
≥50 to <100 acres	25 ft.	Variable from 50-200 ft.
≥100 acres	50 ft.	Variable from 50-200 ft.
Perennial Streams:		
Other than Tualatin River	50 ft.	Variable from 50-200 ft.
Tualatin River	125 ft.	Variable from 125-200 ft.

*See definition of Isolated Wetland in Chapter 1.

Figure 10. Table 3-1 from Chapter 3 of R&O 07-20 – Sensitive Areas and Vegetated Corridors Protection Regulations

4.5 Groundwater Resources

The Forest Grove drinking water system is supplied by five surface water intakes located on Clear, Roaring, Smith, Deep and Thomas Creeks – tributaries of Gales Creek – located about eight miles upstream of Forest Grove (**Figure 11**). The City of Forest Grove treats the water in a conventional

water treatment plant that uses a rapid sand filtration system. Forest Grove conducts all water quality tests and data collection as required by law, and limits logging and related activities in the water supply watershed.

Gales Creek is listed in Oregon as a 303d water (“waters where required pollution controls are not sufficient to attain or maintain applicable water quality standards”), with its water quality impairment caused by clear-cut forests and landslides, but also by over-application or improper handling of pesticides or fertilizers, and proximity to surface waters that may contain elevated levels of fecal coliform or sediment. The 303d listing is only applied to the main channel of Gales Creek. However, Gales Creek water quality is potentially significant to Forest Grove since the City has water rights to withdraw water from the main channel. The City currently does not withdraw water from the creek but may do so in the foreseeable future. Any water taken from Gales Creek main channel would be diverted to the Joint Water Commission water treatment facility located on Fern Hill before entering into the City’s water system.

In addition to the City’s surface drinking water system, there are dozens of wells along both Gales Creek and Council Creek systems (**Figure 12**). Many are irrigation wells, but some serve as a drinking water supply, mostly outside of City limits. Goal 5 requires protection for certain critical groundwater areas, but none of the planning area is currently designated as a critical groundwater supply area.

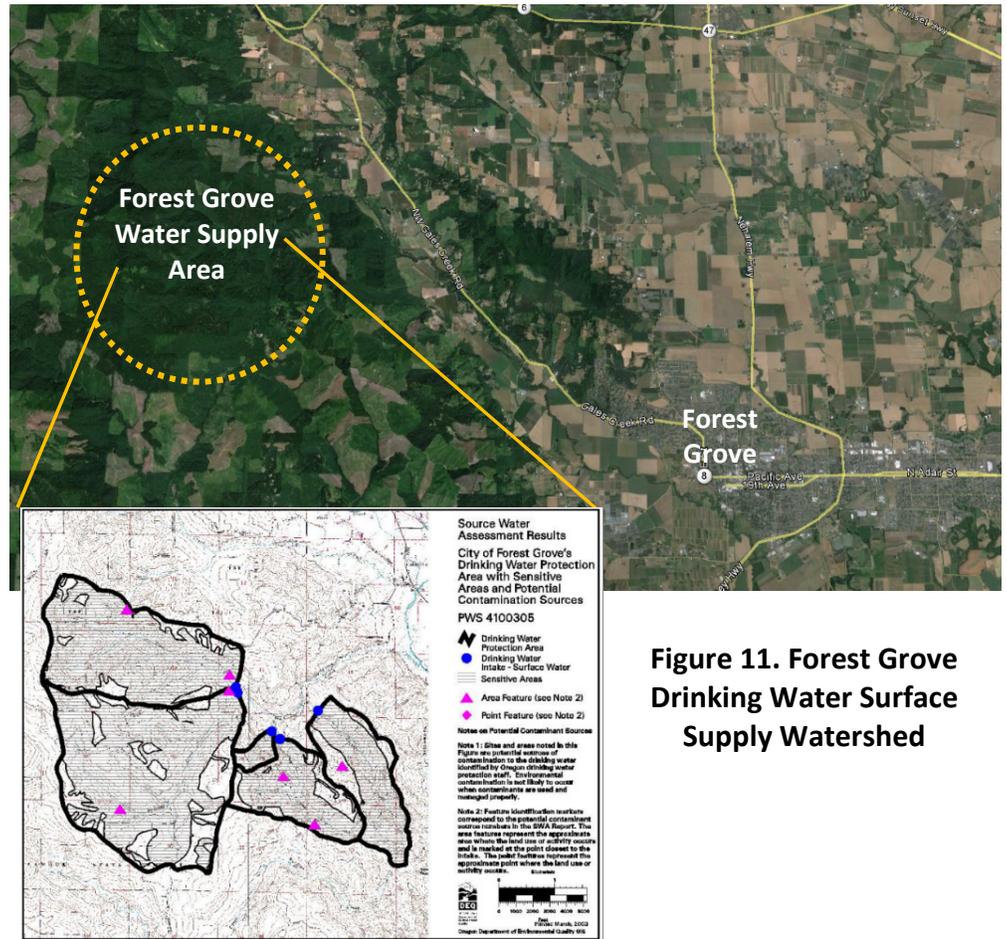


Figure 11. Forest Grove Drinking Water Surface Supply Watershed

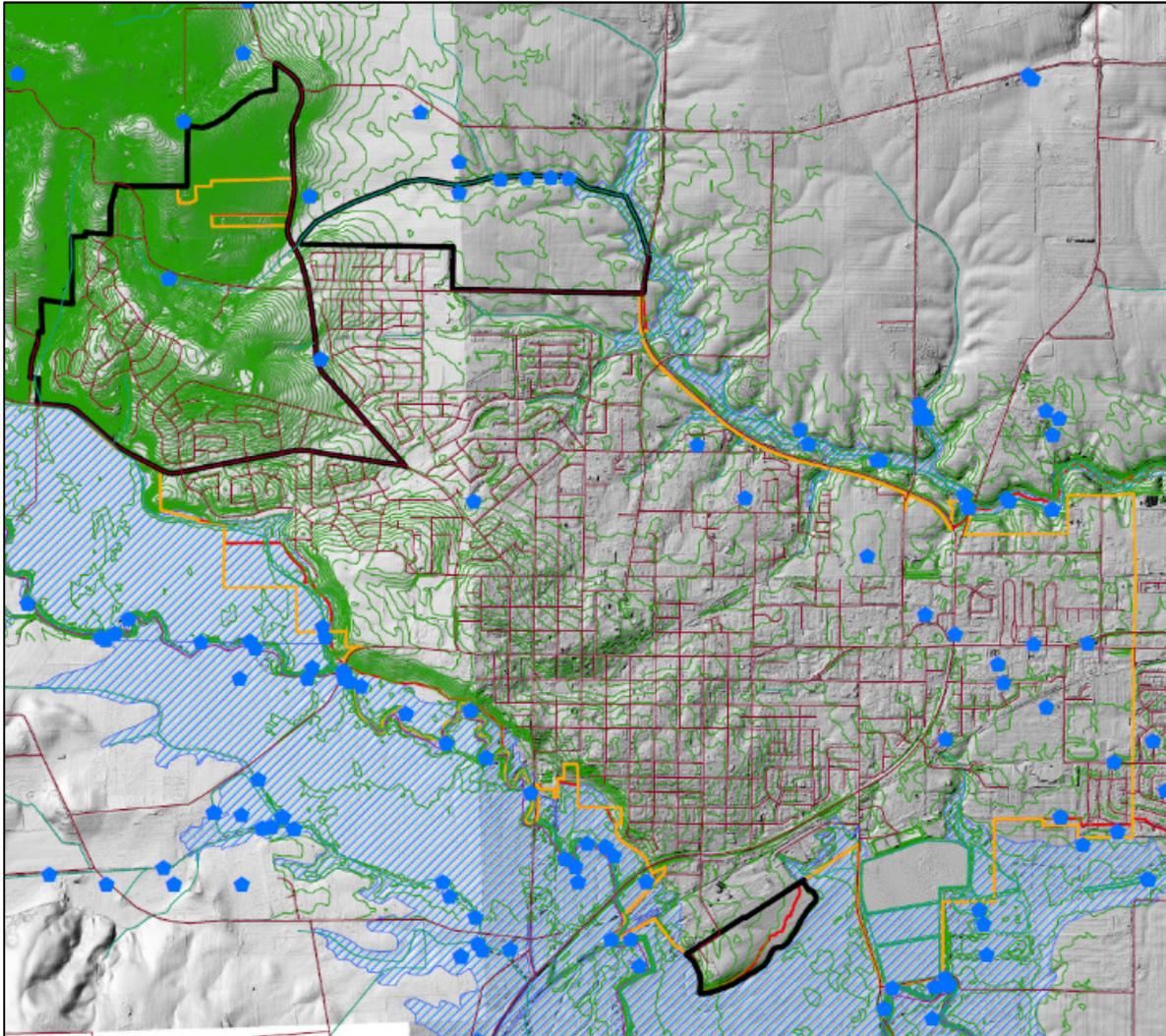


Figure 12. Documented Wells and Water Rights (blue dots) in the Forest Grove Vicinity (adapted from PBS Environmental GIS map layers)

4.6 Designated Oregon Recreation Trails Resources

There are several local and regional trail systems in and around the Forest Grove area. The 30-mile long Tualatin Valley Scenic Bikeway (Oregon’s 10th designated scenic bikeway) starts near Hillsboro and meanders through the valley and Forest Grove, ending at Banks, north of Forest Grove. In addition, a Council Creek *Regional Trail System Master Plan* is under way and is intended to ultimately provide an additional 15 miles of public trails between Banks, Forest Grove and Hillsboro (**Figure 13**). Forest Grove also maintains other trail systems within the City, as well as public trails in the Fernhill Wetlands complex to the south.

Based on a 2007 *Community Trails Master Plan* that incorporates ideas about connecting to Metro regional trails systems, Forest Grove is in the process of planning, developing and implementing a system of community-wide trails designed to “*promote a sense of community, build physical connections, serve all ages and abilities, contribute to a strong local economy and establish partnerships.*” Plans include connecting to County trails planned along Gales Creek, as well as

consideration of other ideas for additional regional trail links suggested by community members, such as:

- A link to Hagg Lake along Carpenter Creek
- A loop around Fernhill Wetland, through Cornelius and along Council Creek to the north
- A link to Gaston and points south along the railroad grade

4.7 Open Space Resources

The City is just beginning a process to update its Parks and Recreation Master Plan. Forest Grove currently has over 350 acres of Park Land and Open Space within City Limits (see **Figure 14**), and access to additional acreage in park and open space areas immediately surrounding the City. Of the fourteen parks, eleven have ball fields and or playground equipment; many also have picnic and barbeque areas as well as walking trails. In addition, there is an aquatic center and skateboard park outside of the study area, and an off-leash dog area adjacent to Thatcher Park within the study area. The City also manages the Fernhill Wetland park/trail system in the Clean Water Services property located at the southeast end of the City.

To expand and connect Open Space, Parks and Trails systems, the City has developed cooperative relationships with several regional organizations and agencies outside of the City – such as the Intertwine Alliance (<http://theintertwine.org/partners>), Metro and Washington County Parks. For example, the Forest Grove Parks Department sponsors cleanup activities at Hagg Lake, a Washington County Parks Department recreation area located about 5 miles south of Forest Grove.

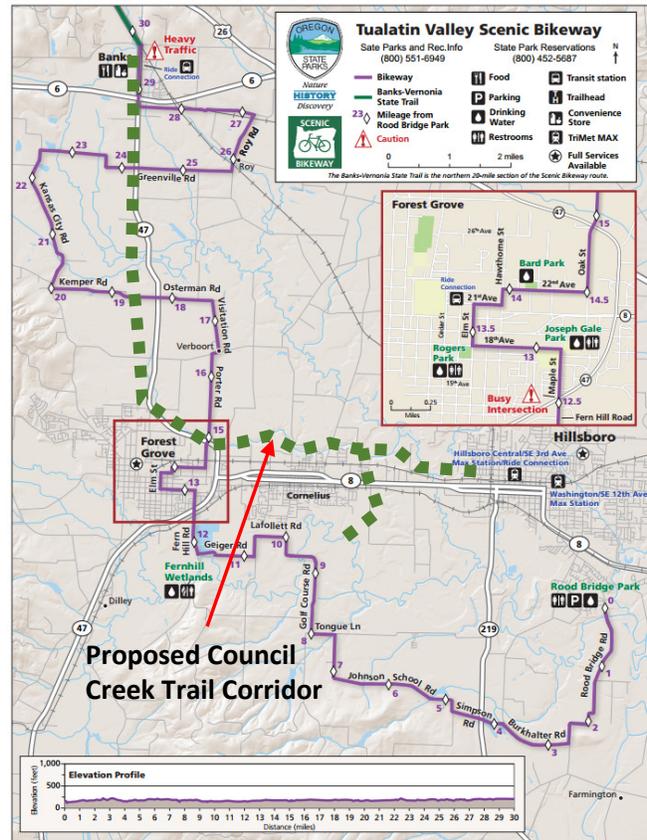


Figure 13. Tualatin Valley Bikeway (Existing) and Proposed Council Creek Regional Trail Corridor

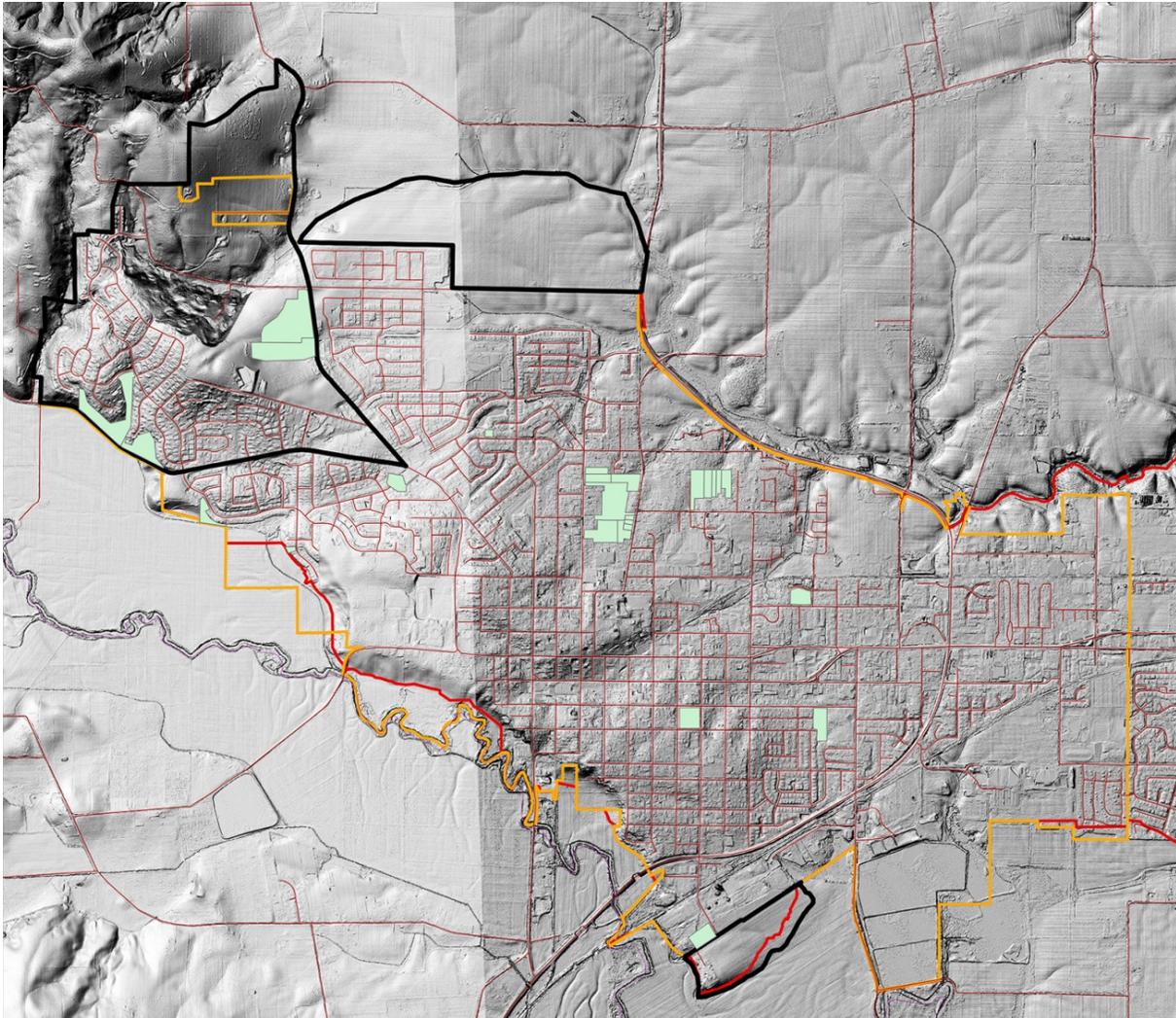


Figure 14. Parks in and near Forest Grove

4.8 Mineral and Aggregate Resources

Although dredging activities are described as occurring throughout the Gales Creek basin, we could find record of only two local mines (per Oregon Department of Geology and Mineral Industries) – one for sand and gravel and one for industrial mineral clays. DOGAMI records indicated that both of these possible mines are located on the Gales Creek floodplain southwest of Forest Grove (outside of the City Limits) and are shown in **Figure 15**. According to City staff, it appears that these two old mines are not currently active and there are no traces of old mining activities. One mine is described as a “past producer”, being run by Forest Grove Clay Products Co. which is listed as a brick manufacturer in a July 13, 1920 publication labeled “Brick and Clay Record, Volume 57”. Both are described as surface mines.

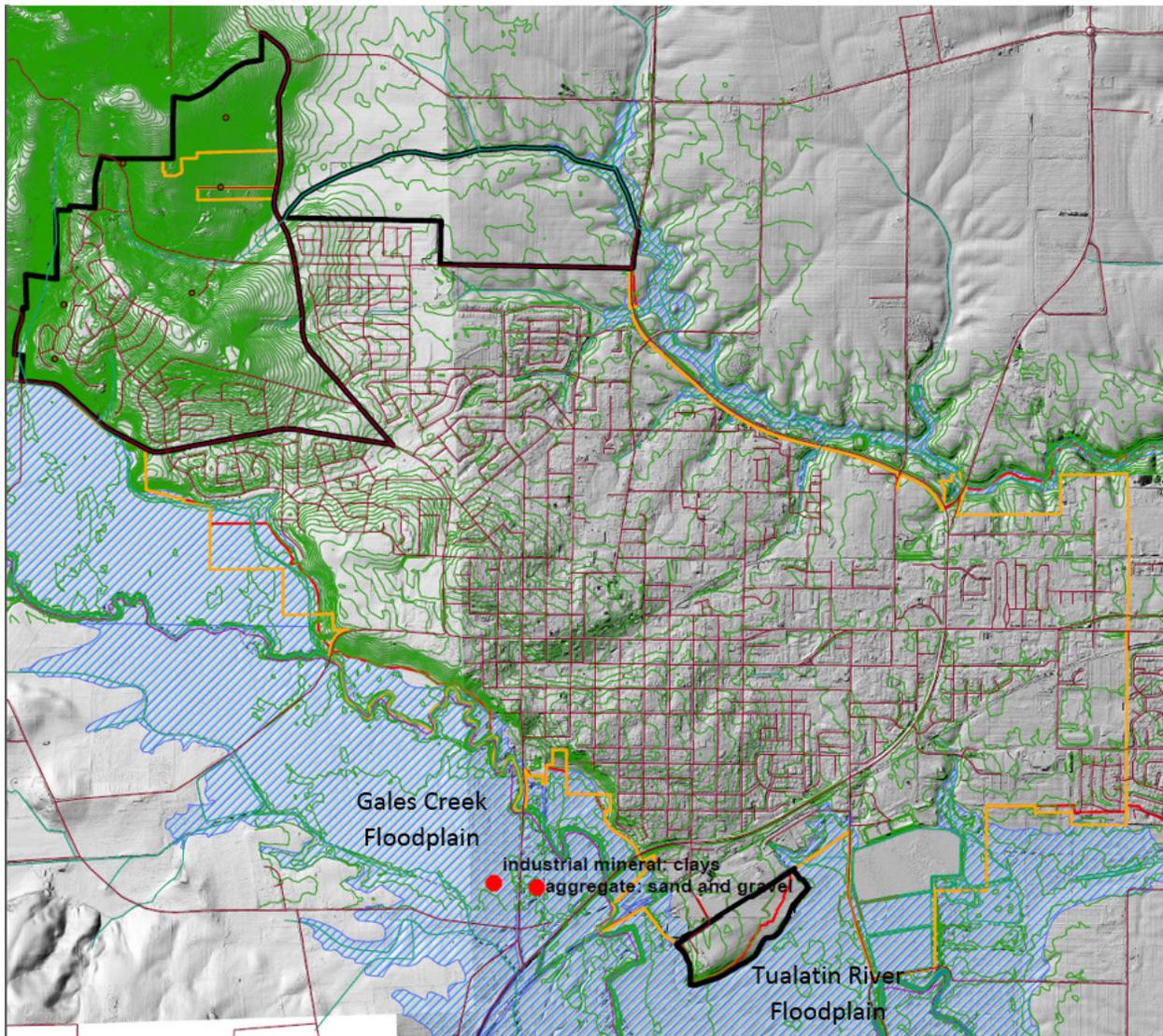


Figure 15. Mineral and Gravel Extraction Areas on the Gales Creek Floodplain near Forest Grove (adapted from PBS Environmental GIS maps)

4.9 Cultural Area Resources

Forest Grove has an Historic Landmarks Board responsible for protecting and preserving historic districts in the City and finding a balance with allowing responsible development in and near the historic districts. Forest Grove adopted a Historic Landmarks Ordinance in 1980. There are currently 84 individual structures on the Forest Grove Register of Historic and Cultural Landmarks and five different Historic Districts -- one undesignated District (Historic Downtown) with 21 "significant historic building"; three Districts designated as National Historic Districts, and one District (Pacific University campus) with eight buildings on the Forest Grove Register, and one on the National Register.

Forest Grove's founders were missionaries, and Missionary Alvin Thompson Smith's home was built in 1854 (shown in **Figure 16**) and is located directly adjacent to the ES site on a 1.84 acre property. This

building is on the National Register and is currently preserved and managed by Friends of Historic Forest Grove (a volunteer non-profit organization).

The Friends of Historic Forest Grove purchased the 1.84 acre parcel along with two additional 3.38 acres parcels, totaling 5.22 acres (acreages according to Washington County Assessor data). The City recently purchased 3.20 acres of this land while the Friends will retain ownership of the remaining 2.02 acres. The Comprehensive Plan designation and zone district for the entire 5.22 acre site has been changed from “General Industrial” to “Institutional” (as of 2014) to reflect the future recreation and historic use of the site.

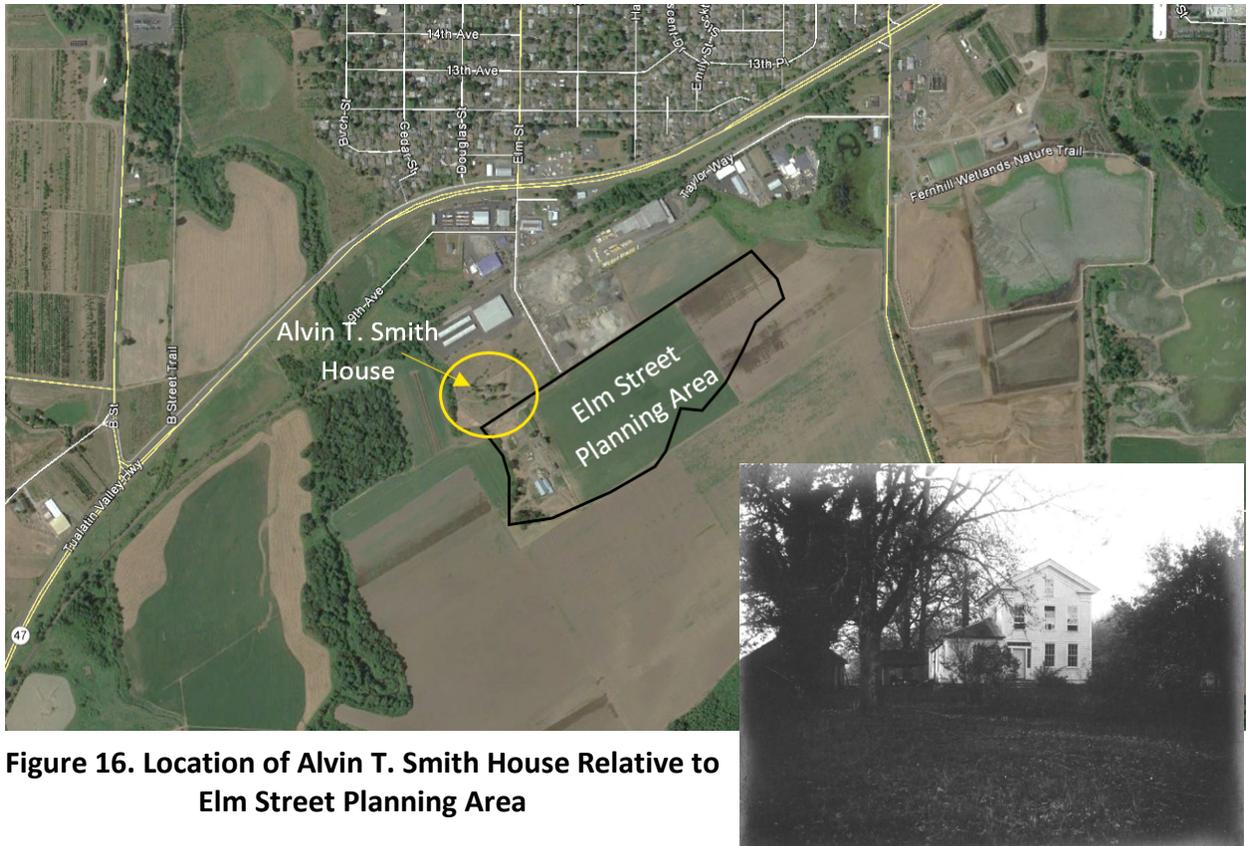


Figure 16. Location of Alvin T. Smith House Relative to Elm Street Planning Area

5. OPPORTUNITIES

This review of project area resources helps in developing a list of potential opportunities to protect and improve natural resource conditions in the Westside planning areas, as well as throughout Forest Grove. We note that Forest Grove had already developed several programs and processes that support the Goal 5 planning process.

5.1 Potential Ecological Protection and Enhancement Opportunities near the Planning Areas

5.1.1 DHG and PR Planning Areas Opportunities

- Council Creek riparian area enhancement: planting a wider, naturally vegetated riparian corridor to provide room for a public trail system as well as improved wildlife habitat and water quality.
- Landslide stabilization on steep slopes by replanting with deep-rooted native vegetation
- Wider roads with bike lanes connected to existing regional and City trail systems

5.1.2 ES Planning Area Opportunities

- Fernhill Wetlands expansion to incorporate undeveloped wetlands and riparian areas adjacent to the Tualatin River
- Landscaping requirements for new development in ES with trail systems connecting to Fernhills Wetland trail systems
- Development of the adjacent Alvin T. Smith Historic Homesite into a new park or special events facility
- Redevelopment of existing adjacent industrial areas to incorporate perimeter vegetation to improve views from the AT Smith facility
- Installation of street trees along the roadway leading to the AT Smith facility
- Promote voluntary conservation measures and integration of built and natural systems

5.1.3 General Opportunities

- Update 1993 Forest Grove Wetland and Stream Inventory using current definitions and mapping processes as needed
- Blend storm water management with natural systems (using constructed wetlands adjacent to natural systems to improve water quality and wildlife habitat opportunities)
- Remove invasive plants throughout City riparian and wetland areas to minimize invasive growth, reduce and stream bank erosion and improve wildlife habitat.
- Develop new connections and cooperative efforts between landowners and other government agencies.

References:

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2. State of Oregon, Dept. of Geology and Mineral Industries: <http://www.oregongeology.org/sub/milo/milo-washington.htm>
3. Source Water Assessment Summary Brochure City of Forest Grove PWS # 4100305 (<http://www.deq.state.or.us/wq/dwp/docs/swasummary/pws00305.pdf>)
4. Forest Grove Website: (<http://www.forestgrove-or.gov/>)
 - Council Creek Regional Trail System: (http://www.forestgrove-or.gov/images/stories/services/engineering/pdf/Brochure_Final.pdf)
 - Fernhill Wetlands: <http://www.forestgrove-or.gov/residents/fernhill-wetlands.html>
 - Forest Grove Parks: <http://www.forestgrove-or.gov/visitors/nature-and-recreation.html>
 - Forest Grove Historic Districts: <http://www.forestgrove-or.gov/city-hall/citizen-boards-commissions/historic-landmarks-board-historic-neighborhoods.html>
 - Forest Grove Community Trails Master Plan: <http://www.forestgrove-or.gov/images/stories/services/parksandrec/pdf/forms/trailmasterplan.pdf>
5. The Oregonian Articles:
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 - “Improvements at Fernhill Wetlands soothe the soul, invite public participation (guest opinion)” http://www.oregonlive.com/forest-grove/index.ssf/2014/02/improvements_at_fernhill_wetla.html
6. Tualatin River Watershed Council:
 - Tualatin River Watershed Council Tualatin Basin Information (<http://trwc.org/tualatin-basin-information/>)
 - Tualatin River Watershed Council Tualatin Basin Maps (<http://trwc.org/tualatin-basin-information/maps/>)
 - Tualatin River Watershed Atlas publication, March 2001 (edited and assembled by Andree Pinnell) <http://trwc.org/wp-content/uploads/2013/03/Watershed-Atlas.pdf>
 - Gales Creek Watershed Assessment Project, Tualatin River Watershed Council, 1998 (<http://trwc.org/tualatin-basin-info/environmental-reports/gales-creek-reports/gales-creek-watershed-analysis/>)
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<http://water.oregonstate.edu/roundtables/download/Adams&Taratoot.pdf>

9. **Hook and Bullet website, showing stream locations on a Google Earth basemap.**
<http://www.hookandbullet.com/googlemap.aspx?lat=45.5662231445313&lon=-123.2384414672852>

10. National Wetland Inventory Mapper (<http://www.fws.gov/wetlands/data/mapper.HTML>)

11. NRCS Washington County Soil Survey (online version)
(<http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>)

12. A.T. Smith House Historic Structures Report, Prepared for Friends of Historic Forest Grove by Historic Preservation Northwest, August 31, 2007
(<http://www.historicforestgrove.org/PDFs/AT%20Smith%20HSR.pdf>)