APPENDIX 45
SPRINGWATER COMMUNITY PLAN REPORT
NATURAL RESOURCES REPORT

Introduction/Overview

SITE LOCATION

The Springwater Phase I Planning Area (Springwater) begins at the southeastern edge of the City of Gresham's urban growth boundary in Multnomah County. The Springwater planning area (Figure 1) also includes a portion of Clackamas County south of Rugg Road and part of incorporated Gresham in the "brickworks" area. The total study area for resources comprises about 1,727 acres and is a roughly rectangular piece of land bounded in the east by 282nd Avenue and in the west by Hogan Butte and other volcanic geologic features.

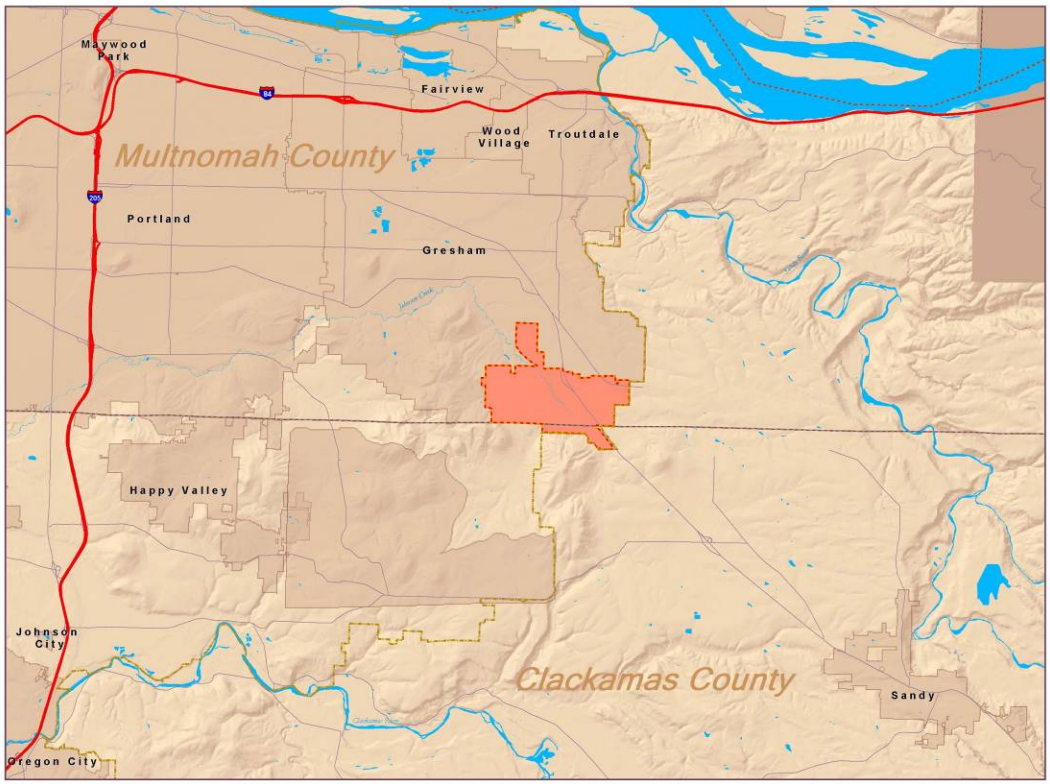

Figure 1. Site Location - Springwater Phase I Planning Area

OVERVIEW OF AREA'S NATURAL RESOURCES

Natural resources and significant physiographic features within the Springwater planning area are aesthetically pleasing and ecologically diverse (Figure 2). Its environmentally sensitive natural features include unique habitats such as the buttes with their steep terrain; seasonal drainages, springs and seeps; ponded wetlands; a two-mile section of mainstem Johnson Creek (Figure 3). Johnson Creek is the region's principal basin that feeds into the Willamette Valley, and four miles of major tributaries.

Figure 2. Landscape of the Springwater Planning Area June 2004

The portion of Johnson Creek flowing through Springwater features a wide range of habitat and water quality conditions. There are areas where the main stem or tributaries have been channelized and denuded of riparian vegetation, but there do also exist intact sections of high quality. The small portion of Reach 16 (ODFW 2000), for instance, that is located within the plan area includes some of the highest functioning riparian and aquatic resources in the watershed, according to analyses completed by the Oregon Department of Fish and Wildlife (2000).

Figure 3. Johnson Creek at Bankfull Flow 2004

HISTORICAL CONTEXT

The natural resource planning area for Springwater extends just beyond the Multnomah and Clackamas County line into the Sunshine Creek basin. It is defined by rolling hills in the west and a series of highways and flat agricultural parcels with mostly single-family residential areas along most of the areas local roads. Steeper slopes on the western buttes are typically forested and contain some areas of seeps and springs that feed the tributaries of Johnson Creek. The buttes also feature a number of seasonal drainages that collect precipitation during the rainy season and direct it to receiving tributaries on the eastern portion of the plan area. The buttes were cleared in the early 1900's, but are now covered mostly by mid-succession forest that is 60 to 100 years old. The lowlands were originally forested but were cleared in the late 1800's and early 1900's for farming and timber. The majority of the lowland areas have remained in agricultural and residential use, and in many areas have been tiled for drainage. The site contains forest types in the Willamette Valley vegetation zone (Franklin and Dyrness, 1988).

Johnson Creek is one of the last streams in the Portland Metro region with anadromous salmon and steelhead present, albeit in small numbers. These fish-bearing waters and the associated floodplains and riparian corridor form the spine of the natural resources through the Springwater Community. The mainstem of Johnson Creek runs through the study area flowing west, then entering the urban growth boundary of Gresham at the edge of study area about 500 feet east of SE Palmblad Rd. Its headwaters are to the east of the study area where nursery and other agricultural industrial inputs from upstream introduce pollutants and sediments into the water column. Paralleling the creek throughout the plan area is the Springwater Recreational Trail, which was created by the City of Portland on the rail line that once ran between Portland and Clackamas County. This trail is still maintained by the City. Large areas of cleared riparian corridor and multiple manmade discharge outlets from surrounding rural agricultural uses have changed the stream hydraulics, resulting in increased flood damage and downcutting in many areas within the entire basin.

Natural Resources as a Framework for the Springwater Community

The resources of the natural and physical environment within the Springwater planning area are beautiful to view and rich with a variety of landscape types. Central to the planning area is the confluence of four major tributaries with the Johnson Creek mainstem. There are also several other tributaries (Figure 4) as well as the steep butte slopes at the western border. The planning team and community members agreed that the physical layout of the landscape and creeks provided an environmental framework around which development decisions could be made, based upon features of the landscape that best lend to certain land uses. As such, careful analysis of the current and potential function of Springwater's natural resources was needed in order to develop a green framework that adequately considered the landscape's unique features. This analysis would be used to inform the decision making process regarding the siting of the roadway network, determining land use designations, placement of public infrastructure, providing adequate open space and habitat areas, and ensuring optimal function of the creek system to help meet water quality goals and minimize potential downstream impacts from Springwater development.

NATURAL RESOURCE PLANNING OVERVIEW

This section of the report describes the framework in which the natural resource planning was conducted. It describes the goals and policies of the natural resource planning effort, reviews existing regulatory guidance, and describes data used to conduct the natural resource inventory.

Figure 4. Riparian Condition on Bus Creek Brickworks Site

Goals

The Community Working Group (CWG) – the public committee that provided input through the planning process – worked with the project team to develop a goal and set of policies to guide natural resource protection and enhancement in Springwater. The goal established for Springwater natural resources reads:

The plan will preserve, protect and enhance natural resources. *It will define, protect, restore and enhance significant natural resources, including stream corridors, wetlands, and forested areas. Resource areas will provide the basis for identifying development constraints as well as serving as open space amenities for the Springwater community. Resource protection and enhancement will be a shared responsibility of property owners, developers, and governments.*

To achieve this goal, a natural resource needs analysis and protection strategy for Springwater was developed to:

- Embrace community values for regionally connected greenspaces that have outstanding views, healthy wildlife habitats, clean water, and can support diverse plant assemblages.
- Conform to the legal requirements and policies adopted by the City, Metro, the State of Oregon Goal 5 process and the Federal Government.

- Consider the role that natural resources play in sustainable land development and incentives for economic growth.
- Include land use code and ordinance responsibilities that are simple to understand and limit costly maintenance or monitoring for compliance.
- Integrate with the design and implementation of public parks and recreation, roads, sewer and stormwater facilities.

Policy Statements
The project team and CWG also developed policy statements to guide the team in developing a plan to achieve the natural resource goal. These policy statements directed the Springwater Community Plan to:

1. The Springwater Community Plan shall recognize the importance of the upper Johnson Creek system for Gresham, the Portland Metro region and the Willamette Valley.

2. Mitigation for any impacts of development in Springwater to stream corridor function shall be prioritized first to other sites in the Springwater Plan District and second to within the upper Johnson Creek basin.

3. The Plan will result in a green infrastructure that will provide regional natural amenities for future generations.

4. The plan will identify potential opportunities for “natural park” facilities that would enhance the sense of place for economic developments and that could be an attraction for residents and businesses.

5. Stream crossings will be minimized to the greatest extent feasible.

6. Road and pedestrian crossings of the natural resources areas shall be designed for the least impact practical.

7. The entire Johnson Creek Watershed and ecosystem will be considered.

8. To the extent practical, watershed functions and sensitive/natural species will be restored.

9. Barriers to wildlife habitat corridors, such as bridges and roads, shall be designed to provide proper opportunities for wildlife migration.

10. The urbanization of the Springwater Community shall be balanced with the protection of sensitive species and habitat, water quality, and groundwater resources.

11. The urbanization of the Springwater Community shall achieve, to the maximum extent practical, low levels of effective impervious surfaces, high levels of tree protection and reforestation, management of stormwater as close to the point of origin as possible, improved hydrology and flood protection, and removal of barriers to fish passages.

12. Urbanization of the Springwater Community shall provide appropriate erosion control and shall control sedimentation through the use of green development practices, context sensitive design, and appropriate construction management practices, re-vegetation of disturbed areas, and regular maintenance and monitoring.

13. Lands with slopes of 25 percent or above shall be protected.

14. The use of native plants shall be a priority for re-vegetation and Green Streets.

15. The development code for Springwater shall maintain fish and wildlife habitat protection measures that are at least as protective as those adopted by Multnomah County for the West of Sandy River Plan Area upon annexation.

Furthermore, the plan was developed to support urbanization in Springwater that is:

- Balanced with the protection of sensitive species and habitat, water quality, and groundwater resources.
- Achieves, to the maximum extent practical, low levels of effective impervious surfaces, high levels of tree protection and reforestation, management of stormwater as close to the point of origin as possible, improved hydrology and flood protection, and removal of barriers to fish passages.
- Provides appropriate erosion control and controls sedimentation through the use of green development practices, context sensitive design, appropriate construction management practices, vegetation of disturbed areas with native plants, and regular maintenance and monitoring.

Regulatory Guidance

The lands within Springwater are managed by an array of laws, ordinances, regulations, plans and policies via various jurisdictions that have authority in the area. One of the primary regulatory programs guiding the land use in Springwater is Oregon's land use planning goal for "Open Spaces, Scenic and Historic Areas, and Natural Resources," known as Goal 5 (Oregon Administrative Rule (OAR) 600-023-0000, et. al.; Goal 5 is "to protect natural resources and conserve scenic and historic areas and open spaces"). Various jurisdictions have developed programs to meet the Goal 5 vision. The City of Gresham has specifically adopted Multnomah County's program for Goal 5 protection. For Springwater, however, the City's intention is to establish a new district that has a unique set of guidance, a separate Goal 5 Resource Inventory, a separate Economic, Social, Environmental and Energy (ESEE) analysis and a development code unique to Springwater. To achieve this, it is prudent to research and compare the Goal 5 programs and floodplain protections currently in place to use as references in developing the Springwater Community guidelines.

Multnomah County and the City of Gresham entered into an intergovernmental agreement (IGA) that provides a concept of environmental protection measures that are al least as protective as thos of Multnomah County. Multnomah County has recently adopted wildlife habitat protection measures for the Springwater area, has adopted a Metro Title 3 implementation program, and the Senate Bill 1010 Basin Plan that is implemented by the Oregon Department of Agriculture has also recently been adopted. As well, the County currently has a Goal 5 resource map and manages all County lands in accordance with the West of Sandy River Rural Area Transportation and Land Use Plan. The results of the ESEE analysis propose conserving a 200-foot corridor on either side of the stream channels and limiting development (while allowing existing uses to continue) within that 200-foot corridor. This is further discuss within the section describing the West of Sandy Plan and Metro's Allow/Limit/Prohibit (ALP) discussion in the ESEE analysis report for this Springwater Community Plan.

The Metro Council recently developed the definitions for allowing, limiting and prohibiting development within the Metro Goal 5 resource areas. Metro Council proposes to adopt these definitions in the fall of 2005 as part of the Functional Plan adoption. Once adopted, Metro's Goal 5 Protection Program will define the level of protection that is necessary for natural resources within the entire tri-county Metro area. The various regulatory programs within Metro's plan do not prohibit activities; rather they suggest varying levels of limited activity based upon the activity's proximity to the resource and magnitude of impact. Although not protective of all Goal 5 resources, the guidance in Metro's Title 3 - Water Quality and Flood Management Plan is a good basis for protection of aquatic habitat and riparian areas from perturbations such as flooding and erosion. For water quality protection and flood control, this plan recommends that structures not be built and activities are limited with a specified distance from top of bank on either side of all the channels. The actual distance varies between 50 and 200 feet depending on the creek flow volume, the slope of the bank, and the extent of the drainage basin. Table 1 compares the recommendations or development limits under the current programs for the Metro Tri-County Region, Multnomah County, and the City of Gresham.

Table 1. Current CODES, Regulatory Guidelines and Policies

Resource	Multnomah County Code and Policies[2]	Metro's Title 3 Water Quality and Flood Management Standards	Metro's Goal 5 Recommendations[1]	City of Gresham Code [3]
Riparian Corridors	Development permit required within 200 feet and requires mitigation for development within that area, allows development as close as 100" of the stream where slopes are <25% implements Metro Title 3	50 feet from top of bank on slopes <25%; up to 200 feet from top of bank on slopes >200%; 15 to 50 feet from top of bank for streams that drain between 50 and 99 acres of land	Class I and II Riparian Habitats are protected with variable regulatory width from 50 to 200 feet from top of bank	50 feet from top of bank on slopes <25%; and up to 200 feet from top of bank with slopes >25%
Trees and Wildlife Habitat	Riparian areas protected as wildlife habitat, standards applicable >200" from stream require development in cleared areas or wildlife conservation plan required, cleared area limit of 1 acre	N/A	Riparian areas are protected as wildlife habitat	One grove of the City's Hogan Cedars is protected
Floodplains and Wetlands	Consistent with Metro Title 3, no increase in fill allowed	Implement FEMA standards and require balanced cut and fill in 100 year floodplains; maintain a 50 foot buffer around wetlands.	Avoid undeveloped floodplains; protect any locally significant wetlands	Consistent with Metro Title 3
Steep Slopes (>25%)	Geotechnical review/development permit on slopes >25%	N/A	Avoid landslide prone areas and geologic hazards such as faults according to the USGS	Hillside Physical Constraint Density 1 DU per acre; Maximum Average = 1 acre; Preserve all areas exhibiting slopes >35%

[1] Source: Metro ESEE Analysis 2003 and Phase II Analysis of program options 2004
[2] Source: West of Sandy River Rural Plan Area Chapter 36.4500 Significant Environmental Concern Overlay Zone
[3] Source: City of Gresham Development Code, Section(s) 4.1300, 5.0103, 5.0200; 5.0600

Planning Steps

The planning process used to determine the Springwater resources that would be protected under the State's Goal 5 rule followed a sequence using similar methods as those used by Metro and Multnomah County, but at a higher level of resolution, pursuant to the Goal 5 process in OAR 660-023. Consistent with the standard Goal 5 process, the team:

- Collected and reviewed existing information
- Determined the adequacy of the information
- Conducted field studies and determined habitat quantity and quality
- Prepared map layers of resources
- Determined the significance of all resources mapped
- Adopted a list of significant resource sites

INVENTORY PROCESS

The basis for the inventory was the Statewide Goal 5 process adopted by Metro, as outlined in the procedures and requirements for complying with Goal 5. The development of the natural resources inventory is the result of the collation of existing data along with fresh analysis of the plan region. The focus is on creek and riparian condition, flow modifications and restrictions at road crossings, wetlands in ponds and riparian forests, wildlife use areas, scenic quality, and topography.

Existing information review

The inventory utilized information from previous studies conducted in the Johnson Creek drainage. Full citations for sources are listed in the bibliography at the end of this chapter.

The natural resource features inventory and needs analysis study began by collecting and reviewing existing data on Johnson Creek. These sources included:

1. Metro's baseline information for riparian and wildlife resources, specifically Metro's adopted regionally significant habitat inventory (Figure 5). The planning team found this inventory for Metro's Goal 5 resources needed refining to better understand the possibilities after future development. The areas that were misinterpreted or in a few cases overlooked in Metro's high-level air photo interpretation evaluation were corrected through ground-level observations (Figure 6). Consistent with Metro's inventory, the project team found most of the riparian areas and waterways are assumed to be regionally significant.

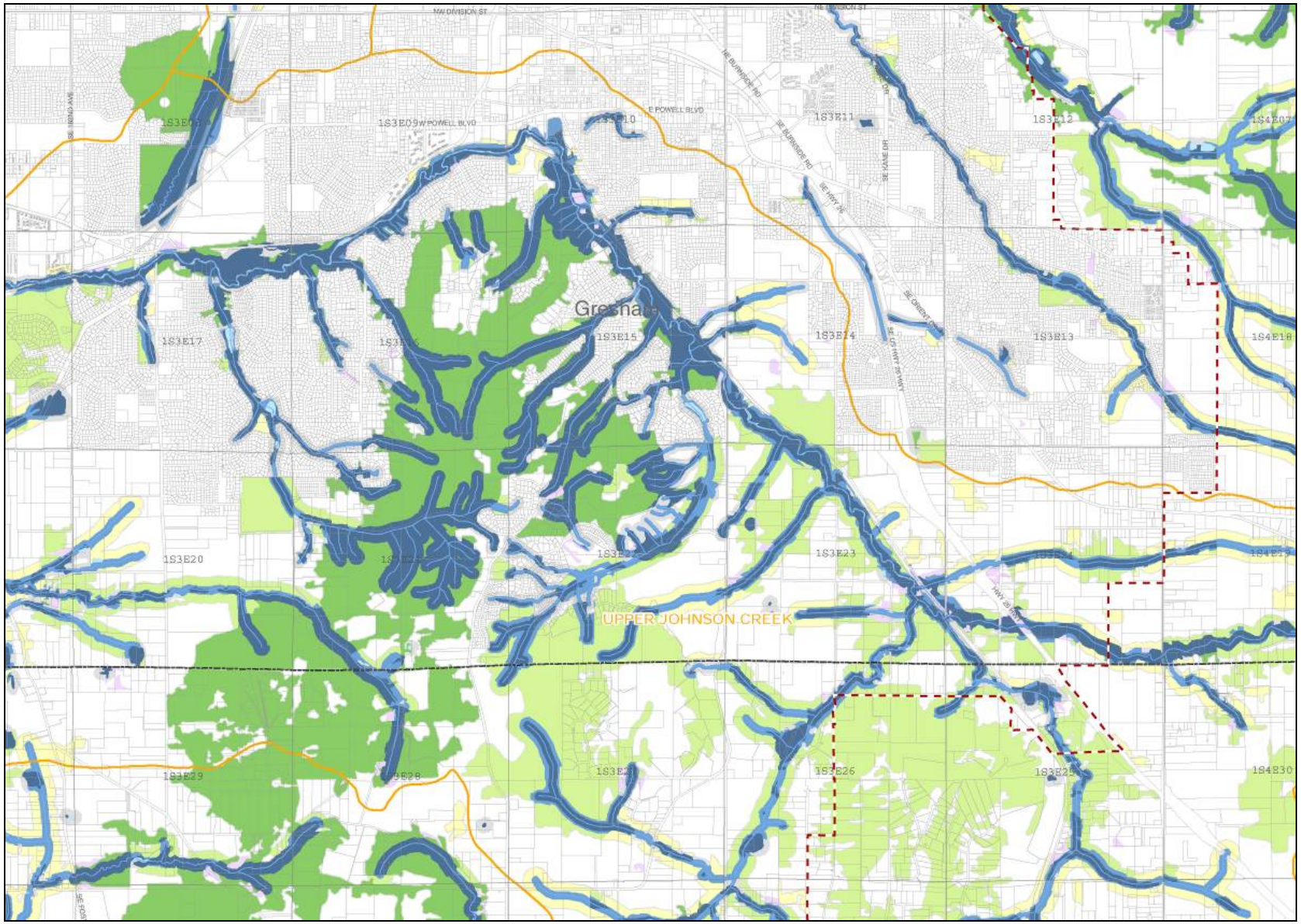

Figure 5. Metro's Resource Areas Map

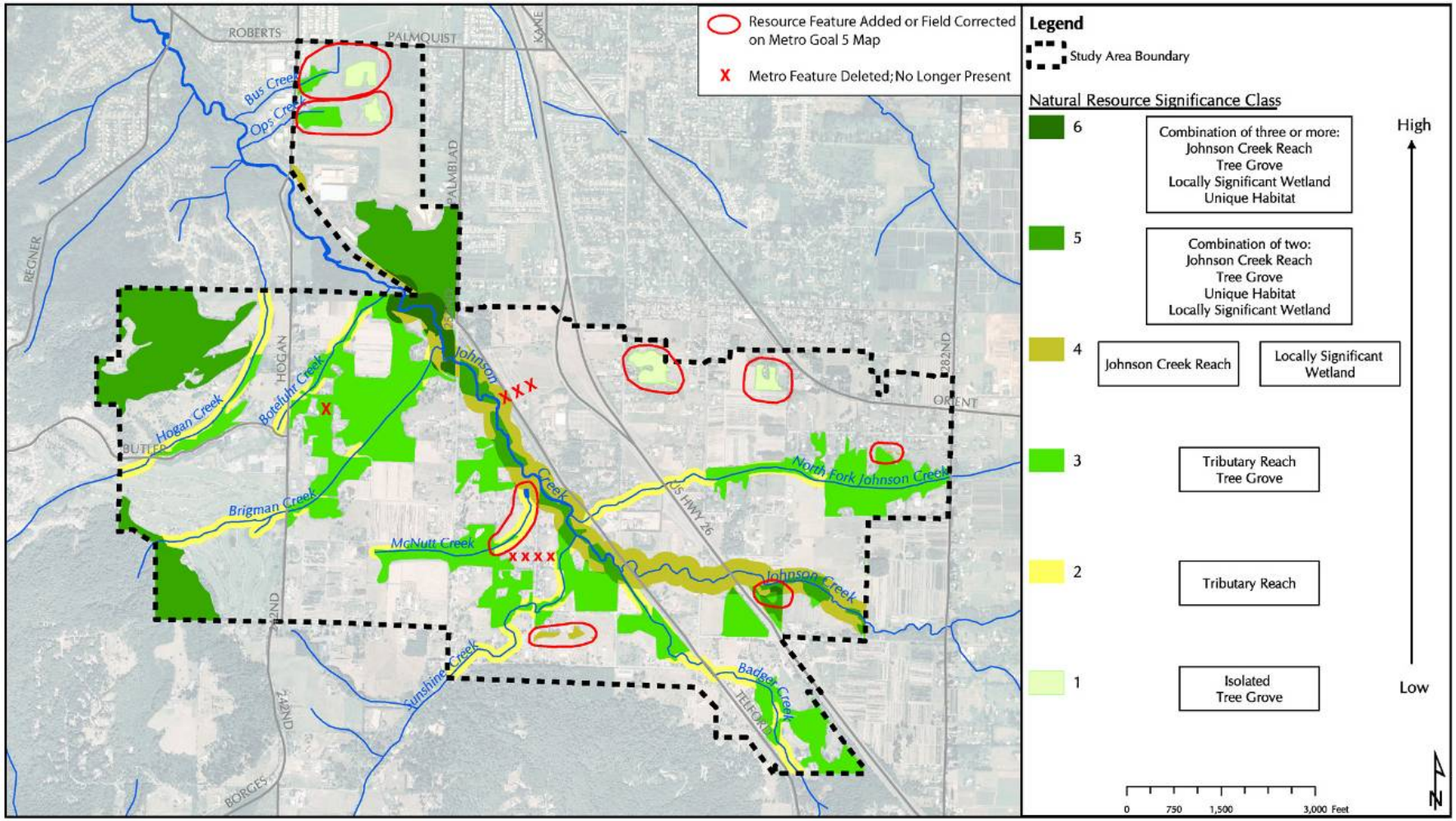

Figure 6. Field Corrections to Metro's Resources Map

2. Multnomah County West of Sandy Rural Transportation Plan Natural Resource Inventory and wildlife habitat protection measures.
3. Oregon Department of Fish and Wildlife (ODFW) stream surveys. Detailed stream survey of the Johnson Creek mainstem conducted by ODFW between1999 and 2000. Reach designations from this inventory including portions of Reach 16, all of Reach 17, 18 and a portion of Reach 19. The entire Johnson Creek contains 39 reaches according to the ODFW nomenclature.
4. Other regional studies coordinated by the Johnson Creek Watershed Council, the City of Portland or Metro Greenspaces Program. Products include the Johnson Creek Restoration Plan by the City of Portland, and the Johnson Creek Watershed Action Plan.

Data Adequacy Review

The availability of these resources meant that the City had enough data on Johnson Creek to aide decisions about protecting resources that it considers significant, which is acceptable under Goal 5 procedures (OAR 660- 023-0000 through 660-023-0250). However the project team and community supported refinements of existing data sets through field analysis where site access could be gained in the planning area. The approach to the field component of the additional natural resource inventory was to create a consistent database to document and compare function and value of the eight tributaries, wetlands, riparian and upland vegetation, and the value of these lands to wildlife.

Field surveys

The data analysis reviewed for baseline information was augmented through field observations and resource mapping conducted by Natural Resource Planning Services, Inc. staff, MDRM LLC, and John Gordon, wetland consultant, in May 2003 and February to April of 2004. Several methodologies were used to document characteristic wetlands, riparian and upland vegetation, wildlife habitat, sensitive species, steep slopes, springs, seeps, viewpoints and other natural features or geologic hazard zones. The Urban Riparian Inventory and Assessment Method (City of Portland 2000), Oregon Freshwater Wetland Assessment Methodology (Oregon Department of State Lands 2001), and Wildlife Habitat Assessment (WHA) (Metro 2003) parts of the Oregon Watershed Assessment Methodology (Watershed Professionals Network, 1999) methods were used to collect and record data on natural features. The Oregon Department of Land Conservation and Development (DLCD) has accepted use of the WHA method for compliance with Goal 5 guidelines. Results of the field surveys were tabulated and are included in the Reference Documents that accompany this report.

The initial study (Upper Springwater Corridor Study, NRPS, Spring 2003) involved outlining four Planning Units based upon the roads and geophysical constraints within the area in south Multnomah County between the Urban Growth Boundary (UGB) and the Clackamas County line. This initial study provided the following for the City:

- A database framework for incorporating detailed channel characteristics by reach sometime in the future
- Eight to ten key observation points with data at a high level of detail comparable to the UGB database (at least one location in each tributary)
- Riparian - Composition of riparian communities and species richness along at least one transect per each tributary of Johnson Creek

- Surface area extent of natural features that were measured using a Geographic Information System (GIS) and tabulated
- Transects of sampling sites located using the Global Positioning System (GPS) and imported into the GIS and mapped
- Wetlands and plants – general vegetative cover type map with open water wetlands and large wetland complexes identified
- Aerial photo mapping of general land uses and natural resources for the entire 1575 acres

Additional field study conducted (NRPS Fall 2003 and Spring 2004) during this inventory period included the Brickworks area, i.e., roughly 160 acres of additional study area north of Telford between Palmblad and Palmquist roads, and 81 acres south of the Clackamas County line between Telford Rd. and Mt. Hood Highway (US-26). It also included a detailed literature review and analysis, agency coordination, additional field observations, GPS data collection, and input to the GIS mapping system. This study provided:

- Identification of potential conflicts with the City's existing transportation network
- Field assessment of forested riparian wetlands, seeps and ponds and emergent marshes
- Analysis of scenic quality and viewsheds
- Identification of geologic hazards, faults, seismic zones
- Hydraulic data analysis and re-evaluation of flood-prone areas

Floodplain Function

The 100-year flood plain extent (Figure 7) shows the Johnson Creek floodplain. Aerial photographs of the1996 flood extent were examined at the U.S. Army Corps of Engineers District office; however, this event was beyond the 500 year level and inappropriate for map comparison for adequate flood protection. The examination of the major flood occurrence in the project study area provides important so that the goals of the project to safeguard or restore wetland function, to minimize flooding in the planning area, and to ensure that Springwater development does not exacerbate flooding downstream after implementation. The riparian zone, wetlands and undeveloped floodplain serve as water infiltration areas that are important for support of base flows within the watershed. Careful management of undeveloped floodplains will help the city and the region to meet water quality standards and provide for water temperatures and flows that allow the resident and anadromous fish species to thrive.

Resource Quantity and Quality

To gain an understanding of the planning area's resource quality, one must comprehend some concepts of landscape ecology. The operation of an ecological system depends upon a number of factors at a number of different scales (USBLM 2002). Each level in this time-space hierarchy has its' own importance. Assessing the watershed and using this assessment in a predictive fashion needs both an understanding and analysis of the natural processes occurring at all relevant spatial and temporal scales.

Figure 7. Johnson Creek Floodplain FEMA 100-year extent

A watershed resembles a pyramid with three levels representing scales. The highest scale of assessment of ecosystem function and dynamics contains the control, which describe the ecosystem state variables. They represent ecosystem elements as geology, geography, and climate. All ecosystem control have (varying) degrees of resistance to change, of time it takes to return to steady state, of levels of disturbance from which they will not return to steady state, and of differences between initial and recovered steady states. Identifying the control provides the constraints for determining the resiliency of the system and the prediction of the trajectory of changes that may occur. They also put boundaries on the range of natural variability, and provide some insight into the time frame for these changes to occur (Carlsson and Nilsson 2001, Martin 2001, Martin and Benda 2001).

A watershed's land base controls its processes. Focusing all rehabilitative efforts within the stream channel ignores the effects of land use and riparian vegetation on the supply of water, sediment, shade, and wood to the streams. Past errors, based on doing things thought to be 'good' for the species, eg. placing large wood in any salmonid streams, would be less likely to occur if the restoration goal is to reestablish processes to which most species have adapted. In addition, by looking at watershed processes instead of individual species habitat requirements, actions can be identified that restore habitat for aquatic and terrestrial species. This approach requires analysis of habitat forming processes at the watershed scale in order to identify processes that have been disrupted, as well as the locations and timing of land use effects on those processes.

Field Study Results and Resource Mapping

The key natural resources within the planning area are depicted on Figure 8. The Natural Resource documentation in the Reference Documents contain detailed characteristics and functional values of Springwater’s natural features by stream reach or plot of riparian and stream characteristics, tree groves and wetland types, sensitive species, wildlife habitat value, and unique habitat features. A summary of the characteristics by subwatershed is provided in Table 2, with a more detailed description of the stream reaches following the table.

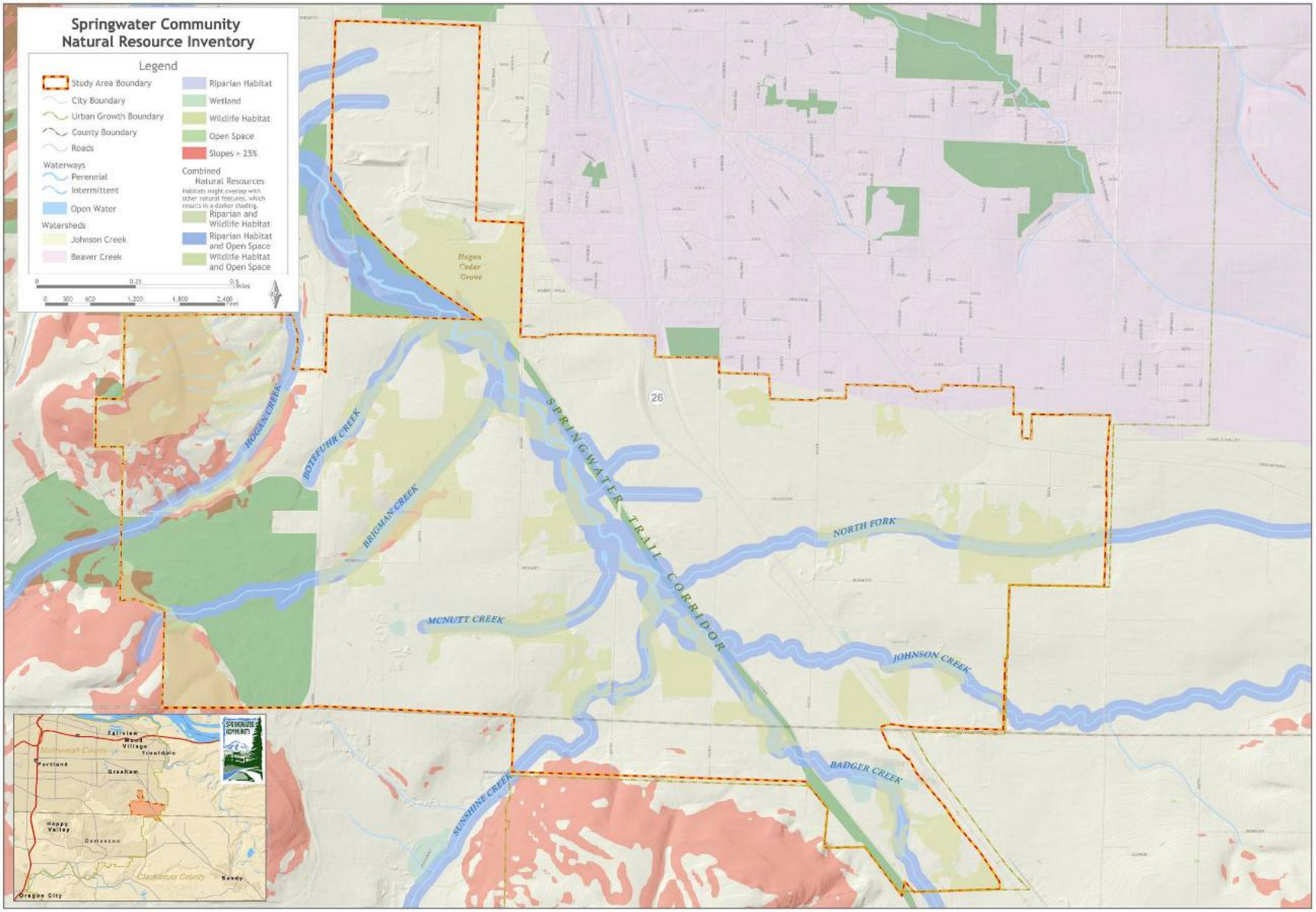

Figure 8. Natural Resource Inventory

Table 2 Natural Features Summary

Basin	Riparian	Wetlands	Wildlife Habitat	Slopes
Hogan Creek	Early to mid successional stage mixed deciduous and conifer (37.3 acres)	A few intermittent seeps and seasonal drainages flow from buttes to Hogan Creek	Good wildlife value on the buttes; good along the creek with mix of tree ages	Buttes > 25% along entire western side of the creek
Bus Creek	Conifer with extensive ivy and other non-native plants (6.9 acres)	None	Limited; development encroaches on all sides; creek is fed through a culvert and pipe	flat
Ops Creek	Conifer with extensive ivy and other non-native plants (8.2 acres)	None	Limited; development encroaches on all sides	flat
Botefuhr Creek	Very high quality reach in study area; Mature mixed deciduous and conifer (26.6 acres)	None	Near pristine condition; wildlife movement corridor	Rolling hills with channels in steep ravines
Brigman Creek	Mature mixed deciduous and conifer (54.2 acres)	Limited due to steep slopes	Good value; slightly disturbed understory; upper reaches poor vegetation is invasives only	Rolling hills with channels in steep ravines
McNutt Creek	Mature mixed deciduous and conifer (29.4 acres)	Small isolated manmade pond at headwaters	Marginal; impacts to understory shrubs reduces value for wildlife	flat
Johnson Creek Reach 16	Highest quality reach in study area; Mature high quality mixed deciduous and conifer. One fifth of reach is within the study area (981 sq. m; 0.2 acres)	Three possible palustrine wetlands	Highest quality conifer stands; near pristine condition and good wildlife movement corridor; Dense Hogan Cedar groves east of creek with lush undergrowth of shrubs, forest ferns and forbs	Variable throughout the reaches; 0.5% gradient

Table 2 Natural Features Summary (Continued)

Basin	Riparian	Wetlands	Wildlife Habitat	Slopes
Johnson Creek Reach 17	Second highest quality reach in study area: Mature mixed deciduous and conifer (4245 Sq. m; 1.0 acres)	Locally Significant Wetland near 252nd and the Springwater Trail and ten possible wetlands mostly on the east side of the creek	Good wildlife movement along reach	Variable throughout the reaches; 0.8% gradient
Johnson Creek Reach 18	Mature mixed deciduous and conifer (3477 sq. m: 0.86 acres)	One Locally Significant Wetland and two possible wetlands west of US Hwy 26 crossing	Poor; land is devoid of wildlife habitat	Variable throughout the reaches; 0.8% gradient
Johnson Creek Reach 19	Mature mixed deciduous and conifer (3010.4 sq. m; 0.74 acres)	Three Locally Significant Wetlands east of US Hwy 26 crossing	Marginal to good, some thick understory provides for bird species and cover for mammals others are surrounded by nurseries	Variable throughout the reaches; 0.9% gradient
Sunshine Creek	Mature mixed deciduous and conifer (34.4 acres)	A two-part Locally Significant Wetland southeast of the creek	Good as patches are connected to mainstem; also wildlife habitat connection between McNutt and Sunshine creeks	Area within the Springwater study area is meandering and mostly flat, the creek is fed by higher gradient upper reaches
Badger Creek	Mature mixed deciduous and conifer (43 acres)	Manmade pond near confluence with Johnson Creek	Marginal due to relatively small patch size but better where it does connect with riparian	Mostly flat
North Fork Johnson	High riparian function except for flood management function; Mature mixed deciduous and conifer (56 acres)	A Locally Significant Wetland and a cluster of possible palustrine emergent wetlands ¼ mi west of 282nd Avenue north of the creek	Good mixture of habitat for all wildlife species; thick understory provides food and cover for birds and mammals	Mostly flat

Johnson Creek and Tributaries

The study area's creek system (Johnson Creek main stem and nine tributaries) create opportunities to achieve multiple benefits in preserving a healthy aquatic habitat combined with meeting stormwater treatment/conveyance needs, restoring riparian or wetland habitats in headwaters, and providing passive recreation areas and natural areas.

Central to the area is the Johnson Creek mainstem (specifically the upper portion of reach 16, all of reaches 17 and 18, and the lower portion of reach 19--see Figure 9 Stream Reach and

Riparian Index), which runs through the entire planning area diagonally. Again, ODFW field surveys called out reach 16 as one of the watershed's most valuable reaches and fieldwork by NRPS staff confirmed the portion of reach 16 within the planning area is in excellent condition. The Springwater section of Johnson Creek has the following qualities:

- Reaches 16 and 17 have shown to be fish-bearing, with high channel complexity and lack of human disturbance. This provides good fish habitat for resident and anadromous fish.
- At time of printing, NOAA Fisheries is considering the main stem of Johnson Creek (including the Springwater section) as critical habitat for Lower Columbia River steelhead and Chinook, and the Magnuson Stevens Act lists it as essential fish habitat (EFH) for Coho and Chinook.
- Johnson Creek is considered by Oregon Department of Environmental Quality as a water quality-limited stream, and is 303(d)-listed for toxins (PCBs, Polynuclear Aromatic Hydrocarbons, dieldrin, and DDT), temperature, and fecal coliform.
- Relatively good riparian condition exists along the main stem.

Within the Springwater planning area, nine creeks are primary tributaries to Johnson Creek. These creeks are:

- Hogan Creek
- Bus Creek
- Ops Creek
- Botefuhr Creek
- Brigman Creek
- McNutt Creek
- Sunshine Creek
- Badger (MacDonald) Creek
- North Fork Johnson Creek

Existing rural development and agricultural practices creates many environmental planning issues for water resources. For example, while North Fork Johnson Creek is surrounded by complexes of tree groves and is not "water quality limited" according to the Oregon State Department of Environmental Quality (DEQ), Badger Creek (otherwise known as MacDonald Creek) has been modified by Telford Road. Coordination and Green Streets design for road improvements are intended to increase functional value and aesthetics of this riparian area. Also, urban development at the headwaters of Botefuhr Creek at Butler Road has changed the flow regime of the creek channel. Opportunity exists to restore the area west of Hogan Road where a Himalayan blackberry monoculture currently exists, and an incised channel has minimized the channel's connectivity to its floodplain. Brigman Creek is currently constrained by the golf course. It is essential that the creek's riparian corridor and headwaters be preserved to maintain the water quality of Brigman Creek.

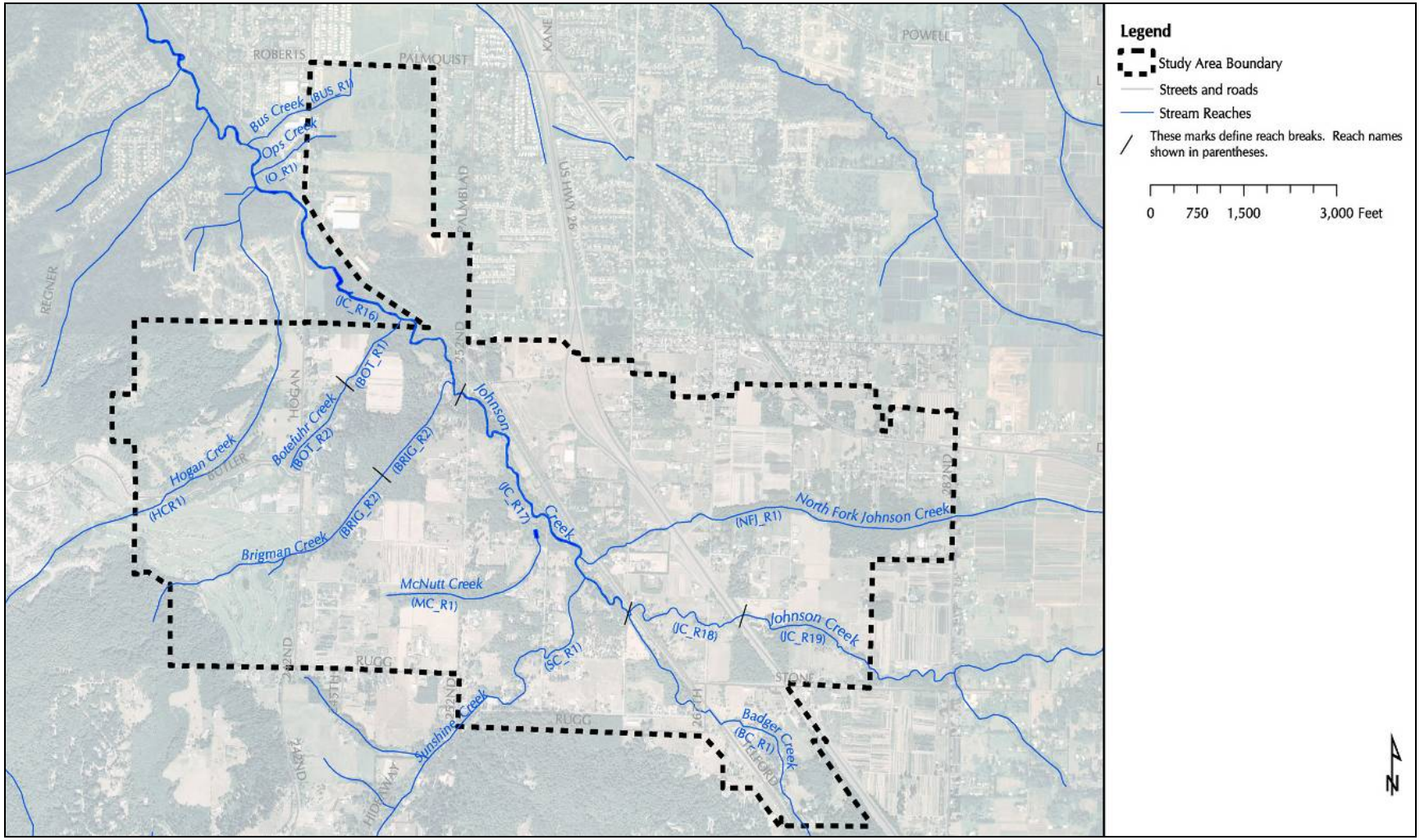

Figure 9. Stream Reach and Riparian Index

Stormwater management, or the lack thereof, has been a major influence on the landscape. Over ninety percent of the site has an open stormwater system, (predominantly ditched), which adds to sediment concerns in Johnson Creek due to erosion. For homes constructed decades ago, occasional septic system failures contribute to the degradation of water quality.

There is currently no treatment of stormwater in the Springwater plan area except at Highway 26 and at Butler Road. The increased direct input to the creek during high precipitation events increases seasonal flooding potential due to the high water table.

Wetlands

Through conducting a Local Wetland Inventory (Gordon, J. 2004), six of the planning areas emergent marsh type complexes were determined to be “locally significant” as defined by the functional and site characterization of the OFWAM (Figure 10). These wetlands totaled no more than six (6) acres across the study area and were recommended for protection usually as part of a larger wetland, floodplain, and forest complex. Restoration of original headwater wetlands should improve the following environmental conditions that were apparent during the resource inventory and needs analysis planning process.

Across the planning area, there are:

- Undulating landscapes that tends to pond water (Figure 11)
- Many roads and manmade linear features that increase surface water runoff to the low areas
- A high percentage of altered wetlands and
- A high water table

Figure 11 Badger Creek near Johnson Creek Confluence Ponded Wetlands

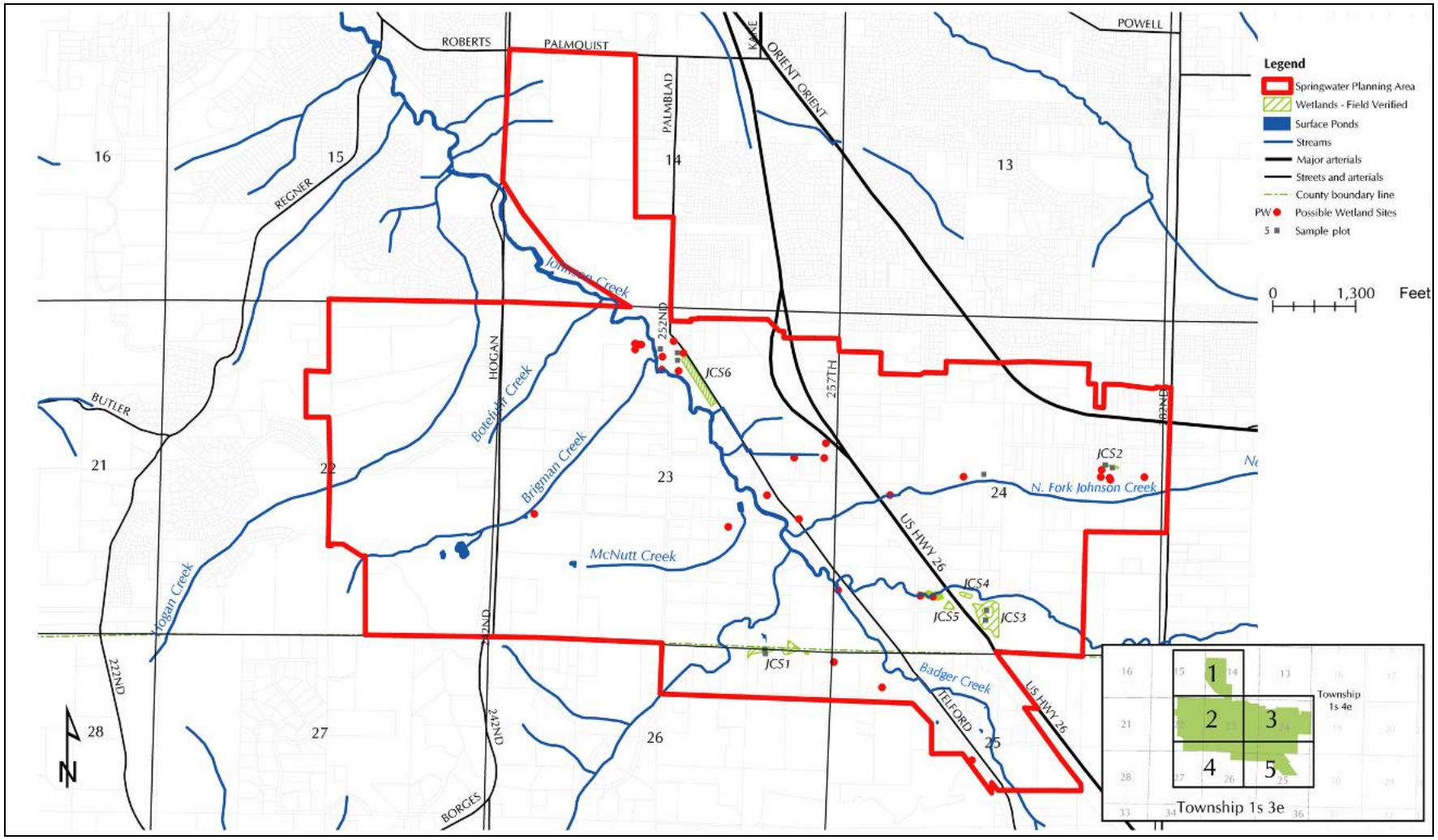

Figure 10 Wetlands Inventory

Riparian Areas

Riparian corridors are essential to wildlife passage, streambank protection and erosion control, and fish and aquatic habitat health, and they perform numerous necessary ecological functions. In Springwater, riparian vegetation has been removed, mowed or cleared throughout much of the planning area. The riparian area of Johnson Creek has been altered due to Telford Road and the Springwater Trail; in some places the riparian area is less than 20 feet wide. However, the intact portions of riparian areas are home to a dense mix of shrubs and mature conifer and deciduous trees. The trees provide shade to the waterway and protect aquatic habitat of this fish-bearing stream. Table 3 shows the riparian corridors that form the green corridors along each creek in the planning area and some results of the condition analysis. Out of 430 acres of riparian habitat approximately 14 percent or 60 acres have been entirely denuded and need to be restored to provide the expected functions of high quality riparian habitat (Figures 12 and 13). Approximately 40% of the riparian area is greatly intact and in comparatively healthy condition. These will be important areas to focus protection and some enhancement efforts. The majority of the riparian area (60%) has experienced varying degrees of alteration 14 percent has been physically mowed or cleared, and will need corresponding degrees of restoration and enhancement activity conducted in order to return the riparian area to a higher quality functional condition.

Table 3 Riparian Habitat with Highest Restoration Needs

Location	Total Riparian Area[1]	Percentage to be Replaced
Hogan Creek	37.3	13%
Bus Creek (Brickworks Ditch 1)	6.9	8%
Ops Creek (Brickworks Ditch)	8.2	0%
Botefuhr Creek	26.2	11%
Brigman Creek	54.2	17%
McNutt Creek	29.4	13%
Johnson Creek	109.6	11%
Badger (MacDonald)) Creek	43.0	16%
Sunshine Creek	34.4	14%
North Fork Johnson Creek	56.0	13%
Totals	429.9	14%

[1] Area within 100 feet of either side of top of bank. Note: There is some variability in calculations (approx. ±1 acre in 632)

Figure 12 Riparian Area North Fork Johnson Creek

Figure 13 Riparian Zone Overgrown with Invasive Plants Bus Creek

Where native vegetation still exists, it varies from riparian shrubs and trees to mature tree groves. This portion of the landscape is characterized by:

- Predominantly mixed deciduous/conifer tree groves
- Large tree groves within Botefuhr, Brigman, and Johnson Creeks
- Landscape, which is predominantly nursery farms (wholesale and public) and rural residential with light grazing
- Predominant tree species of Douglas fir, Western red cedar (and Hogan Cedars), Red alder, Oregon ash, black cottonwood, and big-leaf maple
- Hogan Cedars Grove. This is one of the most valuable natural resource portions of the watershed landscape and certainly the Springwater Community Planning area, because of the relatively pristine and rare nature of vegetation, value to wildlife, and benefits to Johnson Creek riparian and aquatic zones.

Wildlife Habitat

Mid- to late-succession mixed conifer/deciduous tree groves within the study area provide a structurally diverse environment for numerous bird and terrestrial mammals. There are several ponded wetlands associated with these woodlands (Figure 14, Tree Groves and Wildlife Index). Individual plots are described in data sheets in the Reference Documents and depicted on Figure 14. A summary of the wildlife habitat inventory is also given in Table 4.

Wildlife habitats (e.g., woodland and tree groves and riparian wetland complexes) and non-riverine wetlands were examined in surveys conducted by the team in Spring 2004. Metro's fish and wildlife model used quantified data regarding vegetation structure, patch size, water quality/quantity, and other features to determine the value of an area to wildlife.

Incidental sightings of mammals, birds, and fish that use the study area throughout the two-year study revealed numerous deer present as well as migratory songbirds, diving ducks, and raptors. Amphibians and juvenile fish appear to be prevalent within the entire subbasin. The area is so highly disturbed there is very little habitat broad enough to support winter or breeding ranges for large ungulates or carnivores. The wildlife habitat assessment relied primarily on the vegetative structure, diversity, patch size and connections to waterways for determining the relative value of certain portions of the study area for wildlife.

Springwater's mature forests are valuable wildlife use areas within the watershed's landscape because of their relatively pristine nature, large patch size and proximity to the Johnson Creek riparian zone (Figure 15). Forested patches often provide continuous wildlife passages between the major western tributaries to Johnson Creek; i.e., McNutt and Brigman Creeks, Sunshine and MacDonald Creeks, Brigman and Botefuhr Creeks. Tree groves provide contiguous large patches of mature forest habitat that extend to the northeast as far as Johnson Creek and Telford Road. They connect with undeveloped forest habitat in south, northwest, and southeast directions and therefore are likely to be important to the regional wildlife migration or movement (D. Apostel, Personal Communication, June 2004).

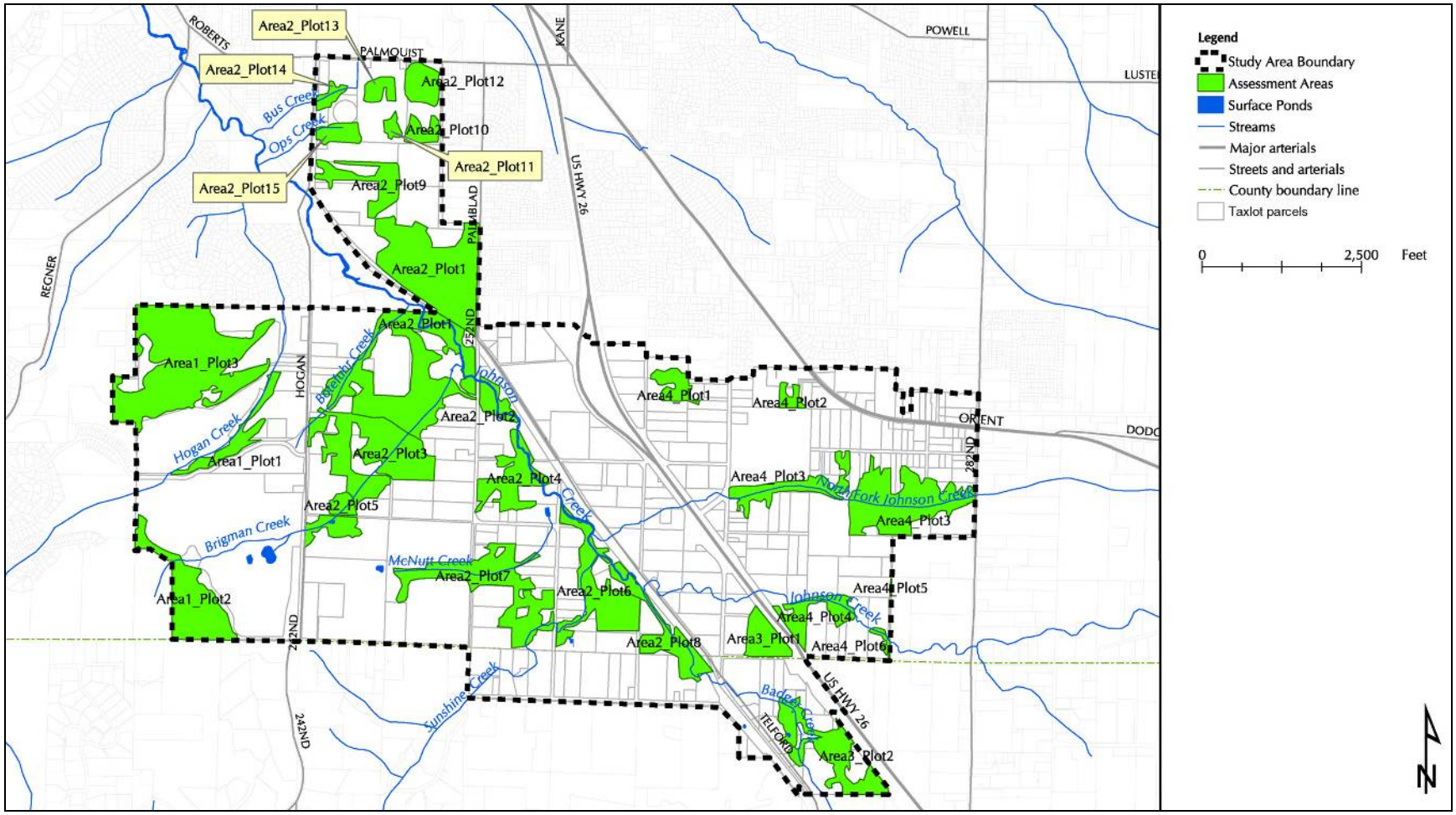

Figure 14 Tree Groves and Wildlife Index

Table 4. Wildlife Habitat Inventory

Planning Area	Plot (Tree Grove #)	Surveyed ((Y)es or (N)o)	Vegetation Type (Vegetation Community Composition)	Seral Stage (Age of the stand)	Wildlife Value	Recreation Value
Area 1	Plot 1	Y	Mixed Deciduous/Conifer	Early to Mid Deciduous/Mid to Late Conifers	Good, as wildlife movement corridor.	Poor, due to existing constraints and steep riparian area.
	Plot 2	N	Mixed Deciduous/Conifer	Mid to Late Deciduous/ Coniferous	Good, mixture of young and old trees. Both deciduous and Evergreen.	Good, view of valley and good mixture of young and old trees.
Area 2	Plot 1	Y	Mixed Conifer/Deciduous	Late Deciduous/ Coniferous	Good, wildlife movement corridor. Undisturbed area.	Marginal, untouched forest. Should be saved as wildlife
	Plot 2	N	Mixed Conifer/Deciduous	Mid to Late Deciduous/ Coniferous	Good, small patch, but provides continued wildlife movement corridor for wildlife along Johnson.	Marginal, trail already exists.
	Plot 3	Y	Predominantly Deciduous	Early to Mid Deciduous	Good, slightly disturbed understory. Connected to plot 1 to form large continous grove.	Marginal, due to lack of scenic value, but a quiet place to see wildlife.
	Plot 4	N	Predominantly Deciduous	Early to Mid	Good	Poor
	Plot 5	N	Mixed Conifer/Deciduous	Mid to Late Conifer/Early to Mid	Marginal, due to himalayan blackberry infestation.	Poor
	Plot 6	N	Predominantly Deciduous	Early to Mid Deciduous	Good, because of connection to the mainstem of johnson.	Poor
	Plot 7	N	Mixed Conifer/Deciduous	Mid to Late Conifer/Early to Mid Deciduous	Marginal, coonection to maintstem Johnson provides movement corridor but impacts to understory and shrub reduce value.	Poor, narrow and steap.
	Plot 8	N	Predominantly Deciduous	Early to Mid Deciduous/Mid to Late Conifers	Marginal, due to relative small size but is of value due to connection to riparian area of creek.	Poor
Area 3	Plot 1	N	Mixed Conifer/Deciduous	Early to Mid Deciduous/Mid to Late Conifers	Good, thick understory provides for bird species and cover for mammals.	Poor, very thick understory.
Area 4	Plot 1	N	Predominantly Deciduous	Early to Mid Deciduous	Marginal, due to surrounding constraints.	Marginal, up on a plateau with possible view of the
	Plot 2	N	Mixed Deciduous/Conifer	Early to Mid Deciduous/Mid to Late Conifers	Marginal, due to surrounding constraints and relative size.	Poor
	Plot 3	N	Mixed Deciduous/Conifer	Early to Mid Deciduous/Mid to Late Conifers	Good, large continous tree grove surrounding creek channel. Provides a good mixture of habitat for all species.	Marginal, due to thick understory and relatively little scenic value but could provide an area for a nice
	Plot 4	N	Mixed Deciduous/Conifer	Early to Mid Deciduous/Early to Mid Conifers	Good, thick understory provides for bird species and cover for mammals. Also connected to Johnson Creek riparian area.	Poor, very thick understory.
	Plot 5	N	Predominantly Conifer	Mid to Late Conifer	Marginal, small grove surronded completely by nursery land.	Marginal, up on a plateau with possible view of the
	Plot 6	N	Predominantly Deciduous	Early to Mid Deciduous	Marginal, provides movement corridor. Rehabilitation to north side could increase value.	Poor, high density of streamside wetlands. Possible flooding concerns.

Figure 15 Wildlife Use Areas Near Springwater Trail

Wildlife certainly uses Johnson Creek and its tributaries' riparian/upland habitats as travel corridors, and for feeding, resting and potentially for denning or nesting, depending on the species and their respective behavior. Mature tree groves give wildlife the protection they need to travel to and from, as well as along, the Johnson Creek riparian area.

SIGNIFICANCE DETERMINATION

Natural resource significance determination used a combination of inventories from NRPS fieldwork and data analysis, as well as Goal 5 resources identified by Multnomah County and Metro for the same planning area. These studies used a set of criteria to evaluate the resources' significance for the regional planning goal for land use. Our study used the same significance criteria as Metro which relies heavily on well-researched, scientifically established, regionally recognize studies that evaluate the function and value of natural and biological resources (see Table 5). We then considered the tolerance or thresholds that each resource has for long term viability within the physical environment and the resources location within the context of the other resources and the landscape. For example, not only was function considered but also position in a spatial hierarchy and size of the area. This enabled us to rate them on the basis of the multiple factors within certain types of landscape forms. The significant natural features of Springwater Community compared favorably with those identified within the West of Sandy River Rural Area Transportation and Land Use Plan, Goal 5 process and with Metro's Goal 5 resource inventory.

The following section details the approach used to evaluate the data and create an accurate description of the baseline conditions. The basis of the analysis recognizes that the dynamic nature of systems in both space and time must be used to inform any determinations of significance for the purposes of planning. Critical to the process is the realization that while each

area deserves and requires protection of some sort, planning must take into account that not all functions exist in all areas, so the “cookie-cutter” approach typically used will fail to recognize the key ecological elements of each area, and the scale at which these elements should be recognized.

This first step occurs at a very broad scale and requires recognition of ecoregion characteristics. These include the geology and terrain as well as any human infrastructure (it tends to constrain processes in a manner similar to geology). For instance, Springwater is positioned between the buttes in the south and west and Mt. Hood foothills toward the east; the Johnson Creek bisects it diagonally draining toward the northwest.

The next step involves a determination of ecosystem processes and habitat effects, or “functions”. Identifying the conditions provides the constraints for determining the resiliency of the system and the prediction of the trajectory of changes that may occur. They also put boundaries on the range of natural variability, and provide some insight into the time frame for these changes to occur. Each individual natural feature within Springwater was examined for the number of functions that were available to it at the observation year and the question was asked, given the area is not manipulated, what would it look like how would it function over time. Many of Springwater’s habitat effects within many of its riparian zones are frequent flooding; streambank erosion due to clearing, poor water quality degraded by fertilizers. Should these stream reaches be left alone with no human influence, the system is resilient and the trajectory of change would be to re-establish the channel migration zone, aggrade the streambed, self seed the riparian vegetation and improve water quality by reducing turbidity and inputs from surrounding land uses.

The third step identifies those elements of the system that demonstrate the least resilience to change, over time; those characteristics modified most. In Springwater several stormwater ditches that drain the existing highways, highways, bridges and culverts, the Springwater Trail and Persimmon Golf Course are fixed and least resilient to the natural process of ecosystem variability and resources in or near these areas would require the most human effort and cost to return them to their natural state. The third step also allows the siting of development features to allow system function to continue along a desired trajectory. On the other hand, those areas where several natural features or ecosystem elements occur in combination at a single location, i.e. backwater wetlands along a low gradient stream with well developed riparian vegetation structure along a gradient to scrub shrub and then mature mixed conifer/deciduous forest are examples of highly functioning natural areas that are relatively unmodified, pristine. All of these elements provide a rating of the “significance” or value to overall function of each of the major ecosystem elements represented in Springwater community.

Using a watershed approach for planning and rehabilitation, therefore, involves understanding the arena in which change occurs (controls), the vehicle for change (processes), and the outcomes, as well as responses to change (disturbance and resilience). Ultimately preserving watershed function, and in the case of the City of Gresham, preserving desired riparian conditions, means allowing these elements, or understanding how they respond to the various changes required to produce the desired result. Natural systems have a dynamic nature that consists of all the above, and that an attempt to draw a circle around the result of control and processes, the effects, will eventually result in the cessation of the more dynamic nature of the environment. This, in turn, will cause the system to assume a stable state not resembling the desired condition, as some its more important elements no longer process inputs as they originally did, or the system overwhelms the attempt at preservation and retains its original dynamism.

By preserving specific areas, and paying attention to processes and inputs, the City of Gresham will achieve its desired result of combining development with maintaining a watershed functioning in a manner they desire. The distances around each natural feature recommended for environmental protection are defined by fitting each to the current control constraining the area, identifying the important processes, understanding the inputs to the systems, and preserving the important features.

The basic resource characteristics inherent in certain natural systems (incorporating the spatial and temporal elements described above) provided the foundation for significance rating criteria (Table 5). These have been evaluated through numerous research studies and used to represent areas of importance to the continued functioning of the natural environment. Table 5 shows the relationship of each resource function to a particular resource or land form. Functions such as: water flow, storage and sources, water quality, channel dynamics and morphology, microclimate, fish and aquatic habitat, riparian habitat, upland vegetated habitat, and provision for sensitive plant or animal species are part of the equation for significance. If none of these functions exist, the site was not identified as significant. If any of these factors exist, the site was identified as significant to ecological system.

Table 5 Significance Criteria

Resource functions	Land features with functional value	Land features	Primary factor	Contributing factor
Water Quality (including sediment filtering, nutrient/pollutant filtering, erosion control, thermal regulation, and stream bank stability)	Vegetation and streambank areas. Vegetation growing from the streambank can help prevent erosion. Roots and fallen tree trunks may also stabilize stream channel banks. Artificial channelization of stream reaches can lead to additional erosion in other downstream reaches. Vegetation growing in the riparian area filters sediment, excess nutrients, and chemical pollutants from stormwater runoff. This functional value occurs where stormwater is allowed to flow through riparian vegetation before entering the stream channel. Riparian vegetation preserves un-compacted topsoil that is rich in organic materials and allows stormwater to infiltrate into the ground rather than flow over the surface (reduced surface erosion). Wetlands and floodplains. Wetlands and vegetated floodplains help to purify water by removing sediments, excess nutrients, and chemical pollutants.	**Vegetation**	– Vegetation within 100' of stream or wetland – Vegetation within 200' of stream or wetland if slope $\geq$ 25%	- Vegetation within 100-200' of strea or wetland[1]
		Water Bodies	- All land within 50' of a stream - All inventoried wetlands	
		Floodplain	- "Undeveloped" floodplain	- "Developed" floodplain

[1] Intact forests contiguous to riparian areas are included out to a maximum of 860 feet.

Table 5 Significance Criteria (Continued)

Resource functions	Land features with functional value	Land features	Primary factor	Contributing factor
Channel Dynamics	Large trees. Stream channels that have complex "structure" support a larger diversity of wildlife (for example, a variety of features, such as pools, areas of white water, meanders). Large wood that falls into the stream channel can create pools and other complex channel habitat features. Side-channels, oxbows, and off-channel wetlands. These areas provide refuge for fish during flooding, when the current in the main channel may be too fast. The Meander Zone. Low gradient streams tend to "snake" across their floodplain in a series of "S"-curves. This is a natural hydrologic process. Altering this natural flow pattern in one location can cause significant change in another location as the stream seeks a new equilibrium. Human structures built in the meander zone can interfere with natural stream hydrology, and lead to decreased in-stream habitat complexity. Streambank Areas. The landscape in close proximity to a stream is a dynamic place. Pools, small backwaters, meanders, and other important stream channel features will not form if the channel is confined to a narrow space.	**Vegetation**	– Vegetation within 100' of a stream, stream meander zone, or wetland connected to a stream – Vegetation within 150' of fish-accessible stream – Vegetation within the floodplain	– Vegetation within 150-200' of fish-accessible stream
		Water Bodies	- Within 50' of a stream - Within wetlands connected to a stream	
		Floodplain	- "Undeveloped" floodplain	- "Developed" floodplain

Table 5 Significance Criteria (Continued)

Resource functions	Land features with functional value	Land features	Primary factor	Contributing factor
Water Quantity: Stream Flow, Sources, and Storage	Springs, seeps, and wetlands. These land features supply water to streams (cold water sources are particularly important in an urban area). Floodplains and wetlands. These areas store floodwaters and reduce "flashy" stream hydrology. Forests. Headwaters and riparian forests act as a sponge to hold water, slow stormwater runoff, and maintain stable flow in streams (baseflow). Un-compacted topsoil rich in organic materials can hold water and slow stormwater runoff.	**Vegetation**		– Vegetation within 98 of stream
		Water bodies	– Within 50' of streams and isolated wetlands. – Within 100' of stream associated wetlands	
		Floodplain	– Within flood prone areas	
Microclimate	Stands of trees and shrubs. Stands of trees and other vegetated areas can impact air temperature and humidity within both upland and riparian areas. The local humidity and air temperature can impact water temperature in small streams and impact localized habitat conditions. Topographic features. Localized topography can also impact air temperature and humidity (for example, habitats on a north slope or within a deep gorge may be cooler).	**Vegetation**	– Woody vegetation within 50' of water body	– Woody vegetation contiguous extent to maximum 525'

Table 5 Significance Criteria (Continued)

Resource functions	Land features with functional value	Land features	Primary factor	Contributing factor
Fish and Aquatic Habitat	In-water habitat structure. Certain configurations of pool and riffle sequences in the stream channel, off-channel wetlands, side channels, oxbows, meanders, backwaters, frequently flooded areas (10-year flood or higher frequency), known spawning gravel.	**Aquatic Habitat**	– Within 100' of high or medium rated stream segment	– Within 100' of low rated stream segment
		Sensitive Species	Within 200' of channel meander zone of a stream containing aquatic sensitive species or potential (high or medium rated) habitat for sensitive species	
		Wetlands	– Within wetlands connected to a stream	
		Floodplain	– Within channel meander zone of accessible reach	– Within channel meander zone of upstream reach – Within flood prone areas
Organic Materials	Vegetation. Trees and other overhanging vegetation are a source of leaf-litter, fallen branches, logs, and other organic matter. This material is an important food source for the organisms that fish eat (aquatic and terrestrial invertebrates). Floodplains. Organic material can enter the aquatic environment by falling into the stream, or when the stream floods and carries away organic material from a vegetated area.	**Vegetation**	– Vegetation within 100' of stream – Vegetation within 50' of a wetland connected to a stream	– Vegetation within 100-200' of stream – Vegetation within 50 - 200' of a wetland

Table 5 Significance Criteria (Continued)

Resource functions	Land features with functional value	Land features	Primary factor	Contributing factor
Terrestrial Wildlife Habitat Quality	Vegetation or land features that provide food and cover for wildlife. Water and food sources, and structure for nesting, dening, rearing, and cover are important indicators of habitat quality. Corridors and connected patches of native vegetation. Wildlife populations that are connected to each other are more likely to survive over the long term than isolated ones. Many species must migrate seasonally to meet basic needs for food, shelter and breeding, and connections between habitat patches allow this migration to occur. Corridors play an important role in urban areas to provide opportunity for migration and movement, including between upland and riparian habitats.	**Vegetation**	– Vegetation within 100' of a stream or wetland	– Vegetation within 100-300' of a stream[4]
		Structure	– Within 50' of wildlife habitat (woody vegetation) with WHA score of 45 or more – Wildlife habitat areas within identified habitat corridors	– Within 50' of wildlife habitat (woody vegetation) with WHA >34 and < 45[4]
		Water bodies	– Within 50' of water body	
		Floodplain		– Within flood prone area
Terrestrial Sensitive Species	Sensitive species habitats. Areas that provide life-history requirements for sensitive animal and plant species are important for maintaining sensitive species populations.	**Vegetation**	– Wildlife habitat areas within 100' of terrestrial sensitive species point	– Wildlife habitat areas within 100'-300' of terrestrial sensitive species point[4]
Upland Interior Habitat	Large intact habitat patches. Long-term trends in wildlife populations are directly related to the area of habitat available—the larger the patch, the longer a population can sustain itself.	**Vegetation Patches**	– Wildlife habitat areas with an acre or more of interior habitat	

The Johnson Creek watershed and its resources are very important to the region and the integrity of the areas outside the urban growth boundary. Approximately 450 acres of significant natural resource areas exist across the 1700-acre planning area. To determine where the most function could be regained, the inventory evaluated the types of land forms or natural features that occur and the total quantity of resources in any particular area within the planning area. For example, if the stream riparian corridor adjoined a mature grove of trees, i.e. upland wildlife habitat or a wetland, it was rated a higher class than if there was only a single resource at that point in the planning area. In this way, the detail of the field observations and GIS mapping were employed to help the planners make informed decisions about the recommendations for protection and enhancement of the green framework of the planned community.

Classification of Protection and Enhancement Sites

More refined significance classes provided the planners with a simple tool to better inform decisions concerning proper levels of site development, or priorities for site protection or restoration. Once the resource inventory was complete, and natural features mapped individually, and discretely, the resource GIS layers were combined (Figure 16). Certain patterns arose that provided a mechanism to discern the difference in condition and resource value, as well as the level of potential for improving natural resource function and value. While the LWI process, the wildlife habitat assessment, and stream survey methodologies all contain this capability, none of them can evaluate the increases in functionality (and therefore, significance) provided when resources combine at a location. The Significance Class map shows the proximity of resources and their relative value and current function (Figure 16). Those functioning well, and/or combining three or more resource features, gained a rating of 6 whereas those isolated and lacking proximity to water were rated low (1). The various classes of significance (shown in Table 6) provide the basis for planning and prioritizing resource protection and restoration activities. Resource data sheets and summary tables for individual factors, evaluated for each resource that combined to create the significance classes, are provided in the Reference Documents.

Table 6. Natural Resource Significance Classification

High Resource Function	
6	Combination of three or more of the following: Johnson Creek Reach Tree Grove Locally Significant Wetland Unique Habitat
5	Combination of two of the following: Johnson Creek Reach Tree Grove Locally Significant Wetland Unique Habitat
4	Johnson Creek Reach or Locally Significant Wetland
3	Tributary Reach with a Tree Grove
2	Tributary Reach
1	Isolated Tree Grove
Low Resource Function	

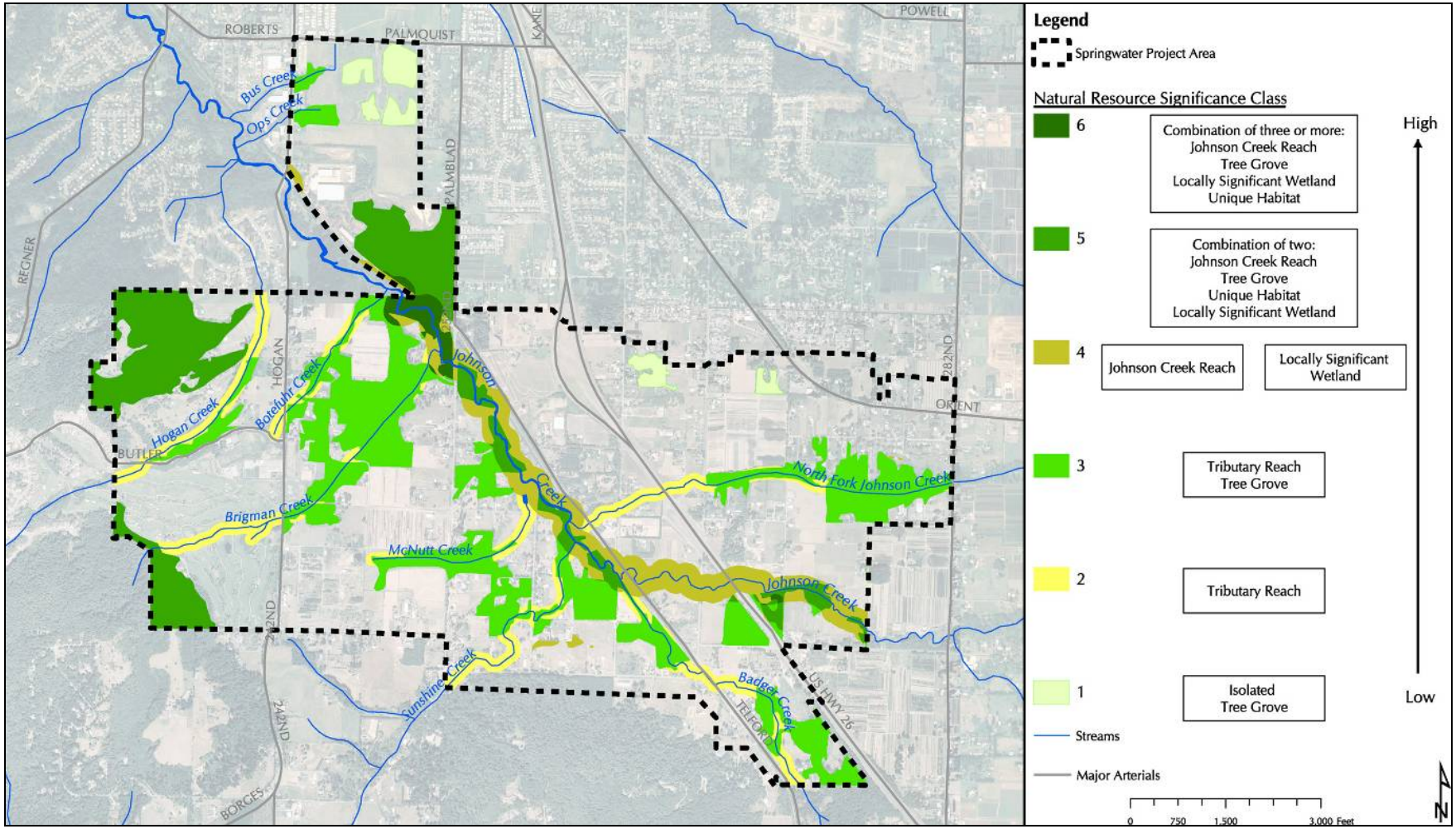

Figure 16. Significant Resource Classifications

The various grouping of resource features and landforms were then evaluated to identify the potential for enhancement and to identify the few areas where the current function and value is so high that it is particularly important to preserve and protect these lands.

Summary of Recommendations

MANAGEMENT PLAN OBJECTIVES

Following the community working group meetings and field observations made by the planning team, priorities emerged for the planning area's natural resources. These priorities are key objective elements in managing the environmentally sensitive resource areas and include:

- Restoring the headwater wetlands of McNutt Creek and riparian habitat along the tributaries of Johnson Creek.
- Retaining undeveloped land as "green" wildlife corridors between the buttes and major tributaries of Johnson Creek.
- Protecting the mature forests and riparian habitat within the five-creek confluence area in the southeastern part of the study area.
- Preserving the integrity of large stands of mature forests such as the Hogan Cedars grove.

Preliminary results suggest that the study area presents many opportunities for increasing watershed health, resource value, and improving water quality. The gentle westerly slopes and rolling terrain is the water source of several creeks and is the location of many disturbed wetland complexes. The headwaters of Botefuhr and Brigman Creeks and the channel of Hogan Creek have all been altered by construction; which results in sedimentation of the waterways. Butler Road is the only treated roadway within the area, leaving many of the roads without stormwater flow detention or treatment before discharging to the creeks.

Protecting the wetlands and forested area complexes at the southeastern boundary of the study area preserves the value of the natural resource and provides a "gateway" to Springwater that reflects the desired character of the community. High-quality, riparian wetlands and wildlife habitats of concern within the study area, if protected, will allow the entire planning area to be more ecologically sustainable. This will include improving the aquatic habitat through cool, clear, healthy streams, promoting Green Streets, and providing and aesthetically pleasing stormwater treatment areas.

REGULATED LANDS

All lands within the Environmentally Sensitive Resource Areas (ESRA) will be protected from urban development. Limited development will be allowed and managed in a way that is compatible with the goals of the natural resource protection. Properly constructed, this development could lend itself to habitat enhancement. The requirements for limited development will be stipulated through the development code.

OPPORTUNITIES FOR RESOURCE PROTECTION AND ENHANCEMENT

The habitat quantity and quality classification created by the Springwater Planning Team serve as the basis for appropriate decisions to protect or enhance natural resource areas, and

determining protection or enhancement priorities. Areas where multiple resources overlapped or existed adjacent to each other, rated highest. Where a solitary resource was isolated from other aspects of the environment that could assist it in functioning viably, these areas rated lowest. Recommendations for areas to protect and preserve as well as enhancement opportunities are shown on Table 7 and located on Figure 17.

FUNDING STRATEGY

As the area develops, environmentally sensitive habitats and natural features will be protected through a combination of public acquisition and regulation.

Several mechanisms have been evaluated for funding the proposed preservation and restoration goals for the project. For those lands that are not fully protected by federal, state or local regulation, but have high resource value, the City would be well advised to attempt to acquire the sites. The Parks and Open Space Plan estimates land acquisition costs to be approximately $48,000 per acre; however, including typical costs for enhancement and maintenance of the site, the cost for the City to acquire and manage a natural resource area is likely to be near $100,000/acre. Table 7 shows the lands that are recommended for incorporation into a land acquisition program. Also, for those projects that would not be required, options are explored for funding mechanisms for enhancement of the natural resources.

Other means to preserve the resource value without direct acquisition would include tax incentives to the property owner. For tax incentives, City Council would create an ordinance, then apply to the County with a certified management plan and in turn the City reduces their tax assessment on the parcel that contains the natural resources. When individual property owners are asked to give something up for the greater good, they often respond well to a long-term reduction of taxes on the land.

Additional programs exist at the city, state, and federal level to assist with natural resource planning efforts. These provide financial and technical assistance and incentives, but require a commitment from the property owners and the communities. Potential funding opportunities are listed below.

1. Reduce stormwater fees in exchange for protection of resources in the form of conservation easements.

2. Encourage and further investigate density and development transfer rights and other transfer mechanisms form properties inside the ESRA to properties outside.

3. Consider a new System Development Charge (SDC) on all development in the study area to purchase conservation easements. This effectively distributes the burden of resource protection to all who benefit.

4. Consider a bond measure to acquire property along streams and wetlands, either region wide or specific to Springwater. The measure could be patterned after Metro's bond measure that successfully acquired upland habitat in and around the study area.

5. Grants and donations should continue to be used whenever possible. Numerous programs exist at the state and federal level to assist with natural resource related planning efforts, especially if those planning efforts are related to natural hazard

mitigation strategies. In addition to opportunities to obtain funding for the protection and restoration of habitats, opportunities are available to obtain public open space as part of a hazard mitigation/prevention strategy.

6. Landscape Assessment Districts (LADs) could be established as an overlay zone to provide a higher level of design and maintenance standards.

7. Restoration projects could be combined with other public utilities construction projects to minimize total project costs.

Table 7 Natural Resource Management Plan

Project Name	Location	Existing Functions and Values	Expected Outcomes	Natural Resource Plan Objectives Met	Cost, $Million[1]	Potential Funding Source
PROTECTION						
Hogan Cedar Grove	Area 2 Plot 1	scored 28 highest for tree grove; scored 103 for wildlife highest value; enhanced score increased by 5	preservation recommended as enhanced score increased only by 5; future successional stages will be very valuable	opportunity for a natural park; protects a significant patch of forested wildlife habitat	$8.6	consider acquisition as the parcel is within City limits and has tremendous development pressure
Springwater Gateway Wetlands (Stone Rd/Hwy 26)	Area 3 Plot 1 Area 4 Plot 4	Area 3 Plot 1 has poor recreation value and scores 17 average for tree grove and 71 for wildlife; Area 4 Plot 4 contains a significant wetland; scores 18 for tree groves; 79 for wildlife	Area 3 Plot 1 enhanced score increased only 9 whereas Area 4 Plot 4 enhanced score increased 17 for wildlife value if the wetland is protected	protects the areas most significant wetland and provides a natural beauty for the southern gateway to the community	$1.6	may be partially within the highway right-of-way and riparian corridor of Johnson Creek; consider acquiring the remainder of parcel
Buttes with Slopes > 25%	Area 1 Plot 3	unique habitat with tree groves; landslide and uncertain geologic hazard	high development pressure for single family residential to capture views	protects forested areas and open space amenities with views	$6.0	density requirements and developers fees for mitigation on slopes greater than 20%

1. Based on $100,000/acre for acquisition and enhancement projects. Cost for acquisition only is $48,000/acre.

Table 7 Natural Resource Management Plan (Continued)

Project Name	Location	Existing Functions and Values	Expected Outcomes	Natural Resource Plan Objectives Met	Cost, $Million[1]	Potential Funding Source
WILDLIFE PASSAGE						
Reserve a corridor between Hogan and Botefuhr creeks for wildlife passage	connects BOT R2 with HC R1	Botefuhr Creek is a deep channel with dense high value riparian; steep area containing springs are excellent wildlife habitat with poor recreation potential	Locating this corridor somewhere between the two creek channels would provide east-west route for wildlife to pass from Johnson Creek through to the buttes	increases opportunities for wildlife movement east and west through the community to buttes in the west	$0.6	most of this corridor should be included as either setbacks from creeks or "green street" redesign of Butler Road
Sunshine and McNutt Wildlife Corridor	Area 2_ Plot 7	this channel has been degraded score is 69 for wildlife habitat and the understory has been modified by residents' activities and there are three existing houses	protection of this corridor will allow understory to grow back and the wildlife a choice to use this as an alternate route to the Sunshine Valley	increases passageways for wildlife movement south to the buttes	$2.8	preservation through including these lands in the green infrastructure
RESTORATION – WETLAND RIPARIAN COMPLEX						
Brigman Pond Removal and Restoration	BRIG_R2	the creek riparian has been removed; golf course filled in the headwaters and caused down cutting and poor water quality	restore the flood control function and water quality of Brigman Creek; will improve riparian condition	long term water quality improvement and sustainable development	$0.9	encourage private property owner; otherwise not likely to be completed
McNutt Headwater Wetland Complex	MC_R1	Wetlands filled; riparian degraded as the channel has been ditched	improved water quality; aesthetically pleasing area for local residents	long term water quality improvement and sustainable development	$0.4	reserve as environmentally sensitive and engage volunteer efforts
Johnson Creek Hwy 26 Wetland Complex and Floodplain Reconnection	Area 4 Plot 5 Area 4 Plot 4 JC R19	poor quality habitat due to surrounding nursery activities and poorly functioning culvert	reconnect floodplain and flood storage function; enhance wetlands and riparian	improves aesthetic quality, water quality, riparian and wildlife habitats	$0.9	some of this site is within right-of-way for Hwy 26; consider acquiring the wetland site

1. Based on $100,000/acre for acquisition and enhancement projects. Cost for acquisition only is $48,000/acre.

Table 7 Natural Resource Management Plan (Continued)

Project Name	Location	Existing Functions and Values	Expected Outcomes	Natural Resource Plan Objectives Met	Cost, $Million[1]	Potential Funding Source
RIPARIAN REHABILITATION						
North Fork Johnson Creek Riparian Restoration	NF_R1	riparian quality is low as vegetation is cleared or mowed on one or both banks of the creek	improved aquatic habitat, water quality, culvert should be upgraded	provides natural corridor for wildlife movement east to west	$0.75	consider volunteer riparian planting
Johnson Creek (Telford - Hwy 26) Riparian Floodplain Reconnection	JC_R18	riparian quality is low as vegetation has been altered by logging and land practices	culvert should be replaced with a bridge; channel should be allowed to meander and riparian vegetation replaced	confluence of the five creeks is of high aesthetic value for public and recreationists	$0.1	consider acquiring the corridor and designing a bridge that reconnects floodplain or integrate with stormwater facilities
Badger Creek Culvert Removal and Channel Rehabilitation	BC_R1 at Telford Rd.	riparian quality is low as vegetation is invasive species; stream channel has been moved and displaced riparian and altered flow	culvert should be replaced with a bridge	provides natural corridor for wildlife movement to southeast and buttes	$0.67	culvert may be included in the highway improvements program; consider volunteer riparian planting

1. Based on $100,000/acre for acquisition and enhancement projects. Cost for acquisition only is $48,000/acre.

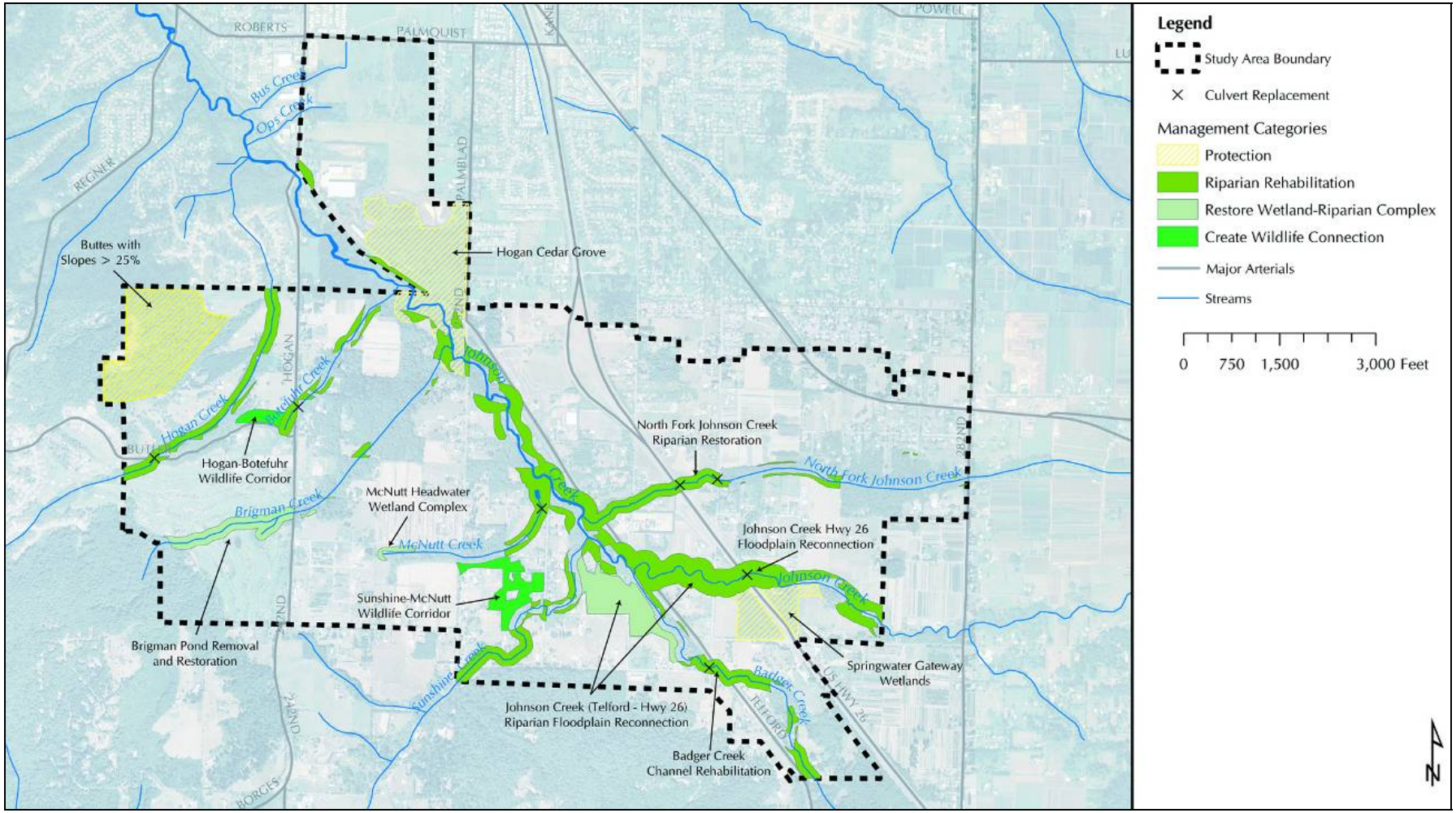

Figure 17 Natural Resource Protection and Restoration Plan

ABBREVIATIONS AND ACRONYMS

CWA – Clean Water Act
ESRA – Environmentally Sensitive Resource Areas
ESRA-SW – Environmentally Sensitivie Resource Areas - Springwater
ESA – Endangered Species Act
ESU – Evolutionary Significant Unit
FEMA – Federal Emergency Management Agency
GIS – Geographic Information Systems
GPS – Global Positioning System
LWD – large woody debris
NMFS – National Marine Fisheries Service
NRCS – Natural Resources Conservation Service
NWI – National Wetland Inventory
ODFW – Oregon Department of Fish and Wildlife
SEC – Significant Environmental Concern
WDFW – Washington Department of Fish and Wildlife

GLOSSARY

Allow - Decision to permit land-use activities regardless of the impacts on *fish and wildlife habitat*. Under an allow decision, habitat areas would be protected only by existing regulations and *non-regulatory tools*. This option offers the lowest level of protection for regionally significant habitat.

Anadromous - Moving from sea to freshwater for reproduction.

Anthropogenic - Relating to, or resulting from the influence of human beings on nature.

Assessment - A thorough documentation of existing conditions within a watershed. Identifies the actions needed to get from baseline conditions to the conditions implied in the vision and goals for a watershed. Refines objectives by identifying where and to what extent existing conditions diverge from the vision, and identifying appropriate targets for an objective given existing conditions.

Bankfull width – Channel width between the tops of the most pronounced banks on either side of a stream reach.

Baseline – Reference point for comparison of subsequent measurements or observations

Basin – A topographical area of a watershed or geological land area that slopes toward a common center or depression where all surface and subsurface water drains

Bedrock type – The parent rock (e.g., granite or sandstone) in a channel

Biodiversity - The variety of plants and animals in a particular area.

Conflicting uses - As defined by the Goal 5 planning guidelines, a land-use practice or development activity that is harmful to *fish and wildlife habitat.* Two major conflicting uses are removing plants and increasing *impervious* surfaces such as roads.

Edge effects - The negative impacts on wildlife that occur along the border of a *fish and wildlife habitat* area such as greater vulnerability to predators, *nonnative* plants, traffic and noise.

ESEE analysis - The second step of Metro's fish and wildlife habitat protection program which entails assessing the potential economic, social, environmental and energy (ESEE) impacts of protecting and not protecting regionally significant fish and wildlife habitat.

Fish and wildlife habitat - An area upon which fish and wildlife depend in order to meet their requirements for food, water, shelter and reproduction.

Goal 5 - One of 19 statewide planning objectives (adopted in 1973) that establishes standards for protecting natural resources, open spaces, and scenic and historic areas. Metro is currently working to address Goal 5 by developing a program to protect the region's significant natural resources, specifically *fish and wildlife habitat*.

Habitat fragmentation - The breaking up of a single large habitat area such that the remaining *habitat* patches are smaller and farther apart from each other. This results in a lack of connections among different habitat areas, which makes movement between areas difficult for

wildlife and reduces habitat quality (for example, by increasing *edge effects* and decreasing important *interior habitat*).

Habitat inventory - The first step of Metro's fish and wildlife habitat protection program that involved identifying the significant *fish and wildlife habitat* in the region. The result of the inventory is a map of regionally significant habitat classified from low to high value based on each area's importance for fish and wildlife.

Impervious/impermeable surface - A surface that does not allow water to seep into the ground and, therefore, increases *stormwater runoff*. Roads, parking lots and standard building roofs are all impervious surfaces.

Interior habitat - The area in the center of a *fish and wildlife habitat* patch that is higher quality habitat than areas along the edge of patches, since areas along the border are more prone to *edge effects*. Some species need interior habitat to survive.

Impact area - Land next to regionally significant habitat that may significantly affect the condition and value of the habitat area. Certain land-use and development activities within impact areas may have a substantial adverse effect on nearby habitats, and thus are worthy of special consideration.

Limit - Decision to apply some restrictions to land use activities that harm *fish and wildlife habitat*, but not *allow* or *prohibit* development entirely. This is the "middle-of-the-road" option for protecting regionally significant habitat.

Metro - A regional government that serves the 1.3 million people who live in 24 cities and three counties in the Portland metropolitan area. Metro works on land-use, transportation, natural resources, parks and greenspaces planning and waste management issues that cross local boundaries.

Non-native species - A type of plant or animal that is not local to an area, but rather originates from a another place. Also called "exotic" or "alien" species.

Non-regulatory tool - A way of achieving *fish and wildlife habitat* protection that does not rely on legal standards and restrictions, but instead relies on other methods such as education and outreach, financial and other incentives, and land acquisition from willing sellers.

Program development - The third step of Metro's fish and wildlife habitat protection program which entails determining how to protect various habitat lands identified in the inventory (step 1) while balancing the economic, social, environmental and energy (ESEE) impacts of protecting and not protecting *fish and wildlife habitat* (identified in step 2). Program development will entail deciding which policy tools – incentives, education, regulation or land acquisition – to apply to various lands throughout the region.

Prohibit - Decision to not *allow* a conflicting use because of the negative impacts on *fish and wildlife habitat*. This option offers the highest level of regulatory protection for *regionally significant habitat*.

Regionally significant habitat - Habitat areas Metro has identified as important at the regional level based on a resource inventory undertaken in the first step of Metro's *fish and wildlife*

habitat protection program. Regionally significant habitat includes habitat in riparian areas near water and drier upland areas away from water.

Regulatory tool - A way of achieving *fish and wildlife habitat* protection that relies on legal standards and restrictions on such things as vegetation removal and development activities.

Riparian area - The vegetated land near water bodies such as streams, rivers, wetlands and lakes that provides important benefits to wildlife and humans including clean water, reduced flooding and healthy habitat.

Soil erosion - The action of soil being worn away by water or wind.

Stormwater runoff - Water that flows off *impervious surfaces* such as roads, parking lots and roofs of buildings because it cannot enter and soak into the ground.

Title 3 - An ordinance adopted by Metro Council in 1998 to meet standards for statewide planning goals that deal with water quality (Goal 6) and flood management (Goal 7). Title 3 also establishes a plan to address the *fish and wildlife habitat* protection aspects of *Goal 5* within the metro region.

Upland area - Land located at a higher elevation than *riparian areas* that stays relatively dry.

Urban growth boundary (UGB) - The line that marks the separation between rural and urban land. The UGB is updated every five years so that the land within the boundary can accommodate 20 years of expected growth in the region. *Metro's* jurisdiction covers the land within the UGB plus some additional lands outside the UGB.

Watershed - All the land and streams that drain to a particular water body or point in a stream. Since water flows downhill, points of high elevation generally determine watershed boundaries.

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Springwater Community Plan Report
Economic, Social, Environmental and Energy (ESEE) Decision

1.0 SPRINGWATER NATURAL RESOURCE INVENTORY AND ESEE REPORT

1.1 PURPOSE

In order for the City of Gresham to comply with Oregon Statewide Goal 5 requirements (Oregon Administrative Rules [OAR] 660-023 et. al.) to conserve significant natural resources, an Economic, Social, Environmental and Energy (ESEE) analysis has been performed to identify the consequences for allowing, limiting, or prohibiting conflicting uses in the Springwater Community Planning area. The ESEE analysis follows the procedures outlined in OAR 660-023-0040, which states that "local governments shall develop a program to achieve Goal 5 for all significant resource sites based on an analysis of the economic, social environmental, and energy (ESEE) consequences."

1.2 STUDY AREA

The study area for the ESEE decision report includes the entire Springwater Community Planning area. It is divided into three distinct areas that encompass three jurisdictions (City of Gresham, unincorporated Multnomah County (Springwater), and the incorporated portion of Clackamas County that is now the City of Damascus) for a total of 1,589 acres (See Figure 1.1).

The Springwater area has approximately 1,272 acres of unincorporated Multnomah County. It is part of the study because it is included in Gresham's recent (December 2002) Gresham Urban Growth Boundary (UGB) expansion. This area includes approximately 120 acres of unincorporated Multnomah County that is located at the foot of the buttes west of Hogan Road. It has been included in the study because the area has never been planned, yet it is within Gresham's UGB and its Urban Services Boundary.

A second area is the "Brickworks" site, which includes approximately 183 acres of land north of the Springwater area. It is currently zoned as Heavy Industrial (HI) and is within the City of Gresham. It is included in the Springwater Community Planning area in order to access the relationship of the site and its current HI designation to the proposed industrial lands in the Springwater Community. The current Springwater Plan District adoption process will not apply to the "brickyards" site, though it may be included at a future date through a separate legislative action.

A third area includes approximately 139 acres that are located in Clackamas County. That area is included in the Study because it was originally included as part of Gresham's UGB expansion (December 2002) and is located in the same Johnson Creek watershed basin as the Multnomah County portion of Springwater. During the Springwater Community Planning process, however, the City of Damascus incorporated the Clackamas portion of Springwater. While the City of Gresham does not consider the City of Damascus as part of the Springwater Community Plan, the area has been kept in the study to help broaden the understanding of the environmental processes operating in the area and to contribute to the decision making process.

1.3 GOAL 5 PLANNING REQUIREMENTS

Prior to performing an ESEE analysis, Goal 5 requirements outline specific procedures for identifying and inventorying Goal 5 resources. Inventoried resources are subject to a significance determination based on the resources quality, location and quantity.
Only Goal 5 resources considered significant can be subject to protections though either a Safe Harbor process (OAR 660-023-0090) or a more complex ESEE analysis, which allows a jurisdiction greater flexibility in determining and implementing Goal 5 protections. The ESEE analysis is used to determine whether a jurisdiction will allow, limit or prohibit a use that may conflict with preservation of the significant natural resource.

To perform an ESEE analysis OAR 660-023-0040 requires the following steps to be addressed:

- Identify conflicting uses,
- Determine the impact area,
- Analyze the ESEE consequences, and
- Develop a program to achieve Goal 5.

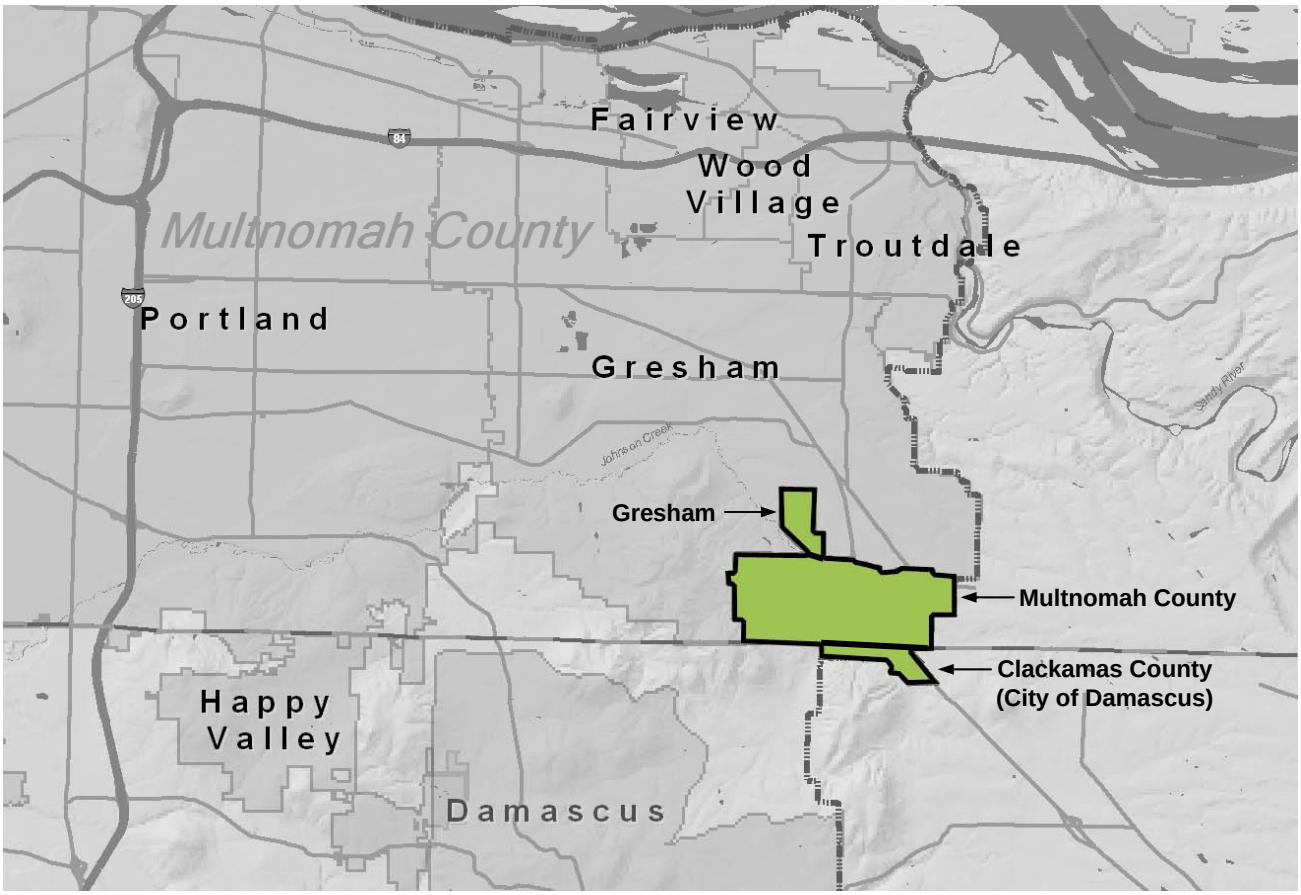

Figure 1.1 Springwater Community Plan Area Existing Jurisdictions

1.4 ESEE REPORT SECTIONS

Before performing an ESEE analysis, however, a local jurisdiction must conduct a thorough inventory and identification of all Goal 5 significant natural resource sites. Section 2.0 below briefly addresses what the City of Gresham has done to comply with the Goal 5 inventory and resource identification process. Section 3.0 discusses the elements that must be addressed in the ESEE report. The body of the report follows with discussions regarding Conflicting Uses (Section 4.0), Impact Area Identification (Section 5.0), ESEE Consequences (Section 6.0), and Goal 5 Program Development (Section 7.0).

2.0 NATURAL RESOURCE INVENTORY AND SIGNIFICANCE DETERMINATION

2.1 INTRODUCTION

This section briefly reviews the natural resource information that was collected for the study and assessment process to determine significant Goal 5 resources. For a comprehensive discussion of the Goal 5 inventory and significant resource determination process see the *Springwater Community Plan Natural Resource Protection and Restoration Plan* (April 2005).

2.2 RESOURCE INVENTORY

Prior to the ESEE analysis, a comprehensive inventory and examination of all Goal 5 natural resources was performed in 2003-04.

2.2.1 Data Collected

The following natural resource data were reviewed and collected in the Springwater Community Plan area.

- Existing fish distribution studies (ODFW, Portland BES, Multnomah County)
- Local Wetlands Inventory
- Streambank characterization
- Riparian characterization
- Tree grove characterization
- Wildlife and aquatic species habitat identification

2.3 SIGNIFICANCE DETERMINATION

2.3.1 Significance Criteria Guidelines

Goal 5 provides guidelines for determining the significance of the resource sites that are identified (OAR 660-023-0030). The determination of significance shall be based on the quality, quantity and location information; supplemental or superseding significance criteria outlined in other sections of OAR 660-023-0090 to 0230; and additional criteria that is adopted by the local government (as long as the criteria do not conflict with Goal 5). A list of resource sites that are determined to be significant based on these criteria are to be adopted by the jurisdiction's comprehensive plan or as a land use regulation. Those sites not considered significant shall not be regulated under Goal 5.

2.3.2 Sites Identified as Significant

The Springwater Community Plan adopted the Natural Resource Significance Class rating system. The system outlined the minimum criteria a natural resource area must meet to be considered significant. In addition, the rating system also ranked each significant resource area as to its relative value or contribution toward sustaining Goal 5 natural resources within the Springwater area. That is, some Goal 5 resources were considered to make a greater contribution toward protecting the natural resources than other Goal 5 resources.

Briefly, the Natural Resource Significance Class rating system incorporates criteria to determine significance as well as relative value for each Goal 5 resource area. The criteria are based on the quantity and quality of the Springwater natural resources, their spatial distribution, and their relative contribution toward sustaining and preserving the natural resources (see the *Springwater Community Plan Natural Resource and Hazards Inventory* (April 2005)).

The rating system uses a 1 (low) to 6 (high) ranking. Goal 5 resource sites that are isolated and only have a single natural resource, such as an isolated tree grove, are rated low or 1. Goal 5 resource sites that are located along the mainstem of Johnson Creek and have multiple natural resources, such as significant local wetlands, unique habitat (aquatic and terrestrial), and tree groves, are rated as highly significant or a 6. In between the 1 to 6 rating are resource sites that have natural resources that are considered of greater value than the isolated tree groves but less valuable than the Johnson Creek mainstem with tree groves, wetlands and unique habitat.

Figure 2.1 displays all the significant Goal 5 natural resource sites. All sites have been classified according to their contribution toward sustaining and preserving the natural resources in the Springwater Area.

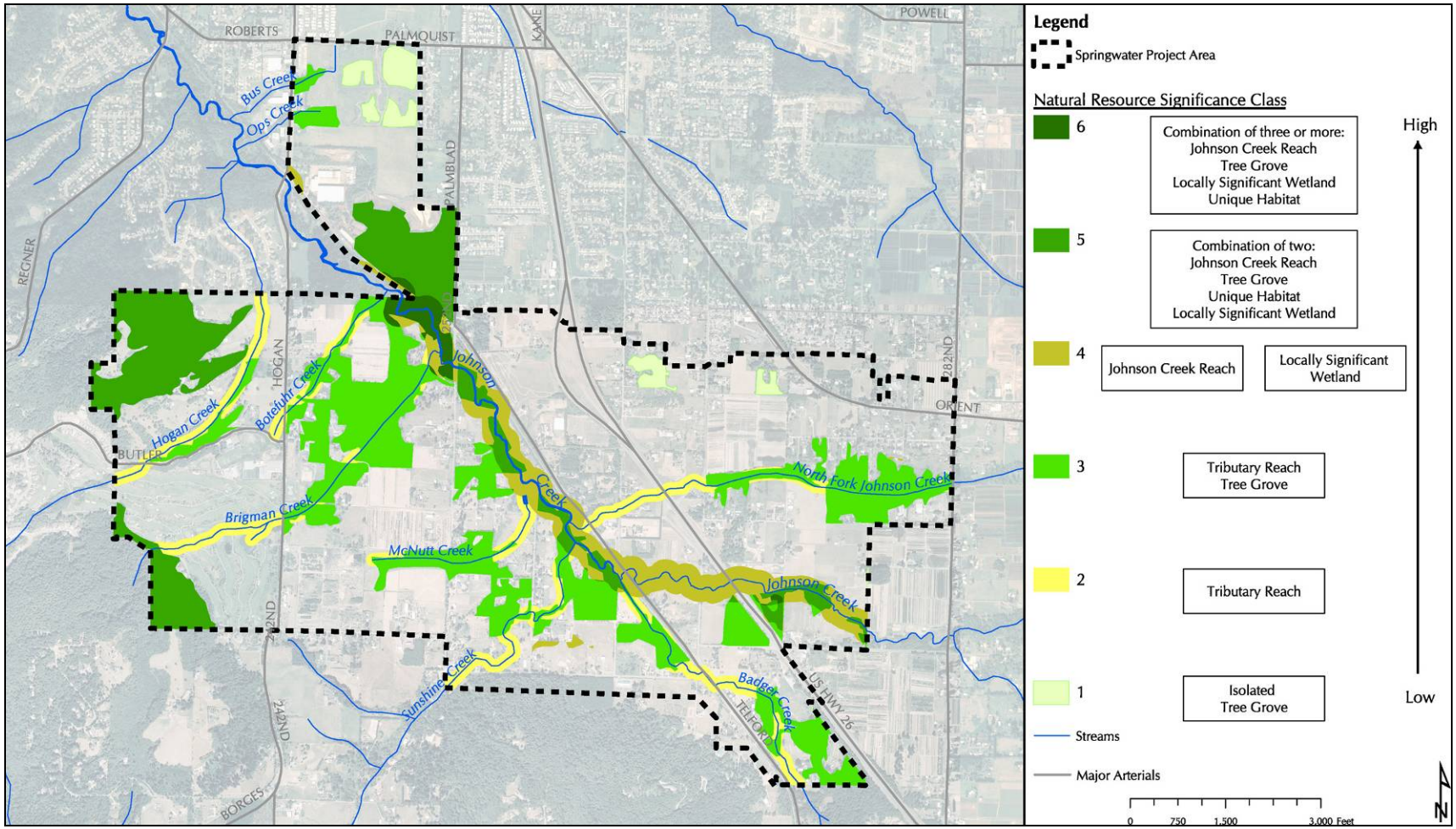

Figure 2.1 Springwater Community Natural Resource Inventory

3.0 ESEE ELEMENTS

This section provides an outline of the ESEE analysis. It addresses the components of the analysis and the specific information that must be provided in order for the City of Gresham to make an informed decision as to the level of Goal 5 protection that will be adopted in the Springwater Community Plan: The following are the range of protections to be considered for each resource site.

- Protect the resource (do not allow conflicting uses within the impact area)
- Partially protect the resource (limit conflicting uses within the impact area)
- Allow conflicting uses in the impact area.

The advantage of using the ESEE approach is its flexibility. The ESEE process makes it possible to adopt different Goal 5 protections for different Goal 5 resource sites. For example, Goal 5 protections could vary between the resource sites based on the Goal 5 Significance ratings. That is, those Goal 5 resources with a higher significance rating could have greater resource protections than those with a lower significance rating.

3.1 COMPONENTS OF THE ESEE ANALYSIS

There are a set of procedures that need to be performed to complete the ESEE analysis. Goal 5 (OAR 660-023-0040) outlines the three steps.

- Identify conflicting uses
- Determine the impact area
- Analyze the ESEE consequences

The results of these procedures are then used to determine the Goal 5 program to protect the resource sites. The Goal 5 resource program is adopted into the Springwater Community Plan and implemented through ordinance.

3.2 CONFLICTING USES

OAR 660-023-0040 (2) specifies that local governments must identify conflicting uses that “exist or could occur” with respect to the identified Goal 5 resources. The conflicting uses to be examined are those that the zone allows either outright or conditionally within the impact area and natural resource site.

The Springwater area has two sets of zones for which conflicting uses must be analyzed – existing zoning and proposed or future zoning districts. With respect to the existing zones, there are currently seven zoning districts located in the Springwater area. The zoning districts are administered by three jurisdictions – City of Gresham and Multnomah and Clackamas Counties.

With respect to future zones, there will be seven new zoning districts. Only one jurisdiction, the City of Gresham, will administer these new zones once the City annexes the entire Springwater Area within Multnomah County.

The purpose of the conflicting use analysis is to determine whether a particular zone may restrict or upset the environmental health of the resource site. The analysis can range from the identification of conflicting uses that lead to permanent natural resource loss to zones where

there are no conflicting uses. In the later instance where no conflicting use is identified, the zoning regulations are considered adequate to fully protect the resource site.

3.3 IMPACT AREA

The jurisdiction is required to identify the impact area for each resource site. The impact area according to OAR 660-023-0010 is that "geographic area within which conflicting uses could adversely affect a significant Goal 5 resource."

The impact area defines the geographic limit of the ESEE analysis. Since ESEE analysis will not be performed outside of the impact area, the boundary must be wide enough to cover all conflicting uses that could affect the resource.

For the purposes of the Springwater ESEE analysis, the impact area will be the boundary surrounding the entire Springwater Community Planning Area. Figure 3.1 displays the impact area boundary for the ESEE analysis.

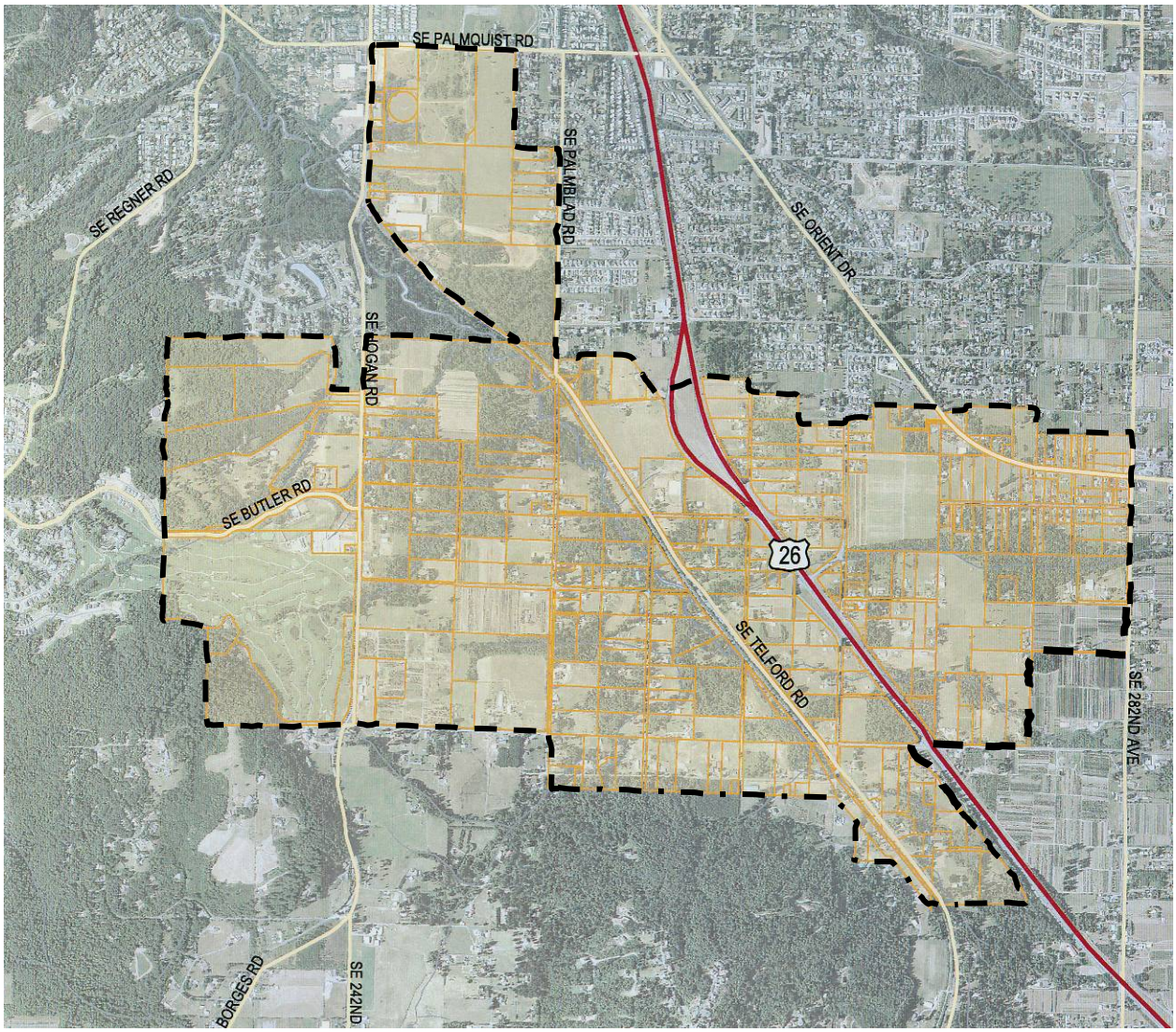

Figure 3.1 Springwater Community Impact Area Boundary

3.4 ESEE RANGE OF ALTERNATIVES AND CONSEQUENCES

Goal 5 requires that the ESEE analysis address three alternatives. For each of the alternatives the analysis must examine the potential ESEE consequences of allowing, limiting or prohibiting a conflicting use to the natural resource site and to the permitted use (OAR 660-023-0040 (4)).

- Alternative One – Conflicting Use is Allowed
  - Examine the impact to the resource site if conflicting use is allowed.
  - Examine the impact to the permitted use if the conflicting use is allowed.

- Alternative Two – Conflicting Use is Limited.
  - Examine the impact to the resource site if conflicting use is limited.
  - Examine the impact to the permitted use if the conflicting use is limited.

- Alternative Three – Conflicting use Prohibited.
  - Examine the impact to the resource site if conflicting use is prohibited.
  - Examine the impact to the permitted use if the conflicting use is prohibited.

For each alternative the analysis will examine the economic, social, environmental and energy consequences of the conflicting use. Where possible, the ESEE analysis will incorporate allowances outlined in OAR 660-023-0040(4). The allowances described in the OAR include performing a single analysis for similar resource sites subject to the same zoning and applying a matrix of commonly occurring conflicting uses to resource sites.

The ESEE consequences section will only address conflicting uses identified for future zoning in those areas that are currently under the jurisdiction of Multnomah and Clackamas Counties. This is due to the following reasons:

- Gresham does not now and will not in the future have jurisdiction over the Springwater area until it is annexed.
- Current zoning remains under the jurisdiction of Multnomah and Clackamas Counties (City of Damascus) and therefore it is their responsibility for implementing all land use and zoning activities.
- Proposed Springwater Plan District for the Springwater Community Plan will not be implemented until the territory is annexed into the City of Gresham.

3.5 PROGRAM DEVELOPMENT

The ESEE analysis will become the basis for the City of Gresham to develop the program to achieve Goal 5 requirements. The City is required to determine whether to allow, limit or prohibit conflicting uses on the resource sites. Different resource sites may have different determinations. Some sites may allow some or all conflicting uses, while others may prohibit or restrict the number of conflicting uses. All combinations are acceptable as long as it is supported by the ESEE analysis.

The City will need to make a determination once the ESEE analysis is complete as to the program it will implement. Program decisions must be based on the ESEE analysis. Regardless of whether conflicting uses should be prohibited or, conversely, conflicting uses be allowed, the ESEE analysis must demonstrate with sufficient evidence either decision.

4.0 CONFLICTING USES

4.1 INTRODUCTION

The following section identifies the conflicting land uses. The focus of the section is on types of changes to land that are allowed to occur within a zoning district and how those changes may conflict with Springwater's Goal 5 Resource sites.

Since OAR 660-023-0040(2) requires identification of conflicting uses "that exist, or could occur, with respect to significant Goal 5 resources", this section addresses zoning that currently exists and future zoning that has been proposed by the City after annexation of the Springwater Community Planning Area.

4.2 ZONING DESIGNATIONS, RESOURCE SITES AND ACREAGE CALCULATIONS

Within each of the zoning designations are activities and uses that are permitted outright and uses and activities that may be permitted should certain conditions be met. Permitted uses and conditional uses can potentially conflict with the environmental health of the resource sites. This section identifies the zoning districts and area of each zone that is located inside and outside of the significant resource sites.

4.2.1 Existing Zoning and Goal 5 Resource Sites

The following lists the three jurisdictions that are located in the Springwater Community Planning Area and the seven zoning districts for which they are responsible (See Figure 4.1).

- City of Gresham
  - Heavy Industrial District (HI)

- Multnomah County
  - Exclusive Farm Use District (EFU)
  - Multiple Use Agriculture District (MUA-20)
  - Rural Center (RC)
  - Urban Future (UF-20)

- Clackamas County
  - Rural Residential Farm/Forest 5 Acres District (RRFF-5)
  - Timber District (TBR)

Table 4.1 displays the area that each existing zone has within the Goal 5 resource sites that have been identified in the Springwater Community Planning Area.

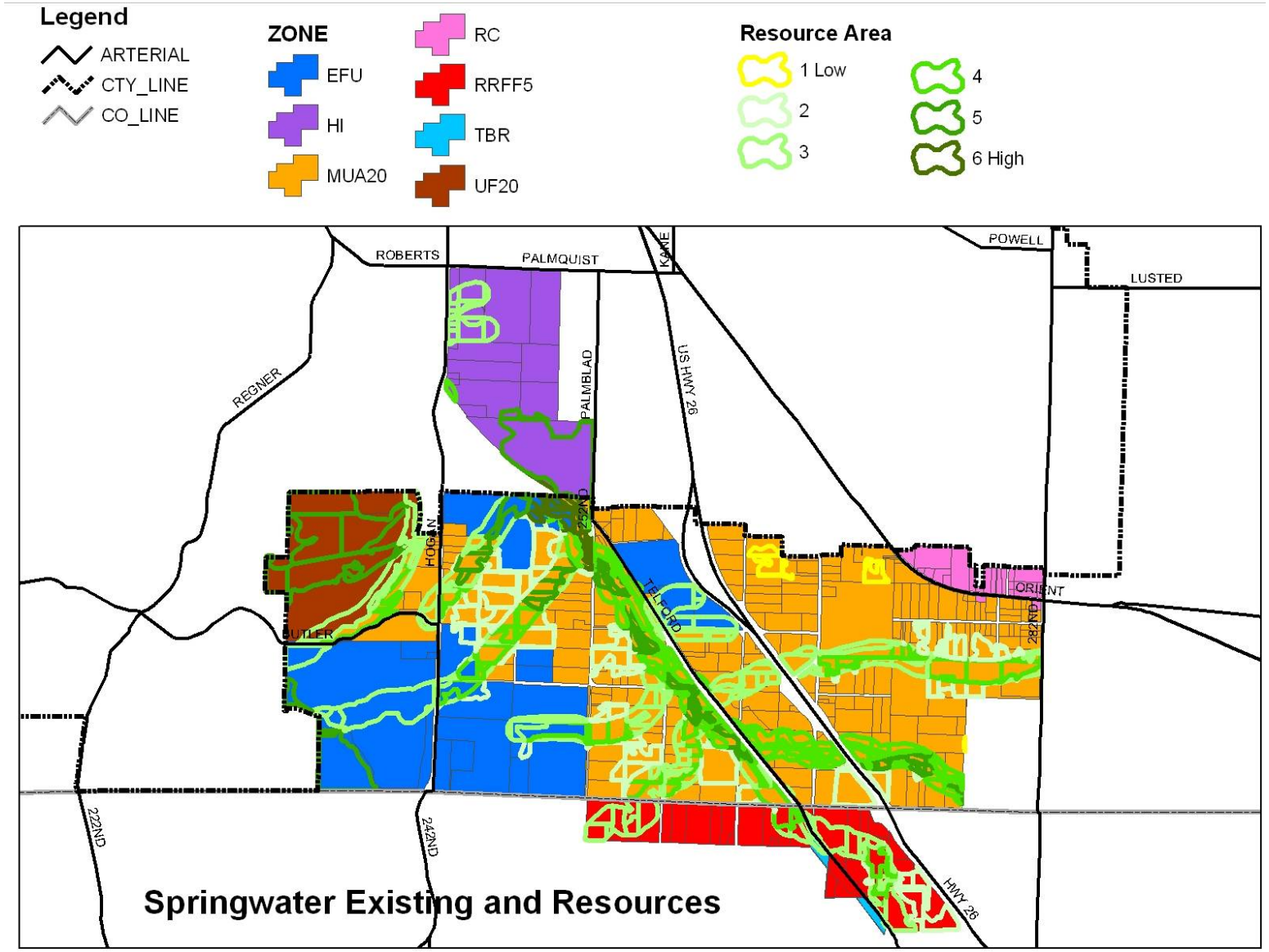

Figure 4.1 Current Zoning with Significant Resource Area Overlay

Table 4.1 Existing Zoning Districts and Goal 5 Resource Sites

Jurisdiction	Zone District	Total Acreage	Acreage Within Resource Sites	Acreage Outside Resource Sites
City of Gresham	HI	158.3	51.8	106.6
Subtotal		158.3	51.8	106.6
Multnomah County	EFU	352.6	102.7	249.9
	MUA-20	783.7	339.0	444.8
	RC	28.4	0.0	28.4
	UF-20	115.6	72.8	42.8
Subtotal		1,280.3	514.5	765.9
Clackamas County	RRFF-5	130.4	56.2	74.3
	TBR	4.0	0.8	3.9
Subtotal		134.4	57.0	78.2
Total Acreage		**1,573.0**	**623.3**	**950.7**

4.2.2 Proposed Zoning District and Goal 5 Resource Sites

The following lists the eight sub-districts (zones) that the City of Gresham is proposing to implement in the Springwater Community Planning Area once annexation is completed. Gresham will be responsible for implementing and enforcing all of these sub-districts (See Figure 4.2 for a display of proposed zoning sub-districts).

- City of Gresham
  - Very Low-Density Residential - Springwater (VLDR-SW)
  - Low Density Residential - Springwater (LDR-SW)
  - Townhouse Residential – Springwater (THR-SW)
  - Village Center – Springwater (VC-SW)
  - Neighborhood Commercial – (NC-SW)
  - Industrial – Springwater (IND-SW)
  - Research/Technology Industrial – Springwater (RTI-SW)[1]
  - Environmentally Sensitive Resource Areas –Springwater (ESRA-SW)

[1] The district RTI-SW was formerly called OFF-SW, and is shown as such on Figure 4.1 and 4.2

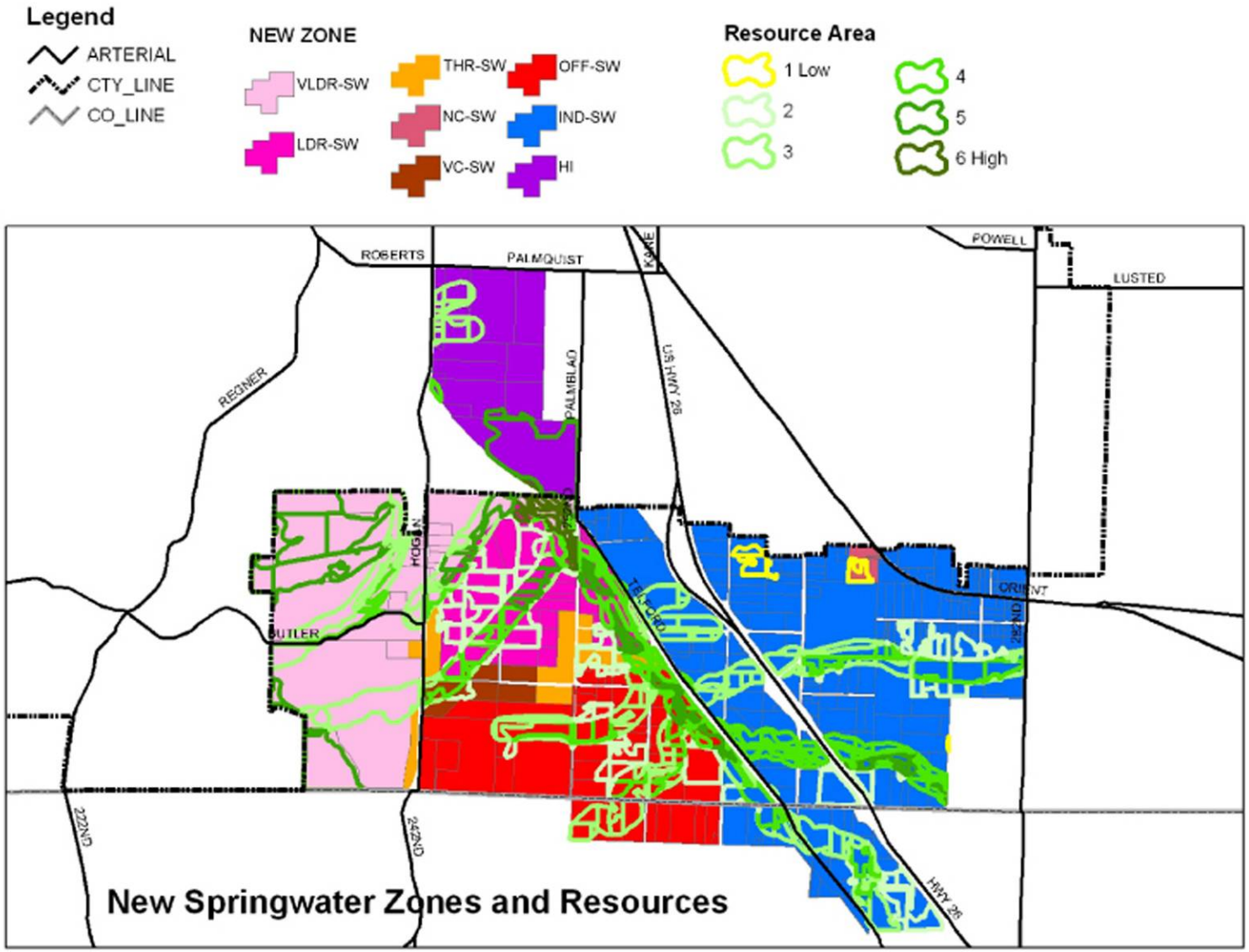

Figure 4.2 Proposed Zone Districts with Significant Natural Resource Area Overlay

Table 4.2 displays the area that each proposed zone has within the Goal 5 resource sites that have been identified in the Springwater Community Planning Area.

Table 4.2 Proposed Zoning and Environmentally Sensitive Resource Areas

Jurisdiction	Zone	Total Acreage	Acreage Within ESRA Boundary	Acreage Outside ESRA Boundary
City of Gresham (Springwater)*	VLDR-SW	202.2	0.0	202.2
	LDR-SW	99.4	0.0	99.4
	THR-SW	43.5	0.0	43.5
	VC-SW	23.3	0.0	23.3
	NC-SW	7.4	0.0	7.4
	RTI-SW	155.5	0.0	155.5
	IND-SW	462.2	0.0	462.2
	ESRA-SW (Springwater)	404.6	404.6	0.0
	SubTotal Acreage:	**1,398.1**	**404.6**	**993.5**
City of Gresham (Brickworks Area)	HI	106.5	0.0	106.5
	ESRA-SW	51.8	51.8	0.0
	SubTotal Acreage	**158.3**	**51.8**	**106.5**
Springwater & Brickworks Areas	**Total Acreage:**	**1,556.4**	**456.4**	**1,100.0**
City of Damascus (Clackamas Co.)	ESRA-SW	57.0	57.0	0.0
Total Acreage (Springwater, Brickworks, Damascus)		**1,613.4**	**513.4**	**1,100.0**

**Includes 115.6 acres of unincorporated Multnomah County that is located at the foot of the buttes west of Hogan Road.*

4.3 USES PERMITTED BY ZONING DISTRICTS

Both existing and proposed district codes outline land use activities that are allowed within the particular zoning district. This section describes the allowable uses beginning with a narrative of each district's purpose and a brief list of potential conflicting uses that may negatively impact the environmental health of the Goal 5 resource sites, followed by a table displaying uses that are allowed outright and those allowed conditionally for each district.

4.3.1 Uses Permitted by Existing Zoning Districts

4.3.1.1 Existing Gresham Zoning Districts

Heavy Industrial

The Heavy Industrial District is primarily intended for industrial uses which are generally not compatible with residential development because of their operational characteristics, which can include noise and air pollution. The district is also intended for uses that may require extensive outdoor areas to conduct business activities, or for product storage or display. These regulations are designed to permit the development of land within the district in a manner consistent with efficient industrial operations.

Existing conflicting uses within the zone: manufacturing, storage, assembly, warehousing and industrial uses.

4.3.1.2 Existing Multnomah County Zoning Districts

Exclusive Farm Use

The purposes of the Exclusive Farm Use District are to preserve and maintain agricultural lands for farm use consistent with existing and future needs for agricultural products, forests and open spaces. In addition, it is designed to conserve and protect scenic and wildlife resources, as well as maintain and improve the County's air quality, water and land resources, and to establish criteria and standards for farm uses and related and compatible uses, which are deemed appropriate. Land within this district shall be used exclusively for farm uses as provided in the Oregon Revised Statutes (ORS) Chapter 215 and OAR Chapter 660, Division 33 as interpreted by this Exclusive Farm Use code section.

Existing conflicting uses within the zone: agricultural, mining/extraction uses, as well as residential, business and utility uses.

Multiple Use Agriculture - 20

The purposes of the Multiple Use Agriculture District are to conserve those agricultural lands not suited to full-time commercial farming for diversified or part-time agriculture uses. In addition, the district is designed to encourage the use of non-agricultural lands for other non-agricultural purposes, such as forestry, outdoor recreation, open space, low density residential development as well as appropriate conditional uses when these uses are shown to be compatible with the natural resource base, the character of the area and the applicable County policies.

Existing conflicting uses within the zone: agricultural, mining/extraction uses, as well as residential and business uses.

Rural Center

The purposes of the Rural Center District are to provide standards and review procedures that will encourage concentrations of rural residential development, together with limited local and tourist commercial uses which satisfy area and regional needs. In addition, the district is designed to provide for local employment through light industrial uses consistent with rural character and to manage the location and extent of public service centers and limit the extension of public services.

Existing conflicting uses within the zone: residential uses, public services, commercial uses, manufacturing uses.

Urban Future - 20

The purposes of the Urban Future Districts are to implement the growth management policy of the community plans and to provide for appropriate interim uses, which are consistent with the resource base, community identity and unique natural features pending the reclassification of specific areas for urban uses. To accomplish this purpose the district encourages retaining land suitable for future urbanization in large parcels in consideration of the levels of public services available, the characteristics of current uses, the needs for larger sites for planned future uses and for maximum flexibility in the preparation of future development plans. The district also is designed to provide for public review of other use proposals in order to assure compatibility with applicable Multnomah County policies.

Existing conflicting uses within the zone: agricultural, farm, and forest uses; mining and extraction uses; kennels; residential uses; community services.

4.3.1.3 Existing Clackamas County Zoning Districts

Rural Residential Farm/Forest - 5

The purposes of this district are to provide areas for rural living that is compatible with the continuation of farm and forest uses. The zone is intended to conserve the natural scenic beauty of Clackamas County, and to protect the watersheds of existing or potential major sources of municipal or domestic water supply from encroachment by uses that would affect the quantity or quality of water produced, protect wildlife habitats, and other such uses associated with the forest. Finally, the zone is designed to avoid the potential hazards of damage from fire, pollution, and conflict caused by urbanization.

Existing conflicting uses within the zone: rural residential and agriculture uses.

Timber District

The purposes of this zone are to conserve forest lands and protect the state's forest economy by making possible economically efficient forest practices that assure the continuous growing and harvesting of timber as the leading use on forest land. It is also designed to conserve, protect and enhance watersheds, wildlife and fisheries resources, agriculture, and recreational opportunities that are compatible with the primary intent of the zone. By doing so the district will help to minimize wildfire hazards and risks.

Existing conflicting uses within the zone: mining/extraction uses, agriculture and forest practice uses, parks and campground uses.

Table 4.3 Summary of Uses Permitted by Existing Zone Districts/Jurisdictions

Zone	Uses Permitted Outright or Prescribed Conditions	Uses Permitted Conditionally	Minimum Lot Size / Allowed Density
Gresham			
HI	• Manufacturing, assembly and distribution activities • Storage and warehousing uses • Research and Development activities • Repair, finishing, testing activities • Commercial services • Retail sales activities • Wholesale activities • Industrial services • Laboratory activities	• Community services	20,000 sq. ft., building coverage may cover up to 75% of the lot.
Multnomah County			
EFU	• Farm and forest product harvesting uses • Farm use buildings, accessory structures • New dwellings, mobile/modular dwellings (not on high value farmland) • Geothermal and mineral Exploration/ production • Roads (detours, passing lanes, reconstruction) • Community service uses (schools, churches, cemeteries) • Emergency disaster response • Utility poles, towers	• Commercial activities related to farm use • Mining and Geothermal processing operations • Parks (private and public) • Home occupations • Forest products processing (temporary) • Dog kennels • Aquatic species cultivation and harvesting • Dwellings (allowed on high value farmland) • Public road improvements related to rest stops, maintenance yards, etc.	80 acres (exceptions can allow smaller lot sizes to a minimum of 19 acres); allowed density for dwelling unit dependent on factors such as soil class, but must be on a lot less than 21 acres.
MUA-20	• Farm and forest product uses including sale of farm and forest products • Residential dwelling construction • Conservation/ protection of water, soil, open space, forest and wildlife resources • Placement/ replacement of public safety structures	• Mining and geothermal operations • Agricultural and forest products processing • Livestock and fowl raising • Dog kennel operations • Planned residential developments • Rural commercial uses (e.g., repair/maintenance shops, retail, etc.) • Tourist commercial uses	1 dwelling unit/20 acres

Table 4.3 Summary of Uses Permitted by Existing Zone Districts/Jurisdictions

Zone	Uses Permitted Outright or Prescribed Conditions	Uses Permitted Conditionally	Minimum Lot Size / Allowed Density
RC	• Residential dwellings • Farm related commercial uses • Placement/ replacement of public safety structures	• Community service uses • Rural commercial services • Tourist commercial services • Light manufacturing uses • Commercial agricultural processing uses • Home occupations • Large fills • Family day care uses	1 acre (some exceptions that can reduce the lot size); dwelling unit/acre
UF-20	• Residential dwellings • Agricultural and animal husbandry activities • Forest product activities • Home occupation activities • Conservation activities (e.g., water, soil, open space, forest and wildlife resources) • Emergency response and public safety activities	• Community services • Agricultural product processing activities • Animal husbandry activities • Mining and processing of geothermal resource activities • Dog kennel activities • Log storage and sorting activities	1 dwelling unit/ 20 acres
Clackamas County			
RRFF-5	• Rural residential • Farming and forest operations • Resource conservation uses • Non-profit recreation uses • Utilities and wireless telecommunication facilities • Accessory structures and signs • Home occupations and family daycare • Produce stand	• Public facilities • Community service uses (churches, schools, day care center) • Aircraft land uses • Sanitary landfills • Commercial recreational uses • Mining and geothermal • Commercial activities associated with timber and farm uses	1 dwelling unit/5 acres

Table 4.3 Summary of Uses Permitted by Existing Zone Districts/Jurisdictions

Zone	Uses Permitted Outright or Prescribed Conditions	Uses Permitted Conditionally	Minimum Lot Size / Allowed Density
TBR	• Farm and forest operations/ practices • Conservation activities (e.g., wildlife, fisheries, water quality, soil, air) • Mining and gravel extraction uses • Residential development • Road maintenance • Utility installation/ service (electrical, wireless communication, gas, water supply) activities • Irrigation activities • Home occupation uses	• Forest products uses • Park and campground uses • Mining, exploration, processing subsurface resource activities • Solid waste disposal site • Fire station and protection activities • Utility activities (e.g., wireless communication, electric transmission, power generation, etc.) activities. • Water supply impoundment activities • Cemeteries • Asphalt production activities • Aircraft and navigation aid activities • Public road improvement activities • Composting activities	Varies subject to parcel size and conditions: 1 dwelling unit/200 acres; 1 dwelling unit/160 acres, and up to 5 dwelling units/160 acres

4.3.2 Uses Permitted by Proposed Zoning Districts

4.3.2.1 Proposed Springwater Zoning Districts

Very Low Density Residential - SW

The district purpose is primarily intended for single-family detached dwelling development. Lot sizes are larger than the other proposed residential districts to create more open space and lower density residential areas. The district covers the largest land area of the three residential districts and is located on the western portion of the Springwater Community area. The district is designed for the most constrained lands where low-density development will result in less disruption of the landscape. In addition, the areas on the small volcanic butte with views of Mt. Hood are included, offering the opportunities for larger lots with scenic views.

Potential conflicting uses within the zone: residential uses and community services.

Low Density Residential - SW

The purpose of this district is intended primarily for residential development. The district provides a range of residential options with greater urban density than the Very Low Density Residential - SW District. It consists primarily of detached and attached dwellings, but attached housing must be on its own lot. The district covers the next largest land area of the three residential districts and is located west of Telford Road, generally north of McNutt and east of Hogan Roads.

Potential conflicting uses within the zone: residential uses, community services.

Townhouse Residential - SW

Like all the residential districts proposed for the Springwater Community this district is primarily intended for residential development. This district is designed to allow for the greatest residential density of the three districts purposed in the Springwater Community area and is located in three smaller areas all located west of Telford Road and adjacent to the Village Center and Industrial districts and the Very Low Density Residential and Low Density Residential districts. It consists of detached and attached dwellings like Low Density Residential district but double the dwelling unit density. In addition to attached single-family homes, it is intended to allow for detached single-family homes on small lots, also called patio, cottage or green court homes. Like the Low Density Residential zone, each home must be on its own taxlot, and duplexes are not allowed

Potential conflicting uses within the zone: residential uses, live-work uses, community services.

Village Center - SW

The Village Center - SW sub-district (VC-SW) is intended to provide retail and services to the Springwater Community employees and residents. The district will be located in a rectangular band of land west of 242nd Street and east of Hogan Avenue. It will contain a mix of retail, office, and civic uses, and housing opportunities in a pedestrian oriented area. The Village Center shall be the focus of retail, civic, and office related uses, and services that serve the daily needs of the local neighborhood and the adjacent employment areas. It shall be served by a multi-modal transportation system with good access by vehicular, pedestrian, bicycle, and when appropriate, transit traffic.

Potential conflicting uses within the zone: business, professional and retail trade/services, residential uses, utility services, education and public services (community services).

Research/Technology Industrial - SW

The Research/Technology Industrial sub-district (RTI-SW) is primarily intended to provide industrial uses in a business/office park setting. Primary uses shall include knowledge-based industries (graphic communications, creative services, etc.), research and development facilities and corporate headquarters. Emphasis is placed on business suited to a high environmental quality setting. The design will create pedestrian-friendly areas and utilize cost effective green development practices.

The proposed location of this district is along the southern portion of Springwater west of Telford Road, extending into Clackamas County (note that the RTI-SW shown in the Clackamas County area is only for analysis purposes as the land is in the City of Damascus). This area is one of more varied topography, and buildings with smaller footprints are expected to locate here. Also, the research/technology uses do not require that the entire site be at the same level, as is frequently the case with other industrial uses. No residential uses are permitted. This sub-district is expected to interact with the Village Center sub-district to provide retail and entertainment needs for persons employed in the area.

Potential conflicting uses within the zone: business, professional and retail trade/services, utilities, education and public services (community services).

Industrial - SW

The Industrial (I-SW) sub-district is intended to provide industrial land for the City and the east metro area. It is the largest district and is located generally east of Telford Road, except for a small area west of Telford Road in Clackamas County and a triangular shaped portion extending into Multnomah County bounded on the west by 267th Street and on the east by Telford Road. Note that the I-SW shown in the Clackamas County area is for analysis purposes only as the land is within the City of Damascus.

It will be predominantly a mix of manufacturing and information industries, with a high degree of use diversity. It is intended to have an aesthetic appearance of a business park with a high degree of sustainable design practices, reflecting the water quality and quantity concerns of the area as well as the sensitive streams that cross the district.

Potential conflicting uses within the zone: business, medical; and professional services; manufacturing, construction and warehousing activities; public, educational and community services.

Neighborhood Commercial –SW Sub-district

The purpose of the Neighborhood Commercial (NC-SW) sib-district is to provide for small- to medium-sized shopping and service facilities and limited office uses adjacent to residential neighborhoods. The district is intended to meet the shopping and service needs of the immediate neighborhood and to have minimal negative impacts on surrounding residential uses. It is located adjacent to the I-SW sub-district at the north edge of the Springwater Planning area with frontage on the southwest side of Orient Drive.

Potential conflicting uses within the zone: commercial and business uses, community services uses.

Heavy Industrial

The Heavy Industrial District is primarily intended for industrial uses which are generally not compatible with residential development because of their operational characteristics, which can include noise and air pollution. This sub-district will continue to be located in the same area as currently located. The district is also intended for uses, which may require extensive outdoor areas to conduct business activities or for product storage or display. These regulations are designed to permit the development of land within the district in a manner consistent with efficient industrial operations.

Existing conflicting uses within the zone: manufacturing, storage, assembly, warehousing and industrial uses.

Environmentally Sensitive Resource Areas (ESRA-SW)

The Environmentally Sensitive Resource Areas (ESRA-SW) sub-district provides a framework for protection of Metro Title 13 (Nature in the Neighborhoods) lands and Statewide Planning Goal 5 resources within the Springwater Plan District. The ESRA-SW is located on Goal 5 significant resource sites. It implements the Springwater Natural Resource Goals and Policies and is intended to resolve conflicts between development and conservation of streams corridors, wetlands, floodplains, and forests. The sub-district contributes to the following community objectives:

- Protect and restore streams and riparian areas for their ecologic functions and as an open space amenity for the community.
- Protect floodplains and wetlands, and restore them for improved hydrology, flood protection, aquifer recharge, and habitat functions.
- Protect upland habitats, and enhance connections between upland and riparian habitats and between Springwater habitats and nearby habitats.
- Maintain and enhance water quality and control erosion and sedimentation through the revegetation of disturbed sites and by placing limits on construction, impervious surfaces, and pollutant discharges.
- Conserve scenic, recreational, and educational values of significant natural resources.

Potential conflicting uses within the zone: unlike all other sub-district designations, the ESRA-SW does not have conflicting uses.

Table 4.4 Summary of Uses Permitted by Proposed Zone/Jurisdiction

Zone	Uses Permitted Outright or Prescribed Conditions	Uses Permitted Conditionally	Minimum Lot Size/ Allowed Density
City Gresham			
VLDR-SW	• Residential dwelling units • Accessory structures and dwellings • Home occupations • Temporary uses • Residential facility and home	• Community services	10,000 sq. ft.; 2.9-3.6 dwelling units/net acre
LDR-SW	• Residential dwelling units • Accessory structures and dwellings • Home occupations • Temporary uses • Residential facility and home	• Community services	5,000 sq. ft.; 5.8-7.3 dwelling units/net acre
THR-SW	• Residential dwelling units • Accessory structures • Home occupations • Temporary uses • Residential facility • Live-Work units	• Community services	Attached dwelling = 2,200 sq. ft.; Detached = 3,000 sq. ft.;12.5-16 dwelling units/net acre
VC-SW	• Mixed use residential (office/residential with residential on upper floors)) activities • Temporary uses • Home occupations • Offices • Clinic • Retail trade/services • Business services • Live-work residential uses (i.e., limited office, retail services, and/or business services with residential living space)	• Community services	None

Table 4.4 Summary of Uses Permitted by Proposed Zone/Jurisdiction

Zone	Uses Permitted Outright or Prescribed Conditions	Uses Permitted Conditionally	Minimum Lot Size/ Allowed Density
RTI-SW	• Finance and insurance services • Real estate and renal and leasing • Professional, Scientific, and technical services • Management of companies and enterprises • Health care and social assistance • Arts, entertainment, and recreation • Accommodation and food services • Public Administration • Retail trade • Transportation and warehousing • Information uses • Educational Services	• Community service (electric power and natural gas distribution, and water, sewage and other systems)	5,000 square feet
IND-SW	• Construction • Management of companies and enterprises • Health care and social assistance • Arts, entertainment, and recreation • Accommodation and food services • Public Administration • Manufacturing • Wholesale trade • Retail trade • Transportation and warehousing • Information uses • Finance and insurance • Real estate and rental and leasing • Professional, Scientific, and technical services • Educational Services	• Community services (electric power and natural gas distribution, and water, sewage and other systems)	10,000 square feet

Table 4.4 Summary of Uses Permitted by Proposed Zone/Jurisdiction

Zone	Uses Permitted Outright or Prescribed Conditions	Uses Permitted Conditionally	Minimum Lot Size/ Allowed Density
ESRA-SW	• Stream, wetland, riparian, upland restoration and enhancement • Farming Practices as defined under ORS 215.203 (Exclusive Farm Use), excluding buildings and structures • Utility service poles that meet site installation requirements • Boundary and topographic surveys that meet survey requirements • Soil testing that meet testing requirements • Trails that meet siting, design, and construction specifications • Land divisions with tentative plans and approved building permit/construction plans that meet siting, design, and construction specifications (i.e., parcel's building sites, utilities, streets/driveways/parking outside ESRA), ESRA-SW portions of lot protected by conservation easement or entire lot or tract created and dedicated for unimproved open space • Routine repair and maintenance of existing structures, roadways, driveways and utilities • Replacement, additions, alterations and rehabilitation of existing structures, roadways, utilities, etc. where there is no increase in impervious surface • Measures mandated by city of Gresham to remove or abate nuisances or hazardous conditions • Planting native vegetation, removal non-native vegetation that meets City of Gresham requirements	• Existing structure alteration that does not violate uses exempted by uses allowed outright • Vacant lot development with less than 3,500 sq. ft. buildable area outside the ESRA-SW portion of the property. • Land division creating a new lot for an existing residence currently within the ESRA-SW • Trails/pedestrian paths that are not exempted under the uses permitted outright • New roadways, bridges/creek crossings, utilities or alterations to such facilities that are not already exempted by uses permitted outright	Varies based on significant resource location and classification

Table 4.4 Summary of Uses Permitted by Proposed Zone/Jurisdiction

Zone	Uses Permitted Outright or Prescribed Conditions	Uses Permitted Conditionally	Minimum Lot Size/ Allowed Density
NC-SW	• Eating and drinking establishments • Insurance agencies, real estate and other offices • Grocery stores • Personal service establishments • Retail businesses • Community services • Temporary uses • Home occupations (only within pre-existing homes) • Temporary health hardship dwellings (only in conjunction with pre-existing single-family homes)		10,000 square feet
HI	• Manufacturing, assembly and distribution activities • Storage and warehousing uses • Research and Development activities • Repair, finishing, testing activities • Commercial services • Retail sales activities • Wholesale activities • Industrial services	• Laboratory activities • Community services • Home occupations • Temporary health hardship dwellings	20,000 sq. ft., building coverage may cover up to 75% of the lot.

4.4 CONFLICTING USE ENVIRONMENTAL IMPACTS

This section describes potential adverse environmental consequences of allowing development adjacent to and within the significant resource sites. The section is divided between the existing zone districts and the proposed zone districts. Conflicting uses have also been grouped into general use categories in order to minimize repetition for each zone district.

4.4.1 Existing Zone District Conflicting Use Environmental Impacts

4.4.1.1 Agricultural, Farm Uses

Agricultural and farm uses are allowed in four of the seven existing zoning districts. These activities include crop growing, animal husbandry, agricultural product processing and associated commercial activities to support the farming uses.

While agricultural activities can have a positive impact on significant resources (e.g., wildlife food source, run-off filtering, habitat cover and connectivity), there are activities associated with agricultural and farming practices that can have detrimental impacts related not only to activities concentrated in the area of the farm buildings where conflicting impacts may be similar to residential development (see below for further discussion) but, more importantly, on the larger land areas where the farming practices occur.

Agricultural uses often require plowing fields and exposing bare soil causing erosion that degrades water quality, which can adversely impact aquatic habitat. The conversion of forests to farmland replaces diverse, complex forest plant communities with a few, cultivated, non-native species. Vegetation acts as a filter, cleansing runoff before it reaches streams or wetlands. Tilling of the soil and removal of vegetation for agricultural uses reduces these water quality benefits. Further, conversion of forests to farmland can reduce tree cover canopy leaving fragmented forest patches instead of corridors on which wildlife rely for travel, foraging and protection (see forest uses below).

Agriculture typically (but not always) involves the use of pesticides, herbicides, and fertilizers. These chemicals can contaminate surface and groundwater areas and harm fish and wildlife.

Animal husbandry (livestock) activities can degrade stream water quality as well as accelerate erosion in riparian areas. Concentrated animal waste and unimpeded access to streams and water bodies can result in contaminated run-off to streams, additional channel down-cutting along stream banks, loss or degradation of riparian vegetation and wetland areas and detrimental impacts to aquatic habitat . Presence of livestock can also degrade wildlife habitats that depend on riparian cover and the natural function and value of the riparian, stream, wetland interface for survival.

Agriculture may draw irrigation water from wells or directly from streams. Extensive use of groundwater can result in draw down of the water table, which in turn can reduce groundwater discharge to streams and degrade fish and wildlife habitats. Use of water from streams directly reduces flow. These surface water reductions are most common during the summer growing season when natural stream flows are low and the potential adverse impacts to fish are the greatest.

Commercial and other activities associated with agriculture uses generally have detrimental effects similar to residential uses. That is, these activities share with residential uses such as buildings, structures, and parking lots, which may increase the detrimental impacts of impervious surfaces (e.g., reduced infiltration and higher runoff, lower groundwater levels, interference with the transfer of air and gases from the soil). Commercial uses may also involve increased risk of pollution from oil, gasoline, and other vehicle-related contamination.

4.4.1.2 Forestry Facilities

Forestry and associated activities, like agricultural and farming practices is one of the most commonly allowed activities in all the existing zone districts. Forest activities are allowed in four of the seven zone districts, although the one district that is dedicated exclusively to promoting forest growing and harvesting practices, Clackamas County's Timber District, occupies only a tiny four acre portion of the Springwater area (less than 1% of the entire area). While there are still significant tree groves located in the Springwater Community, the area has a history of timber harvests that has resulted in the clearing of most of the Springwater area for agricultural activities. Even existing tree groves are third and even fourth generation stands.

Forestry uses can have major impacts on watershed health. Timber harvest and particularly clear-cutting increases the rate and volume of runoff to streams as well as stream velocity. Such runoff to streams can promote sediment transport, soil loss and erosion, channel down-cutting, bank undercutting and failure, and increased risk of landslides and floods, which can also lead to riparian vegetation and wetland loss.

Removal of vegetation eliminates habitat for native wildlife. Clearing also removes important structural features of the forest and creates fragmented patches. Forest fragmentation increases the isolation of one habitat area from another. As the range of habitat for indigenous wildlife becomes restricted and isolated, opportunities for recruitment from other areas are limited and wildlife populations become vulnerable to disease, predation, and local extinction.

The forestry impacts on watershed hydrology are not generally permanent since harvested areas are replanted with trees or allowed to naturally recover, although recovery is slow. Impacts to wildlife habitat can be permanent when diverse native forest is replaced with intensively managed single-species tree farming. Herbicides and fertilizers may be used and the tree stands grow to be more dense and even-aged than natural forest conditions with little or no understory structure. Such commercial forests have limited value for wildlife.

Forest operations and commercial operations can have similar impacts as the previously described farm operations. Staging areas, log sorting and storage areas, and accessory building/structures as well as parking areas can increase run-off and erosion that is associated with impervious surfaces. Traffic and motorized equipment may increase risk of pollution from oil, gasoline, and other vehicle-related contamination.

4.4.1.3 Mining and Extraction Facilities

Mining is a conditional use in five of the seven zoning districts. Mining generally has the most severe environmental impacts of all uses allowed. All resources are normally eliminated. Once a mining operation is closed, some restoration of soil, vegetation and other resources may be possible but resources will remain permanently degraded.

Springwater has no active gravel extraction or mining activities. From a practical standpoint there will not likely be such activities that would meet the conditional requirements for such activities.

4.4.1.4 Residential Dwelling Facilities

Residential dwellings are permitted in four of the seven existing zone districts. Lot sizes are generally low density, ranging from the greatest density of one dwelling unit per acre to the lowest density of one dwelling unit per 200 acres. Most zoning districts, however, do have some exceptions that could allow slightly greater dwelling densities.

Residential Dwelling Facilities typically allow the construction of accessory structures and features such as garages, storage sheds and other buildings, and driveways, parking areas, lawns and managed landscaped areas. In addition, septic systems and drain fields, and related development necessary to support a residential structure are allowed.

There are both short-tem, construction-related impacts, and long-run or permanent environmental conflicts. Short-run conflicts occur when preparing land for and constructing the dwelling or accessory structures. This short-term period may also happen with dwelling restoration, remodeling or rehabilitation of an existing structure.

Short-run conflicts may not have long lasting impacts, but can temporarily create environmental problems that may take time to restore natural functions. These temporary conflicts include any land clearing or vegetation removal related to staging areas, storage of materials, parking of equipment, etc. Equipment clean-up (concrete wash-down, paint clean-up, etc.) in construction areas can also contribute to contamination. These activities can cause erosion, increased run-

off, and soil contamination. Impacts to streams may include water quality degradation and increased sedimentation, which can affect aquatic resources. In addition, construction noise can have a detrimental impact on wildlife, especially during nesting periods.

Building a dwelling and accessory structure commonly includes excavation and removal of vegetation, or “ground disturbing activities.” Excavation and removal of vegetative cover eliminates habitat for native wildlife and increases the likelihood of erosion. Lost habitat includes feeding, nesting, perching and roosting places for birds, and loss of feeding, nesting and refuge areas for mammals, reptiles, amphibians, fish, and insects. Clearing also removes important structural habitat elements of the forest such as multiple layered canopies, snags and downed logs, and large trees. These habitat components may be removed and replaced with lawns and ornamental, non-native vegetation. Impervious surfaces such as buildings, long driveways, and large vehicle parking and maneuvering areas also may permanently replace native habitats.

Landscape trees, shrubs, and groundcover plants often include invasive, non-native species that escape into natural areas and compete aggressively with natives. For example, English ivy and holly are commonly used in residential landscapes and have escaped into nearby natural habitats in some parts of the valley.

Forest fragmentation caused by the clearing of vegetation for residential uses increases the isolation of one habitat area from another, and can result in similar environmental conflicts identified in the previous forest section. The lack of habitat connectivity (except along stream corridors) limits wildlife migration opportunities. Roads (and roadway traffic) and fences can form barriers to wildlife migration. As the range of habitat for indigenous wildlife becomes restricted and isolated, opportunities for recruitment from other areas are limited and wildlife populations become vulnerable to disease, predation and local extinction.

The construction of homes, outbuildings, roads and other impervious surface facilities, and the replacement of native vegetation with lawns and landscaped areas has adverse consequences on watershed function. Increased impervious surface and vegetation loss leads to increased storm runoff and peak flows in streams, resulting in erosion, bank failure, flooding, and significant loss of fish and aquatic habitat function.

The increase in impervious surface and storm runoff also leads to reduced groundwater recharge and altered volumes of water in wetlands and streams contributed by groundwater. This can alter an area's hydrology by lowering surface water levels or groundwater tables and removing a local source of water essential to the survival of fish, amphibians and aquatic organisms as well as terrestrial animals. Clearing and grading activities can reduce the capacity of soil to support vegetation and absorb groundwater by reducing soil fertility, microorganisms, and damaging soil structure.

Pollution associated with residential development such as oil, gasoline, tar, antifreeze, and other contaminants from vehicles, heating and cooling systems, and roofs degrade habitat and water quality. Heated runoff from roads and vehicle maneuvering areas impacts water quality in streams by raising temperatures and stressing local fish runs. Pesticides, herbicides, and fertilizers used on rural residential landscaping and fields can pollute ground and surface waters and degrade habitat.

4.4.1.5 Heavy Industrial Facilities

Large scale and intensive industrial uses are allowed in one of the seven zone districts (City of Gresham Heavy Industrial Zone). The scale of activities and the facilities necessary to support industrial uses can significantly conflict with resource sites. Activities such as manufacturing, assembly, storage and warehousing require large structures and impervious surfaces, as well as transportation networks needed to move materials and goods into and out of the area. The City recognizes that these activities are intensive and extensive, and consequently allow building coverage to cover up to 75% of a 20,000 square foot lot.

To provide these facilities large land areas must be cleared, soil excavated to level grade variation, and vegetation removed to build structures and pave outdoor areas. Roads must be constructed to handle heavy vehicle traffic. The result is increased stormwater run-off volumes that can cause erosion and transport sediment as well as contaminants (e.g., petroleum, manufacturing chemical spills, etc.) to streams and wetlands.

This can have long-term consequences on riparian areas, wetlands and streams and the terrestrial and aquatic habitat that it supports. Unchecked, the long-term impacts can be increased flood events, increased stream water temperature and sediment that can cover spawning gravels. Overall, water quality would be degraded and the functions and value that the resource site provides would be reduced.

4.4.1.6 Park and Recreation Facilities

Two zone districts allow development of park and recreation activities. Park and recreation uses typically focus on public and private parks, recreational grounds, hiking and horse trails, and other similar uses. While most such lands tend to have few structures and facilities and therefore minimal conflict with the environmental resources, the Timber District allows campgrounds as a conditional use. Such uses can conflict with resource sites because of the facilities and features necessary to support camping activities.

Parks and recreation construction and maintenance practices can cause erosion and damage vegetation and habitat. Removal of vegetation, creation of impervious surfaces such as roads, parking lots, and construction of buildings are activities associated with development of parks. These activities normally require less impervious surface coverage than residential uses yet, though they may have fewer environmental impacts, they can still increase run-off and erosion.

Recreational trails can have very few impacts on natural resources depending on their location, design, and materials used for construction. Trials that are close to or within riparian areas, designed wide enough to accommodate bikes or other wheeled equipment require cut and fill to minimize grade differential, and use impervious materials. This can result in increased run-off and native vegetation removal. Such impacts could disrupt the natural filtering processes of vegetation.

4.4.1.7 Community Service Facilities

Community service facilities are allowed in four of the seven zoning districts. These uses generally provide a local service to people of the community, such as community centers, schools, daycare centers, religious institutions and cemeteries. These uses have similar impacts as those described for residential uses, but usually with greater impervious surface impacts related to larger buildings and parking areas (e.g., reduced infiltration and higher runoff, lower groundwater levels, interference with the transfer of air and gases from the soil). Schools may have significant impacts for this reason. By contrast, daycare uses are normally small in size and often contained within other buildings (e.g., religious institutions or community centers).

Grounds maintenance for community service uses has the same effects as those described for parks and recreation.

4.4.1.8 Public Facilities, Utilities, and Communication Facilities

Public facilities, utilities, and communication facilities are allowed in five of the seven zone districts. Public facilities includes a broad set of activities such as roads, water, sewer, power transmission, wireless communication, and other public utilities infrastructure services such as water and sewer pump stations, water towers, and utility and communication poles.

Although operation of existing facilities may have limited adverse environmental effects, construction and maintenance practices for the facilities typically are greater. These activities may create cleared corridors that increase wind and light penetration into adjacent habitats, providing opportunities for the establishment of invasive, non-native plant species. Construction may fragment wildlife habitat areas, degrade wetlands and streams, increase stormwater runoff and erosion, and reduce forest cover.

Specific public infrastructure features can have detrimental impacts. Underground pipelines can upset local groundwater hydrology and groundwater flow to streams. Transportation facilities such as roads and bridges can result in water run-off and transport of petroleum contaminants, which can be detrimental to aquatic species, wetlands, and riparian areas. If designed correctly, bridges can span streams and riparian areas, but often they do not and therefore can result in modifying stream flow as well as increasing sedimentation, which fill gravels that fish rely on for spawning. In addition, bridges can increase channel down-cutting and increase the risk of bank failure.

Communication towers can also conflict with the resource sites. Their effects can be similar to residential uses, but with less impervious surface and greater adverse visual impacts. Communication towers can be tall, which can be deadly to birds, which are attracted by the tower lights. Some facilities require cables to be laid in the ground, with potential impacts to wetlands, streams, and vegetation, and associated fauna.

Public facility construction that includes structures generally have the same effects as those described for residential uses. That is, staging areas, equipment storage and cleaning can have a negative impact on the resource sites through erosion, contamination transport, and vegetation removal.

4.4.1.9 Aircraft Land Uses

Aircraft land uses are allowed as conditional land uses in two of the seven zone districts (RRFF-5, TBR). These uses involve only light airplane operations serving local or agricultural needs and have impacts comparable to those for commercial uses described above.

4.4.2 Proposed Zone District Conflicting Use Environmental Impacts

4.4.2.1 Introduction

Unlike existing zoning districts and their conflicting uses that are addressed in the previous section, the proposed zone districts in the Springwater Community Plan have considered the potential conflicting uses that could impact significant environmental resource sites and have integrated design and development features that avoid, minimize, or mitigate the potential impacts. That is, the code incorporates features that “mimic” the natural functions of the surrounding environmental processes (e.g., management of run-off, landscaping, tree

replacement, etc). These features are a critical component of the zoning code and cover design requirements as well as operations and maintenance activities to ensure that the zone districts continue to operate in an environmentally friendly and sustainable fashion as much as possible. While there are inevitable conflicting uses, they are expected to be minor compared to existing zone districts.

4.4.2.1 Urbanized Residential Facilities

The Springwater Community Plan proposes three exclusively residential zone districts (VLDR-SW, LDR-SW, and THR-SW) and a mixed use zone district (VC-SW) that allows residential living, which are designed to provide a diverse range of housing. It will encourage transition from its current rural residential character to a more densely urban oriented character (approximately 3 to 16 dwelling units per acre) to support employment growth in the Springwater Community and eastern Multnomah and Clackamas Counties. Such higher density residential uses, though, could conflict with environmental resource sites.

The construction of homes whether single-family detached or attached will result in greater land coverage with impervious surfaces such as dwellings, garages and accessory structures, driveways, and parking areas. In addition, supporting infrastructure such as roads and utilities would also contribute to the total impervious surface area.

Land clearing for residential development will remove native vegetation as well as trees. Even with landscaping requirements to encourage replacement with native vegetation and requirements for tree replacement, there will be less area for these natural functions and processes to take place. There will also be non-native landscaping such as lawns and managed landscape areas (roads and utilities).

The resulting conflicting uses would likely be habitat loss, including feeding, nesting, perching and roosting places for birds, and loss of feeding, nesting and refuge areas for mammals, reptiles, amphibians, fish, and insects. There would also be a potential for increasing stormwater run-off volumes that could include contaminants washed from driveways and streets. Greater water run-off volumes would increase erosion as well as sediment transport that could enter streams. Flooding and stream bank down-cutting and failure from increased volumes and velocity would impact riparian vegetation, wetlands, and aquatic habitat. Lack of water filtration could impact groundwater hydrology and impact water temperature in streams and wetlands. Contaminants can degrade water quality. Sediments can cover gravels, preventing fish from spawning.

There is also the potential for short-term uses that conflict with resource sites. Staging areas for storing construction materials, parking equipment, cleaning equipment (e.g., cement trucks, paint and solvent cleaners, etc.), and even construction noise could have negative consequences. These supporting activities for residential development could reduce food sources, contaminant soil, and, depending on the season, disrupt bird nesting and foraging patterns.

The environmental impacts of this type of development are somewhat similar to those that have been described in the previous section on residential development in existing zone districts, however the impacts could be on a much greater scale due to the increased density.

4.4.2.3 Commercial and Employment Facilities

Commercial and Employment uses, including retail, service, and office/office parks, are in four of the nine proposed zone districts (VC-SW, RTI-SW, I-SW, NC-SW). The environmental

impacts of these uses are generally similar to the impacts related to residential uses described in the previous section. The scale of the impacts, however, would be expected to be greater primarily because of the greater amount of impervious surface and larger size of buildings and accessory structures.

In particular, the VC-SW, NC-SW and commercial areas, which will allow dense urban development (primarily commercial retail) to support the residential and business communities, will have significant conflicting uses. There will be greater impervious surface due to shorter blocks, higher street development densities, and more parking lots. the area will be designed as a walkable center where commercial and businesses are compact and close by therefore there would not be large landscaped yards or wide stream buffers.

RTI-SW zone district would have some of the same conflicting uses, although, there scale of development will not be as dense. Development would be more “campus” oriented with landscaped areas. Multi-story buildings will result in smaller footprints, which will allow some flexibility in design to avoid or minimize environmental impacts. Nevertheless, there will be large areas of impervious surfaces from parking lots, roadways, and buildings.

The conflicting uses would result from land clearing, ground excavation and disturbance, vegetation removal, replacement with impervious surfaces, and reduction of open space for the operation of natural processes (e.g., groundwater percolation, contaminant filtering, etc.). From this would be a higher risk of soil erosion, increased stormwater run-off, stream water quality degradation, and potential habitat loss (aquatic as well as terrestrial).

4.4.2.4 Heavy Industrial Facilities

Large scale and intensive industrial uses will continue to be allowed in one of the nine proposed zone districts (Heavy Industrial Zone). While this existing zone district will require the adoption of the “Green Development Practices” that are proposed for the new zone districts, the scale of activities and the facilities necessary to support industrial uses could still significantly conflict with resource sites.

Activities such as manufacturing, assembly, storage and warehousing require large structures and impervious surfaces, as well as transportation networks needed to move materials and goods into and out of the area. These activities are intensive and extensive, and the zone allows buildings to cover up to 75% of a 20,000 square foot lot. The remaining portion of the lot can be paved as necessary to support the industrial activity.

To provide these facilities large land areas must be cleared, soil excavated to level grade variation, and vegetation removed to build structures and pave outdoor areas. Roads must be constructed to handle heavy vehicle traffic. The result will be increased stormwater run-off volumes that can cause erosion, and transport sediment as well as contaminants (e.g., petroleum, manufacturing chemical spills, etc.) to streams and wetlands.

This can have long-term consequences on riparian areas, wetlands and streams and the terrestrial and aquatic habitat that it supports. Unchecked, the long-term impacts can be increased flood events, increased stream water temperature and sediment that can cover spawning gravels. Overall, water quality would be degraded and the functions and value that the resource site provides would be reduced.

4.4.2.5 Industrial Facilities

One zone district is designed to provide land for industrial activities (IND-SW). The types of facilities to be developed in this zone district will support research, development and information activities; and some light manufacturing and warehousing. In the proposed Springwater Plan District the emphasis is on a mix of facilities and sustainable design practices that are integrated into structures and surrounding land.

Conflicting uses will likely occur. Land clearing, excavation, vegetation removal, building and accessory structure construction, parking lots, maneuvering areas, infrastructure support, streets and roads, and open paved areas could conflict with resource sites. These types of impacts are similar to those described in the previous urban residential section. However, they will have a greater degree of conflicting uses because the I-SW zone district covers more land than any of the other eight zone districts and allows greater overall development density.

4.4.2.6 Community Service Facilities

Community service facilities covers a wide set of facilities. Some community service facilities are allowed in eight of the nine zoning districts (VLDR-SW, LDR-SW, THR-SW, VC-SW, RTI-SW, IND-SW, NC-SW,). Not all zone districts, however, allow the same set of community services. Restrictions on the types of community services permitted are detailed in Springwater Community Plan Report, which identifies the allowed community services for each zone district (detailed definitions are in the City of Gresham Development Code: Article VIII Special Uses, Section 8.0100, Community Services).

Community services generally provide a local service to people of the community, such as community centers, public buildings, schools, daycare centers, religious institutions, cemeteries, community parks, campgrounds and public plazas. Utilities (e.g., water, sewer, cellular communication, telephone, power transmission) are also listed as a community service, though, due to their conflicting use impacts, they are discussed in the next section.

Community service facilities have similar impacts as those described for residential uses, but usually with greater impervious surface impacts related to larger buildings and parking areas (e.g., reduced infiltration and higher runoff, lower groundwater levels, interference with the transfer of air and gases from the soil, etc.). Schools may have significant impacts for this reason. By contrast, daycare uses are normally small in size and often contained within other buildings (e.g., religious institutions or community centers).

4.4.2.7 Public Facilities, Utilities, Communication Facilities

Public facilities and utilities are allowed in all proposed zone districts, although the ESRA-SW zone district has very restrictive standards for utilities. Public facilities and utilities includes a broad set of facilities such as roads, water, sewer, and other public utilities infrastructure services such as water and sewer pump stations, water towers, and utility, power, and communication poles.

Although operation of existing facilities may have limited adverse environmental effects, construction and maintenance practices for the facilities typically are greater. These activities may create cleared corridors that increase wind and light penetration into adjacent habitats, providing opportunities for the establishment of invasive, non-native plant species. Construction may fragment wildlife habitat areas, degrade wetlands and streams, increase stormwater runoff and erosion, and reduce forest cover.

Specific public infrastructure features can have detrimental impacts. Underground pipelines may upset local groundwater hydrology and groundwater flow to streams. Transportation facilities such as roads and bridges can result in water run-off and transport of petroleum contaminants, which can be detrimental to aquatic species, wetlands, and riparian areas. If designed correctly, bridges can span streams and riparian areas, but often they do not and therefore can result in modifying stream flow as well as increasing sedimentation, which fill gravels that fish rely on for spawning. In addition, bridges can increase channel down-cutting, scour, and increase the risk of bank failure.

Communication towers can also conflict with the resource sites. Their effects can be similar to residential uses, but with less impervious surface and greater adverse visual impacts. Communication towers can be tall, which can be deadly to birds, which are attracted by the tower lights. Some facilities require cables to be laid in the ground, with potential impacts to wetlands, streams, and vegetation, and associated fauna.

Public facility construction that includes structures generally have the same effects as those described for residential uses. That is, staging areas, equipment storage and cleaning can have a negative impact on the resource sites through erosion, contamination transport, and vegetation removal.

4.4.2.8 Parks and Trail Facilities

Seven zone districts of the nine allow development of park and trail facilities (VLDR-SW, LDR-SW, THR-SW, VC-SW, RTI-SW, IND-SW, ESRA-SW). These activities typically focus on public and private parks, hiking and horse trails, and other similar uses. Most such lands tend to have few structures and facilities and therefore minimal conflict with the environmental resources. Such uses, though, can conflict with resource sites because of the necessary facilities and features to support the activities.

Parks construction and maintenance practices can cause erosion and damage vegetation and habitat. Removal of vegetation, creation of impervious surfaces such as roads, parking lots, and construction of buildings are activities associated with park development. These activities normally require less impervious surface coverage than residential uses yet they can still increase run-off and erosion, although they may have fewer environmental impacts.

Recreational trails can have few impacts on natural resources depending on their location, design, and materials used for construction. Trials that are close to or within riparian areas, designed wide enough to accommodate bikes or other wheeled equipment require cut and fill to minimize grade differential, and use impervious materials that can result in increased run-off and native vegetation removal. Such impacts could disrupt the natural filtering processes of vegetation.

The ESRA-SW sub-district only allows the development of trail facilities, no parks. The trail standards, though, are extremely restrictive in their design, location and construction materials. These restrictions minimize conflicting uses.

4.4.2.9 Agricultural, Farm Uses

Only the ESRA-SW sub-district allows farming uses that are related to Exclusive Farm Use as defined in ORS 215.203. The ESRA-SW further restricts development by prohibiting buildings and structures within the district. As defined in the ORS, activities that are allowed include crop growing, animal husbandry activities, propagation, cultivation, maintenance and harvesting of aquatic species, and all supporting activities necessary to manage these activities.

While prohibition of farm structures reduces some of the conflicting uses other farming activities can conflict with the resource sites. The conflicting uses include plowing fields and exposing bare soil causing erosion that degrades water quality, which can adversely impact aquatic habitat. Conversion of forests to farmland replaces diverse, complex forest plant communities with a few, cultivated, non-native species. Vegetation acts as a filter, cleansing runoff before it reaches streams or wetlands. Tilling of the soil and removal of vegetation for agricultural uses reduces these water quality benefits. Conversion of forests to farmland can reduce tree cover canopy leaving fragmented forest patches instead of corridors on which wildlife rely for travel, foraging and protection.

Agriculture typically (but not always) involves the use of pesticides, herbicides, and fertilizers. These chemicals can contaminate surface and groundwater areas and harm fish and wildlife.

Animal husbandry (livestock) activities can degrade stream water quality as well as accelerate erosion in riparian areas. Concentrated animal waste and unimpeded access to streams and water bodies can result in contaminated run-off to streams, additional channel down-cutting along stream banks, loss or degradation of riparian vegetation and wetland areas and detrimental impacts to aquatic habitat. Presence of livestock can also degrade wildlife habitats that depend on riparian cover and the natural function and value of the riparian, stream, wetland interface for survival.

Agriculture may draw irrigation water from wells or directly from streams. Extensive use of groundwater can result in draw down of the water table, which in turn can reduce groundwater discharge to streams and degrade fish and wildlife habitats. Use of water from streams directly reduces flow. These surface water reductions are most common during the summer growing season when natural stream flows are low and the potential adverse impacts to fish are the greatest.

Commercial and other activities associated with agriculture uses generally have detrimental effects similar to residential uses. That is, these activities share with residential uses such as buildings, structures, and parking lots, which may increase the detrimental impacts of impervious surfaces (e.g., reduced infiltration and higher runoff, lower groundwater levels, interference with the transfer of air and gases from the soil). Commercial uses may also involve increased risk of pollution from oil, gasoline, and other vehicle-related contamination.

5.0 IMPACT AREA IDENTIFICATION

The impact area has been defined as the boundary surrounding the Springwater Community Area. See Figure 3.1 for a map of the Springwater Community Impact Area.

6.0 ESEE ANALYSIS

6.1 INTRODUCTION

The following ESEE analysis examines the impacts to significant resource sites based on the three options – allow the conflicting use, limit the conflicting use, or prohibit the conflicting use (ALP). As discussed in an earlier section of this report, only economic, social, environmental, and energy (ESEE) consequences for proposed zoning districts are analyzed.

For efficiency purposes resource sites have been grouped into areas that have similar zoning districts. This allows the analysis to be consistently applied.

The Springwater Community Area has conflicting uses for proposed zone districts, as outlined above. To weigh the consequences of alternative methods of managing these conflicts the next step in the Goal 5 process is to conduct an ESEE consequences analysis. The following section presents this analysis, which is based on the Goal 5 inventory, significance determination, and conflicting use impacts described in this document.

The significant Goal 5 resource sites correspond to the Environmental Sensitive/Restoration Areas (ESRA) outlined in the concept plan (See Volume I of the Springwater Community Plan). The impact area for the significant resource sites is the remainder of the Springwater Community Planning area.

The Goal 5 rule requires that the ESEE consequences of "full protection," "limited protection," and "no protection" of the resource site and its impact area be considered. The Springwater Community Plan envisions much greater residential development and employment densities, while offering a much more comprehensive and effective level of natural resource protection through the ESRA-SW zone district. What is important in the ESEE analysis is to determine what level of protection should be provided for the Springwater environmental resource sites to meet the Goal 5 requirements while at the same time achieving the development goals that are outlined in the Springwater Community Plan. Table 6.1 summarizes key elements of the decision options used in this analysis.

Table 6.1 Summary of Goal 5 Decision Options

	Within Resource Site	**Within Impact Area**
Full Protection This option would nullify the Springwater Community Plan by prohibiting all conflicting uses within the significant resource site and the impact area	No conflicting uses allowed (e.g., no ground-disturbing activity, no expansion of existing uses, no new impervious surface area, no new public facilities or trails).	No conflicting uses allowed (e.g., no ground-disturbing activity, no expansion of existing uses, no new impervious surface area, no new public facilities, no "green development practices").
Limited Protection This option carries out most of the policies outlined in the Springwater Community Plan, and achieves a balance between intensive urbanization and resource conservation.	Allows for limited ground-disturbing activities for planned public facilities (roads and utilities) and trails. Allows for prohibiting activities in certain resource areas (based on the Natural Resource Significance Classifications). Requires mitigation for all development. Allows density transfer from resource site to impact area. Existing agricultural operations may continue.	Provides for intensive urban development outside the significant resource site, subject to green development practices and tree planting requirements as required in the Springwater Development Code and Gresham water quality manual. Existing agricultural operations may continue.

Table 6.1 Summary of Goal 5 Decision Options

	Within Resource Site	Within Impact Area
No Protection Would allow unrestricted development in planned housing and employment, but would violate two central organizing principals of the Springwater Community Plan by allowing unrestricted development within and outside the significant resource site.	All conflicting uses allowed (e.g., ground-disturbing activity, unrestricted expansion of existing uses, unrestricted impervious surface area, unmitigated public facilities).	All conflicting uses allowed without "green development practices."

The ESEE analysis supports a range of limited protections based on the ESEE consequences and the impact these consequences have on the resource sites as measured by the natural resource significance classes in accordance with the Springwater Community Plan. The range of these limited protections are based on the fact that the economic, social, environmental and energy consequences of the limited protection option are positive (i.e., meet Goal 5 requirements and Springwater Community Plan goals), while the consequences of "no protection" and "full protection" will be overwhelmingly negative.

The ESRA-SW concept and the associated green development practices required in the proposed zone districts serve as central organizing features of the Concept Plan. Intensive urban residential and employment development using green development practices is encouraged on buildable land outside the significant resource sites while the significant resource site is protected from most conflicting uses. A limited amount of development (e.g. roads and utilities) will be allowed on land within the significant resource site, except for those specific resource sites that are determined to require full protection. In addition, as allowed by the ESEE Decision Process (ORS 660-023-0040(5)(c)), there are some sites where the conflicting uses should be allowed fully notwithstanding the possible impacts on the resource site.

Green development practices refer to a toolbox of stormwater management and design techniques that are required as part of development in each zone district. The techniques involve landscape features that are designed to "mimic and incorporate the predevelopment hydrology of a site into future development" through site design that minimizes ground disturbance (to soils, tree canopy, and other sensitive natural features), and minimal impervious surfaces. Run-off that does occur is managed through "techniques that use natural areas and landscaping to treat, retain, attenuate, and infiltrate stormwater on the development site" (Development Code, Springwater Community Plan Report).

The benefits of green development practices include the following:

- Reduced stormwater runoff. Traditional development practices clear entire areas for development, add large amounts of impervious surfaces, and compromise the ability of soils to absorb stormwater. Through better site design, soil disturbance can be minimized, unnecessary impervious surfaces can be eliminated, and tree canopy protected, resulting in reduced generation of stormwater runoff.

- Reduced damage from unregulated stormwater flow. Traditional stormwater management techniques convey runoff quickly to management facilities. Without any prior management, these facilities are quickly overwhelmed and release water into streams at rates, volumes, and durations that compromise stream habitat. Green development practices infiltrate stormwater close to the source, give it an opportunity to evaporate, and attenuate its progress towards streams so that the release of runoff into streams more closely mimics the natural hydrology of the area.

- Increased tree canopy. Green development practices when combined with tree planting requirements promote the conservation of existing trees and forests, and providing tree-planting opportunities in order to create an urban forest. In a forested environment, rainfall is intercepted by vegetation reducing its impact by slowly allowing it to infiltrate and saturate the soil thus promoting infiltration, minimizing erosion and enhancing water quality. Trees also consume many different types of stormwater-linked pollutants through uptake from the root zone. Forested areas along stream banks provide stability by holding soil in place and slow runoff velocities.

There are tree planting requirements (Development Code) and sustainability goals that are incorporated into the Springwater Community Plan. These elements, when combined with the green development practices, provide a comprehensive approach to ensure that the Springwater Community will preserve significant resources while allowing growth and development to occur in the area.

6.2 ECONOMIC CONSEQUENCES

6.2.1 Introduction

To provide a consistent economic analysis covering the most critical factors, all parcels have been analyzed according to both existing and potential conflicting uses. The economic analysis for each parcel – the comparison of impacts on development and on resource values – has been repeated for three development level scenarios: allowing conflicting uses fully; limiting conflicting uses; and prohibiting all conflicting uses.

Through the economic analysis, a determination is made on the type and quantity of functions that are at risk with the loss of these resources, as well as the type and quantity of conflicting uses that may be affected.

This process is aided by including a natural resource significance classification system that ranks significance resource sites according to their overall functional and value and contribution toward maintenance and preservation of the watershed (see detailed explanation of the classification system elsewhere in this report). What this allows is the ability to make more informed decisions on resource sites and their impact from allowing, limiting or prohibiting development activities.

It is important to carefully separate the economic consequences on conflicting uses that exist due to physical constraints and those associated with protecting significant resources. There are increased costs incurred in the design and construction of structures and roads where slopes, certain soil types, streams, wetlands, or floodplains exist.

In determining the economic consequences of protecting significant resources, it is first necessary to define value with respect to a significant resource (i.e., natural resource significance classes). Many of the benefits of environmental policies are difficult measure. The

benefits are found more in an increase in the quality of life than in a incremental contribution to a region's economic output, although, value of environmental quality has been shown as a desirable factor that affects real estate purchases. Further, environmental features have been shown to increase property values as they provide aesthetic and recreational pleasure and a more livable environment. As a result, properties next to these features generally have higher property values and produce greater tax revenues.

6.2.2 Methods and Analysis

A parcel-by-parcel database (developed using GIS) provides the basis for this analysis. The planning consultant team created the database for analyzing the land in the Springwater community. The database includes information on tax lots, including ownership, size and characteristics, proposed zoning, Metro Title 13 designation, public facilities, significant resource area designation and classification, units allowed under density transfer, and units allowed by sub-district (outside ESRA-SW, by sub-district).

The economic analysis considers the impact of allowing, prohibiting, or limiting conflicting uses within the significant resource site and the impact area. The analysis addresses lots with no significant resource area, lots with partial significant resource area, and lots with substantial significant resource area. In this context, "substantial" is defined as when the non-resource portion of a lot is insufficient in size to accommodate the total number of units transferred out of the resource area of the lot. "Partial" coverage means that the lot has some resource area but not enough to qualify as "substantial".

Lots with no significant resource area may have conflicting uses that produce off-site impacts on the significant resource area. These uses include residential, commercial, industrial, manufacturing and community service uses, which have significant potential off-site impacts due to the removal of vegetation, creation of impervious surfaces, and construction of stormwater facilities that discharge into streams and wetlands, and similar activities.

Conflicting uses within significant resource areas have direct impacts on resources and resource functions as described in the previous section. Conflicting uses with the greatest potential impacts are the higher density residential areas, commercial, business, manufacturing, industrial and community service areas. Public facilities also can have significant impacts, but may also have important siting constraints (such as the need for roads and utilities to cross streams and other natural resources). As noted above, some public facilities, including certain stormwater facilities and road and utility crossings (e.g., via bridges) can have fewer localized resource impacts. Park and recreation uses also range in impact, with natural open space and recreational trails generally having the fewest impacts.

For the following analysis, conflicting uses are organized in three classes or groups, based broadly on degree of impact. One class includes residential, community service facilities (CSF), and broadcast facilities. The second class is public facilities. The third class is park and recreation uses.

6.2.3 Economic Consequences of Allowing Conflicting Uses

Allowing conflicting uses within the impact area of Springwater could provide major economic benefits as the area urbanizes up to a point. As the area urbanizes and there are increased development densities beyond what is proposed by sub-districts, there will likely be a diminishing marginal economic return. That is, a break point where the additional increment of development may not increase overall value because the costs of development would increase

as more marginal land converted and the amenities that would attract developers, buyers or employers become less attractive. This will likely occur as the resource sites are degraded.

New buildings and roads, for example, will bring a dramatic increase in impervious surfaces within the impact area. This can lead to reduced infiltration and higher runoff, increased flooding; degradation of aquatic habitat; and negative impacts to salmon, wetlands and riparian areas in the Johnson Creek watershed (including tributaries).

While the application of green development practices and other requirements (e.g., tree planting requirements, and sustainable designs) will help to off-set adverse impacts to resource sites, the point where development density exceeds the ability of these design elements to prevent environmental impacts will likely have a progressive adverse economic impact in the Springwater Community.

Table 6.2 summarizes the economic consequences of allowing conflicting uses.

Table 6.2 Economic Consequences of Allowing Conflicting Uses

Lot Type	Conflicting Uses	Consequences	Assessment
Lots with no significant resource sites	All	▪ Increase in housing and jobs beyond the planned increase (an estimated 10,000 households and 17,000 new jobs) on parcels within the resource sites as there will be no protections ▪ Will increase traffic and pollution, but will provide no open space benefit or protections to resource sites. ▪ No restrictions placed on building coverage, impervious surface area or construction methods ▪ Loss of economic values associated with accessible scenic and recreational areas ▪ Specific problem areas: lots adjacent to resources areas, especially with resource class designations of 3, 4, 5, 6 with 5 and 6 under the greatest risk of negative environmental consequence. ▪ However, lower adverse economic impact where lots are distant from resource sites, especially in the I-SW area along northern boundary, and lots near resource sites rated #1 (isolated tree groves).	• Negative: ▪ Increase in neighboring densities and traffic, accompanied by loss of economic (amenity) values associated with community open space, clean water, groundwater recharge, recreation, wildlife habitat and scenic views.

Table 6.2 Economic Consequences of Allowing Conflicting Uses

Lot Type	Conflicting Uses	Consequences	Assessment
Lots with partial significant resource sites.	All	• Lots with partial resource site coverage would have unrestricted development potential under this option, although development costs are greater because some lands are highly constrained • Loss of economic value associated with loss of adjacent community open space, scenic, recreational amenities • Economic impacts resulting from risk of destabilization of slopes and stream banks, flooding and landslide hazards through vegetation removal, increased impervious surfaces and lack of appropriate stormwater management. • Adverse economic impact resulting from decreased amenity values for homes and businesses adjacent to water features and upland forests • Specific problem areas: Most impact to sites along Johnson Creek and tributaries, Boring Hills (ratings #2-6). Least impact lots w/ isolated tree groves (rated #1) – Brickworks, proposed NC-SW area and lots between 267th and 262nd.	• Negative to mixed. • The land area can be devoted to development is increased, but densities will be greater than proposed. The economic value of adjacent open space, water features and forested areas would be lost. • Employment, commercial, industrial zone districts will develop beyond densities proposed and economic value of planned development that offers amenities to attract specific types of businesses, industries, and commerce would be lost.
Lots with substantial significant resource sites	All	• Parcels substantially covered by the resource sites would now be able to develop without restriction, although development costs may be greater because some of the lands are more constrained land area • Loss of economic value associated with on-site community open space, scenic, recreational amenities • Economic impacts resulting from potential destabilization of slopes and stream banks • Increase in flood and landslide hazards through vegetation removal, impervious surfaces • Adverse economic impact resulting from decreased amenity values for homes, and commercial, industrial, business, and employment areas within resource sites.	• Negative • Land area can be devoted to development is increased substantially. However, economic value of adjacent to resource areas is reduced, especially for residential areas that rely on these amenities to attract buyers. • For some development, such as the HI zone district, there will likely be little economic change. • Other land that depends on the economic values imputed to resource sites will have adverse economic impacts even if development densities can be increased.

There are significant economic costs associated with allowing conflicting uses within the resource areas (allowing significant stream, wetland, and forest resources to be eliminated). These resources collectively provide the community's natural and open space system, a unique and highly valued feature along Johnson Creek, its tributaries and along the forested corridors between creeks (e.g., Sunshine Creek to McNutt and Johnson Creeks, Brigman Creek to Botefuhr Creek). The amenity values of the resource site, including its natural, open space, recreational (local parks and trails), and scenic values, are expected to grow as the valley urbanizes. These amenity values will be capitalized into local property values.

These resources also provide community services with economic benefits, such as flood reduction, clean water, and slope stabilization. Johnson Creek and its tributaries provide pollution assimilation/water purification, flood attenuation and storage functions. The damage costs associated with flooding and landslide hazards increase with development activities and increased soil disturbance in resource areas. Vegetation loss can have additional economic costs in the form of lost air conditioning, erosion control, stormwater management, and air pollution control services.

The increment of additional housing, business, industry/manufacturing, office and village center, if "allowed fully" without controls, must be weighed against the unique and highly valued attributes of the community. Other considerations, such as physical (e.g., steep ravines, broad floodplains and wetlands, shallow water tables) and regulatory constraints (e.g., wetlands, water quality, listed species) may further limit the developable land within the resource sites.

This analysis strongly favors allowing conflicting uses fully only within the impact area, outside of significant resource areas where the off-site impacts will be relatively low. At some point, however, the scale of development could risk off-site adverse impacts to surrounding resource. Since preservation of these resource areas have been identified as critical to the development success of the Springwater Community, there is a risk that development beyond the proposed densities will reduce the attractiveness of the area and therefore the economic values expected to be generated by development.

6.2.4 Economic Consequences of Limiting Conflicting Uses

To determine the consequences of "limiting" conflicting uses, it is helpful to define what limiting means, at least in broad terms. The basis for these limits comes in large part from the Springwater Community Plan (see Volume I of the Springwater Community Plan Report). Through an active public involvement and participation element and a special Community Working Group, appointed to create guiding goals and policies to help "codify" the major themes for the Springwater Community, a number of policy statements and goals were identified. An overarching theme was creation of an environmentally sustainable community. Resource site preservation and the incorporation of sustainable design and green development practices were seen as key to Springwater Community's success. Economic development, housing, jobs and all supporting or accessory activities were considered important, but in the context of how they would fit into the environmental sustainability theme.

From these goal statements and policies it was apparent that streams, wetlands, and forests were highly valued community assets. Residential development, employment and supporting activities and needs were generally to be met with land outside the resource sites. These unique assets were to be preserved and restored as best as possible. Certain conflicting uses were envisioned within resource areas, including limited road and utility crossings, parks and trail uses, and continuation of agricultural practices.

It was recognized that resource areas would not be able to develop to the surrounding proposed zone densities. To provide additional economic value for these properties, a density transfer provision was developed that would permit the transfer of development out of the resource area onto the same or adjoining properties. These provisions were incorporated into the "limit" program for the Springwater Community Plan.

Table 6.3 summarizes the economic impacts resulting from limiting conflicting uses in accordance with the Springwater Community Plan, consistent with the program outlined above.

Table 6.3 Economic Consequences of Limiting Conflicting Uses Consistent with the Springwater Community Plan

Lot Type	Conflicting Uses	Consequences	Assessment
Lots with no significant resource sites	All (off-site impacts on resource sites)	• Provide for significant increase in housing and jobs beyond what is currently allowed under the proposed zoning districts (an estimated 10,000 households and 17,000 new jobs). • Some increased long-term costs associated with green development practices (i.e., increased maintenance versus reduced initial construction costs). • Restrictions placed on building coverage, impervious surface area or construction methods. • Maintain economic values associated with community open space, accessible scenic, recreational benefits. • Avoid adverse economic impact resulting from decreased amenity values for homes and businesses near resource sites.	Positive: • Manyfold increase in development potential over existing zoning districts, while maintaining economic values of community open space, clean water, wildlife habitat, scenic views and groundwater recharge. • Some long-term maintenance costs increase for green development practices, although short-term costs are usually less. • Economic values of incorporating the goals of environmental and economic sustainability will, in the long run exceed development costs as Springwater will attract the type of employment and residential development that values such preservation.
Lots with partial significant resource sites	All (except for public facilities, parks recreation)	• Significant increase in allowed density through up-zoning and density transfer from resource sites • Since the remaining portions of parcels outside resource sites are from building constraints, development costs are reduced • Maintain economic value associated with adjacent community open space, scenic, recreational amenities • Avoids adverse economic impacts resulting from potential destabilization of slopes and stream banks due to green development practices • Avoids adverse economic impact resulting from decreased amenity values for homes and businesses adjacent to resource sites and adjacent open space and recreational sites.	Positive: • Significant increase in development potential over existing zoning, while maintaining economic values of community open space, clean water, wildlife habitat, scenic views and groundwater recharge. • Some long-term increase in costs for green development practices.

Table 6.3 Economic Consequences of Limiting Conflicting Uses Consistent with the Springwater Community Plan

Lot Type	Conflicting Uses	Consequences	Assessment
	Public facilities	• Some increase in long-term construction costs resulting from green development practices • Limited new and redeveloped roads provide connections through resource sites • Limited utilities and green stormwater facilities link and serve local neighborhoods within community, located within planned road crossings, or along the outer edge of resource areas.	Positive: • Allows roads and other public facilities that are essential to an integrated urban community; resource impacts controlled and mitigated through development standards and green development practices.
	Parks and recreation uses	• Parks and trail system located in and along resource areas (as designated in the Plan District) bring residents close to area's unique features • An integrated network of trails, parks and open space is an essential part of a successful urban community. • Trails and paths will also be part of the transportation network linking residential areas to commercial, business, and employment areas, which minimizes pollution impacts	Positive: • An integrated (natural resource-oriented) parks and trail system provides a major community asset.
Lots with substantial resource site coverage (and limited transfer-ability)	All (except for public facilities, parks recreation)	• Comparable density to that which is allowed under existing zoning • May not be sufficient area for density transfer from resource site • Maintain economic value associated with adjacent community open space, scenic, recreational amenities • Avoids adverse economic impacts resulting from potential destabilization of slopes and stream banks, and increase in flood and landslide hazards through vegetation removal, increased impervious surfaces • Avoids adverse economic impact resulting from decreased amenity values for homes and businesses adjacent to resource sites and adjacent open space and recreational sites. • Decrease in short-term construction costs, but increase in long-term maintenance costs, resulting from green development practices	Neutral: • Development potential approximately the same, but lower increase than properties largely or completely outside ESRA-SW. For this reason, recommend adjustments to ESRA-SW boundary to allow for full density transfer. Economic values associated with significant resources protected.

Table 6.3 Economic Consequences of Limiting Conflicting Uses Consistent with the Springwater Community Plan

Lot Type	Conflicting Uses	Consequences	Assessment
	Public facilities	• New and redeveloped roads provide an integrated transportation system within the community • Slight increase in construction costs due to mitigation	Neutral to Positive: • Allows roads that are essential to an integrated urban community with mitigation for impacts on natural resources.

This analysis supports limiting conflicting uses within significant resource areas of the Springwater Community. Housing and employment opportunities are dramatically increased within non-resource areas (by an estimated 1,500 households and 16,000 new jobs in the Springwater Plan District area). Additional housing and employment options are permitted through transfers from resource sites to more suitable locations in the impact area, which protects the community's unique natural, scenic, and open space resources.

There will be a number of constrained properties in some of the high valued resource areas (ratings of 4, 5, and 6) that would not be able to transfer densities on site. These sites could be addressed through other methods or development flexibility. Importantly, the higher rated resource sites, which are critical to the preservation of Johnson Creek watershed within the Springwater Community, may need methods to ensure preservation without development. The City could consider designating these or some portion of these parcels for public ownership. Thus, a public program to purchase these properties to preserve them in perpetuity could compensate the property owners.

6.2.5 Economic Consequences of Prohibiting Conflicting Uses

Table 6.4 summarizes the impacts on both significant resources and on conflicting uses of prohibiting conflicting uses.

Table 6.4 Economic Consequences of Prohibiting Conflicting Uses

Lot Type	Conflicting Uses	Consequences	Assessment
Lots with no significant resource sites	All (off-site impacts on resource sites)	• Loss of development potential for all parcels in this category. • Springwater Community Plan could not be implemented.	Negative: • No new development allowed; substantial economic costs; housing and employment goals cannot be achieved. • Annexation not likely
Lots with partial significant resource sites	All (except for public facilities, parks recreation)	• Loss of development potential and density transfer options. • Although protects community open space, scenic, and recreational amenities, the economic value of these amenities will likely be lower, because fewer people will enjoy them • Although stabilization of slopes and stream banks, and reduction in flood and landslide hazards would occur, there would be no new development	Negative: • Significant loss of development potential from existing zoning, without corresponding increase in amenity value to existing homes. • Annexation not likely
	Public facilities	• No new roads or public facilities would be allowed • Loss of connectivity and services provided by public facilities and roads	Negative: • Road and public facility connectivity is essential to an integrated urban community and could not be provided.

Table 6.4 Economic Consequences of Prohibiting Conflicting Uses

Lot Type	Conflicting Uses	Consequences	Assessment
	Parks and recreation uses	• Loss of integration of parks and trail system with the community's natural, scenic, and open space resources	Negative: • An integrated parks and trail system is a vital part of a successful community.
Lots with substantial significant resource sites	All (except for public facilities, parks recreation)	• Conflicting uses prohibited on a number of parcels located within resource sites rated 4, 5, and 6.	Negative: • Comparable or lower development potential than allowed under existing zoning, without density transfer or economic value associated with natural resource amenities.
	Public facilities	• Loss of connectivity provided by planned roads (on 14 properties)	Negative: • Road connectivity is essential to an integrated urban community.
	Parks and recreation uses	• No existing or planned parks or recreation uses will impact the properties within the resource sites.	Not applicable.

The economic consequences of prohibiting conflicting uses are generally negative for both resource and impact areas. New housing and employment opportunities would be eliminated, and prohibiting all conflicting uses within the impact area would essentially preclude further growth or urbanization of the Springwater Community. By prohibiting conflicting uses, the community's unique natural, scenic, and open space resources are preserved. Arguably, however, these resources will likely have considerably fewer economic amenity values should the Community not be able to grow. Further, there would be no economic incentive for the City to annex the properties as the economic value from property tax revenue would not likely support the costs of public services to the area.

6.2.6 Conclusion

The economic analysis supports limiting conflicting uses within significant resource areas and allowing them fully within the impact area. The analysis assumes that within the impact area, potential adverse effects on nearby resource sites can be mitigated by provisions for green development practices. For the highly constrained lots where housing density transfer may not be feasible, some additional flexibility may be warranted in the way the City may compensate these landowners.

6.3 SOCIAL CONSEQUENCES

This section considers the social consequences of allowing, limiting, or prohibiting conflicting uses in the Springwater Community. The discussion focuses on the following topics: recreational and educational opportunities; housing and employment opportunities; historic, heritage, and cultural values; screening and buffering of land uses; and health, safety, and welfare.

Allowing, limiting, or prohibiting conflicting uses may have a variety of potential social effects, including the following:

- Changes to the value of the site for recreation and education;
- Changes to the quantity and quality of housing units;
- Changes in an area's scenic qualities;
- Changes to the historic and cultural values of the site;
- Changes to the health, safety, and welfare benefits provided by resources; and

- Changes in the ability of natural resources to function as an edge or buffer between different land uses.

The characteristics of these potential social consequences are outlined in the following discussion. The social analysis focuses on how conflicting uses may create positive or negative social consequences within resource and impact areas.

Recreational and Educational Amenities (for more details See the Springwater Community Plan Report): Existing public recreational opportunities are limited in Springwater. There are no parks in the area. There is one trial, the Springwater Trail, which bisects the planning area and public space running adjacent to the Trail. There is the privately owned Persimmon Golf Course located in the area.

There are no public educational facilities within the Springwater Community.

Housing Opportunities: The Springwater Community Plan proposes urban levels of density for the area once annexed resulting in an estimated 1,500 housing units in the Springwater Plan District area.

Employment Opportunities. Employment opportunities in the Springwater Community are currently very restricted and are mainly those associated with agriculture, with the exception of the HI zone District that is currently within the City of Gresham. At build-out, there are estimated to be approximately 16,000 new jobs in the Springwater Plan District area.

Historic, Heritage, and Cultural Values. The floodplains and upland areas of the Johnson Creek basin are believed to have been used by Native Americans. Although no archeological sites are known in Springwater Community area, early Native Americans used the valley as a travel route, and hunting and other subsistence activities likely took place there.

Euro-American settlement in the area began in the mid 1800s.

Screening and Buffering: Natural resources, such as those in Springwater, can function as an edge to different land uses, separating and buffering them from each other both visually and physically. Forest vegetation can serve as a buffer between residential, institutional, commercial, and open space uses. Similarly, Johnson Creek and its tributaries (North Fork Johnson, Badger, McNutt, Sunshine, Brigman, Botefuhr and Hogan Creeks, and to a certain extent Bus and Ops Creeks) and their associated ravines, wetlands, and vegetation are major defining elements of the community that also provide buffering and other important watershed health functions.

Health, Safety, and Welfare. Erosion and flooding are natural phenomena in Springwater, but when aggravated by the modification, alternation or removal of vegetation, or increased stormwater runoff, it can lead to damage, injury, or displacement of people and property, and significantly impact aquatic habitats. For example, the area's vegetation helps to stabilize stream banks and hill slopes, and its soils infiltrate rainwater and reduce the frequency and severity of flood events. These functions contribute to the health, safety and welfare of community residents.

There are several other health and welfare benefits provided by forest and riparian vegetation. The following are some of the other health and welfare benefits:

- Vegetation in urban or urbanizing areas may reduce stress-related impacts on health.
- Exposure to natural environments has significant “restorative” benefits.
- Forests help reduce air pollution problems and resulting health impacts

6.3.1 Social Consequences of Allowing Conflicting Uses

Table 6.5 summarizes the consequences of allowing conflicting uses to occur in the Springwater Community. These consequences are discussed in the context of the social functions or benefits described above. As with the economic analysis, conflicting uses are addressed together or in groups where appropriate.

Table 6.5 Social Consequences of Allowing Conflicting Uses Fully

Lot Type	Conflicting Uses	Consequences	Assessment
Lots with no significant resource sites	All (off-site impacts)	• Increase in the number of jobs and housing units at densities greater that the Community Plan proposes. • With all conflicting uses there will likely be a loss of nearby community open space and associated social values	Negative: • Marginal increase in jobs and housing opportunities, but at expense of community open space, degraded water quality and decreased quality of life. • Also, risk that development with all conflicting uses allowed to degrade resource sites and associated social values
Lots with partial significant resource sites	All	• Increase in potential damage, injury, and displacement caused by erosion, landslides, and flooding along Johnson Creek and tributaries • Loss of scenic and open space values of resource sites • Decrease in screening and buffering benefits • Potential loss of historic features • Increase in housing, employment opportunities on constrained lands, through these goals are met outside of resource sites.	Negative: • Unique social values of community and multiple resources highly degraded or lost.
Lots with substantial significant resource sites	All	• Increase in potential damage, injury, and displacement caused by erosion, landslides, and flooding along Johnson Creek and tributaries • Loss of scenic and open space values of resource sites • Decrease in screening and buffering benefits • Potential loss of historic features • Increase in housing, employment opportunities on constrained lands, through these goals are met outside of resource sites.	Negative: • Unique attributes of community and multiple resources highly degraded or lost

This analysis supports allowing conflicting uses within the impact area, outside of significant resource sites. The resource sites provide important social values, and include many of the attributes that make the Springwater Community unique. The Springwater Plan District proposes a mix of housing and employment opportunities within the non-resource sites that

satisfies planning goals. Goals and policies identified in the Plan are designed to maintain existing amenities and develop new ones that will enhance the community's unique resources.

6.3.2 Social Consequences of Limiting Conflicting Uses

Table 6.6 summarizes the consequences of limiting conflicting uses in the Springwater Community Area.

Table 6.6 Social Consequences of Limiting Conflicting Uses

Lot Type	Conflicting Uses	Consequences	Assessment
Lots with no significant resource sites	All (off-site impacts)	• Maintain most social values on nearby protected open space areas • Maintain housing and employment objectives of Springwater Community Plan • Allow for public facilities and streets necessary to support proposed housing and employment • Maintain social values associated with clean water and aquatic habitat by implementing Green Development Practices, tree planting and sustainable design development	Positive: • Social values of community open space maintained for new residents and employees. Green Development Practices minimize off-site impacts.
Lots with partial significant resource sites	All	• Decrease in potential damage, injury, and displacement caused by erosion, landslides, and flooding along Johnson Creek and its tributaries • Maintain scenic and open space values of ESRA-SW • Maintain screening and buffering benefits • Maintain historic features • Allow for housing, employment opportunities through density transfer provisions	Positive: • Social values of community open space and natural resources conserved.
Lots with substantial significant resource area (and limited transfer-ability)	All	• Decrease in potential damage, injury, and displacement caused by erosion, landslides, and flooding along Johnson and Kelley Creeks • Maintain scenic and open space values of ESRA-SW • Maintain screening and buffering benefits • Maintain historic features • Allow for housing, employment opportunities through density transfer provisions	Positive: • Social values of community open space and natural resources conserved.

This analysis supports limiting conflicting uses within significant resource sites. Housing and employment opportunities are dramatically increased within non-resource areas (by an estimated 1,500 housing units and 16,000 new jobs in the Springwater Plan District area). Additional housing and employment options are permitted through transfers from resource areas to more suitable locations in the impact area, which protects the community's unique resources and avoids higher costs associated with development on constrained lands. Limiting conflicting uses in resource areas preserves a variety of important social values including recreational and educational values, soil stabilization, flood management, land use buffering, and scenic and open space values.

6.3.3 Social Consequences of Prohibiting Conflicting Uses

Table 6.7 summarizes the consequences of prohibiting conflicting uses in the Springwater Community Area. These consequences are reviewed in the context of the social functions or benefits described previously.

The social consequences of prohibiting conflicting uses are generally negative, except in certain resource areas where social benefits roughly balance the costs. New housing and employment opportunities would be eliminated, and prohibiting all conflicting uses within the impact area would essentially preclude further growth or urbanization of the Springwater Community area.

Table 6.7 Social Consequences of Prohibiting Conflicting Uses

Lot Type	Conflicting Uses	Consequences	Assessment
Lots with no significant resource sites	All (off-site impacts)	• Prohibiting conflicting uses on non-resource (impact) areas would preclude new housing and employment options • Social benefits of community open space and natural resource preservation would be limited, because fewer people to enjoy these benefits	Negative: • No further growth in community; social benefits associated with community open space and natural resource preservation lost.
Lots with partial significant resource sites	All	• Most social benefits of resources preserved, including health, safety and welfare values, screening and buffering, scenic amenities • Recreational and educational opportunities limited by lack of people to enjoy resources and open space • Livability degraded by prevention of transportation and infrastructure connections.	Negative: • Unique attributes of community open space preserved, but few people to enjoy, and most access and use precluded.
Lots with substantial significant resource sites	All	• Same as above, with housing limited on those located within resource rating of 4, 5, and 6.	Negative • Unique attributes of community open space preserved, but few people to enjoy, and most access and use precluded.

6.3.4 Conclusion

The social analysis supports limiting conflicting uses within significant resource areas and allowing them fully within the impact area. The analysis assumes that within the impact area, potential adverse effects on the social values of nearby resource areas can be mitigated by green development practices, tree-planting requirements and sustainable design requirements outlined in the Plan. For the highly constrained lots where housing density transfer may not be feasible, there may be a need for the City to consider other methods of compensation such as purchase of the land.

6.4 ENVIRONMENTAL CONSEQUENCES

This analysis outlines the environmental consequences of allowing, limiting, or prohibiting conflicting uses within the Springwater Community. The inventory of natural resources in the Springwater Community Plan describes the environmental functions and values at this resource site (Springwater Community Plan Natural Resource and Hazards Inventory, October 2004). The basis for determining the significance of various types of natural resources also is provided in a technical memorandum to the report. The natural resource significance rating criteria are based on fundamental elements, or "functions" that must be present for natural systems to work properly, and for long-term sustainability. The functional elements included are based on recent scientific literature, the inventory, and the subwatershed assessment conducted as part of the inventory.

The following resource functions are those identified for the Springwater Community area:

- Water quality
- Channel dynamics and morphology
- Water quantity: stream flow, sources, and storage
- Microclimate
- Fish and aquatic habitat
- Organic inputs
- Riparian and upland wildlife habitat quality
- Upland sensitive species
- Upland interior habitat

In addition, each significant resource site has been assigned a Natural Resource Significance Classification rating of 1 to 6. This corresponds to their functional value and contribution toward preservation of the watershed in the Springwater Community.

Briefly, the rating class addresses the number of functions exhibited by the specific site. The greater the number of functions exhibited, the greater the significance class and overall importance to the watershed. This rating system allows differentiations between resource sites. That is, not all resource sites may be of equal importance to the maintenance of the watershed. Some resources sites may be more valuable than others (see Technical Memorandum on Resource Needs Analysis and Significance, August 2004).

The value of this rating is that decision makers could use it when deciding what levels of protections they are willing to accept in order to meet planning goals in the Springwater Community area.

The following are the significance Classifications:

1. Isolated Tree Groves (single attribute, not located adjacent to any other significant resource sites)
2. Tributary Reach (single attribute but located adjacent to other significant resource sites)
3. Tributary Reach and Tree Grove
4. Johnson Creek Reach, locally Significant wetland
5. Combination of Two: Johnson Creek Reach, Tree Grove, unique habitat, locally significant wetland
6. Combination of three or more: Johnson Creek Reach, tree grove, locally significant wetland, unique habitat

6.4.1 Environmental Consequences of Allowing Conflicting Uses

Basically, the resource functions listed above would be highly degraded or lost in the absence of an environmental protection program. Allowing conflicting uses in resource areas without limits or controls results in the loss of significant environmental functions and values identified in the Springwater Community Plan natural resources inventory. The environmental consequences, therefore, are extremely negative.

Table 6.8 summarizes the potential impacts of allowing the conflicting uses.

Table 6.8 Environmental Consequences of Allowing Conflicting Uses

Lot Type	Conflicting Uses	Consequences	Assessment
Lots with no significant resource sites	All (off-site impacts)	▪ Degradation of water quality and aquatic habitat functions from off-site impacts ▪ Reduction or disruption of groundwater recharge, stream flow, and hydro-period	Negative: ▪ Lack of Green Development Practices means that water quality and aquatic habitat values of streams and wetlands are lost; probable reduction in groundwater discharge and hydro-period.
Lots with partial significant resource sites	All	▪ Reduction of water quantity function ▪ Degradation or loss of fish and aquatic habitat functions ▪ Reduction of water quality, slope stabilization, microclimate amelioration functions ▪ Disruption or loss of vegetation and organic materials function ▪ Reduction of floodplain and channel dynamics functions ▪ Loss of wildlife habitat functions in wetlands, riparian areas, and uplands	Extremely Negative: ▪ Community natural resources and functions highly degraded or lost.
Lots with substantial significant resource sites	All	▪ Disruption or elimination of all functional values listed above	Extremely Negative: ▪ Community natural resources and functions highly degraded or lost.

6.4.2 Environmental Consequences of Limiting Conflicting Uses

The decision to limit conflicting uses as indicated in the Springwater Community Plan conserves most of the environmental resources and functional values identified in the natural resource inventory. Limiting conflicting uses allows the development goals of the Plan to be met, by preserving most of the ESRA-SW and providing reasonable mitigation for impacts resulting from planned public facilities and limited development. Although impacts are mitigated (i.e., reduced) there would still be limited degradation and loss of some functional values. Provisions for restoration potentially will increase functional values. The environmental consequences are generally positive under the Springwater Community Plan objective where development impacts are limited to areas generally outside the ESRA-SW and mitigated through green development practices and restoration within the resource site.

Table 6.9 summarizes the consequences of limiting conflicting uses.

Table 6.9 Environmental Consequences of Limiting Conflicting Uses

Lot Type	Conflicting Uses	Consequences	Assessment
Lots with no significant resource sites	All (except for public facilities, parks recreation)	▪ Degradation of water quality and aquatic habitat functions from off-site impacts mitigated through Green Practices ▪ Reduction or disruption of groundwater recharge, stream flow, and hydro-period mitigated through Green Practices	Positive: ▪ Potential off-site impacts on resource functions mitigated by Green Development Practices.
	Public facilities	▪ Potential degradation of water quality and aquatic habitat functions from off-site impacts, particularly streets, mitigated through Green Development Practices.	Positive: ▪ Potential off-site impacts on resource functions mitigated by Green Development Practices.
	Parks and recreation uses	▪ Potential increase in some functional values outside resource sites.	Positive: ▪ Potential increase in some functional values.
Lots with partial significant resource sites	All (except for public facilities, parks recreation)	▪ Protection of functional values through avoidance and density transfer ▪ Potential increase in some functional values with restoration	Positive: ▪ Degradation of some resource functions but potential overall increase throughout the community through restoration.
	Public facilities	▪ Limited disruption resulting from construction of planned public facilities. ▪ Mitigation for most impacts through required restoration.	Neutral to Slightly Negative: ▪ Limited loss of some resources and functions but adverse impacts limited through required mitigation and restoration.
	Parks and recreation uses	▪ Limited disruption of functional values. ▪ Mitigation for most impacts through required restoration	Neutral to Slightly Negative: ▪ Limited loss of some resources and functions but adverse impacts limited through required mitigation and restoration.

Table 6.9 Environmental Consequences of Limiting Conflicting Uses

Lot Type	Conflicting Uses	Consequences	Assessment
Lots with substantial significant resource sites (and limited transfer-ability)	All (except for public facilities, parks recreation)	▪ With recommended adjustments to resource site boundary to allow for full density transfer, minor reduction of resource area ▪ However, with required mitigation, potential increase in some functional values with restoration	Neutral to Slightly Negative: ▪ Limited loss of some resources and functions but adverse impacts limited through required mitigation and restoration.
	Public facilities	▪ Limited disruption of some functional values ▪ Potential increase in some functional values with restoration	Positive: ▪ Potential off-site impacts on resource functions mitigated by Green Practices.
	Parks and recreation uses	▪ No park or recreational uses planned for these parcels, except for potential trails	Not Applicable

6.4.3 Environmental Consequences of Prohibiting Conflicting Uses

The environmental consequences of fully protecting the resource sites are positive. However, as noted in previous sections, the economic and social consequences are extremely negative since the Springwater Community Plan goals would not be met. It would not be likely that the City of Gresham would consider annexing the Springwater Plan District area if it was constrained to prohibiting all conflicting uses.

Table 6.10 summarizes the environmental consequences of prohibiting conflicting uses in the Springwater Community Plan.

Table 6.10 Environmental Consequences of Prohibiting Conflicting Uses

Lot Type	Conflicting Uses	Consequences	Assessment
Lots with no significant resource sites	All (except for public facilities, parks recreation)	▪ No adverse impacts from off-site development on resource functions.	Positive: ▪ No off-site impacts on resource functions.
	Public facilities	▪ No adverse impacts from public facility construction on resource functions.	Positive: ▪ No off-site impacts on resource functions.
	Parks and recreation uses	▪ No adverse impacts from park construction on resource functions.	Positive: ▪ No off-site impacts on resource functions.
Lots with partial significant resource sites	All (except for public facilities, parks recreation)	▪ No adverse impacts from residential or commercial construction on resource functions.	Positive: ▪ No on- or off-site impacts on resource functions.
	Public facilities	▪ No adverse impacts from public facility construction on resource functions.	Positive: ▪ No impacts from public facility construction on resource functions.

Table 6.10 Environmental Consequences of Prohibiting Conflicting Uses

Lot Type	Conflicting Uses	Consequences	Assessment
	Parks and recreation uses	▪ No adverse impacts from park construction on resource functions.	Positive: ▪ No on- or off-site impacts from parks on resource functions.
Lots with substantial significant resource sites	All (except for public facilities, parks recreation)	▪ No adverse impacts from residential or commercial construction on resource functions.	Positive: ▪ No on- or off-site impacts on resource functions.
	Public facilities	▪ No adverse impacts from road construction on resource functions.	Positive: ▪ No public facilities construction impacts on resource functions.
	Parks and recreation uses	▪ No park or recreational uses planned except for trails.	Not Applicable

6.4.4 Conclusion

This environmental consequences analysis supports either prohibiting conflicting uses or limiting conflicting uses to planned public facilities and limiting incursion into the resource sites to allow for full density transfer for substantially affected parcels, and using green development practices. Impacts from limited residential and public facility development within the resource sites can be reduced and mitigated through restoration. The resource areas provide important functional values and the opportunity of greatly improving resource function through restoration in the resource sites. The Springwater Plan District proposes a mix of housing and employment opportunities outside the resource sites while maintaining and restoring significant riparian, wetland, and upland areas within the resource sites with limited intrusion.

6.5 ENERGY ANALYSIS

This analysis outlines the energy consequences of allowing, limiting, or prohibiting conflicting uses. The energy discussion focuses on three topics: transportation; infrastructure; and the heating and cooling of structures. A general discussion of these topics is presented first, followed by an analysis applying these topics in the context of allowing, limiting, and prohibiting conflicting uses.

Transportation. Energy expenditures for transportation relate primarily to travel distance from origin to destination and mode of transportation used. Both variables can be affected by natural resource protection. The Springwater Community Plan outlines goals and policies to develop an efficient transportation system with a range of modes available to those who reside and work in the Community as well as those commuting to and from the area to work or live (See Development Policies of the Springwater Community Plan Report).

Transportation in the Springwater Community involves moving people between homes, employment, commercial areas, and other services. The site will have major employment areas with in the Community as well as be within very short distances of other major employment areas elsewhere in the City of Gresham and the eastern portions of Multnomah and Clackamas Counties. Automobiles will still be the primary means of transportation in and out of the area and though convenient, they generally are not energy efficient. Roads will be upgraded to allow for other transportation modes including transit and bicycles. The Springwater Trail, which passes through the northern part of the site, provides alternative transportation options.

With the Village Center, industrial, and employment areas to be developed within the community it is expected that residents will not have to travel far to and from work. Locating homes, jobs, and services within the Community means that residents may not need to travel outside the community to work or for basic services.

The availability of natural resources at the Springwater Community, such as the streams, wetlands and riparian areas, provide opportunities for wildlife observation, education, and recreation for area residents. A growing system of public open space is planned for developed within the Springwater Community. Because these open space resources are close to users, limited transportation energy is used in reaching them. In addition, the system of trails that are planned within the Springwater Community will provide walking routes to local services, schools, and civic amenities, potentially decreasing dependence on the automobile.

Infrastructure. Locating housing and other development outside of natural resource sites in a planned and efficient manner normally results in less infrastructure needed to serve sewer, water, transportation, and other needs. Development located away from flood and slope hazard areas can reduce or eliminate the need for additional construction considerations, hazard control structures, or emergency repairs. In general, urbanization that is carefully planned and performed efficiently adjacent to existing urban centers can help to reduce and manage energy consumption within the region.

Heating and Cooling of Structures. Energy consumption for the purpose of heating and cooling structures is impacted by resource protection in two ways: building form and presence of vegetation.

Protection of Springwater Community's trees and forested stream corridors, and other resource sites, can help reduce energy costs for heating and cooling. Trees and riparian vegetation within the Community will reduce energy demands for cooling in the summer by providing shade on nearby structures. Plants also absorb sunlight and transpire during growing seasons, thus reducing ambient air temperatures. This moderating effect can reduce energy needs for cooling of nearby development. Trees and large shrubs can also act as a windbreak during winter. Slowing or diverting cold winter winds will reduce heat loss in structures from convection, resulting in lower energy needs.

Planned urban densities will generally result in an efficient compact development form, which includes greater common wall construction and reduced building surface areas, reducing heat loss and energy consumption. In addition, the incorporation of sustainable development designs will encourage more efficient selection and use of materials that reduce energy consumption.

6.5.1 Energy Consequences of Allowing Conflicting Uses

Table 6.11 summarizes the energy consequences of allowing conflicting uses to occur in the Springwater Community. These consequences are discussed in the context of the energy functions or benefits described above. As with the preceding analyses, conflicting uses are addressed together or in groups where appropriate.

Table 6.11 Energy Consequences of Allowing Conflicting Uses Fully

Lot Type	Conflicting Uses	Consequences	Assessment
Lots with no significant resource sites	All (off-site impacts)	▪ Proximity of housing, jobs, and services reduces energy needs for transportation ▪ Infrastructure development on unconstrained land reduces energy expenditures ▪ Without green development practices, energy benefits related to heating and cooling will be lost.	Slightly Negative: The Springwater Community Plan provides for clustering of housing and jobs. These benefits are also found under the "limited option." However, without green development practices, energy consequences are slightly negative.
Lots with partial significant resource sites	All	▪ Transportation and infrastructure energy consumption increases as development extends into constrained lands ▪ Loss of nearby open spaces, increasing transportation energy demand for recreation ▪ Energy benefits related to heating and cooling of structures lost as vegetation is removed	Negative: ▪ Energy benefits of resources lost, less energy-efficient use of land.
Lots with substantial sig. resource sites	All	▪ Same as above; ▪ Building on highly constrained lots increases energy expenditures.	Negative: ▪ Energy benefits of resources lost, less energy-efficient use of land.

This analysis supports the clustering of housing and jobs served by an energy efficient transportation system. These benefits, however, are also realized in the "limited option." Allowing conflicting uses within the resource sites has negative energy consequences, as does the lack of green development practices. The resource sites provide important energy benefits for nearby development and for the community as a whole.

6.5.2 Energy Consequences of Limiting Conflicting Uses

Table 6.12 summarizes the energy consequences of limiting conflicting uses in the Springwater Community. These consequences are discussed in the context of the energy functions or benefits described above.

Table 6.12 Energy Consequences of Limiting Conflicting Uses

Lot Type	Conflicting Uses	Consequences	Assessment
Lots with no significant resource sites	All (off-site impacts)	▪ This option includes the benefit of energy efficient development through density and clustering of jobs near housing ▪ Energy benefits related to heating and cooling preserved ▪ Green development practices conserve energy	Positive: ▪ Energy benefits accrue from density transfer and heating and coloring effects of natural resource preservation and green development practices
Lots with partial significant resource sites	All	▪ Transportation and infrastructure energy expenditures reduced through avoidance of constrained lands; ▪ Open spaces conserved, reducing transportation energy demand for recreation; ▪ Supports energy benefits related to heating and cooling of structures.	Positive: ▪ Energy benefits accrue from density transfer and heating and coloring effects of natural resource preservation and green development practices.
Lots with substantial sig. resource area (and limited transfer-ability)	All	▪ Same as above; ▪ Lack of density transferability may lead to greater energy expenditures.	Positive: ▪ Energy benefits accrue from density transfer and heating and coloring effects of natural resource preservation and green development practices. However, because not all density may be transferable for substantially covered parcels, limited incursion into the resource sites is recommended.

This analysis supports limiting conflicting uses within significant resource areas of the site, implementing density transfer, and employing green development practices. Urban housing and employment opportunities can be provided in an energy-efficient manner within non-resource areas. Additional housing and employment options are permitted through transfers from resource areas to more suitable locations in the impact area, which protects the community's unique natural resources and avoids higher energy costs associated with development on constrained lands. Limiting conflicting uses in resource areas preserves a variety of important energy values related to transportation, infrastructure, and the heating and cooling of structures.

6.5.3 Energy Consequences of Prohibiting Conflicting Use

Table 6.13 summarizes the energy consequences of prohibiting conflicting uses in the Springwater Community. These consequences are reviewed in the context of the social functions or benefits described previously.

Table 6.13 Energy Consequences of Prohibiting Conflicting Uses

Lot Type	Conflicting Uses	Consequences	Assessment
Lots with no sig. resource site	All (off-site impacts)	▪ Precludes new housing and employment options, potential of forcing developers to look for land further distant, thus increasing vehicle miles traveled.	Negative: ▪ No further growth in community, which would result in higher energy costs and expenditures.
Lots with partial sig. resource site	All	▪ Loss of transportation and infrastructure connectivity within valley would lead to significant inefficiencies and energy costs; ▪ Loss of recreational and educational opportunities in resource areas could increase energy costs.	Negative: ▪ No further growth in community, which would result in higher energy costs and expenditures. ▪ Local access and recreational use precluded.
Lots with substantial sig. resource site	All	▪ Same as above; ▪ Lack of density transferability may lead to greater energy expenditures.	Negative: ▪ No further growth in community, which would result in higher energy costs and expenditures. ▪ Local access and recreational use precluded.

The energy consequences of prohibiting conflicting uses are negative, creating the potential for urban sprawl into more remote parts of the region, potentially outside of established urban growth boundaries. Prohibiting all conflicting uses within the impact area would essentially preclude further growth or urbanization of the Community. Prohibiting conflicting uses within resource areas would prevent efficient transportation and infrastructure systems, and increase energy costs. It would also limit access to open spaces for recreational use, increasing travel costs.

6.5.4 Conclusion

The energy analysis supports limiting conflicting uses within significant resource areas and allowing them fully within the impact area.

The retention of natural resources in the Springwater Community can reduce heating and cooling related energy needs both within the site and in the surrounding community. Conservation of resources can also reduce infrastructure-related energy use and enhance the attractiveness of local walking and bicycle routes, including the Springwater Trail and other trails. This can decrease transportation-related energy use. Locating homes, jobs, and services in close proximity to one another can significantly reduce transportation-related energy demands.

7.0 DETERMINING LEVEL OF PROTECTION BASED ON ESEE RESULTS

This section contains the levels of protections recommended for implementation for the Goal 5 significant resources. It will be based on the ALP, the resource classifications that the City has identified for each resource site, and the goals and policies that the City has developed to plan the Springwater community. The Goal 5 significant resource sites will be identified and incorporated into the Environmentally Sensitive Resource Areas (ESRA-SW) developed to provide adequate protections to maintain the functional value of each site.

After review of the ESEE impacts on property owners within Springwater, several conclusions can be drawn. First, the Springwater Community Plan is designed to provide greater residential and employment densities than what currently exists. The economic benefits of urbanization are substantial for all lands including the ESRA-SW sites. The analysis indicates that most properties located partially within the ESRA-SW will experience substantial increases in development potential and economic value as a result of the Springwater Community Plan implementation compared to the existing rural zoning.

For landowners with highly constrained property that may be located substantially within resource sites, the economic impacts are varied and could be marginal or negative. The proposed ESRA-SW sub-district addresses these impacts in a number of ways. A program has been developed to provide additional economic value from lands within the ESRA-SW through a density transfer allowance. This density transfer allowance increases the net development potential of lands outside the ESRA-SW. Aggregation of properties in common ownership or as part of a larger development package may effectively increase the overall development potential of lands adjacent to the ESRA-SW. Additional value accrues to local landowners from the proximity of these properties to the community's natural, scenic, and open space amenities.

Table 7.1 summarizes the conclusions for each of the four ESEE factors considered. In the table, "prohibit" indicates an analysis conclusion to prohibit conflicting uses, "limit" refers to limiting conflicting uses, and "allow" refers to fully allowing conflicting uses. The final column, "conclusion," lists the aggregated assessment for the site.

Table 7.1 Conflict Resolution Summary Table

Property	Economic	Social	Environmental	Energy	Conclusion*
Lots with no ESRA-SW coverage	Limit	Limit	Limit	Limit	Limit
Lots with partial ESRA-SW coverage	Limit	Limit	Prohibit	Limit	Limit
Lots with substantial ESRA-SW coverage (and limited transfer-ability)	Limit**	Limit**	Prohibit	Limit	Limit**

** Green Development Practices standards that will apply throughout the Plan District will minimize impacts on nearby/downstream significant resources and resource functions.*

*** In certain cases, on-site density transfers are not possible, with potential loss of economic and social values. Therefore, this analysis recommends limited incursions into the ESR-SW A to allow full density transfer potential to be realized, or alternatively, outright purchase of those parcels located within the resource sites.*

Most properties containing significant resources will experience substantial increases in development potential and economic value as a result of Plan District implementation. Fully allowing conflicting uses (i.e., allowing unrestricted development within the ESRA-SW) fails to meet the goals and objectives of the Concept Plan, fails to protect the unique attributes of the community, and could result in major impacts and loss of significant natural resources and ecological functions. Prohibiting conflicting uses altogether would preclude urbanization of the community, and similarly fail to meet the goals of the community, as expressed in the Springwater Community Plan.

Limiting conflicting uses through proposed ESRA-SW land use regulations has positive economic, social, environmental and energy implications for the landowners, resources, and the larger community – so long as existing uses can be maintained, planned streets, utilities, and pedestrian trails are allowed to pass through the ESRA-SW in a manner that minimizes impacts, and residential units within the ESRA-SW can be transferred to more suitable buildings sites outside the ESRA-SW.

Some properties with "substantial ESRA-SW coverage" do not have sufficient area outside the ESRA-SW to fit all of the allowed transfer units on site. As a result of the economic and social analysis, the ESEE recommendation is to create a provision that permits these highly constrained properties to build into the ESRA-SW, after available non-ESRA-SW land has been used, in a manner that minimizes impacts. Alternatively, the City of Gresham could decide to compensate parcel owners by purchasing the parcels located within the resource sites.

7.1 ESRA BOUNDARIES

Finally, there is a need to determine the correct boundaries for the resource sites that will become part of the ESRA-SW sub-district. As mentioned in the ESEE analysis, resource sites have been classified according to their contribution to the functional value of the watershed by using a 1 to 6 rating (see section 2.3 and Figure 2.1). This reflects the variability of the resource sites. That is, not all sites have equal value. While they may contribute to maintenance and protection of a watershed's function and value, the ESEE approach allows flexibility to make the following determinations:

- Flexibility to determine buffer widths and boundaries that differ between each resource site, yet provide adequate protection

- When justified by the ESEE analysis a jurisdiction may decide not to provide protective measures should it be demonstrated that the "conflicting use is of sufficient importance relative to the resource site" that any "measure to protect the resource to some extent should not be provided" (ORS 660-023-0040(5)(c))

7.1.1 Springwater Environmental Protection and Enhancement Goals

As mentioned in the introduction of this section, one of the goals for the Springwater Community development will be to "protect, restore and enhance significant natural resources, including stream corridors, wetlands, and forested areas." This goal and the 12 policy statements, which are designed to guide development, are a critical part of the principles (others include economic development, sustainability, community, livability, and transportation) that the Springwater Community Plan will use to ensure a successful development and a desirable place to live (see Springwater Community Plan Report).

The policies shed light on how the natural resource goals will be met. These are important statements because they help outline levels of environmental maintenance, protection, and enhancement that will be implemented in the community. An important element of the environmental protection and enhancement is the determination of the ESRA-SW sub-district size and extent. That is, what are appropriate boundaries for the natural resource sites that meet the natural resource goal?

The policy statements clearly recognize that proper stewardship of the Springwater Community portion of the Johnson Creek Watershed is necessary because of its importance locally and regionally. Further, the policies express that any new development must be balanced against:

- Protection of sensitive species and habitat, water quality, and groundwater resources,
- Restoration of watershed functions as well as sensitive/natural species,
- Protection of steeply sloped lands, and
- Protection of wildlife habitat corridor for wildlife migration.

With goal and policy statements in mind, combined with the significant resource site classifications and the "Limited" conflicts approach that this ESEE analysis supports, it is possible to provide guidance and recommendations for ESRA-SW boundaries. Not all ESRA-SW boundaries need to be identical; there can boundary flexibility depending on the combination of the three factors.

7.1.2 ESRA-SW Boundary Determination Guidelines

The following outlines the boundaries for the Springwater ESRA-SW. Using the four factors of goal/policies, resource rating classifications, Metro Title 13 protections (as part of the Gresham/Multnomah Intergovernmental Agreement), and allowance of Limited conflicts as supported by the ESEE analysis, it is possible to outline a set of guidelines to determine appropriate ESRA-SW boundaries. These guidelines are then compared to the proposed Springwater Concept Plan to determine whether the ESRA-SW boundaries are adequate to at least meet the minimum boundary requirements.

Once the minimum boundaries for protection of significant natural resource sites have been identified based on the four factors, the ESRA-SW boundaries should be broad enough to:

- Prevent resource site degradation
- Protect the functional value of the resource site and health of the watershed
- Provide where possible opportunities for enhancement of resource site and overall watershed health

7.1.2.1 Boundary Determination and Natural Resource Classifications

The ESRA-SW boundary can vary depending on the significant resource site's functional classification and their location in the watershed. The following are boundary guidelines for each resource classification. For detailed discussion of the significance class determination see the *Springwater Community Plan Natural Resource Protection and Restoration Plan* (April 2005).

Class 1 – Isolated Tree Grove

Class 1 areas are small-sized tree groves isolated from streams or wetland. They have the lowest functional value within the planning area and limited enhancement potential. Sites in this classification provide some habitat resource value, but not are considered critical to preservation of watershed health. Boundary protections can be minimal and could, given, the tree planting standards, be non-existent. No specific recommended boundary.

Class 2 – Tributary Reach

Class 2 areas are located along the relatively narrow tributaries to the Johnson Creek main stem. While they lack mature tree cover they have value by providing function to prevent erosion, bank cutting, and some wildlife habitat value. In most cases, these areas have been disturbed (mowed) and no longer have native vegetation, but they do contribute to overall watershed health. Boundaries need to be adequate to protect this function, though they could be narrower than the natural resource inventory boundary and still protect the sites. Should enhancement opportunities be considered, the sites would need to be equal to the boundary

identified in the natural resource inventory. Recommended boundary width is 100 feet either side of stream or wetland unless there are steep slopes (greater than 25% slope) in which case the recommended boundary width is 175 feet.

Class 3 – Tributary Reach and Tree Grove

Class 3 acknowledges the increased functional value of two resource features in one site, i.e., tributary reach and a tree grove. The combination of the elements provides stream protection for aquatic habitat, water quality and erosion protection from canopy and riparian vegetation, and forested corridors to support wildlife habitat. Boundaries for these areas need to be of adequate width to protect the tree groves and that there be adequate width of tree groves spanning the tributaries or the Johnson Creek main stem to maintain wildlife passage. Recommended boundary width is 175 feet either side of stream or wetland, or 250 feet where tree groves are located away from water features.

Class 4 – Johnson Creek Reach or Locally Significant Wetland

Class 4 sites include either the entire Johnson Creek corridor or those sites identified through the Local Wetland Inventory (see Reference Documents) as locally significant wetlands. As documented through the inventory process, these sites provide significant value to watershed health through water quality and channel protection and support of aquatic and terrestrial habitat. ESRA-SW boundaries should match the natural resource inventory boundaries in order to protect existing resource functions. Similarly for enhancement opportunities, the ESRA-SW boundary should be equal to the natural resource inventory boundary. Recommended boundary width is 200 feet either side of stream or 100 feet surrounding a wetland.

Class 5 – Combination of Two: Johnson Creek Reach, Tree Grove, Unique Habitat, Locally Significant Wetland

Class 5 sites include multiple functions that contribute to watershed health, habitat protection (aquatic and terrestrial) and protection of steep slopes. ESRA-SW boundary should match the existing natural resource inventory boundary to maintain existing resource functions and provide enhancement opportunities. Recommended boundary width is 200 feet either side of stream or wetland. Recommended boundary should surround entire resource site if it is located away from a water feature.

Class 6 – Combination of Three or More: Johnson Creek Reach, Tree Grove, Unique Habitat, Locally Significant Wetland

Class 6 sites provide the greatest functional value of all resource sites. These sites exhibit the greatest number of resource functions and are vital to maintaining watershed health. These sites are also the most sensitive to changing conditions and can be degraded should there not be adequate protection. Therefore, ESRA-SW boundaries should match the existing natural resource boundary to preserve existing resource functions and provide enhancement opportunities. Recommended boundary width is to surround entire resource site.

7.1.2.2 Boundary Determination - Sites Adjacent to Water Features

The ESRA-SW boundary must also conform to the requirements set forth in the Intergovernmental Agreement between the City of Gresham and Multnomah County. That agreement states that the City will apply Metro's Title 13 protection standards and where possible exceed them.

A recent draft of Metro's Title 13 Model Habitat Conservation Ordinance (March 24, 2005) outlines the proposed setback boundary distances for protecting resource sites adjacent to water features. These setback boundary requirements have been applied to Springwater's natural resource classifications (see previous classification definitions and Figure 2.1) to determine a recommended boundary setback for the ESRA-SW District. Table 7.2 identifies the recommended setback widths. For comparative purposes the table also includes the minimum setback widths currently required by the Gresham Water Quality Resource Area Ordinance and Metro's existing Title III Ordinance. All setback distances are measured in feet from top-of-bank if a stream or from delineated wetland boundary.

Table 7.2 Springwater Minimum ESRA-SW Setback Distance – Sites Adjacent to Water Features

Resource Classification	**Regulated Corridor for Water Quality Protection[1]**	**Recommended Distance for Primary Factor Protection[2]**
Class 2 – Tributary to Johnson Creek with no or highly modified riparian vegetation	50 feet	100 feet either side of top-of-bank or one site potential tree height for streambank protection and replacement of riparian vegetation
Class 2 – Tributary to Johnson Creek, slopes greater than (>) 25% grade. Applies only to a small segment of Hogan Creek. (see Figure 7.1, letter A)	75 feet	175 feet either side of top of bank for stream bank protection; water quality
Class 3 – Tributary to Johnson Creek in forest canopy	75 feet	175 feet either side of top of bank for riparian/upland connectivity and proximity to upland habitat area; large wood recruitment
Class 3 -- Tributary to Johnson Creek, slopes greater than (>) 25% grade in forest canopy. Applies only to small segments of Brigman and Botefuhr Creeks, and a larger segment of Hogan Creek. (see Figure 7.1, letter B)	150 feet	175 feet either side of top of bank for wildlife passage while protecting the integrity of the streambanks or vegetated ravines
Class 4 – Johnson Creek Mainstem	150 feet	200 feet either side of top of bank or to the edge of the 100 year floodplain, whichever is greater. For the extent of 100 yr floodplain and channel dynamics; wildlife passage; riparian/upland connectivity; flood storage
Class 4 – Locally Significant Wetland as shown in Figure 4 of the Natural Resources Report	50 feet	100 feet surrounding the entire wetland for connection to upland interior habitat
Class 5 – Johnson Creek mainstem, tree groves, unique habitat, and or locally significant wetland.	150 feet	200 feet either side of top of bank or to the edge of the 100 year floodplain, whichever is greater. For the extent of 100 yr floodplain and channel dynamics; wildlife passage; riparian/upland connectivity; flood storage

[1] From City of Gresham's Water Quality Resource Areas Ordinance and Metro's existing Title 3 Ordinance.

[2] Metro's Title 13 Model Habitat Conservation Ordinance (3/24/05).

7.1.2.3 Boundary Determination – Sites Not Adjacent to Water Features and Class 6 Resource Site

For resource sites not located adjacent to water features and a Class 6 resource site, recommended boundary distance guidelines have been identified by the Springwater Community Working Group to meet protection goals. Table 7.3 displays the recommended distance boundaries for those natural resource site classifications away from water features and a Class 6 resource site near Johnson Creek.

It is recognized that the protection recommendations for these areas go beyond Goal 5 requirements. They are recommended because of the Springwater Community Planning goals designed to promote a sustainable community. A previous section of the ESEE report (Section 7.1.1) outlined the Community Plan's stewardship goals for environmental resources. Among the goals were protection of steep slopes, sensitive species and habitats, and protection of wildlife habitat corridors for wildlife migration. The boundary recommendations for sites not adjacent to water features meets these goals by protecting steep slopes and maintaining corridors that allow wildlife to migrate between upland areas and the stream corridors. The boundary recommendation for the Class 6 resource site meets these goals by protecting a particularly high value and sensitive habitat site located along the upper mainstem of Johnson Creek.

7.3 Springwater Minimum ESRA-SW Setback Distance – Sites Not Adjacent to Water Features & a Class 6 Resource Site

Resource Classification	**Recommended Boundary on Sites Not Adjacent to Water Features**[1]
Class 3 – Tree Groves as corridors between water features See Figure 14 Tree Groves in the Natural Resources Report. Applies only to the tree grove between Sunshine and McNutt Creeks and the tree grove near Badger Creek.	250-feet wide for riparian to upland connection; wildlife habitat larger patch sizes, microclimate and shade, recharge to groundwater sources and large woody recruitment
Class 5 -- Slopes greater than (>) 25% grade. Applies only to the Hogan Butte and the Persimmon Areas. (see Figure 7.1, letter C)	Preserve entire resource site; but allow needed public facilities
Class 6 – Johnson Creek Reach, Tree Grove, Unique Habitat, Locally Significant Wetlands	Preserve entire resource site; but allow needed public facilities

[1] From Springwater Community Working Group

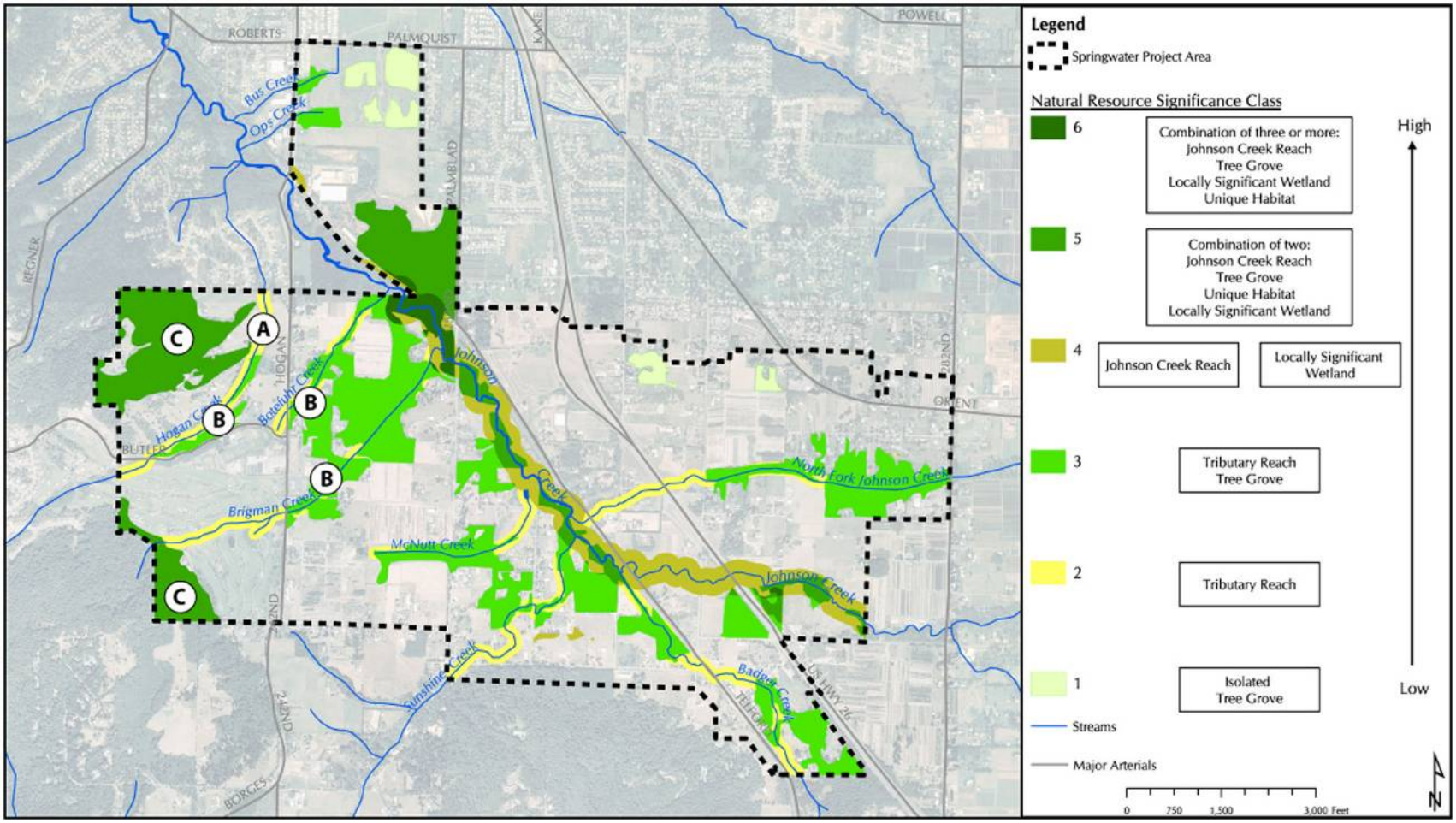

Figure 7.1 Approximate Locations of Steep Slope Sites by Natural Resource Significance Class

7.2 ESRA-SW COMPARISON TO CONCEPT PLAN AND NATURAL RESOURCE SITE INVENTORY BOUNDARY

The following section compares boundary guidelines in the previous sub-section to the proposed Springwater Community Concept Plan (Figure 7.2) and the resource site inventory boundary (Figure 7.3). Figure 7.3 is a composite map that overlays the proposed ESRA-SW district boundary on the resource site inventory boundary. This allows the reader to view differences, if any, between the ESRA and resource boundary.

The ESRA-SW boundary guidelines are applied to each of the resource sites by resource significance classifications and/or stream reach. In the first sub-section a determination has been made as to whether the Concept Plan boundary meets the recommended ESRA-SW boundary guidelines. In the second subsection the ESRA-SW boundary is compared to determine differences, if any, between the proposed ESRA-SW boundary and the resource site inventory boundary. Both the Concept Plan and Natural Resource Site Inventory Boundary figures are labeled 1 to 5 to identify sections that are addressed in the comparisons.

7.2.1 ESRA-SW Boundary and Concept Plan Comparison

The recommended ESRA-SW sub-district boundary widths are met for the entire Springwater Community except in locations that are indicated in Figure 7.2. There are five sites where the ESRA-SW sub-district boundaries do not exist. These five are identified and discussed in detail below.

7.2.1.1 Sites 1 and 2

Sites 1 and 2 in Figure 7.2 do not have ESRA-SW sub-district boundaries. These sites have a natural resource significance class rating of #1 Sites with this classification provide the lowest contribution to watershed health and protection (see Figure 7.1 and sub-section 7.1.2.1). The sites are located in the Brickworks area (zoned district HI or Heavy Industrial) and the Springwater Community area along the northern boundary of the Springwater Community bounded by 262nd Street on the western side and 267th Street on the eastern side (to be zoned IND-SW or Industrial)

These are isolated tree groves that, if left, unprotected and the conflicting uses of the proposed zone district allowed, would not impact the overall functional value of the watershed. Certainly, tree removal would be a concern and therefore such removal would need to comply with the tree planting requirements, but the overall impact would not risk the environmental health of the Springwater Community. Given the lower functional value of these resource sites and tree planting the requirements that must be followed should there be development at the sites, there is no need to provide an ESRA-SW boundary for these locations.

7.2.1.2 Site 3

Site 2 has a tree grove that spans the upper reaches between Botefuhr and Brigman Creeks. Site 3 has a natural resource significance class rating of #3, which means that the site's contribution to watershed health is based either on its proximity to a tributary of the Johnson Creek Watershed or in this case its contribution as a tree grove connecting tributaries to allow wildlife passage between reaches, to a forested area, or for wildlife cover protection.

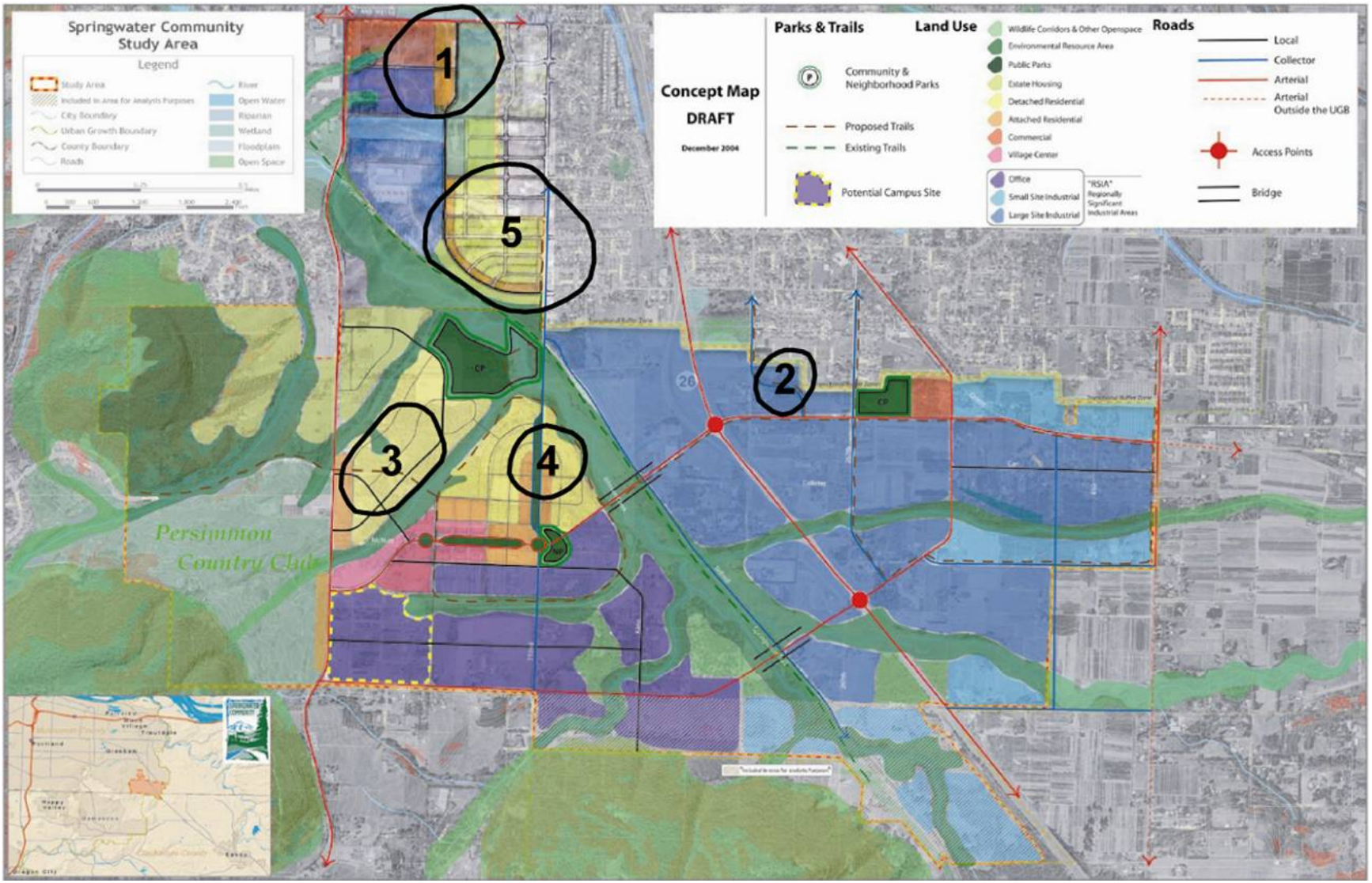

Figure 7.2 Springwater Community Concept Plan

The concept plan does not provide a boundary for this site, which has a recommended tree grove corridor boundary width of 250 feet to allow for wildlife passage. The reason for this is due to the higher development densities that are proposed for this area. The area is to be zoned Low Density Residential (LDR-SW) which allows single detached dwellings. The following is the rationale for the lack of an ESRA-SW boundary:

- Encourage urbanization such as higher residential density, commercial and business development and activities that result from urbanization (e.g., vehicular traffic, impervious surfaces, residential and business population) that may conflict with wildlife and aquatic habitat.
- Promote public safety: reduce the potential interaction between human populations and wildlife (e.g., deer/vehicle collisions) that might otherwise result in safety and health concerns.

Reduce risk to wildlife: increased vehicle movement, noise, presence of domestic pets could result in greater risks to wildlife if there is a tree grove corridor.

7.2.1.3 Site 4

Site 4 has a natural resource significance class rating of #3. It is located upland from the Johnson Creek. Its rating, like Site 3, is based on its contribution as a tree grove that provides wildlife cover and protection.

The concept plan provides a partial boundary around some of the tree grove but there is a significant portion of Site 4 that is outside the ESRA-SW. This is due to the same reasons as Site 3. High development densities are proposed for this area. The area is to be zoned Low Density Residential (LDR-SW), Townhouse Residential (THR-SW), and Research/Technology Industrial (RTI-SW). Such development will allow attached dwellings commercial and retail development. The following is the rationale for the lack of an ESRA-SW boundary surrounding the entire tree grove area:

- Encourage urbanization such as higher residential density, commercial and business development and activities that result from urbanization (e.g., vehicular traffic, impervious surfaces, residential and business population) that may conflict with wildlife and aquatic habitat.
- Promote public safety: reduce the potential interaction between human populations and wildlife (e.g., deer/vehicle collisions) that might otherwise result in safety and health concerns.
- Reduce risk to wildlife: increased vehicle movement, noise, presence of domestic pets could result in greater risks to wildlife if there is a tree grove corridor.

7.2.1.4 Site 5

Site 5 has a natural resource significance class rating of #5. It is located in the Brickworks area within Gresham city limits. As a resource class #5 rating its major contribution to watershed protection is based on a combination of tree grove and unique habitat protection qualities. The boundary width recommendation for this resource rating is to preserve the entire site. The Concept Plan, however, proposes housing development in this area and no ESRA-SW boundary.

There are several indications that the Concept Plan's proposed activity for this site might change. First, the City of Gresham is continuing is assessment of the appropriate land uses and ESRA-SW protection boundaries to propose for this site. Second, the City currently has a protection ordinance for heritage trees. A Hogan Cedar tree that is located in this site is on that

list. The City also has a tree ordinance to protect significant, mature trees. Many of the trees that are within the site qualify for protection under this ordinance. Since the site has a high significance rating it is likely that the Concept Plan land use proposal will be modified to protect the area following the recommended boundaries for a class #5 natural resource site.

7.2.2 ESRA-SW and Natural Resource Boundary Comparison

By overlaying the ESRA-SW district on the significant natural resource boundaries, it is possible to compare the ESRA-SW boundaries to the resource site boundaries. Figure 7.3 displays these overlays.

Within the Springwater Community Planning Area (the area excluding Brickworks and Clackamas County) the ESRA-SW boundary matches closely with nearly all natural resource classes, except for the 4 sites that are labeled on the figure. In a few other locations there are slight differences in boundaries, however, they do not affect the functional integrity of the resource sites.

7.2.2.1 Site 1

Site 1 is located along the North Fork of Johnson Creek and has a natural resource significance rating of #3 as a Johnson Creek Tributary. A recommended boundary for a #3 rating is 175 feet. The proposed ESRA-SW boundary for this site, though, is wider than the recommended width. The total corridor width approaches 500 feet. The natural resource boundary associated with this tributary, however, extends in some places beyond the ESRA-SW boundary by several hundred feet.

From the standpoint of protection of watershed functions the ESRA-SW boundary width that has been recommended for this site is considered sufficient to help maintain the functional integrity of the Johnson Creek watershed. That the boundary has been expanded by a total of nearly 150 feet will provide additional resource protection.

7.2.2.2 Site 2

Site 2 has a natural resource significance class rating of #3. It is located upland from the Johnson Creek. Its rating is based on its contribution as a tree grove that provides wildlife cover and protection. The ESRA-SW boundary does not include a significant portion of this natural resource site.

It is removed from ESRA-SW protection because the area has been designated for higher density development (housing, office and commercial). This is the flexibility that performing an ESEE analysis allows under the Goal 5 statue (ORS 660-023-0040(5)(c)). The Springwater Community Plan has identified this area for future development. Through the ESEE analysis that has assessed the consequences of conflicting uses, it has been determined that development is considered of greater importance than the Goal 5 protections. Therefore at this particular location the ESRA-SW boundary does not protect the entire natural resource site.

That there is not an ESRA-SW boundary surrounding this site does not mean that the site will be completely degraded. There are environmental standards in the proposed development code for these sub-districts that promote sustainability and environmental protection. These requirements include standards for water quality, stormwater run-off, tree replacement, etc.

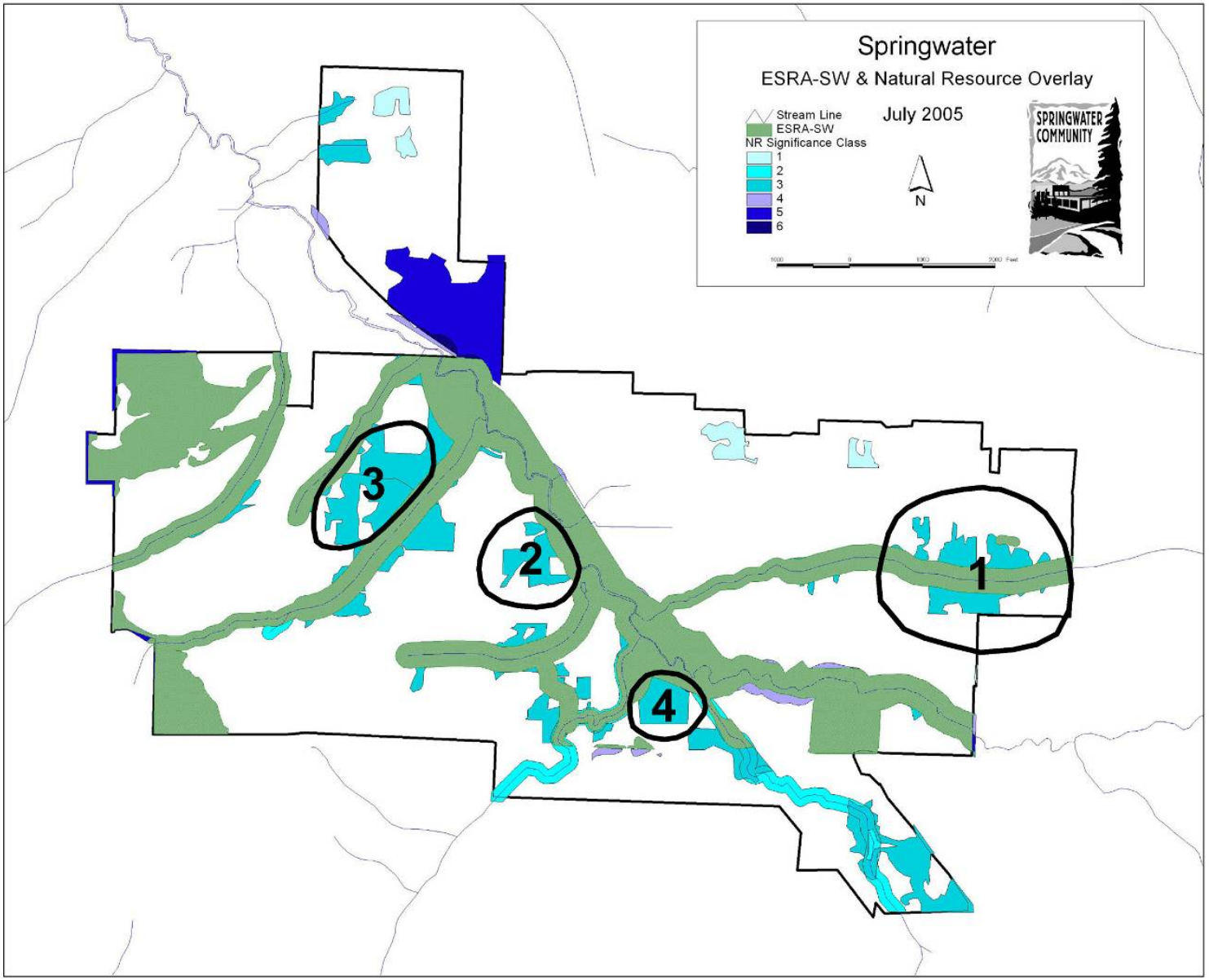

Figure 7.3 Springwater ESRA-SW and Natural Resource Boundary Overlays

7.2.2.3 Site 3

Site 3 has a natural resource significance class rating of #3. It is located between Brigman and Botefuhr Creeks. Its rating is based on its contribution as a tree grove that provides wildlife passage, cover and protection. The ESRA-SW boundary does not include this natural resource site.

It is removed from ESRA-SW protection for the same reasons as Site 2, which has been designated for higher density development (principally housing). Like Site 2, the ESEE allows flexibility in determining protection boundaries. For this specific site allowing the consequences of conflicting uses has been determined to be of greater importance than protecting the site.

Like Site 2, the development standards for the proposed sub-districts in Site 3 will require environmental protections to address water quality, stormwater run-off, and vegetation and tree replacement. These requirements will not prevent the conflicting uses but will reduce their overall impact on the resource site.

7.2.2.4 Site 4

Site 4 has a natural resource significance class rating of #3. It is located between Sunshine Creek and the confluence of Badger and Johnson Creeks. Like Site 3 the rating is based on its contribution as a tree grove that provides wildlife passage, cover and protection. The proposed ESRA-SW boundary does not include the entire natural resource site boundary at this location.

Site 4 is also removed from ESRA-SW protection because the area has been designated for higher density development, primarily office development. Again, the ESEE allows flexibility in determining protection boundaries. For this specific site allowing the consequences of conflicting uses has been determined to be of greater importance than protecting the site.

Like Site 2, the development standards for the proposed sub-district in Site 4 will require environmental protections to address water quality, stormwater run-off, and vegetation and tree replacement. These requirements will not prevent the conflicting uses but will reduce their overall impact on the resource site.