West of the Sandy River Rural Area Transportation and Land Use Plan

Wildlife Habitat and Stream Corridor ESEE Report

Board of County Commissioners Draft

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1 West of Sandy Natural Resource Inventory and ESEE Report

1.1 Purpose

This ESEE document has been prepared as part of the West of Sandy River Transportation and Land Use Plan. Included is a natural resource inventory conducted as part of the project, a summary of the method used to determine significance, an identification of conflicting uses, and finally an analysis of the Economic, Social, Environmental, and Energy consequences of allowing, limiting, or prohibiting conflicting uses.

1.2 West of Sandy Study Area

The study area is characterized by rural agricultural land bisected by several riparian corridors. The predominant land uses in the study area are ornamental tree farms and pastures. The study area is located in two major drainage basins, the Sandy River and the Willamette River. Three large riparian corridor systems are present in the study area: Beaver Creek, which flows northwest through the central portion of the study area to the Sandy River; Johnson Creek, which flows west along the southern portion of the study area to the Willamette River; and the Sandy River, which forms the north and east study area boundary. Kelly Creek north (a tributary to Beaver Creek) and Kelly Creek South (a tributary to Johnson Creek) as well as many unnamed tributaries to Beaver Creek, Johnson Creek and the Sandy River are present in the study area. Clearing of riparian corridor trees and shrubs has occurred along several streams in the study area due to adjacent agricultural land use activities. However, several streams are bordered by large and intact riparian forests with low levels of human disturbance and provide important habitat for wildlife and anadromous fish species as well as provide important water quality function.

The character of the study area is influenced by large expanses of native upland forest habitat in parks, private ownership and also some land owned by the Nature Conservancy within the study area and contiguous natural lands outside of the study area. Connectivity between the riparian corridors in the study area and these large blocks of upland forest increases the wildlife habitat value of both the riparian corridors and adjacent upland forest resources.

The project team noted that most resources are located on steep slopes or other areas that would be difficult to convert to agriculture or forestry use. In addition, there are a number of properties in public and private ownership that do not practice farm or forestry where resources are identified.

1.3 Goal 5 Planning in the Study Area

Oregon's 19 statewide planning goals are the framework for local planning programs in the State. Goal 5 is one of these statewide planning goals that each County and City must address. The goal itself and Oregon Administrative Rule 660, Division 23 establish specific procedures and criteria for the Goal 5 process. Division 23 replaces the old rule, OAR 660-016-000. The revised Goal 5 rule is similar to the old rule in that it requires an inventory and ESEE analysis of natural resources.

The Goal 5 process begins with an inventory of the quantity, quality and location of an identified resource site. A resource site describes an area identified which is not limited to individual taxlots or parcels, but includes the area where Goal 5 resources are located and therefore may include multiple and/or contiguous parcels.

The objective of a Goal 5 inventory is to obtain "adequate" information regarding quantity, quality, and location of the resource sites. Goal 5 permits local jurisdictions to choose the information they include in the inventory. Once the information is deemed to be adequate, a significance determination process evaluates the quality, quantity, and location information for the resource.

After significant resource sites are identified, and based on the best available information found in the inventory phase, land uses that conflict with Goal 5 resource sites are identified. Next, the economic, social, environmental, and energy consequences (ESEE) of allowing or not allowing conflicting uses are considered.

The "ESEE" analysis is considered in the local governments' determination of whether to:

- Allow conflicting uses,
- Limit conflicting uses,
- Prohibit conflicting uses.

A fundamental requirement of the ESEE analysis is that it be as site-specific as possible. It is equally important that the methodology and factual justification are useful to local decision-makers and are capable of withstanding legal challenge.

(OAR 660-023-0100) Wetlands

(5) For areas outside UGBs and UUCs, local governments shall either adopt the statewide wetland inventory (SWI; see ORS 196.674) as part of the local comprehensive plan or as a land use regulation, or shall use a current version for the purpose of section (7) of this rule.

(6) For areas outside UGBs and UUCs, local governments are not required to amend acknowledged plans and land use regulations in order to determine significant wetlands and complete the Goal 5 process. Local governments that choose to amend acknowledged plans for areas outside UGBs and UUCs in order to inventory and protect significant wetlands shall follow the requirements of sections (3) and (4) of this rule.

(7) All local governments shall adopt land use regulations that require notification of DSL concerning applications for development permits or other land use decisions affecting wetlands on the inventory, as per ORS 227 .350 and 215.418, or on the SWI as provided in section (5) of this rule.

1.4 Resources Considered in the West of Sandy Plan

The West of Sandy ESEE analysis addresses the Riparian Corridors

(OAR 660-023-0090) and Wildlife Habitat (OAR 660-023-0110) resources as defined in the rule. Wetlands have not been inventoried and significance has not been determined for wetlands. The West of Sandy plan includes the Statewide Wetland Inventory (SWI) and the County has a program to notify the Division of State Lands (DSL) concerning development applications that may affect wetlands on this inventory. Wetlands were not inventoried for this project as permitted by Goal 5 [660-023-0100 (5) and (6)].

2 Natural Resource Inventory and Significance Determination

2.1 Summary

Fishman Environmental Services, LLC conducted a Riparian Corridor and Wildlife Habitat Inventory and Assessment for the unincorporated areas of Multnomah County, located west of the Sandy River. The study area is bordered by the Sandy River on the north and east and by the urban growth boundary on the south and west. Total study area acreage is approximately 10,250 acres or 16 square miles.

Goal 5 provides a series of riparian definitions. Riparian area is "the area adjacent to a river, lake, or stream, consisting of the area of transition from an aquatic ecosystem to a terrestrial ecosystem". A riparian corridor "includes the water areas, fish habitat, adjacent riparian areas, and wetlands within the riparian boundary".

Wildlife habitat is defined as an area upon which wildlife depend in order to meet their requirements for food, water, shelter, and reproduction. Examples include wildlife migration corridors, big game winter range, and nesting and roosting sites.

In the West of Sandy study area, fish habitat is evaluated under riparian corridors and not wildlife habitat. Riparian corridor conditions have a more direct impact upon fish habitat than do areas that are not adjacent to a stream, river, or lake. In some wildlife habitat areas there is no fish habitat, whereas in riparian corridors fish habitat is always evaluated.

Twenty riparian corridor units were inventoried and assessed, all of which were determined to be significant based upon scoring high in one or more of the following categories: fish habitat, wildlife habitat, water quality protection, ecological integrity, or connectivity. Federal Endangered Species Act listed salmonid fish species are known to be present in Johnson Creek and the Sandy River; therefore, both the Johnson Creek and Sandy River riparian corridors rate high for fish habitat. All streams within the study area are either tributaries to Johnson Creek or the Sandy River, and all of these tributaries have the potential to provide fish habitat, or to affect fish habitat downstream (i.e. water quality). Therefore, all riparian corridors in the study area rate high for fish habitat.

Twenty-nine wildlife habitat units were inventoried and assessed, of which twenty are stream-associated and nine are isolated. All stream-associated wildlife habitat units were determined to be significant based upon scoring high in one or more of the following categories: wildlife habitat, water quality protection, ecological integrity, connectivity, or uniqueness. Five of the isolated wildlife habitat units (U1, U2, U3, U4, U6, U9) were determined to be significant. These isolated wildlife habitat units were found to be suitable for special status wildlife species that have been documented in the project area, and for small bird and mammal habitat. However, these units do not provide as valuable wildlife habitat as the stream-associated wildlife habitat units. The

remaining four isolated wildlife habitat units were determined to be non-significant. The non-significant units consist of small forests isolated from riparian corridors and surrounded by agricultural land use. Factors contributing to a determination of non-significance include poor vegetation structure and diversity, no adjacent permanent or seasonal water, small size of the unit, no connectivity to riparian corridors or other wildlife habitat areas due to paved roads or adjacent agricultural land use, grazing disturbance, and high occurrence of invasive species.

Additional detailed information is included in the accompanying report, and appendices provide summary tables and resource unit summary sheets.

2.2 Project Description

Project Purpose

Multnomah County is conducting an update of the West of the Sandy River Rural Transportation and Land Use Plan. To insure that the plan is compliant with Goal 5, the County is required to inventory natural resources including riparian corridors and wildlife habitat according to OAR 660-023. The following provides a summary of the inventory.

Study Area

The study area includes the unincorporated areas of Multnomah County located west of the Sandy River and is characterized by rural agricultural land dissected by several riparian corridors. The predominant land uses are ornamental tree farms and pastures. The character of the study area is influenced by large expanses of native upland forest habitat in public parks (e.g. Oxbow, Dabney) and land owned by the Nature Conservancy that is contiguous with natural lands outside of the study area. The study area is bordered by the Sandy River on the north and east and by the urban growth boundary on the south and west. Total study area acreage is approximately 10,250 acres or 16 square miles. This figure includes roads in the study area. Other portions of the West of Sandy Plan may include acreage calculations that exclude roads. As a result, these numbers appear higher. The study area is shown on Map 1 after page 25.

The study area extends into 26 sections on four USGS topographic quadrangles (Washougal, WA-OR; Camas, WA-OR; Damascus, OR; and Sandy, OR) as follows:

- T1N R3E Section 36
- T1N R4E Section 31
- T1S R3E Sections 1, 12, 20, 21, 22, 23, 24
- T1S R4E Sections 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22 & 23

Drainage Basins

The study area is located in two major drainage basins including the Sandy River and the Willamette River. It also includes three large riparian corridor systems: Beaver

Creek, which flows northwest through the central portion of the study area to the Sandy River; Johnson Creek, which flows west along the southern portion of the study area to the Willamette River; and the Sandy River, which forms the north and east study area boundaries. Kelly Creek north (a tributary to Beaver Creek) and Kelly Creek South (a tributary to Johnson Creek) as well as many unnamed tributaries to Beaver Creek, Johnson Creek and the Sandy River are also present.

2.3 Scope of Work

Wetlands

A Local Wetlands Inventory was not conducted for this project. For areas outside urban growth boundaries (UGBs) and urban unincorporated communities (UUCs), local governments are not required to conduct a Local Wetlands Inventory under the Goal 5 process (OAR 660-23-0100). As an alternative to conducting a Local Wetlands Inventory, local governments located outside UGBs and UUCs are required to adopt the Statewide Wetland Inventory. The Statewide Wetland Inventory is based on the National Wetland Inventory. It is important to note that the Statewide Wetland Inventory is meant to be used as a general planning tool, and there may be many wetlands present in the study area that are not mapped on the Statewide Wetland Inventory. This is due to the fact that the Statewide Wetland Inventory was prepared using aerial photo interpretation at a large photo scale, and many small or seasonally wet wetlands are typically not identified.

Wetlands are regulated by Oregon's Removal/Fill Law (ORS 196.800 - 196.990) and by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act. An on-site wetland determination or delineation should be conducted by a qualified wetland specialist prior to any development activities proposed in or adjacent to streams or wetlands.

The Division of State Lands (DSL) maintains databases of all wetland determinations / delineations and wetland removal / fill permits. More information is available from the Division of State Lands.

Riparian Corridor and Wildlife Habitat Inventory

The intent of this natural resource inventory is to identify the riparian corridors and wildlife habitat natural resources that are considered for protection under Oregon's Statewide Planning Goal 5. Riparian corridor and wildlife habitat inventory methods are not precisely defined in the Goal 5 OAR.

The process of determining an exact location of the boundaries of a riparian corridor requires onsite resource delineation. Even among experts, the definition of "riparian" and the position of the boundary is often debated. For the purposes of Goal 5 the definition states (OAR 660-23-0090):

(b) "Riparian area" is the area adjacent to a river, lake, or stream, consisting of the area of transition from an aquatic ecosystem to a terrestrial ecosystem.

(c) "Riparian corridor" is a Goal 5 resource that includes the water areas, fish habitat, adjacent riparian areas, and wetlands within the riparian area boundary.

(d) "Riparian corridor boundary" is an imaginary line that is a certain distance upland from the top of bank, for example, as specified in section (5) of this rule.

Based on the above definitions in the rule, the project team interprets "riparian area" to be an ecological designation representing the ecotone, or transition between two distinct ecosystem types. The location of the riparian area edge, therefore, is not a standard distance measured from a streambank, it is a real boundary that can only be determined on the ground on a site-specific basis. As required by Goal 5, the riparian corridor, which includes the riparian area, has been identified and is shown on Figure 1, page 36.

The standard inventory method [OAR 660-023-0030] of Goal 5 requires [660-023-0110] that the wildlife habitat inventory, at a minimum, include:

(a) Threatened, endangered, and sensitive wildlife species habitat information;

(b) Sensitive bird site inventories; and

(c) Wildlife species of concern and/or habitats of concern identified and mapped by ODFW (e.g., big game winter range and migration corridors, golden eagle and prairie falcon nest sites, and pigeon springs).

This wildlife habitat inventory for the West of Sandy River area also includes sites meeting the Goal 5 definition of wildlife habitat including those "areas upon which wildlife depend in order to meet their requirements for food, water, shelter, and reproduction."

Inventory and Mapping Methodology

This inventory was conducted using an offsite inventory and assessment method developed by Fishman Environmental Services, LLC and approved by Multnomah County. The offsite methodology was appropriate for the Multnomah County inventory since the study area has many roads crossing streams that enable easy visual access to the adjacent riparian corridor. In addition, most wildlife habitat areas could also be viewed either from adjacent roads or from a distance using binoculars. Fieldwork was conducted on March 13 and 20, 2001.

Riparian corridors were mapped as combinations of stream channels, associated wetlands and wildlife habitat (forests) adjacent to streams. As a result, some of the larger riparian corridor units are a combination of riparian corridor and adjacent upland

forested wildlife habitat. Other riparian corridor segments are mapped as just the stream channel. These segments have adjacent agricultural or other land uses to the top of the stream bank, and no riparian corridor vegetation signature appears on the aerial photos. The disturbed riparian areas are included in the Impact Area discussed in the ESEE Evaluation report.

The outer extent of riparian corridors and wildlife habitat areas and field observation points were mapped by hand on July 1997 or July 1998 digital color aerial photographic base maps (1 inch = 400 or 800 feet). The study area is contained on five base maps. Resource boundaries have been digitized by Fishman Environmental Services, LLC GIS staff onto 1998 digital color aerial photographic maps.

Summary sheets were prepared for each riparian corridor and wildlife habitat unit using existing background information when available and aerial photo interpretation along with limited ground-truthing. Each riparian corridor unit was viewed from at least one road crossing to collect data on stream characteristics and dominant vegetation. Most wildlife habitat units were also viewed from adjacent roads. Summary sheets include the site name, site code, location, drainage basin (riparian corridor summary sheets only), adjacent land use, Township, Range, and Section location, map sheet number, date(s) of field work, general description, stream information, dominant vegetation, functions, significance determination, and recommendations for enhancement.

Significance Determination

The summary sheet for each resource site includes a determination of significance that is based on assessment criteria developed by Fishman Environmental Services, LLC. The assessment criteria are unique to the West of Sandy River area and were reviewed and accepted by the Task Force. These items are based on, a modified application of the Wildlife Habitat Assessment (WHA) method originally developed by the City of Beaverton and subsequently modified with input from state and federal resource agencies and the Audubon Society of Portland. The WHA method, which has been adapted and applied throughout the region, relies on qualitative analysis of resource sites by trained field biologists. The biologists rank each site for five main habitat components, water, food, cover, values and features. The WHA utilizes a number ranking system to represent high, medium and low rankings for each habitat component. The West of Sandy River area assessment criteria (described below) are substantially similar to the WHA criteria. However, instead of using a numeric system to represent high, medium and low the project biologists simply used high, medium or low to describe the habitat components present in each resource site. As with the WHA method, a decision is made on what is significant based on the systematic and qualitative ranking of each of the resource sites.

Public Involvement Process

Fishman Environmental Services, LLC presented the inventory information at two Task Force meetings. The first introduced the project to the Task Force members and the

second presented the preliminary inventory maps. The Task Force provided information and analysis regarding their local knowledge of the resource sites. Inventory information also was presented to potentially affected land owners in two separate meetings.

2.4 Riparian Corridors (OAR 660-023-0090)

Portions of the historic riparian corridors in the study area have been altered due to adjacent agricultural or nursery land use activities. However, sections of several streams and tributaries are bordered by large intact riparian forests that have low levels of human disturbance. Riparian corridor are important for water quality, flood management, and fish and wildlife resources. Riparian corridors provide habitat that may be used by threatened and endangered fish and wildlife species. Riparian corridors can protect water quality parameters such as temperature, suspended sediment and contaminants both on-site and in downstream waters that provide habitat for federally listed salmonid fish species. Riparian trees contribute large pieces of wood to the stream channel that provide habitat and channel structure. Riparian corridors also provide a link or continuity for wildlife movement between riparian corridors and adjacent wildlife habitat areas. Headwater areas, including intermittent streams, can be important for fish and wildlife resources. These areas can provide good quality water, insect and organic material, protect existing water quality, and other important factors for downstream habitat areas[1].

Human activities have adversely impacted functions of several riparian corridor units in the study area. Clearing of riparian trees and shrubs occurred along several streams. A well-vegetated riparian corridor filters out many of the pollutants present in runoff and prevents pollutants from entering the stream. A well-vegetated corridor also provides shade to the stream resulting in lower water temperatures. Therefore, clearing of riparian corridor negatively impacts water quality. Clearing of riparian corridors is especially detrimental to the water quality of streams that are bordered by agricultural land uses because runoff from pastures and ornamental nursery fields often contains pollutants (i.e. animal waste, fertilizers, pesticides). Once a riparian corridor has been cleared, the area adjacent to the stream often consists of sparse herbaceous vegetation or bare soils which occur as a result of intensive grazing or plowing activities. In addition to failing to filter out harmful pollutants, these sparsely vegetated or bare soil areas increase erosion and sedimentation into the adjacent stream.

Riparian Corridor Units

Twenty riparian corridor units were evaluated in the inventory. The site code and reach number or tributary number and the location of each unit are listed below. The riparian corridor data sheets are included in Appendix B.

[1] Spence, B.C., G.A. Lomnicky, R.M. Hughes, and R.P. Novitzki. 1996. An ecosystem approach to salmonid conservation. TR-4501-96-6057. ManTech Environmental Research Services Corp., Corvallis, Oregon.

Beaver Creek
B-1 UGB to 322nd Avenue
B-2 322nd Avenue to headwaters

Beaver Creek Tributaries
BT-1 South of Troutdale Road, west of 302nd Avenue
BT-2 East of 287th Avenue, north & south of Division Street
BT-3 East of Troutdale Road, north of Dodge Park Boulevard
BT-4 South of Oxbow Drive, east & west of Honser

Johnson Creek
J-1 UGB to Telford Road
J-2 East of Telford Road, west of Highway 26
J-3 Between Highway 26 & Orient Drive and adjacent to Revenue Road
J-4 East & west of Cottrell Road

Johnson Creek Tributaries
JT-1 North of Butler Road
JT-2 West of 252nd Avenue
JT-3 East of Telford Road, north of Callister Road
JT-4 South of McNutt Road
JT-5 East of Telford Road, south of Orient Drive
JT-6 East & west of Kane Road, north of Rugg Road
JT-7 East of Orient Drive, north & south of Bluff Road

Kelly Creek North
KN North of Dodge Park Road, east & west of 302nd Avenue

Kelly Creek South
KS South of Rodlun Road

Sandy River
S North and east study area boundary

Riparian Corridor Assessment Criteria

The following assessment criteria developed by Fishman Environmental Services, LLC, were used to assess riparian corridors, as defined for this project. These assessment criteria are unique to the West of Sandy River area, though they are based on the criteria found in Framework Plan Policy 16-G. The criteria were reviewed and accepted by the Task Force.

Fish Habitat - evaluates existing and potential aquatic habitat. It also evaluates the use of the habitat on-site, upstream and downstream. The presence, either on-site or downstream, of state or federal Endangered Species Act listed fish species habitat

automatically results in a rating of high. Disturbed stream channels with no on-site or downstream habitat for listed fish species have a low rating. Disturbed stream channels include those that have been straightened, armored, cleared of large wood, have large sediment loads, lack riparian vegetation, and other disturbances. Stream channels rate high if they have natural or naturalistic channel morphology, variable substrate types (i.e. boulders, gravel, fines), moderate to high amounts of large wood, riffles and pools, functional floodplain, and intact riparian corridor vegetation that provides habitat, nutrients, and moderates water temperature.

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

Water Quality Protection - evaluates the potential of the resource to protect contiguous streams and wetlands. Riparian corridors adjacent to streams maximize water quality protection from surface water runoff if the riparian corridor zone is greater than 50 feet wide, well vegetated, and has a well-established duff layer[2]. Well-vegetated slopes also minimize erosion. Water quality protection rates high on moderate and steep slopes adjacent to a stream if well vegetated; medium if vegetation or duff is patchy; low if hillslopes are eroding or not well vegetated.

Ecological Integrity - evaluates the condition of native site vegetation and the degree of human disturbance. If the historic riparian corridor vegetation adjacent to the stream is intact, it rates high. Sites where the riparian corridor has been cleared of most trees and shrubs rate low. If vegetation is dominated by a mixture of native species with limited invasive species influence, it rates high. Sites with mostly native species and with invasive species that could be removed rate medium. Sites strongly impacted by invasive species (Himalayan blackberry, English ivy, English holly) rate low.

Connectivity - evaluates the importance of linkage or continuity of a resource site to allow wildlife passage between larger habitat units, fish passage up- and downstream, or genetic flow between plant populations. Connectivity for wildlife rates high if the riparian corridor is large and connected to other Goal 5 resources (i.e. wildlife habitat); medium if the riparian corridor is narrow or connectivity is reduced due to partial clearing; low if the riparian corridor is fragmented or if only sparse riparian tree or shrub cover is present. Connectivity for fish rates high if there are no barriers to fish passage (adult and juvenile) downstream for headwater reaches and up- or downstream for lower reaches between the resource site and stream reaches known to have fish access. Connectivity for fish rates low if there are such barriers. Barriers to fish passage are only known at stream crossings of County roads that were evaluated in a

[2] Spence, B.C., G.A. Lomnicky, R.M. Hughes, and R.P. Novitzki. 1996. An ecosystem approach to salmonid conservation. TR-4501-96-6057. ManTech Environmental Research Services Corp., Corvallis, Oregon.

Multnomah County culvert survey. There may be other natural or artificial barriers to fish passage, including stream crossings of state- or privately-owned roads. Ratings for this criterion are expressed as X/Y, with X representing wildlife and Y representing fish. "U" is used if fish passage conditions are unknown.

Determination of Significance for Riparian Corridors

Twenty riparian corridor units were inventoried and assessed. Riparian corridor units were determined to be significant for this area if they rated high in one of the following riparian corridor assessment criteria: fish habitat, wildlife habitat, water quality protection, ecological integrity, or connectivity. It should be noted that "significant" means that the resource site is then carried through the Goal 5 process including undergoing further analysis through the ESEE process. The ESEE process determines whether the resource is protected, or whether the conflicting use (residential or industrial development, for example) is allowed or limited.

Federal Endangered Species Act (ESA) listed salmonid fish species known to be present in the study area include Chinook salmon (threatened), and steelhead trout (threatened). In addition, coastal cutthroat trout (proposed threatened) and coho salmon (candidate for listing) are also present. ESA listed salmonids are known to be present in Johnson Creek and the Sandy River; therefore, both the Johnson Creek and Sandy River riparian corridors rate high for fish habitat. All streams within the study area are either tributaries to Johnson Creek or the Sandy River, and all of these tributaries have the potential to provide fish habitat, or to affect fish habitat downstream (i.e. water quality). Therefore, all riparian corridors in the study area rate high for fish habitat. The Division of State Lands has mapped essential indigenous salmonid habitat in the study area along the Sandy River and the lower portions of Beaver Creek and Johnson Creek.

The determination of significance for riparian corridors is summarized in Table 1 on page 17.

TABLE 1: SIGNIFICANT RIPARIAN CORRIDORS MULTNOMAH COUNTY WEST OF SANDY						
RIPARIAN UNIT(feet)	Fish Habitat	Wildlife Habitat	Water Quality	Ecological Integrity	Connectivity (wildlife/fish)	Significant?*
BEAVER CREEK (12.2 miles)						
B-1	H	H	H	M	H/L	Y
B-2	H	M	L	L	L/U	Y
BEAVER CREEK TRIBUTARIES						
BT-1	H	H	H	M	H/L	Y
BT-2	H	H	H	M	L/U	Y
BT-3	H	H	H	M	H/L	Y
BT-4	H	M	L	L	L/U	Y
JOHNSON CREEK						
J-1	H	H	H	M	H/U	Y
J-2	H	L	L	L	L/U	Y
J-3	H	H	M	M	M/L	Y
J-4	H	H	M	M	M/U	Y
JOHNSON CREEK TRIBUTARIES						
JT-1	H	H	H	M	H/U	Y
JT-2	H	H	H	M	H/U	Y
JT-3	H	L	L	L	L/U	Y
JT-4	H	H	H	M	M/U	Y
JT-5	H	H	H	M	M/L	Y
JT-6	H	H	H	M	H/U	Y
JT-7	H	M	M	L	L/U	Y
KELLY CREEK NORTH						
KN (7157)	H	M	H	M	M/L	Y
KELLY CREEK SOUTH						
KS	H	H	H	M	H/L	Y
SANDY RIVER						
S	H	H	H	H	H/H	Y

H = Highest function; large intact riparian corridor; ESA-listed fish species.
M = Medium function; riparian corridor function reduced due to partial clearing, invasive species, grazing.
L = Lowest function; riparian corridor is no longer functioning due to extensive clearing of trees and shrubs.
U = Fish passage conditions are unknown.
Riparian corridors which scored high in at least one of the functions evaluated were determined to be significant.

2.5 Wildlife Habitat (OAR 660-023-0110)

Wildlife Habitat Definition

Wildlife Habitat resource areas, as defined in this study for the purpose of meeting Goal 5, include upland forests at least one acre in size. Most of the wildlife habitat units in the study area are associated with streams and riparian corridors; however, several wildlife habitat units are isolated. These wildlife habitat areas are typically isolated from streams and riparian corridors by large expanses of agricultural land use or by paved roads. Areas not considered to be wildlife habitat include orchards and Christmas tree plantations, small clumps of trees, and areas with only a few scattered trees.

Although meadows, in addition to forests, provide important wildlife habitat, no native prairie meadows were identified within the study area. Existing upland meadows and fields in the study area have been modified in some way by plowing, planting, mowing, etc. Meadows were therefore not included in this inventory.

Wildlife Habitat Units

Thirty wildlife habitat units were evaluated in the inventory. The wildlife habitat units consist of both stream-associated (riparian/upland) forests and isolated (upland) forests. The site code and the location of each unit are listed below. Wildlife habitat data sheets are included in Appendix A.

Stream-Associated Wildlife Habitat Units

B1-R/U	Beaver Creek, reach 1
B2-R/U	Beaver Creek, reach 2
BT1-R/U	Beaver Creek tributary 1
BT2-R/U	Beaver Creek tributary 2
BT3-R/U	Beaver Creek tributary 3
BT4-R/U	Beaver Creek tributary 4
J1-R/U	Johnson Creek, reach 1
J2-R/U	Johnson Creek, reach 2
J3-R/U	Johnson Creek, reach 3
J4-R/U	Johnson Creek, reach 4
JT1-R/U	Johnson Creek tributary 1
JT2-R/U	Johnson Creek tributary 2
JT3-R/U	Johnson Creek tributary 3
JT4-R/U	Johnson Creek tributary 4
JT5-R/U	Johnson Creek tributary 5
JT6-R/U	Johnson Creek tributary 6
JT7-R/U	Johnson Creek tributary 7
KN-R/U	Kelly Creek North
KS-R/U	Kelly Creek South
S-R/U	Sandy River

Isolated Wildlife Habitat Units

U1 Regner Road
U2 Butler Road South
U3 Telford Road
U4 262nd Avenue
U5 Highway 26
U6 Stone Road
U7 Orient Drive
U8 Bluff Road
U9 Division/Troutdale Road

Wildlife Habitat Assessment Criteria

The following assessment criteria developed by Fishman Environmental Services, LLC, were used to assess wildlife habitat.

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

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

Ecological Integrity - evaluates the conditions of native site vegetation and the degree of human disturbance. If the forest is intact, it rates high. Sites where the vegetation diversity and/or structure have been decreased due to grazing or other activities rate low. If vegetation is dominated by a mixture of native species with limited invasive species influence, it rates high. Sites with mostly native species and with invasive species that could be removed rate medium. Sites strongly impacted by invasive species (Himalayan blackberry, English ivy, English holly) rate low.

Connectivity - evaluates the importance of linkage or continuity of a resource site to allow wildlife passage between larger habitat units, or genetic flow between plant populations. Connectivity rates high if forests are large and connected to other Goal 5 resources (i.e. riparian corridors); medium if forests are narrow or are separated from adjacent resources by a paved road; low if forests are fragmented or are isolated from adjacent resources by a large expanse of agricultural land use.

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

Determination of Significance for Wildlife Habitat

Wildlife Habitat resource areas were determined to be significant if they rated high in one of the above mentioned wildlife habitat assessment criteria. It should be noted that "significant" means that the resource is identified as a Goal 5 resource. Further analysis through the ESEE process is then required to determine whether the resource is protected, or whether the conflicting use (residential or industrial development, for example) is allowed or limited.

Twenty-nine wildlife habitat units were inventoried and assessed, of which twenty are stream-associated and nine are isolated. All stream-associated wildlife habitat units were determined to be significant based upon scoring high in one or more of the following categories: wildlife habitat, water quality protection, ecological integrity, connectivity, or uniqueness. Five of the isolated wildlife habitat units (U1, U2, U3, U6, U9) were determined to be significant. These isolated wildlife habitat units were found to be suitable for Special-Status Wildlife Species that have been documented in the project area, and for small bird and mammal habitat. However, these units do not provide as valuable wildlife habitat as the stream-associated wildlife habitat units. Four isolated wildlife habitat units were determined to be non-significant. Factors contributing to a determination of non-significance include poor vegetation structure and diversity, no adjacent permanent or seasonal water, small forest size, no connectivity to riparian corridors due to paved roads or adjacent agricultural land use, grazing disturbance, and high occurrence of invasive species.

The determination of significance/non-significance for wildlife habitat areas is summarized in Table 2 on page 24.

A Threatened and Endangered Species Background Review (OAR 660-023-0110(3)(a)) was conducted to check for the presence of sensitive species that have unique habitat requirements that are considered as the habitat is evaluated. To accomplish this review the Oregon Natural Heritage Program and the Oregon Department of Fish and Wildlife (ODFW) were contacted.

The Natural Heritage Data System is Oregon's most comprehensive database of rare, threatened and endangered species, and includes site-specific information on the occurrences, biology and status of over 2,000 species throughout Oregon. It includes the state's only database of natural vegetation, with descriptions and information on the occurrences and protected locations of all known ecosystem types. It is contracted to provide natural heritage and sensitive species information to state and federal agencies, and is accessed daily by public land managers, private developers, researchers and educators.

The Natural Heritage Data System was contacted for information regarding special-status species that were documented to occur in the study area. Special-status species include fish, wildlife and plant species that are federally or state listed as threatened or endangered, candidate species for listing, and other species of concern that do not currently have legal status but are being monitored by regulatory agencies because their populations have declined or are declining.

Special-Status Fish Species:

Coho salmon	*Oncorhynchus kisutch*	Federal candidate; State endangered
Chinook Salmon	*Oncorhynchus tshawytscha*	Federal threatened
Steelhead	*Oncorhynchus mykiss*	Federal threatened

Special-Status Wildlife Species
Special-status wildlife species that have been documented in the project area include red-legged frog, Oregon slender salamander, bald eagle, pileated woodpecker, little willow flycatcher, and olive-sided flycatcher.

The northern red-legged frog (*Rana aurora*) is a federal species of concern and a state sensitive species of undetermined status. It inhabits wetlands and slow moving streams. It breeds in seasonal ponds where it deposits large egg masses in January/February. Red-legged frogs have been observed in forested wetlands along Johnson Creek immediately downstream of the project area. In addition, public comments offered at the Task Force meetings have indicated that there may be additional occurrences of the red-legged frog in other portions of the study area. Staff did not confirm these sightings but has suggested that the citizens contact the Oregon Natural Heritage Program.

The Oregon slender salamander (*Batrachoseps wrighti*) is a state sensitive species of undetermined status. It inhabits old decaying logs and stumps in old growth and second growth coniferous forests. It has been observed in Oxbow Park and on the Nature Conservancy land west of the Sandy River.

The bald eagle (*Haliaeetus leucocephalus*) is a federal and state threatened species. It is associated with rivers and lakes with nearby tall trees or cliffs for nesting. It feeds mainly on fish and also eats a variety of carrion. The bald eagle is occasionally observed on the Sandy River; no known nests occur in the project area.

The pileated woodpecker (*Dryocopus pileatus*) is a state vulnerable species. It is associated with mature coniferous and deciduous forest habitat and requires large snags for nesting and foraging. Optimum nest snags are at least 20 inches in diameter and 31 feet tall (Marshall 1996). Other habitat components include dense forest, high snag densities, stumps, large woody debris and tall shrub cover. It has been observed in Oxbow Park and on the Nature Conservancy land west of the Sandy River.

The little willow flycatcher (*Empidonax trailii brewsteri*) is a federal species of concern and a state vulnerable species. It is found in willow thickets at the edges of streams or forest clearings. It eats mostly flying insects. It is a summer resident that typically arrives in Oregon in mid-May. It has been observed along the Sandy River and is likely present along streams in the project area where there is suitable habitat.

The olive-sided flycatcher (*Contopus cooperi*) is a federal species of concern and a state vulnerable species. It nests in coniferous forest and forages primarily on flying insects. Olive-sided flycatchers have been observed in Oxbow Park and on the Nature Conservancy land along the Sandy River.

A variety of federal species of concern and state sensitive bat species potentially roost and/or forage along the Sandy River and its tributaries. Bats are likely present in the project area, but no bat roosting areas have been documented.

Special-Status Vegetation Species
Tall bugbane (*Cimicifuga elata*) is a federal species of concern and a state candidate species. It inhabits moist forest habitat and has been observed in old growth forest habitat on BLM land outside the project area.

TABLE 2: SIGNIFICANT WILDLIFE HABITAT MULTNOMAH COUNTY WEST OF SANDY RIVER						
WILDLIFE HABITAT UNIT	Wildlife Habitat	Water Quality	Ecological Integrity	Connectivity	Uniqueness	Significant?*
STREAM ASSOCIATED WILDLIFE HABITAT UNITS						
B1-R/U	H	H	M	H	M	Y
B2-R/U	M	L	L	L	L	Y
BT1-R/U	H	H	M	H	L	Y
BT2-R/U	H	H	M	L	L	Y
BT3-R/U	H	H	M	H	L	Y
BT4-R/U	M	L	L	L	L	Y
J1-R/U	H	H	M	H	H	Y
J2-R/U	L	L	L	L	L	Y
J3-R/U	H	M	M	M	M	Y
J4-R/U	H	M	M	M	L	Y
JT1-R/U	H	H	M	H	L	Y
JT2-R/U	H	H	M	H	L	Y
JT3-R/U	L	L	L	L	L	Y
JT4-R/U	H	H	M	M	L	Y
JT5-R/U	H	H	M	M	L	Y
JT6-R/U	H	H	M	H	L	Y
JT7-R/U	M	M	L	L	L	Y
KN-R/U	M	H	M	M	L	Y
KS-R/U	H	H	M	H	L	Y
S-R/U	H	H	H	H	H	Y
ISOLATED WILDLIFE HABITAT UNITS						
U1	H	L	M	H	M	Y
U2	H	L	H	H	M	Y
U3	H	M	M	M	M	Y
U4	L	L	L	L	L	N
U5	M	L	L	L	L	N
U6	H	L	M	M	L	Y
U7	L	L	L	L	L	N
U8	L	L	L	L	L	N
U9	H	L	M	M	L	Y

H = Highest function; large undisturbed forest adjacent to permanent or seasonal water.

M = Medium function; wildlife habitat function reduced due to lack of adjacent permanent or seasonal water, reduced connectivity to other wildlife habitat areas, low vegetation diversity, invasive species, grazing.

L = Lowest function; forest is too small and isolated to provide any wildlife habitat.

* Wildlife habitat areas which scored high in at least one of the functions evaluated were determined to be significant.

2.6 Location, Quantity, and Quality

Goal 5 requires location, quantity, and quality information to be used in significance determination. In this inventory, location information can be found on the maps for each drainage, quantity information found in Table 7 on page 51, and quality information found on each data sheet located in the appendix. This information is considered adequate per OAR 660-023-0030(3)(a, b, c)

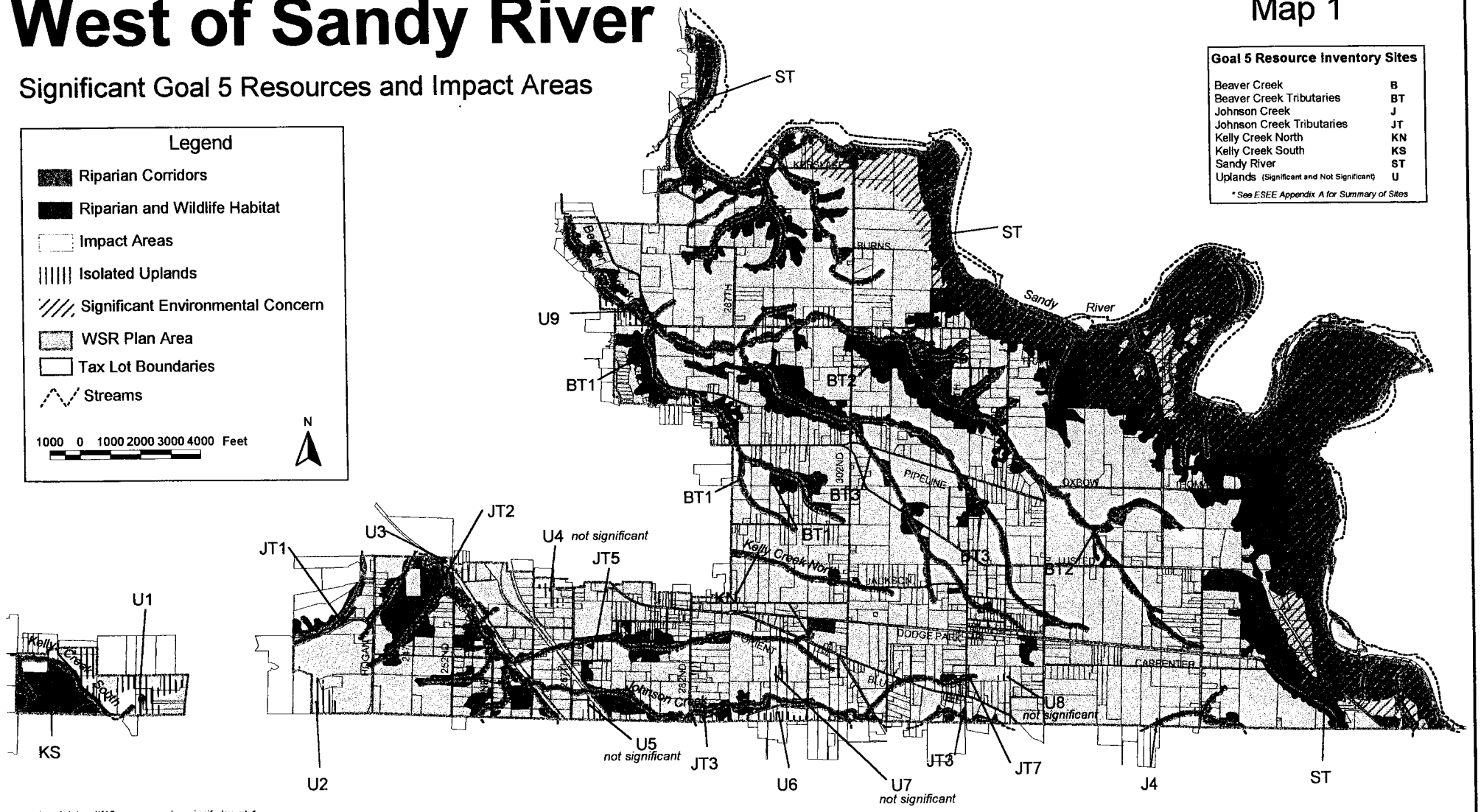
Goal 5 also requires consultation with ODFW as well as other agencies to obtain current habitat information (660-023-0110(3)). Fishman Environmental Services LLC has consulted ODFW as well as the Oregon Natural Heritage Database to meet this requirement.

Insert Significant Goal 5 Resources and Impact Areas Map Map 1

West of Sandy River

Significant Goal 5 Resources and Impact Areas

Map 1



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3 Regulations in the Study Area

3.1 Introduction

The regulations in the study area have contributed over the years to the nature of the development pattern and land uses in the study area. The physical landscape in combination with commercial farm and forest zoning dominates the land use pattern in the West of Sandy Study Area. The physical limitations have determined where development or conversion to farm and forest use is practical, the zoning helps to maintain farm and forest use and each in turn helps to maintain the rural character of the study area.

State, Federal, and local regulations are discussed below. In order to understand the conflicting uses that will be discussed later in the analysis, the discussion highlights the impact of these regulations upon Goal 5 natural resources

3.2 Multnomah County Zoning Ordinance

Broad policy goals are part of the purpose statements for each zone found in the study area. Policy goals are particularly useful in the determination of the impacts that permitted uses may impose upon Goal 5 resources. Conflicting uses found within each zone are discussed in chapters 5 and 6 of this report.

Exclusive Farm Use (EFU)

"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; to conserve and protect scenic and wildlife resources, to maintain and improve the quality of the air, water and land resources of the County 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 Chapter 215 and the Oregon Administrative Rules Chapter 660, Division 33."

EFU zoning is found in resource areas of Beaver Creek, Johnson Creek, Kelly Creek North, Sandy River, and unit U3

Multiple Use Agriculture (MUA20)

"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; to encourage the use of non-agricultural lands for other purposes, such as forestry, outdoor recreation, open space, low density residential development and 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. "

MUA-20 zoning is found in resource areas of Beaver Creek, Kelly Creek North, Johnson Creek, Sandy River, U4, and U7

Commercial Forest Use (CFU)
"The purposes of the Commercial Forest Use District are to conserve and protect designated lands for continued commercial growing and harvesting of timber and the production of wood fiber and other forest uses; to conserve and protect watersheds, wildlife habitats and other forest associated uses; to protect scenic values; to provide for agricultural uses; to provide for recreational opportunities and other uses which are compatible with forest use; implement Comprehensive Framework Plan Policy 11, Commercial Forest Land, and to minimize potential hazards or damage from fire, pollution, erosion or urban development."

CFU zoning is found in resource areas of Kelly Creek South, Beaver Creek, Sandy River and U1

Rural Residential (RR)

"The purposes of the Rural Residential District are to provide areas for residential use for those persons who desire rural living environments; to provide standards for rural land use and development consistent with desired rural character, the capability of the land and natural resources; to manage the extension of public services; to provide for public review of non-residential use proposals and to balance the public's interest in the management of community growth with the protection of individual property rights through review procedures and flexible standards."

RR zoning is found in resource areas of the Sandy River, Beaver Creek, U10

Rural Center (RC)

"The purposes of the Rural Center District are to provide standards and review procedures which will encourage concentrations of rural residential development, together with limited local and tourist commercial uses which satisfy area and regional needs; 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.

The RC zone is found in the Johnson Creek resource unit.

Significant Environmental Concern (SEC)

"The purposes of the Significant Environmental Concern sub-district are to protect, conserve, enhance, restore, and maintain significant natural and man-made features which are of public value, including among other things, river corridors, streams, lakes and islands, domestic water supply watersheds, flood water storage areas, natural shorelines and unique vegetation, wetlands, wildlife and fish habitats, significant

geological features, tourist attractions, archaeological features and sites, and scenic views and vistas, and to establish criteria, standards, and procedures for the development, change of use, or alteration of such features or of the lands adjacent thereto."

The SEC is applied to the Sandy River resource unit.

3.3 Other State, Federal and Regional Regulations

Metro Title 3

The Title 3 Water Quality and Floodplain requirements of the Metro Urban Growth Management Functional Plan will be applied across the study area. Title 3 provides regional standards for the protection of water quality and floodplains. The third element of Title 3, protection for significant streams pursuant to Goal 5 is in process.

Title 3 of the Metro Urban Growth Management Functional Plan requires local jurisdictions to adopt ordinances to regulate development in "water quality and flood management areas." An official map must be adopted, and specific performance standards for water quality and flood management must be implemented. Title 3 setbacks from streams and wetlands vary from 15 to 200 feet, based on site-specific conditions. The protection program developed in conjunction with this ESEE analysis is substantially compliant with Title 3.

The Metro Title 3 program for fish and wildlife is presently being developed. The Multnomah County program reported here will be discussed with Metro as their program develops to determine how the County program will meet compliance requirements of Title 3.

A program will be developed for the study area pursuant to Statewide Goal 6, "Air, Water and Land Resources Quality", that meets the standards set in the Title 3 Water Quality and Floodplain ordinance.

Wetlands

Wetlands and streams are regulated under both federal and state law. The U.S. Army Corps of Engineers administers Section 404 of the Clean Water Act that regulates discharge of any amount of dredged or fill material into "waters of the United States". Waters of the United States include essentially all surface waters such as all navigable waters and their tributaries, all interstate waters and their tributaries, all wetlands adjacent to these waters, and all impoundments of these waters. The Division of State Lands administers Oregon's Removal-Fill Law (ORS 196.800-990), which regulates the removal or fill of more than 50 cubic yards of material in "waters of the state", or the movement of any amount of material in either a stream designated as Essential Indigenous Anadromous Salmonid Habitat or in a State Scenic Waterway. Waters of the state are defined as natural waterways including all tidal and nontidal bays, intermittent

streams, constantly flowing streams, lakes, wetlands and other bodies of water in this state, navigable and non-navigable, including that portion of the Pacific Ocean which is in the boundaries of this state.

Endangered Species Act

Wildlife Species
As discussed in section 2.5, special-status wildlife species that have been documented in the project area include red-legged frog, Oregon slender salamander, bald eagle, pileated woodpecker, little willow flycatcher, olive-sided flycatcher, and a variety of bat species.

Plant Species
Tall bugbane (*Cimicifuga elata*) is a federal species of concern and a state candidate species.

Fish Species
Several evolutionarily significant units (ESUs) of salmonids have been listed by the federal government under the Endangered Species Act (ESA). Three ESUs are listed as threatened and have designated critical habitat within the study area including Lower Columbia River Chinook Salmon, Lower Columbia River Steelhead and Columbia River Chum Salmon. In addition Southwestern Washington/Columbia River Coastal Cutthroat Trout are proposed for listing as threatened. The Lower Columbia River/Southwest Washington ESU for Coho Salmon is currently a candidate for listing.

Critical habitat for these ESUs include "all river reaches accessible to listed salmon or steelhead within the range of the ESUs listed" and consists of the water, substrate and adjacent riparian zones of riverine reaches listed in tables prepared by the National Marine Fisheries Service (NMFS) (50 CFR Part 226). Accessible riverine reaches "are those within the historical range of the ESUs that can still be occupied by any life stage of salmon or steelhead." (50 CFR 226.212). Riverine reaches are considered to be accessible unless they are blocked by longstanding (i.e. hundreds of years or greater) natural barriers, such as waterfalls.

In the West of Sandy study area, it is certain that the Sandy River, Johnson Creek, Beaver Creek, and Kelly Creek north contain "indigenous anadromous salmonid habitat" (ORS 141-102).

The National Marine Fisheries Service (NMFS) identifies riparian zones as ecological units that provide important watershed functions that directly benefit salmonids. These functions include: vegetation that produces stream shade, bank stabilization, organic litter and large woody debris; sediment storage; nutrient and chemical recycling; mediation of stream hydraulics; microclimate control; water quality protection. The critical habitat designations do not specify a standard riparian management area or zone based on some distance measured from the stream or river. Instead, the rule allows for site-specific determination of riparian function. The NMFS therefore defines

adjacent riparian zones as "...the area adjacent to a stream that provides the following functions: shade, sediment transport, nutrient or chemical regulation, streambank stability, and input of large woody debris or organic matter." (Federal Register, Vol.65, No. 32, February 16, 2000, p.7769) NMFS further states that "streams regularly submerge portions of the riparian zone via floods and channel migration, and portions of the riparian zone may contain off-channel rearing habitats used by juvenile salmonids, especially during periods of high flow." (Federal Register, Vol. 65, No. 32, February 16, 2000, p. 7768)

The West of Sandy project defines riparian area in a manner consistent with the NMFS definition discussed above. This definition relies on a functional view of riparian areas, rather than a standard landscape measurement.

ESA Recommendations

ESA compliance is not the same as compliance with specific regulatory code measures or standards. Under the ESA, all federal agencies are required to ensure that their actions, including permit authorizations, will not jeopardize the continued existence of a listed species and are not likely to result in the destruction or adverse modification of critical habitat. Under Section 9 of the ESA, it is illegal to take an endangered species.[3] For species listed as threatened, Section 4(d) of the ESA requires the federal government to issue regulations necessary and advisable to provide for the conservation of the species. These 4(d) regulations may include any or all of the prohibitions, such as take prohibitions, that automatically apply to endangered species under ESA Section 9.

The NMFS issued 4(d) rules for threatened fish species in June 2000. The rules describe limits on the take prohibitions of ESA section 9, some of which may be applicable to the West of Sandy study area. These potentially applicable limits on take prohibitions are described below:

Limit No. 8 - Habitat Restoration Limits on the Take Prohibitions

The take prohibitions do not apply to habitat restoration activities if the State of Oregon certifies to NMFS in writing that the activity is part of a watershed conservation plan certified by NMFS to meet specific guidelines

Limit No. 9 - Water Diversions Screening

The take prohibitions do not apply to physical diversion of water from a stream or lake if NMFS engineering staff agrees in writing that the diversion facility is screened, maintained and operated in compliance with NMFS screening criteria;

[3]Take is defined to include harass, harm, pursue, hunt, shoot, wound, kill, trap, or collect; or to attempt any of these.

Limit No. 10 - Routine Road Maintenance Activities

The take prohibitions do not apply to routine road maintenance activities if the routine activity complies with the ODOT Maintenance Management System Water Quality and Habitat Guide (June 1999)

Limit No. 12 - Municipal, Residential, Commercial and Industrial Development and Redevelopment (MRCI)

The take prohibitions do not apply to MRCI development or redevelopment if such development occurs pursuant to local ordinances that NMFS has agreed in writing are adequately protective, or that Metro has found comply with an Urban Growth Management Functional Plan that NMFS has agreed in writing is adequately protective. For NMFS to find adequate protection, the following issues must be addressed in a manner that assures urban development will contribute to conserving listed salmonids:

- Avoid inappropriate areas (unstable slopes, wetlands, areas of high habitat value, similarly constrained sites).
- Prevent stormwater discharge impacts to water quality and quantity, or to the hydrograph of the watershed.
- Protects riparian areas well enough to attain or maintain properly functioning condition (PFC) around all perennial and intermittent streams, lakes or wetlands.
- Avoid stream crossings by roads whenever possible, and where one must be provided, minimize impacts through choice of mode, sizing, placement.
- Protect historic stream meander patterns and channel migration zones; avoid hardening of stream banks.
- Protect wetlands, wetland buffers, and wetland functions -including isolated wetlands.
- Preserve the hydrologic capacity of any intermittent or permanent stream to pass peak flows.
- Landscape with native vegetation to reduce need for watering and application of herbicides, pesticides and fertilizer.
- Prevent erosion and sediment runoff during (and after) construction.
- Assure that water supply demands for the new development can be met without impacting flows needed for threatened salmonids either directly or through

groundwater withdrawals, and that any new water diversions are positioned and screened in a way that prevents injury or death of salmonids.

- Provide mechanisms for monitoring, enforcing, funding, reporting, and implement a program.

- The development ordinance or plan complies with all other state and Federal environmental or natural resource laws and permits.

Although this natural resource inventory report and ESEE analysis does not directly address the ESA regulatory process as found in Federal law, the MRCI issues do provide good direction to the programmatic elements that are developed under Goal 5. Any comprehensive plan policies, ordinance revisions, overlay zones, or other implementation tools should consider the 12 MRCI issues in order for the program to be compatible with any jurisdiction-wide ESA compliance program.

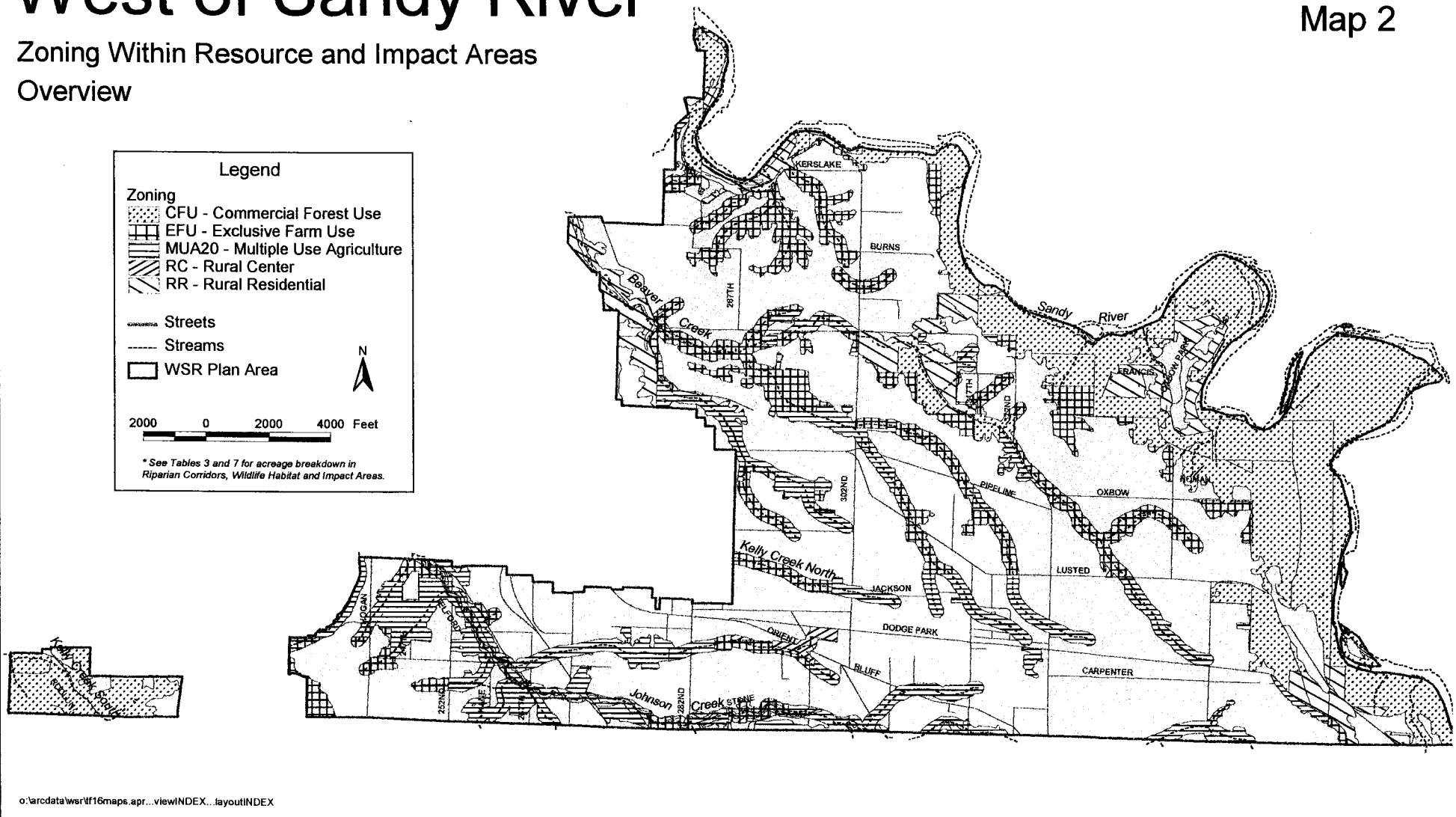
Department of Environmental Quality 303(d)

DEQ is required by the federal Clean Water Act to maintain a list of stream segments that do not meet water quality standards. This list is called the 303(d) List because of the section of the Clean Water Act that makes the requirement. The U.S. Environmental Protection Agency has approved DEQ's 1998 list. The Sandy River is listed for temperature, downstream reaches of Johnson Creek are listed for toxics, bacteria, temperature. Beaver Creek is currently being studied for a potential listing on the 2002 update. This listing is important to keep in mind while formulating the Goal 5 program. Any program should consider not only direct impacts to the Goal 5 resources, but also impacts to the Goal 5 resource that can affect a 303(d) listing.

West of Sandy River

Map 2

Zoning Within Resource and Impact Areas
Overview



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4. ESEE Components

This section contains an overview of the elements in the analysis. The goal of the Economic, Social, Environmental and Energy (ESEE) analysis is to provide a rational basis for land use decisions in the study area. The ESEE does not include "what-if" scenarios for actions that otherwise would not be permitted under the current zoning ordinance.

The goal is to quantify the impacts of protecting significant Goal 5 resources. The ESEE analysis includes impacts upon property value (economic), quality of life (social), natural resource value (environment) and energy.

4.1 Components of the ESEE Analysis

Goal 5 requires the following steps to perform the ESEE (660-023-0040)

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

The results of the ESEE evaluation are used as the basis for development of a riparian corridor and wildlife habitat protection ordinance to protect these resources pursuant to Goal 5.

4.2 Conflicting Uses

Goal 5 directs local governments to identify conflicting uses that exist, or could occur within the impact area of significant Goal 5 resource sites. To identify these uses, local governments are directed to examine land uses allowed outright or conditionally within the zones applied to the resource site and in its impact area. Local governments are not required to consider uses that would be unlikely to occur in the impact area because existing permanent uses occupy the site. The following also applies in the identification of conflicting uses:

(a) If no uses conflict with a significant resource site, acknowledged policies and land use regulations may be considered sufficient to protect the resource site. The determination that there are no conflicting uses must be based on the applicable zoning rather than ownership of the site. (Therefore, public ownership of a site does not by itself support a conclusion that there are no conflicting uses.)

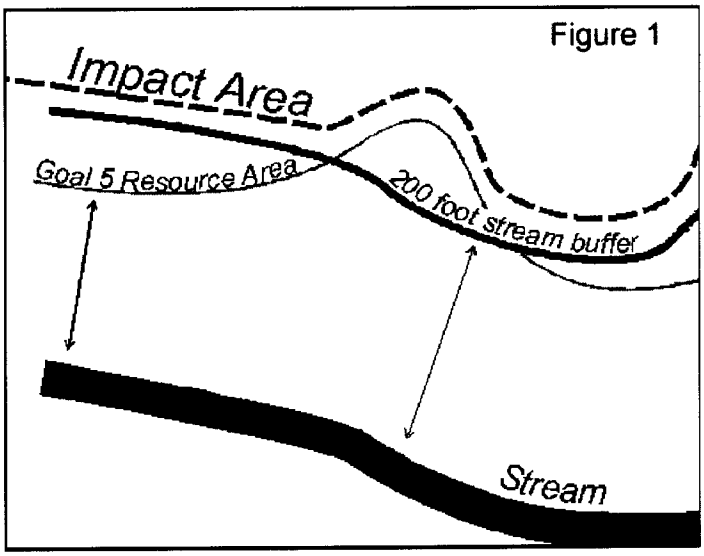
(b) A local government may determine that one or more significant Goal 5 resource sites are conflicting uses with another significant resource site. The local government shall determine the level of protection for each significant site using the ESEE process and/or the requirements.

The discussion of conflicting uses in the West of Sandy plan area is included in Section 5 of this report.

4.3 Impact Area

Local governments must determine an impact area for each significant resource site. The impact area must be drawn to include the area in which allowed uses could adversely affect the riparian corridor or wildlife habitat site. The impact area defines the geographic limits within which to conduct the ESEE analysis for the identified significant resource site. The impact area for the West of Sandy River plan has been drawn as selectively as possible based on observed conditions in the field, aerial photography, and public comments.

Figure 1



The impact area for riparian corridor and adjacent wildlife habitat resource areas has been developed using a nested approach. The size of the impact area varies with the type of natural resource and the slope in the immediate vicinity. The first boundary has been drawn to include a minimum of 200 feet from all streams that are mapped in the study area. Please see chapter 6.4 "riparian areas" and "wildlife habitat" for a discussion of habitat needs and impact areas. This distance is based both in the science of the functions and values of riparian corridors and the need for the County to adopt a Title 3 Water Quality and Floodplain ordinance that may include riparian corridors up to 200 feet wide. Appendix H contains tables summarizing some of the scientific research into habitat needs.

660-023-0010
(3) "Impact area" is a geographic area within which conflicting uses could adversely affect a significant Goal 5 resource.

The second boundary has been drawn to extend 25 feet from the outer edge of all wildlife habitat areas. This distance was used to protect the root zone of forest resources. The final boundary includes the top of all slopes that are equal to or greater than 25% (measured in rise over run). This method was used since activities on steep slopes may contribute to impacts upon riparian corridors. Please see the report section subtitled 6.4, "riparian areas" and "wildlife habitat" for a discussion of how these measurements were obtained.

The project team used GIS (Geographic Information Systems) to create the boundaries. The original stream mapping was obtained though the RLIS (Regional Land Information System) data maintained by Metro. This information was supplemented by field

observed stream locations. The field biologists created wildlife habitat and riparian boundaries through the use of aerial photography and off-site inventory methods.

4.4 ESEE Scenarios

As Goal 5 directs, the ESEE analysis looks at two aspects of three different scenarios for each resource group. This analysis is included within section 6 of this report.

Scenario One

- The impact upon the natural resource site if the conflicting use is prohibited
- The impact upon the permitted use (including conditionally permitted uses) if the conflicting use is prohibited

Scenario Two

- The impact upon the natural resource site if the conflicting use is partially permitted
- The impact upon the permitted use (including conditionally permitted uses) if the conflicting use is partially prohibited

Scenario Three

- The impact upon the natural resource site if the conflicting use is permitted
- The impact upon the permitted use (including conditionally permitted uses) if the conflicting use is permitted

4.5 Analyze The ESEE Consequences

Local governments must analyze the ESEE consequences that could result from decisions to allow, limit, or prohibit a conflicting use. The analysis may address each of the identified conflicting uses, or it may address a group of similar conflicting uses. A local government may conduct a single analysis for two or more resource sites that are within the same area or that are similarly situated and subject to the same zoning. A local government may conduct a single analysis for a site containing more than one significant Goal 5 resource. The ESEE analysis must consider any applicable statewide goal or acknowledged plan requirements, including the requirements of Goal 5. The analyses of the ESEE consequences shall be adopted either as part of the plan or as a land use regulation.

4.6 Develop a Program to Comply with Goal 5

Local governments are required to determine whether to allow, limit, or prohibit identified conflicting uses for significant resource sites. This decision must be based on and supported by the ESEE analysis. A decision to prohibit or limit conflicting uses protects a resource site from the impacts of development. A decision to allow some or all of the conflicting uses for a particular site may also be consistent with Goal 5, provided it is supported by the ESEE analysis. The possible outcomes of the analysis are listed in the Goal 5 Rule as follows:

(a) A local government may decide that a significant resource site is of such importance compared to the conflicting uses, and the ESEE consequences of allowing the conflicting uses are so detrimental to the resource, that the conflicting uses should be prohibited.

(b) A local government may decide that both the resource site and the conflicting uses are important compared to each other, and, based on the ESEE analysis, the conflicting uses should be allowed in a limited way that protects the resource site to a desired extent.

(c) A local government may decide that the conflicting use should be allowed fully, notwithstanding the possible impacts on the resource site. The ESEE analysis must demonstrate that the conflicting use is of sufficient importance relative to the resource site, and must indicate why measures to protect the resource to some extent should not be provided, as per subsection (b) of this section.

5 Conflicting Uses

5.1 Introduction

Following the inventory of Goal 5 resources, local governments must identify conflicting uses that could occur within inventoried resource sites. According to the Goal 5 administrative rule, a conflicting use is one that is customarily subject to land use regulations and, if allowed, could negatively impact a significant resource site. To identify potential conflicts, the rule directs local governments to examine the uses allowed within broad zoning categories. The zoning categories in the West of Sandy River area are described in section 3.2, and include Exclusive Farm Use, Commercial Forest Use, Multiple Use Agriculture, Rural Residential, and Rural Center. The various uses allowed in these zones are listed in section 5.3 of this report.

Section 5.2 below describes the conflicting uses that could be allowed in the zones and groups them into the broad categories of agriculture, forest, rural residential, commercial, industrial, and public facilities. The intent is to discuss the impact of these uses in a broad context and to set up the more detailed discussion of the conflicting uses that takes place in section 6, the ESEE analysis. Section 5 provides a detailed list of uses with impacts. Section 6 takes into consideration the unique conditions of the resource sites and examines in more detail how the conflicting uses listed here are considered in the economic, social, environmental, and energy context.

Agricultural Practices
Agricultural uses are permitted outright in all zones except RR, where "Limited Farm Use" is permitted as a primary use. Approximately 7,100 of the total 10,000 acres in the area are in two agricultural zones, EFU and MUA-20 as shown in Table 3. Nearly 1,000 acres in each of these zones falls within the impact area of riparian corridors or wildlife habitat (see Table 7 pg 51). The landscape of the study area is characterized by agricultural uses that include predominately nursery and berry farming, and pastures. There is at least one small sheep raising operation, and there may be other small livestock farming uses as well. The conflicts that can occur between farm uses and wildlife habitat are several. Wildlife connectivity often suffers from the presence of large areas of cultivated land that has no forest cover or is enclosed by fencing that prevents the migration of animals from various areas within their range. The use of pesticides and fertilizers that often accompanies farm uses may discourage native species from flourishing and limit the nature of forage for other species. This impacts both native plant and animal species.

Some farm practices impact riparian corridors in the plan area where crop management areas extend into the corridor. Livestock found at the edge of a stream can destroy riparian vegetation and trample stream banks. Unfiltered runoff from areas used by livestock can get into the stream and often contributes elevated levels of nitrogen and other nutrients that can impact both fish habitat and native plant habitats.

State statutes delegate regulation of farm practices for the protection of water quality to the Oregon Department of Agriculture, and the Senate Bill 1010 planning and rule provisions of (ORS 568.900 through 568.933, OAR 603-090-0000 through -0120). For this reason, the zoning ordinances that will be used to protect fish and wildlife in the plan area will not regulate farm practices. Farm practices common to the area include tilling, clearing, planting, harvesting, spraying of chemicals, irrigation, grazing, and livestock management. Development activities that occur on farm land are proposed to be subject to the habitat protection ordinances, and are therefore considered as conflicting uses in the ESEE analysis. Development activities may include, for example, barn and outbuilding construction or remodeling, construction of horse arenas, and manipulation of riparian vegetation for landscaping purposes.

Forest Practices

The propogation and harvesting of forest products is permitted outright in all zones in the plan area. The plan area contains approximately 2,075 acres of forest land in the CFU zone, most of which is within the Sandy River canyon. Nearly 90% of this land is within Goal 5 areas associated with wildlife habitat and riparian corridors. Typical forestry involves the construction of access roads, cutting of timber, clearing the site, and then replanting the site with a single commercial species. This practice impacts exiting habitat conditions and may have significant impacts upon resource units. Impacts range from habitat fragmentation to the loss of native plant and animal species.

In the West of Sandy study area, much of the forested land is on steep side slopes of the Sandy River canyon. The predominate soil type is Halumbrepts, and is characterized in the Soil Conservation Service manual as subject to slumping and erosion. Commercial forest practices on steep slopes can lead to erosion and geologic instability due to the loss of the root structure that holds fragile soils together. This results in deposition of sediments into adjacent riparian areas. This process also results in the loss of fish habitat due to the sedimentation of gravels and pools that fish depend upon, as well as impacts to water quality through increased sediment loading.

Typical forest practices often involve the application of chemicals to encourage the growth of commercial tree species. By encouraging the growth of a single tree species, the wide range of other plant species that would otherwise be present is reduced or eliminated. As a result, the structure of the forest is changed from one with a developed ground cover, shrub, hardwood, and evergreen layer, to one with a single canopy of a single species. The wildlife habitat typically found within the structure is thereby eliminated.

In addition to the proposed designation of the Sandy River canyon as significant fish and wildlife habitat under this plan, all of the land within ¼ mile of the Sandy River except for a short segment at the north end of the plan area, is already designated as a Scenic Waterway and a Goal 5 resource. As is the case for farm practices, regulation of timber harvest is delegated to the Oregon Department of Forestry under state statutes. Commercial timber harvest operations that are carried out under the Department of Forestry and Scenic Waterway programs are therefore not proposed for

regulation under the plan and are not considered as conflicting uses in the ESEE analysis.

5.2 Conflicting Uses in Riparian Corridors and Wildlife Habitat Areas

There are a number of potential conflicting uses in the study area. As Goal 5 allows, they can all be grouped into the broad categories of agriculture, forestry, rural residential, commercial, industrial, and public facilities. It is important to note that some of these broad categories are represented in more than one zone. For example, public facilities are allowed in some capacity in all zones, as is agriculture.

Agriculture Uses
As described above, agricultural practices are an allowed use in all zones, but are not regulated by the County. There are, however, a number of uses allowed within the agricultural zones that are regulated by the County, and which represent conflicting uses within riparian corridors and wildlife habitat areas. The entire list of these uses is included in Section 5.3. Conflicting uses within the agriculture zones include commercial uses in conjunction with farm uses, cottage industry and dwellings. These uses are described in the Commercial, Industrial and Residential sections below.

Road building and public utilities such as radio towers, transmission towers and utility facilities necessary for public services are all similar in impacts to those conflicting uses described in the public facilities section below.

Expansion of existing schools and churches have similar though sometimes fewer adverse impacts as those described for commercial uses. Also included in the farm zones are wineries and farm stands, which also have impacts similar to those described in the commercial uses section.

Parks and other recreational facilities such as playgrounds can cause impacts to resources while providing for a public good. Parks and open areas 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 tennis courts, and construction of buildings are activities commonly associated with development of parks and open areas. The environmental consequences of these activities are similar to those described for residential uses except that normally a smaller percentage of land areas is covered by impervious surfaces. Unleashed domestic animals in parks and open areas can injure or kill wildlife.

Commercial activities that are associated with farm use, construction of new buildings, and other development activities that can occur on farm land are conflicting uses. The County may place appropriate conditions of approval to limit their impact upon resource functions and values when the County zoning code provides for this.

The county can also provide information regarding local programs available in the study area that encourage sustainable farm practices and other methods that result in minimum impacts or the elimination of impact to natural resources from farm uses.

Forestry Uses

As described above, forestry practices are an allowed use in all zones, but are not regulated by the County. There are, however, a number of uses allowed within the forestry zone that are regulated by the County, and which represent conflicting uses within riparian corridors and wildlife habitat areas. The entire list of these uses is included in Section 5.3. Those uses include many of the same uses described in the agriculture section, residential, commercial, industrial, road building, public facilities (including transmission towers and distribution lines), and parks and recreational facilities.

In addition to those use previously described, there are a number of uses that are unique to the forestry zone, including structures associated with forestry or conservation, solid waste disposal sites and landfills, forest product processing, logging equipment storage and repair, log scaling and weigh stations and aircraft landing areas. Structures associated with forestry and conservation uses, including inhabited and uninhabited structures have an impact similar, but probably lesser than those impacts described in the residential section. The structure would require site clearing leading to habitat disruption, erosion and other similar impacts. Roads would be required for maintenance and construction and utility lines would need to be run to provide electric service.

Solid waste disposal and landfills have substantial impacts to resources. As with mining operations (also allowed in the forestry zone) all resources are destroyed with the creation of a landfill. In addition to the short-term impact of resource removal, long-term impacts could include leaching of hazardous wastes, continued maintenance to prevent natural gas build up and the inability to reestablish significant forest growth.

Forest product processing, logging equipment storage and repair and log scaling and weigh stations have impacts similar to those described in the industrial section. These uses are characterized by large amounts of impervious surface, disruption of habitat through clearing and operations and the use of potentially hazardous chemicals that could cause significant resource degradation if a spill were to occur.

Residential

Residential uses are permitted outright in the RR, MUA-20 and RC zones, and conditionally in the EFU and CFU zones. Rural Residential uses are prominent in the study area. The study area contains a diverse mix of small lot rural residential use, to larger lot hobby farm residences. Rural residential uses in the area typically rely upon septic systems to provide sanitary sewer, and wells are used for water service in some areas. In high densities, septic systems can infiltrate groundwater and the use of wells can impact the level of the water table. Soils in the area typically hold water near the surface, and drainage measures are sometimes necessary to remove water from the

drainfield area in order for the system to function properly. Density varies but residential density in the area increases to one dwelling per acre in the Orient Rural Center area. There are no sanitary sewers in the area, and the roadside stormwater system has limited capacity.

Rural residential development often results in the fragmentation of native landscapes. Large lawns and landscaped areas, long graveled or paved driveways, stream crossings, and multiple buildings with large areas of impervious surface all contribute to this fragmentation. 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. Increased impervious surface or compacted soils and loss of tree cover can increase runoff and may result in warm water entering a stream and contribute to water temperatures too high for healthy habitats. Large lawns and landscaped areas are often treated with fertilizers and pesticides that can end up in adjacent streams and wetlands.

Common residential landscaping as well as the removal of native vegetation may reduce natural resource values. Landscaping often includes invasive and other non-native species that compete with native vegetation. The use of products including fertilizer and pesticides is generally associated with residential development and if used improperly may have a detrimental effect on the significant natural resource site. Household lights and loud noises can be another significant impact by disturbing the breeding and predator instincts of animals. Activity levels as defined by noise and movement increase from between 10 and 100 times that of normal (natural systems) producing disruptions in competition, communication, mating and predation habits of animals[4].

The project team found many examples of good stewardship in the study area. Along with encouraging these users, the County can also provide educational information regarding techniques to live near Goal 5 resources with minimum impact or possibly even improve the functions and values of the site.

Commercial

Commercial uses are currently allowed only as a conditional use in the RC and RR zones. Commercial uses are generally characterized by a high level of disturbance. Existing non-farm commercial uses in the area are concentrated in the Orient and Pleasant Home Rural Centers. Smaller scale home occupations and farm related commercial uses exist in limited numbers throughout the study area. Disturbances include site clearing, large building footprints, and large parking areas. The large impervious areas associated with these uses can result in increased stream temperatures and decreased water quality due to runoff from these areas flowing into local wetlands, riparian areas and streams. Storage of chemicals and other toxics related to commercial uses is also a concern. Common sources include gas tanks,

[4] Brown, Gardener M. and Henry O. Pollakowski. (1977). "Economic valuation of Shoreline," *Review of Economics and Statistics.* v.59

motor oil, and other lubricants and solvents associated with commercial vehicles and maintenance and repair facilities. If uncontained, these products may find their way into local resource sites as stormwater carries them away.

Commercial activities are usually conditional uses under the County zoning code, and the County may place appropriate conditions of approval to limit their impact upon resource functions and values when the County zoning code provides for this.

Industrial
Limited industrial uses that are associated primarily with resource management are allowed as conditional uses in all zones in the plan area. Industrial use is generally considered the most intensive level of development. Industrial uses are generally the most intrusive on the landscape due to maximization of floor area ratios, large parking and loading areas, and well as potential sources of toxic run-off, effluent, are factors that are generally detrimental to significant natural resource sites.

Industrial uses often require complete site clearing and grading, with the retention of few if any natural resources on a site. They can have more severe environmental effects than commercial uses. Industrial uses often draw substantial amounts of water from wells and public water sources, which can draw down on the water table resulting in reduced stream flows.

Public Facilities
Public facilities are allowed conditionally and in limited cases outright in all of the zones in the plan area. Public facilities generally consist of a wide range of uses from building pump stations, roads, schools, parks, and other Community Service uses that are both privately and publicly operated. The impacts from these facilities are highly variable and specific to the individual developments.

Construction of roads associated with outright and conditional uses results in concentration of surface water, compaction of soils and the resulting loss of water absorption and higher runoff rates, alteration to groundwater recharge (alteration of area hydrology), erosion of side slopes, ditches, and the surface of unpaved roads.

Basic utilities are infrastructure services such as water and sewer pump stations, electrical substations, utility towers, radio towers and water towers that need to be located in or near the area where the service is provided. Although operation of existing facilities may have few adverse environmental effects, construction, maintenance, and upgrading of basic utilities can have a variety of adverse effects. These activities often create cleared corridors which increase wind and light penetration into forest and other habitats providing opportunities for the establishment of invasive, non-native plant species. Construction often fragments wildlife habitat areas, degrades wetlands and streams, increases stormwater runoff and erosion, and reduces forest cover. Basic utility construction generally has the same effects as those described for housing. Certain types of basic utilities, such as stormwater retention areas, sediment traps, and constructed wetland pollution treatment facilities can have beneficial environmental

effects if located without disruption to existing resources. However, replacement of existing resources areas with these facilities can have significant detrimental effects.

Due to the highly variable nature of the public facilities, it is difficult to assess the impact that *could* take place. Generally, any implementation of a natural resource program should include a mechanism for the review of the impact these developments may have to the natural resource functions and values, and the projects designed to maintain or replace any disturbed natural resource values.

5.3 Multnomah County Zoning Uses

Please note that these use descriptions are more general in nature than found in the zoning ordinance. Conflicts that are considered as part of this Goal 5 analysis are conflicts that *could* occur in reasonable scenarios.

EFU Exclusive Farm Use

Permitted Outright
Farm Use
Accessory Farm Buildings
Forestry
Exploration and Production Of Geothermal Resources
Exploration and Extraction Of Minerals
Road Building
Creation, Restoration, Enhancement of Wetlands
Replacement Dwelling
Expansion/Maintenance of Existing Schools
Expansion/Maintenance of Existing Churches And Cemeteries

Permitted Under Prescribed Conditions
Utility Facilities Necessary for Public Service
Radio Towers
Dwellings
Kennels
Farm Stands
On-Site Filming Activities
Winery
Structures Necessary for Public Safety

Conditional Uses
Commercial Activities in Conjunction With Farm Use
Geothermal and Aggregate Operations
Dwelling
Parks, Playgrounds, Hunting and Fishing Preserves, other Recreational
Home Occupations
Processing Forest Products

Hardship Dwelling
Transmission Towers
Kennels
Propagation, Cultivation, Maintenance of Aquatic Species
Road Building
Dwelling

Accessory Uses
Accessory Structures
Structures and Fencing for Poultry or Livestock
Signs
Off-Street Parking and Loading
Home Occupation

CFU Commercial Forest Use

Permitted Outright
Forest Uses
Forest Processing
Farm Use
Replacement Dwelling
Resource Conservation
Uninhabitable Structure in Association with Fish and Wildlife Enhancement
Caretaker Residence for Public Park or Fish Hatchery
Local Distribution Lines
Road Building
Lookout Tower for Forest Fire Protection
Water Intake Facility
Temporary Forest Camp
Exploration for Aggregate Resources
Exploration for Geothermal Resources
Solid Waste Disposal Site
Emergency Actions

Permitted Under Prescribed Conditions
Dwellings
Community Service Uses
Campground
Cemetery
Fire Station
Aid to Navigation and Aviation
Water Intake Facility
Reservoir
Distribution Lines
Forest Research and Experimentation Facility
Parks

Utility Facility
Transmission Towers
Dump/Landfill
Private Hunting and Fishing Facilities
Mining/Production of Geothermal Resources
Aggregate Mining
Forest Product Processing
Permanent Logging Equipment Storage And Repair
Log Scaling and Weigh Stations

Conditional Uses
Road Building
Aircraft Landing Areas in Conjunction with Forest Use
Home Occupation
Large Lot and Template Dwellings

Accessory Uses
Accessory Structures
Signs
Off-Street Parking and Loading
Home Occupation

Temporary Uses
Hardship Dwelling
Batch Plant for Road Building
Mobile Home

MUA-20 Multiple Use Agricultural

Permitted Outright
Farm Use
Forest Uses
Dwelling
Resource Conservation
Emergency Activities
Retail/Wholesale Farm Sales
Structures for Public Safety

Conditional Uses
Community Service Uses .7005-.741
Mining/Geothermal
Commercial uses in conjunction with farm use
Raising fowl
Feed lots
Raising swine
Raising fur bearing animals

Commercial dog kennels
Commercial uses in conjunction with forest use
Houseboats and houseboat moorages
Planned developments
Cottage industry
Rural commercial services
Tourist commercial uses
Home occupations
Large fills

Accessory Uses
Accessory Structures
Signs
Off-street parking and loading
Home occupation
Family day care

RC Rural Center

Primary Uses
Farm Use
Forest Use
Dwelling
Resource Conservation
Emergency Actions

Uses Permitted Under Prescribed Conditions
Dwelling
Farm Stands
Emergency Actions

Conditional Uses
Community Service Uses (.7005-.7001)
Rural service commercial
Tourist commercial
Light Manufacturing (.5120)
Commercial processing of agriculture and forest products grown in the vicinity
Planned Development
Light Industrial
Home occupations
Large fills

Accessory Uses
Accessory Structures
Signs
Off-street parking and loading

Home occupation
Family day care

RR Rural Residential

Primary Uses
Limited farm use
Forest use
Dwellings
Resource conservation
Emergency actions

Uses Permitted Under Prescribed Conditions
Dwelling
Farm Stands
Structures for Public Safety

Conditional Uses
Community Service Uses
Geothermal
Commercial uses in conjunction with farm uses
Raising/Processing fowl
Feed lots
Raising swine
Raising fur bearing animals
Kennels
Planned development
Cottage industry
Rural commercial services

Accessory Uses
Accessory Structures
Signs
Off-street parking and loading
Home occupation
Family day care

Tables 3,4, 5 and 6 on page 50 provide the specific quantities of each type of zoning that can be found in the study area (660-023-0030(4)(a). The table provides the quantity of each zone that can be found in the study area, in significant resource units by type, as well total acreage found in each drainage.

Table 3, 4 and 5: Zoning in the Study Area and in the significant natural resource units. See Tables 6 and 7 for a more detailed analysis of the zoning of each resource unit.

Table 3: Total Zoning Acreages in the Study Area

Zone	Description	Total Acres
EFU	Exclusive Farm Use	3727
MUA20	Multiple Use Agriculture	3398
CFU	Commercial Forest Use	2075
RR	Rural Residential	647
RC	Rural Center	209

Total Acreage of Study Area 10,056

Table 4: Zoning And Acreage Of Isolated Upland Wildlife Habitat Resources By Resource Unit

Unit	Zone	Acres
U1	CFU	59.5
U2	EFU	20
U3	MUA-20	6.5
~~U4~~	~~MUA-20~~	~~8.7*~~
~~U5~~	~~MUA-20~~	~~8.5*~~
U6	MUA-20	12
~~U7~~	~~EFU~~	~~6.9*~~
~~U8~~	~~MUA-20~~	~~2.4*~~
U9	RR	9.7

*Mapped but not *significant* after evaluation

Table 5: Total Acreage Of Each Zone Found In Significant Wildlife Habitat Resources Unit, by Drainage

Beaver Creek	
CFU	42
EFU	223
MUA20	167
RR	141

Johnson Creek	
EFU	53
MUA20	286
RC	7

Kelly Creek North	
EFU	9
MUA-20	5

Kelly Creek South	
CFU	73

Sandy River	
CFU	1449
EFU	230
MUA20	12
RR	214

Source: Metro RLIS, 2001 and FES, 2001

Table 6: Acres Of Each Zone Found in the Goal 5 Resource Area and The Impact Area , Combined, by Drainage

Beaver Creek	
CFU	52
EFU	463
MUA20	370
RR	207

Johnson Creek	
EFU	141
MUA20	566
RC	26

Kelly Creek North	
EFU	32
MUA-20	23

Kelly Creek South	
CFU	178

Sandy River	
CFU	1580
EFU	333
MUA20	23
RR	240

Table 7: Summary of the Zoning and Total Acres in the Goal 5 Areas *															
Zone	Total Acres in Study Area	Total Acres of Goal 5 Areas	Percentage of Study Area in Goal 5 Acres	Acreage of Goal 5 Area, and Percent of Total Goal 5 Area in the Study Area, by Watershed										Total %
				Sandy	%	Johnson	%	Beaver	%	Kelly North	%	Kelly South	%	
EFU	3727	983	26%	333	34%	141	14%	463	47%	32	3%			99%
CFU	2075	1808	87%	1580	87%	0	0%	52	3%			178	10%	100%
MUA20	3398	992	29%	23	2%	566	57%	370	37%	23	2%			99%
RR	647	447	69%	240	54%			207	46%					100%
RC	209	26	12%			26	100%							100%
Totals	10056	4256	42%	2176	177%	733	171%	1092	134%	55	6%	178	10%	498%

Total % of Study Area in Impact Areas: 42%

* "Goal 5 Areas" includes the Goal 5 resources and associated Impact Areas.

6 ESEE Analysis

6.1 Introduction

The ESEE analysis is composed of two distinct parts. The first part includes an analysis of common uses in the study area. These uses are grouped to allow for a more efficient analysis in broad topic areas. The second part of the ESEE analysis includes a more detailed look at the resource sites. The resource sites are not analyzed individually, but as allowed by Goal 5, have been grouped by drainage to allow for an efficient analysis. The five drainages include:

- Sandy River
- Johnson Creek
- Beaver Creek
- Kelly Creek North
- Kelly Creek South

6.2 ESEE Impacts Common Throughout The Study Area

There are five principal land uses in the West of Sandy study area.

- Agricultural Uses
- Forestry Uses
- Rural Residential
- Public Facilities
- Commercial and Industrial

It is important to note that the County does not have the authority to regulated farm and forest practices. These uses are regulated under state law and as a result the County does not have the ability to address conflicting uses that result from these practices.

The list of uses found in section 5.3 is a more comprehensive list of uses as they are listed in the zoning ordinance. These additional uses generally take place within the context of the broad categories listed above.

This section of the ESEE report discusses these broad categories of uses as they occur throughout the Study area. Other more specific uses are discussed in section 6.7.

Some generalizations can be made regarding the conflicts between development and natural resources. First, environmental protection often results in lost economic value when potential development is limited. On the other hand, development often degrades natural resources functions and values when in conflict. Social impacts of limiting conflicting uses are mixed. Often times the lack of development may result in the loss of jobs. Alternatively, communities often enjoy the presence of intact natural resources

as well as the benefits that they provide. Energy consequences are often felt when more roads are built or more industry developed.

The following section discusses common ESEE impacts that occur evenly throughout the study area. In the following section titled "Drainage Maps and Unique ESEE Discussions", ESEE consequences that are unique and specific to individual sites and zoning are discussed.

6.3 Economics Impacts Analysis

Economic Values of Riparian Corridors and Wildlife Habitat

Although the economics of riparian corridors are not subject to the traditional marketplace, the Endangered Species Act (ESA) has forced local governments to consider economics more closely with regard to natural resource protection programs.

A primary economic threat stemming from riparian corridors is a "Take" lawsuit under the ESA. If, through a lawsuit, a local jurisdiction is found to be responsible for the "take" of an individual or the habitat of an individual threatened or endangered species there may be direct economic penalties as well as an order to change the practice in question. This may be as expensive or more expensive than any punitive damages. It would be financially devastating to a local jurisdiction if, for example, they were ordered to restore large portions of developed riparian corridors to a properly functioning condition or install or upgrade a comprehensive stormwater management system due to the lack of a riparian corridor that provides a water filtration function.

> "Harm in the definition of "take" in the Act means an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering."

It is equally difficult to provide hard economic data for the economic activity generated from fishing, hunting, recreation and the associated business that relies upon intact riparian corridors and wildlife habitat areas to provide for healthy populations of fish, wildlife and other recreational opportunities. The Sandy River riparian corridor is one of the most important and heavily used recreational riparian corridors in the region drawing large numbers of people from inside and outside the study area for park use, boating, fishing, hiking and other outdoor activities.

The farm economy, particularly as it relates to nursery operations, is an important feature in the study area. Several characteristics of this area explain the relative strength of its nursery economy. First, proximity to the metropolitan area is key. It allows these firms access to transportation wholesalers, saving time and cost in the transport of nursery stock. The area is also close to PDX airport, allowing nursery

buyers better access to their market. In addition, this location allows nursery owners closer connections to suppliers and the urban labor force, an essential component of an industry dependent upon seasonal labor.

Within the study area alone, there are approximately 130 Oregon Department of Agriculture licenses for nursery-related operations, including: cash buyers, Christmas tree growers, greenhouse growers, nursery stock growers, nursery dealers and landscape contractors, and wholesale produce dealers. Nursery stock growers constitute the bulk of nursery-related businesses found in this study area. This area contains not just nursery and farming operations, but over 20 businesses (among others) that focus specifically on agricultural and farm services, nursery supplies, feed stores, landscaping, trucking and warehousing, food processing and farm production/raw materials.

The economic Impacts of allowing conflicting uses in riparian corridors and wildlife habitat.

Agricultural Uses, Forestry Uses, Rural Residential, Public Facilities, and Commercial and Industrial Uses

Farming, farm related uses and residential uses have been established through a long history in the study area. Due to this development some riparian corridor areas are highly impacted and the lack of intact riparian vegetation contributes to the high temperatures and the 303(d) listings of Johnson Creek and the Sandy River. These are serious issues for fish habitat in these systems. If current practices are not improved in some areas, the conditions of riparian corridors are not likely to improve. If "take" lawsuits follow, property owners and the County may suffer economic consequences.

Continuing to allow agriculture and its supporting uses will likely lead to the continuation, and the possible expansion, of the nursery economy. In addition, 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 or within these features often have higher property values and can produce greater tax revenues. Allowing additional commercial and industrial development in the area will generally maintain the property values of those lands where these activities are allowed and thus maintain the property taxes paid to the County for these properties.

The economic impacts of limiting conflicting uses in riparian corridors and wildlife habitat

Agricultural Uses, Forestry Uses, Rural Residential, Public Facilities, and Commercial and Industrial Uses

Limiting conflicting uses through the application of a protection program may increase the soft costs (e.g. planning and design) of a development. Limits may impose constraints on business owners that increase the cost of business and prevent small business owners from expanding their operations. However,

limiting conflicting uses can also lead to some economic gain for a property owner looking to develop a portion of their property, as lots that are adjacent to protected resources often have higher value. Limiting agricultural related uses may have some impact on the nursery economy in the study area, but because of much of the infrastructure for the farming is in place and has been occurring in the study areas for many years that impact is likely to be minimal.

The economics impacts of prohibiting conflicting uses in riparian corridors and wildlife habitat.

Agricultural Uses

If conflicting agricultural use were eliminated, as well as activities in conjunction with farm use, a decline in total acres of agricultural land may result. This may result in a direct loss of income to individual farmers and/or property owners.

Forestry Uses

If forest use and uses in conjunction with forest use are prohibited, individual property owners may loose a potential source of income from forest products on their land. If accessory uses, including large lot and template dwellings were prohibited, the potential increase value that is realized from having buildable lots may be lost.

Rural Residential

If rural residential uses are prohibited property owners may suffer a loss of property value if a building site cannot be located on the property. On the other hand, properties that already contain dwellings may realize an economic benefit from the prohibition of additional dwellings. If a prohibition leads to the preservation of open space and a rural character that the residents value as an amenity, then existing property owners may see an increase in property value. Although no conclusive studies exist for the West of Sandy study area, the County may lose an opportunity for an increase in the tax base if additional development is prohibited. But on the other hand again, if the prohibition of additional dwellings is valued by the residents of the area, this loss of a potential increase in the tax base may be offset by the increased value of existing dwellings. In some cases prohibiting conflicting residential uses may lead to the loss of all economic value to individual property owners, resulting in a lawsuit or the requirement that the County purchase their property.

Public Facilities

The existing transportation system is well established so there are few large economic impacts from prohibiting the construction or improvement of new roadways. However, prohibiting new driveways or private roads for all uses in the study areas is likely to cause significant economic hardship to some landowners, particularly those who have the ability to further subdivide their land for residential uses.

Commercial and Industrial

Prohibiting new commercial and industrial uses could cause property owners to suffer a loss of property value if a building cannot be located on the property. The loss of property value would eventually lead to a loss of property taxes collected by the County. Prohibiting new commercial or industrial services in the study area may also cause people to travel greater distances for those services expending some money in transportation costs and time.

Conclusion

Based on the above analysis, it is clear that from an economic impact standpoint, limiting conflicting uses is the most appropriate recommendation.

6.4 Environmental Impacts Analysis

To understand the environmental impacts that may result from conflicting uses, a discussion of the functions and values of riparian corridors and wildlife habitat follows. The intent is not to present a discussion that includes the full range of detail concerning riparian corridor and wildlife science. Rather, a brief discussion of the core functions and values has been included for the sites that have been rated in the data sheets found in appendix A and B.

Riparian Corridors

The Goal 5 riparian corridors provide essential habitat for many fish and wildlife species during critical life stages and development. They provide basic food and shelter and serve as travel corridors for the movement of fish and wildlife across the landscape. The corridors protect water quality as stormwater runoff is filtered before it flows into streams. A well-vegetated corridor can moderate stream temperatures.

The importance of riparian corridors includes:

- Habitat for terrestrial wildlife. Native vegetation provides food and shelter. It can also provide a corridor for the movement of wildlife and refuge during drought and wild fires.

- Food, shade, and shelter for aquatic organisms. Riparian vegetation provides detritus, or organic matter, which breaks down and provides food for aquatic invertebrates. Shade from riparian vegetation helps maintain cool water temperatures in pools. In addition, fallen branches, large woody debris and aquatic plants provide habitat for instream fauna such as native fish and other macroinvertebrates.

- Bank and bed stability. Native riparian vegetation is important in the prevention of streambank erosion. Vegetation binds soil and provides "roughness" that reduces flow rates, particularly during flood events. Vegetation at the "toe" of

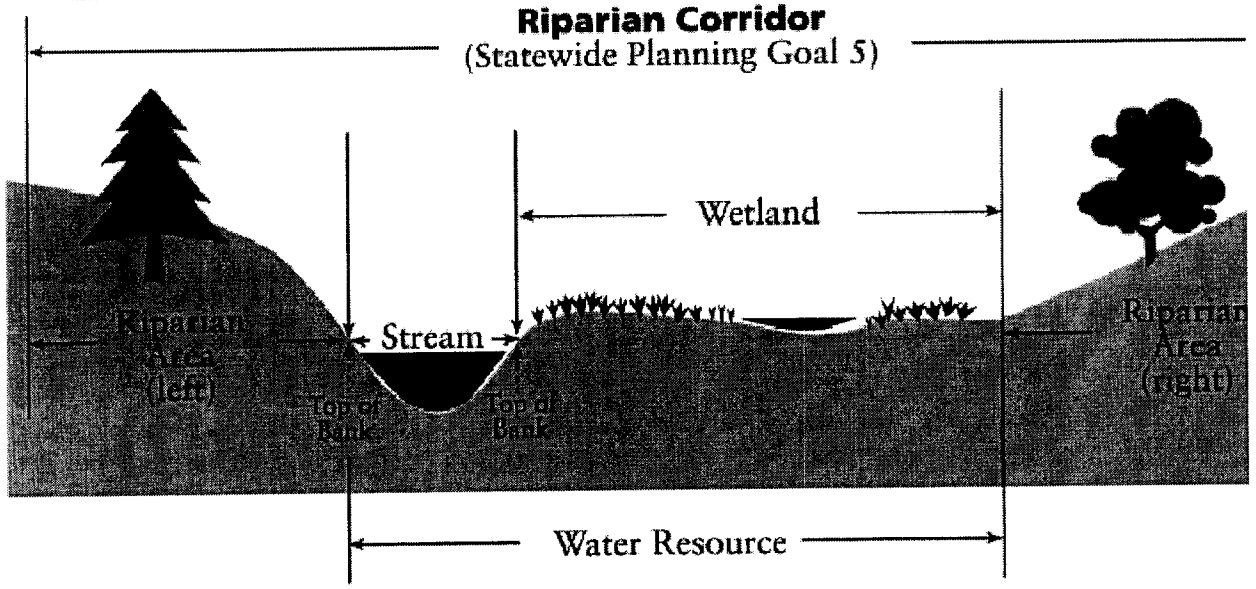
riverbanks is especially important to riverbank stability, particularly on outside bends of meanders and on other banks where flow is deflected.

- Buffer to nutrients and sediment. Vegetated riparian zones maintain water quality by filtering sediment and nutrients, and reducing the amounts entering a watercourse. Any vegetation that provides a dense cover at ground level will be an effective buffer.

- Aesthetic benefit and intrinsic value. Riparian vegetation has an inherent aesthetic and intrinsic worth that is difficult to value in monetary terms. Different people value the aesthetic or intrinsic features of riparian areas differently. This often depends on their association with and understanding of these areas. For many landowners the aesthetic appeal of trees on farms is a primary motivation for wanting to manage river and creek systems.

- Stream channel morphology and habitat. Large wood recruited to small and medium streams from riparian forests can play a major role in forming and maintaining stream channel morphology. Large wood also provides in-stream structure that is an important aquatic habitat component.

Figure 2



There is an active discussion within the community of ecologists and regulating agencies regarding the appropriate width of a riparian corridor management area. The draft version of Metro's CPR includes a table of preferred "riparian area widths" for various fish and wildlife species. The table includes 29 separate widths that apply to

particular species and/or functions. The recommended widths vary from 15-656 feet[5]. Of these, Metro chose 175 feet plus an additional impact area that can increase the width to more than 200 feet. This "riparian management area" (RMA) is for the maintenance of riparian corridor functions and values and not wildlife habitat.

> 660-023-0090(1)
> (d) "Riparian corridor boundary" is an **imaginary** line that is a certain distance upland from the top bank..."

These varied widths are sometimes based on the concept of "potential tree height" (PTH). PTH is the height of the trees that one could expect to see along a healthy and properly functioning riparian corridor. US Fish and Wildlife suggests that 200 feet is the appropriate PTH for Multnomah County based on soils and native trees (Metro, 1999).

In the West of Sandy study area, a minimum 200-foot combined resource and impact area was used in this ESEE analysis. Many locations have resource areas much greater in size due to the presence of adjacent wildlife habitat areas. This area is based on the actual observed conditions of the study area.

It is important to understand the distinction between the riparian corridor resource and the impact area or management area. The functioning riparian corridor has varying widths dependant upon the size of the adjacent water resource, the slope of the site, groundwater and surface hydrology characteristics, soil characteristics and vegetation. The 200-foot impact area for the West of Sandy Study Area is intended to serve as an indicator that a riparian corridor resource is present, but the location of the resource is not exactly known without detailed survey work.

The environmental impacts of allowing conflicting uses in riparian corridors

Agricultural Uses

Agricultural uses may contribute to the loss of vegetated riparian corridor areas along streams. This loss may result in a reduction in the ability of the riparian corridor to filter runoff as it drains farmed fields and the associated structures needed to support farm practices. Uses that support agriculture such as roads, storage areas and accessory farm buildings increase the impervious surfaces and areas of compacted soil within the study area, which can result in an increase in stormwater runoff and pollution into a riparian corridor. Once the unfiltered runoff ends up in creeks, streams, and rivers it may contribute to nutrient loading and/or the destruction of native plant and animal life. Stormwater runoff may carry the pesticides and fertilizers used in agricultural practices and the storage of such chemicals creates a risk of accidental spillage into the resource.

[5] Development Of Measures To Conserve, Protect And Restore Riparian Corridors In The Metro Region "Streamside Cpr", December 1999, Metro Growth Management Services

The other uses that are allowed in agricultural zones as discussed in Section 5.2 can also impact riparian corridors if allowed without limitation. The impacts to corridors are the result of clearing, soil compaction, impervious surfaces, human intrusion, domestic animals, and others.

Forestry

Forest practices include the cutting of timber, site clearing, sometimes burning the "slash" or "leftovers" and then the replanting of the site with a single tree species. Riparian corridors in forested areas provide critical water filtration functions as well as provide stability to forest soils. When the riparian corridor is impacted, erosion upon the slopes of the corridor may lead to sedimentation of the streambed. It also allows unfiltered runoff to enter the channel that may carry pesticides used to control the growth on non-commercial species. The crossing of riparian corridors by heavy equipment on inadequate or non-existent roads can destroy the streambed and introduce new passage barriers.

Rural Residential

The introduction of residential uses into riparian corridors may lead to severe and wide-ranging impacts to the resource. The typical lawns and landscaping that are present around houses may include the use of non-native and invasive plants, fertilizers and pesticides that find their way into the stream channel.

In the interest of fire safety homeowners often clear wide areas around a dwelling and associated structures to create a "fire break". This is a direct impact to the riparian corridor vegetation that leads to the loss of the functions and values of the riparian corridor. In encouraging this practice in the name of fire safety, there is a direct impact upon riparian corridors.

Residential Development also results in additional impervious areas that carry stormwater into the stream channel. When the stormwater does not pass through a riparian corridor, it is not filtered and as a result increased levels of pollutants are released into the water channel. Impervious surfaces can also contribute to the raised temperature of streams by allowing the water to be warmed before it is released in the channel.

Domestic pets often associated with rural residential use can contribute to the pollution of stream corridors and disturbance or loss of native wildlife. Without healthy, intact, and properly functioning riparian corridors the waste from these animals can flow into the stream channel. This can cause nutrient loading and impact healthy habitats and also contribute pathogens including such as e-coli bacteria and others into the water supply. Without the filtration of the riparian corridor, these pollutants can cause direct harm to both native wildlife species and humans.

Public Facilities

The construction of public facilities, particularly roads, increases impervious surfaces resulting in greater stormwater runoff increased water temperatures and increased pollutant loads. Public facilities also can lead to obstruction of fish passages and construction activities directly impacting the function and value of the riparian corridor resources.

Environmental impacts of limiting conflicting uses in riparian corridors

Agriculture, Forestry, Rural Residential and Public Facilities

Limiting conflicting uses through a protection program can help prevent new environmental impacts to a resource site. The protection program works through the development review process by requiring certain findings of fact from property owners that environmental impacts to resource sites (see Appendices A and B) will be avoided and/or mitigated.

A protection program that limits conflicting uses is particularly valuable where it places greater limits on development in proximity to the most sensitive resources areas. Studies show that fully protected riparian buffers of approximately one site potential tree height (SPTH)[6] are likely adequate to maintain 90%-100% of most key functions, including shading, LWD recruitment (excluding wood recruited from upslope and upchannel areas), small organic litter inputs, nutrient regulation, and sediment control (for surface erosion in the riparian zone only)[7]. The same research also indicates that on sites with limited slopes, bank stability is maintained at ½ SPTH, shade nutrients and organics are maintained at ¾ SPTH, and large woody debris recruitment is maintained at 1 SPTH.

Limiting conflicting uses through a protection program also can result in increased stewardship and restoration opportunities to mitigate development impacts.

Environmental impacts of prohibiting conflicting uses in riparian corridors

Agriculture

Although the County does not regulate most farm practices, it does have the ability to review a wide range of farm related development including a range of farm related dwellings, commercial uses associated with farm uses, utility

[6] One site potential tree height in the study are varies according to the individual site, but the Douglas Fir is considered the species with the highest SPTH at 120 feet

[7] Spence, B. C., G. A. Lomnicky, R. M. Hughes, and R. P. Novitzki. 1996. An ecosystem approach to salmonid conservation. TR-4501-96-6057. ManTech Environmental Research Services Corp., Corvallis, OR. (Available from the National Marine Fisheries Service, Portland, Oregon.) (http://www.nwr.noaa.gov/1habcon/habweb/ManTech/front.htm)

facilities and public facilities. Prohibition of these uses in riparian corridors would avoid impacts to the functions and therefore result in no further reduction.

Many of the resources require more action to restore functions and values that have been lost over time. To restore the functions and values of each of the riparian corridors in the study area, more action will be required that results in enhancement and restoration.

Forestry

The County does not regulate most forestry related uses. It does have the ability to review uses that are associated with forest use. In the riparian corridors of the study area, forestry has generally not been practiced on steep slopes and other areas where the economic restraints or the physical limitations of the site have made it an unattractive pursuit. For the most part, the prohibition of conflicting uses in riparian corridors does not require a change in current practice. The uses are already limited due to the historic economic and physical difficulties present.

Rural Residential

Rural residential use includes the installation of fencing, the introduction of domestic animals, the use of pesticides and fertilizers in landscaping, and the introduction of light, noise, and non-native landscaping plants. Each of these impacts may be avoided by the prohibition of conflicting uses in the significant resource area.

Public Facilities

Prohibiting the construction and improvement of public facilities would generally have a positive environmental impact. However, there are instances where prohibiting improvement of public facilities could lead to greater environmental impacts. For example, there are a number of road culverts that block fish passage in the study area. Improvement of this public facility would lead to an environmental benefit. The same could be said for reducing the risk of a sewage disposal accident at Sam Barlow High School by improving their waste disposal system.

Conclusion

Prohibiting conflicting uses would generally be most beneficial to riparian corridors from an environmental perspective. However, there appears to be significant benefit to limiting conflicting uses through a well-crafted protection program. Limiting uses may result in more proactive efforts to restore resource sites in addition to providing the necessary protections.

Wildlife Habitat

The Goal 5 "Wildlife Habitat" natural resource provides for the food and shelter requirements of wildlife in the area including small mammals, birds, and others found in the study area. In this study, riparian corridors and wildlife habitat share many functions and values and each are rated for the quality of wildlife habitat. Although fish are considered wildlife too, in this study fish habitat is considered as part of the riparian corridor discussion.

The Goal 5 impact area for wildlife habitat resource areas has been drawn at 25 feet beyond the edge of the resource. This width was chosen to protect the root zone around forested resource sites[8].

Wildlife habitat resource sites in the study area have been evaluated for:

- Wildlife Habitat
- Water Quality Protection
- Ecological Integrity
- Connectivity
- Uniqueness

Environmental Impacts of allowing conflicting uses in wildlife habitat

Agriculture

Typical agricultural practices include clearing the land of trees and preparing the ground for the planting of agricultural crops. This eliminates the native habitat and associated native species of plants and wildlife.

This practice also leads to the fragmentation of forest habitat by creating small islands of forest habitat that are no longer connected to other wildlife habitats or riparian corridors. As a result, the diversity of species that would otherwise make use of the habitat are unable to find food, water, and shelter to sustain viable populations. As some species move across agricultural fields they may fall victim to predators while out in the open. This may benefit a small number of individual predators at the expense of the biologically diverse mix of species that benefit from intact wildlife corridors.Fragmented habitat also increases the amount of "edge" habitat, which attracts a variety of opportunistic and non-native species.

The isolated upland wildlife habitat units in the study area do suffer from fragmentation and those that have been determined to not be significant have rated low for connectivity.

[8] Personal Communication, P.A. Fishman, Fishman Environmental Services LLC, 2001

Forestry

Forestry often involves the practice of selectively cutting or clear-cutting a site of timber. This practice removes one type of habitat and replaces it with another. The "edge effect" that results from clear cutting next to an established forest habitat changes the edge of the forest left standing to a varying degree based on the type of trees left standing. This edge creates a new type of habitat for a suite of species that differs from those that were present before the clearing.

Forest practices may also lead to the fragmentation of forest habitat. Fragmentation results in the inability of the normal range of species to use the forest habitat due to the isolation of the habitat from other appropriate habitat that aids in providing food, shelter, and cover.

Rural Residential

Rural residential use impacts habitat by placing dwellings, accessory structures, and other related uses in the wildlife habitat areas. In combination with edge effects that result from clearing forested areas for homes and other buildings, native species are often displaced by the human inhabitants. Pets and other domestic animals that are often associated with rural residential uses can also result in wildlife habitat impacts.

Public Facilities

Construction and improvement of public facilities, particularly roads, can have a significant impact on wildlife habitat. Roads can fragment wildlife habitat resulting in the edge effect described above and a decrease in connectivity between resource sites. Increase in auto use from new or improved roads can lead to more animal deaths from vehicle strikes.

Environmental impacts of limiting conflicting uses in wildlife habitat

Agriculture, Forestry, Rural Residential and Public Facilities

Limiting conflicting uses through a protection program can help prevent new environmental impacts to a resource site. The protection program works through the development review process by requiring certain findings of fact from property owners that environmental impacts to resource sites (see Appendices A and B) will be avoided and/or mitigated. Limiting conflicting uses can help decrease the likelihood of fragmentation of the resource. Thoughtful consideration to the location of a house can mitigate much of the impact described above. Limitations on fencing and bright lights can decrease the impacts caused by those activities related to rural residential development. If done correctly, native landscaping requirements can help further mitigate impacts of conflicting uses and prevent the continued spread of non-native species.

Environment impact of prohibiting conflicting uses on wildlife habitat

Agriculture

Although the County does not regulate most farm practices, it does have the ability to review a wide range of farm related development including a range of farm related dwellings, commercial uses associated with farm uses, utility facilities and public facilities. Prohibition of these uses in riparian corridors would avoid impacts to the functions and therefore result in no further reduction.

Many of the resources require more action to restore functions and values that have been lost over time. To restore the functions and values of each of the wildlife habitat in the study area, more action will be required that results in enhancement and restoration.

Forestry

The County does not regulate most forestry related uses. It does have the ability to review uses that are associated with forest use. In the wildlife habitat sites found in the study area, forestry has generally not been practiced on steep slopes and other areas where the economic restraints or the physical limitations of the site have made it an unattractive pursuit. For the most part, the prohibition of conflicting uses in riparian corridors does not require a change in current practice. The uses are already limited due to the historic, economic and physical difficulties present.

Rural Residential

Rural residential use of the study area is an extremely attractive and popular lifestyle choice for the residents. Rural residential uses often introduce conflicts such as light, noise, fencing, landscaping, and removal of habitat. These conflicts may be avoided through the prohibition of these conflicting uses.

Public Facilities

Prohibiting the construction and improvement of public facilities, particularly roads, would generally result in positive environmental impacts. Most notably, impacts resulting in loss of connectivity and from increased incidences of non-native species would be reduced.

Conclusion

Prohibiting conflicting uses would generally be most beneficial to wildlife habitat from an environmental perspective. However, there appears to be significant benefit to limiting conflicting uses through a well-crafted protection program.

6.5 Social Impacts Analysis

Riparian Corridors and Wildlife Habitat

There are a number of social values associated with riparian corridors and wildlife habitat. Those values include recreational and educational opportunities, improved residential environments, cultural values and screening and buffering benefits.

Recreational opportunities in the study area include wildlife viewing, hiking, fishing and some hunting. Kayak and float trips on the Sandy River are popular and benefit from a complete forest canopy and an intact riparian corridor. Educational opportunities for students and others in the study area are present at Oxbow Park and other areas of public access to stream corridors and wildlife habitat areas.

Residential living can be improved by the preservation of green spaces in the form of riparian corridors and wildlife habitat. Many residents appear to live in the study area due to the proximity to natural resources. Cultural values in the study area are primarily rooted in agriculture, but there also is an ethic of land stewardship, which includes preservation of green spaces and threatened and endangered species. Many residents also benefit from the screening and buffering that intact wildlife habitat and riparian corridors provide.

The social Impacts of allowing conflicting uses in riparian corridors and wildlife habitat

Agriculture and Forestry

Conflicting agricultural and forestry uses and uses associated with farm and forestry use may erode the quantity and quality of the green space benefits riparian corridors and wildlife habitat provide. The conversion of land to agricultural fields or the clear cutting of existing forest may lead to a loss of these social values. In addition, allowing these conflicting uses may diminish recreational and educational opportunities and some of the benefits of rural residential living. In addition, there may be negative impacts to threatened and endangered species.

Rural Residential

One of the primary reasons for the popularity of rural residential development is the sense of closeness to the surrounding landscape and a "sense of space" that large lot development permits. But as more and more large lot development is permitted, that sense of space for existing residents may be impacted. The conversion of land to rural residential development may erode the sense of green space that existing residents of the study area enjoy. Ironically, as more and more seek to find these qualities, the further they are eroded. In addition, residential uses placed in sensitive portions of resources may lead ot negative impacts to threatened and endangered species.

Public Facilities

Construction and improvement of public facilities, particularly roads, can lead to impacts to many of the social values described above. However, roads may provide some access for recreation and education opportunities in the study area.

Social impacts of limiting conflicting uses in riparian corridors and wildlife habitat

Agriculture, Forestry, Rural Residential and Public Facilities

Limiting conflicting uses through a protection program can help prevent new impacts to a resource site. The protection program works through the development review process by requiring certain findings of fact from property owners that impacts to resource sites (see Appendices A and B) will be avoided and/or mitigated. Limiting conflicting uses can help decrease the likelihood of reductions in the education and recreation benefits provided by resource sites. In addition, a protection program can include an educational component, in the form of brochures or other information available at the planning counter, that can further the educational and stewardship values described above. Limiting construction of public facilities can still allow for improved access to recreation areas while protecting the resources that provide the opportunity.

The social impact of prohibiting conflicting uses in riparian corridors and wildlife habitat

Agriculture and Forestry

Prohibiting farm, forest, and their associated uses may result in a social impact felt by a private property owner that they are not free to use their land in the fashion they choose. Some property owners feel that they are being punished for the poor stewardship of generations past.

Prohibiting conflicting agriculture and forestry uses could result in the maintenance of the social values described above. Green spaces and recreation opportunities would remain intact and existing property owners would continue to benefit from the proximity to riparian and wildlife resources.

Rural Residential

Existing residential uses may benefit from the exclusion of additional residential uses to the extent prohibiting these uses protects the social values described above. On the other hand, some residents may be prevented from building new homes for their children or other relatives, a social value that may outweigh other values described in this section. Task Force input revealed that prohibiting new residential or other uses was not an acceptable solution.

Public Facilities

Prohibiting construction or improvement of public facilities may have some negative impacts to the social values described above. If roads to Oxbow Park

are unable to be improved they may eventually not be passable, preventing many visitors from coming to the park. Public facility improvements can remove negative environmental impacts such as fish barriers, helping preserve a threatened and endangered species and help improve stewardship in the study area.

Conclusion

Prohibiting all conflicting uses minimizes many of the potential social impacts described above, but also creates its own set of social impacts. Given the analysis above and the input of the Task Force, it appears that limiting conflicting uses provides the most social benefit.

6.6 Energy Impacts Analysis

Riparian Corridors and Wildlife Habitat

Energy impacts are hard to quantify and sometimes speculative or elusive. Obvious energy impacts include the energy required to develop new uses. Heavy equipment that is used to develop land and new uses that are the result will consume energy. In some cases, forested areas create microclimates that regulate temperatures within the canopy. For existing residents of an area, this may provide for shelter from cold wind from the Columbia Gorge. It may also shade some of the direct sunshine during the warm days of summer. This may result in direct savings of energy for these users. If the energy consequences are examined at a large enough scale, one could argue that if threatened and endangered species in the study area are not recovered adequately that it may contribute to a decision to remove dams along the Columbia River. If this were to happen, the energy that is now generated from the dams would be lost.

If road building is required to circumvent a resource area and the resulting route is longer than otherwise possible, then more energy will be used by the vehicles that travel along the road.

The energy impacts of allowing conflicting uses in riparian corridors and wildlife habitat

Agriculture and Forestry

The heavy equipment used in farm and forest use requires energy. The fertilizers and pesticides used in these practices consume energy as well. Allowing conflicting uses may eliminate microclimates and lead to increased energy needs for heating and cooling of structures.

Rural Residential

Rural residential development requires energy. Rural residential uses also consume energy

Public Facilities

The construction and improvement of public facilities, particularly roads, consumes a substantial amount of energy. Construction of new road capacity often leads to increased travel and increased energy use.

Energy impacts of limiting conflicting uses in riparian corridors and wildlife habitat

Agriculture and Forestry

Limiting agriculture and forestry uses and their associated use may decrease some energy consumption in the study area. However, it may also have the unintended impact of increasing the overall amount of energy used as nursery owners are required to transport their goods to market from further and further away.

Rural Residential

Limiting rural residential uses through an appropriate protection program could somewhat limit the energy expended on residential construction by limiting the amount of site clearing and excavating. Protection of resources also can serve to protect the natural cooling associated with resource sites leading to decreased energy use.

Public Facilities

Limiting construction and improvement of public facilities may prevent some additional development in the study area, thus reducing the energy use for both construction of the public facility and new residential uses.

The energy impact of prohibiting conflicting uses in riparian corridors and wildlife habitat

Agriculture and Forestry

Prohibiting agriculture and forestry and their associated uses would likely reduce energy consumption in the study area. However, there may be a net gain in regional consumption as nursery wholesalers and growers are required to ship their goods to the Portland market and airport from further away than the study area.

Rural Residential

Prohibiting rural residential would reduce the energy required to build new residential uses. It may also reduce the energy required for cooling of certain homes in the study area if resource sites bordering these homes are preserved. There may be a slight increase in energy used for transportation as those people seeking a rural life style are required to look further away from the Portland metro area for a rural home.

Public Facilities

Prohibiting new public facilities is unlikely to have significant energy consequences. The transportation system is largely constructed and state law generally prohibits construction of urban facilities in the study area except to rectify health problems.

Conclusion

Based on the above analysis it appears that limiting conflicting uses provides a similar amount of energy benefit as prohibiting conflicting uses.

6.7 Drainage Maps and Unique ESEE Discussions

The previous sections contain ESEE discussions that apply evenly throughout the study area. In this section, significant Goal 5 natural resource units found in the study area have been grouped into five drainages for purposes of identifying unique conditions or situations. The drainage may include certain conflicting uses that are only permitted there or it may include a certain significant natural resource site with particularly unique characteristics not already discussed. Grouping resource sites by drainage allows for a broad ESEE analysis. The drainages include:

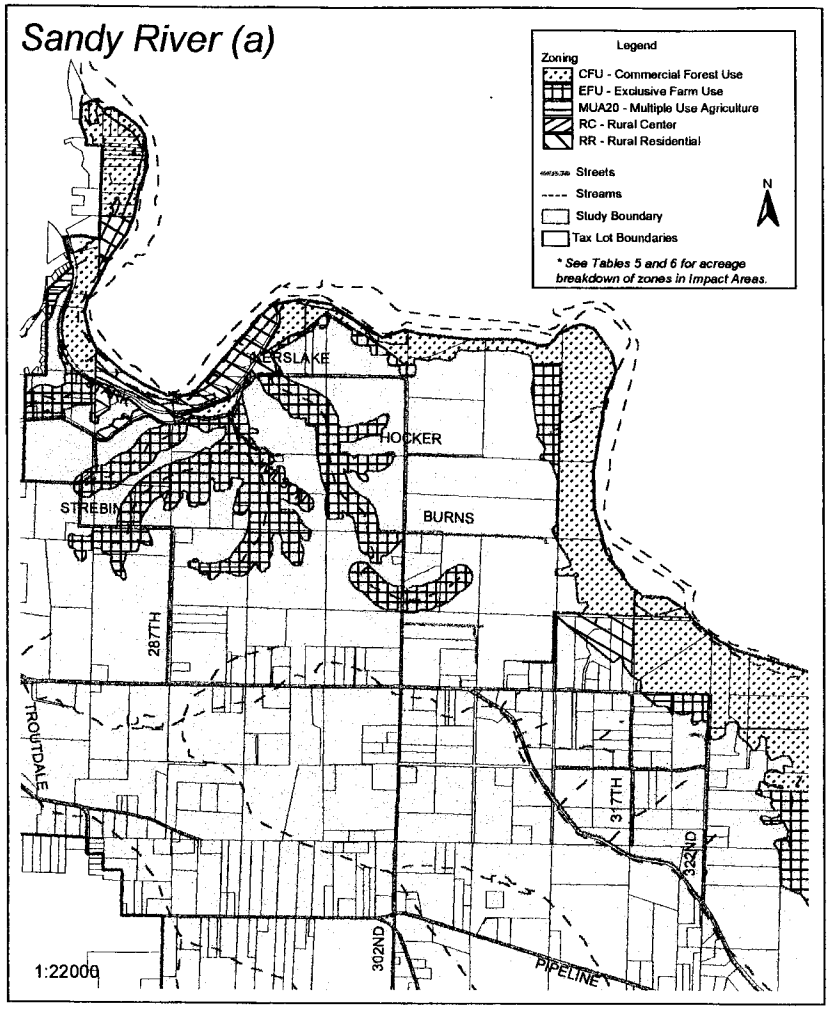
- Sandy River
- Johnson Creek
- Beaver Creek
- Kelly Creek North
- Kelly Creek South

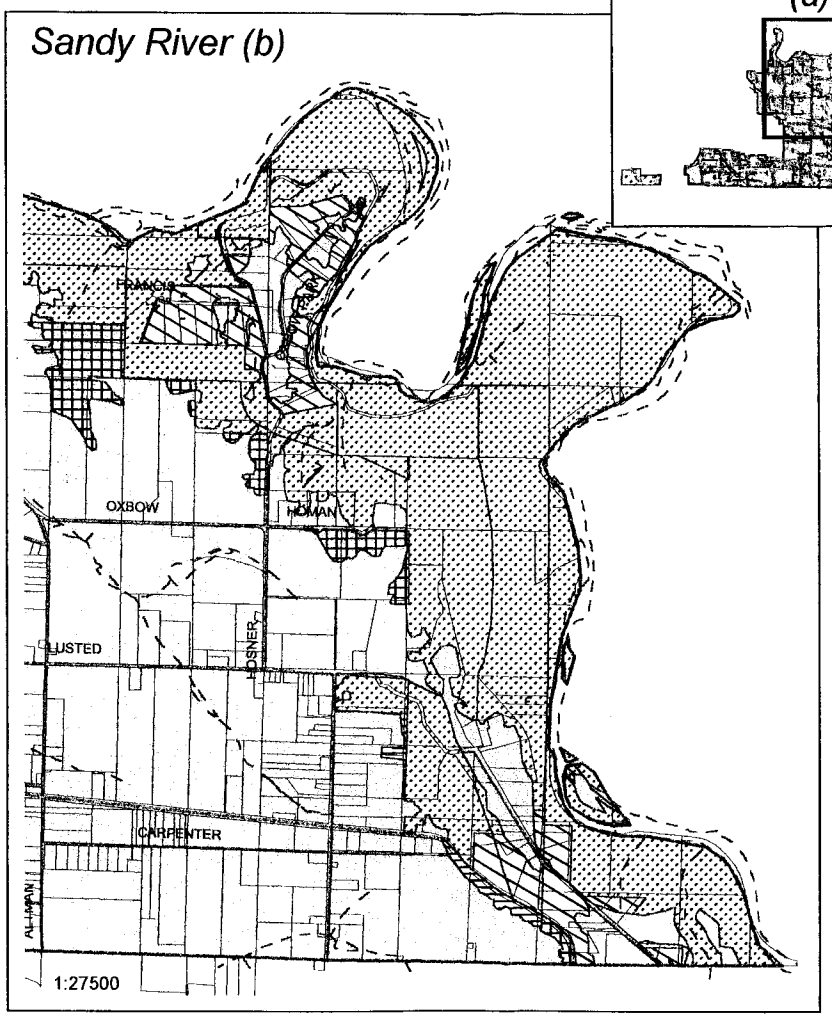
Of these five drainages, all but Kelly Creek South are designated by DSL as Essential Anadromous Salmonid Habitat. This designation remains of particular importance throughout the ESEE analysis due to the high level of importance placed upon habitat associated with listed threatened or endangered species under the Endangered Species Act (ESA).

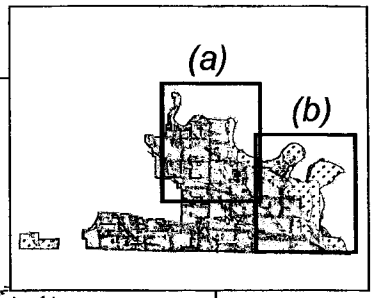
West of Sandy River

Map 3

Zoning Within Resource and Impact Areas







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Sandy River

The Sandy River is one of the dominant natural features of the landscape in the study area. The river provides a high level of access to recreational uses in the region that includes fishing, hunting, hiking, camping, boating, swimming and many more. The wide river and the steeply sloped cliffs constitute an important visual resource that contributes to the character of the study area. The Sandy River also supports populations of numerous fish and wildlife species, including fish listed under the federal Endangered Species Act.

The riparian corridor of the Sandy River Goal 5 resources includes steep, forested slopes and wide floodplains. The Goal 5 wildlife habitat resource largely follows the steep slopes and natural topography of the landscape.

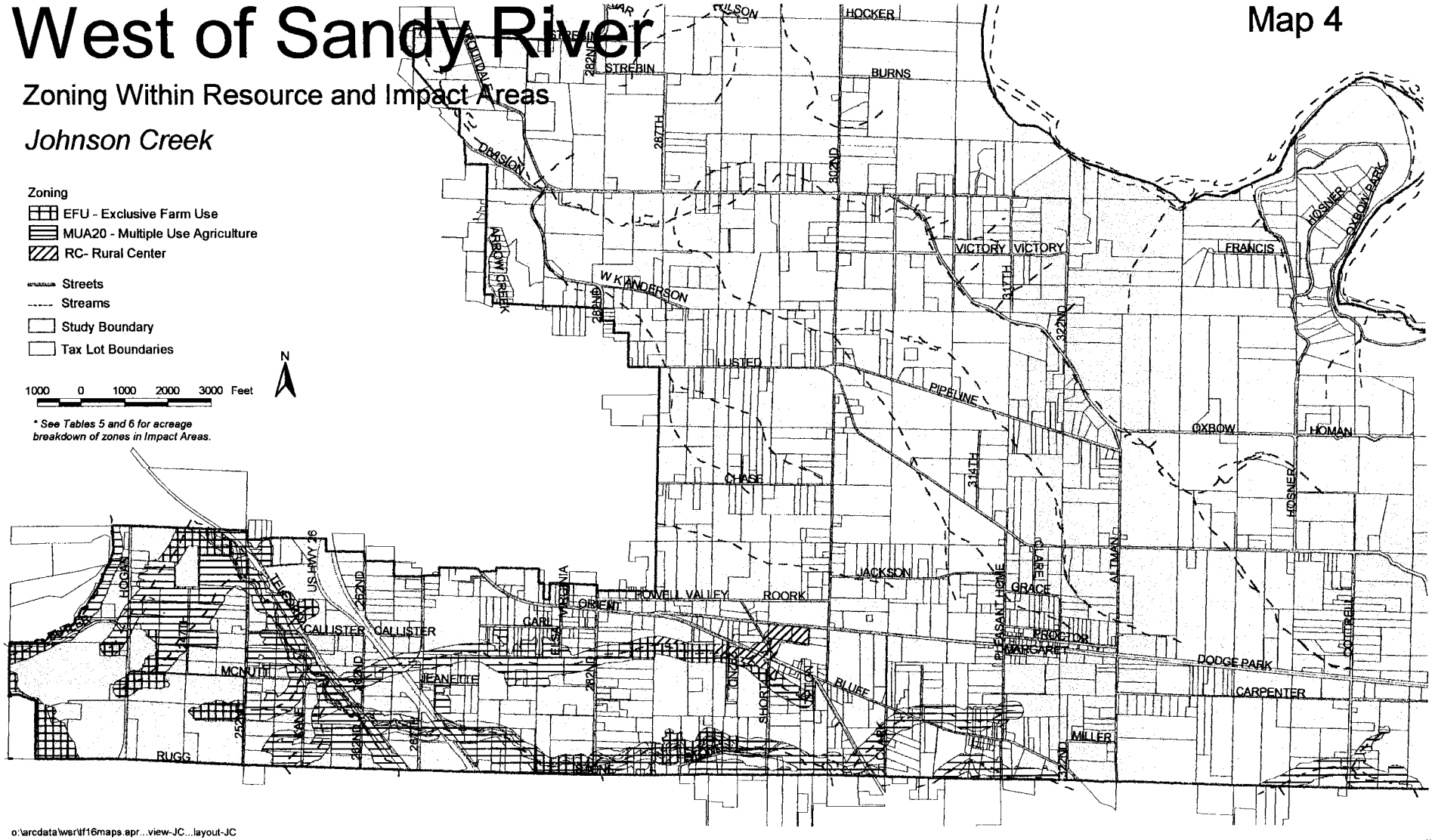
The Sandy River resource units and impact area contains close to 2200 acres of CFU, EFU, MUA-20, and RR zoning. The ESEE analysis of these units is discussed in section 6. It is evident from the analysis in the previous sections that the economic, social and environmental benefits of limiting conflicting uses in all riparian corridor and wildlife habitat resource units of the Sandy River outweigh the benefits of allowing conflicting uses. The analysis also shows that there are some benefits from prohibiting conflicting uses, particularly in the environmental analysis, but that limiting uses with a solid protection program provides the most overall benefits.

West of Sandy River

Zoning Within Resource and Impact Areas

Johnson Creek

Map 4



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Johnson Creek

Johnson Creek has an active Watershed Council that has been working on habitat restoration, flood control and other activities for many years. The presence of ESA listed fish has been documented in the system and there are direct efforts to support the recovery of these species. There has been a direct economic investment by a consortium of local jurisdictions and other groups in the Johnson Creek Watershed Council for watershed management, habitat enhancement and restoration, water quality control, flood control and others.

Rural Center Zoning in the Johnson Creek Drainages

A resource site that includes a tributary of Johnson Creek contains approximately 26 acres of property that is zoned Rural Center (RC). RC zoning permits high-density residential use as well as some commercial and light industrial use. This is the only part of the study area containing RC zoning. These types of uses, particularly commercial and industrial, often include a higher percentage of impervious surface.

The Goal 5 resources on the site include both riparian corridor and wildlife habitat resources. The riparian corridor leads directly to Johnson Creek that, downstream, has been designated as Essential Anadromous Salmonid Habitat by the Oregon Department of State Lands (DSL). It is important to maintain the riparian corridor functions and values along this riparian corridor. In it's current state the site is heavily impacted. The data sheet for resource unit JT7 describes the site in detail.

The team recommends protecting the riparian corridor of the site to the maximum extent possible due to listed salmon present downstream in Johnson Creek. The functions and values evaluated for this site in this inventory were degraded.

The following analysis focuses on the uses permitted in the RC zone and supplements the main analysis found in sections 6.1 through 6.6.

Impact of allowing conflicting uses upon goal 5 resources

Economic Impacts

The activities associated with light manufacturing and light industrial uses may impact the water quality of Johnson Creek. Toxic substances or other materials may be used in such activity. If these uses are considered a "take" under the ESA, the County, the property owners, and others may be liable for economic damages under the ESA.

Fully allowing commercial, light industrial and higher density residential provides economic benefit to individual property owners. In some instances property owners may construct building for uses that benefit the farm economy of the area, perhaps making farming and nursery operations more efficient. Allowing full

use of the RC zone may also provide slightly more tax revenue to Multnomah County.

Social Impacts

There are not any additional social impacts of allowing the conflicting uses other than those discussed in sections 6.1 through 6.6 of this report.

Environmental Impacts

The impact of high density residential, commercial and industrial uses may contribute additional environmental impacts to the riparian corridor resource. If any use of the property involves any toxic substances in the manufacturing or industrial use, they may cause a direct impact to the water quality of Johnson Creek if they are not properly contained. High density development also leads to greater amounts of impervious surfaces that may degrade water quality.

Energy Impacts

No significant additional energy consequences to the Goal 5 resource are present.

Impact of limiting conflicting uses in Goal 5 resources

Economic Impacts

Limiting conflicting uses through a well-crafted protection program may have the effect of reducing some liability the County may face from an ESA related lawsuit. Limiting uses may result in many of the same economic benefits of allowing uses given the relatively small area where conflicting RC uses are present.

Social Impacts

Limiting conflicting uses will not have additional social impacts upon the Goal 5 resource.

Environmental Impacts

Limiting commercial, industrial and higher density residential uses with a protection program can help preserve and even restore the functions and values of resource sites. Encouraging or requiring restoration efforts in areas where the resource is extremely impacted, such as this tributary to Johnson Creek, can help improve the resource and the water quality downstream.

Energy Impacts

Limiting conflicting uses will not have additional energy impacts upon the Goal 5 resource.

Impact of prohibiting conflicting uses

Economic Impacts

Prohibiting the conflicting uses in the RC zone may result in the loss of jobs that may otherwise be established in the zone. In addition, farm-related businesses that are regulated by the County may not be able to locate in this area, causing possible impacts to the farm economy in the study area.

Social Impacts

The social impacts of limiting conflicting RC uses are not significantly different than those impacts described in sections 6.1 through 6.6.

Environmental Impacts

Prohibiting conflicting RC uses will likely prevent additional direct negative impacts on the resource. Prohibiting conflicting uses also will prevent an increase in impervious surfaces in the area, lessening the chance for increased water quality impacts.

Energy Impacts

The energy impacts of limiting conflicting RC uses are not significantly different than those impacts described in sections 6.1 through 6.6.

Conclusion

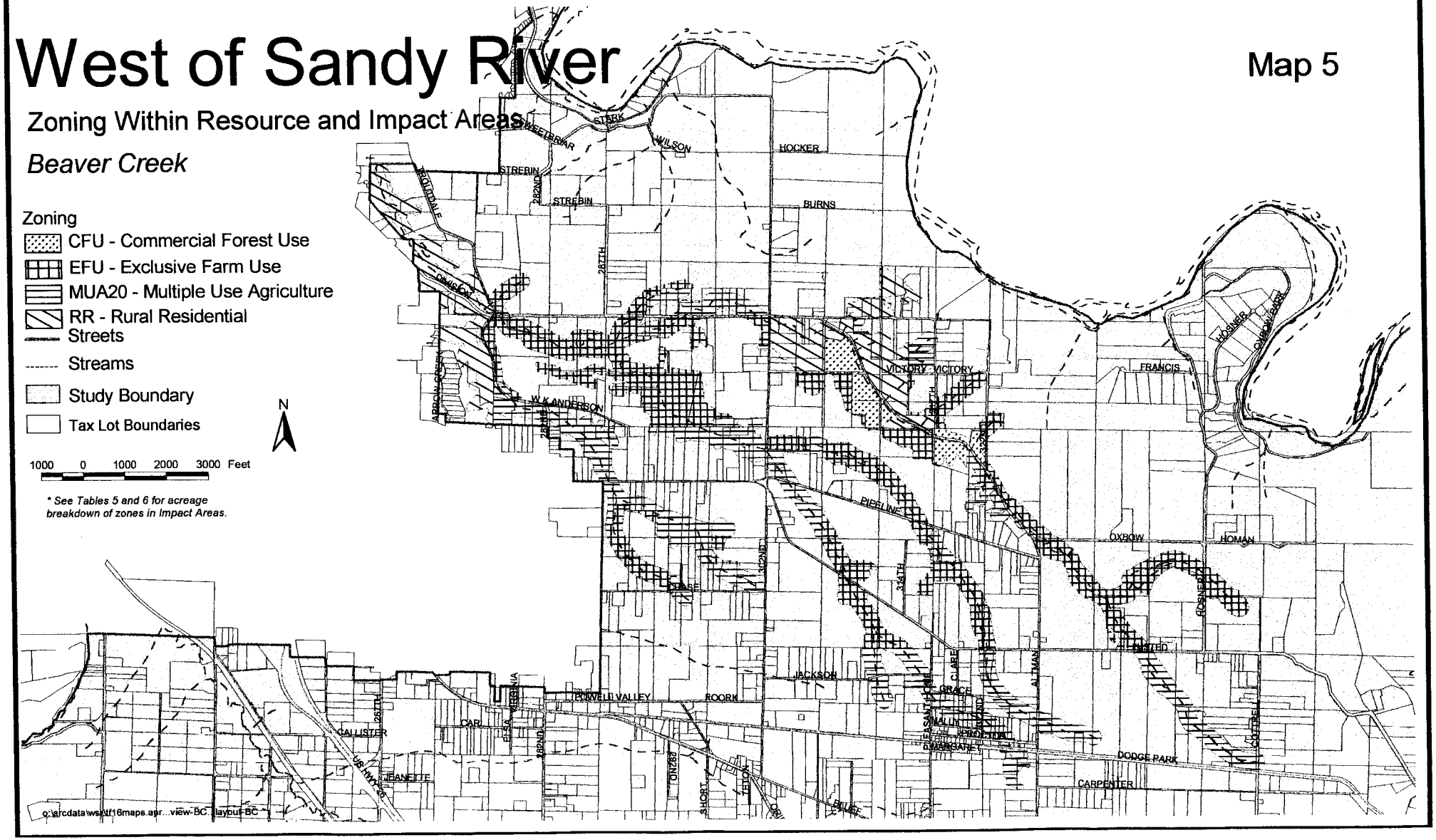
Limiting conflicting RC uses through a protection program appears to provide the most benefit to this resource area. A protection program can be tailored to protect the most important resources and encourage or require restoration of degrading resources.

West of Sandy River

Map 5

Zoning Within Resource and Impact Areas

Beaver Creek



Beaver Creek

The Beaver Creek drainage dominates the northern and central portions of the study area. The impact and resource areas include almost 1100 acres. Downstream portions of Beaver Creek are listed as Essential Anadromous Salmonid Habitat. The headwaters of Beaver Creek lie entirely within the study area. As a result, the riparian corridors for Beaver Creek in our study are especially important to the overall health of the drainage. The zoning of the drainage includes CFU, EFU, MUA-20, and RR. The ESEE analysis for these zones can be found in sections 6.1 through 6.6.

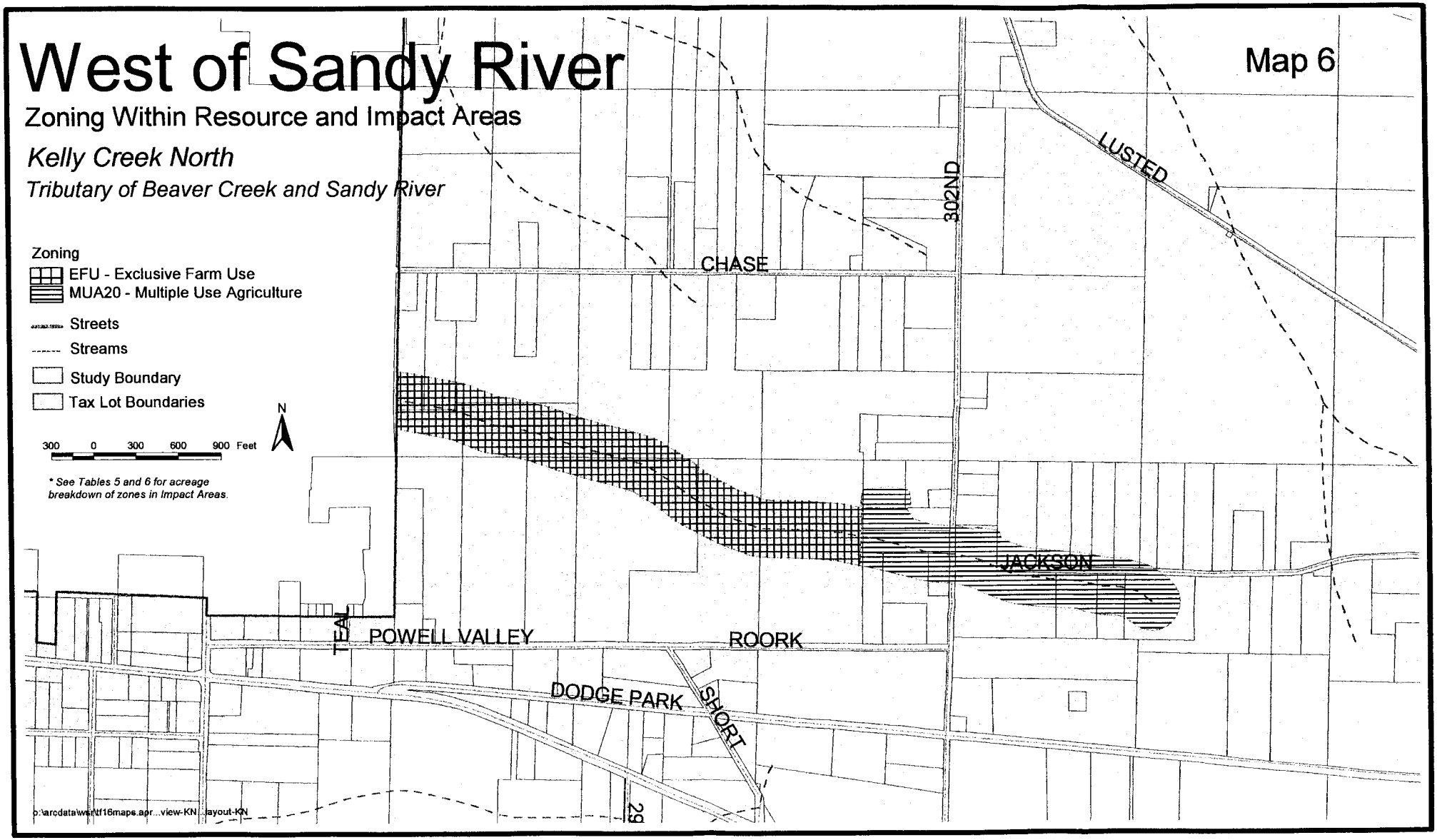
West of Sandy River

Zoning Within Resource and Impact Areas

Kelly Creek North

Tributary of Beaver Creek and Sandy River

Map 6



Kelly Creek North

The total area in the Goal 5 resource and impact area is 54 acres. This total area is very small compared to the entire drainage for the creek, but the riparian corridor system in this headwater area does contribute to the overall health of the creek. Kelly Creek North is listed as Essential Anadromous Salmonid Habitat. Due to the presence of listed species in the system, it is important to maintain the functions and values of the riparian corridor. The zoning of the resource unit is MUA-20 and EFU. The ESEE analysis for Kelly Creek South can be found in sections 6.1 through 6.6.

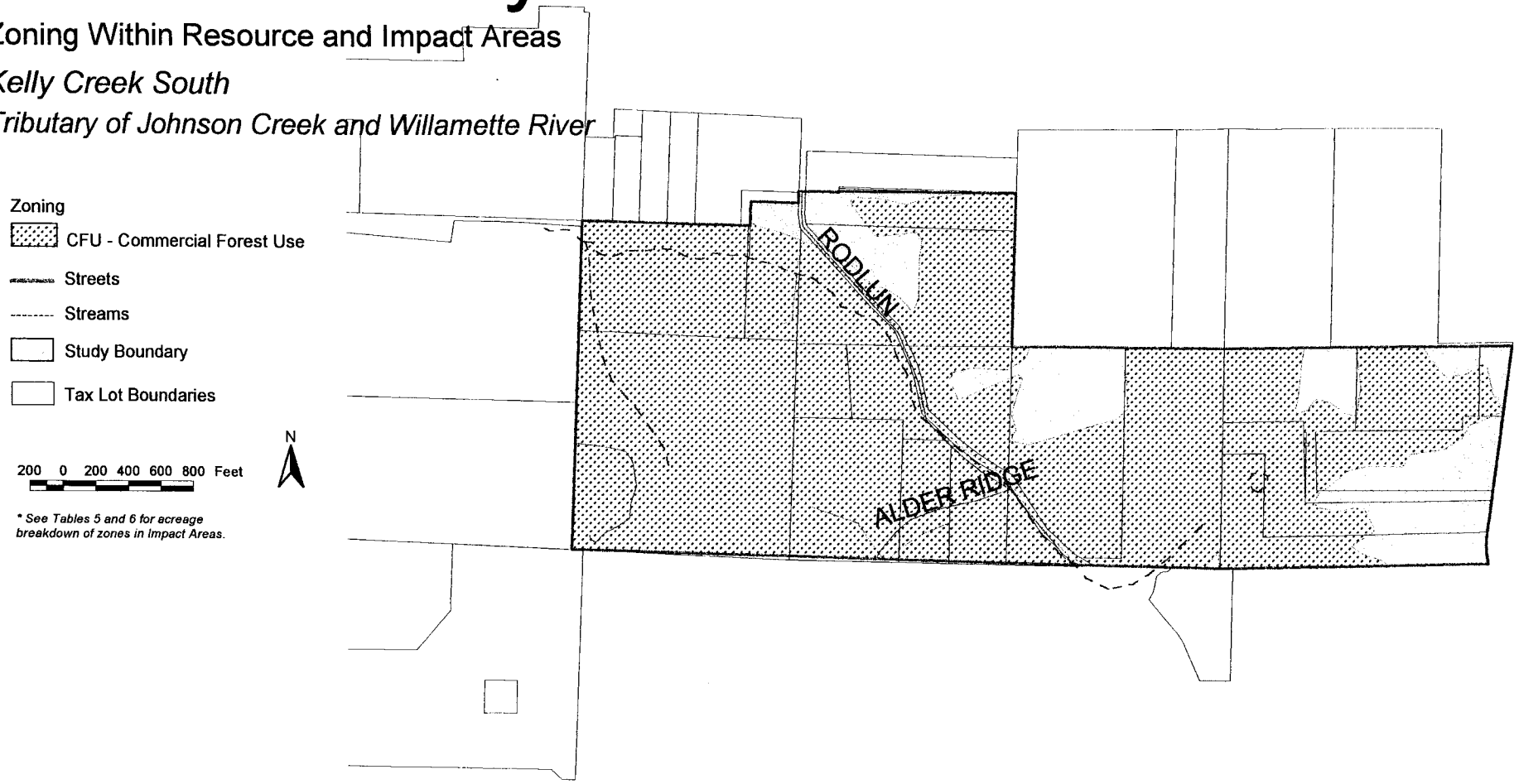
West of Sandy River

Map 7

Zoning Within Resource and Impact Areas

Kelly Creek South

Tributary of Johnson Creek and Willamette River



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Kelly Creek South

The total area in the Goal 5 resource and impact area is 178 acres. This total area is very small compared to the entire drainage for the creek, but the riparian corridor system remains largely intact. The zoning over the entire resource unit is Commercial Forest Use (CFU). The ESEE analysis for Kelly Creek South can be found in section 6.

6.8 Recommendations for Allowing, Limiting or Prohibiting Conflicting Uses

A draft recommendation for allowing, limiting, or prohibiting conflicting uses is made based upon the ESEE analysis above.

The project team recommends that the Goal 5 program for the West of Sandy study area include the development of a protection program that will apply to each significant Goal 5 resource site and it's impact area. Conflicting uses proposed in riparian corridor impact areas should be limited in order to avoid environmental impacts. Development proposals should document how the applicant tried to avoid adverse environmental impacts, and what methods are being proposed to minimize such impacts and mitigate for those that cannot be avoided. There are a variety of options available to the County that may be included in the protection program. These include:

- Limited touch zones- limited conflicting uses may be allowed if it is shown that the use will not degrade any of the functions and values of the resource site.
- Trade enhancement for impact- if it can be shown that an enhancement opportunity exists on a site that would normally not be realized, the County may allow impacts to less valuable significant natural resources in return for resource enhancement.

Riparian Corridors

It is the project team's recommendation that conflicting uses be limited in riparian corridors due to the presence of ESA listed species in each of the drainages. This recommendation is based on the ESEE findings that riparian corridors provide essential functions and values that not only support ESA listed salmonid species, but also provide for an ecologically healthy system.

As noted previously the impact area for riparian corridors has been drawn to include a minimum of 200 feet from all streams that are mapped in the study area. Riparian corridors and their associated impact areas provide a number of functional values including:

- ❖ Food, water and cover for wildlife and fish;
- ❖ Travel routes for fish and wildlife movement;
- ❖ Large woody debris for channel morphology, organic debris storage and food supply;
- ❖ Shade and regulation of stream temperature;
- ❖ Stabilization of stream banks and reduction of sedimentation;
- ❖ Filtering and removal of sediments; and
- ❖ Reduction of excess nutrients, metal contaminants and fecal coliform.

Within the riparian corridor impact area, the project team recommends limiting conflicting uses to a higher degree in those areas that are closest to the stream. Graduating the degree of protection reflects the varying functions provided by the riparian and impact areas. Studies show that fully protected riparian buffers of

approximately one site potential tree height (SPTH)[9] are likely adequate to maintain 90%-100% of most key functions, including shading, LWD recruitment (excluding wood recruited from upslope and upchannel areas), small organic litter inputs, nutrient regulation, and sediment control (for surface erosion in the riparian zone only) [10]. The same research also indicates that on sites with limited slopes, bank stability is maintained at ½ SPTH, shade nutrients and organics are maintained at ¾ SPTH, and large woody debris recruitment is maintained at 1 SPTH. Bank slope can affect the role of the riparian corridor and impact area in protecting water quality and bank stability. Larger riparian buffers may be required where there are steeper banks (in excess of 25% slope). At 2 SPTH, the functions protected include the microclimate and some wildlife (Spence et al).

Wildlife habitat

All conflicting uses should be limited and findings made that proposed uses do not impact or degrade the functions and values of the significant natural resource site. This recommendation is based on the ESEE findings that through careful review of development proposals, the impacts to the functions and values that have been evaluated as part of this report my be limited to a degree that permits the use and protects habitat.

The program to implement Goal 5 may include performance standards, enhancement incentives, or areas of zero impact. To mitigate for loss of development opportunities on a site, the program may include density transfers that would allow for minimized or increased economic consequences on a parcel that contains a significant natural resource.

[9] One site potential tree height in the study are varies according to the individual site, but the Douglas Fir is considered the species with the highest SPTH at 120 feet

[10] Spence, B. C., G. A. Lomnicky, R. M. Hughes, and R. P. Novitzki. 1996. An ecosystem approach to salmonid conservation. TR-4501-96-6057. ManTech Environmental Research Services Corp., Corvallis, OR. (Available from the National Marine Fisheries Service, Portland, Oregon.) (http://www.nwr.noaa.gov/1habcon/habweb/ManTech/front.htm)

7 ESEE Analysis and other Statewide Planning Goals

Goal 1 Citizen Involvement

The West of Sandy Planning Effort has included a citizen task force and multiple public workshops and open meetings.

Goal 2 Land Use Planning

The West of Sandy Plan is taking place according the process Oregon statewide planning program as set out in Goal 2.

Goal 3- Agricultural Land

Goal 3 applies to the EFU zone. The County does not regulate most farm practices and therefore does not have control over the potential impact to natural resources from farm practices. The EFU zone does maintain large lot sizes and discourages small lot residential development. In this capacity the EFU zone does allow for the maintenance of large parcel sizes that contributes to the maintenance of significant natural resources.

Goal 4- Forest Land

The County has highly limited ability to regulate forest practices. State law through the Forest Practices Act determines the nature of commercial forestry operations. The CFU zone does maintain large parcel sizes and has contributed to the maintenance of the associated natural resources.

Goal 5 Open Space, Scenic and Historic Areas, and Natural Areas

This West of Sandy Plan ESEE addresses the Goal 5 riparian corridor and wildlife habitat resources.

Goal 6 Air, Water and Land Resources

Compliance with the Clean Water Act and the adoption of a program to address Metro Title 3 Water Quality and Floodplain requirements will substantially address water quality. Water quality has a direct impact upon many Goal 5 resources.

Goal 7 Areas Subject to Natural Disasters and Hazards

Natural disaster and hazards may occur on the steep slopes and the floodplains found on the hillsides and in the streams in the study area. The identification of conflicting uses and the limitation of these uses contributes to the minimization of potential hazards by limiting development in the hazard zones.

Goal 8 Recreational Needs

This ESEE does not impact currently established recreational uses and does not limit new recreational uses.

Goal 9 Economic Development

89% of the study area consists of EFU, CFU, and MUA-20 zoning. These zones encourage and maintain the rural character of the area and promote the continued operation of agricultural and forest practices. There is additional property zoned as RC to provide for additional non-farm and non-forest uses. Other exception areas include the RR zone and provide for rural residential use. The balance of the land in the study area is in the UF zone and is maintained at current levels of development in order to provide for the orderly urbanization of the lands when and if they are included in an urban area.

Goal 10 Housing

Goal 10 provides for the full range of housing options within urban growth boundaries. It encourages increased densities within urban growth boundaries in order to maintain farm and forest lands. The study area is entirely outside of any UGB.

Goal 11 Public Facilities and Services

Goal 11 encourages the timely provision of services for new development in urban areas. It states that sewer and waterlines should not be extended to serve rural areas. The study area is entirely outside of any UGB.

Goal 12 Transportation

Although cited as an issue by the West of Sandy Task Force, the decision to prohibit, limit, or allow uses that conflict within significant natural resources units does not impact the transportation infrastructure in the study area.

Goal 13 Energy Conservation

The maintenance of tree canopy may result in an insulating effect on housing or other uses within resource areas. This may reduce the need for energy consumption by creating windbreaks and shading from the sun.

Goal 14 Urbanization

There are no current considerations for including the study area into the UGB as part of the West of Sandy ESEE report.

Goal 15 Willamette River Greenway
There is no Willamette River Greenway in the study area.

Goals 16-19 apply to coastal resources and do not apply

WEST OF SANDY ESEE APPENDICES

APPENDIX A:

WILDLIFE HABITAT DATA SHEETS

WILDLIFE HABITAT SUMMARY SHEETS
TABLE OF CONTENTS

Site Code **Summary Sheet Page No.**

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Beaver Creek, reach 1	Site Code: B1-R/U
Location: UGB to 322nd Avenue	Map Sheet(s) #: 1, 4 & 5
Adjacent Land Use: agricultural, nurseries, rural residential	Field Date(s): 3/13/01, 3/20/01

T 1S, R 3E/4E Sections: 1, 12 / 7, 8, 16, 17, 21
General Description: A wide, diverse mixed deciduous/coniferous forest is present along most of the lower reach of Beaver Creek. The forest has a multilayered tree and shrub canopy and several large snags. The forest is undisturbed south of Oxbow Road, where Beaver Creek meanders through a broad, diverse western red cedar-dominated floodplain. A large forest with several small seasonal drainages feeding into Beaver Creek is present to the north of Oxbow Road. A portion of the historic riparian corridor has been cleared of trees and shrubs downstream of 302nd Avenue. Wildlife habitat is reduced where Himalayan blackberry and English ivy are present along the stream and where the stream is bordered by mowed grass.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder	*Indian plum	sword fern
Douglas fir	salmonberry	stinging nettle
western red cedar	red elderberry	Pacific waterleaf
black cottonwood	beaked hazelnut	wood sorrel
big-leaf maple	red osier dogwood	bleeding heart
ponderosa pine	willow	California false hellebore

Functions	Rating	Comments
Wildlife Habitat	High	perennial stream, wide forest, diverse veg., snags
Water Quality Protection	High	well vegetated corridor, runoff from ag fields
Ecological Integrity	Medium	portions mowed, English ivy, Himalayan blackberry
Connectivity	High	wildlife travel corridor to several tributaries
Uniqueness	Medium	higher quality forest within study area

Significant? Yes
Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor west of 302nd Avenue. Control Himalayan blackberry and English ivy adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Beaver Creek, reach 2	Site Code: B2-R/U
Location: 322nd Avenue to headwaters	Map Sheet(s) #: 1, 4 & 5
Adjacent Land Use: agricultural, nurseries, rural residential	Field Date(s): 3/13/01, 3/20/01

T 1S, R 4E Sections: 18, 21, 22
General Description: A very narrow forested area is present along portions of this reach; however, riparian tree and shrub cover is generally sparse. Wildlife habitat is reduced where extensive patches of Himalayan blackberry and English ivy are present along the stream and where the stream is bordered by mowed grass.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder	salmonberry	sword fern
black cottonwood		
Douglas fir		
western red cedar		

Functions	Rating	Comments
Wildlife Habitat	Medium	perennial stream, narrow forest, ponds
Water Quality Protection	Low	narrow riparian corridor, runoff from nursery fields
Ecological Integrity	Low	much of historic riparian corridor has been cleared
Connectivity	Low	fragmented wildlife travel corridor to downstream
Uniqueness	Low	no unique features

Significant? No

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor. Control Himalayan blackberry and English holly adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Beaver Creek Tributary 1	Site Code: BT1-R/U
Location: South of Troutdale Road, west of 302nd Avenue	Map Sheet(s) #: 4
Adjacent Land Use: nurseries, agricultural, rural residential	Field Date(s): 3/13/01, 3/20/01

T 1S, R 3E/4E Section: 12 / 7, 18

General Description: A wide mostly deciduous forest is present along most of this forked tributary to Beaver Creek. A multilayered tree and shrub canopy is present, along with several large snags and large down logs across the stream. The forest is narrowest along the southern fork. Wildlife habitat is reduced in areas where Himalayan blackberry is present along the stream, English ivy has invaded the trees, and where the stream is bordered by mowed grass.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder	*Himalayan blackberry	English ivy
*black cottonwood	*Indian plum	sword fern
western red cedar	beaked hazelnut	
Douglas fir	red elderberry	
big-leaf maple	willow	

Functions	Rating	Comments
Wildlife Habitat	High	perennial stream, wide forest, diverse veg., snags
Water Quality Protection	High	
Ecological Integrity	Medium	well vegetated, runoff from ag and nursery fields
Connectivity	High	Himalayan blackberry & English ivy
Uniqueness	Low	wildlife travel corridor to Beaver Creek no unique features

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor. Control Himalayan blackberry and English ivy adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Beaver Creek Tributary 2	Site Code: BT2-R/U
Location: East of 287th Avenue, north & south of Division Street	Map Sheet(s) #: 1
Adjacent Land Use: agricultural, nurseries	Field Date(s): 3/20/01

T 1S, R 4E Section: 7

General Description: A mixed deciduous/coniferous forest is present along the upper portion of this tributary, north of Division. The herbaceous and shrub layers are sparse in the forest, probably due to past grazing. No riparian tree or shrub cover is present adjacent to the stream south of Division Street.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder	Himalayan blackberry	stinging nettle
*western red cedar	willow	skunk cabbage
big leaf maple		water parsley
black cottonwood		pasture grasses
Douglas fir		

Functions	Rating	Comments
Wildlife Habitat	High	perennial stream, wide forest in upper portion
Water Quality Protection	High	well vegetated in upper portion, runoff from ag fields
Ecological Integrity	Medium	
Connectivity	Low	riparian corridor cleared in lower portion, grazed
Uniqueness	Low	fragmented wildlife travel corridor to Beaver Creek
		no unique features

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs adjacent to stream to enhance riparian corridor. Control Himalayan blackberry adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Beaver Creek Tributary 3	Site Code: BT3-R/U
Location: East of Troutdale Road, north of Dodge Park Blvd	Map Sheet(s) #: 4
Adjacent Land Use: agricultural, nurseries, rural residential	Field Date(s): 3/13/01

T 1S, R 4E Sections: 7, 17, 18, 20, 21

General Description: A wide, multi-layered, mixed deciduous/coniferous forest is present along the lower portion of this forked tributary to Beaver Creek. Upstream of 302nd Avenue the forest narrows, and no riparian tree or shrub cover is present in several areas. Wildlife habitat is reduced where the stream is bordered by mowed grass and pastures. An Oregon ash wetland forest is present south of Dodge Park Boulevard at the headwaters of the southern fork.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder	Himalayan blackberry	sword fern
*western red cedar	Indian plum	reed canarygrass
black cottonwood	salmonberry	
Douglas fir	red elderberry	
Oregon ash	beaked hazelnut	
	willow	

Functions	Rating	Comments
Wildlife Habitat	High	perennial stream, wide forest, diverse vegetation
Water Quality Protection	High	
Ecological Integrity	Medium	well vegetated, runoff from ag and nursery fields
Connectivity	High	cleared in upper portion, grazed, blackberry
Uniqueness	Low	wildlife travel corridor to Beaver Creek no unique features

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor in mowed areas.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Beaver Creek Tributary 4	Site Code: BT4-R/U
Location: South of Oxbow Drive, east & west of Honser	Map Sheet(s) #: 5
Adjacent Land Use: nurseries	Field Date(s): 3/20/01

T 1S, R 4E Sections: 18, 19
General Description: A narrow, mostly deciduous forest is present along portions of this tributary. Wildlife habitat is degraded where large patches of Himalayan blackberry are present along the stream, English ivy has invaded the trees, and where the stream is bordered by mowed grass.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder	*Himalayan blackberry	English ivy
big-leaf maple	Indian plum	
Douglas fir		
western red cedar		

Functions	Rating	Comments
Wildlife Habitat	Medium	perennial stream, narrow forest, large pond
Water Quality Protection	Low	narrow riparian corridor, runoff from nursery fields
Ecological Integrity	Low	much of historic riparian corridor has been cleared
Connectivity	Low	fragmented wildlife travel corridor to Beaver Creek
Uniqueness	Low	no unique features

Significant? No

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor. Control Himalayan blackberry and English ivy adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Johnson Creek, reach 1	Site Code: J1-R/U
Location: UGB to Telford Road	Map Sheet(s) #: 3 & 4
Adjacent Land Use: agricultural, rural residential	Field Date(s): 3/13/01

T 1S, R 3E Section: 23

General Description: A multi-layered, mixed deciduous/coniferous forest with mature trees and large diameter cottonwood snags is present along the lower reach of Johnson Creek. Oregon ash, red alder, western red cedar, willow, red-osier dogwood, and reed canarygrass dominate the floodplain. Himalayan blackberry is dominant in disturbed areas along the road and in forest edges. The riparian corridor widens where four tributaries join Johnson Creek from the southwest, enhancing connectivity.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*Oregon ash	*Himalayan blackberry	*reed canarygrass
*red alder	Indian plum	water parsley
*western red cedar	rose	
black cottonwood	red elderberry	
big leaf maple	vine maple	
Douglas fir	willow	
	red-osier dogwood	

Functions	Rating	Comments
Wildlife Habitat	High	perennial stream, wide forest, diverse veg,
Water Quality Protection	High	snags
Ecological Integrity	Medium	well vegetated corridor, runoff from ag fields
Connectivity	High	Himalayan blackberry
Uniqueness	High	wildlife travel corridor to 4 tributaries
		potential red-legged frog habitat

Significant? Yes

Comments/Recommendations: Control Himalayan blackberry along stream. Red-legged frog observed downstream of study area in 1995 by Fishman Environmental Services.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Johnson Creek, reach 2	Site Code: J2-R/U
Location: East of Telford Road and west of Highway 26	Map Sheet(s) #: 3 & 4
Adjacent Land Use: agricultural, rural residential	Field Date(s): 3/13/01

T 1S, R 3E Section: 24

General Description: Wildlife habitat along this reach of Johnson Creek is limited since most of the trees and shrubs which were historically present adjacent to this reach have been cleared due to adjacent agricultural land use, and only very narrow and sparse riparian tree and shrub cover remains.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder	Himalayan blackberry	*reed canarygrass
Oregon ash	Douglas spirea	pasture grasses
Douglas fir	Indian plum	
birch	willow	
ponderosa pine		

Functions	Rating	Comments
Wildlife Habitat	Low	perennial stream, narrow & sparse tree/shrub cover
Water Quality Protection	Low	narrow riparian corridor, runoff from pasture w/cattle
Ecological Integrity	Low	most of riparian corridor has been cleared, grazed
Connectivity	Low	no wildlife travel corridor to up- or downstream
Uniqueness	Low	no unique features

Significant? No

Comments/Recommendations: Plant native trees and shrubs adjacent to stream to enhance riparian corridor to provide connectivity to upstream and downstream reaches of Johnson Creek.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Johnson Creek, reach 3	Site Code: J3-R/U
Location: Between Highway 26 & Orient Dr. & adjacent to Revenue Rd.	Map Sheets #: 4 & 5
Adjacent Land Use: agricultural, nurseries, rural residential	Field Date(s): 3/13/01

T 1S, R 3E/4E Sections: 24 / 19, 20

General Description: A mixed deciduous/coniferous forest is present in along portions of this reach. No riparian tree or shrub cover is present in some areas where pastures are present up to the edge of the stream. This unit includes several wetland pastures with slough sedge and soft rush and a wetland forest dominated by Oregon ash, black cottonwood, willow, and red-osier dogwood.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*Oregon ash	willow	bittersweet nightshade
*red alder	red-osier dogwood	reed canarygrass
*western red cedar	beaked hazelnut	slough sedge
black cottonwood	Himalayan blackberry	soft rush
Douglas fir	Indian plum	stinging nettle
big leaf maple	red elderberry	English ivy
	snowberry	sword fern

Functions	Rating	Comments
Wildlife Habitat	High	perennial stream, diverse vegetation, wetlands
Water Quality Protection	Medium	portion of riparian corridor cleared, pasture runoff
Ecological Integrity	Medium	portion of riparian corridor cleared, grazed
Connectivity	Medium	wildlife travel to Johnson Creek reduced by Hwy 26
Uniqueness	Medium	large wetlands in floodplain

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor. Control Himalayan blackberry and English ivy adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Johnson Creek, reach 4	Site Code: J4-R/U
Location: East and west of Cottrell Road	Map Sheet(s) #: 5
Adjacent Land Use: agricultural, nurseries, rural residential	Field Date(s): 3/13/01

T 1S, R 4E Section: 22
General Description: A mostly deciduous forest is present along the headwater area of Johnson Creek. The forest is broader upstream of Cottrell Road and is very narrow downstream of Cottrell.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder	Indian plum	reed canarygrass
western red cedar	ocean spray	skunk cabbage
Douglas fir	English holly	slough sedge
black cottonwood		sword fern

Functions	Rating	Comments
Wildlife Habitat	High	perennial stream, wide forest in upper, diverse veg.
Water Quality Protection	Medium	narrow riparian corridor, nursery & ag field runoff
Ecological Integrity	Medium	portions of riparian corridor have been cleared
Connectivity	Medium	narrow wildlife travel corridor
Uniqueness	Low	no unique features

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor. Control English holly adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Johnson Creek Tributary 1	Site Code: JT1-R/U
Location: North of Butler Road	Map Sheet(s) #: 3
Adjacent Land Use: residential, agricultural, golf course	Field Date(s): 3/13/01

T 1S, R 3E Section: 22
General Description: A mostly deciduous forest is present adjacent to this tributary north of Butler Road. The herbaceous layer is sparse due to the dense tree canopy and red alder regeneration in the shrub layer. No riparian tree or shrub cover is present adjacent to the stream on the golf course.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder	*red alder	sword fern
western red cedar	willow	Pacific blackberry
Douglas fir	Himalayan blackberry	broad-leaf cattail
big-leaf maple		sedge
		soft rush

Functions	Rating	Comments
Wildlife Habitat	High	perennial stream, wide forest, diverse
Water Quality Protection	High	vegetation
Ecological Integrity	Medium	well vegetated corridor, runoff from golf
Connectivity	High	course
Uniqueness	Low	Himalayan blackberry
		wildlife travel corridor along most of tributary
		no unique features

Significant? Yes

Comments/Recommendations: Control Himalayan blackberry adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Johnson Creek Tributary 2	Site Code: JT2-R/U
Location: West of 252nd Avenue	Map Sheet(s) #: 3
Adjacent Land Use: agricultural, rural residential, golf course	Field Date(s): 3/13/01

T 1S, R 3E Section: 22, 23
General Description: This unit consists of a steeply sloped deciduous forest surrounding two Johnson Creek tributaries. A portion of the interior of the forest was cleared in the past and appears to be currently used as a plant nursery field. Wildlife habitat is reduced where Himalayan blackberry is present along both tributaries.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder	*salmonberry	*sword fern
*big-leaf maple	*Himalayan blackberry	piggy-back plant?
Douglas fir	red elderberry	licorice fern
western red cedar	Indian plum	
	willow	
	English holly	

Functions	Rating	Comments
Wildlife Habitat	High	perennial stream, wide forest, diverse vegetation
Water Quality Protection	High	well vegetated, runoff from ag fields and golf course
Ecological Integrity	Medium	Himalayan blackberry
Connectivity	High	wildlife travel corridor to Johnson Creek
Uniqueness	Low	no unique features

Significant? Yes

Comments/Recommendations: Control Himalayan blackberry and English holly adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Johnson Creek Tributary 3	Site Code: JT3-R/U
Location: East of Telford Road, north of Callister Road	Map Sheet(s) #: 3
Adjacent Land Use: agricultural, rural residential	Field Date(s): 3/13/01

T 1S, R 3E Section: 23

General Description: Wildlife habitat along this tributary is limited since shrub cover is very sparse and narrow and consists predominantly of Himalayan blackberry and a few scattered shrubs.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
	*Himalayan blackberry	pasture grasses
	few unidentified shrubs	

Functions	Rating	Comments
Wildlife Habitat	Low	seasonal stream, very sparse riparian
Water Quality Protection	Low	tree/shrub cover
Ecological Integrity	Low	sparse riparian corridor, runoff from pasture
Connectivity	Low	w/horses
Uniqueness	Low	historic riparian corridor has been cleared, grazed
		no wildlife travel corridor to Johnson Creek
		no unique features

Significant? No

Comments/Recommendations: Plant native trees and shrubs to enhance the riparian corridor. Control Himalayan blackberry adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Johnson Creek Tributary 4	Site Code: JT4-R/U
Location: South of McNutt Road	Map Sheet(s) #: 3
Adjacent Land Use: agricultural, nurseries, rural residential	Field Date(s): 3/13/01

T 1S, R 3E Section: 33
General Description: A narrow forest dominated by red alder and Himalayan blackberry is present along this tributary immediately south of McNutt Road. The forest widens considerably upstream. Several pastures are present adjacent to this unit. One wet field with soft rush was noted adjacent to this unit, south of McNutt Road.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder	*Himalayan blackberry	small-fruited bulrush
black cottonwood	willow	
Douglas fir		

Functions	Rating	Comments
Wildlife Habitat	High	perennial stream, wide forest in upper portion
Water Quality Protection	High	portion well vegetated, runoff from pastures
Ecological Integrity	Medium	w/horses
Connectivity	Medium	Himalayan blackberry, grazed
Uniqueness	Low	narrow wildlife travel corridor to Johnson Creek
		no unique features

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs south of McNutt Road to enhance the riparian corridor and provide a wildlife travel corridor from Johnson Creek to upstream portions of the tributary. Control Himalayan blackberry adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Johnson Creek Tributary 5	Site Code: JT5-R/U
Location: East of Telford Road, south of Orient Drive	Map Sheet(s) #: 3, 4
Adjacent Land Use: agricultural, nurseries, rural residential, school	Field Date(s): 3/13/01

T 1S, R 3E/4E Sections: 23, 24 / 19
General Description: A mixed deciduous/coniferous forest is present along much of this tributary. The forest is narrow and somewhat sparse in the lower portion but widens considerably upstream of Highway 26. Wildlife habitat is reduced where Himalayan blackberry is dominant along the stream and where the stream is bordered by mowed grass. A transitional wet forest is present at the headwaters of this tributary, just north of the West Orient School.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder	Himalayan blackberry	sword fern
*Douglas fir	Indian plum	Pacific blackberry
black cottonwood	beaked hazelnut	English ivy
big-leaf maple	red-osier dogwood	reed canarygrass
western red cedar	Pacific ninebark	slough sedge
	willow	
	English holly	

Functions	Rating	Comments
Wildlife Habitat	High	perennial stream, mostly wide forest
Water Quality Protection	High	well vegetated, runoff from ag and nursery fields
Ecological Integrity	Medium	Himalayan blackberry, English holly, English ivy
Connectivity	Medium	wildlife travel to Johnson Creek reduced by Hwy 26
Uniqueness	Low	no unique features

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor in areas where stream is currently bordered by mowed grass. Control Himalayan blackberry and English holly adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Johnson Creek Tributary 6	Site Code: JT6-R/U
Location: East and west of Kane Road, north of Rugg Road	Map Sheet(s) #: 3
Adjacent Land Use: agricultural, rural residential	Field Date(s): 3/13/01

T 1S, R 3E Section: 23
General Description: A mostly deciduous forest is present along this tributary. The shrub layer is sparse in some areas, likely due to past grazing. Wildlife habitat is reduced near the road where Himalayan blackberry is dominant. One wet field with soft rush was noted adjacent to this unit.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder	*Himalayan blackberry	grasses
western red cedar	salmonberry	sword fern
Douglas fir	Indian plum	

Functions	Rating	Comments
Wildlife Habitat	High	perennial stream, wide forest
Water Quality Protection	High	wide corridor, runoff from adjacent pastures
Ecological Integrity	Medium	w/horses
Connectivity	High	Himalayan blackberry, grazed
Uniqueness	Low	wildlife travel corridor to Johnson Creek
		no unique features

Significant? Yes

Comments/Recommendations: Control Himalayan blackberry adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Johnson Creek Tributary 7	Site Code: JT7-R/U
Location: East of Orient Drive, north & south of Bluff Road	Map Sheet(s) #: 4
Adjacent Land Use: agricultural, rural residential	Field Date(s): 3/13/01

T 1S, R 4E Section: 20

General Description: One forested area is present along this tributary near its headwaters, west of Pleasant Home Road. Downstream of this forested area, no riparian tree or shrub cover is present adjacent to the tributary, and the stream channel is disturbed and is dominated by Himalayan blackberry.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
Oregon ash	*Himalayan blackberry	English ivy
western red cedar	English holly	reed canarygrass
Douglas fir		soft rush

Functions	Rating	Comments
Wildlife Habitat	Medium	perennial stream, forested only in upper portion
Water Quality Protection	Medium	most of riparian corridor cleared, ag & nursery runoff
Ecological Integrity	Low	most of riparian corridor cleared, invasive species
Connectivity	Low	no wildlife travel corridor to Johnson Creek
Uniqueness	Low	no unique features

Significant? No

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor and provide a wildlife travel corridor from the upstream forest to Johnson Creek. Control Himalayan blackberry, English holly, and English ivy adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Kelly Creek North	Site Code: KN-R/U
Location: North of Dodge Park road, east and west of 302nd Avenue	Map Sheet(s) #: 4
Adjacent Land Use: agricultural, nurseries	Field Date(s): 3/13/01

T 1S, R 4E Section: 18, 19, 20

General Description: A narrow mostly deciduous forest is present along most of this stream, except at the headwaters. The riparian corridor downstream of 302nd Avenue has a very sparse shrub and herbaceous layer. Wildlife habitat is reduced where Himalayan blackberry and English ivy are present along the stream and where the stream is bordered by mowed grass.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder	Indian plum	sword fern
*Pacific willow	Himalayan blackberry	English ivy
big-leaf maple		
Douglas fir		
western red cedar		
black cottonwood		

Functions	Rating	Comments
Wildlife Habitat	Medium	perennial stream, narrow forest, diverse vegetation
Water Quality Protection	High	well vegetated, runoff from nursery fields
Ecological Integrity	Medium	narrow riparian with invasive species and ornamentals
Connectivity	Medium	narrow wildlife travel corridor to Johnson Creek
Uniqueness	Low	no unique features

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor in mowed areas. Control Himalayan blackberry and English ivy adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Kelly Creek South	Site Code: KS-R/U
Location: South of Rodlun Road	Map Sheet(s) #: 3
Adjacent Land Use: scattered residential, tree farm	Field Date(s): 3/13/01

T 1S, R 3E Sections: 20, 21

General Description: A mature mostly deciduous forest with steep slopes is present along this stream. Several large old stumps are present. Some human disturbance is present as indicated by the presence of non-native species (Himalayan blackberry, English ivy, periwinkle) and a tire and scattered trash adjacent to the road. Wildlife habitat is reduced where Himalayan blackberry increases in the riparian corridor in areas where the stream closely parallels the road. Rodlun Road separates this unit from an upland forest (Unit U1) to the north.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder	*salmonberry	*sword fern
big-leaf maple	*Indian plum	*Pacific waterleaf
Douglas fir	Himalayan blackberry	English ivy
western red cedar		periwinkle (Vinca sp.)

Functions	Rating	Comments
Wildlife Habitat	High	perennial stream, wide forest, diverse vegetation
Water Quality Protection	High	well vegetated slopes adjacent to stream
Ecological Integrity	Medium	some invasive species, human disturbance
Connectivity	High	wildlife travel corridor along entire reach
Uniqueness	Low	no unique features

Significant? Yes

Comments/Recommendations: Control Himalayan blackberry and English ivy adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Sandy River	Site Code: S-R/U
Location: North and east study area boundary	Map Sheet(s) #: 1, 2
Adjacent Land Use: agricultural, nurseries	Field Date(s): 3/20/01

T 1N, R 3E, S 36; T 1N, R4E, S 31; T 1S, R3E, S 1; T 1S, R4E, S 5-11, 14-16, 22, 23:
General Description: The Sandy River Unit is the largest resource in the project area. It includes the Sandy River floodplain, relict slough channels, hillslopes and adjacent forests. Vegetation is dominated by a mixed coniferous / deciduous forest with pockets of old growth. The multi-layered canopy provides diverse habitat for a variety of wildlife species. Sensitive salmon species spawn in the river and a variety of sensitive plant, bird, herptile and mammal species potentially occur in the unit. The large size of this unit with its variety of resources and its connectivity to the Columbia River further increase its resource values. It also includes a large amount of public and protected land (Nature Conservancy). Portions of the riparian corridor east and west of Lusted Road have been cleared for agricultural and nursery field use. This unit is bordered by agricultural fields on the west and an intact riparian corridor east of the Sandy River.

Adjacent Stream Information: See riparian corridor summary sheet

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
big-leaf maple	beaked hazelnut	sword fern
black cottonwood	Indian plum	candy flower
Douglas fir	red elderberry	Dewey's sedge
red alder	salmonberry	fairy lanterns
vine maple	snowberry	insideout flower
western red cedar	thimbleberry	wild ginger
	willow	English ivy

Functions	Rating	Comments
Wildlife Habitat	High	perennial water, large forest with diverse
Water Quality Protection	High	vegetation
Ecological Integrity	High	wide riparian corridor with well vegetated
Connectivity	High	slopes
Uniqueness	High	patches of invasive species but mostly native
		wide wildlife travel corridor
		old growth forest, sensitive species

Significant? Yes
Comments/Recommendations: Avoid fragmentation of this unit due to further clearing for use as agricultural or nursery fields which reduces connectivity.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Regner Road	Site Code: U1
Location: North of Rodlun Road, west of Regner Road	Map Sheet(s) #: 3
Adjacent Land Use: agricultural, rural residential	Field Date(s): 3/13/01

T 1S, R 3E Sections: 21

General Description: The west portion of this unit consists of a mature, high quality undisturbed mostly coniferous forest on a steep slope above Rodlun Road. Many large Douglas fir trees (>24 inch diameter) and several large old stumps are present. This unit was likely larger in the past, as portions of the forest appear to have been cleared for scattered residential development and pastures. This unit is part of a very large upland forest located north of the study area. The east portion of this unit consists of a young deciduous forest with smaller diameter trees (<12 inch diameter). The understory is open in the deciduous forest edge, probably due to grazing. A few animals were observed grazing adjacent to the forest, west of Regner Road.

Species Information: This site is suitable habitat for the special-status wildlife species that have been documented in the project area including red-legged frog, Oregon slender salamander, bald eagle, pileated woodpecker, little willow flycatcher, and olive-sided flycatcher.

Adjacent Stream Information: This unit is separated from the Kelly Creek South riparian corridor to the south by Rodlun Road.

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*Douglas fir	Indian plum	*sword fern
*big-leaf maple	Himalayan blackberry	dull Oregon grape
red alder		

Functions	Rating	Comments
Wildlife Habitat	High	large mostly undisturbed forest, near perennial water
Water Quality Protection	Low	no adjacent tributary/runoff source
Ecological Integrity	Medium	limited human disturbance, some grazing
Connectivity	High	connected to large upland forest & tributary to north
Uniqueness	Medium	high quality upland forest in west portion

Significant? Yes

Comments/Recommendations: Install fence to prevent grazing access in east portion of unit

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Butler Road South	Site Code: U2
Location: SW corner of Area 3	Map Sheet(s) #: 3
Adjacent Land Use: golf course	Field Date(s): 3/13/01

T 1S, R 3E Section: 22
General Description: This unit is located on a hill south of the Persimmon Country Club golf course and consists of a mature, high quality undisturbed mostly deciduous forest with a coniferous component at the higher elevations. This unit is part of a large upland forest located west of the study area. This unit was viewed from a distance using binoculars, and no shrub or groundcover species could be determined.
Species Information: This site is suitable habitat for the special-status wildlife species that have been documented in the project area including bald eagle, pileated woodpecker, little willow flycatcher, and olive-sided flycatcher.
Adjacent Stream Information: None

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder		
big-leaf maple		
Douglas fir		
western red cedar		

Functions	Rating	Comments
Wildlife Habitat	High	large undisturbed forest, near perennial water
Water Quality Protection	Low	no adjacent tributary/runoff source
Ecological Integrity	High	no human disturbance
Connectivity	High	connected to large upland forest & tributary to west
Uniqueness	Medium	high quality undisturbed upland forest

Significant? Yes

Comments/Recommendations:

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Telford Road	Site Code: U3
Location: North of Telford Road, east and west of Palmblad Road	Map Sheet(s) #: 3
Adjacent Land Use: agricultural, rural residential	Field Date(s): 3/20/01

T 1S, R 3E Section: 23

General Description: This unit consists of a mostly deciduous forest with a few conifers and good shrub cover. The forest is mostly even-aged with a few large black cottonwood trees and snags also present. The unit receives seasonal road runoff, and wetland trees, shrubs and groundcovers are present along the south and east edges of the forest. This unit is part of a large red alder-dominated upland forest located north of the study area.

Species Information: This site is suitable habitat for the special-status wildlife species that have been documented in the project area including red-legged frog, Oregon slender salamander, bald eagle, pileated woodpecker, little willow flycatcher, and olive-sided flycatcher.

Adjacent Stream Information: This unit is separated from the Johnson Creek riparian corridor to the west by Telford Road.

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*black cottonwood	snowberry	sword fern
red alder	Indian plum	Pacific blackberry
Oregon ash	willow	slough sedge
Douglas fir	red-osier dogwood	reed canarygrass
	Douglas spirea	
	English holly	

Functions	Rating	Comments
Wildlife Habitat	High	part of large forest, seasonal water
Water Quality Protection	Medium	may provide some treatment for runoff
Ecological Integrity	Medium	English holly
Connectivity	Medium	separated from Johnson Creek by Telford
Uniqueness	Medium	Road
		mixed wet/upland forest

Significant? Yes

Comments/Recommendations:

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: 262nd Avenue	Site Code: U4
Location: East of Highway 26 and 262nd Avenue, south of Hilyard	Map Sheet(s) #: 4
Adjacent Land Use: agricultural, rural residential	Field Date(s): 3/20/01

T 1S, R 3E Section: 24
General Description: This isolated unit consists of a red alder-dominated forest. The understory is open in the forest edge, probably due to grazing. A few sheep were observed grazing adjacent to the forest, west of 267th Avenue. This unit was viewed from a distance using binoculars, and no shrub or groundcover species could be determined.
Species Information: The habitat on this site rates low. Use by special status species is doubtful.
Adjacent Stream Information: None

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder		

Functions	Rating	Comments
Wildlife Habitat	Low	low vegetation diversity, no adjacent water
Water Quality Protection	Low	no adjacent tributary/runoff source
Ecological Integrity	Low	small size & edge effect, grazing disturbance
Connectivity	Low	isolated from Johnson Creek & JT- 5 by ag fields
Uniqueness	Low	no unique features

Significant? No

Comments/Recommendations: Install fence to prevent grazing access

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Highway 26	Site Code: U5
Location: West of Highway 26, north of Stone Road	Map Sheet(s) #: 4
Adjacent Land Use: agricultural	Field Date(s): 3/13/01

T 1S, R 3E Section: 24

General Description: This isolated unit consists of a mixed deciduous/coniferous forest less than 50 years old. Black cottonwood, big-leaf maple, red alder, western red cedar, and Douglas fir trees are equally represented. Black cottonwood and Douglas fir are the tallest trees in the canopy and have diameters # 16 inches. Himalayan blackberry is dominant along the forest edges.

Species Information: The habitat on this site rates low. Use by special status species is doubtful.

Adjacent Stream Information: None

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
black cottonwood	*Himalayan blackberry	sword fern
big-leaf maple	Indian plum	
red alder		
western red cedar		
Douglas fir		

Functions	Rating	Comments
Wildlife Habitat	Medium	diverse veg., no adjacent water, highway
Water Quality Protection	Low	disturbance
Ecological Integrity	Low	no adjacent tributary/runoff source
Connectivity	Low	small size & edge effect, highway disturbance
Uniqueness	Low	isolated from other units by Hwy 26 & Telford Road
		no unique features

Significant? No

Comments/Recommendations:

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Stone Road	Site Code: U6
Location: South of Stone Road, east of 282nd Avenue	Map Sheet(s) #: 4
Adjacent Land Use: agricultural, rural residential	Field Date(s): 3/13/01

T 1S, R 3E Section: 24

General Description: This unit consists of a mixed deciduous/coniferous forest on a hill above Stone Road. This unit is part of a large upland forest located south of the study area.

Species Information: This site is suitable habitat for the special-status wildlife species that have been documented in the project area including bald eagle, pileated woodpecker, little willow flycatcher, and olive-sided flycatcher.

Adjacent Stream Information: This unit is separated from the Johnson Creek riparian corridor to the north by Stone Road and agricultural fields.

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder	Indian plum	sword fern
*Douglas fir	Himalayan blackberry	

Functions	Rating	Comments
Wildlife Habitat	High	part of large forest, near perennial water
Water Quality Protection	Low	no adjacent tributary/runoff source
Ecological Integrity	Medium	Himalayan blackberry
Connectivity	Medium	separated from Johnson Creek by Stone Road
Uniqueness	Low	no unique features

Significant? Yes

Comments/Recommendations:

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Orient Drive	Site Code: U7
Location: South of Orient Drive, east of 282nd Avenue	Map Sheet(s) #: 4
Adjacent Land Use: nurseries, agricultural	Field Date(s): 3/20/01

T 1S, R 4E Section: 19
General Description: This isolated unit consists of a Douglas fir-dominated forest surrounded by predominantly nursery fields. This unit was viewed from a distance using binoculars, and no shrub or groundcover species could be determined.
Species Information: The habitat on this site rates low. Use by special status species is doubtful.
Adjacent Stream Information: None

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*Douglas fir		

Functions	Rating	Comments
Wildlife Habitat	Low	small size, no adjacent water
Water Quality Protection	Low	no adjacent tributary/runoff source
Ecological Integrity	Low	small size & edge effect, disturbance from nurseries
Connectivity	Low	isolated from other units by nursery & ag. fields
Uniqueness	Low	no unique features

Significant? No

Comments/Recommendations:

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Bluff Road	Site Code: U8
Location: North of Bluff Road, east of Pleasant Home	Map Sheet(s) #: 4
Adjacent Land Use: nurseries, agricultural	Field Date(s): 3/20/01

T 1S, R 4E Section: 20, 21
General Description: This isolated unit consists of a mixed deciduous/coniferous forest. English ivy has invaded the trees. An even-aged, dense Douglas fir plantation, likely an old Christmas tree farm, is connected to the northeast corner of this unit; however, the plantation is too dense to provide wildlife habitat. This unit was viewed from a distance using binoculars, and no shrub or groundcover species could be determined.
Species Information: The habitat on this site rates low. Use by special status species is doubtful.
Adjacent Stream Information: None

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
Douglas fir		English ivy
red alder		
big-leaf maple		

Functions	Rating	Comments
Wildlife Habitat	Low	small size, no adjacent water
Water Quality Protection	Low	no adjacent tributary/runoff source
Ecological Integrity	Low	small size & edge effect, English ivy
Connectivity	Low	isolated from other units by nursery & ag. fields
Uniqueness	Low	no unique features

Significant? No

Comments/Recommendations:

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
WILDLIFE HABITAT SUMMARY SHEET

SITE: Division/Troutdale Road	Site Code: U9
Location: South of Division, west of Troutdale Road	Map Sheet(s) #: 1
Adjacent Land Use: agricultural, rural residential	Field Date(s): 3/20/01

T 1S, R 3E Section: 12

General Description: This unit consists of a mixed deciduous/coniferous forest on a tall, steep hill above Division Street. Groundcover is sparse in several areas, and the steep slopes are prone to erosion. English ivy has invaded the trees.

Species Information: This site is suitable habitat for the special-status wildlife species that have been documented in the project area including bald eagle, pileated woodpecker, little willow flycatcher, and olive-sided flycatcher.

Adjacent Stream Information: This unit is separated from the Beaver Creek riparian corridor to the north by Division.

Dominant Forest Vegetation: (* = major dominant)

Trees	Shrubs	Herbs
*red alder	Indian plum	sword fern
big-leaf maple	beaked hazelnut	grasses
western red cedar	snowberry	English ivy
Douglas fir	Himalayan blackberry	

Functions	Rating	Comments
Wildlife Habitat	High	large forest, near perennial water
Water Quality Protection	Low	no adjacent tributary/runoff source
Ecological Integrity	Medium	Himalayan blackberry, English ivy
Connectivity	Medium	separated from Beaver Creek by Division
Uniqueness	Low	no unique features

Significant? Yes

Comments/Recommendations:

APPENDIX B:

RIPARIAN CORRIDOR DATA SHEETS

RIPARIAN CORRIDOR SUMMARY SHEETS
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MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Beaver Creek, reach 1	Site Code: B-1
Location: UGB to 322nd Avenue	Map Sheet(s) #: 1, 4 & 5
Drainage Basin: Sandy River	Field Date(s): 3/13/01, 3/20/01
Adjacent Land Use: agricultural, nurseries, rural residential	

T 1S, R 3E/4E Sections: 1, 12 / 7, 8, 16, 17, 21

General Description: Beaver Creek is a perennial stream, and the lower reach ranges from 8 to 15 feet wide with channel meanders and cobbles. A wide, diverse mixed deciduous/coniferous forest is present along most of the lower reach of Beaver Creek. The forest has a multilayered tree and shrub canopy and several large snags. The riparian corridor is in excellent condition south of Oxbow Road, where Beaver Creek meanders through a broad, diverse western red cedar-dominated floodplain. A large forest with several small seasonal drainages feeding into Beaver Creek is present to the north of Oxbow Road. A portion of the historic riparian corridor has been cleared of trees and shrubs downstream of 302nd Avenue. Mowed lawns are present in several areas up to the edge of the stream, and Himalayan blackberry and English ivy are present in disturbed areas. Division separates this unit from an upland forest (Unit 10) to the south. Beaver Creek continues outside the study area into Troutdale before it flows into the Sandy River.

Dominant Vegetation Type: Predominantly forested, several pastures and a few ornamental nurseries and mowed grass areas. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	High	see wildlife habitat summary sheets
Water Quality Protection	High	well vegetated corridor, runoff from ag fields
Ecological Integrity	Medium	portions mowed, English ivy, Himalayan blackberry
Connectivity	High/Low	large forest along most of reach

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor west of 302nd Avenue. Control Himalayan blackberry and English ivy adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Beaver Creek, reach 2	Site Code: B-2
Location: 322nd Avenue to headwaters	Map Sheet(s) #: 1, 4 & 5
Drainage Basin: Sandy River	Field Date(s): 3/13/01, 3/20/01
Adjacent Land Use: agricultural, nurseries, rural residential	

T 1S, R 4E Sections: 18, 21, 22

General Description: The headwaters of Beaver Creek originate in an agricultural field as an approximately 2 feet wide channelized stream. A very narrow forested area is present along portions of this reach; however, riparian tree and shrub cover is generally sparse. Mowed grass is present up to the edge of stream in other areas. The uppermost portion of this reach (east of 322nd Avenue) is degraded where the stream is bordered by extensive patches of Himalayan blackberry and English ivy. Adjacent land use along this reach is predominantly nursery fields. Nursery fields are often planted very close to the stream with planted rows being oriented perpendicular to the stream with bare soil between plant rows which contributes to runoff and erosion entering the stream. Several large ponds, probably used to irrigate adjacent fields, are mapped along Beaver Creek on the National Wetlands Inventory map

Dominant Vegetation Type: Narrow forested areas, and several ornamental nurseries and pastures. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	Medium	see wildlife habitat summary sheets
Water Quality Protection	Low	narrow riparian corridor, runoff from nursery fields
Ecological Integrity	Low	much of historic riparian corridor has been cleared
Connectivity	Low/U	narrow fragmented forest along reach

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor. Improve use of soil conservation measures in nursery fields. Control Himalayan blackberry and English holly adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Beaver Creek Tributary 1	Site Code: BT-1
Location: South of Troutdale Road, west of 302nd Avenue	Map Sheet(s) #: 4
Drainage Basin: Sandy River	Field Date(s): 3/13/01, 3/20/01
Adjacent Land Use: nurseries, agricultural, rural residential	

T 1S, R 3E/4E Section: 12 / 7, 18
General Description: This unit consists of a forked perennial tributary to Beaver Creek. The tributary is channelized to 1 foot wide at the headwaters and widens downstream of Lusted Road to 5 to 10 feet wide with channel meanders and cobbles present. A wide mostly deciduous forest is present along most of this tributary. A multilayered tree and shrub canopy is present, along with several large snags and large down logs across the stream. The forest is narrowest along the southern fork. Mowed lawns and cattle grazing occur up to the top of streambank in the upper portions of this unit. Large Himalayan blackberry patches are present throughout the corridor, and English ivy has invaded trees in areas. Adjacent land use in the upstream portion of this unit (south of Lusted Road) is nursery fields. Nursery fields are often planted very close to the stream with planted rows being oriented perpendicular to the stream with bare soil between plant rows which contributes to runoff and erosion entering the stream.

Dominant Vegetation Type: Predominantly forested, with ornamental nurseries and pastures in the upstream portion. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	High	see wildlife habitat summary sheets
Water Quality Protection	High	well vegetated, runoff from ag and nursery fields
Ecological Integrity	Medium	Himalayan blackberry & English ivy
Connectivity	High/Low	large forest along most of tributary

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor. Improve use of soil conservation measures in nursery fields. Control Himalayan blackberry and English ivy adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Beaver Creek Tributary 2	Site Code: BT-2
Location: East of 287th Avenue, north & south of Division Street	Map Sheet(s) #: 1
Drainage Basin: Sandy River	Field Date(s): 3/20/01
Adjacent Land Use: agricultural, nurseries	

T 1S, R 4E Section: 7

General Description: This perennial tributary is a deeply incised 2 feet wide channel in the pasture south of Division and widens to approximately 5 feet upstream. A mixed deciduous/coniferous forest is present along the upper portion of this stream, north of Division. The herbaceous and shrub layers are sparse in the forest, probably due to past grazing. No riparian trees and shrubs are present adjacent to the stream south of Division Street, and the slopes adjacent to the stream are heavily grazed by cattle and eroding on both sides of the stream.

Dominant Vegetation Type: Forested in the upstream portion and pastures and ornamental nurseries in the downstream portion. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	High	see wildlife habitat summary sheets
Water Quality Protection	High	well vegetated in upper portion, runoff from ag fields
Ecological Integrity	Medium	riparian corridor cleared in lower portion, grazed
Connectivity	Low/U	forested only along upper portion of reach

Significant? Yes

Comments/Recommendations: Install fence adjacent to riparian corridor to prevent cattle access to stream. Plant native trees and shrubs adjacent to stream to enhance riparian corridor. Control Himalayan blackberry adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Beaver Creek Tributary 3	Site Code: BT-3
Location: East of Troutdale Road, north of Dodge Park Blvd	Map Sheet(s) #: 4
Drainage Basin: Sandy River	Field Date(s): 3/13/01
Adjacent Land Use: agricultural, nurseries, rural residential	

T 1S, R 4E Sections: 7, 17, 18, 20, 21

General Description: This unit consists of a forked perennial tributary to Beaver Creek. The stream is channelized to 1 foot wide at the headwaters, where the stream is confined within retaining walls along the stream banks. The stream widens to 10 feet downstream of 302nd Avenue, with channel meanders and cobbles present. A wide, multi-layered, mixed deciduous/coniferous forest is present in the lower portion of this tributary. Upstream of 302nd Avenue, the forest narrows, and no riparian tree and shrub cover is present in several areas. Several mowed lawns and pastures with horses are present up to the edge of the stream in several areas. An Oregon ash wetland forest is present south of Dodge Park Boulevard at the headwaters of the southern fork. Adjacent land use in the upstream portion of this unit is nursery fields. Nursery fields are often planted very close to the stream with planted rows being oriented perpendicular to the stream with bare soil between plant rows which contributes to runoff and erosion entering the stream.

Dominant Vegetation Type: Predominantly forested in the downstream area, and many ornamental nurseries and pastures in the upstream portion. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	High	see wildlife habitat summary sheets
Water Quality Protection	High	well vegetated, runoff from ag and nursery fields
Ecological Integrity	Medium	cleared in upper portion, grazed, blackberry
Connectivity	High/Low	large forest along upper portion of reach

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor in mowed areas. Improve use of soil conservation measures in nursery fields.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Beaver Creek Tributary 4	Site Code: BT-4
Location: South of Oxbow Drive, east & west of Honser	Map Sheet(s) #: 5
Drainage Basin: Sandy River	Field Date(s): 3/20/01
Adjacent Land Use: nurseries	

T 1S, R 4E Sections: 18, 19

General Description: This perennial tributary is channelized to 2 to 3 feet wide. A narrow, mostly deciduous forest is present along portions of the stream. The riparian corridor is degraded where large patches of Himalayan blackberry are present and English ivy has invaded the trees. No riparian tree or shrub cover is present in some areas which have mowed grass present up to the edge of stream. Adjacent land use is predominantly nursery fields. Nursery fields are often planted very close to the stream with planted rows being oriented perpendicular to the stream with bare soil between plant rows which contributes to runoff and erosion entering the stream. A large pond, probably used to irrigate adjacent fields, is mapped on the tributary on the National Wetlands Inventory map.

Dominant Vegetation Type: Narrow forested areas and ornamental nurseries. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	Medium	see wildlife habitat summary sheets
Water Quality Protection	Low	narrow riparian corridor, runoff from nursery fields
Ecological Integrity	Low	much of historic riparian corridor has been cleared
Connectivity	Low/U	narrow fragmented forest along reach

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor. Improve use of soil conservation measures in nursery fields. Control Himalayan blackberry and English ivy adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Johnson Creek, reach 1	Site Code: J-1
Location: UGB to Telford Road	Map Sheet(s) #: 3 & 4
Drainage Basin: Willamette River	Field Date(s): 3/13/01
Adjacent Land Use: agricultural, rural residential	

T 1S, R 3E Section: 23

General Description: Johnson Creek is a perennial stream ranging from 15 to 20 feet wide with channel meanders in the lower reach. The streambed substrate generally consists of large rocks and smaller cobbles. A multi-layered, mixed deciduous/coniferous forest with mature trees and large diameter cottonwood snags is present along this reach. Oregon ash, red alder, western red cedar, willow, red-osier dogwood, and reed canarygrass dominate the floodplain. Himalayan blackberry is dominant in disturbed areas, especially near roads. The riparian corridor widens where four tributaries join Johnson Creek from the southwest, enhancing connectivity. Telford Road separates this unit from an upland forest (Unit U4) to the east. The Springwater Corridor trail parallels the site providing recreational opportunities. Johnson Creek continues outside the study area into Gresham before flowing into the Willamette River.

Dominant Vegetation Type: Forested along the entire reach. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	High	see wildlife habitat summary sheets
Water Quality Protection	High	well vegetated corridor, runoff from ag fields
Ecological Integrity	Medium	Himalayan blackberry
Connectivity	High/U	forested along entire reach

Significant? Yes

Comments/Recommendations: Control Himalayan blackberry along stream. Red-legged frog observed downstream of study area in 1995 by Fishman Environmental Services.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Johnson Creek, reach 2	Site Code: J-2
Location: East of Telford Road and west of Highway 26	Map Sheet(s) #: 3 & 4
Drainage Basin: Willamette River	Field Date(s): 3/13/01
Adjacent Land Use: agricultural, rural residential	

T 1S, R 3E Section: 24

General Description: This perennial reach of Johnson Creek ranges from 5 to 15 feet wide. The stream has channel meanders downstream of 267th Avenue and is channelized upstream. This reach has been cleared of most of the riparian trees and shrubs which were historically present adjacent to the stream due to adjacent agricultural land use, and only very narrow and sparse riparian tree and shrub cover remains. Cows were noted grazing up to the edge of the stream west of 267th Avenue. This unit receives roadside runoff.

Dominant Vegetation Type: Narrow forest and pastures. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	Low	see wildlife habitat summary sheets
Water Quality Protection	Low	narrow riparian corridor, runoff from pasture w/cattle
Ecological Integrity	Low	most of riparian corridor has been cleared, grazed
Connectivity	Low/U	no forest along reach

Significant? Yes

Comments/Recommendations: Install fence adjacent to riparian corridor to prevent cattle access to stream. Plant native trees and shrubs adjacent to stream to enhance riparian corridor to provide connectivity to upstream and downstream reaches of Johnson Creek.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Johnson Creek, reach 3	Site Code: J-3
Location: Between Highway 26 & Orient Dr. & adjacent to Revenue Rd.	Map Sheets #: 4 & 5
Drainage Basin: Willamette River	Field Date(s): 3/13/01
Adjacent Land Use: agricultural, nurseries, rural residential	

T 1S, R 3E/4E Sections: 24 / 19, 20

General Description: This perennial reach of Johnson Creek ranges from 5 to 8 feet wide with channel meanders. A mixed deciduous/coniferous forest is present in along portions of this reach. No riparian tree or shrub cover is present in some areas where pastures are present up to the edge of the stream. This unit includes several wetland pastures with slough sedge and soft rush and a wetland forest dominated by Oregon ash, black cottonwood, willow, and red-osier dogwood. Stone Road separates this unit from an upland forest (Unit U7) to the south. Three tributaries join this reach of Johnson Creek to the south of the study area, enhancing connectivity. This unit receives roadside runoff.

Dominant Vegetation Type: Predominantly forested, with several pastures and ornamental nurseries also present. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	High	see wildlife habitat summary sheets
Water Quality Protection	Medium	portion of riparian corridor cleared, pasture runoff
Ecological Integrity	Medium	portion of riparian corridor cleared, grazed
Connectivity	Medium/Low	narrow fragmented forest along reach

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor. Control Himalayan blackberry and English ivy adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Johnson Creek, reach 4	Site Code: J-4
Location: East and west of Cottrell Road	Map Sheet(s) #: 5
Drainage Basin: Willamette River	Field Date(s): 3/13/01
Adjacent Land Use: agricultural, nurseries, rural residential	

T 1S, R 4E Section: 22

General Description: This perennial reach consists of the headwater area of Johnson Creek and ranges from approximately 3 to 4 feet wide with channel meanders. The headwaters originate just upstream of the study area. The mostly deciduous forest is broader upstream of Cottrell Road and is very narrow downstream of Cottrell. A large pond is mapped above Cottrell on the National Wetlands Inventory map that is probably used for irrigation. Adjacent land use is predominantly nursery fields. Nursery fields are often planted very close to the stream with planted rows being oriented perpendicular to the stream with bare soil between plant rows which contributes to runoff and erosion entering the stream.

Dominant Vegetation Type: Narrow forested areas, with several ornamental nurseries and pastures also present. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	High	see wildlife habitat summary sheets
Water Quality Protection	Medium	narrow riparian corridor, nursery & ag field runoff
Ecological Integrity	Medium	portions of riparian corridor have been cleared
Connectivity	Medium/U	narrow forest along reach

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor. Improve use of soil conservation measures in nursery fields. Control English holly adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Johnson Creek Tributary 1	Site Code: JT-1
Location: North of Butler Road	Map Sheet(s) #: 3
Drainage Basin: Willamette River	Field Date(s): 3/13/01
Adjacent Land Use: residential, agricultural, golf course	

T 1S, R 3E Section: 22

General Description: This perennial tributary is approximately 3 feet wide at the Butler Road culvert. A mostly deciduous forest is present adjacent to this tributary north of Butler Road. The herbaceous layer is sparse due to the dense tree canopy and red alder regeneration in the shrub layer. Upstream of Butler Road, the tributary flows through the Persimmon Country Club golf course. No riparian tree or shrub cover is present adjacent to the stream on the golf course. A man-made pond is present on the tributary immediately south of Butler Road. The pond is surrounded by cattail, willow and red alder shrubs and is used by mallards. Downstream of the study area, most of the riparian trees and shrubs which were historically present adjacent to the stream were cleared in the past for residential subdivision.

Dominant Vegetation Type: Predominantly forested, with a few pastures also present. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	High	see wildlife habitat summary sheets
Water Quality Protection	High	well vegetated corridor, runoff from golf course
Ecological Integrity	Medium	Himalayan blackberry
Connectivity	High/U	forested along most of reach

Significant? Yes

Comments/Recommendations: Control Himalayan blackberry adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Johnson Creek Tributary 2	Site Code: JT-2
Location: West of 252nd Avenue	Map Sheet(s) #: 3
Drainage Basin: Willamette River	Field Date(s): 3/13/01
Adjacent Land Use: agricultural, rural residential, golf course	

T 1S, R 3E Section: 22, 23
General Description: This unit consists of two perennial tributaries to Johnson Creek which are approximately 3 to 5 feet wide near their headwaters. A steeply sloped deciduous forest surrounds the two tributaries. A portion of the interior of this unit was cleared in the past and appears to be currently used as a nursery field. The headwaters of the both tributaries originate in the golf course at the Persimmon Country Club. The riparian corridor adjacent to the northern tributary is disturbed near the road where Himalayan blackberry is dominant. Some recent clearing of trees has occurred east of 242nd Avenue along the northern tributary. The headwaters of the southern tributary are disturbed and are dominated by Himalayan blackberry and English holly is also present.

Dominant Vegetation Type: Predominantly forested, except where one ornamental nursery is present and the headwater area at the Persimmon Country Club. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	High	see wildlife habitat summary sheets
Water Quality Protection	High	well vegetated, runoff from ag fields and golf course
Ecological Integrity	Medium	Himalayan blackberry
Connectivity	High/U	large forest along both tributaries

Significant? Yes

Comments/Recommendations: Control Himalayan blackberry and English holly adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Johnson Creek Tributary 3	Site Code: JT-3
Location: East of Telford Road, north of Callister Road	Map Sheet(s) #: 3
Drainage Basin: Willamette River	Field Date(s): 3/13/01
Adjacent Land Use: agricultural, rural residential	

T 1S, R 3E Section: 23

General Description: This very short tributary originates in a pasture with horses and has been channelized to 1 foot wide. This tributary is probably seasonal. No riparian tree cover is present, and shrub cover is very sparse and narrow and consists predominantly of Himalayan blackberry. The tributary is channelized in a roadside ditch before being culverted under Telford Road and the Springwater Trail to Johnson Creek.

Dominant Vegetation Type: Pasture

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	Low	see wildlife habitat summary sheets
Water Quality Protection	Low	sparse riparian corridor, runoff from pasture w/horses
Ecological Integrity	Low	historic riparian corridor has been cleared, grazed
Connectivity	Low/U	no forest along tributary

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs to enhance the riparian corridor. Control Himalayan blackberry adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Johnson Creek Tributary 4	Site Code: JT-4
Location: South of McNutt Road	Map Sheet(s) #: 3
Drainage Basin: Willamette River	Field Date(s): 3/13/01
Adjacent Land Use: agricultural, nurseries, rural residential	

T 1S, R 3E Section: 33
General Description: This perennial tributary is approximately 3 to 5 feet wide. A narrow forested area is present along the stream immediately south of McNutt Road, and the forest widens considerably upstream. The tributary is culverted under McNutt Road to Johnson Creek, not under Kane Road as mapped by Metro in RLIS. Several pastures with horses are present adjacent to this unit. One wet field with soft rush was noted adjacent to this unit, south of McNutt Road.

Dominant Vegetation Type: Predominantly forested and one pasture. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	High	see wildlife habitat summary sheets
Water Quality Protection	High	portion well vegetated, runoff from pastures w/horses
Ecological Integrity	Medium	Himalayan blackberry, grazed
Connectivity	Medium/U	narrow forest along portion of tributary

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs south of McNutt Road to enhance the riparian corridor and provide a wildlife travel corridor from Johnson Creek to upstream portions of the tributary. Control Himalayan blackberry adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Johnson Creek Tributary 5	Site Code: JT-5
Location: East of Telford Road, south of Orient Drive	Map Sheet(s) #: 3, 4
Drainage Basin: Willamette River	Field Date(s): 3/13/01
Adjacent Land Use: agricultural, nurseries, rural residential, school	

T 1S, R 3E/4E Sections: 23, 24 / 19

General Description: This perennial tributary varies in width from 2 to 6 feet wide and is channelized in portions. A mixed deciduous/coniferous forest is present along much of the tributary. The forest is narrow and somewhat sparse in the lower portion but widens considerably upstream of Highway 26. Below 262nd Avenue, the riparian corridor is disturbed in areas where Himalayan blackberry is dominant. Above 262nd Avenue, riparian tree and shrub cover is absent in a few areas where mowed grass is present up to the edge of the stream. Several nursery fields are present adjacent to the upstream portion of this unit. The stream originates in a transitional wet forest just north of the West Orient School. This unit receives roadside runoff.

Dominant Vegetation Type: Predominantly forested in the downstream portion, with several pastures and ornamental nurseries present in the upstream portion. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	High	see wildlife habitat summary sheets
Water Quality Protection	High	well vegetated, runoff from ag and nursery fields
Ecological Integrity	Medium	Himalayan blackberry, English holly, English ivy
Connectivity	Medium/Low	narrow fragmented forest along portion of tributary

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor in areas where stream is currently bordered by mowed grass. Control Himalayan blackberry and English holly adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Johnson Creek Tributary 6	Site Code: JT-6
Location: East and west of Kane Road, north of Rugg Road	Map Sheet(s) #: 3
Drainage Basin: Willamette River	Field Date(s): 3/13/01
Adjacent Land Use: agricultural, rural residential	

T 1S, R 3E Section: 23
General Description: This perennial tributary is approximately 10 feet wide with channel meanders and cobbles present. A mostly deciduous forest is present along this tributary. The shrub layer is sparse in some areas, likely due to past grazing. Portions of the riparian corridor are disturbed near the road where Himalayan blackberry is dominant. Several pastures with horses are present adjacent to this unit. One wet field with soft rush was noted adjacent to this unit.

Dominant Vegetation Type: Predominantly forested, with a few pastures also present. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	High	see wildlife habitat summary sheets
Water Quality Protection	High	wide corridor, runoff from adjacent pastures w/horses
Ecological Integrity	Medium	Himalayan blackberry, grazed
Connectivity	High/U	forested along entire tributary

Significant? Yes

Comments/Recommendations: Control Himalayan blackberry adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Johnson Creek Tributary 7	Site Code: JT-7
Location: East of Orient Drive, north & south of Bluff Road	Map Sheet(s) #: 4
Drainage Basin: Willamette River	Field Date(s): 3/13/01
Adjacent Land Use: agricultural, rural residential	

T 1S, R 4E Section: 20

General Description: The headwaters of this perennial tributary originate in an agricultural field, and the stream is channelized to 1 to 2 feet wide. A forest is present near the headwaters, west of Pleasant Home Road. Downstream of this forested area, no riparian tree or shrub cover is present adjacent to the tributary, and the riparian corridor is disturbed and is dominated by Himalayan blackberry. A large National Wetland Inventory pond is mapped on this tributary, south of Bluff Road.

Dominant Vegetation Type: Predominantly pastures and ornamental nurseries, with one forested area also present. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	Medium	see wildlife habitat summary sheets
Water Quality Protection	Medium	most of riparian corridor cleared, ag & nursery runoff
Ecological Integrity	Low	most of riparian corridor cleared, invasive species
Connectivity	Low/U	forested only along upper portion of tributary

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor and provide a wildlife travel corridor from the upstream forest to Johnson Creek. Control Himalayan blackberry, English holly, and English ivy adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Kelly Creek North	Site Code: KN
Location: North of Dodge Park road, east and west of 302nd Avenue	Map Sheet(s) #: 4
Drainage Basin: Sandy River	Field Date(s): 3/13/01
Adjacent Land Use: agricultural, nurseries	

T 1S, R 4E Section: 18, 19, 20

General Description: Kelly Creek North is a perennial stream which is channelized to 2 to 3 feet wide near its headwaters at 302nd Avenue. The stream widens downstream, and a few channel meanders are present. A narrow mostly deciduous forest is present along most of this stream, except at the headwaters. The riparian corridor downstream of 302nd Avenue has a very sparse shrub and herbaceous layer, and several trees have been recently cleared adjacent to the stream. English ivy is present on several remaining trees. Upstream of 302nd Avenue, the stream channel flows through a backyard where a mowed lawn is present up to the edge of the stream and many footbridges and ornamental species (i.e. deodar cedar, pampas grass) are present. The headwaters of this tributary originate as a roadside ditch adjacent to a nursery field south of Jackson Road. Adjacent land use is predominantly nursery fields. However, in most areas, an at least 25 feet wide riparian corridor/buffer is present between the stream and the nursery fields, unlike the majority of the nursery fields in the study area which were planted up to the edge of the stream.

Dominant Vegetation Type: Narrow forest, with a few ornamental nurseries present at the headwaters. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	Medium	see wildlife habitat summary sheets
Water Quality Protection	High	well vegetated, runoff from nursery fields
Ecological Integrity	Medium	narrow riparian with invasive species and ornamentals
Connectivity	Medium/Low	narrow forest along most of reach

Significant? Yes

Comments/Recommendations: Plant native trees and shrubs to enhance riparian corridor in mowed areas. Control Himalayan blackberry and English ivy adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Kelly Creek South	Site Code: KS
Location: South of Rodlun Road	Map Sheet(s) #: 3
Drainage Basin: Willamette River	Field Date(s): 3/13/01
Adjacent Land Use: scattered residential, tree farm	

T 1S, R 3E Sections: 20, 21

General Description: Kelly Creek South is a perennial stream ranging in width from 3 to 10 feet. The stream is a natural meandering channel with nice cobbles. A portion of the stream channel is braided. A small tributary to Kelly Creek is present in the west portion of this unit. A mature, mostly deciduous forest with steep slopes is present along the stream. Several large old stumps are present and large woody debris is present over the stream. Some human disturbance is present as indicated by the presence of non-native species (Himalayan blackberry, English ivy, periwinkle) and a tire and scattered trash adjacent to the road. Himalayan blackberry increases in the riparian corridor in areas where the stream closely parallels the road. Rodlun Road separates this unit from an upland forest (Unit U1) to the north.

Dominant Vegetation Type: Predominantly forested, and one tree farm is present in the downstream portion. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	High	see wildlife habitat summary sheets
Water Quality Protection	High	well vegetated slopes adjacent to stream
Ecological Integrity	Medium	some invasive species, human disturbance
Connectivity	High/Low	large forest along entire reach

Significant? Yes

Comments/Recommendations: Control Himalayan blackberry and English ivy adjacent to stream.

MULTNOMAH COUNTY WEST OF SANDY RIVER
NATURAL RESOURCE INVENTORY AND ASSESSMENT
RIPARIAN CORRIDOR SUMMARY SHEET

SITE: Sandy River	Site Code: S
Location: North and east study area boundary	Map Sheet(s) #: 1, 2
Drainage Basin: Sandy River	Field Date(s): 3/20/01
Adjacent Land Use: agricultural, nurseries	

T 1N, R 3E, S 36; T 1N, R4E, S 31; T 1S, R3E, S 1; T 1S, R4E, S 5-11, 14-16, 22, 23:
General Description: The Sandy River unit is the largest resource in the project area. It includes the Sandy River floodplain, relict slough channels, hillslopes and adjacent forests. Vegetation is dominated by a mixed coniferous / deciduous forest with pockets of old growth. The multi-layered canopy provides diverse habitat for a variety of wildlife species. Sensitive salmon species spawn in the river and a variety of sensitive plant, bird, herptile and mammal species potentially occur in the unit. The large size of this unit with its variety of resources and its connectivity to the Columbia River further increase its resource values. It also includes a large amount of public and protected land (Nature Conservancy). Portions of the riparian corridor east and west of Lusted Road have been cleared for agricultural and nursery field use.

Dominant Vegetation Type: Forested. Refer to wildlife habitat summary sheet for forest information.

Functions	Rating	Comments
Fish Habitat	High	ESA listed salmonid species present in drainage basin
Wildlife Habitat	High	see wildlife habitat summary sheets
Water Quality Protection	High	wide riparian corridor with well vegetated slopes
Ecological Integrity	High	patches of invasive species but mostly native
Connectivity	High/High	large forest along entire reach

Significant? Yes

Comments/Recommendations: Avoid fragmentation of this unit due to further clearing for use as agricultural or nursery fields which reduces connectivity.

APPENDIX C:

GOAL 5

Oregon's Statewide Planning Goals & Guidelines
GOAL 5: NATURAL RESOURCES, SCENIC AND HISTORIC AREAS, AND OPEN SPACES

OAR 660-015-0000(5)

(Please Note: Amendments Effective 08/30/96)

To protect natural resources and conserve scenic and historic areas and open spaces.

Local governments shall adopt programs that will protect natural resources and conserve scenic, historic, and open space resources for present and future generations. These resources promote a healthy environment and natural landscape that contributes to Oregon's livability.

The following resources shall be inventoried:

a. Riparian corridors, including water and riparian areas and fish habitat;
b. Wetlands;
c. Wildlife Habitat;
d. Federal Wild and Scenic Rivers;
e. State Scenic Waterways;
f. Groundwater Resources;
g. Approved Oregon Recreation Trails;
h. Natural Areas;
i. Wilderness Areas;
j. Mineral and Aggregate Resources;
k. Energy sources;
l. Cultural areas.

Local governments and state agencies are encouraged to maintain current inventories of the following resources:

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

Following procedures, standards, and definitions contained in commission rules, local governments shall determine significant sites for inventoried resources and develop programs to achieve the goal.

GUIDELINES FOR GOAL 5

A. PLANNING

1. The need for open space in the planning area should be determined, and standards developed for the amount, distribution, and type of open space.

2. Criteria should be developed and utilized to determine what uses are consistent with open space values and to evaluate the effect of converting open space

lands to inconsistent uses. The maintenance and development of open space in urban areas should be encouraged.

3. Natural resources and required sites for the generation of energy (i.e. natural gas, oil, coal, hydro, geothermal, uranium, solar and others) should be conserved and protected; reservoir sites should be identified and protected against irreversible loss.

4. Plans providing for open space, scenic and historic areas and natural resources should consider as a major determinant the carrying capacity of the air, land and water resources of the planning area. The land conservation and development actions provided for by such plans should not exceed the carrying capacity of such resources.

5. The National Register of Historic Places and the recommendations of the State Advisory Committee on Historic Preservation should be utilized in designating historic sites.

6. In conjunction with the inventory of mineral and aggregate resources, sites for removal and processing of such resources should be identified and protected.

7. As a general rule, plans should prohibit outdoor advertising signs except in commercial or industrial zones. Plans should not provide for the reclassification of land for the purpose of accommodating an outdoor advertising sign. The term "outdoor advertising sign" has the meaning set forth in ORS 377.710(23).

B. IMPLEMENTATION

1. Development should be planned and directed so as to conserve the needed amount of open space.

2. The conservation of both renewable and non-renewable natural resources and physical limitations of the land should be used as the basis for determining the quantity, quality, location, rate and type of growth in the planning area.

3. The efficient consumption of energy should be considered when utilizing natural resources.

4. Fish and wildlife areas and habitats should be protected and managed in accordance with the Oregon Wildlife Commission's fish and wildlife management plans.

5. Stream flow and water levels should be protected and managed at a level adequate for fish, wildlife, pollution abatement, recreation, aesthetics and agriculture.

6. Significant natural areas that are historically, ecologically or scientifically unique, outstanding or important, including those identified by the State Natural Area Preserves Advisory Committee, should be inventoried and evaluated. Plans should provide for the preservation of natural areas consistent with an inventory of scientific, educational, ecological, and recreational needs for significant natural areas.

7. Local, regional and state governments should be encouraged to investigate and utilize fee acquisition, easements, cluster developments, preferential assessment, development rights acquisition and similar techniques to implement this goal.

8. State and federal agencies should develop statewide natural resource, open space, scenic and historic area plans and provide technical assistance to local and regional agencies. State and federal plans should be reviewed and coordinated with local and regional plans.

9. Areas identified as having non-renewable mineral and aggregate resources should be planned for interim, transitional and "second use" utilizations well as for the primary use.

APPENDIX D:

GOAL 5 ADMINISTRATIVE RULE OAR 660-023

Note: This copy of OAR 660-023 has been print from the Department of Land Conservation and Development website on April 10, 2001.

The Oregon Administrative Rules contain OAR's filed through March 15, 2001

LAND CONSERVATION AND DEVELOPMENT DEPARTMENT

DIVISION 23

PROCEDURES AND REQUIREMENTS FOR

COMPLYING WITH GOAL 5

660-023-0000

Purpose and Intent

This division establishes procedures and criteria for inventorying and evaluating Goal 5 resources and for developing land use programs to conserve and protect significant Goal 5 resources. This division explains how local governments apply Goal 5 when conducting periodic review and when amending acknowledged comprehensive plans and land use regulations.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0010

Definitions

As used in this division, unless the context requires otherwise:

(1) "Conflicting use" is a land use, or other activity reasonably and customarily subject to land use regulations, that could adversely affect a significant Goal 5 resource (except as provided in OAR 660-023-0180(1)(b)). Local governments are not required to regard agricultural practices as conflicting uses.

(2) "ESEE consequences" are the positive and negative economic, social, environmental, and energy (ESEE) consequences that could result from a decision to allow, limit, or prohibit a conflicting use.

(3) "Impact area" is a geographic area within which conflicting uses could adversely affect a significant Goal 5 resource.

(4) "Inventory" is a survey, map, or description of one or more resource sites that is prepared by a local government, state or federal agency, private citizen, or other organization and that includes information about the resource values and features associated with such sites. As a verb, "inventory" means to collect, prepare, compile, or refine information about one or more resource sites. (See resource list.)

(5) "PAPA" is a "post-acknowledgment plan amendment." The term encompasses actions taken in accordance with ORS 197.610 through 197.625, including amendments to an acknowledged comprehensive plan or land use regulation and the adoption of any new plan or land use regulation. The term does not include periodic review actions taken in accordance with ORS 197.628 through 197.650.

(6) "Program" or "program to achieve the goal" is a plan or course of proceedings and action either to prohibit, limit, or allow uses that conflict with significant Goal 5 resources, adopted as part of the comprehensive plan and land use regulations (e.g., zoning standards, easements, cluster developments, preferential assessments, or acquisition of land or development rights).

(7) "Protect," when applied to an individual resource site, means to limit or prohibit uses that conflict with a significant resource site (except as provided in OAR 660-023-0140, 660-023-0180, and 660-023-0190). When applied to a resource category, "protect" means to develop a program consistent with this division.

(8) "Resource category" is any one of the cultural or natural resource groups listed in Goal 5.

(9) "Resource list" includes the description, maps, and other information about significant Goal 5 resource sites within a jurisdiction, adopted by a local government as a part of the comprehensive plan or as a land use regulation. A "plan inventory" adopted under OAR 660-016-0000(5)(c) shall be considered to be a resource list.

(10) "Resource site" or "site" is a particular area where resources are located. A site may consist of a parcel or lot or portion thereof or may include an area consisting of two or more contiguous lots or parcels.

(11) "Safe harbor" has the meaning given to it in OAR 660-023-0020(2).

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & 197.225 - 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0020

Standard and Specific Rules and Safe Harbors

(1) The standard Goal 5 process, OAR 660-023-0030 through 660-023-0050, consists of procedures and requirements to guide local planning for all Goal 5 resource categories. This division also provides specific rules for each of the fifteen Goal 5 resource categories (see OAR 660-023-0090 through 660-023-0230). In some cases this division indicates that both the standard and the specific rules apply to Goal 5 decisions. In other cases, this division indicates that the specific rules supersede parts or all of the standard process rules (i.e., local governments must follow the specific rules rather than the standard Goal 5 process). In case of conflict, the resource-specific rules set forth in OAR 660-023-0090 through 660-023-0230 shall supersede the standard provisions in OAR 660-023-0030 through 660-023-0050.

(2) A "safe harbor" consists of an optional course of action that satisfies certain requirements under the standard process. Local governments may follow safe harbor requirements rather than addressing certain requirements in the standard Goal 5 process. For example, a jurisdiction may choose to identify "significant" riparian corridors using the safe harbor criteria under OAR 660-023-0090(5) rather than follow the general requirements for determining "significance" in the standard Goal 5 process under OAR 660-023-0030(4). Similarly, a jurisdiction may adopt a wetlands ordinance that meets the requirements of OAR 660-023-0100(4)(b) in lieu of following the ESEE decision process in OAR 660-023-0040.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0030

Inventory Process

(1) Inventories provide the information necessary to locate and evaluate resources and develop programs to protect such resources. The purpose of the inventory process is to compile or update a list of significant Goal 5 resources in a jurisdiction. This rule divides the inventory process into four steps. However, all four steps are not necessarily applicable, depending on the type of Goal 5 resource and the scope of a particular PAPA or periodic review work task. For example, when proceeding under a quasi-judicial PAPA for a particular site, the initial inventory step in section (2) of this rule is not applicable in that a local government may rely on information submitted by applicants and other participants in the local process. The inventory process may be

followed for a single site, for sites in a particular geographical area, or for the entire jurisdiction or urban growth boundary (UGB), and a single inventory process may be followed for multiple resource categories that are being considered simultaneously. The standard Goal 5 inventory process consists of the following steps, which are set out in detail in sections (2) through (5) of this rule and further explained in sections (6) and (7) of this rule:

(a) Collect information about Goal 5 resource sites;

(b) Determine the adequacy of the information;

(c) Determine the significance of resource sites; and

(d) Adopt a list of significant resource sites.

(2) Collect information about Goal 5 resource sites: The inventory process begins with the collection of existing and available information, including inventories, surveys, and other applicable data about potential Goal 5 resource sites. If a PAPA or periodic review work task pertains to certain specified sites, the local government is not required to collect information regarding other resource sites in the jurisdiction. When collecting information about potential Goal 5 sites, local governments shall, at a minimum:

(a) Notify state and federal resource management agencies and request current resource information; and

(b) Consider other information submitted in the local process.

(3) Determine the adequacy of the information: In order to conduct the Goal 5 process, information about each potential site must be adequate. A local government may determine that the information about a site is inadequate to complete the Goal 5 process based on the criteria in this section. This determination shall be clearly indicated in the record of proceedings. The issue of adequacy may be raised by the department or objectors, but final determination is made by the commission or the Land Use Board of Appeals, as provided by law. When local governments determine that information about a site is inadequate, they shall not proceed with the Goal 5 process for such sites unless adequate information is obtained, and they shall not regulate land uses in order to protect such sites. The information about a particular Goal 5 resource site shall be deemed adequate if it provides the location, quality and quantity of the resource, as follows:

(a) Information about location shall include a description or map of the resource area for each site. The information must be sufficient to determine whether a resource exists on a particular site. However, a precise location of the resource for a particular site, such as would be required for building permits, is not necessary at this stage in the process.

(b) Information on quality shall indicate a resource site's value relative to other known examples of the same resource. While a regional comparison is recommended, a comparison with resource sites within the jurisdiction itself is sufficient unless there are no other local examples of the resource. Local governments shall consider any determinations about resource quality provided in available state or federal inventories.

(c) Information on quantity shall include an estimate of the relative abundance or scarcity of the resource.

(4) Determine the significance of resource sites: For sites where information is adequate, local governments shall determine whether the site is significant. This determination shall be adequate if based on the criteria in subsections (a) through (c) of this section, unless challenged by the department, objectors, or the commission based upon contradictory information. The determination of significance shall be based on:

(a) The quality, quantity, and location information;

(b) Supplemental or superseding significance criteria set out in OAR 660-023-0090 through 660-023-0230; and

(c) Any additional criteria adopted by the local government, provided these criteria do not conflict with the requirements of OAR 660-023-0090 through 660-023-0230.

(5) Adopt a list of significant resource sites: When a local government determines that a particular resource site is significant, the local government shall include the site on a list of significant Goal 5 resources adopted as a part of the comprehensive plan or as a land use regulation. Local governments shall complete the Goal 5 process for all sites included on the resource list except as provided in OAR 660-023-0200(7) for historic resources, and OAR 660-023-0220(3) for open space acquisition areas.

(6) Local governments may determine that a particular resource site is not significant, provided they maintain a record of that determination. Local governments shall not proceed with the Goal 5 process for such sites and shall not regulate land uses in order to protect such sites under Goal 5.

(7) Local governments may adopt limited interim protection measures for those sites that are determined to be significant, provided:

(a) The measures are determined to be necessary because existing development regulations are inadequate to prevent irrevocable harm to the resources on the site during the time necessary to complete the ESEE process and adopt a permanent program to achieve Goal 5; and

(b) The measures shall remain effective only for 120 days from the date they are adopted, or until adoption of a program to achieve Goal 5, whichever occurs first.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0040

ESEE Decision Process

(1) 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 that could result from a decision to allow, limit, or prohibit a conflicting use. This rule describes four steps to be followed in conducting an ESEE analysis, as set out in detail in sections (2) through (5) of this rule. Local governments are not required to follow these steps sequentially, and some steps anticipate a return to a previous step. However, findings shall demonstrate that requirements under each of the steps have been met, regardless of the sequence followed by the local government. The ESEE analysis need not be lengthy or complex, but should enable reviewers to gain a clear understanding of the conflicts and the consequences to be expected. The steps in the standard ESEE process are as follows:

(a) Identify conflicting uses;

(b) Determine the impact area;

(c) Analyze the ESEE consequences; and

(d) Develop a program to achieve Goal 5.

(2) Identify conflicting uses. Local governments shall identify conflicting uses that exist, or could occur, with regard to significant Goal 5 resource sites. To identify these uses, local governments shall examine land uses allowed outright or conditionally within the zones applied to the resource site and in its impact area. Local governments are not required to consider allowed uses that would be unlikely to occur in the impact area because existing permanent uses occupy the site. The following shall also apply in the identification of conflicting uses:

(a) If no uses conflict with a significant resource site, acknowledged policies and land use regulations may be considered sufficient to protect the resource site. The determination that there are no conflicting uses must be based on the applicable zoning rather than ownership of the site. (Therefore, public ownership of a site does not by itself support a conclusion that there are no conflicting uses.)

(b) A local government may determine that one or more significant Goal 5 resource sites are conflicting uses with another significant resource site. The local government

shall determine the level of protection for each significant site using the ESEE process and/or the requirements in OAR 660-023-0090 through 660-023-0230 (see OAR 660-023-0020(1)).

(3) Determine the impact area. Local governments shall determine an impact area for each significant resource site. The impact area shall be drawn to include only the area in which allowed uses could adversely affect the identified resource. The impact area defines the geographic limits within which to conduct an ESEE analysis for the identified significant resource site.

(4) Analyze the ESEE consequences. Local governments shall analyze the ESEE consequences that could result from decisions to allow, limit, or prohibit a conflicting use. The analysis may address each of the identified conflicting uses, or it may address a group of similar conflicting uses. A local government may conduct a single analysis for two or more resource sites that are within the same area or that are similarly situated and subject to the same zoning. The local government may establish a matrix of commonly occurring conflicting uses and apply the matrix to particular resource sites in order to facilitate the analysis. A local government may conduct a single analysis for a site containing more than one significant Goal 5 resource. The ESEE analysis must consider any applicable statewide goal or acknowledged plan requirements, including the requirements of Goal 5. The analyses of the ESEE consequences shall be adopted either as part of the plan or as a land use regulation.

(5) Develop a program to achieve Goal 5. Local governments shall determine whether to allow, limit, or prohibit identified conflicting uses for significant resource sites. This decision shall be based upon and supported by the ESEE analysis. A decision to prohibit or limit conflicting uses protects a resource site. A decision to allow some or all conflicting uses for a particular site may also be consistent with Goal 5, provided it is supported by the ESEE analysis. One of the following determinations shall be reached with regard to conflicting uses for a significant resource site:

(a) A local government may decide that a significant resource site is of such importance compared to the conflicting uses, and the ESEE consequences of allowing the conflicting uses are so detrimental to the resource, that the conflicting uses should be prohibited.

(b) A local government may decide that both the resource site and the conflicting uses are important compared to each other, and, based on the ESEE analysis, the conflicting uses should be allowed in a limited way that protects the resource site to a desired extent.

(c) A local government may decide that the conflicting use should be allowed fully, notwithstanding the possible impacts on the resource site. The ESEE analysis must demonstrate that the conflicting use is of sufficient importance relative to the resource site, and must indicate why measures to protect the resource to some extent should not be provided, as per subsection (b) of this section.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0050

Programs to Achieve Goal 5

(1) For each resource site, local governments shall adopt comprehensive plan provisions and land use regulations to implement the decisions made pursuant to OAR 660-023-0040(5). The plan shall describe the degree of protection intended for each significant resource site. The plan and implementing ordinances shall clearly identify those conflicting uses that are allowed and the specific standards or limitations that apply to the allowed uses. A program to achieve Goal 5 may include zoning measures that partially or fully allow conflicting uses (see OAR 660-023-0040(5)(b) and (c)).

(2) When a local government has decided to protect a resource site under OAR 660-023-0040(5)(b), implementing measures applied to conflicting uses on the resource site and within its impact area shall contain clear and objective standards. For purposes of this division, a standard shall be considered clear and objective if it meets any one of the following criteria:

(a) It is a fixed numerical standard, such as a height limitation of 35 feet or a setback of 50 feet;

(b) It is a nondiscretionary requirement, such as a requirement that grading not occur beneath the dripline of a protected tree; or

(c) It is a performance standard that describes the outcome to be achieved by the design, siting, construction, or operation of the conflicting use, and specifies the objective criteria to be used in evaluating outcome or performance. Different performance standards may be needed for different resource sites. If performance standards are adopted, the local government shall at the same time adopt a process for their application (such as a conditional use, or design review ordinance provision).

(3) In addition to the clear and objective regulations required by section (2) of this rule, except for aggregate resources, local governments may adopt an alternative approval process that includes land use regulations that are not clear and objective (such as a planned unit development ordinance with discretionary performance standards), provided such regulations:

(a) Specify that landowners have the choice of proceeding under either the clear and objective approval process or the alternative regulations; and

(b) Require a level of protection for the resource that meets or exceeds the intended level deter-mined under OAR 660-023-0040(5) and 660-023-0050(1).

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0060

Notice and Land Owner Involvement

Local governments shall provide timely notice to landowners and opportunities for citizen involvement during the inventory and ESEE process. Notification and involvement of landowners, citizens, and public agencies should occur at the earliest possible opportunity whenever a Goal 5 task is undertaken in the periodic review or plan amendment process. A local government shall comply with its acknowledged citizen involvement program, with statewide goal requirements for citizen involvement and coordination, and with other applicable procedures in statutes, rules, or local ordinances.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0070

Buildable Lands Affected by Goal 5 Measures

(1) If measures to protect significant resource sites inside urban growth boundaries affect the inventory of buildable lands in acknowledged plans required by Goals 9, 10 and 14, a local government outside of the Metro UGB, and Metro inside the Metro UGB, prior to or at the next periodic review, shall:

(a) Amend its urban growth boundary to provide additional buildable lands sufficient to compensate for the loss of buildable lands caused by the application of Goal 5;

(b) Redesignate other land to replace identified land needs under Goals 9, 10, and 14 provided such action does not take the plan out of compliance with other statewide goals; or

(c) Adopt a combination of the actions described in subsections (a) and (b) of this section.

(2) If a local government redesignates land for higher density under subsections (1)(b) or (c) of this rule in order to meet identified housing needs, the local government shall ensure that the redesignated land is in locations appropriate for the housing types, and is zoned at density ranges that are likely to be achieved by the housing market.

(3) Where applicable, the requirements of ORS 197.296 shall supersede the requirements of sections (1) and (2) of this rule.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0080

Metro Regional Resources

(1) For purposes of this rule, the following definitions apply:

(a) "Metro" is the Metropolitan Service District organized under ORS Chapter 268, and operating under the 1992 Metro Charter, for 24 cities and certain urban portions of Multnomah, Clackamas, and Washington counties.

(b) "Regional resource" is a site containing a significant Goal 5 resource, including but not limited to a riparian corridor, wetland, or open space area, which is identified as a regional resource on a map adopted by Metro ordinance.

(2) Local governments shall complete the Goal 5 process in this division for all regional resources prior to or during the first periodic review following Metro's adoption of a regional resources map, unless Metro adopts a regional functional plan by ordinance to establish a uniform time for all local governments to complete the Goal 5 process for particular regional resource sites.

(3) Metro may adopt one or more regional functional plans to address all applicable requirements of Goal 5 and this division for one or more resource categories and to provide time limits for local governments to implement the plan. Such functional plans shall be submitted for acknowledgment under the provisions of ORS 197.251 and 197.274. Upon acknowledgment of Metro's regional resource functional plan, local governments within Metro's jurisdiction shall apply the requirements of the functional plan for regional resources rather than the requirements of this division.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0090

Riparian Corridors

(1) For the purposes of this rule, the following definitions apply:

(a) "Fish habitat" means those areas upon which fish depend in order to meet their requirements for spawning, rearing, food supply, and migration.

(b) "Riparian area" is the area adjacent to a river, lake, or stream, consisting of the area of transition from an aquatic ecosystem to a terrestrial ecosystem.

(c) "Riparian corridor" is a Goal 5 resource that includes the water areas, fish habitat, adjacent riparian areas, and wetlands within the riparian area boundary.

(d) "Riparian corridor boundary" is an imaginary line that is a certain distance upland from the top bank, for example, as specified in section (5) of this rule.

(e) "Stream" is a channel such as a river or creek that carries flowing surface water, including perennial streams and intermittent streams with defined channels, and excluding man-made irrigation and drainage channels.

(f) "Structure" is a building or other major improvement that is built, constructed, or installed, not including minor improvements, such as fences, utility poles, flagpoles, or irrigation system components, that are not customarily regulated through zoning ordinances.

(g) "Top of bank" shall have the same meaning as "bankfull stage" defined in OAR 141-085-0010(2).

(h) "Water area" is the area between the banks of a lake, pond, river, perennial or fish-bearing intermittent stream, excluding man-made farm ponds.

(2) Local governments shall amend acknowledged plans in order to inventory riparian corridors and provide programs to achieve Goal 5 prior to or at the first periodic review following the effective date of this rule, except as provided in OAR 660-023-0250(5).

(3) Local governments shall inventory and determine significant riparian corridors by following either the safe harbor methodology described in section (5) of this rule or the standard inventory process described in OAR 660-023-0030 as modified by the requirements in section (4) of this rule. The local government may divide the riparian

corridor into a series of stream sections (or reaches) and regard these as individual resource sites.

(4) When following the standard inventory process in OAR 660-023-0030, local governments shall collect information regarding all water areas, fish habitat, riparian areas, and wetlands within riparian corridors. Local governments may postpone determination of the precise location of the riparian area on lands designated for farm or forest use until receipt of applications for local permits for uses that would conflict with these resources. Local governments are encouraged, but not required, to conduct field investigations to verify the location, quality, and quantity of resources within the riparian corridor. At a minimum, local governments shall consult the following sources, where available, in order to inventory riparian corridors along rivers, lakes, and streams within the jurisdiction:

(a) Oregon Department of Forestry stream classification maps;

(b) United States Geological Service (USGS) 7.5 minute quadrangle maps;

(c) National Wetlands Inventory maps;

(d) Oregon Department of Fish and Wildlife (ODFW) maps indicating fish habitat;

(e) Federal Emergency Management Agency (FEMA) flood maps; and

(f) Aerial photographs.

(5) As a safe harbor in order to address the requirements under OAR 660-023-0030, a local government may determine the boundaries of significant riparian corridors within its jurisdiction using a standard setback distance from all fish-bearing lakes and streams shown on the documents listed in subsections (a) through (f) of section (4) of this rule, as follows:

(a) Along all streams with average annual stream flow greater than 1,000 cubic feet per second (cfs) the riparian corridor boundary shall be 75 feet upland from the top of each bank.

(b) Along all lakes, and fish-bearing streams with average annual stream flow less than 1,000 cfs, the riparian corridor boundary shall be 50 feet from the top of bank.

(c) Where the riparian corridor includes all or portions of a significant wetland as set out in OAR 660-023-0100, the standard distance to the riparian corridor boundary shall be measured from, and include, the upland edge of the wetland.

(d) In areas where the top of each bank is not clearly defined, or where the predominant terrain consists of steep cliffs, local governments shall apply OAR 660-023-0030 rather than apply the safe harbor provisions of this section.

(6) Local governments shall develop a program to achieve Goal 5 using either the safe harbor described in section (8) of this rule or the standard Goal 5 ESEE process in OAR 660-023-0040 and 660-023-0050 as modified by section (7) of this rule.

(7) When following the standard ESEE process in OAR 660-023-0040 and 660-023-0050, a local government shall comply with Goal 5 if it identifies at least the following activities as conflicting uses in riparian corridors:

(a) The permanent alteration of the riparian corridor by placement of structures or impervious surfaces, except for:

(A) Water-dependent or water-related uses; and

(B) Replacement of existing structures with structures in the same location that do not disturb additional riparian surface area; and

(b) Removal of vegetation in the riparian area, except:

(A) As necessary for restoration activities, such as replacement of vegetation with native riparian species;

(B) As necessary for the development of water-related or water-dependent uses; and

(C) On lands designated for agricultural or forest use outside UGBs.

(8) As a safe harbor in lieu of following the ESEE process requirements of OAR 660-023-0040 and 660-023-0050, a local government may adopt an ordinance to protect a significant riparian corridor as follows:

(a) The ordinance shall prevent permanent alteration of the riparian area by grading or by the placement of structures or impervious surfaces, except for the following uses, provided they are designed and constructed to minimize intrusion into the riparian area:

(A) Streets, roads, and paths;

(B) Drainage facilities, utilities, and irrigation pumps;

(C) Water-related and water-dependent uses; and

(D) Replacement of existing structures with structures in the same location that do not disturb additional riparian surface area.

(b) The ordinance shall contain provisions to control the removal of riparian vegetation, except that the ordinance shall allow:

(A) Removal of non-native vegetation and replacement with native plant species; and

(B) Removal of vegetation necessary for the development of water-related or water-dependent uses;

(c) Notwithstanding subsection (b) of this section, the ordinance need not regulate the removal of vegetation in areas zoned for farm or forest uses pursuant to statewide Goals 3 or 4;

(d) The ordinance shall include a procedure to consider hardship variances, claims of map error, and reduction or removal of the restrictions under subsections (a) and (b) of this section for any existing lot or parcel demonstrated to have been rendered not buildable by application of the ordinance; and

(e) The ordinance may authorize the permanent alteration of the riparian area by placement of structures or impervious surfaces within the riparian corridor boundary established under subsection (5)(a) of this rule upon a demonstration that equal or better protection for identified resources will be ensured through restoration of riparian areas, enhanced buffer treatment, or similar measures. In no case shall such alterations occupy more than 50 percent of the width of the riparian area measured from the upland edge of the corridor.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0100

Wetlands

(1) For purposes of this rule, a "wetland" is an area that is inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

(2) Local governments shall amend acknowledged plans and land use regulations prior to or at periodic review to address the requirements of this division, as set out in OAR 660-023-0250(5) through (7). The standard inventory process requirements in OAR 660-023-0030 do not apply to wetlands. Instead, local governments shall follow the requirements of section (3) of this rule in order to inventory and determine significant wetlands.

(3) For areas inside urban growth boundaries (UGBs) and urban unincorporated communities (UUCs), local governments shall:

(a) Conduct a local wetlands inventory (LWI) using the standards and procedures of OAR 141-086-0110 through 141-086-0240 and adopt the LWI as part of the comprehensive plan or as a land use regulation; and

(b) Determine which wetlands on the LWI are "significant wetlands" using the criteria adopted by the Division of State Lands (DSL) pursuant to ORS 197.279(3)(b) and adopt the list of significant wetlands as part of the comprehensive plan or as a land use regulation.

(4) For significant wetlands inside UGBs and UUCs, a local government shall:

(a) Complete the Goal 5 process and adopt a program to achieve the goal following the requirements of OAR 660-023-0040 and 660-023-0050; or

(b) Adopt a safe harbor ordinance to protect significant wetlands consistent with this subsection, as follows:

(A) The protection ordinance shall place restrictions on grading, excavation, placement of fill, and vegetation removal other than perimeter mowing and other cutting necessary for hazard prevention; and

(B) The ordinance shall include a variance procedure to consider hardship variances, claims of map error verified by DSL, and reduction or removal of the restrictions under paragraph (A) of this subsection for any lands demonstrated to have been rendered not buildable by application of the ordinance.

(5) For areas outside UGBs and UUCs, local governments shall either adopt the statewide wetland inventory (SWI; see ORS 196.674) as part of the local comprehensive plan or as a land use regulation, or shall use a current version for the purpose of section (7) of this rule.

(6) For areas outside UGBs and UUCs, local governments are not required to amend acknowledged plans and land use regulations in order to determine significant wetlands and complete the Goal 5 process. Local governments that choose to amend acknowledged plans for areas outside UGBs and UUCs in order to inventory and protect significant wetlands shall follow the requirements of sections (3) and (4) of this rule.

(7) All local governments shall adopt land use regulations that require notification of DSL concerning applications for development permits or other land use decisions affecting wetlands on the inventory, as per ORS 227 .350 and 215.418, or on the SWI as provided in section (5) of this rule.

(8) All jurisdictions may inventory and protect wetlands under the procedures and requirements for wetland conservation plans adopted pursuant to ORS 196.668 et seq.

A wetlands conservation plan approved by the director of DSL shall be deemed to comply with Goal 5 (ORS 197.279(1)).

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0110

Wildlife Habitat

(1) For purposes of this rule, the following definitions apply:

(a) "Documented" means that an area is shown on a map published or issued by a state or federal agency or by a professional with demonstrated expertise in habitat identification.

(b) "Wildlife habitat" is an area upon which wildlife depend in order to meet their requirements for food, water, shelter, and reproduction. Examples include wildlife migration corridors, big game winter range, and nesting and roosting sites.

(2) Local governments shall conduct the inventory process and determine significant wildlife habitat as set forth in OAR 660-023-0250(5) by following either the safe harbor methodology described in section (4) of this rule or the standard inventory process described in OAR 660-023-0030.

(3) When gathering information regarding wildlife habitat under the standard inventory process in OAR 660-023-0030(2), local governments shall obtain current habitat inventory information from the Oregon Department of Fish and Wildlife (ODFW), and other state and federal agencies. These inventories shall include at least the following:

(a) Threatened, endangered, and sensitive wildlife species habitat information;

(b) Sensitive bird site inventories; and

(c) Wildlife species of concern and/or habitats of concern identified and mapped by ODFW (e.g., big game winter range and migration corridors, golden eagle and prairie falcon nest sites, and pigeon springs).

(4) Local governments may determine wildlife habitat significance under OAR 660-023-0040 or apply the safe harbor criteria in this section. Under the safe harbor, local governments may determine that "wildlife" does not include fish, and that significant wildlife habitat is only those sites where one or more of the following conditions exist:

(a) The habitat has been documented to perform a life support function for a wildlife species listed by the federal government as a threatened or endangered species or by the state of Oregon as a threatened, endangered, or sensitive species;

(b) The habitat has documented occurrences of more than incidental use by a species described in subsection (a) of this section;

(c) The habitat has been documented as a sensitive bird nesting, roosting, or watering resource site for osprey or great blue herons pursuant to ORS 527.710 (Oregon Forest Practices Act) and OAR 629-024-0700 (Forest Practices Rules);

(d) The habitat has been documented to be essential to achieving policies or population objectives specified in a wildlife species management plan adopted by the Oregon Fish and Wildlife Commission pursuant to ORS Chapter 496; or

(e) The area is identified and mapped by ODFW as habitat for a wildlife species of concern and/or as a habitat of concern (e.g., big game winter range and migration corridors, golden eagle and prairie falcon nest sites, or pigeon springs).

(5) For certain threatened or endangered species sites, publication of location information may increase the threat of habitat or species loss. Pursuant to ORS 192.501(13), local governments may limit publication, display, and availability of location information for such sites. Local governments may adopt inventory maps of these areas, with procedures to allow limited availability to property owners or other specified parties.

(6) As set out in OAR 660-023-0250(5), local governments shall develop programs to protect wildlife habitat following the standard procedures and requirements of OAR 660-023-0040 and 660-023-0050. Local governments shall coordinate with appropriate state and federal agencies when adopting programs intended to protect threatened, endangered, or sensitive species habitat areas.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 297.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0120

Federal Wild and Scenic Rivers

(1) At each periodic review, local governments shall amend acknowledged plans and land use regulations to address any federal Wild and Scenic River (WSR) and associated corridor established by the federal government that is not addressed by the

acknowledged plan. The standards and procedures of OAR 660-023-0030 through 660-023-0050 apply to WSRs, except as provided in this rule.

(2) Local governments shall not inventory WSRs using the standard process under OAR 660-023-0030, except that local governments shall follow the requirements of OAR 660-023-0030(5) by designating all WSRs as significant Goal 5 resources.

(3) A local government may delay completion of OAR 660-023-0040 and 660-023-0050 for a WSR until the federal government adopts a management plan for the WSR. Prior to the federal government adoption of a management plan, the local government shall notify the federal government of proposed development and changes of land use within the interim WSR corridor.

(4) Prior to or at the first periodic review following adoption of a management plan by the federal government for an established WSR, the local government shall adopt a program to protect the WSR and associated corridor by following the ESEE standards and procedures of OAR 660-023-0040 and 660-023-0050. The impact area determined under OAR 660-023-0040(3) shall be the WSR corridor that is established by the federal government. Notwithstanding the provisions of OAR 660-023-0040(5), the local program shall be consistent with the federal management plan.

(5) For any lands in a designated WSR corridor that are also within the impact area of a designated Oregon Scenic Waterway, the local government may apply the requirements of OAR 660-023-0130 rather than the applicable requirements of this rule in order to develop a program to achieve Goal 5.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0130

Oregon Scenic Waterways

(1) At each periodic review, local governments shall amend acknowledged plans and land use regulations to address any Oregon Scenic Waterway (OSW) and associated corridor that is not addressed by the acknowledged plan. The standards and procedures of OAR 660-023-0030 through 660-023-0050 apply to OSWs, except as provided in this rule.

(2) Local governments shall not inventory OSWs following all the steps of the standard inventory process under OAR 660-023-0030. Instead, local governments shall follow only the requirements of OAR 660-023-0030(5) by designating OSWs as significant Goal 5 resources.

(3) A local government may delay completion of the Goal 5 process (OAR 660-023-0040 and 660-023-0050) for an OSW until the Oregon Parks and Recreation Commission (OPRC) adopts a management plan for the OSW. Prior to the OPRC adoption of a management plan for the OSW, the local government shall:

(a) Notify the Oregon Parks and Recreation Department (OPRD) of proposed developments and changes of land use on land within the interim OSW corridor; and

(b) Inform landowners who apply to the local government for development approval or changes of land use within the OSW corridor of their notice obligations under ORS 390.845.

(4) Prior to or at the first periodic review following adoption of a management plan by the OPRC for an established OSW, the local government shall adopt a Goal 5 program for the OSW and associated corridor by following either the ESEE standards and procedures of OAR 660-023-0040 and 660-023-0050 or the safe harbor provisions in section (5) of this rule. The impact area determined under OAR 660-023-0040(3) shall be the scenic waterway and adjacent lands as set forth in ORS 390.805(2) and (3). Notwithstanding the provisions of OAR 660-023-0040(5), the local program for the OSW shall be consistent with the management plan adopted by OPRC.

(5) As a safe harbor, a local government may adopt only those plan and implementing ordinance provisions necessary to carry out the management plan adopted by OPRC rather than follow the ESEE standards and procedures of OAR 660-023-0040 and 660-023-0050.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0140

Groundwater Resources

(1) For purposes of this rule, the following definitions apply:

(a) "Delineation" is a determination that has been certified by the Oregon Health Division pursuant to OAR 333-061-0057, regarding the extent, orientation, and boundary of a wellhead protection area, considering such factors as geology, aquifer characteristics, well pumping rates, and time of travel.

(b) "Groundwater" is any water, except capillary moisture, beneath the land surface or beneath the bed of any stream, lake, reservoir, or other body of surface water.

(c) "Protect significant groundwater resources" means to adopt land use programs to help ensure that reliable groundwater is available to areas planned for development and to provide a reasonable level of certainty that the carrying capacity of groundwater resources will not be exceeded.

(d) "Public water system" is a system supplying water for human consumption that has four or more service connections, or a system supplying water to a public or commercial establishment that operates a total of at least 60 days per year and that is used by 10 or more individuals per day.

(e) "Wellhead protection area" is the surface and subsurface area surrounding a water well, spring, or wellfield, supplying a public water system, through which contaminants are reason-ably likely to move toward and reach that water well, spring, or wellfield.

(2) Local governments shall amend acknowledged plans prior to or at each periodic review in order to inventory and protect significant groundwater resources under Goal 5 only as provided in sections (3) through (5) of this rule. Goal 5 does not apply to other groundwater areas, although other statewide Goals, especially Goals 2, 6, and 11, apply to land use decisions concerning such groundwater areas. Significant groundwater resources are limited to:

(a) Critical groundwater areas and ground-water-limited areas designated by the Oregon Water Resources Commission (OWRC), subject to the requirements in section (3) of this rule applied in conjunction with the requirements of OAR 660-023-0030 through 660-023-0050; and

(b) Wellhead protection areas, subject to the requirements in sections (4) and (5) of this rule instead of the requirements in OAR 660-023-0030 through 660-023-0050.

(3) Critical groundwater areas and groundwater-limited areas designated by order of the OWRC pursuant to ORS 537.505 et seq. are significant groundwater resources. Following designation by OWRC, and in coordination with the Oregon Water Resources Department (WRD), local plans shall declare such areas as significant groundwater resources as per OAR 660-022-0030(5). Following the requirements of OAR 660-023-0040 and 660-023-0050 and this rule, local governments shall develop programs to protect these significant groundwater resources.

(4) A local government or water provider may delineate a wellhead protection area for wells or wellfields that serve lands within its jurisdiction. For the delineation of wellhead protection areas, the standards and procedures in OAR Chapter 333, Division 61 (Oregon Health Division rules) shall apply rather than the standards and procedures of OAR 660-023-0030.

(5) A wellhead protection area is a significant groundwater resource only if the area has been so delineated and either:

(a) The public water system served by the wellhead area has a service population greater than 10,000 or has more than 3,000 service connections and relies on groundwater from the wellhead area as the primary or secondary source of drinking water; or

(b) The wellhead protection area is determined to be significant under criteria established by a local government, for the portion of the wellhead protection area within the jurisdiction of the local government.

(6) Local governments shall develop programs to resolve conflicts with wellhead protection areas described under section (5) of this rule. In order to resolve conflicts with wellhead protection areas, local governments shall adopt comprehensive plan provisions and land use regulations, consistent with all applicable statewide goals, that:

(a) Reduce the risk of contamination of groundwater, following the standards and requirements of OAR Chapter 340, Division 40; and

(b) Implement wellhead protection plans certified by the Oregon Department of Environmental Quality (DEQ) under OAR 340-040-0180.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0150

Approved Oregon Recreation Trails

(1) For purposes of this rule, "recreation trail" means an Oregon Recreation Trail designated by rule adopted by the Oregon Parks and Recreation Commission (OPRC).

(2) Recreation trails are designated by OPRC in cooperation with local governments and private land owners. Local governments are not required to inventory recreation trails under OAR 660-023-0030. Instead, local governments shall designate all recreation trails designated by OPRC as significant Goal 5 resources. At each periodic review, local governments shall amend acknowledged plans to recognize any recreation trail designated by OPRC subsequent to acknowledgment or a previous periodic review.

(3) Local governments are not required to amend acknowledged plans or land use regulations in order to supplement OPRC protection of recreation trails. If a local

government chooses to supplement OPRC protection, it shall follow the requirements of OAR 660-023-0040 and 660-023-0050.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0160

Natural Areas

(1) For purposes of this rule, "natural areas" are areas listed in the Oregon State Register of Natural Heritage Resources.

(2) At periodic review, local governments shall consider information about natural areas not addressed at acknowledgment or in previous periodic reviews. Local governments shall inventory such areas as significant and develop a program to achieve the goal following the standard Goal 5 process in OAR 660-023-0040 and 660-023-0050.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0170

Wilderness Areas

(1) For purposes of this rule, "wilderness areas" are those areas designated as wilderness by the federal government.

(2) Local governments are not required to inventory wilderness areas using the procedures of OAR 660-023-0030, except that local governments shall list all federally designated wilderness areas as significant Goal 5 resources as provided under OAR 660-023-0030(5).

(3) At periodic review, local governments shall amend acknowledged plans to recognize any wilderness areas designated after the last periodic review or acknowledgment.

(4) A local government need not complete the Goal 5 process in OAR 660-023-0040 and 660-023-0050 for wilderness areas unless it chooses to provide additional

protection for the wilderness area, such as the regulation of conflicting uses in an impact area adjacent to the wilderness area.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0180

Mineral and Aggregate Resources

(1) For purposes of this rule, the following definitions apply:

(a) "Aggregate resources" are naturally occurring concentrations of stone, rock, sand and gravel, decomposed granite, lime, pumice, cinders, and other naturally occurring solid materials used in road building.

(b) "Conflicting use" is a use or activity that is subject to land use regulations and that would interfere with, or be adversely affected by, mining or processing activities at a significant mineral or aggregate resource site (as specified in sections 4(b) and (5) of this rule).

(c) "Existing site" is a significant aggregate site that is lawfully operating, or is included on an inventory in an acknowledged plan, on the applicable date of this rule.

(d) "Expansion area" is an aggregate mining area contiguous to an existing site.

(e) "Mining" is the extraction and processing of mineral or aggregate resources, in the manner provided under ORS 215.298(3).

(f) "Minimize a conflict" means to reduce an identified conflict to a level that is no longer significant. For those types of conflicts addressed by local, state, or federal standards (such as the Department of Environmental Quality standards for noise and dust levels) to "minimize a conflict" means to ensure conformance to the applicable standard.

(g) "Mining area" is the area of a site within which mining is permitted or proposed, excluding undisturbed buffer areas or areas on a parcel where mining is not authorized.

(h) "Processing" means the activities described in ORS 517.750(11).

(i) "Protect" means to adopt land use regulations for a significant mineral or aggregate site in order to authorize mining of the site and to limit or prohibit new conflicting uses within the impact area of the site.

(j) "Width of aggregate layer" means the depth of the water-lain deposit of sand, stones, and pebbles of sand-sized fraction or larger, minus the depth of the topsoil and nonaggregate overburden.

(k) "Willamette Valley" means Benton, Clackamas, Columbia, Linn, Marion, Multnomah, Polk, Washington, and Yamhill counties and the portion of Lane County east of the summit of the Coast Range.

(2) Local governments are not required to amend acknowledged inventories or plans with regard to mineral and aggregate resources except in response to an application for a PAPA, or at periodic review as specified in OAR 660-023-0180(7). The requirements of this rule either modify, supplement, or supersede the requirements of the standard Goal 5 process in OAR 660-023-0030 through 660-023-0050, as follows:

(a) A local government may inventory mineral and aggregate resources throughout its jurisdiction, or in a portion of its jurisdiction. When a local government conducts an inventory of mineral and aggregate sites in all or a portion of its jurisdiction, it shall follow the requirements of OAR 660-023-0030 as modified by subsection (b) of this section. When a local government is following the inventory process for a mineral or aggregate resource site filed under a PAPA, it shall follow only the applicable requirements of OAR 660-023-0030, except as provided in sections (3) and (6) of this rule;

(b) Local governments shall apply the criteria in section (3) of this rule rather than OAR 660-023-0030(4) in determining whether an aggregate resource site is significant;

(c) Local governments shall follow the requirements of section (4) of this rule in deciding whether to authorize the mining of a significant mineral or aggregate resource site; and

(d) For significant mineral and aggregate sites where mining is allowed, local governments shall decide on a program to protect the site from new off-site conflicting uses by following the standard ESEE process in OAR 660-023-0040 and 660-023-0050 with regard to such uses.

(3) An aggregate resource site shall be considered significant if adequate information regarding the quantity, quality, and location of the resource demonstrates that the site meets any one of the criteria in subsections (a) through (c) of this section, except as provided in subsection (d) of this section:

(a) A representative set of samples of aggregate material in the deposit on the site meets Oregon Department of Transportation (ODOT) specifications for base rock for air degradation, abrasion, and sodium sulfate soundness, and the estimated amount of material is more than 2,000,000 tons in the Willamette Valley, or 100,000 tons outside the Willamette Valley;

(b) The material meets local government standards establishing a lower threshold for significance than subsection (a) of this section; or

(c) The aggregate site is on an inventory of significant aggregate sites in an acknowledged plan on the applicable date of this rule.

(d) Notwithstanding subsections (a) through (c) of this section, except for an expansion area of an existing site if the operator of the existing site on March 1, 1996 had an enforceable property interest in the expansion area on that date, an aggregate site is not significant if the criteria in either paragraphs (A) or (B) of this subsection apply:

(A) More than 35 percent of the proposed mining area consists of soil classified as Class I on Natural Resource and Conservation Service (NRCS) maps on the date of this rule; or

(B) More than 35 percent of the proposed mining area consists of soil classified as Class II, or of a combination of Class II and Class I or Unique soil on NRCS maps available on the date of this rule, unless the average width of the aggregate layer within the mining area exceeds:

(i) 60 feet in Washington, Multnomah, Marion, Columbia, and Lane counties;

(ii) 25 feet in Polk, Yamhill, and Clackamas counties; or

(iii) 17 feet in Linn and Benton counties.

(4) For significant mineral and aggregate sites, local governments shall decide whether mining is permitted. For a PAPA application involving a significant aggregate site, the process for this decision is set out in subsections (a) through (g) of this section. For a PAPA involving a significant aggregate site, a local government must complete the process within 180 days after receipt of a complete application that is consistent with section (6) of this rule, or by the earliest date after 180 days allowed by local charter. The process for reaching decisions about aggregate mining is as follows:

(a) The local government shall determine an impact area for the purpose of identifying conflicts with proposed mining and processing activities. The impact area shall be large enough to include uses listed in subsection (b) of this section and shall be limited to 1,500 feet from the boundaries of the mining area, except where factual information indicates significant potential conflicts beyond this distance. For a proposed expansion of an existing aggregate site, the impact area shall be measured from the perimeter of the proposed expansion area rather than the boundaries of the existing aggregate site and shall not include the existing aggregate site.

(b) The local government shall determine existing or approved land uses within the impact area that will be adversely affected by proposed mining operations and shall specify the predicted conflicts. For purposes of this section, "approved land uses" are

dwellings allowed by a residential zone on existing platted lots and other uses for which conditional or final approvals have been granted by the local government. For determination of conflicts from proposed mining of a significant aggregate site, the local government shall limit its consideration to the following:

(A) Conflicts due to noise, dust, or other discharges with regard to those existing and approved uses and associated activities (e.g., houses and schools) that are sensitive to such discharges;

(B) Potential conflicts to local roads used for access and egress to the mining site within one mile of the entrance to the mining site unless a greater distance is necessary in order to include the intersection with the nearest arterial identified in the local transportation plan. Conflicts shall be determined based on clear and objective standards regarding sight distances, road capacity, cross section elements, horizontal and vertical alignment, and similar items in the transportation plan and implementing ordinances. Such standards for trucks associated with the mining operation shall be equivalent to standards for other trucks of equivalent size, weight, and capacity that haul other materials;

(C) Safety conflicts with existing public airports due to bird attractants, i.e., open water impoundments. This paragraph shall not apply after the effective date of commission rules adopted pursuant to Chapter 285, Oregon Laws 1995;

(D) Conflicts with other Goal 5 resource sites within the impact area that are shown on an acknowledged list of significant resources and for which the requirements of Goal 5 have been completed at the time the PAPA is initiated;

(E) Conflicts with agricultural practices; and

(F) Other conflicts for which consideration is necessary in order to carry out ordinances that supersede Oregon Department of Geology and Mineral Industries (DOGAMI) regulations pursuant to ORS 517.780;

(c) The local government shall determine reasonable and practicable measures that would minimize the conflicts identified under subsection (b) of this section. To determine whether proposed measures would minimize conflicts to agricultural practices, the requirements of ORS 215.296 shall be followed rather than the requirements of this section. If reasonable and practicable measures are identified to minimize all identified conflicts, mining shall be allowed at the site and subsection (d) of this section is not applicable. If identified conflicts cannot be minimized, subsection (d) of this section applies.

(d) The local government shall determine any significant conflicts identified under the requirements of subsection (c) of this section that cannot be minimized. Based on these conflicts only, local government shall determine the ESEE consequences of either

allowing, limiting, or not allowing mining at the site. Local governments shall reach this decision by weighing these ESEE consequences, with consideration of the following:

(A) The degree of adverse effect on existing land uses within the impact area;

(B) Reasonable and practicable measures that could be taken to reduce the identified adverse effects; and

(C) The probable duration of the mining operation and the proposed post-mining use of the site.

(e) Where mining is allowed, the plan and implementing ordinances shall be amended to allow such mining. Any required measures to minimize conflicts, including special conditions and procedures regulating mining, shall be clear and objective. Additional land use review (e.g., site plan review), if required by the local government, shall not exceed the minimum review necessary to assure compliance with these requirements and shall not provide opportunities to deny mining for reasons unrelated to these requirements, or to attach additional approval requirements, except with regard to mining or processing activities:

(A) For which the PAPA application does not provide information sufficient to determine clear and objective measures to resolve identified conflicts;

(B) Not requested in the PAPA application; or

(C) For which a significant change to the type, location, or duration of the activity shown on the PAPA application is proposed by the operator.

(f) Where mining is allowed, the local government shall determine the post-mining use and provide for this use in the comprehensive plan and land use regulations. For significant aggregate sites on Class I, II and Unique farmland, local governments shall adopt plan and land use regulations to limit post-mining use to farm uses under ORS 215.203, uses listed under ORS 215.213(1) or 215.283(1), and fish and wildlife habitat uses, including wetland mitigation banking. Local governments shall coordinate with DOGAMI regarding the regulation and reclamation of mineral and aggregate sites, except where exempt under ORS 517.780.

(g) Local governments shall allow a currently approved aggregate processing operation at an existing site to process material from a new or expansion site without requiring a reauthorization of the existing processing operation unless limits on such processing were established at the time it was approved by the local government.

(5) Local governments shall follow the standard ESEE process in OAR 660-023-0040 and 660-023-0050 to determine whether to allow, limit, or prevent new conflicting uses within the impact area of a significant mineral and aggregate site. (This requirement

does not apply if, under section (4) of this rule, the local government decides that mining will not be authorized at the site.)

(6) In order to determine whether information in a PAPA submittal concerning an aggregate site is adequate, local government shall follow the requirements of this section rather than OAR 660-023-0030(3). An application for a PAPA concerning a significant aggregate site shall be adequate if it includes:

(a) Information regarding quantity, quality, and location sufficient to determine whether the standards and conditions in section (3) of this rule are satisfied;

(b) A conceptual site reclamation plan;

(NOTE: Final approval of reclamation plans resides with DOGAMI rather than local governments, except as provided in ORS 517.780)

(c) A traffic impact assessment within one mile of the entrance to the mining area pursuant to section (4)(b)(B) of this rule;

(d) Proposals to minimize any conflicts with existing uses preliminarily identified by the applicant within a 1,500 foot impact area; and

(e) A site plan indicating the location, hours of operation, and other pertinent information for all proposed mining and associated uses.

(7) Local governments shall amend the comprehensive plan and land use regulations to include procedures and requirements consistent with this rule for the consideration of PAPAs concerning aggregate resources. Until such local regulations are adopted, the procedures and requirements of this rule shall be directly applied to local government consideration of a PAPA concerning mining authorization, unless the local plan contains specific criteria regarding the consideration of a PAPA proposing to add a site to the list of significant aggregate sites, provided:

(a) Such regulations were acknowledged subsequent to 1989; and

(b) Such regulations shall be amended to conform to the requirements of this rule at the next scheduled periodic review, except as provided under OAR 660-023-0250(7).

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225- ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0190

Energy Sources

(1) For purposes of this rule,

(a) "Energy source" includes naturally occurring locations, accumulations, or deposits of one or more of the following resources used for the generation of energy: natural gas, surface water (i.e., dam sites), geothermal, solar, and wind areas. Energy sources applied for or approved through the Oregon Energy Facility Siting Council (EFSC) or the Federal Energy Regulatory Commission (FERC) shall be deemed significant energy sources for purposes of Goal 5.

(b) "Protect," for energy sources, means to adopt plan and land use regulations for a significant energy source that limit new conflicting uses within the impact area of the site and authorize the present or future development or use of the energy source at the site.

(2) In accordance with OAR 660-023-0250(5), local governments shall amend their acknowledged comprehensive plans to address energy sources using the standards and procedures in OAR 660-023-0030 through 660-023-0050. Where EFSC or FERC regulate a local site or an energy facility that relies on a site specific energy source, that source shall be considered a significant energy source under OAR 660-023-0030. Alternatively, local governments may adopt a program to evaluate conflicts and develop a protection program on a case-by-case basis, i.e., upon application to develop an individual energy source, as follows:

(a) For proposals involving energy sources under the jurisdiction of EFSC or FERC, the local government shall comply with Goal 5 by amending its comprehensive plan and land use regulations to implement the EFSC or FERC decision on the proposal as per ORS 469.503; and

(b) For proposals involving energy sources not under the jurisdiction of EFSC or FERC, the local government shall follow the standards and procedures of OAR 660-023-0030 through 660-023-0050.

(3) Local governments shall coordinate planning activities for energy sources with the Oregon Department of Energy.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0200

Historic Resources

(1) For purposes of this rule, the following definitions apply:

(a) "Designation" is a decision by a local government declaring that a historic resource is "significant" and including the resource on the list of significant historic resources.

(b) "Historic areas" are lands with buildings, structures, objects, sites, or districts that have local, regional, statewide, or national historic significance.

(c) "Historic resources" are those buildings, structures, objects, sites, or districts that have a relationship to events or conditions of the human past.

(d) "Historic resources of statewide significance" are buildings, structures, objects, sites, or districts listed in the National Register of Historic Places, and within approved national register historic districts pursuant to the National Historic Preservation Act of 1966 (PL 89-665; 16 U.S.C. 470).

(e) "Protect" means to require local government review of applications for demolition, removal, or major exterior alteration of a historic resource.

(2) Local governments are not required to amend acknowledged plans or land use regulations in order to provide new or amended inventories or programs regarding historic resources, except as specified in this rule. The requirements of the standard Goal 5 process (see OAR 660-023-0030 through 660-023-0050) in conjunction with the requirements of this rule apply when local governments choose to amend acknowledged historic preservation plans and regulations. However, the sequence of steps in the standard process is not recommended, as per section (3) of this rule. The provisions in section (3) of this rule are advisory only. Sections (4) through (9) of this rule are mandatory for all local governments, except where the rule provides recommended or optional criteria.

(3) Local comprehensive plans should foster and encourage the preservation, management, and enhancement of structures, resources, and objects of historic significance within the jurisdiction in a manner conforming with, but not limited by, the provisions of ORS 358.605. In developing local historic preservation programs, local governments should follow the recommendations in the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation. Where possible, local governments should develop a local historic context statement and adopt a historic preservation plan and a historic preservation ordinance before commencement of local historic inventories.

(4) Local governments shall provide broad public notice prior to the collection of information about historic resources. Local governments shall notify landowners about opportunities to participate in the inventory process. Local governments may delegate the determination of significant historic sites to a local planning commission or historic resources commission. The determination of significance should be based on the

National Register Criteria for Evaluation or the Secretary of the Interior's Standards for Evaluation.

(5) Local governments shall adopt or amend the list of significant historic resource sites (i.e., "designate" such sites) as a land use regulation. Local governments shall allow owners of inventoried historic resources to refuse historic resource designation at any time prior to adoption of the designation and shall not include a site on a list of significant historic resources if the owner of the property objects to its designation.

(6) The local government shall allow a property owner to remove from the property a historic property designation that was imposed on the property by the local government.

(7) Local governments are not required to apply the ESEE process in order to determine a program to protect historic resources. Rather, local governments are encouraged to adopt historic preservation regulations regarding the demolition, removal, or major exterior alteration of all designated historic resources. Historic protection ordinances should be consistent with standards and guidelines recommended in the Standards and Guidelines for Archeology and Historic Preservation published by the U.S. Secretary of the Interior.

(8) Local governments shall protect all historic resources of statewide significance through local historic protection regulations, regardless of whether these resources are "designated" in the local plan.

(9) A local government shall not issue a permit for demolition or modification of a historic resource described under subsection (6) of this rule for at least 120 days from the date a property owner requests removal of historic resource designation from the property.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0220

Open Space

(1) For purposes of this rule, "open space" includes parks, forests, wildlife preserves, nature reservations or sanctuaries, and public or private golf courses.

(2) Local governments are not required to amend acknowledged comprehensive plans in order to identify new open space resources. If local governments decide to amend acknowledged plans in order to provide or amend open space inventories, the

requirements of OAR 660-023-0030 through 660-023-0050 shall apply, except as set forth in section (3) of this rule.

(3) Local governments may adopt a list of significant open space resource sites as an open space acquisition program. Local governments are not required to apply the requirements of OAR 660-023-0030 through 660-023-0050 to such sites unless land use regulations are adopted to protect such sites prior to acquisition.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0230

Scenic Views and Sites

(1) For purposes of this rule, "scenic views and sites" are lands that are valued for their aesthetic appearance.

(2) Local governments are not required to amend acknowledged comprehensive plans in order to identify scenic views and sites. If local governments decide to amend acknowledged plans in order to provide or amend inventories of scenic resources, the requirements of OAR 660-023-0030 through 660-023-0050 shall apply.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0240

Relationship of Goal 5 to Other Goals

(1) The requirements of Goal 5 do not apply to the adoption of measures required by Goals 6 and 7. However, to the extent that such measures exceed the requirements of Goals 6 or 7 and affect a Goal 5 resource site, the local government shall follow all applicable steps of the Goal 5 process.

(2) The requirements of Goals 15, 16, 17, and 19 shall supersede requirements of this division for natural resources that are also subject to and regulated under one or more of those goals. However, local governments may rely on a Goal 5 inventory produced under OAR 660-023-0030 and other applicable inventory requirements of this division to satisfy the inventory requirements under Goal 17 for resource sites subject to Goal 17.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

660-023-0250

Applicability

(1) This division replaces OAR 660, Division 16, except with regard to cultural resources, and certain PAPAs and periodic review work tasks described in sections (2) and (4) of this rule. Local governments shall follow the procedures and requirements of this division or OAR 660, Division 16, whichever is applicable, in the adoption or amendment of all plan or land use regulations pertaining to Goal 5 resources. The requirements of Goal 5 do not apply to land use decisions made pursuant to acknowledged comprehensive plans and land use regulations.

(2) The requirements of this division are applicable to PAPAs initiated on or after September 1, 1996. OAR 660, Division 16 applies to PAPAs initiated prior to September 1, 1996. For purposes of this section "initiated" means that the local government has deemed the PAPA application to be complete.

(3) Local governments are not required to apply Goal 5 in consideration of a PAPA unless the PAPA affects a Goal 5 resource. For purposes of this section, a PAPA would affect a Goal 5 resource only if:

(a) The PAPA creates or amends a resource list or a portion of an acknowledged plan or land use regulation adopted in order to protect a significant Goal 5 resource or to address specific requirements of Goal 5;

(b) The PAPA allows new uses that could be conflicting uses with a particular significant Goal 5 resource site on an acknowledged resource list; or

(c) The PAPA amends an acknowledged UGB and factual information is submitted demonstrating that a resource site, or the impact areas of such a site, is included in the amended UGB area.

(4) Consideration of a PAPA regarding a specific resource site, or regarding a specific provision of a Goal 5 implementing measure, does not require a local government to revise acknowledged inventories or other implementing measures, for the resource site or for other Goal 5 sites, that are not affected by the PAPA, regardless of whether such inventories or provisions were acknowledged under this rule or under OAR 660, Division 16.

(5) Local governments are required to amend acknowledged plan or land use regulations at periodic review to address Goal 5 and the requirements of this division only if one or more of the following conditions apply, unless exempted by the director under section (7) of this rule:

(a) The plan was acknowledged to comply with Goal 5 prior to the applicability of OAR 660, Division 16, and has not subsequently been amended in order to comply with that division;

(b) The jurisdiction includes riparian corridors, wetlands, or wildlife habitat as provided under OAR 660-023-0090 through 660-023-0110, or aggregate resources as provided under OAR 660-023-0180; or

(c) New information is submitted at the time of periodic review concerning resource sites not addressed by the plan at the time of acknowledgement or in previous periodic reviews, except for historic, open space, or scenic resources.

(6) If a local government undertakes a Goal 5 periodic review task that concerns specific resource sites or specific Goal 5 plan or implementing measures, this action shall not by itself require a local government to conduct a new inventory of the affected Goal 5 resource category, or revise acknowledged plans or implementing measures for resource categories or sites that are not affected by the work task.

(7) The director may exempt a local government from a work task for a resource category required under section (5) of this rule. The director shall consider the following factors in this decision:

(a) Whether the plan and implementing ordinances for the resource category substantially comply with the requirements of this division; and

(b) The resources of the local government or state agencies available for periodic review, as set forth in ORS 197.633(3)(g).

(8) Local governments shall apply the requirements of this division to work tasks in periodic review work programs approved or amended under ORS 197.633(3)(g) after September 1, 1996. Local governments shall apply OAR 660, Division 16, to work tasks in periodic review work programs approved before September 1, 1996, unless the local government chooses to apply this division to one or more resource categories, and provided:

(a) The same division is applied to all work tasks concerning any particular resource category;

(b) All the participating local governments agree to apply this division for work tasks under the jurisdiction of more than one local government; and

(c) The local government provides written notice to the department. If application of this division will extend the time necessary to complete a work task, the director or the commission may consider extending the time for completing the work task as provided in OAR 660-025-0170.

Stat. Auth.: ORS 183 & ORS 197

Stats. Implemented: ORS 197.040 & ORS 197.225 - ORS 197.245

Hist.: LCDC 2-1996, f. 8-30-96, cert. ef. 9-1-96

APPENDIX E:

GLOSSARY

A GLOSSARY OF TERMS AND ACRONYMS

AGENCIES

DLCD — Department of Land Conservation and Development is the agency that aids in implementing State of Oregon Land Use laws.

DSL - — Oregon Division of State Lands (the State agency that regulates wetlands and waters of the State)

LCDC — The State of Oregon's Land Conservation and Development Commission (LCDC) is made up of seven unpaid citizen volunteers appointed by the Governor and confirmed by the Senate. The commission directs the work of the DLCD.

NMFS - — National Marine Fisheries Service (the federal agency responsible for ESA listed marine and anadromous fish species)

STATE AND FEDERAL LAWS

ESA - — The Federal Endangered Species Act purpose statement reads "...to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved (and) to provide a program for the conservation of such endangered species and threatened species..."

Goal 5 - — One of nineteen statewide planning goals that is intended "to conserve open space and protect natural and scenic resources." Every city and county in the state is required to inventory, determine the significance of, and conserve these resources.

Title 3 - — The Water Quality and Flood Management Conservation portion of Metro's Urban Growth Management Functional Plan. (Metro code 3.07.310-3.07.370).

SCIENTIFIC AND REGULATORY TERMS

ESEE- — "ESEE consequences" are the positive and negative economic, social, environmental, and energy (ESEE) consequences that could result from a decision to allow, limit, or prohibit a conflicting use.

Riparian - — Goal 5 defines "riparian area" as the area adjacent to a river, lake or stream consisting of the area of transition from an aquatic ecosystem to a terrestrial ecosystem.

Wildlife Habitat Resource Area - — Wildlife Habitat Resource Areas, as used in this project, are defined as upland (non-wetland) forested areas. Minimum forest size mapped was at least one acre. Hazelnut (filbert) orchards were excluded, and small clumps of trees and areas with only a few scattered trees were not included as upland forested areas. Meadows were not included in this inventory since no native prairie meadows are present within the study area (upland fields have been modified in some way by plowing, planting, mowing).

Wetland - — Wetlands are federally defined as: "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils conditions." Wetlands generally include swamps,

marshes, bogs, and similar areas, but may also include seasonally wet meadows, farmed wetlands and other areas that may not appear "wet" year round. Wetlands typically display three wetland criteria: a predominance of hydrophytic (wetland) vegetation, the presence of hydric (wet) soils, and wetland hydrology (ponding or near-surface saturated soils for at least 5 percent of the growing season).

TOOLS

GIS - **Geographic Information Systems. Computer software that allows a user to analyze, query and map spatial data. GIS is the tool used to produce display maps.**

APPENDIX F:

REFERENCES

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APPENDIX G:

PROJECT STAFF MEMBERS

Appendix H: Project Staff Members

Staff Qualifications

Fishman Environmental Services
Project Manager: Daniel J Stark, AICP, Natural Resource Planner/GIS Program Manager
Responsibilities: Dan provided project management and coordination with the Multnomah County Project Manager, presented the inventory information and maps to the Task Force, provided coordination of GIS mapping and database development, and provided review and quality assurance of all inventory and assessment products.

Field Inventory Staff: Stacy N. Benjamin, M.S., Wetland Ecologist
Responsibilities: Stacy managed the field inventory, mapped the riparian corridors and wildlife habitat units, conducted the riparian corridor and wildlife habitat assessment, prepared the resource site summary sheets and summary tables, and prepared the Goal 5 report. Stacy also provided quality control of map products.

Field Inventory Staff: Christie Galen, B.S., Senior Ecologist
Responsibilities: Christie assisted with the field inventory and preparation of the report and resource unit summary sheets.

GIS Staff: Rafael Gutierrez, B.S., M.S. (in progress), GIS Analyst
Responsibilities: Rafael digitized riparian corridor and wildlife habitat units into ArcView and coordinated GIS database development.

Project / Contract Oversight: Paul A. Fishman, M.S., CEP, Principal Ecologist
Responsibilities: Paul provided contract management oversight and assistance as necessary in this project, report review and editing, and guidance on the current state of affairs for riparian corridor analysis, Metro Title 3 issues, and the Endangered Species Act as it relates to fish.

Parametrix, Inc.
Product Review and ESEE Analysis Jason Franklin, AICP, MURP
Responsibilities: Jason was the overall project manager for the West of Sandy River Transportation and Land Use Plan. He provided review of the ESEE and additional ESEE analysis in section 6 of the document.

APPENDIX H

FISH AND WILDLIFE HABITAT NEEDS TABLES

Range of recommended minimum riparian area widths for fish and wildlife habitat

AQUATIC HABITAT			
Function		**Reference**	**Minimum width** *(each side of stream)*
Temperature regulation and shade	Shade	FEMAT 1993	100 ft
	Shade	Castelle et al. 1994	50-100 ft
	Shade	Spence et al. 1996	98 ft
	Shade	May 2000	98 ft
	Shade	Osborne and Kovacic 1993	33-98 ft
	Shade/reduce solar radiation	Brosofske et al. 1997	250 ft
	Control temperature by shading	Johnson and Ryba 1992	39-141 ft
Bank stabilization and sediment control	Bank stabilization	Spence et al. 1996	170 ft
	Sediment removal and erosion control	May 2000	98 ft
	Ephemeral streams	Clinnick et al. 1985	66 ft
	Bank stabilization	FEMAT 1993	½ SPTH
	Sediment control	Erman et al. 1977	100 ft
	Sediment control	Moring 1982	98 ft
	Sediment removal	Johnson and Ryba 1992	10 ft (sand) – 400 ft (clay)
	High mass wasting area	Cederholm 1994	125 ft
Pollutant removal	Nitrogen	Wenger 1999	50-100 ft
	General pollutant removal	May 2000	98 ft
	Filter metals and nutrients	Castelle et al. 1994	100 ft
	Pesticides	Wenger 1999	>49 ft
	Nutrient removal	Johnson and Ryba 1992*	13 – 141 ft
Large woody debris and organic litter	Large woody debris	FEMAT 1993	1 SPTH
	Large woody debris	Spence et al. 1996	1 SPTH
	Large woody debris	Wenger 1999	1 SPTH
	Large woody debris	May 2000*	262 ft
	Large woody debris	McDade et al. 1990	150 ft
	Small woody debris	Pollock and Kennard 1998	100 ft
	Organic litterfall	FEMAT 1993	½ SPTH
	Organic litterfall	Erman et al. 1977	100 ft
	Organic litterfall	Spence et al. 1996	170 ft
Aquatic wildlife	Cutthroat trout	Hickman and Raleigh 1982	98 ft
	Brook trout	Raleigh 1982	98 ft
	Chinook salmon	Raleigh et al. 1986	98 ft
	Rainbow trout	Raleigh et al. 1984	98 ft
	Cutthroat trout, rainbow trout and steelhead	Knutson and Naef 1997	50 – 200 ft
	Maintenance of benthic communities (aquatic insects)	Erman et al. 1977	100 ft
	Shannon index of macroinvertebrate diversity.	Gregory et al. 1987	100 ft
	Trout and salmon influence zone (Western Washington)	Castelle et al. 1992	200 ft

*Source: Metro. (October 17, 2001) "Determining Significant Resources and Regional Resources"

TERRESTRIAL HABITAT			
Function		**Reference**	**Minimum width** *(each side of stream)*
Wildlife needs	Willow flycatcher nesting	Knutson and Naef 1997	123 ft
	Frogs and salamanders	NRCS 1995	100 ft
	Full complement of herpetofauna	Rudolph and Dickson 1990	>100 ft
	Belted Kingfisher roosts	USFWS HEP Model	100 – 200 ft
	Deer	NRCS 1995	200 ft
	Smaller mammals	Allen 1983	214 – 297 ft
	Birds	Jones et al. 1988	246 – 656 ft
	Beaver	NRCS 1995	300 ft
	Minimum distance needed to support area-sensitive Neotropical migratory birds	Hodges and Krementz 1996	328 ft
	Western pond turtle nests	Knutson and Naef 1997	330 ft
	Pileated woodpecker	Castelle et al. 1992	450 ft
	Bald eagle nest, roost, perch Nesting ducks, heron rookery and sandhill cranes	Castelle et al. 1992	600 ft
	Pileated woodpecker nesting	Small 1982	328 ft
	Mule deer fawning	Knutson and Naef 1997	600 ft
	Rufous-sided towhee breeding populations	Knutson and Naef 1997	656 ft
	General wildlife habitat	FEMAT 1993	100-600 ft
	General wildlife habitat	Todd 2000	100-325 ft
	General wildlife habitat	May 2000	328 ft
Edge effect	Interior bird species	Tassone 1981	164 ft
	Neotropical migrants	Keller et al. 1993	328 ft
	Effect of increased predation	Wilcove et al. 1986	2,000 ft
	Noise reduction of a mature evergreen buffer	Harris 1985	20 ft
	Reduce commercial noise	Groffman et al. 1990	100 ft
LWD and structural complexity	Snags and downed wood	FEMAT 1993	1 SPTH outside the buffer
	Width necessary to minimize non-native vegetation	Hennings 2001	650 ft
Movement corridors	Travel corridor for red fox and marten	Small 1982	328 ft
	Minimum to allow for interior habitat species movement	Environment Canada 1998	328 ft
Microclimate	Maintain microclimate	May 2000	328 ft
	Prevent wind damage	Pollock and Kennard 1998	75 ft
	Approximate natural conditions	Brosofske et al. 1997	250 ft
	Maintain microclimate	Knutson and Naef 1997	200-525 ft
	Maintain humidity and soil temperature	Chen et al. 1995	98 – 787 ft
	Maintain microclimate	FEMAT 1993	3 SPTH

*Source: Metro. (October 17, 2001) "Determining Significant Resources and Regional Resources"