THE RIVER PLAN
NORTH REACH

PROPOSED PLAN
OCTOBER 28, 2008

VOLUME 3C:
ECONOMIC, SOCIAL, ENVIRONMENTAL AND ENERGY ANALYSIS AND RECOMMENDATIONS FOR RIPARIAN CORRIDORS AND WILDLIFE HABITAT




CITY OF PORTLAND BUREAU OF PLANNING
RIVER RENAISSANCE

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RIVER PLAN / NORTH REACH VOLUMES

VOLUME 1: PROPOSED RIVER PLAN / NORTH REACH **Volume 1A: Policies, Objectives and Recommendations** *This document describes the project background, policy context and recommendations to address Economic Prosperity, Watershed Health, Access, Riverfront Communities, and Working with our Partners.* **Volume 1B: Code Amendments and Zoning Maps** *This volume contains amendments to the comprehensive plan, zoning code, and other City titles, and zoning maps.*	Available in print Available in print
VOLUME 2: ECONOMIC PROSPERITY BACKGROUND INFORMATION *This volume includes background information for some of the economic prosperity recommendations. For additional information please see the River Plan website.*	Available on CD
VOLUME 3: WATERSHED HEALTH BACKGROUND INFORMATION **Volume 3A: Willamette River Natural Resources Inventory: Riparian Corridors and Wildlife Habitat** *This volume contains natural resource information for 13 resource sites in the North Reach* **Volume 3B: Willamette River Natural Resources Inventory: Riparian Corridors and Wildlife Habitat—Appendices** *This volume contains five technical appendices to the Willamette River Natural Resource Inventory including a description of the methodology used to develop the inventory.* **Volume 3C: Economic, Social, Environmental and Energy Analysis and Recommendations for Riparian Corridors and Wildlife Habitat** *This volume contains a State Land Use Planning Goal 5 required analysis of the tradeoffs associated with different levels of natural resource protection for the upland portions of the River Plan / North Reach planning area.*	Available on CD Available on CD Available on CD
VOLUME 4: ACCESS BACKGROUND INFORMATION *This volume includes background information for the access related recommendations. For additional information please see the River Plan website.*	Available on CD

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Chapter 1 – Introduction

This report was prepared as part of the River Plan project. The River Plan is a comprehensive multi-objective plan for the Willamette River corridor in Portland and also serves as an update of the City of Portland's 20-year-old *Willamette Greenway Plan.* The River Plan addresses a broad set of issues, including harbor industries, neighborhoods, recreation and natural resources. The River Plan project area is divided into 3 sub-areas: North, Central and South Reach. The first sub-area being addressed is the North Reach.

1.a Overview of Goal 5 and the ESEE Analysis

As part of the River Plan/North Reach project, the City is completing steps to comply with Statewide Planning Goal 5, which requires Oregon cities and counties "to conserve open space and protect natural and scenic resources."

The Goal 5 process follows three steps. The first step is to inventory significant natural resources. The *Willamette River Natural Resources Inventory* (2008) report (published separately) presents the location, extent, quantity and quality of significant natural resources in the North Reach. The second step of the Goal 5 process is to complete an economic, social, environmental and energy (ESEE) analysis. This report was produced to document this step in the process. The third step is to develop a program to protect significant natural resources. Portland's existing Goal 5 program relies primarily on the established environmental overlay zone. The results of the ESEE analysis will include decisions that will provide the basis for an updated Goal 5 program for the North Reach. The specific program will be established through adoption of the River Plan.

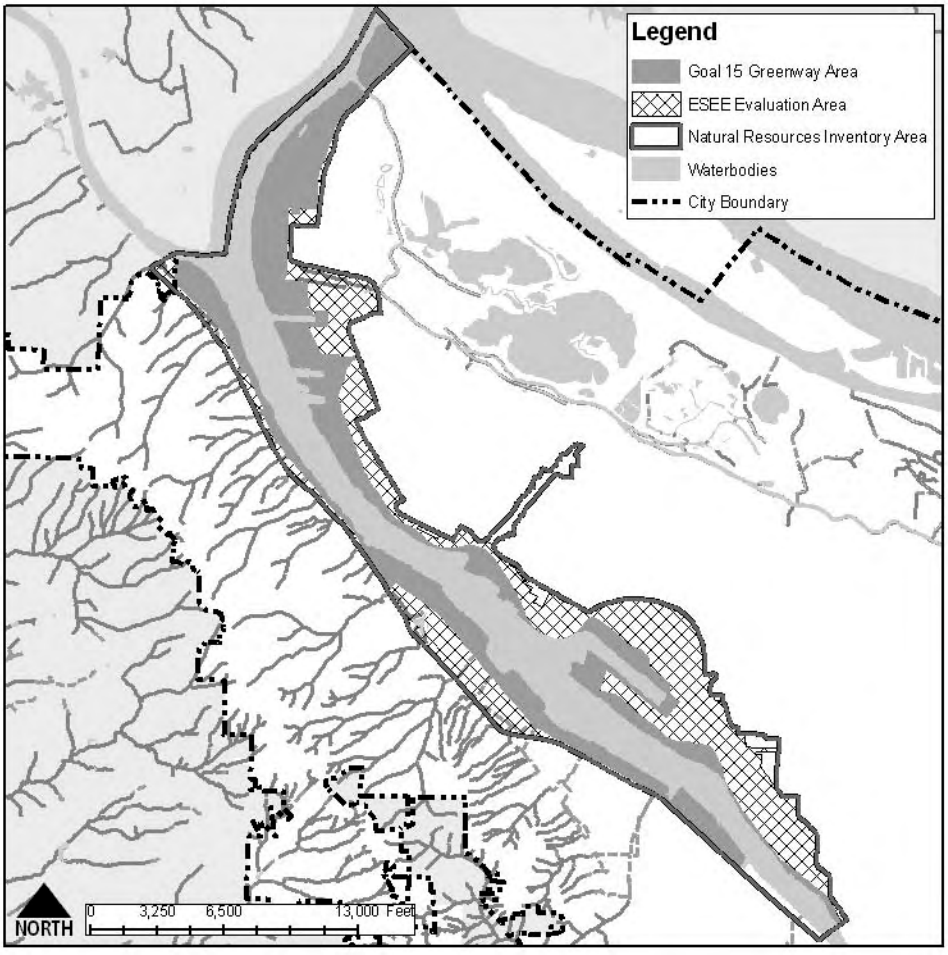
The ESEE analysis involves evaluating the tradeoffs associated with different levels of natural resource protection. As required by the Goal 5 rule, the evaluation process involves identifying the consequences of allowing, limiting or prohibiting conflicting uses in areas containing significant natural resources. The rule requires that this analysis be completed before actions are taken to protect or not protect natural resources. Specifically, the rule requires the following steps:

1. Identify conflicting uses – A conflicting use is a land use or activity that may negatively impact natural resources.
2. Determine impact area – The impact area represents the extent to which land uses or activities in areas adjacent to natural resources could negatively impact those resources. The impact area identifies the geographic limits within which to conduct the ESEE analysis.
3. Analyze the ESEE consequences – The ESEE analysis considers the consequences of a decision to either fully protect natural resources; fully allow conflicting uses; or limit the conflicting uses. The analysis looks at the consequences of these options for both development and natural resources.
4. Develop a program – The results of the ESEE analysis are used to generate recommendations or an "ESEE decision." The ESEE decision sets the direction for how and under what circumstances the local program will protect significant natural resources.

Geographic Scope of this ESEE Analysis

This ESEE analysis focuses only on the portion of the River Plan North Reach Project Area that is subject to the Goal 5 compliance process. The analysis does not address the Willamette River or other inventoried significant natural resources on properties located directly adjacent to the Willamette River. The program to address natural resources on riverfront properties is being developed pursuant to Oregon Land Use Planning Goal 15 for the Willamette Greenway. Although the City is considering tradeoffs for these areas too, Goal 15 does not require a specific ESEE analysis in order to establish programs to protect identified significant natural resources associated with Willamette River. As such, this ESEE analysis applies only to land within the River Plan North Reach project area that that is outside the area being addressed under Goal 15 (map 1). So while the North Reach Inventory area is 6,470 acres in size (2,150 acres of which is the Willamette River), the ESEE evaluation area is only 2,280 acres in size, 25% of which contains of significant natural resource areas.

Map 1: Willamette Greenway Goal 15 Area and ESEE Evaluation Area



1.b Organization of this Report

The Willamette River ESEE analysis and recommendations are the focus of this report. Below is summary of the information contained in each chapter:

Chapter 1: Introduction – This chapter introduces and provides context for the ESEE analysis, presents the history of the City's Environmental Program, and describes the relationship of the program to the Oregon Statewide Land Use Planning Program and Metro's Urban Growth Management Functional Plan. Also presented in this chapter is a description of city policies and federal regulations related to natural resources.

Chapter 2: Summary of Willamette River Natural Resources Inventory – The proposed draft of the *Willamette River Natural Resources Inventory: Riparian Corridors and Wildlife Habitat* (August 2008) is contained in a separate document. A brief summary of the inventory is presented in this chapter.

Chapter 3: Conflicting Uses Analysis – The conflicting uses analysis identifies the land use activities allowed either by right, with limitations or as conditional uses, for each of the base zones in the North Reach. The general impacts of conflicting uses on natural resources are described.

Chapter 4: Impact Area – This chapter describes the approach used to identify the impact area the ESEE Analysis.

Chapter 5: Willamette River North Reach ESEE Analysis – This chapter presents the general ESEE analysis for the North Reach. The analysis is qualitative and performed for the Willamette River North Reach as a whole. This general analysis examines the potential positive and negative consequences, on both development and natural resources, of allowing, limiting or prohibiting conflicting uses in areas containing significant natural resources. The economic, social, environmental and energy consequences are analyzed and presented separately, including program recommendations for each of the four factors. Following the four initial analyses is the recommended general ESEE decision for the North Reach. This overall decision is intended to optimize the ESEE consequences to meet multiple objectives in the North Reach, as called for by the City's River Renaissance Vision and is a stated purpose of the River Plan project itself.

Chapter 6: Inventory Site Supplemental ESEE Analyses – The Willamette Natural Resource Inventory study area is divided into sub-areas called inventory sites. Some of the inventory sites in the North Reach contain unique conditions that warrant additional site-specific ESEE analysis. These supplemental ESEE analyses either confirm or propose modifications the general ESEE recommendations presented in Chapter 5. Final recommendations regarding under what circumstances to allow, limit or prohibit conflicting uses is presented for each site, along with draft environmental overlay zoning maps that, if adopted, will implement the decision.

1.c Oregon's Statewide Land Use Program and Metro's Urban Growth Management Functional Plan

Oregon Land Use Planning Program and the Natural Environment

Comprehensive land use planning was mandated by the 1973 Oregon Legislature, primarily in response to growth pressures on valuable farm and forest land in Oregon. Since 1975, cities and counties in Oregon have been required to comply with Statewide Land Use Planning Goals. Nineteen goals have been established and cities and counties must comply with the goals by adopting, implementing and maintaining local comprehensive plans. Portland adopted its first comprehensive plan in 1981 to satisfy the requirements of the Statewide Land Use Planning Program.

It is the intent of this ESEE evaluation to consider and achieve multiple goals in the North Reach. The state land use planning goals that relate most directly to Portland's natural resources are:

- **Goal 5, Natural Resources, Scenic and Historic Areas, and Open Spaces** – Goal 5 addresses many types of resources. It establishes a process in which resources are inventoried and evaluated for significance. If a resource or site is deemed significant, the local government has three policy choices: to preserve the resource, allow proposed uses that conflict with it, or establish a balance between protecting and allowing uses that conflict with the resource.
- **Goal 6, Air, Water, and Land Resources Quality** – This goal requires local comprehensive plans and implementing measures to be consistent with state and federal regulations on matters such as air quality, stream quality, and groundwater pollution.
- **Goal 7, Areas Subject to Natural Hazards** – Goal 7 deals with development in places subject to natural hazards such as floods or landslides. It requires that jurisdictions apply "appropriate safeguards" (floodplain zoning, for example) when planning for development.
- **Goal 15, Willamette River Greenway** – Goal 15 sets forth procedures for protecting the diverse qualities of the 300 miles of land along the Willamette River. Multiple uses and functions are to be conserved, enhanced, and maintained, including significant habitat, and economic and recreational uses.

To address Goals 5, 6, and 7, cities and counties must use inventories to inform development of their local compliance programs. Goals 5 and 15 require local jurisdictions to develop their own resource inventories, while Goal 7 refers to land hazard inventories developed by federal and state agencies to be used for implementing policy. Goal 6 does not require an inventory, but does require local programs to be consistent with adopted state and federal clean water and clean air laws.

Additional state planning goals are applicable to the Willamette River North Reach.

- **Goal 9, Economic Development** – Goal 9 requires comprehensive plans and polices to contribute to a stable and healthy economy; to provide for an adequate supply of sites of suitable sizes, types, locations, and service levels for a variety of industrial and commercial uses consistent with plan policies; and to limit uses on or near sites zoned for

specific industrial and commercial uses to those which are compatible with proposed uses.

- **Goal 11, Public Facilities and Services –** This goal requires local jurisdictions to plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development. Jurisdictions with in the urban growth boundary must develop public facilities plans to coordinate the type, location and delivery of public facilities and services in a manner that best supports existing and proposed land uses.
- **Goal 10, Housing –** This goal requires jurisdictions to provide for the housing needs of citizens including encouraging the availability of adequate numbers of needed housing units at a range of prices and allow for flexibility of housing location, type and density.
- **Goal 12, Transportation** – Goal 12 requires the city to develop a transportation plan that considers all modes of transportation (car, public transit, bike, pedestrian) and accessibility to these modes; conserve energy; and facilitate the flow of goods and services so as to strengthen the local and regional economy.
- **Goal 13, Energy Conservation –** The intent of Goal 13 is that land use and development be managed and controlled to maximize the conservation of all forms of energy, based upon sound economic principles.
- **Goal 14, Urbanization –** The intent of Goal 14 is to accommodate urban population and urban employment inside urban growth boundaries, to ensure efficient use of land, and to provide for livable communities.

Metro Urban Growth Management Functional Plan – Key Titles Affecting the North Reach

The 1973 Oregon Legislature granted expanded powers for the Columbia Region Association of Governments (now called Metro), to "coordinate regional planning in metropolitan areas" and to "establish a representative regional planning agency to prepare and administer a regional plan." During the 1990s, Metro worked with local jurisdictions to develop Regional Urban Growth Goals and Objectives (RUGGOs) and the *Urban Growth Management Functional Plan.* The *Urban Growth Management Functional Plan* provides a regional approach to growth management by tailoring several key state planning goals to meet regional population growth expectations. This approach recognizes the interrelationships between housing, employment, clean air and water, natural resources, and transportation networks across jurisdictional boundaries. Metro developed the plan with input from the 24 cities and 3 counties within the Urban Growth Boundary.

Metro's *Urban Growth Management Functional Plan* was acknowledged by the Oregon Department of Land Conservation and Development and became law. Metro area cities and counties achieve compliance by updating comprehensive plans and land use ordinances to meet regional requirements. Cities and counties within the Metro Urban Growth Boundary must have comprehensive plans and ordinances that also comply with remaining state goals not covered by the *Urban Growth Management Functional Plan.*

Nine titles in the Urban Growth Management Functional Plan are derived from or relate to State Planning Goals and the rest are procedural. Key titles pertaining to the North Reach include Titles 3 and 13, which pertain most directly to natural resources management and watershed

health. Title 4 pertains to management and protection of industrial and other employment areas. These titles and associated compliance obligations are summarized below.

Title 3

Title 3 addresses portions of State Goals 6 and 7, and establishes regional requirements relating to water quality, erosion control, and flood hazard management. In September 2002, the City of Portland submitted to Metro a detailed report titled the *Title 3 Water Quality Compliance Report.* The report explains how the City complies with Title 3 requirements through the existing environmental overlay zoning program and newer regulations established through adoption of the *Willamette River Title 3 Water Quality Compliance Project* in August 2002. Metro found the City in substantial compliance with Title 3 in December 2002**.**

Title13

Title 13, adopted by the Metro Council in September 2005, establishes the Nature in Neighborhoods program to protect, conserve and restore significant riparian corridors and wildlife habitat. Metro's approach focused on achieving the goals of the 2040 Growth Concept. The 2040 Growth Concept specifies that the region should manage growth while protecting the natural environment, maintaining a high quality of life and providing affordable housing options.

The intent of the Title 13 program is, in summary, to:

- Protect, conserve and restore a continuously viable stream corridor system, in a manner that is integrated with upland wildlife habitat and the urban landscape; and,
- Control and prevent water pollution for the protection of public health and safety, and to maintain and improve water quality throughout the region.

As stated in Title 13, the program is also intended to:

- Achieve its purpose through conservation, protection and restoration of fish and wildlife habitat using voluntary and, incentive-based, educational and regulatory components;
- Balance and integrate goals of protecting and restoring habitat with regional goals for livable communities, a strong economy, preventing pollution, and compliance with federal laws including the Clean Water Act and Endangered Species Act;
- Include provisions to monitor and evaluate program performance over time, including meeting program objectives and targets, and local compliance; and,
- Establish minimum requirements and is not intended to repeal or replace existing local resource protections, nor is it intended to prohibit cities and counties from adopting or enforcing fish and wildlife habitat protection and restoration programs that exceed the requirements of this title.

Metro completed the required process to comply with State Land Use Planning Goal 5 in developing the Nature in Neighborhoods program. First, Metro developed an inventory of regionally significant riparian corridors and wildlife habitat in based on a scientific assessment of functional values (August 2002). In developing the inventory Metro produced a number of technical reports, GIS data and models, and maps of showing natural resource features and relative quality ranks. Metro then completed an ESEE analysis to assess the tradeoffs of protecting or not protecting the resources identified in the inventory. Metro completed the ESEE analysis in two phases. The first phase was completed in fall 2003 and describes the trade-offs associated with allowing, limiting or prohibiting conflicting uses that could adversely affect significant natural resources in the region.

In the first phase of the ESEE analysis Metro identified conflicting uses by establishing 7 regional zones and examined the distribution of its riparian corridor and wildlife habitat inventory relation to the generalized zones, 2040 design type priorities and impact areas. Phase 1 of Metro's ESEE analysis showed that neither allowing all of the regionally significant natural resource areas nor protecting all significant resources would satisfy competing land use interests in the region.

The second phase of the analysis evaluated various non-regulatory programs and six different regulatory programs to protect significant resources. Metro evaluated the economic, social, environmental and energy consequences of the program options in relation to an identified baseline condition. Given the inconsistency of existing local programs to protect natural resources, Metro elected to use the existing requirements of Title 3 of the Urban Growth Management Functional Plan as the baseline condition. Title 3 established a water quality resource area map and associated requirements to maintain vegetated corridors along waterways and wetlands.

The potential regulatory programs assessed during the second phase of the Title 13 ESEE identified whether development would be allowed, lightly limited, moderately limited, strictly limited or prohibited. The program options were assessed against 19 criteria that emerged from Metro's initial analysis of the economic, social, environmental and energy tradeoffs. Metro also evaluated how potential program options would address the federal regulatory requirements of the Clean Water Act and the Endangered Species Act relative to the baseline condition.

In the summary and conclusions of the ESEE analysis for Title 13, Metro acknowledged the important role of non-regulatory measures to protect important natural resources in the region. Metro listed a number of non-regulatory measures to and noted that acquisition is the most effective and reliable of the measures. Metro also pointed out that non-regulatory programs have not been successful in preventing the overall decline in regional ecosystem health. Metro noted that non-regulatory tools have been most effective when used in conjunction with a regulatory program to protect important resources. Metro listed potential options for packaging incentives, acquisition and regulations to protect significant resources. Metro also emphasized the need for adequate funding to protect and restore important fish and wildlife habitat, and provided a list of potential funding mechanisms that local jurisdictions should consider.

The Metro Council established the Title 13 through adoption of Ordinance NO. 05-1077C. Through this action the Metro Council adopted the inventory of regionally significant fish and wildlife habitat and its ESEE analysis as the basis for the Nature in Neighborhoods program.

Section 2 of this ordinance states: "…Based on Metro's ESEE analysis, Metro has determined to allow some conflicting uses and to limit some conflicting uses, but not to prohibit any conflicting uses." Metro's determination is reflected in tables 3-07-13a and 3-07-13b, which are contained in Title 13 (see Table 1). These tables illustrate Metro's decision to establish different levels of protection for significant fish and wildlife habitat based on habitat quality and urban development potential. Metro established High, Medium and Low Habitat Conservation Areas that are to be protected through a tiered approach outlined in Title 13. "High" Habitat Conservation Areas were established where relatively high value riparian corridors and wildlife habitat coincide with areas of low urban development potential. "Low" Habitat Conservation

Areas are areas of relatively low value resources coincide with areas of high urban development potential.

For land within Metro's Urban Growth Boundary at the time Title 13 was adopted, Habitat Conservation Areas were established only in conjunction with Class I and Class II riparian corridors identified in the regional inventory. Metro determined that development could be allowed in significant resource areas outside of the Class I and II riparian corridors, including all upland wildlife habitat areas. For lands in Future Metro Urban Growth Boundary Expansion Areas, Habitat Conservation Areas were established for Class I and II Riparian Areas and Class A and Class B Wildlife Habitat.

Table 1: Title 13 Method for Identifying Habitat Conservation Areas ("HCA")

Table 3.07-13a: Method for Identifying HCA

Fish and wildlife habitat classification	***High Urban development value[1]***	***Medium Urban development value[2]***	***Low Urban development value[3]***	***Other areas: Parks and Open Spaces, no design types outside UGB***
Class I Riparian	Moderate HCA	High HCA	High HCA	High HCA/ High HCA+[4]
Class II Riparian	Low HCA	Low HCA	Moderate HCA	Moderate HCA/ High HCA+[4]
Class A Upland Wildlife	No HCA	No HCA	No HCA	No HCA/ High HCA[5]/ High HCA+[4]
Class B Upland Wildlife	No HCA	No HCA	No HCA	No HCA/ High HCA[5]/ High HCA+[4]

Table 3.07-13b: Method for Identifying HCA in Future Urban Growth Boundary Expansion Areas

Fish and wildlife habitat classification	***High Urban development value[1]***	***Medium Urban development value[2]***	***Low Urban development value[3]***	***Other areas: Parks and Open Spaces, no design types outside UGB***
Class I Riparian	Moderate HCA	High HCA	High HCA	High HCA/ High HCA+[4]
Class II Riparian	Low HCA	Low HCA	Moderate HCA	Moderate HCA/ High HCA+[4]
Class A Upland Wildlife	Low HCA	Moderate HCA	Moderate HCA	High HCA/ High HCA[5]/ High HCA+[4]
Class B Upland Wildlife	Low HCA	Low HCA	Moderate HCA	Moderate HCA/ High HCA[5]/ High HCA+[4]

Note: The default urban development value of property is as depicted on the Metro Habitat Urban Development Value Map (Title 13 Exhibit C). The Metro 2040 Design Type designations provided in the following footnotes are only for use when a city or county is determining whether to make an adjustment pursuant to Section 4(e)(5) of Title 13.

1 – Primary 2040 design types: Regional Centers, Central City, Town Centers, and Regionally Significant Industrial Areas

2 – Secondary 2040 design types: Main Streets, Station Communities, Other Industrial Areas and Employment Centers

3 – Tertiary 2040 design types: Inner and Outer Neighborhoods, Corridors

4 – Cities and counties shall give Class I and II riparian habitat and Class A and B upland wildlife habitat in parks designated as natural areas even greater protection than that afforded to High HCA, as provided in Section 4(A)(5) of Title 13.

5 – All Class A and B upland wildlife habitat in publicly-owned parks and open spaces, except for parks and open spaces where the acquiring agency clearly identified that it was acquiring the property to develop it for active recreational uses, shall be considered High HCA.

Title 13 requires the cities and counties within Metro's jurisdiction to develop comprehensive plans and implementing ordinances that:

- Contain clear and objective, non-discretionary standards to protect Habitat Conservation Areas. Standards are to limit development more strictly in High Habitat Conservation areas than in Moderate or Low Habitat Conservation areas where increasing levels of development would be allowed. Habitat-friendly development practices (presented in Table 13-07- 13c) area are intended to minimize the impacts of development on significant resources shall be allowed.

- Discretionary development approval standards that would be applied through a review process for development that cannot meet the non-discretionary standards. The discretionary standards are to "require a level of protection or enhancement of, the fish and wildlife habitat that meets or exceeds the level of protection provided by the non-discretionary standards." Title 13 directs local jurisdictions to develop a discretionary process to ensure that impacts on Habitat Conservation Areas are first avoided then minimized to the extent practicable, and requires unavoidable adverse impacts to be mitigated. Cities and counties are directed to take into consideration whether a resource area is a High, Medium or Low Habitat Conservation Area in evaluating whether a proposed project alternative has avoided or minimized impacts to the extent practicable.

Through the ESEE analysis Metro considered the trade-offs of allowing, limiting or prohibiting conflicting uses from a regional perspective. Metro noted that some of the tradeoffs may be different when considering local concerns and priorities, and that Metro's decision "may not address the needs of a city to provide jobs or housing…or to protect locally significant resources.

Cities and counties within Metro's jurisdiction required to demonstrate that their comprehensive plans and implementing ordinances are in substantial compliance with the requirements of Title 13 by January 2009. Title 13 outlines various compliance options and specifies the process that cities and counties must use to establish regulations to protect significant natural resources under Goal 5. In establishing regulations to protect the regional Habitat Conservation Areas established through the adoption of Title 13, cities and counties will submit their programs to Metro for a determination of substantial compliance. Cities and counties may rely on Metro's process and are not required to complete additional steps outline in state rules for compliance with Goal 5.

If a city or county chooses to establish regulations to protect significant natural resources located outside the regionally significant riparian corridors identified in Metro's inventory, Title 13 requires the local jurisdiction to meet the requirements division 23 of OAR 660. The city or county must seek acknowledgement of such provisions from LCDC, or treat such provisions as a post-acknowledgement plan amendment under ORS 197. The same requirement would apply if a city or county chooses to adopt regulations that exceed the requirements of the Title 13 after having been deemed in substantial compliance with Title 13.

That said, Title 13 recognizes and sanctions upland resource protection through local Goal 5 protection programs that were already in effect at the time Title 13 was adopted, The title states: "A city or county that prior to the effective date of this title, adopted any comprehensive plan

amendments or land use regulations that (a) apply to areas identified as upland wildlife habitat on the Inventory Map but not identified as riparian habitat on the Inventory Map, (b) limit development in order to protect fish or wildlife habitat, and (c) were adopted in compliance with division 23 of OAR 660, shall not repeal such amendments or regulations, nor shall it amend such provisions that would allow any more than a de minimus increase in the amount of development that could occur in areas identified as upland wildlife habitat…"

In summary, the City of Portland will be required to demonstrate that its comprehensive plan and implementing ordinances are in substantial compliance with Title 13. For the North Reach, the City may establish regulatory and non-regulatory mechanisms to protect, conserve and restore significant riparian corridors and fish and wildlife habitat in North Reach. The City may establish regulatory protections for areas Metro has designated as Habitat Conservation Areas without conducting a local ESEE analysis. The City may propose more stringent protections than are required by Title 13 for these areas. However, to establish regulatory protections for resources outside Habitat Conservation Areas, the City must conduct an ESEE analysis and submit the regulations to LCDC.

Within the North Reach, the area outside of that which is subject to Goal 15: Willamette Greenway is subject to Title 13 (see Map 1 on page 4).

Title 4 – Industrial and Other Employment Areas

The *Urban Growth Management Functional Plan* calls for a strong economic climate. To improve the region's economic climate, Title 4 seeks to provide and protect a supply of sites for employment by limiting the types and scale of non-industrial uses in Regionally Significant Industrial Areas (RSIAs), Industrial Areas and Employment Areas. Title 4 also seeks to provide the benefits of "clustering" to those industries that operate more productively and efficiently in proximity to one another than in dispersed locations. Title 4 further seeks to protect the capacity and efficiency of the region's transportation system for the movement of goods and services, and to encourage the location of other types of employment in Centers, Employment Areas, Corridors, Main Streets and Station Communities.

Title 4 restricts non-industrial uses in Regionally Significant Industrial Areas, and restricts retail uses limitations in Employment Areas. Portland is currently proposing regulatory improvements in the "RICAP 4" project and prime industrial land provisions in River Plan North Reach to comply with recent changes to Title 4.

1.d City of Portland Environmental Programs

Policies and Plans

The City has established a number of policies and plans that address natural resources. Several of the key policy documents are summarized below:

Comprehensive Plan:
The State of Oregon definition of a "comprehensive plan" is: a generalized, coordinated land use map and policy statement of the governing body of a local government that interrelates all functional and natural systems and activities relating to the use of lands, including but not limited to sewer and water systems, transportation systems, educational facilities, recreational facilities, and natural resources and air and water quality management programs."

Portland's *Comprehensive Plan Goals and Policies* (2006) is the current adopted land use plan for the City of Portland includes a set of goals, policies, and objectives that apply to the entire city. The first Comprehensive Plan was adopted in 1980 and contained 12 goals (a City School Policy was adopted in 1979). Since then many of the goals have been amended.

Goal 8 pertains to the environment and the policies and objectives of the goal were last amended in 1995.

> **Goal 8 – Environment:** Maintain and improve the quality of Portland's air, water and land resources and protect neighborhoods and business centers from detrimental noise pollution.

Below are summaries of two of the citywide Goal 8 policies and objectives that pertain specifically to the resources addressed in the *Willamette Natural Resource Inventory and ESEE Analysis for the North Reach*:

- *Wetlands/Riparian/Water Bodies Protection* - Conserve significant wetlands, riparian areas, and water bodies which have significant functions and values related to flood protection, sediment and erosion control, water quality, groundwater recharge and discharge, education, vegetation, and fish and wildlife habitat. Regulate development within significant water bodies, riparian areas, and wetlands to retain their important functions and values.
    - Create wetland/water body buffers through the designation and protection of transition areas between the resource and other urban development and activities. Restrict non-water dependent or non-water related development within the riparian area.

- *Uplands Protection* - Conserve significant upland areas and values related to wildlife, aesthetics and visual appearance, views and sites, slope protection, and groundwater recharge.
    - Encourage increased vegetation, additional wildlife habitat areas, and expansion and enhancement of undeveloped spaces in a manner beneficial

to the city and compatible with the character of surrounding urban development.
- Protect slopes from erosion and landslides through the retention and use of vegetation, building code regulations, erosion control measures during construction, and other means.
- Conserve and enhance drainageways and linear parkways which have value as wildlife corridors connecting parks, open spaces, and other large wildlife habitat areas, and to increase the variety and quantity of desirable wildlife throughout urban areas.

Some Goal 8 policies and objective are area-specific, four of which includes lands within the Willamette River North Reach:

- *Willamette River Greenway* - Protect and preserve the natural and economic qualities of lands along the Willamette River through implementation of the city's Willamette River Greenway Plan.
- *Northwest Hills* - Protect and preserve forest, wildlife and watershed resources through implementation of the Northwest Hills Natural Areas Protection Plan.
- *East Buttes, Terraces and Wetlands* - Conserve wildlife, forest and water resource values and the unique geology of East Portland through implementation of the East Buttes, Terraces and Wetlands Conservation Plan.
- *Balch Creek Watershed* - Protect and preserve fishery, wildlife, flood control, and other natural resource values of the Balch Creek Watershed through the application of special development standards and approval criteria in the environmental overlay zones.

Another key City policy pertaining to the North Reach is Goal 5 Economic Development

Goal 5 – Economic Development: Foster a strong and diverse economy which provides a full range of employment and economic choices for individuals and families in all parts of the City.

Key policies of Goal 8 that relate to the North Reach include:

- *Business Development* – Sustain and support business development activities to retain, expand, and recruit businesses. Under this policy, some particularly relevant objectives include:
  - Develop incentives for businesses to locate and stay in Council-designated target areas…
  - Incorporate economic considerations in long-range planning activities undertaken by the Bureau of Planning.

- *Transportation System* – Promote a multi-modal regional transportation system that stimulates and supports long term economic development and business investment.

- *Infrastructure Development* – Promote public and private investments in public infrastructure to foster economic development in Council-designated areas.

- *Diversity and Identity in Industrial Areas* – Promote a variety of efficient, safe and attractive industrial sanctuary and mixed employment areas in Portland. Under this policy, some particularly relevant objectives include:
    - Recognize and promote the variety of industrial areas in Portland through development regulations which reflect the varied physical characteristics of the city's industrial areas.
    - For activities which tend to have substantial off-site impacts or demands on public services, limit the zones where they are permitted outright and require additional reviews where they may be appropriate.

- *Protection of Non-Industrial Lands* – Protect non-industrial lands from the potential adverse impacts of industrial activities and development. Under this policy, some particularly relevant objectives include:
    - Where possible, use major natural or made- made features as boundaries and buffers for industrial areas.
    - When industrial zoned lands abut residential zoned lands, and there are no natural boundaries, apply special buffer overlay zone provisions to ensure that development is compatible.

The Comprehensive Plan also contains a number of other policies and objectives that must be considered when evaluating the tradeoffs of different program choices in the North Reach. These include policies related to:

- Urban Development
- Neighborhoods
- Housing
- Transportation
- Energy
- Public facilities
- Urban Design

<u>River Renaissance Vision and Strategy:</u>

River Renaissance coordinates the city's river-related work, engages the public, and connects community partners to create innovative urban solutions. River Renaissance was launched in the fall of 2000, with a series of interactive workshops that resulted in a community vision for a revitalized Willamette River. The Portland City Council endorsed the *River Renaissance Vision* in March 2001. To advance the Vision, a collaborative team of eight city bureaus and community partners produced the *River Renaissance Strategy* which established policy guidance, progress measures, and a set of actions for the city's river-related activities. The Strategy was adopted by the City Council in December 2004. One of the actions described in the Strategy is:

> *Develop a comprehensive* River Plan *package that includes, but is not limited to, plans for riverfront communities, an update of the Willamette Greenway Plan, design guidelines, and recommendations for natural resource restoration.*

Portland Watershed Management Plan:

In December 2005, City Council adopted the Portland Watershed Management Plan. The Watershed Plan describes the approach that will be used to evaluate conditions in the City's urban watersheds and implement projects to improve watershed health. Four city-wide watershed health goals were adopted through the Watershed Plan:

- Hydrology: Move toward normative* stream flow conditions to protect and improve watershed and stream health, channel functions, and public health and safety.
- Physical Habitat: Protect, enhance, and restore aquatic and terrestrial habitat conditions and support key ecological functions and improved productivity, diversity, capacity, and distribution of native fish and wildlife populations and biological communities.
- Water Quality: Protect and improve surface water and groundwater quality to protect public health and support native fish and wildlife populations and biological communities.
- Biological Communities: Protect, enhance, manage and restore native aquatic and terrestrial species and biological communities to improve and maintain biodiversity in Portland's watersheds.

A list of actions is presented in the Watershed Plan that includes updating the city natural resources inventory and to protect sites and features with high watershed values and functions. The *Willamette River Natural Resources Inventory*, this report and the River Plan advance the goals and actions of the Watershed Plan.

Urban Forestry Management Plan (UFMP):

Last updated in 2004, this plan provides direction for the maintenance and improvement of Portland's urban forest and makes recommendations to enhance and improve this valuable resource now and for the future. Specifically, it responds to recent environmental mandates, clarifies resource management and authority, and better coordinates the roles of different agencies and bureaus. The UFMP establishes canopy targets and three main goals and objectives pertaining to the topic headings listed below:

- Protect, preserve, restore and expand Portland urban forest
- Develop and maintain support for the urban forest
- Manage the urban forest to maximize benefits for all residents

To implement the UFMP, the *Urban Forest Action Plan* was developed by an inter-bureau committee to ensure attainment of the many goals and recommendations of the 2004 UFMP. The Action Plan recognizes the full array of benefits and services that trees provide across the urban landscape. The prioritized actions are those that can be done by City of Portland bureaus, although achieving all of the plan's goals will require participation from private organizations, individuals, and other public agencies. The Action Plan was accepted by City Council on March 14, 2007.

The Environmental Overlay Zoning Program

The City of Portland employs a number of tools to meet its environmental goals and policies, including willing-seller land acquisition, revegetation projects, education and stewardship programs, and regulations, including zoning regulations established to meet Oregon Land Use requirements. . Multiple bureaus are responsible for the City's environmental programs, including the Bureau's of Environmental Services, Parks and Recreation, Development Services, and Water Works.

The Bureau of Planning is responsible for creating and maintaining the City's zoning code provisions related to conservation and protection of natural resources. Environmental overlay zoning was first established in the City in 1989, primarily to comply with Goal 5, but also to comply with Goals 6 and 7. Part of the Portland Zoning Code, the environmental overlay zones help protect and conserve natural resource features and the functions and values they provide. The application of environmental overlay zones to protect significant natural resources occurs as the final step in the Goal 5 process. During the past 20 years, eleven Goal 5 processes have been completed for specific areas within the City:

- Columbia Corridor Industrial/Environmental Mapping Project (1989)
- Northwest Hills Protection Plan (1991)
- Southwest Hills Resource Protection Plan (1992)
- East Buttes, Terraces and Wetlands Conservation Plan (1993)
- Fanno Creek and Tributaries Conservation Plan (1994)
- Skyline West Conservation Plan (1994)
- Balch Creek Watershed Protection Plan (1995)
- Johnson Creek Basin Protection Plan (1991); Boring Lava Domes Supplement (1997)
- Columbia South Shore Natural Resources Protection Plan (2000)
- Natural, Scenic and Open Space Resources within Multnomah County Unincorporated Urban Areas (2002)
- Pleasant Valley Natural Resources Protection Plan (2004)

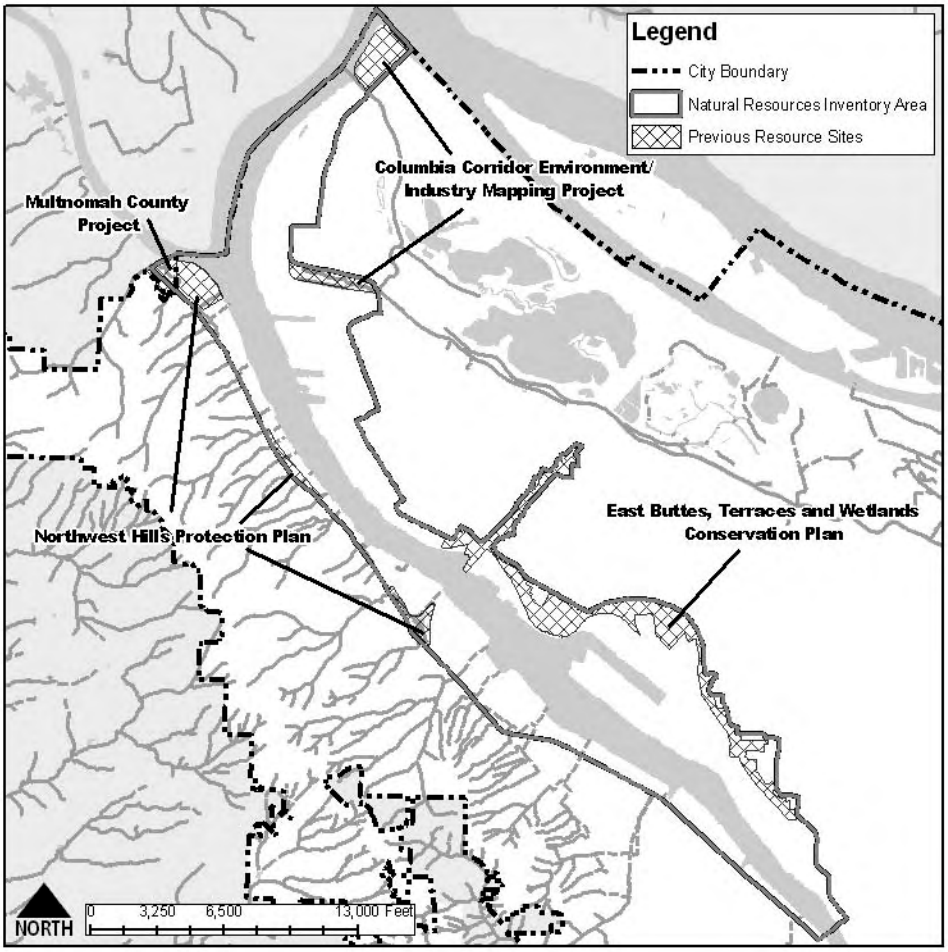
Two types of environmental overlay zones are applied within the city: the environmental conservation overlay zone (c-zone) and the environmental protection overlay zone (p-zone). Within the c-zone, development is allowed if it meets standards or criteria to avoid adversely affecting natural resources where practicable. Mitigation is required for unavoidable impacts. Within the p-zone, only a narrow set of uses or development types are allowed under specific circumstances. Development that is necessary to provide access is allowed. If the public benefits provided by the proposed development are found to outweigh the impacts on natural resources, the development may be allowed with or without conditions. In either situation, mitigation for unavoidable impacts on natural resources is required.

The Environmental Overlay Zone is a key component of the City's program to comply with Metro Titles 3 and 13, and is also a component of the City's plan to comply with Clean Water Act stormwater and Total Maximum Daily Loads (TMDL) requirements.

Several of the City's previous Goal 5 processes have addressed portions of the Willamette North Reach (Map 2). The adopted ESEE analyses and decisions for the existing program within these areas are contained in several reports:

- Columbia Corridor Industrial/Environmental Mapping Project (1989)
- Northwest Hills Protection Plan (1991)
- East Buttes, Terraces and Wetlands Conservation Plan (1993)
- Natural, Scenic and Open Space Resources within Multnomah County Unincorporated Urban Areas (2002)

Map 2: City Adopted Natural Resources Inventory Sites



The ESEE analysis presented in this report builds on these adopted ESEE analyses. However, the North Reach landscape and the local, regional, state and federal policies affecting natural resources have evolved since City's adoption of the inventories and ESEE analyses. While elements of the previous work may still apply, it is appropriate to reexamine the analyses and conclusions.

The ESEE analysis presented in this report will update and supersede the previous analyses the areas addressed in the remainder of this report. These areas will be removed from the previously adopted reports and integrated into the Willamette River inventory and this new ESEE analysis for the North Reach.

1.e Federal Environmental Regulations

The City is required to address a number of federal environmental regulations, and does so through the broad array of program tools mentioned above. These federal regulations are taken into consideration though the course of the ESEE analysis.

Clean Water Act

The Water Pollution Control Act Amendments of 1972 and subsequent amendments, now known as the Clean Water Act (CWA), regulate discharges of pollutants to waters of the United States. The CWA calls for restoration and maintenance of the quality of the nation's water, where attainable, to promote a range of beneficial uses.

Section 303 of the CWA establishes water quality standards and Total Maximum Daily Loads (TMDL) that limit the amount of pollutants that a particular body of water is allowed to receive from all sources. States are required to develop lists of water bodies that are "water quality limited" because they do not meet certain water quality standards. In Portland, major rivers and streams are water quality limited with the exception of Balch Creek. Most of Portland's waterways, including the Willamette River, do not meet water quality standards for temperature and bacteria. The Willamette mainstem also does not meet standards for dioxin and mercury. Some of the City's waterways do not meet standards for parameters such as biological oxygen demand, nutrients, pH, and pesticides. The City has developed a draft Local Implementation Plan to meet TMDL requirements for the Willamette River and its tributaries in Portland. The Local Implementation Plan identifies existing and potential tools the City could utilize to meet TMDL requirements. Existing tools called out include environmental overlay zones and the Watershed Revegetation Program.

Endangered Species Act

In 1998, National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) proposed listing a number of Pacific Northwest salmonid species under the Endangered Species Act (ESA). Portland's Willamette and Columbia rivers, Columbia Slough, Johnson, Tryon and Fanno creeks, and several smaller tributary streams are used by several of these species (i.e., Columbia River steelhead trout, Columbia River Chinook salmon, and Pacific lamprey).

After the 1998 listing of steelhead trout in the Lower Columbia ESU (Evolutionary Significant Unit), the City of Portland began developing a comprehensive, coordinated citywide response for City Council adoption (Resolution No. 35715). The City's response is intended to avoid "take" of a listed species (i.e., harming individuals or populations or their habitat), and to assist with recovery of listed salmonids. The City has since taken actions such as identifying and prioritizing City programs that could affect listed species, providing technical support to bureaus, providing oversight for activities involving federal permitting or funding, and developing a watershed plan to help guide city actions. The City's existing environmental zoning program is one mechanism the City uses to reduce risk under the ESA.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund)

In 2000, a six-mile stretch of the Lower Willamette River – the Portland Harbor – became a designated federal Superfund site due to the discovery of contaminated sediments. Elevated levels of polychlorinated biphenyls (PCBs), heavy metals, polycyclic aromatic hydrocarbons (PAHs), pesticides such as DDT and other contaminants are present in river sediments from Swan Island to the southern tip of Sauvie Island.

In September 2001 an agreement was established between the Oregon Department of Environmental Quality (DEQ) and a coalition of businesses and public agencies – including the City of Portland – to participate in investigation and cleanup of the site. The DEQ is working on the cleanup of approximately 100 upland sites along the banks of the Willamette River. Federal, state and tribal governments serve as the Natural Resource Trustees. The Trustees are conducting a natural resources damage assessment to determine how the release of hazardous substances have harmed natural resources such as fish and wildlife since CERCLA was established in 1980. The Trustees can recover damages from parties who have caused injury, and can mandate restoration and mitigation actions. The Trustees can use this inventory to inform the identification of restoration opportunities to address past damages.

Chapter 2 – Summary of Willamette River Natural Resources Inventory

The first step of the Goal 5 process is inventorying the location, extent, quantity and quality of natural resources within a project area. The *Willamette River Natural Resources Inventory* (2008), published separately, contains the inventory for the North Reach. A brief summary of the approach, methodology and inventory sites is included as background for the ESEE analysis.

2.a Summary of Approach and Methodology

The Bureau of Planning has recently produced substantial new inventory information for riparian corridors and wildlife habitat in Portland. Products include natural resources descriptions, GIS data, GIS models, maps, and a report documenting the project approach.

The Bureau used Metro's inventory of regionally significant riparian corridors and wildlife habitat as a starting point for citywide natural resource inventory development. By basing the City's new refined inventory on Metro's approach, the Bureau was able to incorporate and build on the extensive research, analysis, technical review, and public scrutiny that went into the development of Metro's regional inventory. Metro's inventory was reviewed by the Independent Multidisciplinary Science Team (a group of leading scientists in the Pacific Northwest), and other local experts. Public workshops were held and a public hearing was conducted before the Metro Council. The Metro Council endorsed the regional natural resources inventory in December 2001 and adopted the inventory in 2005 as part of the Title 13: Nature in Neighborhood program

Both the City's and Metro's inventories focus on riparian corridors and wildlife habitat, which can be summarized as follows:

Riparian corridors are comprised of rivers and streams, riparian vegetation, and off-channel areas, including wetlands, side channels, and floodplains. Riparian corridors usually contain a complex mix of vegetation consisting of trees or woody vegetation, shrubs and herbaceous plants. Riparian corridors also include areas that provide the transition between the stream banks and upland areas.

Wildlife habitats provide food, cover, and roosting and nesting sites for a broad array of birds, mammals, reptiles and amphibians. The terrestrial habitat features that provide these functions include forests, woodland, shrubland, grassland and meadows, wetlands, rocky slopes and uplands, buttes, and other topographic features.

Below is a summary of the steps the Bureau took to produce the citywide inventory of riparian corridors and wildlife habitat. Included are brief explanations about how the Bureau built and improved on Metro's inventory work.

1. Compiled GIS Data and mapped key natural resource features, including rivers, streams, wetlands, flood areas, vegetation and topography.

Natural resource feature data are the primary inputs to the GIS inventory models for riparian corridor and wildlife habitat. The Bureau improved Metro's regional natural resource feature GIS data for the City of Portland by:

- Remapping more than 180 miles of stream centerlines; adding 86 miles of open stream channel to the maps.
- Mapping smaller vegetation units (1/2 acre minimum), and classifying forest, woodland, shrubland and herbaceous vegetation (based on the National Vegetation Classification System) over a wider area. Land that is either not vegetated or sparsely vegetated is not mapped as part of the inventory.1
- Updating the City's flood area data for use in the inventory, including incorporation of the 2004 FEMA 100-year floodplain.

2. Developed criteria and GIS models to rank and map the relative functional value of existing natural resources

Like Metro, the City produced GIS models to assess the relative functional value of riparian corridors and wildlife habitat. The riparian corridor and wildlife habitat GIS models assign relative ranks of "high," "medium," or "low" to natural resource features that meet certain science-based model criteria. The ranks are produced using a consistent and replicable method, and represent a simple ordinal scale depicting the relative number and distribution of functions provided by natural resource features in the city. The ranks are not tied to a reference or baseline condition, but allow comparison of the relative condition of natural resources within the region or city.

The City's inventory models apply criteria that are similar to criteria Metro developed for the regional inventory. The Bureau refined some of the regional criteria to reflect additional detail, more recent studies, and local conditions. For example, the City's riparian corridor model assigns a lower value to herbaceous vegetation than Metro's models to reflect the predominance of cultivated landscapes and lawn in Portland's urban watersheds. The riparian corridor model criteria were further refined for the *Willamette River Natural Resources Inventory* to reflect the extent of development and hardened riverbanks in the North Reach. The Bureau of Planning worked closely with Metro, the Bureau of Environmental Services and technical experts to ensure that refinements to the regional inventory would reflect best available science, be consistent with Metro's work and support the City's watershed health goals.

The City's riparian corridor GIS model criteria address the following natural resources functions:

- *Microclimate and shade* – Open water bodies, wetlands, and surrounding trees and woody vegetation are associated with localized air cooling, soil moisture, and increased humidity.
- *Bank function and control of sediments, nutrients and pollutants* – Rivers, streams, trees, vegetation, roots and leaf litter intercept precipitation; hold soils, banks and steep slopes in place; slow surface water runoff; take up nutrients; and filter sediments and pollutants found in surface water. Structures, such as pilings, can also

help stabilize banks and contain contaminants but can impair channel dynamics and other functions.

- *Streamflow moderation and flood storage* – Waterways and floodplains provide for conveyance and storage of streamflows and floodwaters; trees and vegetation intercept precipitation and promote infiltration which tempers stream flow fluctuations or "flashiness" that often occurs in urban waterways.
- *Organic inputs, nutrient cycling and food web* – Water bodies, wetlands and nearby vegetation provide food for aquatic and terrestrial species (e.g., plants, leaves, twigs, insects) and are part of an ongoing chemical, physical and biological nutrient cycling system.
- *Large wood and channel dynamics* – Rivers, streams, riparian wetlands, floodplains and large trees and woody vegetation contribute to changes in location and configuration of waterway channels over time.
- *Wildlife movement corridors* – Rivers and streams and vegetated corridors along waterways allow wildlife to migrate and disperse among different habitat areas and provide access to water.

The predominance of riparian functions occurs within 30 to 100 meters (approximately 100 to 300 feet) of a water body, but some functions, such as the microclimate effect associated with adjacent, contiguous forest vegetation, can occur up to several hundred feet from a river, stream or wetland. Typically, the riparian corridor model assigns aggregated relative ranks to natural resource features as follows:

- **High –** Rivers, streams and wetlands; forest or woodland vegetation within a flood area, in close proximity to a water body, and woody vegetation on steep slopes
- **Medium –** Shrubland and herbaceous vegetation within a flood area or in close proximity to a water body
- **Low —** Vegetation outside the flood area and further from a water body; developed flood areas; and hardened, non-vegetated banks of the North and Central reaches of the Willamette River

The wildlife habitat GIS model assigns scores to mapped habitat patches based on their size, shape, and connectivity to other patches or water bodies. For purposes of the inventory, habitat patches are defined as areas of forest vegetation and wetland that are at least two acres in size, plus adjacent woodland vegetation. The following wildlife habitat attributes are indicators of habitat function:

- *Habitat patch size* – Larger habitat patches generally provide more food, cover, breeding and nesting opportunities for multiple wildlife species.
- *Interior habitat area (edge effect)* – Rounder-shaped habitat patches experience less "edge effect" (disturbance from urban land uses, predation and invasive species) than narrow patches. Larger, rounder patches provide interior habitat that is needed by certain species.
- *Connectivity between habitat patches (including distance and edge effect)* – Patches located closer together generally facilitate species dispersal and migration, and provide access to food, cover, nesting sties, and reproduction opportunities.
- *Connectivity/proximity to water* – Access to water is vital to wildlife survival. Habitat that is connected or close to rivers, streams and wetlands is valuable for all types of wildlife.

Typically, the wildlife habitat model assigns aggregated relative ranks to natural resource features as follows:

- **High –** Large forest and wetland areas such as Forest Park, Smith and Bybee Wetlands, Tryon State Park, and Riverview Cemetery
- **Medium –** Moderate sized forest and wetland areas such as those at Oaks Bottom, portions of Powell Butte, and the South Rivergate Corridor
- **Low –** Numerous smaller forest and wetland areas throughout the city

3. Designated Special Habitat Areas and Updated Regional Species Lists.

The Bureau of Planning worked with Portland's Bureau of Environmental Services and Parks and Recreation to update the documentation and mapping of the regional Habitats of Concern identified in Metro's inventory. Habitats of Concern are areas with sensitive/threatened fish or wildlife species, sensitive/unique plant populations, wetlands, native oak, bottomland hardwood forests, riverine islands, river delta, migratory stopover habitat, connectivity corridors, upland meadow, and other unique natural or built structures or resources (such as bridges that provide habitat for Peregrine Falcons). Habitat of Concern are referred to as Special Habitat Areas (SHAs) in the citywide inventory.

SHAs include certain resource features that are not addressed by the wildlife habitat model criteria, such as the grasslands at Powell Butte. All SHAs receive a high relative rank for wildlife habitat, which would supersede a medium or low rank if assigned by the wildlife habitat model.

In addition to Metro's Habitats of Concern criteria, the SHA criteria include areas designated by National Oceanic and Atmospheric Administration (NOAA) as Critical Habitat for anadromous salmonids. The Willamette River and portions of the Columbia Slough, Johnson Creek and Tryon Creek are designated as Critical Habitat. The City also designated certain urban structures as SHAs, including chimney roosting sites for Vaux's Swifts and several bridges on the Willamette and Columbia rivers that provide nesting sites for Peregrine Falcons. The citywide inventory includes up-to-date plant and wildlife species lists.

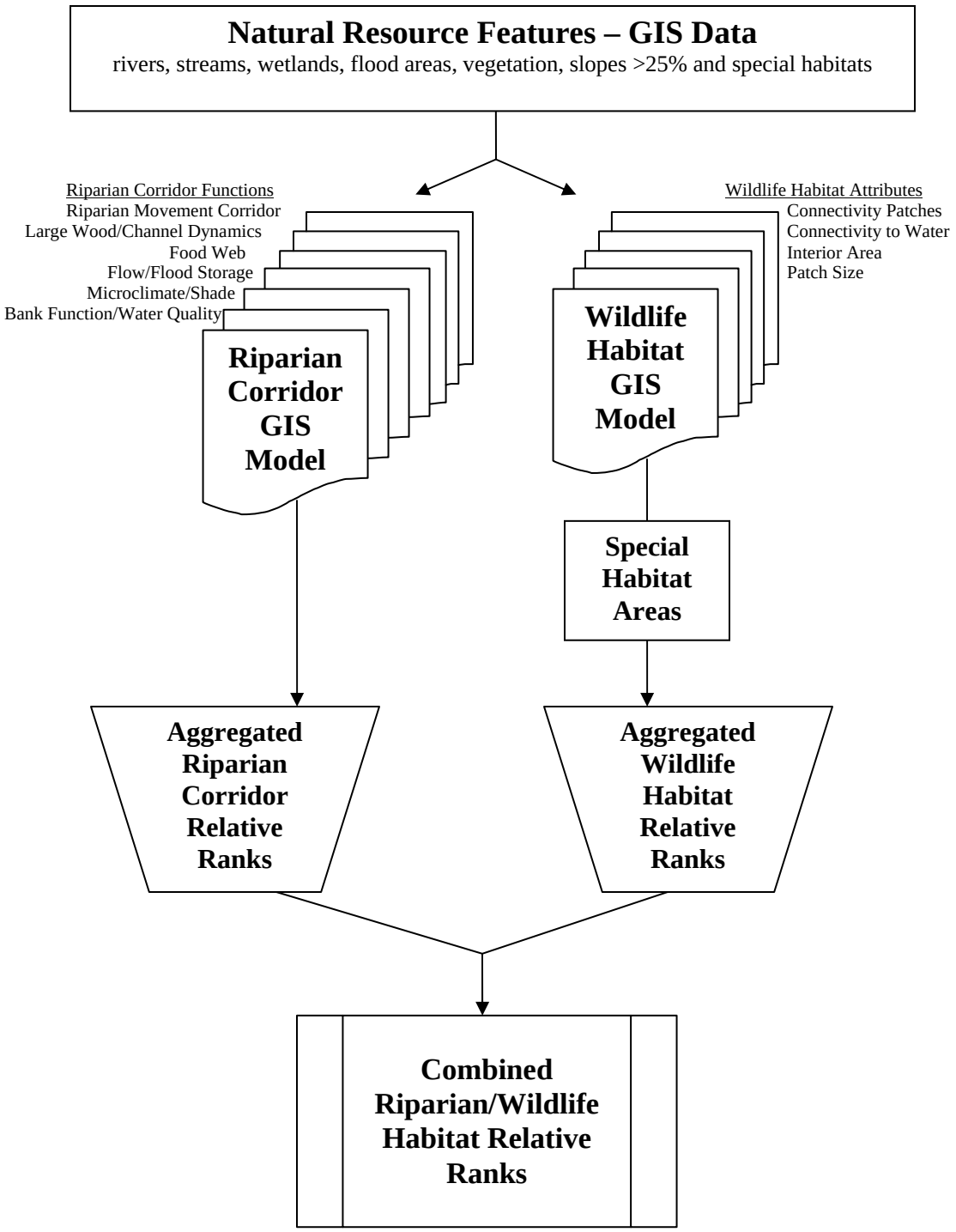
4. Produced combined ranks and maps based on GIS model results and information on Special Habitat Areas.

Once the aggregated riparian corridor and wildlife habitat ranks were generated and SHAs are designated, a single combined relative rank for riparian corridor/wildlife habitat areas was produced. Where ranked riparian corridors and wildlife habitat areas overlap, and if the two aggregated relative ranks differ, the higher of the two ranks becomes the overall combined rank for that resource area. For example, a feature that ranks medium for riparian corridor functions and low for wildlife attributes, would receive a medium combined relative rank.

It is important to note that natural resource features can rank high based on the specific inventory criteria, and also be impacted by land management activities, invasive plants or animals, or contamination. This situation is especially prevalent in highly developed areas such as portions of the Willamette River corridor.

The *Willamette River Natural Resources Inventory* includes maps showing the GIS model results for individual riparian and wildlife habitat functions and attributes, the Special Habitat Areas, the aggregated riparian corridor and wildlife habitat relative ranks, and the combined ranks, for each inventory site in the North Reach.

Figure 1: City's Natural Resources GIS Models Flow Diagram



5. Addressed Resource Significance

To comply with the Goal 5 rule, local jurisdictions must assess inventoried natural resources to determine if the resources are "significant" based on location and relative quantity and quality. Resources that have been deemed significant must then be evaluated to determine if and how those resources should be protected by the local jurisdiction.

Given that the inventory methodology is consistent with Metro's approach, natural resources identified in the City's inventory and Metro's inventory overlap to a large extent. Differences between the two are primarily a reflection of City improvements to the Metro inventory, such as inclusion of more current, accurate and local data. As such, the City proposes that natural resources receiving riparian corridor and wildlife habitat scores and ranks in the City's inventory for the North Reach be deemed ecologically and regionally and locally significant. Official determination(s) of significance will take place at the time of River Plan adoption by the City Council and acceptance of the River Plan by Metro as "in substantial compliance" with the Title 13 inventory.

6. Compiled Inventory Site Descriptions

The Willamette River North Reach was divided into inventory sites (see description below). For each site, a description of natural resources is provided. The site descriptions are intended to provide more detailed natural resources information than can be determined using the GIS models. The descriptions include information regarding plant species and assemblages, wildlife species observed during field visits and from other reports, water quality, and impacts such as invasive plants and contamination.

2.b Description of Inventory Sites

Goal 5 definition and intent

Per the Goal 5 rule a "resource site" or "site" represents a particular portion of the required natural resource inventory study area within which natural resources are located. A site may consist of a single parcel or lot, a portion of a parcel or lot, or an area consisting of two or more contiguous lots or parcels. The *Willamette River Natural Resources Inventory* study area for the North Reach is divided into sites as described in the nest section.

North Reach Inventory Sites

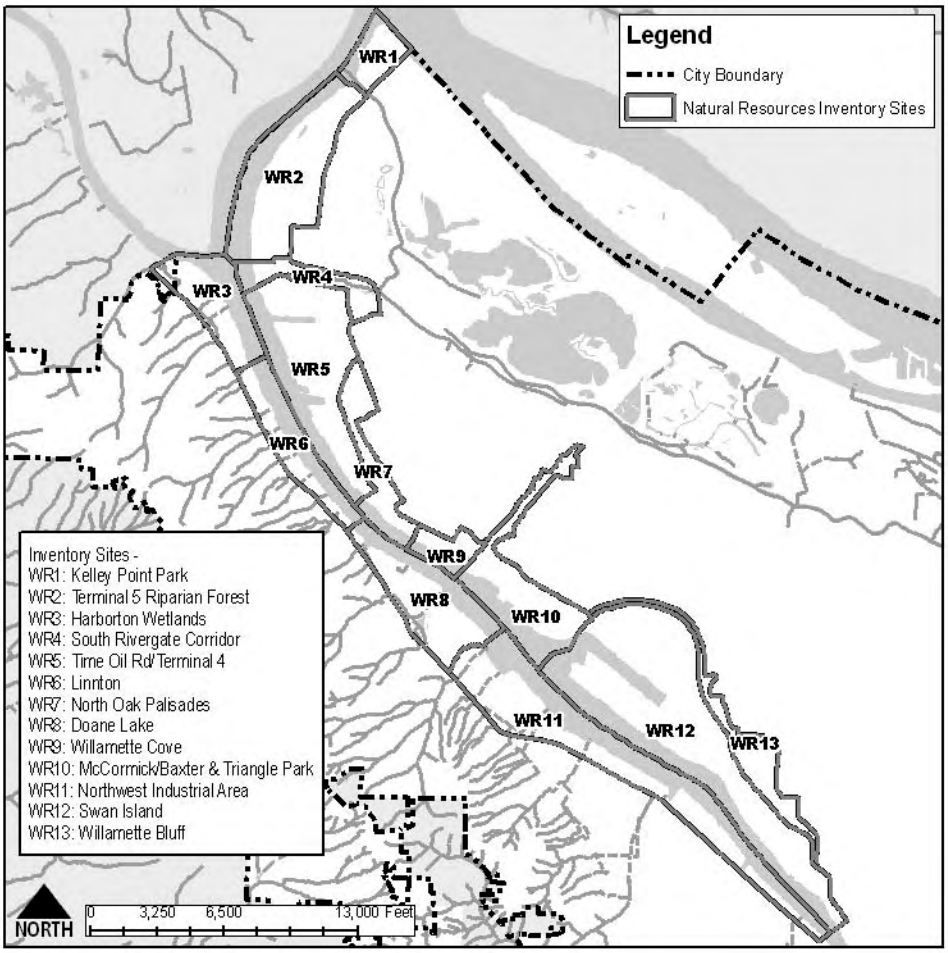
The Bureau of Planning delineated 13 new inventory sites for the *Willamette River Natural Resources Inventory* (Map 3). Consistent with more recent City inventories, the Willamette River inventory sites are contiguous to each other and include not only significant natural resources but also the surrounding land uses as well.

Specifically, the inventory site boundaries are intended to:

- Capture similar and contiguous landscape features (natural and human-made) in the same inventory site.
- Abut one another – i.e., no gaps between inventory sites in the Willamette River study area, or between Willamette River inventory sites and inventory sites established for other inventories, such as the West Hills Inventory. Some Willamette River inventory sites overlap with other sites. In these situations, the portions that overlap will be address within this report.
- Address areas included in Metro's inventory of regionally significant riparian corridors and wildlife habitat.

In other City natural resources inventories and ESEE analyses, the term "resource site" or "habitat site" is used, including in the 1986 inventory produced for the Willamette Greenway. For this process, the Bureau of Planning uses the more general term "inventory site," as the Willamette River inventory sites contain both natural resources and fully developed areas.

Map 3: North Reach Natural Resources Inventory Sites



Inventoried Natural Resources in the North Reach

The North Reach ESEE evaluation area contains 586 acres of significant natural resources; this represents approximately 25% of the evaluation Area (Map 4). Key natural resource areas (moving from north to south) include:

Harborton Wetlands

Approximately half the Harborton Wetlands is located within the ESEE evaluation area on the west side of the Willamette River. It is zoned RF (residential farming). The wetlands provide flood storage, sediment filtering, microclimate affects and habitat for numerous species including Osprey and Bald Eagle that forage over the Willamette River and Multnomah Channel.

South Rivergate Corridor

On the east side of the Willamette, the South Rivergate Corridor provides a wildlife connectivity corridor between the Willamette River and the Columbia Slough. Roughly 2/3 of the corridor is located within the ESEE evaluation area. The wetlands and riparian area

provide flood storage and hydrologic functions. It is zoned IH (heavy industrial) and the main land use is the PGE Powerline Corridor.

Baltimore Woods

Located in the St. Johns and Cathedral Park neighborhoods is a number of woodland patches along the steep slopes. These patches provides a buffer between the residential areas and industrial uses. Remnant stands of Oregon white oak and Pacific madrone are found here along with other tree species and vegetation. The area has a mix of zoning including residential, employment and industrial.

Willamette Bluff

Extending for more than seven miles on the east side of the river is the Willamette Bluff. Much of the bluff is vegetated, including a corridor of continuous tree canopy and vegetation extending a more than four miles. This bluff is very steeply sloped and contains a mix of vegetation types including Oregon white oak and Pacific madrone. The Willamette Bluff provides a wildlife connectivity corridor that generally parallels the river. The area is susceptible to landslides and wildfires. Willamette Bluff has a mix of zoning primarily residential but also small areas of industrial, commercial and institutional.

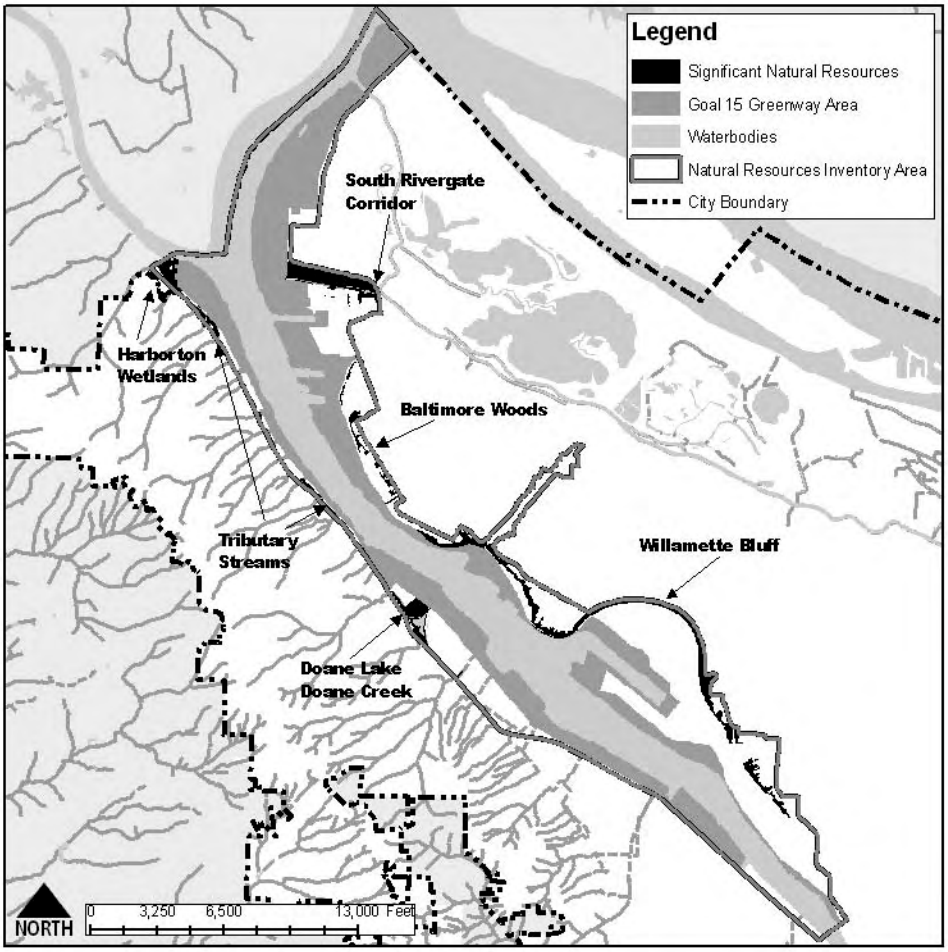
North Doane Lake and Doane Creek

On the west side of the Willamette, North Doane Lake is a low lying wetland complex located due west of the Burlington Northern Railroad Bridge. Doane Creek flows from Forest Park under Highway 30 and is open channel for approximately X feet before entering a pipe to the Willamette River. North Doane Lake, Doane Creek and the surrounding vegetation provide important habitat connectivity between Forest Park and the Willamette River. Both resources are zoned IH (heavy industrial).

Tributary Streams

Numerous tributary streams that originate in Forest Park cross the ESEE evaluation area. The streams are piped under Highway 30 and then are open before entering pipes and discharging to the Willamette River. The open channel segments range from approximately 10 to 200 feet. These tributary streams contribute to the hydrologic and water quality functions of the watershed. The surrounding vegetation contributes to localized microclimate effects, organic inputs and nutrient cycling, and riparian habitat. Most of these tributary streams are zoned IH (heavy industrial), while a few in the northern third of the area are zoned residential.

Map 4: Natural Resource Areas within the ESEE Analysis Evaluation Area



Chapter 3 – Conflicting Uses Analysis

Following development of an inventory of significant natural resources, local governments must identify conflicting land uses that are allowed within inventoried natural resource areas. According to the Goal 5 administrative rule:

> *A **Conflicting Use*** is one that, if allowed, could negatively impact a significant inventory site.

To identify potential conflicts, the rule directs local government to examine the uses allowed within broad zoning categories (e.g., residential, commercial). During previous ESEE analyses, the City of Portland addressed conflicting uses for a portion of the inventoried natural resources within the North Reach (see Map 2). More recently, Metro performed an analysis of conflicting uses by generalized regional zones (see Map 5). Metro's conflicting uses analysis provides a general framework for identifying conflicting uses within the Willamette River North Reach. The generalized regional zones by themselves are not conflicting uses. It is the disturbances activities associated with development permitted by local zoning that potentially conflict with natural resources. Table 2 includes Metro's regional zones and generalized regional zones.

Map 5: Metro Generalized Regional Zones

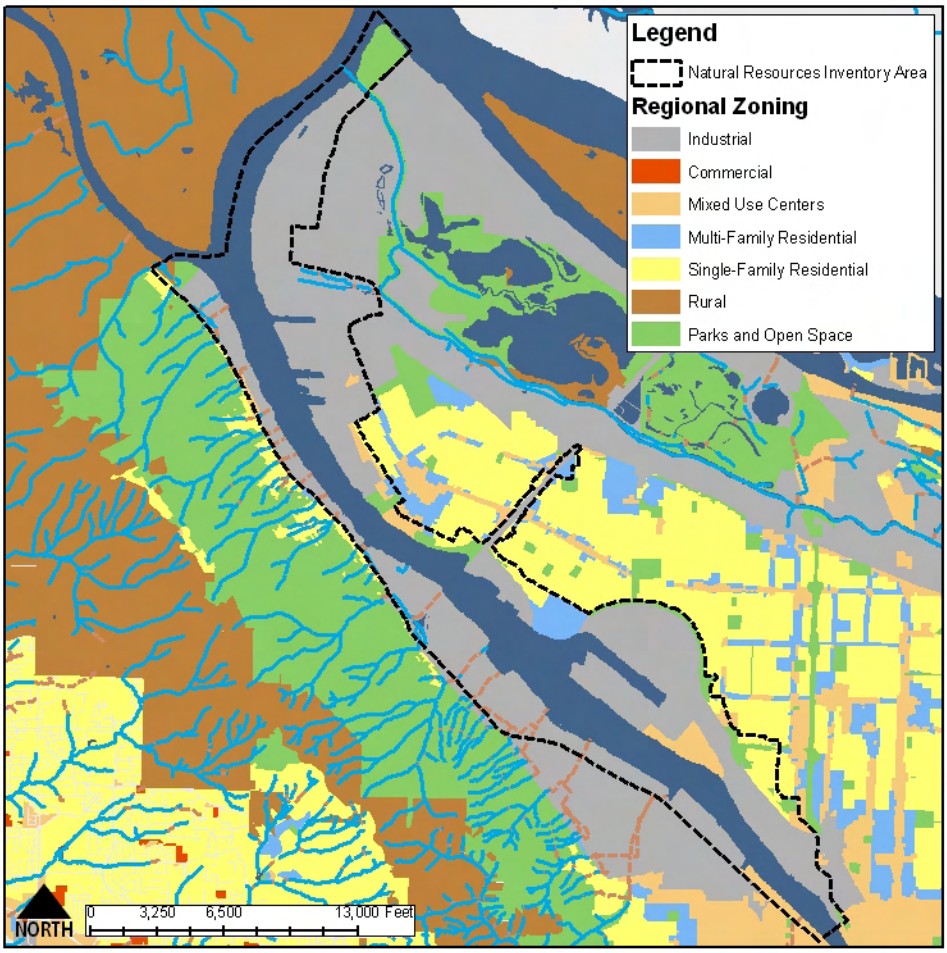


Table 2: Metro Generalized Regional Zones	
Regional Zone	**Generalized Regional Zone**
IL Light Industrial – districts permitting warehousing and light processing and fabrication activities. May allow some commercial	**IND Industrial**
IH Heavy Industrial – districts permitting light industrial and more intensive industrial activities (e.g. heavy manufacturing, limited chemical processing).	
IMU Mixed Use Industrial – districts accommodating a mix of light manufacture, office and retail uses.	
IA Industrial Area – districts designated exclusively for manufacture, industrial, warehouse and distribution related operations.	
CN Neighborhood Commercial – small scale commercial districts with retail and service activities (e.g. grocery stores) supporting the local residential community. Floor space and/or lot size from 5,000 to 10,000 square feet	**COM Commercial**
CG General Commercial – larger scale commercial districts with regional orientation for providing services. High and strip commercial zones are included.	
CC Central Commercial – allows a full range of commercial activities associated with central business districts. More restrictive than CG regarding large lots and highway orientation; allows multi-story development.	
CO Office Commercial – districts accommodating a range of businesses, professional and medical offices, typically a buffer between residential and more intensive uses.	
PF Public Facilities – generally provides for community services such as schools, churches, hospitals, etc.	
MUC1 Mixed Use Center 1 – combines residential and employment uses in town centers, main streets and corridors.	**MUC Mixed Use Centers**
MUC2 Mixed Use Center 2 – combines residential and employment uses in light rail station areas and regional centers.	
MUC3 Mixed Use Center 3 – combines residential and employment uses in central city locations. Mixed use is weighted toward residential development.	
MRF1 Multi-family 1 – housing and/or duplex, townhouse and attached single-family structures allowed outright. Maximum net allowable densities range from 2 to 25 units per acre, with height limits usually set at 2 ½ to 3 stories.	**MFR Multi-family Residential**
MRF2 Multi-family 2 – housing accommodating densities ranging from 25 to 50 units per acre. Buildings may exceed 3 stories in height.	
MFR3 Multi-family 3 – housing accommodating densities ranging from 50 to 100 units per acre.	
MFR4 Multi-family 4 – housing accommodating densities greater than 100 units per acre. This is the densest of the multi-family zones and would require greater use of vertical space and buildings with multiple stories.	
SFR1 Single Family 1 – detached housing with minimum lot sizes from 20,000 square feet and over	**SFR Single-family Residential**
SFR2 Single Family 2 – detached housing with minimum lot sizes from 12,000 to 20,000 square feet	
SFR3 Single Family 3 – detached housing with minimum lot sizes from 8,500 to 12,000 square feet	
SFR4 Single Family 4 – detached housing with minimum lot sizes from 6,500 to 8,500 square feet	
SFR5 Single Family 5 – detached housing with minimum lot sizes from 5,500 to 6,500 square feet	
SFR6 Single Family 6 – detached housing with minimum lot sizes from 4,000 to 5,500 square feet	
SFR7 Single Family 7 – detached housing with minimum lot sizes up to 4,000 square feet	
FF Agriculture or Forestry – activities suited to commercial scale agricultural production, typically with lots sizes of 30 acres or more.	**RUR Rural**
RRFU Rural or Future Urban – residential uses permitted on rural lands or areas designated for future urban development with minimum lots sizes of one acre or more.	
POS Parks and Open Space – preservation of public and private open and natural areas.	**POS Parks and Open Space**

The City of Portland has applied base zones through out the city (see Map 6). Those base zones generally correspond with Metro's generalized regional zones (see Table 3). This conflicting use analysis examines the allowed and conditional uses in the context of Metro's generalized regional zones, and the allowed, limited, conditional, temporary and prohibited uses in the context of each Portland base zone (see also Appendix A). Within the Willamette River North Reach, industrial uses are associated with the majority of the land area; other uses include employment, commercial, multi-family residential, single-family residential, and open space. The Willamette River Natural Resources Inventory identifies significant resources within each of these zones.

Map 6: City of Portland Base Zones

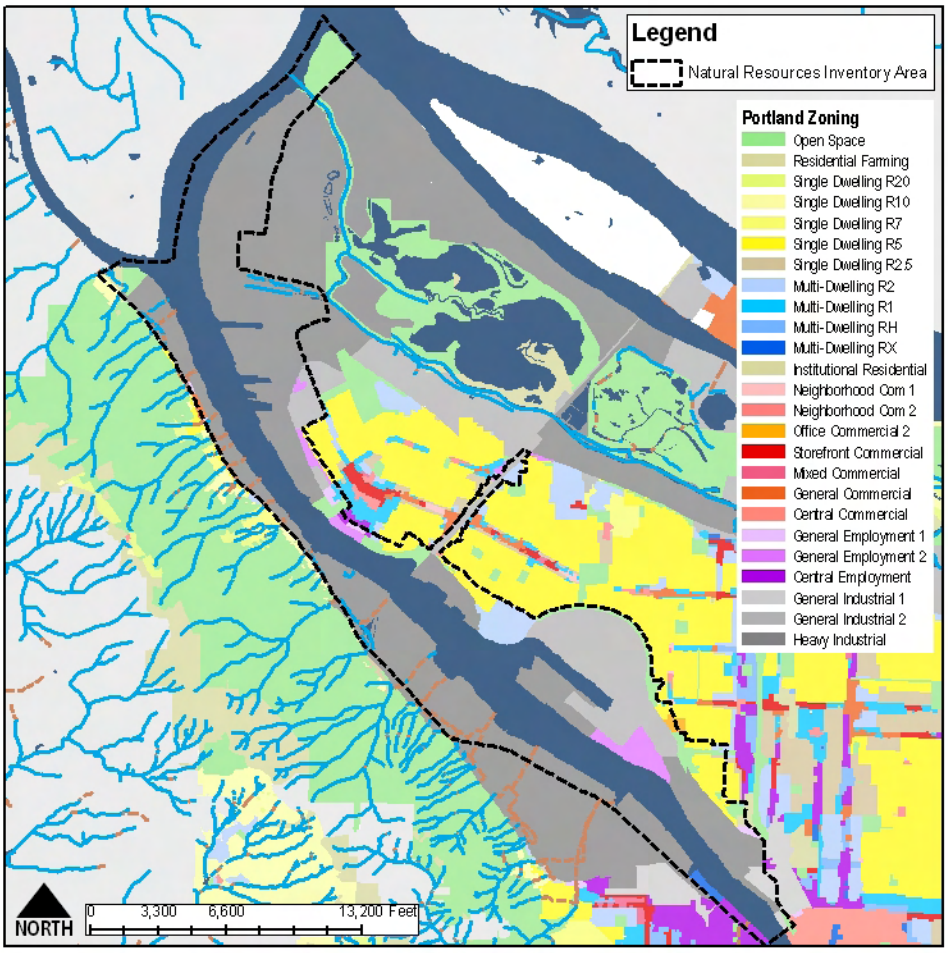


Table 3: City of Portland Base Zones Nested within Metro's Generalized Regional Zones			
Metro Generalized Regional Zone	**Metro Regional Zone**	**City Base Zone in the North Reach**	**City Zone Description**
IND	IH	IG1	General industrial uses on smaller lots; prevents other conflicting uses
	IH	IG2	General industrial uses on larger lots; prevents other conflicting uses
	IA	IH	Heavy industrial
	IL	EG1	Industrial-related businesses on smaller lots
	IL	EG2	Industrial-related businesses on larger lots
	IMU	EX	Mixed-used, industrial-related uses
COM MUC	CC/MUC	CG	Full range commercial retail and service businesses; allows mixed-use; auto accommodating
	CC/MUC	CX	High intensity commercial uses; allows mixed-use; pedestrian oriented
	CN/MUC	CN1	Neighborhood commercial uses on smaller sites; allows mixed-use; pedestrian oriented
	CN/MUC	CN2	Neighborhood commercial uses on small sites; allows mixed-use; auto accommodating
	CO/MUC	CO2	Low/medium intensity office commercial on arterial streets; allows mixed-use
	PF	IR	Institutional campus; high density multi-dwelling residential
MFR	MFR4/MUC	RX	Central residential with >100 units per acre; allows limited mixed-use (retail/office)
	MFR3/4	RH	High density multi-dwelling residential with 80 – 125 units per acre
	MFR2/3	R1	Medium density multi-dwelling residential with maximum of 65 units per acre
	MFR1	R2	Low density multi-dwelling residential with maximum of 22 units per acre
	MFR1	R2.5	Attached residential with maximum density of 17.4 units per acre
SFR	SFR5/6/7	R5	High density single-dwelling residential; 5,000 square foot lots
	SFR2/3	R10	Limited density single-dwelling residential; 4.4 units per acre (10,000 square feet)
	RRFU	RF	Residential farm/forest; 1 unit per 2 acres
POS	POS	OS	Public and private open space

Industrial Uses

Metro's General Regional Zone – IND

Industrial zones allow a variety of industrial uses from light manufacture (e.g. fabrication) to heavy manufacturing (e.g. chemical processing) to mixed use industrial (e.g. mix of light manufacturing, offices and retail uses). Support commercial services such as restaurants and banks may be allowed outright, depending on the zone, or permitted with limitations. Conditional uses may include junkyards, wrecking yards, basic utilities, commercial recreation al facilities, and waste related services.

Portland's Industrial Zones

IG1 – This zone provides area where most industrial uses may locate, with other uses are restricted to prevent potential conflicts and to preserve land for industry. General Industrial 1 areas generally have relatively small lots and a grid block pattern, with site having high building coverages and building located close to the street. All industrial uses categories are permitted by right, except for waste-related uses, which are either conditional or allowed with limitations. Other uses permitted by right are quick vehicle servicing, vehicle repair, self-service storage, parks and open areas, agriculture and rail lines and utility corridors. Household living is a conditional use, while group living is prohibited. Other limited or conditional uses are retail sales and service, office uses, commercial parking, commercial outdoor recreation, major event entertainment, basic utilities, community services, daycare, aviation and surface passenger terminals, detention facilities, mining and radio frequency transmission facilities. Temporary uses allowed are: parking lot sales; seasonal outdoor sales; fairs and carnivals; warehouse sales; temporary actions to respond to natural disasters and emergencies; and staging areas for public utility installation.

A small portion of the North Reach is zoned IG1; located near Fremont Bridge. The land uses here include Union Pacific Railroad, Pacific Power and Light Company and Downtown Recycling LLC, among others.

IG2 – General Industrial 2 areas are intended to provide the same opportunities and uses as IG1 areas. IG2 areas generally have larger lots and an irregular or large block pattern. The area is less developed, with sites having medium and low building coverage and buildings that re usually set back from the street. Uses permitted by right, uses permitted with limitation, conditional use and temporary uses are the same as for the IG1 zone.

Portions of Swan Island, the land below Willamette Bluff and land in the St. Johns neighborhood along the rail line are zoned IG2. On and around Swan Island the land uses include Freightliner Corp., FedEx, Oregon Transfer Company, Port of Portland, Union Pacific Railroad, and others. In the St. Johns neighborhood the Port of Portland and the Union Pacific Railroad are the largest property owners.

IH – The Heavy Industrial zone provides areas where all kinds of industries may located, including those not desirable in other zones due to their impacts or appearance. The development stands are the minimum necessary to assure safe, functional, efficient and environmentally sound development. Uses permitted by right, uses permitted with limitations, conditional uses and temporary uses are the same as for the IG1 zones.

Most of the North Reach is zone for heavy industrial uses and much of that area is within the Willamette Greenway including Port of Portland terminals 2-5. Manufacturing, transportation, wholesale trade and construction are significant industries in the North Reach.

Employment

Metro's General Regional Zone

See Industrial Uses (IND), which allow industrial-related business to operate either by-right or with conditions or limitations.

Portland's Employment Zones

EG1 – The General Employment 1 zone is intended for a variety of employment and business opportunities that are often industrial-related and located in a large building or warehouse type structure. The lots tend to be smaller than other employment and industrial zones. Manufacture and production, warehouse and freight movement, wholesale and industrial services are allowed industrial uses; railroad yards and waste-related uses are prohibited. Quick vehicle service, vehicle repair, self-service storage and commercial outdoor recreation facilities area allowed commercial uses. Aviation, surface passenger terminals, detention facilities, retail sales, residential uses and major event entertainment facilities are conditional uses. Offices, retail sales and service, commercial parking and community services are allowed with limitations. Agriculture, rail lines and utility corridors and other institutional uses are allowed by right. Radio and television broadcast facilities are permitted with limitations or as conditional uses. Temporary activities allowed in the EG1 zone included: parking lot sales; seasonal outdoor sales; fairs and carnivals; warehouse sales; temporary actions to respond to natural disasters and emergencies; and staging areas for public utility installation.

Only a very small portion of the North Reach is zoned EG1. One area is located immediately south of Kaiser along N Greeley and N Interstate avenues. Roughly 8 undeveloped lots are zoned EG1 and are primarily owned by the City of Portland or State of Oregon. Near the St. Johns Bridge, ten lots are zoned EG1 and have active industrial/warehouse uses.

EG2 – General Employment 2 areas are intended to provide for the same opportunities and uses as EG1 areas; however, EG2 areas have larger lots and an irregular or large block pattern. These areas are less intensively developed, with sites having medium and low building coverage and buildings that are usually set back from the street. Uses permitted by right, uses permitted with limitations, conditional uses and temporary uses are the same as for the EG1 zone.

At the south end of Swan Island, is an area zoned EG2 most of which is within the Willamette Greenway. The primarily property owner is the Port of Portland, who leases much of the land to Freightliner. Along the bluff in the St. Johns neighborhood, a number of lots are zoned EG2, many of which are undeveloped.

EX – The Central Employment zone provides mixed-use areas in an overall industrial-type setting. The zone is found in highly developed parts of the city that have the highest levels of public services. Uses permitted by right, uses permitted with limitation, conditional uses and

temporary uses are the same as for the EG1 zone, except that residential uses are allowed by right or with limitations.

In the St. Johns neighborhood, south of the bridge, the slope is zoned EX. Uses include large warehouses with adjacent residential.

Commercial

Metro's General Regional Zone – COM

Commercial districts are generally located near central urban areas and corridors of commercial activity. Commercial uses include a wide range and scale of retail and service businesses, office and civic uses in a concentrated area. Public facilities such as schools, churches, government offices, hospitals, libraries, public recreation facilities and public utilities are allowed in this zone. Conditional uses typically included group living facilities, jails and related facilities, radio transmission facility, transit park-and-rides, rail lines and utility corridors, etc.

Portland's Commercial Zones

CN1 – The Neighborhood Commercial zone is intended for small sites in or near dense residential neighborhoods. This zone allows household living, parks, schools, colleges, medical centers, religious institutions and daycare by right. It encourages small-scale retail and service uses for nearby residential areas, and limited office and manufacturing uses are also allowed. Parking areas are restricted. Group living, community service, transmission facility, basic utilities, rail lines and utility corridors are conditional uses. Allowed temporary uses include: parking lot sales; seasonal outdoor sales; fair and carnivals; warehouse sales; activities and structures needed to deal with natural disasters and emergencies; station areas for public utility installation; and radio frequency transmission facilities.

The corner of N Killingsworth Street and N Greeley Avenue is zoned CN1; one of the properties is located within the North Reach Inventory study area.

CN2 – The Neighborhood Commercial 2 zone is similar to the CN1 zone, but development is to be predominantly auto accommodating, except where the site is adjacent to a transit street. The CN2 zone is intended for uses that will provide services for nearby residential areas, and for other uses which are small scale and have minimal impacts. Allowed, limited, conditional, and temporary uses are the same as for the CN1 zone.

A few residential properties are zoned CN2 along N Willamette Boulevard near the railroad bridge.

CO2 – The Office Commercial 2 zone is a low and medium intensity office zone intended for arterial streets. The zone is intended to prevent the appearance of strip commercial development by allowing office uses but not other commercial uses. Development is generally to be auto accommodating except where the site is adjacent to a transit street. Allowed, limited, conditional and temporary uses are the same as for the CN1 zone, except that only limited retail sales and service is allowed.

The Adidas campus and Kaiser are zoned CO2. No other areas within the North Reach are zoned CO2.

CG – The General Commercial zone allows auto accommodating commercial development in exiting and new commercial areas. The zone allows a full range of retail and service businesses with a local or regional market. Development is to be auto accommodating except where the site is adjacent to a transit street. Household living, office uses, vehicle repair, quick vehicle servicing, commercial outdoor recreation and most institutional uses are allowed by right. Limited group living, commercial parking, wholesale sales, self-storage, community service, and radio frequency transmissions are allowed. Major event entertainment, industrial service, warehousing, freight movement, rail lines, agriculture and utility corridors are conditional uses. Temporary uses are the same as for CN1.

Downtown Linnton is zoned CG; it is the only area zoned as such in the North Reach. Multiple shops, restaurants and a community center are located here.

CX – The Central Commercial zone is intended to provide for commercial development with Portland's most urban and intense areas. Development is intended to by very intense with high building coverage, large buildings, and buildings placed close together. Development is intended to be pedestrian-oriented with a strong emphasis on safe and attractive streetscape. Allowed, limited, conditional and temporary uses are the same as for the CG zone with a few exceptions: major event entertainment is allowed by right; vehicle repair is allowed with limitations; commercial parking is a conditional use; and warehousing and freight movement are prohibited.

Portions of the Broadway Bridge and Larrabee Avenue, located with the North Reach, are zoned CX.

IR – The Institutional Campus zone is a multi-use zone that provides for the establishment and growth of large institutional campuses with higher density residential development. Intensity and density are regulated by the maximum number of dwelling units per acre and the maximum size of buildings permitted. This zone is intended for large institutional campuses such as medical centers, colleges, schools and university that serve a population from a larger are than the neighborhood in which the campus is located. Generally the uses permitted by-right, conditional uses and temporary uses are the same as for the R10 zone. Major event entertainment, which is prohibited in other residential zones, is a conditional use in the IR zone. Mixed-use projects including both residential development and institutions are allowed as well as single use projects that are entirely residential or institutional. IR zones will be located near one or more streets that are designated as collector streets, transit streets or streets of higher classification.

Portions of the Kaiser medical campus along N Interstate Avenue are zoned IR.

Mixed Use

Metro's General Regional Zone – MUC

Mixed use centers include residential along with commercial uses in town centers, main streets, corridors, light rail station areas, regional centers and the central city. Development

types generally permitted include moderate-density to high-density multi-family residential uses, attached single-family dwellings, locally-oriented commercial, retail, services, office uses, community services and daycare. Mixed-use centers have a strong pedestrian and transit orientation.

Portland's Base Zones

See Portland's Central Employment (EX) and Commercial zones, which permitted mixed uses by-right or with limitations or conditions.

Multi-Family Residential

Metro's General Regional Zone – MFR

Multi-family residential zones allow for apartment complexes, duplexes, garden apartments, rowhouse, townhouses, condominium and other attached single-family structures. These range in densities from 2 to 25 units per acre with height limits of 2 ½ to 3 stories to densities greater than 100 units per acre and more than 3 stories. Some mixed-use and neighborhood-scale commercial uses may be allowed under certain circumstances. Condition uses may include churches, governmental facilities, utility structures, schools, residential recreational centers, group living facilities, etc.

Portland's Multi-Dwelling and Attached Residential Zones

R2.5 – The Attached Residential designation is intended for area with complete public services and without development constraints. It allows a mixture of housing types of single-dwelling character, including attached houses. The maximum density is 17.4 units per acre for attached housing. Household living, certain park and open area uses and certain broadcast facilities are permitted by right. Some parks, open areas and broadcast facilities are permitted subject to limitations or as conditional uses. Group living uses, institutional use, agriculture and rail lines and utility corridors are permitted as conditional use. Under certain conditions the following temporary activities are allowed: mobile home use during construction; residential sales offices; garage and seasonal outdoor sales; fairs, carnivals and other major public gatherings; show of model homes; temporary action to respond to natural disasters and emergencies; stating areas for public utility installation; and radio frequency transmission facilities.

There is very little area within the North Reach zoned R2.5. There are a number of residential lots along N Going Street and roughly 50 lots along the Burlington North Railroad north of N Lombard are zoned R2.5.

R2 – The Low Density Multi-Dwelling Residential zone allows up to 22 dwelling units per acre. Density may be as high as 32 units per acre if amenity bonus provisions are used. It is intended for areas with good public services and no development constraints. Uses permitted by-right, conditional uses and temporary uses are generally the same as for R2.5.

A few areas along the east side bluff are zoned R2 including the University of Portland campus, which operates as a conditional use in that zone.

R1 – The Medium Density Multi-Dwelling Residential zone allows approximately 43 dwelling units per acre. Density may be as high as 65 units per acre if amenity bonus

provisions are used. It is intended for areas with good public services, including being well served by transit, and no development constraints. Uses permitted by-right, conditional uses and temporary uses are generally the same as for R2.5.

The St. Johns neighborhood contains the only R1 zoning in the North Reach. Land adjacent to Cathedral Park has single family residences and a few vacant lots.

RH – The High Density Multi-dwelling residential zone does not regulated the maximum number of units per acre but rather the maximum size of buildings and intensity of uses is regulated by floor area ratio (FAR) limits and other site development standards. Generally the density will range from 80 to 125 units per acre. It is intended for areas with good public services including transit, no development constraints and close proximity to commercial areas. Uses permitted by right, conditional uses and temporary uses are generally the same as for the R10 zone.

There are three lots in the North Reach zoned RH; located near N Overlook Boulevard and N Interstate Avenue.

RX – The Central Residential zone is a high density multi-dwelling zone, which allows the highest density of dwelling units of the residential zones. Density is regulated by floor to area ratio (FAR) limits and other site development constraints. Generally the density will be 100 or more units per acre. Uses permitted by-right, conditional uses and temporary uses are generally the same as for the R2.5 zone, but retail sales, office uses and commercial parking maybe allowed as a limited or conditional use. The RX zone is intended for the most built-up parts of the city that have the highest level of public services.

The one area zoned RX in the North Reach immediately north of the Fremont Bridge on the west side of the river. The land is developed with condominiums.

Single-Family Residential

Metro's General Regional Zone – SFR

Single-family residential zones generally allow detached and attached housing on lots up to 20,000 square feet. Conditional uses that often occur within single-family residential zones include residential recreation centers, churches, schools, daycare facilities, nursing homes, retail sales and services, basic utilities and parks/open spaces.

Rural residential lands provide the opportunity for single-family housing on lots of one acre or more in a rural or semi-rural environment. This designation also includes areas set aside for future urban development. Agriculture, horticulture, greenhouses, nurseries, forestry and raising livestock and animals may be allowed.

Portland's Single-Dwelling Residential Zones

RF – The Residential Farm/Forest zone is intended for agricultural and forested areas in the City. Agriculture, forestry and very low-density single-dwelling residences are the primary allowed use. The maximum density is generally one unity per two acres. Group living, basic utilities, community services, schools, colleges, medical centers, religious institutions and

mining are conditional use. Parks, open space areas, daycare facility and broadcast facilities are permitted with certain limitations or as conditional uses. Under certain conditions the following temporary activities are allowed: mobile home use during construction; residential sales offices; garage and seasonal outdoor sales; fairs, carnivals and other major public gatherings; show of model homes; temporary action to respond to natural disasters and emergencies; stating areas for public utility installation; and radio frequency transmission facilities.

Part of Harborton Wetlands, located outside of the city limits and with the Multnomah County pocket, is zoned RF. The land is current undeveloped and is owned by Fred's Marina.

R10 – The Limited Density Single-dwelling Residential zone is intended for areas with public services but which are subject to significant development constraints. The maximum density is generally 4.4 units per acre. Household living, certain park and open area uses and certain broadcast facility are permitted by right in the R10 zone. Some parks, open areas and broadcast facilities are permitted subject to limitations or as conditional uses. Group living uses, institutional uses, agriculture and rail lines and utility corridors are permitted as conditional uses. The same temporary activities described for RF zones are allowed in the R10 zone.

Near Harborton Wetlands, St. Helens Road and the Burlington Northern Railroad are zone R10.

R5 – The High Density Single-dwelling Residential zone is intended for areas with good public services and no development constraints. The maximum density is generally 8.7 units per acre. Single-dwelling residential is the primary use. Use permitted by-right, condition uses and temporary uses are the same as for the R10 zone.

The R5 zone is applied to areas along the Willamette Bluff and north into St. Johns. These areas are almost entirely built out with single family residences.

Parks and Open Spaces

Metro's General Regional Zone – POS

Parks and open spaces are allowed outright or conditionally in all of the generalized regional zones, although to varying degrees. The disturbance activities associated with parks and open spaces vary depending on the intensity of use. Maintenance practices can be similar to residential landscaping practices and have a impacts on natural resources.

Portland's Open Space Zone

OS – The Open Space zone is intended to preserve public and private open and natural areas identified in the Comprehensive Plan. Agriculture, certain park and open area uses and certain broadcast facilities are allowed by right in the OS zone. Park and open area facilities are generally allowed as conditional uses. Retail sales and service uses are allowed only if they are associated with a park and open area use and then only as conditional uses. Several institutional uses are allowed as conditional uses: basic utilities; community service; school; and daycare. Rail lines and utility corridors, mining and certain broadcast facilities are

permitted as conditional uses. Temporary activities are permitted: fairs, carnivals and other special events; temporary actions to respond to natural disasters or emergencies; staging areas for public utility installation; and radio frequency transmission facilities.

With the North Reach there are number of open spaces including Kelley Point Park, Harborton Wetlands (with the city limits), Cathedral Park, Willamette Cove, Willamette Bluff, Madrona Park and Overlook Park.

Figure 2: Base Zones within the ESEE Analysis Evaluation Area

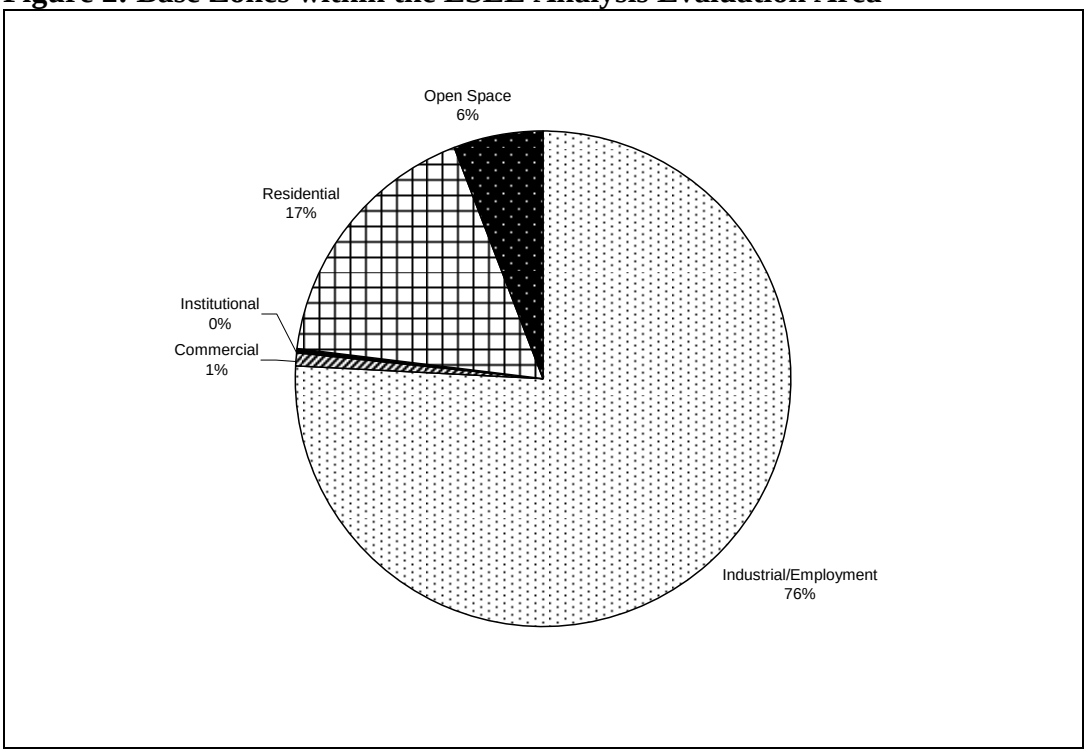


Table 4: Base Zones with the ESEE Analysis Evaluation Area		
	Acres within ESEE Evaluation Area	**Acres of Significant Resources**
Industrial/Employment	1,729	367
Commercial	19	4
Institutional	6	1
Residential	392	136
Open Space	131	78
Total	**2,277**	**586**

Table 5: Uses Permitted by City of Portland Base Zones

Table 5.a: Employment and Industrial Zone Primary Uses						
Use Categories	**EG1**	**EG2**	**EX**	**IG1**	**IG2**	**IH**
Residential Categories						
Household Living	CU	CU	Y	CU [1]	CU [1]	CU [1]
Group Living	CU	CU	L/CU [2]	N	N	N
Commercial Categories						
Retail Sales And Service	L/CU [3]	L/CU [3]	Y	L/CU [4]	L/CU [5]	L/CU [6]
Office	L [3]	L [3]	Y	L/CU [4]	L/CU [5]	L/CU [6]
Quick Vehicle Servicing	Y	Y	N	Y	Y	Y
Vehicle Repair	Y	Y	Y	Y	Y	Y
Commercial Parking	CU [15]	CU [15]	CU [15]	CU [15]	CU [15]	CU [15]
Self-Service Storage	Y	Y	L [7]	Y	Y	Y
Commercial Outdoor Recreation	Y	Y	Y	CU	CU	CU
Major Event Entertainment	CU	CU	CU	CU	CU	CU
Industrial Categories						
Manufacturing And Production	Y	Y	Y	Y	Y	Y
Warehouse And Freight Movement	Y	Y	Y	Y	Y	Y
Wholesale Sales	Y	Y	Y	Y	Y	Y
Industrial Service	Y	Y	Y	Y	Y	Y
Railroad Yards	N	N	N	Y	Y	Y
Waste-Related	N	N	N	L/CU [8]	L/CU [8]	L/CU [8]
Institutional Categories						
Basic Utilities	Y/CU [12]	Y/CU [12]	Y/CU [12]	Y/CU [13]	Y/CU [13]	Y/CU [13]
Community Service	L [9]	L [9]	L [10]	L/CU [11]	L/CU [11]	L/CU [11]
Parks And Open Areas	Y	Y	Y	Y	Y	Y
Schools	Y	Y	Y	N	N	N
Colleges	Y	Y	Y	N	N	N
Medical Centers	Y	Y	Y	N	N	N
Religious Institutions	Y	Y	Y	N	N	N
Daycare	Y	Y	Y	L/CU [11]	L/CU [11]	L/CU [11]
Other Categories						
Agriculture	Y	Y	Y	Y	Y	Y
Aviation And Surface Passenger Terminals	CU	CU	CU	CU	CU	CU
Detention Facilities	CU	CU	CU	CU	CU	CU
Mining	N	N	N	CU	CU	CU
Radio Frequency Transmission Facilities	L/CU [14]	L/CU [14]	L/CU [14]	L/CU [14]	L/CU [14]	L/CU [14]
Rail Lines And Utility Corridors	Y	Y	Y	Y	Y	Y

Y = Yes, Allowed
L = Allowed, But Special Limitations
CU = Conditional Use Review Required
N = No, Prohibited

Notes:

- The use categories are described in Chapter 33.920.
- Regulations that correspond to the bracketed numbers [ ] are stated in 33.140.100.B.
- Specific uses and developments may also be subject to regulations in the 200s series of chapters.

Table 5.b: Commercial Zone Primary Uses								
Use Categories	**CN1**	**CN2**	**CO1**	**CO2**	**CM**	**CS**	**CG**	**CX**
Residential Categories								
Household Living	Y	Y	Y	Y	Y	Y	Y	Y
Group Living	L/CU [1]	L/CU [1]	L/CU [1]	L/CU [1]	L/CU [1]	L/CU [1]	L/CU [1]	L/CU [1]
Commercial Categories								
Retail Sales And Service	L [2]	Y	N	L [3]	L [4]	Y	Y	Y
Office	L [2]	Y	Y	Y	L [4]	Y	Y	Y
Quick Vehicle Servicing	N	L [12]	N	N	N	N	Y	L [12]
Vehicle Repair	N	N	N	N	N	Y	Y	L [5]
Commercial Parking	N	N	N	N	N	Y	CU [11]	CU [11]
Self-Service Storage	N	N	N	N	N	N	L [6]	L [6]
Commercial Outdoor Recreation	N	N	N	N	Y	Y	Y	Y
Major Event Entertainment	N	N	N	N	N	CU	CU	Y
Industrial Categories								
Manufacturing And Production	L [2]	L [2]	N	N	L [4, 5]	L [5]	L [5,7]	L [5]
Warehouse And Freight Movement	N	N	N	N	N	N	CU [5,7]	N
Wholesale Sales	N	N	N	N	L [4, 5]	L [5]	L [5,7]	L [5]
Industrial Service	N	N	N	N	N	CU [5]	CU [5,7]	CU [5]
Railroad Yards	N	N	N	N	N	N	N	N
Waste-Related	N	N	N	N	N	N	N	N
Institutional Categories								
Basic Utilities	Y/CU [10]	Y/CU [10]	Y/CU [10]	Y/CU [10]	Y/CU [10]	Y/CU [10]	Y/CU [10]	Y/CU [10]
Community Service	L/CU [8]	L/CU [8]	L/CU [8]	L/CU [8]	L/CU [8]	L/CU [8]	L/CU [8]	L/CU [8]
Parks And Open Areas	Y	Y	Y	Y	Y	Y	Y	Y
Schools	Y	Y	Y	Y	Y	Y	Y	Y
Colleges	Y	Y	Y	Y	Y	Y	Y	Y
Medical Centers	Y	Y	Y	Y	Y	Y	Y	Y
Religious Institutions	Y	Y	Y	Y	Y	Y	Y	Y
Daycare	Y	Y	Y	Y	Y	Y	Y	Y
Other Categories								
Agriculture	N	N	N	N	N	CU	CU	CU
Aviation And Surface Passenger Terminals	N	N	N	N	N	N	CU	CU
Detention Facilities	N	N	N	N	N	N	CU	CU
Mining	N	N	N	N	N	N	N	N
Radio Frequency Transmission Facilities	L/CU [9]	L/CU [9]	L/CU [9]	L/CU [9]	L/CU [9]	L/CU [9]	L/CU [9]	L/CU [9]
Rail Lines And Utility Corridors	CU	CU	CU	CU	CU	CU	CU	CU

Y = Yes, Allowed
L = Allowed, But Special Limitations
CU = Conditional Use Review Required
N = No, Prohibited

Notes:

- The use categories are described in Chapter 33.920.
- Regulations that correspond to the bracketed numbers [ ] are stated in 33.130.100.B.
- Specific uses and developments may also be subject to regulations in the 200s series of chapters.

Table 5.c: Multi-Dwelling Zone Primary Uses						
Use Categories	**R3**	**R2**	**R1**	**RH**	**RX**	**IR**
Residential Categories						
Household Living	Y	Y	Y	Y	Y	Y
Group Living	L/CU [1]	L/CU [1]	L/CU [1]	L/CU [1]	L/CU [1]	Y [1]
Commercial Categories						
Retail Sales And Service	N	N	N	CU[2]	L/CU [3]	L/CU [10]
Office	N	N	N	CU[2]	L/CU [3]	L/CU [10]
Quick Vehicle Servicing	N	N	N	N	N	N
Vehicle Repair	N	N	N	N	N	N
Commercial Parking	N	N	N	N	CU [4]	N
Self-Service Storage	N	N	N	N	N	N
Commercial Outdoor Recreation	N	N	N	N	N	N
Major Event Entertainment	N	N	N	N	N	CU
Industrial Categories						
Manufacturing And Production	N	N	N	N	N	CU
Warehouse And Freight Movement	N	N	N	N	N	N
Wholesale Sales	N	N	N	N	N	N
Industrial Service	N	N	N	N	N	CU
Railroad Yards	N	N	N	N	N	N
Waste-Related	N	N	N	N	N	N
Institutional Categories						
Basic Utilities	L/CU [14]	L/CU [14]	L/CU [14]	L/CU [14]	L/CU [13, 14]	L/CU [14]
Community Service	CU [6]	CU [6]	CU [6]	L/CU [6]	L/CU [5, 6]	CU [6]
Parks And Open Areas	L/CU [7]	L/CU [7]	L/CU [7]	Y	Y	Y
Schools	CU	CU	CU	CU	L/CU [5]	L/CU [11]
Colleges	CU	CU	CU	CU	CU	L/CU [11]
Medical Centers	CU	CU	CU	CU	CU	L/CU [11]
Religious Institutions	CU	CU	CU	CU	CU	CU
Daycare	L/CU [8]	L/CU [8]	L/CU [8]	L/CU [8]	Y	L/CU [12]
Other Categories						
Agriculture	N	N	N	N	N	N
Aviation And Surface Passenger Terminals	N	N	N	N	N	N
Detention Facilities	N	N	N	N	N	N
Mining	N	N	N	N	N	N
Radio Frequency Transmission Facilities	L/CU [9]	L/CU [9]	L/CU [9]	L/CU [9]	L/CU [9]	L/CU [9]
Rail Lines And Utility Corridors	CU	CU	CU	CU	CU	CU

Y = Yes, Allowed L = Allowed, But Special Limitations
CU = Conditional Use Review Required N = No, Prohibited
Notes:

- The use categories are described in Chapter 33.920.
- Regulations that correspond to the bracketed numbers [ ] are stated in 33.120.100.B.
- Specific uses and developments may also be subject to regulations in the 200s series of chapters.

Table 5.d.: Open Space and Single-Dwelling Zone Primary Uses

Use Categories	OS Zone	RF	R20	R10	R7	R5	R2.5
Residential Categories							
Household Living	N	Y	Y	Y	Y	Y	Y
Group Living	N	CU	CU	CU	CU	CU	CU
Commercial Categories							
Retail Sales And Service	CU [1]	N	N	N	N	N	N
Office	N	N	N	N	N	N	N
Quick Vehicle Servicing	N	N	N	N	N	N	N
Vehicle Repair	N	N	N	N	N	N	N
Commercial Parking	N	N	N	N	N	N	N
Self-Service Storage	N	N	N	N	N	N	N
Commercial Outdoor Recreation	CU	N	N	N	N	N	N
Major Event Entertainment	N	N	N	N	N	N	N
Industrial Categories							
Manufacturing And Production	N	N	N	N	N	N	N
Warehouse And Freight Movement	N	N	N	N	N	N	N
Wholesale Sales	N	N	N	N	N	N	N
Industrial Service	N	N	N	N	N	N	N
Railroad Yards	N	N	N	N	N	N	N
Waste-Related	N	N	N	N	N	N	N
Institutional Categories							
Basic Utilities	L/CU [6]	L/CU [5]	L/CU [5]	L/CU [5]	L/CU [5]	L/CU [5]	L/CU [5]
Community Service	CU [5]	CU [1]	CU [1]	CU [1]	CU [1]	CU [1]	CU [1]
Parks And Open Areas	L/CU [2]	L/CU [2]	L/CU [2]	L/CU [2]	L/CU [2]	L/CU [2]	L/CU [2]
Schools	CU [3]	CU	CU	CU	CU	CU	CU
Colleges	N	CU	CU	CU	CU	CU	CU
Medical Centers	N	CU	CU	CU	CU	CU	CU
Religious Institutions	N	CU	CU	CU	CU	CU	CU
Daycare	CU	L/CU [3]	L/CU [3]	L/CU [3]	L/CU [3]	L/CU [3]	L/CU [3]
Other Categories							
Agriculture	Y	Y	Y	CU	CU	N	N
Aviation And Surface Passenger Terminals	N	CU	N	N	N	N	N
Detention Facilities	N	N	N	N	N	N	N
Mining	CU	CU	N	N	N	N	N
Radio Frequency Transmission Facilities	L/CU [4]	L/CU [4]	L/CU [4]	L/CU [4]	L/CU [4]	L/CU [4]	L/CU [4]
Railroad Lines And Utility Corridors	CU	CU	CU	CU	CU	CU	CU

Y = Yes, Allowed L = Allowed, But Special Limitations
CU = Conditional Use Review Required N = No, Prohibited
Notes:

- The use categories are described in Chapter 33.920.
- Regulations that correspond to the bracketed numbers [ ] are stated in 33.110.100.B.
- Specific uses and developments may also be subject to regulations in the 200s series of chapters.

3.c Conflicting Uses Impacts

This section describes the common impacts associated with conflicting uses generally, and within the areas addressed by the *Willamette River Natural Resources Inventory* for the North Reach. Many of the impacts are similar for each of the conflicting uses; therefore, the analysis begins with impacts that are common to all of the conflicting uses. Following the discussion of common impacts is a description of impacts associated with industrial/employment[1], commercial, residential and open space uses.

3.c.1 Common Impacts of Conflicting Uses

Development and disturbance activities that can adversely affect natural resources occur within each of the City's base zones; however, the degree or intensity of the impacts may vary depending on the intensity of the land use, the form, layout or design of the development, construction protocols or ongoing operation and maintenance activities. Below is a description of activities associated with each of the conflicting uses and related impacts on natural resources.

Clearing vegetation

Rainwater is captured and taken up by vegetation. This function is impaired when vegetation is removed, resulting in increased overland runoff. In turn the increases in runoff increase volume and flows in receiving water bodies following storm events. Increased volumes and flow in water bodies can cause bank erosion, undercutting, and slumping, and flooding. Vegetation also filters surface stormwater flows removing pollutants and sediment. These impacts to natural resources may be attributed to vegetation clearing that occurs far away from inventoried areas containing significant resources because stormwater is piped great distances within the city.

Tree canopy and associated understory vegetation creates shade and local microclimate effects that cool the air and water, and maintain humidity and soil moisture. Trees and vegetation also help capture carbon dioxide; carbon dioxide is a contributing factor to global warming. All of these functions are adversely affected when the vegetation is removed.

Clearing vegetation also removes important structural features of the forest such as multiple layered canopies, snags and downed logs, and large trees. Clearing of vegetation removes root structure that holds soils in place and can result in soil erosion and landslides, especially on steep slopes.

Removal of vegetative cover reduces habitat for native wildlife by removing food, nesting opportunities, cover, and perching and roosting locations. Removal of streamside or shoreline vegetation also eliminates sources of leaf litter (food for in-water organisms), and woody debris that provides aquatic habitat. Wildlife affected by vegetation removal includes

[1] Industrial uses are allowed by-right in both industrial and employment base zones. Uses within the employment base zone are intended to be industrial-related and located in a large building or warehouse type structure. Therefore, the general impacts associated conflicting uses in the industrial and employment base zones are addressed together.

mammals, birds, reptiles, amphibians, fish and insects. Removal of vegetation can fragment riparian and upland wildlife movement corridors, isolate remaining vegetation patches, and limit wildlife access to water. These impacts impede wildlife migration and can limit recruitment from other areas, making wildlife populations more vulnerable to disease, predation and extirpation.

Some vegetation types have been declining in the Portland area due to clearing and grading for development and the use of ornamental vegetation in landscaping (not replacing cleared vegetation with like species). Certain assemblages, such as native Oregon white oak/Pacific madrone, require specific soil, water and sun exposure to survive and are slow growing, taking many years to become established. These unique vegetation assemblages still exist along the east-side bluffs of the Willamette North Reach, and provide important habitat for native wildlife. Removal not only reduces habitat functions as discussed previously, but also would contributes to the decline in these unique vegetation types and potentially extirpation within the city.

Grading, excavation, filling and soil compaction
Grading activities and soil compaction can accelerate soil loss and erosion. These activities can reduce the capacity of soil to support vegetation by disturbing the soil structure and decreasing soil fertility, microorganisms, seeds and rootstocks. Soil porosity and stormwater infiltration can be reduced by grading, excavating, filling and soil compaction. This in turn can reduce groundwater recharge and in-stream summer and fall low flows, which adversely affects aquatic species, such as resident trout.

Adding impervious surface (e.g. buildings, parking areas, roads, sidewalks, driveways)
Impervious surfaces alter the hydrologic cycle by preventing stormwater infiltration and concentrating overland flow. This results in increased stormwater runoff and decreased groundwater recharge. Increased stormwater runoff can result in increased volume and flows in receiving water bodies (see vegetation clearing). Decreased groundwater recharge can reduce in-stream summer low flows (see grading, excavation, filling and soil compaction). Impervious surfaces also contribute to urban heat island effect, which affects local air quality. Increased impervious surfaces also increase wildlife habitat fragmentation and create hazards or barriers to wildlife movement (see vegetation clearing).

Modifying streams, rivers, and floodplains (e.g. piping, widening, deepening, straightening, armoring, filling, etc.)
Altering the natural configuration, geomorphology, and structure of river and stream channels and banks can result in:

- increased in-stream flow velocity, which can cause bank erosion, undercutting and slumping, either on-site or off-site at down stream locations
- reduced aquatic habitat, including removing shallow-water areas, side channels, pools and riffles, and in-stream structures such as downed logs and gravel
- reduced flood storage capacity and other benefits associated with active flood areas (e.g., nutrient transport, off-channel habitat)

Generating pollution
Oil, gas, tar, antifreeze, dissolved metals, and other contaminants from vehicles, heating and cooling system and roofs degrade habitat and water quality. These pollutants often reach water bodies through transport in stormwater from streets, driveways, parking lots and buildings. Dirt and sediments from eroded areas or deposited from vehicles can be transported via stormwater to water bodies and degrade aquatic habitat. Pesticides, herbicides and fertilizers used in landscaping can pollute ground and surface waters and degrade habitat and harm fish and wildlife.

Landscaping with non-native and/or invasive vegetation (e.g. lawns; ornamental trees and shrubs)
The removal of native vegetation and establishment of lawns and cultivated landscapes can reduce food, cover and nesting opportunities for native wildlife. Landscaped areas generally contain reduced vertical structure – little if any multi-layered canopy, large trees, snags, understory vegetation, and downed logs. The reduction in vertical structure reduces wildlife habitat and alters microclimate effects and hydrology. Some non-native plants used in landscaping are invasive (e.g. ivy, morningglory, holly and laurel) and can out-compete native plants. Non-native landscapes may also require irrigation or may be treated with chemical fertilizers and pesticides, which can run-off into local waterways and wetlands, or may be ingested by wildlife.

Building fences and other wildlife barriers
Barriers to wildlife movement can include buildings, roads, fences and other manmade features. These barriers fragment connectivity between wildlife habitats and reduce the ability of native wildlife species to thrive (see clearing vegetation). Some such barriers, such as roads, may create hazards resulting in wildlife mortality.

Others: pets, light, noise, litter, etc.
Outdoor human activities including those that create noise and light can disrupt the competition, communication, mating and predation habits of wildlife (Brown, 1987). Domestic pets can kill or injure native wildlife or compete for limited space. Domestic pet waste, litter and garbage can degrade natural resources including soil and water quality.

3.c.2 Impacts Specific to Conflicting Uses

Industrial and Employment

Industrial uses are allowed by right in the employment and industrial zones. These uses are prohibited in all residential zones and multi-dwelling zones. Some industrial uses are permitted with limitations or as conditional uses in the Institutional (IR) zone and all commercial zones.

Industrial and employment zones constitute roughly 1,729 acres, 76 percent, of the area in the ESEE evaluation area in the Willamette River North Reach. Within the industrial and employment zoned areas, there are 367 acres (21%) of significant natural resources. Typical industrial activities that occur in the Willamette River North Reach include utilities, warehouses, metal fabrication, export and import distribution, and construction.

Development and disturbance activities in industrial and employment areas are typically more intensive than in residential, employment and commercial areas. Site preparation generally includes clearing all vegetation and completely grading the site. Industrial development is usually land intensive and requires a large percentage of the total area to accommodate facilities, resulting in significant areas impervious surfaces, compacted soils and ongoing impacts. Development geometry is often driven by the maneuvering requirements of large freight vehicles and loading equipment. Because the unit of development is often relatively large, in comparison to residential development, there are relatively fewer opportunities to cluster development away from the resource areas. Development practices also generally retain few, if any, natural resources on-site. Industrial uses can diminish or eliminate open space, scenic and recreational values.

Some industrial uses require the use of water in manufacturing processes (e.g. cooling equipment) and draw substantial amounts of water form wells and public water sources. The resulting effluent, which is typically warm, may be discharge to receiving waters, such as a stream, and influence in-water temperature. Cool water temperature is a basic requirement for many aquatic species, including anadromous salmonids. Industries that discharge warm-water effluent are required to obtain a discharge permit through the Oregon Department of Environmental Quality.

In the North Reach many of the industrial uses result in extensive hardening and development of the river banks and adjacent land, including structures that extend over and into the river channel. Vegetation along the riverbank and riparian corridor is highly fragmented throughout considerable portions of the North Reach. This adversely affects natural resources functions as discussed in the previous section.

Industrial areas can contribute high quantities of heavy metals and other toxic material to the soil, water and air. In addition, the use, storage and transport of hazardous materials, waste storage and recycling and similar activities requiring special permitting often occurs in industrial sites. In the North Reach contamination of river sediments and soil from historic and current industrial uses is prevalent.

Commercial Uses

Commercial uses are prohibited in all single-dwelling residential zones and in the R1, R2 and R3 multi-dwelling zones. In all other zones, some commercial uses are either allowed by right or permitted with limitations or as a conditional use.

Commercial zones constitute roughly 20 acres, 1 percent, of the ESEE evaluation area in the North Reach. Approximately 19 acres of significant natural resources are commercial zones. Within the North Reach there are few commercial uses. The Linnton and St. Johns neighborhoods have the most established commercial areas with shops, restaurants and community centers.

Disturbance associated with commercial uses are typically more intense most residential uses, but less intense than industrial uses. As compared to residential uses, commercial uses typically include more extensive clearing and grading. In addition, large parking lots and other impervious areas are common features of commercial, which reduces infiltration and generates stormwater runoff. Vehicle-related pollution is generally greater in commercial areas than in residential areas due to increased traffic and concentrated parking areas. Increased traffic can also be hazardous to wildlife. Commercial uses can diminish or eliminate open space, scenic and recreational values.

Some disturbances occur less with commercial uses than residential use including less use of fertilizers, pesticides and herbicides and fewer impacts from domestic pets.

Commercial development generally has less impact on natural resources than industrial and employment uses because commercial development is usually less land intense. Site layout and design and landscaping reduce or mitigate impacts on natural resources.

Institutional Uses

Institutional uses are allowed by right or with limitations or as a conditional uses in all of the bases zones. However, specific institutional uses – schools, colleges, medical centers and religious institutions – are not allowed in industrial zones. Institutional uses in the North Reach include the University of Portland, Kaiser Permanente and churches.

Institutional uses generally have fewer impacts on natural resources than industrial, employment and commercial uses because they are less land intensive. Site layout and design, incorporation of native vegetation in landscaping, narrow streets, etc. can all reduce or mitigate impacts on natural resources. Typical impacts include clear and grading, creating impervious surfaces, increase traffic and increased noise, light, litter.

Residential (multi- and single-dwelling)

Residential use is permitted by right in all residential (multi- and single-dwelling) and commercial zones and in the Central Employment (EX) zone. It is allowed as a conditional use in all other employment and industrial zones.

Residential zones make up 392 acres, 17 percent, of the ESEE evaluation area of the North Reach. Approximately 136 acres of significant natural resources are located in residential zones.

In the North Reach, residential areas are primarily located along the east-side bluff in the St. Johns neighborhood, near Willamette Cove, along Willamette Boulevard and in the vicinity of N Going Street.

Development and disturbance activities associated with residential uses are typically less intense than industrial and commercial activities. Site layout and design, incorporation of native vegetation in landscaping, narrow streets, etc. can all reduce or mitigate impacts on natural resources. Portland's land division code allows on-site transfer of development rights and clustered configurations by-right, further reducing the potential site layout conflicts associated with standard residential setbacks and minimum lot sizes. Multi-family residential development may add more impervious surface than singe-family resident to provide on-site parking. However, in many cases multi-family residential construction can clear and grade less land area to construct the dwelling units than a typical single-family subdivision.

Rural residential disturbance activities are similar to urban residential disturbances, except that there is typically a lower total amount of impervious surface and less stormwater runoff. However, the use of pesticides, herbicides and fertilizers may be greater in rural development where agricultural uses area allowed.

Open Space

Parks and open spaces are allowed by right in all areas zoned Open Space (OS) and in Central Residential (RX), Institutional (IR) and all commercial and industrial zones. Parks and open spaces are allowed with limitations or as a conditional use in all other residential zones.

Areas zoned OS in the ESEE evaluation area of North Reach constitute 131 acres, 6 percent. There are 78 acres of significant resources located in the OS zone combined.

In the North Reach, open spaces are primarily located at Kelley Point Park, Harborton Wetlands, Cathedral Park, Willamette Bluff, Overlook Bluff and other smaller, neighborhood parks.

Undeveloped open space has the least amount of disturbance of all urban uses. These areas often provide important wildlife habitat and riparian functions (e.g. water storage, microclimate, food web). Landscaping with non-native plants and use of herbicides, pesticides and fertilizers can have a detrimental affect of natural resource. Human activity (e.g. biking, dog walking, boating) can have a negative impact on natural resources including noise, litter and harassing wildlife. Impacts associated with more active open space uses can be similar to residential or commercial development. For example, sports fields generally require significant grading and vegetation management. Some open space uses require development of parking lots, which can impact water quality.

Agriculture

Agriculture is allowed by right in the Open Space (OS), Residential Farm/Forest (RF), Limited Density Single-dwelling Residential (R20) and all employment and industrial zones. It is a conditional use in the Limited Density Single-dwelling Residential (R10), Medium Density Single-dwelling Residential (R7), General Commercial (CG) and Central Commercial (CX) zones. In the North Reach, there are no current agricultural uses.

Traditional agriculture includes clearing vegetation, plowing fields, exposing bare soils and applying fertilizers, pesticides and herbicides. These activities promote soil erosion and degrade soil and water quality. Animal waste from pasture use can reduce water quality. Agriculture may draw irrigation water from wells affecting groundwater. Organic and sustainable agricultural practices reduce the negative impacts on natural resources through reduction or elimination of fertilizers, pesticide and herbicides, cover cropping, which reduces soil erosion, water conservation measures (e.g. drip irrigation), etc.

Basic Utilities

Basic utilities are infrastructure services such as water and sewer pump stations, electrical substations, and water towers that need to be located in or near areas where service is provided. Basic utilities are allowed by right, with limitations or as conditional uses in all zones.

Construction and maintenance can have negative impacts on natural resources. Corridors cleared of vegetation can increase wind and light penetration into adjacent habitat areas and can provide opportunities for intrusion of invasive, non-native plant species. Construction of basic utility facilities often fragments wildlife habitat. Operation of existing facilities has few adverse impacts on natural resources, except in the case of overhead electrical lines which must be cleared of vegetation

Mining

Mining is a conditional use in the Open Space (OS), Residential Farm/Forest (RF), General Industrial 1 and 2 (IG1, IG2) and Heavy Industrial (IH) zones and is prohibited in all other zones. Currently there are no mining operations in the North Reach.

Mining has the most sever environmental impacts of all uses because it generally eliminates all natural resources from the area being mined. Once the mining operation is closed, some restoration of soil and vegetation is possible, but natural resources will remain permanently degraded.

Radio and Television Broadcast Facilities

Most low powered transmitters, such as cordless telephones and citizen band radios are allowed in all zones. More powerful and larger radio, television and cell phone broadcast facilities are allowed in all zones subject to limitations or as conditional uses. The impacts of these facilities

are minimal as compared to other uses, except open space. Certain of these facilities can pose hazards to migratory birds. During bad weather birds fly lower and may be disoriented by the lights of the towers and may run into towers or guy wires. There may be a greater visual impact from these broadcast facilities.

Rail Lines and Utility Corridors

Rail lines and utility corridors are allowed as conditional uses in all residential and commercial zones and allowed by right in all employment and industrial zones. Construction of rail lines often requires substantial excavation and fill to meet the 0-3 percent slope standards. Generally, additional grading results in natural resource disturbance and degradation of soil, vegetation and wildlife habitat. Most rail corridors use extensive chemical vegetation management with a potential for ground and surface water impacts. Rail corridors can also create wildlife hazards or barriers to wildlife movement.

Utility corridors typically must be kept clear of tall vegetation that could harm overhead facilities. Topping of trees is a common practice in utility corridors. Topped trees are more susceptible to disease.

The North Reach is a major transportation hub which contributes to the economic value of the area. Rail lines distribute goods regionally. Burlington Northern and Union Pacific have multiple rail lines and spurs throughout the North Reach.

There is one major utility corridor in the North Reach. The Portland General Electric power line corridor extends across the Willamette River in the vicinity of Harborton Wetlands and South Rivergate Corridor.

Other Land Use and Enabling Procedures

There are certain allowed uses and enabling procedures that are not assigned to a single category by the City zoning code. These include infrastructure, nonconforming situations, land divisions, partitions and property line adjustments.

Infrastructure

Infrastructure uses are accessory to urban development and include roads, water, sewer, electric, television lines and other public and private utilities not described by the zoning code category "basic utilities". Infrastructure is allowed in all city zones. Some of these uses are regulated by city public works and building codes, though requirements do not relate to the protection of Goal 5 resources. The uses generally have similar impacts as other development activities such as vegetation clearing, soil grading, piping streams, etc.

Nonconforming Situations

Nonconforming situations are created when zoning or zoning regulations change and existing uses, densities or development may no longer be allowed by the zone. Nonconforming situations are allowed to continue under the zoning code. The impacts to natural resources are similar to other development activities.

Land Divisions, Partitions and Property Line Adjustments

These are procedures that establish lots or relocate property lines within a zone. While the act of adjusting or creating lot lines does not directly impact resources, the new or modified lots may allow more conflicting uses or a greater intensity of development than the original lots. Often the outcome of adjusting lot lines or creating lots is to increase development opportunities thus increasing impacts on natural resources.

Chapter 4 – Impact Areas

A required step in the ESEE analysis is to identify "impact areas." An impact area is the area surrounding natural resources that may impact the quality, quantity, functionality or extent of those resources. Per the Goal 5 rule:

> *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. (OAR 660-23-040 (3).*

Determining the impact area is complicated in an urban area. As documented in Metro and the City's natural resources inventory reports, the effects of urbanization on the functions and values of fish and wildlife habitat are pervasive. Metro notes in their ESEE analysis:

> *…a compelling case can be made for identifying the entire watershed as an impact area based on the cumulative impacts of urbanization, such as road density, impervious surfaces and altered hydrology, vegetation loss and alteration, and species depletion. However, doing so may necessitate an ESEE analysis for the entire watershed, which significantly encumbers the Goal 5 process. Stormwater management through watershed planning may be more realistic for addressing these larger more pervasive effects of urbanization on the function of fish and wildlife habitats….*

Metro's ESEE identifies impacts areas as the land extending up to 150 feet from a water body, and the land extending up to 25 feet from edge of an inventoried vegetation patch (includes Habitats of Concern). The way Metro applied the impact area is that any land that does not receive a rank as providing natural resources functions and is with 150 feet of a water body or 25 feet from the edge of a vegetation patch, is within the impact area. Metro determined these distances with the intent of:

- Providing all fish and wildlife habitat with an impact area and providing the most sensitive habitat with wider impact areas (note: developed floodplains do not have an impact area)
- Providing impact areas to address tree root zones
- Allowing the potential to address areas that are already degraded, but where negative inputs may strongly influence onsite and downstream water quality and key wildlife habitat (such as wetlands)
- Meeting the requirements of the Goal 5 rule

For purposes of the Willamette River North Reach ESEE, the City elects to use the same methodology as Metro for identifying the impact area: 150 feet from water bodies and 25 feet from vegetation patches (including Special Habitat Areas). The Goal 5 rule requires that these areas be considered along with the inventoried natural resource areas in conducting the ESEE analysis. These areas are considered in the context of the general ESEE and supplemental ESEE analyses presented later in the report. They area considered as extensions of the resource areas and are therefore not addressed separately in the analysis of potential consequences.

Ultimately, Metro did not include impact areas in the Habitat Conservation Areas (HCAs) that are regulated under Title 13. As such, Metro's final ESEE decision was to allow conflicting uses within impact areas. Metro's decision was based on the following findings:

- The negative consequences of allowing conflicting uses in impacts areas would be substantially less for all ESEE factors than in areas containing regionally significant natural resources.
- Impact areas provide little existing ecologic function, so the environmental benefit of limiting or prohibiting conflicting uses is low.
- Other tools, including low impact development standards, best management practices, education and restoration in impact areas, and throughout the watersheds, can restore ecologic function over time.

Impact areas are addressed as part of the general ESEE analysis for the North Reach (section 5.d.6).

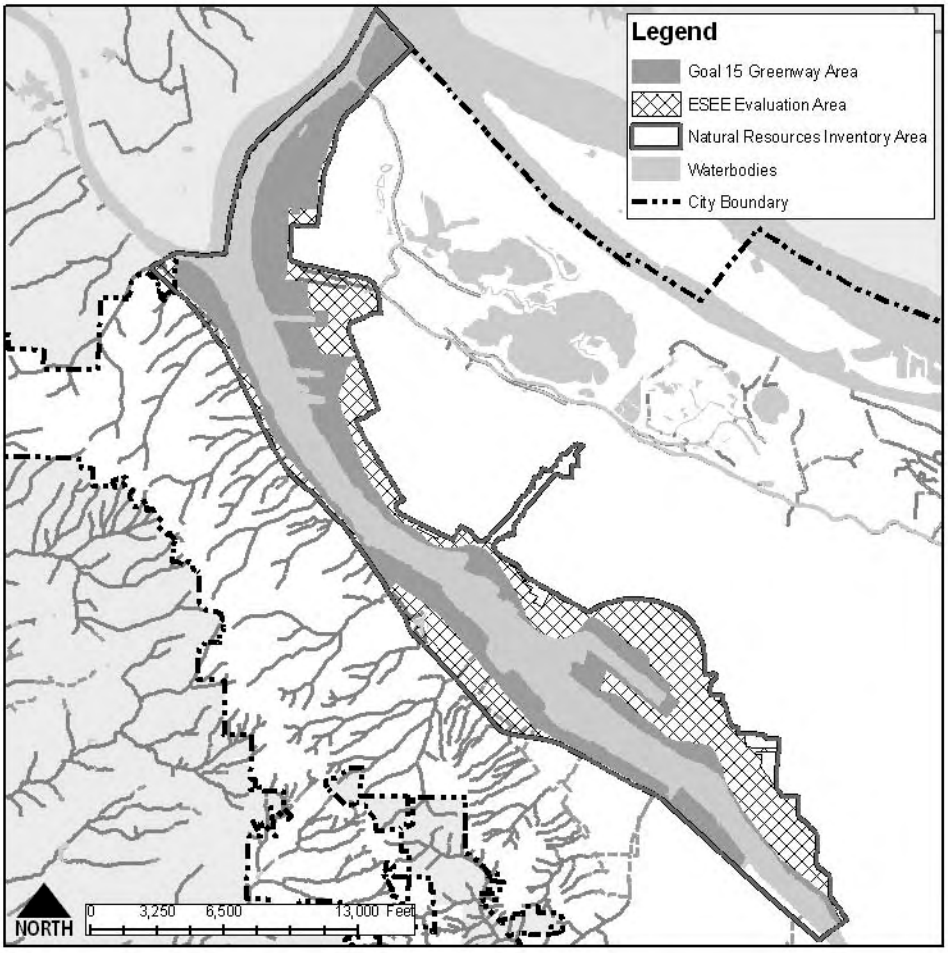
Chapter 5 – Willamette River North Reach ESEE Analysis

The ESEE analysis for the Willamette River North Reach is comprised of two key sequential elements: First is a general ESEE analysis for the North Reach as a whole. Second, a supplemental ESEE analyses have been produced for each inventory site identified in the proposed draft *Willamette Natural Resource Inventory: Riparian Corridors and Wildlife Habitat* (August 2008). These elements of the ESEE analysis are summarized below.

General North Reach ESEE Analysis

The first step involves conducting a general ESEE analysis for the North Reach as a whole. The general ESEE analysis outlines the broad consequences of allowing, limiting, and prohibiting conflicting uses in areas containing significant natural resources. Significant natural resources are identified and mapped in the draft inventory. The inventory assigns these resources scores and ranks to reflect the relative ecologic functions and values they provide (see Chapter 2 for more detail on the inventory methodology). As noted in Chapter 1, the area being addressed within this ESEE analysis is the portion of the North Reach inventory area that is located outside the Goal 15: Willamette Green way (Map 7).

Map 7: Willamette Greenway Goal 15 Area and ESEE Evaluation Area



The general ESEE consequences for the North Reach are presented using qualitative descriptions and simple ratings to show whether the potential impacts of the different program choices would be generally positive, negative, or neutral/negligible. The qualitative descriptions within an ESEE serve to explain the basis of the proposed City decision. The ESEE process is not a precise quantitative exercise. The general ESEE is intended to establish a proposed baseline program decision for the North Reach. The ESEE consequences, recommendations, and decision are intended to reflect conditions specific to the North Reach.

Site-specific Supplemental ESEE Analysis

Within some of the inventory sites there are unique conditions that warrant additional ESEE analysis to supplement and in some instances modify the general North Reach ESEE analysis, recommendations and decision. The supplemental analyses focuses on specific landscape features and conflicting uses contained within individual inventory sites that are not adequately evaluated by the general analysis. The supplemental ESEE analyses confirm where the general ESEE decision would apply and where the general decision should be modified. The final recommended ESEE decision for each inventory site presents the circumstances in which conflicting uses would be allowed, limited or prohibited. Draft recommended environmental overlay zoning maps are presented to illustrate how the decision would be implemented for each site.

The site-specific supplemental ESEE analyses provide the following information:

- Site description
- Quarter sections
- Conflicting uses by city base zones
- Summary of natural resources
- Previous city-adopted ESEE analysis (if applicable)
- Supplemental ESEE analysis
- Relationship to Metro's ESEE decision
- Environmental Overlay Zone (includes zoning map)

5.a "Allow," "Limit," and "Prohibit" Explained

Allow a conflicting use

According to the Goal 5 rule, "a local government may decide that a conflicting use should be allowed fully, notwithstanding the possible impacts on the [inventory] site." The Goal 5 rule also requires that the ESEE analysis "demonstrate that the conflicting uses is of sufficient importance relative to the [inventory] site, and must indicate why measures to protect the resource to some extent should not be provided." [660-23-040(5)(a)]

Where an allow decision is applied, cities and counties may use other tools to protect or enhance natural resource functions. For example, in the City of Portland any new development or redevelopment that includes impervious surfaces (e.g. structures, driveways) must meet the requirements of the Stormwater Management Manual. This requirement came about as a result of other regulatory obligations, independent of a Goal 5 program decision. Other tools include low impact development, best management practices, education and restoration.

Limit a conflicting use

According the Goal 5 rule, "a local government may decide that both the [inventory] site and the conflicting uses are important compared to each other and, based on the ESEE analysis, the conflicting use should be allowed in a limited way that protects the [inventory] site to a desired extent." [660-23-040(5)(b)]

A program to limit a conflicting uses can be designed to allow some level of development with certain restrictions to protect the natural resources to the maximum extent possible. Mitigation standards may be required to replace lost natural resources and/or resource functions (e.g. planting native vegetation, restoring floodplain connectivity, etc.). Design standards may be required to lessen the impact on natural resources (e.g. tree retention, cluster development, impervious surface reduction, etc.).

Historically, the City has applied two types of limit decisions in conjunction with adopted ESEE analyses:

- *Limit* – Proposed development must either meet development standards or undergo a land use review and alternatives analysis. The City must find that the selected project alternative will have the least adverse impact on significant natural resources as is practicable. Impacts that cannot be avoided must be mitigated.
- *Strictly Limit* – Development must avoid significant natural resources except in narrowly defined instances (e.g., the resource area is the only place where access across a property can be provided; the project is needed and the public benefit outweighs the environmental impacts).

Prohibit conflicting uses

Significant natural resources would receive the highest level of protection with a decision to prohibit conflicting uses. According to the Goal 5 rule, "a local government may decide that a significant [inventory] site is of such important compared to the conflicting uses, and the ESEE consequences of allowing the conflicting uses are so detrimental to the resource, that the conflicting use should be prohibited." [660-23-040(5)(c)] Some development may be allowed if all economic use of a property would be prevented through full protection.

5.b Building on Metro ESEE Analysis

As noted in Chapter 1 of this report, Metro conducted a regional-scale ESEE analyses upon which it established the Title 13 Nature in Neighborhoods program. Cities and counties in Metro's jurisdiction may rely on Metro's ESEE decision in developing or refining programs to comply with the requirements of Title 13 to protect and conserve significant riparian corridors and wildlife habitat. Metro's ESEE decisions are reflect in tables 3.07-13a and 13b.

Table 3.07-13a: Method for Identifying Habitat Conservation Areas (HCA)				
Fish and wildlife habitat classification	***High Urban development value[1]***	***Medium Urban development value[2]***	***Low Urban development value[3]***	***Other areas: Parks and Open Spaces, no design types outside UGB***
Class I Riparian	Moderate HCA	High HCA	High HCA	High HCA/ High HCA+[4]
Class II Riparian	Low HCA	Low HCA	Moderate HCA	Moderate HCA/ High HCA+[4]
Class A Upland Wildlife	No HCA	No HCA	No HCA	No HCA/ High HCA[5]/ High HCA+[4]
Class B Upland Wildlife	No HCA	No HCA	No HCA	No HCA/ High HCA[5]/ High HCA+[4]
Table 3.07-13b: Method for Identifying Habitat Conservation Areas in Future Urban Growth Boundary Expansion Areas				
Fish and wildlife habitat classification	***High Urban development value[1]***	***Medium Urban development value[2]***	***Low Urban development value[3]***	***Other areas: Parks and Open Spaces, no design types outside UGB***
Class I Riparian	Moderate HCA	High HCA	High HCA	High HCA/ High HCA+[4]
Class II Riparian	Low HCA	Low HCA	Moderate HCA	Moderate HCA/ High HCA+[4]
Class A Upland Wildlife	Low HCA	Moderate HCA	Moderate HCA	High HCA/ High HCA[5]/ High HCA+[4]
Class B Upland Wildlife	Low HCA	Low HCA	Moderate HCA	Moderate HCA/ High HCA[5]/ High HCA+[4]

Note: The default urban development value of property is as depicted on the Metro Habitat Urban Development Value Map (Title 13 Exhibit C). The Metro 2040 Design Type designations provided in the following footnotes are only for use when a city or county is determining whether to make an adjustment pursuant to Section 4(e)(5) of Title 13.

1 – Primary 2040 design types: Regional Centers, Central City, Town Centers, and Regionally Significant Industrial Areas

2 – Secondary 2040 design types: Main Streets, Station Communities, Other Industrial Areas and Employment Centers

3 – Tertiary 2040 design types: Inner and Outer Neighborhoods, Corridors

4 – Cities and counties shall give Class I and II riparian habitat and Class A and B upland wildlife habitat in parks designated as natural areas even greater protection than that afforded to High HCA, as provided in Section 4(A)(5) of Title 13.

5 – All Class A and B upland wildlife habitat in publicly-owned parks and open spaces, except for parks and open spaces where the acquiring agency clearly identified that it was acquiring the property to develop it for active recreational uses, shall be considered High HCA.

Although Title 13 allows local jurisdictions to rely on Metro's ESEE decisions to guide program development, Metro's decisions are intended to provide a minimum level of resource protection. The City believes it is appropriate to review, verify and potentially refine Metro's ESEE analysis to address current, local conditions and issues in the North Reach. The City will accomplish this by comparing its ESEE analyses and recommendations to Metro's ESEE decision for the North Reach, noting where the results are consistent and where and how they differ.

The results of this portion of the analysis will be used to determine whether the City must submit portions of its program to the Oregon Department of Land Conservation and Development (DLCD) for acknowledgement, as well as to Metro for a determination of substantial compliance with Title 13.

5.c General North Reach ESEE

This section presents the general ESEE analysis for the Willamette River North Reach. This portion of the ESEE analysis is intended to outline the potential consequences of allowing, limiting, and prohibiting conflicting uses in areas containing significant natural resources for the North Reach as a whole. Significant natural resources are identified and mapped in the draft inventory. The inventory assigns these resources scores and ranks to reflect the relative ecologic functions and values they provide (see Chapter 2 for more detail on the inventory methodology).

The general ESEE analysis includes a section for each of the four ESEE factors evaluated. Each section includes a narrative that describes the factors being assessed. For example the social analysis addresses cultural and historic values, education, mental health, etc. Following the narrative are two tables that summarize the consequences of allowing, limiting or prohibiting conflicting uses. The first table addresses impacts on the conflicting uses and the second table addressed impacts on the natural resources. The consequences for natural resources are evaluated separately for high, medium and low ranked resources. All of the consequences are presented using qualitative descriptions and simple ratings to show whether the net potential impacts are expected to be generally and relatively positive, negative, or neutral/negligible. The last table in each of the four ESEE sections presents a recommended decision for that specific factor. This recommended decision is intended to balance the consequences to produce a recommended level of protection taking only that factor into account.

Finally, the recommendations of each ESEE section are evaluated together to produce a recommended overall ESEE program decision. Consistent with the City's River Renaissance Vision and the River Plan project, the intent of the ESEE recommendations is to recommend program decisions that meet multiple objectives and optimize the economic, social, environmental and energy consequences for natural resources and conflicting uses in the North Reach.

The general ESEE analysis is intended to establish a baseline decision for the North Reach. The ESEE consequences, recommendations, and decision are intended to reflect conditions specific to the North Reach, though they may also applicable to other parts of the city. The general ESEE analysis is followed by supplemental ESEE analyses for each of the natural resource inventory sites in the North Reach.

5.c.1 Economic Analysis

This section examines the economic consequences of allowing, limiting or prohibiting conflicting uses for the North Reach. The economic consequences are expressed as the qualitative and relative costs and benefits of the three program choices. The analysis relies on current information and a standard set of assumptions to evaluate the impacts on the economic goods and services provided by the conflicting uses and the ecosystem services provided by existing significant natural resources in the North Reach. Below is a summary of those assumptions.

Goods and Services provided by Conflicting Uses in the North Reach
Generally, the types of goods and services provided by conflicting uses include local and regional economic benefits of industrial development, commerce, employment, and transportation infrastructure, housing, local commercial enterprises, parks and other neighborhood amenities.

The value of development depends on many factors including development potential (i.e. current and future use, location), employment potential, availability of infrastructure, zoning/regulations, lot size and shape, physical terrain and other property amenities. In the North Reach the value of development is generally high. The North Reach being evaluated in this ESEE contains industries and businesses near the Willamette and Columbia rivers and close to the central city. There is access to infrastructure (i.e. sewer, water), and to river, rail and highway transportation corridors. The North Reach is in close proximity to population centers in Portland and Vancouver, which provide a strong employment base.

There are constraints on development in the North Reach, such as the cost to clean up contamination and redevelop brownfield sites, which may reduce overall land value. Other costs of development include site design, permitting and mitigation costs.

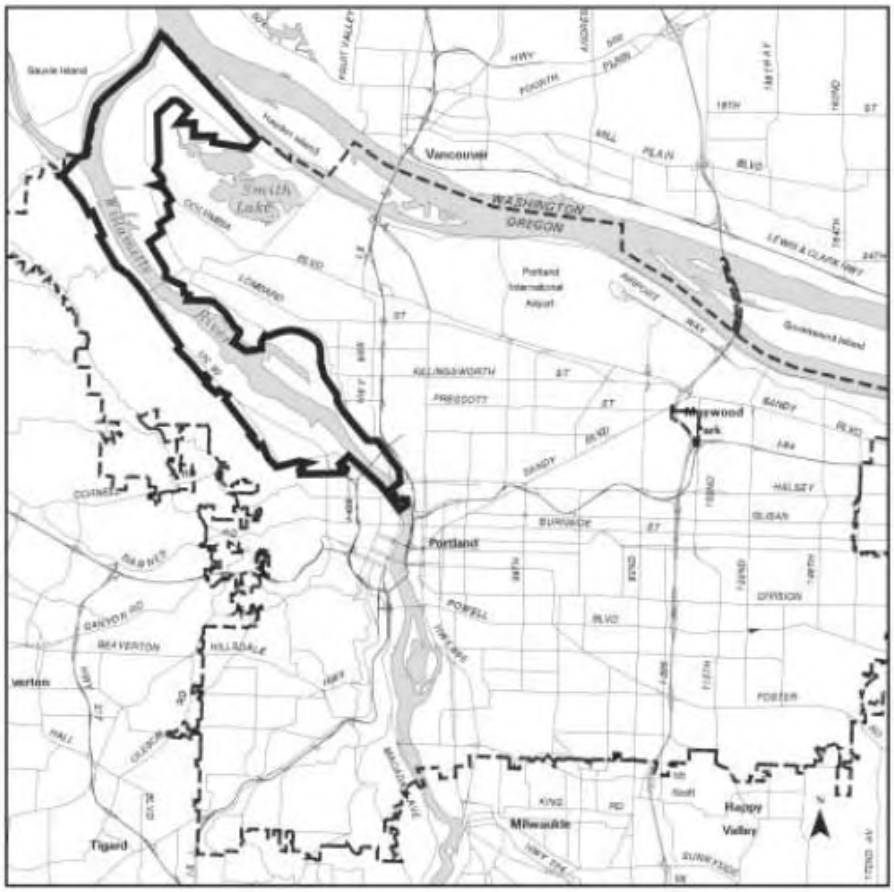
The goods and services provided by development types in the North Reach are presented below.

Industry and Business
Note: The sources of information in this section are provided in the *Portland Harbor Lands Study,* City of Portland Bureau of Planning (2003) and the *River Industrial Zoning Background and Issues Report,* City of Portland Bureau of Planning (2007).

The North Reach ESEE evaluation area includes the Portland Harbor (map 8). Within the Portland Harbor, approximately 940 private businesses employ roughly 39,000 workers. The industrial sector provides the highest earnings prospects for the workforce without a bachelor's degree.

Approximately half of that employment is in the manufacturing sector and one-third in distribution (transportation and wholesale trade). Clusters of particular industries in a district are an indication of its competitive advantage for those industries. Metals and equipment manufacturing is the harbor area's largest industry cluster, accounting for 104 businesses and 14,700 jobs in 2000. These industries have become highly interdependent, forming a large portion of each other's suppliers, subcontractors, and customers. Larger harbor area firms in these industries include Freightliner, Gunderson, Cascade General, ESCO, and Oregon Steel.

Map 8: Portland Harbor



*The Portland Harbor includes the Willamette Greenway and the Rivergate Area, which are not evaluated as part of the ESEE analysis.

Distribution (transportation and wholesale trade) is the second largest industry cluster in the Portland Harbor, consisting of 375 businesses and 12,700 jobs. Distribution industries concentrate in the harbor area because of access to multiple modes of transportation including marine, freight and truck. The distribution industries that have high concentrations of employment in the harbor area are water, air, and truck transportation and wholesale trade of alcoholic beverages, metals, furniture, chemicals, and petroleum products.

The industries and businesses within the North Reach contribute significantly to the regional economy. Approximately 1 in 9 regional jobs depends on harbor industries.

The Portland Harbor is largely built-out and has a tightening land supply. Based on Metro's regional inventory of vacant industrial land dated July 2000, 735 acres were vacant (undeveloped) in the Portland Harbor, which is 13 percent of the total 5,532 acres of harbor area. Over half of the vacant land in the harbor area is located in Rivergate, which is generally located outside of the North Reach.

Neighborhoods

Portions of the Linnton and St Johns neighborhoods, as well as small areas of other neighborhoods, are located in the North Reach and contain a mix of residential, commercial,

industrial and open space uses. These neighborhoods provide a mix of housing types including single and multi-family housing options. The Linnton Village, on the west side of the river east of Highway 30, is located in the North Reach. Multiple businesses have clustered here including Linnton Plywood. The village supports a local community center and seasonal public market. Linnton is close to Highway 30, major industrial areas, the Willamette River and has its own distinct river-oriented character, history and charm.

On the east side of the Willamette, multiple neighborhoods are included within the North Reach – St. Johns, Cathedral Park, University Park, and Overlook. The majority of these these neighborhoods are outside of the North Reach boundary. The neighborhoods within the North Reach are characterized by views of the Willamette River and Forest Park.

A commercial cluster is located near the St. Johns Bridge and Adidas and Kaiser campuses are at the south end of the North Reach. The University of Portland is also located in the North Reach. The university employs 316 professors, numerous other staff, support staff and other employees, and supports other secondary businesses associated with the campus (e.g. cafes). The university also provides an educated employment base for Portland.

Ecosystem Services provided by Significant Natural Resources in the North Reach

Natural resources provide ecosystems services, which are functions that provide benefits with economic value and value to society generally. Table 6 presents key ecosystem services provided by significant riparian corridors and wildlife habitat resources identified in the North Reach.

Table 6: Ecosystem Services

Natural Resource Features	Functions	Ecosystem Services
Water bodies – river, streams, drainageways and wetlands Flood area Riparian and upland vegetation – forest and dense tree canopy, woodland, shrubland and herbaceous vegetation	Microclimate and shade; heat island effect	• Moderating air temperature; reduced energy demand for cooling; reduced costs from public health impacts of urban heat island effect • Moderating water temperature which supports fisheries (commercial and recreational)
	Streamflow moderation and water storage	• Reduced bank erosion; reduced bank stabilization costs • Flood storage; reduced flood management costs • Improved stormwater conveyance and disposal; reduced infrastructure costs
	Bank function, slope stability, and sediment, pollution and nutrient control	• Reduced bank erosion; reduced bank stabilization costs • Improved surface and groundwater water quality; reduced risk to public health; improved fisheries (commercial and recreational) • Improved soil quality; reduced risk to public health • Reduced landslide hazards

Table 6: Ecosystem Services		
	Large wood and channel dynamics	• Reduced bank erosion; reduced bank stabilization costs • Reducing flood damage; reduced flood management costs • Habitat, which supports fisheries (commercial and recreational)
	Organic inputs, food web and nutrient cycling	• Improved surface and groundwater water quality • Improved fisheries (commercial and recreation)
	Habitat patches, wildlife movement corridors and special habitats	• Supports biological communities; reduced costs associated with Endangered Species Act compliance for listed species; prevents costs associated with future species listings

In addition to the specific ecosystem benefits listed above, the existence of trees, greenspaces and other natural resources have been positively correlated with residential property values in Portland. Natural resources contribute to the quality of neighborhood, local and regional recreation and trail systems, and also to the quality of views. Screening and buffering residential from industrial and commercial land uses can be provided by established trees and vegetation, and can improve the economic value of both uses (e.g. noise reduction). Ecosystem services generally increase and landscape maintenance costs generally decrease with the presence of native vegetation compared to highly manicured landscapes. Other indirect "quality of life" values associated with natural resources in include labor force retention, attraction of new employees and reputation. Portland is generally known nationally and internationally as a *green* city and a desirable place to live, visit, work and play, which has a positive impact on aspects of the local and regional economy.

Natural resources can help mitigate the urban heat island effects and global climate change by reducing local air and water temperatures, maintaining flood area to accommodate potential increases in ocean and stream elevations, capturing carbon and other greenhouse gases, and supporting wildlife and plant diversity.

Some benefits from natural resources can be found beyond the immediate resource area. For example, the capacity of a wetland to purify surface water, recharge aquifers and store floodwaters may benefit an entire watershed. When benefits occur off-site, natural resource owners cannot capture the value of these benefits directly. As a result, the market price for natural resources, whether a wetland or a stand of trees, does not fully reflect a true exchange value relative to other goods. In fact, most natural resources are not priced because they are not bought and sold like other products. This makes establishment of value difficult.

Some of the benefits of natural resources take many years to be realized. For example, the potential stormwater management and climate-related values of an immature stand of trees may not be realized for 25-50 years when the trees have grown and matured and are providing maximum shade, carbon capture, rainwater interceptions and evapotranspiration functions. Another complicating factor when determining the economic value of natural resource is that many natural resources have "irreversibility" properties. If the resource is not preserved, it is likely to be eliminated with little or no chance of regeneration in any meaningful timeframe, if ever. Since the future is unknown, there are potential costs if resources are lost and a future choice is foregone.

Natural resources in the Willamette River North Reach have been eliminated over time as a result of extensive development throughout much of the area. Many of the remaining natural resources have been degraded by disturbances, invasive species and contamination. The extent of development minimizes the ecosystem services provided by the remaining natural resources. That said, these resources continue to provide important ecosystem benefits, perhaps made that much more valuable due to limited resource supply.

Economic Consequences by Natural Resource Rank and Land Use Type

To determine the consequences of development, three scenarios are assessed: allowing, limiting and prohibiting conflicting uses that would adversely affect significant natural resources in the North Reach. Each of these program choices would result in different mixes of positive and negative economic consequences as relates to conflicting uses and natural resources.

In evaluating the consequences of *allowing* conflicting uses it is assumed that all significant natural resources would be subject to development allowed by regulations that apply in the base zone. It is also assumed that mitigation for impacts on natural resources would not be required.

In evaluating the consequences of *limiting* conflicting uses it is assumed that rules would be established to limit the impacts of allowable development in areas containing significant natural resources. Areas containing significant natural resources would still be subject to some development, but development restrictions would exist in addition to base zone regulations. The City's current environmental overlay zoning program either *limits* or *strictly limits* the impacts conflicting uses on significant natural resources through the application of the environmental conservation (c) zone or the environmental protection (p) zone, respectively.

- *Within the c-zone*, development is required to avoid adversely affecting natural resources where practicable and to mitigate for unavoidable impacts.
- *Within the p-zone*, only a narrow set of uses or development types are allowed under specific circumstances. Development that is necessary to provide access is allowed. In the circumstance that the public benefits of the proposed development outweigh the impacts on natural resources, the development may be allowed out-right or with conditions. In either situation, mitigation for unavoidable impacts is required.

In evaluating the consequences of *prohibiting* conflicting uses it is assumed that rules would be established that preclude all allowable development in significant natural resource areas.

Tables 7 and 8 address the economic consequences of associated with the three programmatic approaches. Consequences are described, and further represented by these symbols:

- (+) more positive than negative consequences
- (-) more negative than positive consequences
- (+/-) development would have both positive and negative consequences; and/or positive and negative consequences are generally balanced
- (o) consequences would be neutral or negligible

Table 7: Economic Consequences for Conflicting Uses

	Allow		Limit		Prohibit	
Industrial Employment	Would maintain the local and regional economic benefits of industrial development (e.g. commerce, land improvements, employment). Would maintain the supply of land for future industrial development and generation of employment opportunities. Development would incur costs to replace certain ecosystem services provided by natural resources (e.g., stormwater infiltration and treatment, heating and cooling, noise buffering), but would not incur additional costs to avoid, minimize or mitigate for impacts on natural resources.	+	Would maintain most of the local and regional economic benefit of industrial development (e.g. commerce, land improvement, employment). Development would incur design costs to avoid adversely affecting natural resource functions, including ecosystem services. Development would incur costs related to mitigating for impacts on resource functions and values, including ecosystem services (e.g. stormwater management; heating/cooling, noise buffering).	+/-	Would reduce the economic benefit derived from development of industrial areas (e.g. commerce, land improvement, employment). Development would not incur additional costs to avoid, minimize or mitigate for impacts on natural resources or ecosystem services.	-
Commercial	Would maintain local economic benefit of commercial development (e.g. commerce, land improvements, employment). Development would incur costs to replacement certain ecosystem services provided by natural resources (e.g., stormwater infiltration and treatment, heating and cooling, noise buffering), but would not incur additional costs to avoid, minimize or mitigate for impacts on natural resources.	+	Would maintain most of the local economic benefits associated with commercial development (e.g. commerce, land improvements, employment). Development would incur design costs to avoid adversely affecting natural resource functions, including ecosystem services. Development would incur costs related to mitigating for impacts on resource functions and values, including ecosystem services (e.g. stormwater management; heating/cooling, noise buffering).	+/-	Would reduce the economic benefit derived from commercial uses (e.g. land development, employment). Development would not incur additional costs to avoid, minimize or mitigate for impacts on natural resources or ecosystem services.	-
Institutional	Would maintain economic benefit of institutional development (e.g. land improvement, employment). Would degrade environmental amenities that benefit some institutional land uses (e.g. noise buffering, screening). Development would incur costs to replacement certain ecosystem services provided by natural resources (e.g., stormwater infiltration and treatment, heating and cooling, campus amenities, noise buffering), but would not incur additional costs to avoid, minimize or mitigate for impacts on natural resources.	+	Would maintain economic benefits associated with institutional development (e.g. land development, employment). Development would incur design costs to avoid adversely affecting natural resource functions, including ecosystem services. Development would incur costs related to mitigating for impacts on resource functions and values, including ecosystem services (e.g. stormwater management; heating/cooling, noise buffering).	+/-	Would reduce the economic benefit derived from some institutional uses. This impact would occur primarily where allowed uses are land intensive and cannot be clustered into available areas outside the natural resource area, or where allowed institutional uses are location-specific within resource areas. Development would not incur additional costs to avoid, minimize or mitigate for impacts on natural resources or ecosystem services.	-
Residential	Would maintain economic benefits associated with residential development. Would degrade environmental amenities that benefit residential land values (e.g. noise buffering, screening. Development would incur costs to replace certain ecosystem services provided by natural resources (e.g., stormwater infiltration and treatment, heating and cooling, noise buffering), but would not incur additional costs to avoid, minimize or mitigate for impacts on natural resources.	+/-	Would maintain most of the economic benefits associated with residential development, due to allowance for flexible site layout standards. Would increase value of residential development by conserving environmental amenities and associated ecosystem services. Development would incur design costs to avoid adversely affecting natural resource functions, including ecosystem services. Development would incur costs related to mitigating for impacts on resource functions and values, including ecosystem services (e.g. stormwater management; heating/cooling). May add costs associated with site design to avoid natural resources.	+/-	Would reduce economic benefit derived from residential uses where allowed housing density cannot be transferred to land outside the natural resource area. Would maintain economic benefit derived from development of abutting industrial areas (e.g. commerce, land improvement, employment), by reducing proximity-related conflicts that arise between residential and industrial land uses. Would maintain the value of existing residential development by conserving environmental amenities. Development would not incur additional costs to avoid, minimize or mitigate for impacts on natural resources or ecosystem services.	+/-

Table 7: Economic Consequences for Conflicting Uses

	Allow		Limit		Prohibit	
Open Space	Would maintain economic benefit derived from active open space uses (e.g. local commerce, employment at community centers). Development would incur costs to replacement certain ecosystem services provided by natural resources (e.g., stormwater infiltration and treatment, heating and cooling), but would not incur additional costs to avoid, minimize or mitigate for impacts on natural resources. Development of active open space uses could affect the quality of adjacent open spaces used for passive recreation and the desirability of nearby recreation areas.	+/-	Would maintain most of the economic benefit derived from active open space (e.g. local commerce, employment at community center). Development would incur design costs to avoid adversely affecting natural resource functions, including ecosystem services. Development would incur costs related to mitigating for impacts on resource functions and values, including ecosystem services (e.g. stormwater management; heating/cooling). Development could affect the quality of adjacent open spaces used for passive recreation and the desirability of nearby residential areas.	+/-	Would reduce the economic benefit derived from some active open space uses (e.g. community center). Development would not incur additional costs to avoid, minimize or mitigate for impacts on natural resources or ecosystem services. Would help maintain the quality of adjacent open spaces used for passive recreation and the desirability of nearby residential areas.	+/-

Table 8: Economic Consequences for Natural Resources

Conflicting Use	Resource Ranks	Allow		Limit		Prohibit	
Industrial **Employment**	High & SHA	Would reduce the economic benefit derived from multiple ecosystem services. All ecosystem services would be impacted by development of conflicting uses within areas of high ranked natural resources and Special Habitat Areas (greater impacts are associated with these land uses due to the intensive nature of development). Near streams and wetlands, the ecosystem services related to water quality floodwater storage and public health would be reduced. Could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would reduce opportunities for resource enhancement (lost opportunities may have future economic costs).	-	Would maintain most of the economic benefit derived from multiple ecosystem services. Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health could be reduced somewhat. Could complicate the City's ability to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve some opportunities for natural resource enhancement (lost opportunities may have future economic costs).	+/-	Would maintain economic benefits derived from multiple ecosystem services. Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be maintained. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve opportunities for natural resource enhancement (lost appointees may have future economic costs).	+
	Medium	Would reduce the economic benefit derived from multiple ecosystem services. A range of ecosystem services could be impacted by development of conflicting uses within areas of medium ranked natural resources (greater impacts are associated with these land uses due to the intensive nature of development). Near streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be reduced. Could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would reduce opportunities for resource enhancement (lost opportunities may have future economic costs).	-	Would maintain most of the economic benefit derived from multiple ecosystem services. Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health could be reduced somewhat. Could complicate the City's ability to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve some opportunities for natural resource enhancement (lost opportunities may have future economic costs).	+	Would maintain economic benefits derived from multiple ecosystem services. Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be maintained. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve opportunities for natural resource enhancement (lost appointees may have future economic costs).	+
	Low	Existing ecosystem services provided are very limited, therefore development would have a negligible impact on economic benefit. Would reduce opportunities for resource enhancement (lost opportunities may have future economic costs).	o	Existing ecosystem services provided are very limited, therefore development would have a negligible impact on economic benefit. Would preserve some opportunities for natural resource enhancement (lost opportunities may have future economic costs).	o	Existing ecosystem services provided are very limited, therefore development would have a negligible impact on economic benefit.. Would preserve opportunities for natural resource enhancement (lost appointees may have future economic costs).).	o
Commercial	High & SHA	Would reduce the economic benefit derived from multiple ecosystem services. All ecosystem services would be impacted by development of conflicting uses within areas of high ranked natural resources and Special Habitat Areas. Near streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be reduced. Could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would educe opportunities for resource enhancement (lost opportunities may have future economic costs).	-	Would maintain most of the economic benefit derived from multiple ecosystem services. Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health could be reduced somewhat. Could complicate the City's ability to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve some opportunities for natural resource (lost opportunities may have future economic costs).	+/-	Would maintain economic benefits derived from multiple ecosystem services. Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be maintained. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve opportunities for natural resource enhancement (lost appointees may have future economic costs).	+

Table 8: Economic Consequences for Natural Resources

Conflicting Use	Resource Ranks	Allow		Limit		Prohibit	
	Medium	Would reduce economic benefit derived from multiple ecosystem services. A range of ecosystem services could be impacted by development of conflicting uses within areas of medium ranked natural resources. Near streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be reduced. Could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would reduce opportunity for resource enhancement (lost opportunities may have future economic costs)..	-	Would maintain most of the economic benefit derived from multiple ecosystem services. Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health could be reduced somewhat. Could complicate the City's ability to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve some opportunities for natural resource enhancement (lost opportunities may have future economic costs).	+	Would maintain economic benefits derived from multiple ecosystem services Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be maintained. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve opportunities for natural resource enhancement (lost appointees may have future economic costs).	+
	Low	Existing ecosystem services provided are very limited, therefore development would have a negligible impact on economic benefit. Would reduce opportunity for natural resource enhancement (lost opportunities may have future economic costs). .	o	Existing ecosystem services provided are very limited, therefore development would have a negligible impact on economic benefit. Would preserve some opportunities for natural resource (lost opportunities may have future economic costs).	o	Existing ecosystem services provided are very limited, therefore development would have a negligible impact on economic benefit. Would opportunities for natural resource enhancement (lost appointees may have future economic costs).).	o
Institutional	High & SHA	Would reduce the economic benefit derived from multiple ecosystem services. Most ecosystem services would be impacted by development of conflicting uses within areas of high ranking natural resources and Special Habitat Areas. Near streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be reduced. Could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Reduced opportunity for natural resource enhancement.	-	Would maintain most of the economic benefit derived from multiple ecosystem services. Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health could be reduced somewhat. Could complicate the City's ability to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve some opportunities for natural resource enhancement (lost opportunities may have future economic costs).	+/-	Would maintain economic benefits derived from multiple ecosystem services Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be maintained. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve opportunities for natural resource enhancement (lost appointees may have future economic costs).	+
	Medium	Would reduce the economic benefit derived from multiple ecosystem services. A range of ecosystem services could be impacted by development of conflicting uses within areas of medium ranked natural resources. Near streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be reduced. Could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Reduced opportunity for natural resource enhancement.	-	Would maintain most of the economic benefit derived from multiple ecosystem services. Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health could be reduced somewhat. Could complicate the City's ability to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve some opportunities for natural resource enhancement (lost opportunities may have future economic costs).	+	Would maintain economic benefits derived from multiple ecosystem services. Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be maintained. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve opportunities for natural resource enhancement (lost appointees may have future economic costs).	+
	Low	Existing ecosystem services provided are very limited, therefore development would have a negligible impact on economic benefit. Reduce opportunity for natural resource enhancement.	o	Existing ecosystem services provided are very limited, therefore development would have a negligible impact on economic benefit. Would preserve some opportunities for natural resource enhancement (lost opportunities may have future economic costs).	o	Existing ecosystem services provided are very limited, therefore development would have a negligible impact on economic benefit. Preserve opportunities for natural resource enhancement (lost appointees may have future economic costs).).	o
Residential	High & SHA	Would reduce the economic benefit derived from multiple ecosystem services. Most ecosystem services would be impacted by development of conflicting uses within areas of high ranked natural resources and Special Habitat Areas. Near streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be reduced. Could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Some environmental amenities surrounding residential development would be retained by market forces. Would reduce opportunity for natural resource enhancement.	-	Would maintain most of the economic benefit derived from multiple ecosystem services. Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health could be reduced somewhat. Could complicate the City's ability to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve some opportunities for natural resource enhancement (lost opportunities may have future economic costs).	+/-	Would maintain economic benefits derived from multiple ecosystem services, including some services which raise the economic value of abutting land uses (e.g. noise buffering, screening). Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be maintained. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve opportunities for natural resource enhancement (lost appointees may have future economic costs).	+

Table 8: Economic Consequences for Natural Resources

Conflicting Use	Resource Ranks	Allow		Limit		Prohibit	
	Medium	Would reduce the economic benefit derived from multiple ecosystem services. A range of ecosystem services could be impacted by development of conflicting uses within areas of medium ranked natural resources. Near streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be reduced. Could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would reduce opportunity for natural resource enhancement.	-	Would maintain most of the economic benefit derived from multiple ecosystem services. Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health could be reduced somewhat. Could complicate the City's ability to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve some opportunities for natural resource enhancement (lost opportunities may have future economic costs).	+	Would maintain economic benefits derived from multiple ecosystem services. Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be maintained. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve opportunities for natural resource enhancement (lost appointees may have future economic costs).	+
	Low	Existing ecosystem services provided are very limited, therefore development would have a negligible impact on economic benefit. Would Reduce opportunity for natural resource enhancement.	o	Existing ecosystem services provided are very limited, therefore development would have a negligible impact on economic benefit. Would preserve some opportunities for natural resource enhancement (lost opportunities may have future economic costs).	o	Existing ecosystem services provided are very limited, therefore development would have a negligible impact on economic benefit Would preserve opportunities for natural resource enhancement (lost appointees may have future economic costs).).	o
Open Space	High & SHA	Would reduce some economic benefit derived from multiple ecosystem services. A range of ecosystem services would be impacted by development of conflicting uses within areas of high ranked natural resources and Special Habitat Areas. Near streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be reduced. Could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). It is assumed that some natural resources would be retained. Would reduce opportunity for natural resource enhancement.	-	Would maintain most of the economic benefit derived from multiple ecosystem services. Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health could be reduced somewhat. Could complicate the City's ability to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve some opportunities for natural resource enhancement (lost opportunities may have future economic costs).	+/-	Would maintain economic benefits derived from multiple ecosystem services. Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be maintained. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve opportunities for natural resource enhancement (lost appointees may have future economic costs).	+
	Medium	Would reduced economic benefit derived from multiple ecosystem services. A range of ecosystem services could be impacted by development of conflicting uses within areas of medium ranked natural resources. Near streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be reduced. Could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). It is assumed that some natural resources would be retained. Would reduce opportunity for natural resource enhancement.	-	Maintain most of the economic benefit derived from multiple ecosystem services. Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health could be reduced somewhat. Could complicate the City's ability to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve some opportunities for natural resource enhancement (lost opportunities may have future economic costs).	+	Would maintain the economic benefits derived from multiple ecosystem services. Near the streams and wetlands, the ecosystem services related to water quality, floodwater storage and public health would be maintained. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve opportunities for natural resource enhancement (lost appointees may have future economic costs).	+
	Low	Existing ecosystem services provided are very limited, therefore development would have a negligible impact on existing economic benefit. Would reduce opportunity for natural resource enhancement.	o	Existing ecosystem services provided are very limited, therefore development would have a negligible impact on economic benefit. Would preserve some opportunities for natural resource enhancement (lost opportunities may have future economic costs).	o	Existing ecosystem services provided are very limited, therefore development would have a negligible impact on economic benefit Would preserve opportunities for natural resource enhancement (lost appointees may have future economic costs).).	o

Recommendations Based on Economic Analysis

Table 9: Economic Recommendations

Base Zone		A	L	P	Recommendation	Rationale
Industrial **Employment**	Conflicting Use High Ranking Resources/SHA	+ -	+/- +/-	- +	Limit	The goods and services provided by regionally significant industrial/employment uses and high and medium ranked natural resources in industrial areas (primarily, South Rivergate/Powerline Corridor wetlands, North Doane Lake, Doane Creek) are optimized by moderately limiting development in high and medium ranking resource areas. Development would be required to avoid adversely affecting natural resources where practicable, and mitigate for unavoidable impacts.
	Conflicting Use Medium Ranking Resources	+ -	+/- +	- +		
	Conflicting Use Low Ranking Resources	+ o	+/- o	- o	Allow	The goods and services provided by development of regionally significant industrial/employment areas could be fully realized which outweighs impacts on limited ecosystem services provided by low-ranked natural resources.
Commercial	Conflicting Use High Ranking Resources /SHA	+ -	+/- +/-	- +	Limit, except Strictly Limit within 50' of a stream centerline and within 50' of a wetland	The goods and services provided by commercial uses and the ecosystem services provided by significant natural resources can be optimized by limiting development in high and medium ranked resource areas. Development or would be required to avoid adversely affecting natural resources where practicable, and mitigate for unavoidable impacts. Strictly limiting conflicting uses within 50' of a river, stream centerline or wetland would reduce costs to replace critical hydrologic and water quality related ecosystem services, and would advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act).
	Conflicting Use Medium Ranking Resources	+ -	+/- +	- +		
	Conflicting Use Low Ranking Resources	+ o	+/- o	- o	Allow	The goods and services provided by commercial uses could be fully realized. Existing ecosystem services are very limited in low-ranked resource areas; therefore the economic impact of commercial development would be negligible.
Institutional	Conflicting Use High Ranking Resources /SHA	+ -	+/- +/-	- +	Strictly Limit	The ecosystem services provided by significant natural resources are optimized by strictly limiting development in high ranked resource areas. Development would be allowed only under narrowly defined conditions and would require a finding that the public benefit outweighs adverse impacts on resource functions and values. Mitigation would be required. Strictly limiting conflicting uses would advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act).

Table 9: Economic Recommendations						
Base Zone		**A**	**L**	**P**	**Recommendation**	**Rationale**
	Conflicting Use Medium Ranking Resources	+ -	+/- +	- +	Limit, except Strictly Limit within 50' of a stream centerline, and within 50' of a wetland	The goods and services provided by institutional uses and the ecosystem services provided by significant natural resources can be optimized by limiting development in high and medium ranked resource areas. Development would be required to avoid adversely affecting natural resources where practicable, and mitigate for unavoidable impacts. Strictly limiting conflicting uses within 50' of a river, stream centerline or wetland would reduce costs to replace critical hydrologic and water quality related ecosystem services and would advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act).
	Conflicting Use Low Ranking Resources	+ o	+/- o	- o	Allow	The goods and services provided by institutional uses could be fully realized. Existing ecosystem services are very limited in low-ranked resource areas; therefore the economic impact of commercial development would be negligible.
Residential	Conflicting Use High Ranking Resources /SHA	+/- -	+/- +/-	+/- +	Strictly Limit	The goods and services provided by residential uses and significant natural resources can be optimized by strictly limiting residential uses in high ranked resource areas. Development would be allowed only under narrowly defined conditions and would require a finding that the public benefit outweighs adverse impacts on resource functions and values. Mitigation would be required. Strictly limiting conflicting uses would advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act).
	Conflicting Use Medium Ranking Resources	+/- -	+/- +	+/- +	Limit, except Strictly Limit within 50' of a stream centerline, and within 50' of a wetland	The goods and services provided by residential uses and the ecosystem services provided by significant natural resources can be optimized by limiting development in medium resource areas. Development in significant resource areas would be required to avoid adversely affecting natural resources where practicable, and mitigate for unavoidable impacts. Strictly limiting conflicting uses within 50' of a river, stream centerline or wetland would reduce costs to replace critical hydrologic and water quality related ecosystem services and would advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act).
	Conflicting Use Low Ranking Resources	+/- o	+/- o	+/- o	Allow	The goods and services provided by residential uses could be fully realized. Existing ecosystem services are very limited in low-ranked resource areas; therefore the economic impact of commercial development would be negligible.

Table 9: Economic Recommendations						
Base Zone		**A**	**L**	**P**	**Recommendation**	**Rationale**
Open Space	Conflicting Use High Ranking Resources /SHA	+/- -	+/- +/-	+/- +	Strictly Limit	The goods and services provided by open space uses and significant natural resources can be optimized by strictly limiting residential uses in high ranked resource areas. Development would be allowed only under narrowly defined conditions and would require a finding that the public benefit outweighs adverse impacts on resource functions and values. Mitigation would be required.
	Conflicting Use Medium Ranking Resources	+/- -	+/- +	+/- +	Limit; except Strictly Limit within 50' of a stream centerline, and within 50' of a wetland	The goods and services provided by open space uses and the ecosystem services provided by significant natural resources can be optimized by limiting development in medium resource areas. Development in significant resource areas would be required to avoid adversely affecting natural resources where practicable, and mitigate for unavoidable impacts. Strictly limiting conflicting uses within 50' of a river, stream centerlines or wetland would reduce costs to replace critical hydrologic and water quality related ecosystem services.
	Conflicting Use Low Ranking Resources	+/- o	+/- o	+/- o	Allow	The goods and services provided by open space uses could be fully realized. Existing ecosystem services are very limited in low-ranked resource areas; therefore the economic impact of commercial development would be negligible.

5.c.2 Social Analysis

This section examines the social consequences of allowing, limiting or prohibiting conflicting uses for the North Reach. The social analysis focuses on the following topics:

- Health, safety and welfare
- Recreational and educational opportunities
- Housing and employment opportunities
- Historic, heritage and cultural values
- Visual amenities
- Screening and buffering of incompatible uses

A general discussion of each topic is presented below, followed by an analysis of the social consequences of allowing, limiting, or prohibiting conflicting uses that would adversely affect significant resources.

Health, Safety and Welfare

Natural resources and open spaces provide important water quality, air quality, flood control, river/stream bank stability and landslide protection functions. Trees and vegetative cover provide slope stability, prevent stream bank erosion and allow for permeable soils to absorb and hold floodwaters, while conserving fish and wildlife habitat. The cost to property owners and insurance companies from landslides, flooding and erosion can be a significant if development is not carefully engineered; even downstream properties may be affected by vegetation clearing and/or increase surface runoff.

The importance of these values is reflected in regional, state and federal laws such as the Clean Water Act. Metro established requirements that cities and counties create programs to maintain vegetated corridors along streams and wetlands to protect water quality. Metro adopted Regional Water Quality Resource Areas maps and regulations in Title 3 of the Urban Growth Management Functional Plan. Water Quality Resource Areas include land within 50 feet of rivers, streams and wetlands, and land within 200 feet of rivers, streams and wetlands where slopes exceed 25 percent. Similarly, the Clean Water Act requires Designated Management Agencies to establish plans to manage stormwater and to control pollutant loading where water bodies do not water quality meet standards. The City of Portland is a Designated Management Agency. DEQ recently established Total Maximum Daily Loads for the Willamette Basin, including limits on factors that increase water temperature. The primary tool to reduce temperature in streams is shading provided by riparian vegetation. Trees and other types of vegetation also reduce the urban heat island effect, which contributes to respiratory illnesses such as asthma.

Vegetation, natural areas and open spaces have an impact on human behavior and psyche. Dr. Roger Ulrich of Texan A&M's Center for Health Systems and Design found that passive scenic values, such as looking at trees, reduce stress, lower blood pressure and enhance medical recovery (Ulrich et al. 1991). A study of residents in public housing in Chicago found that compared with apartment building that had little or no vegetation, buildings with high levels of greenery had 52% fewer total crimes, including 48% fewer property crimes and 56% fewer violent crimes (Kuo and Sullivan, 2001a). The presence of trees and grass can lower the

incidence of aggression and violent behavior (Kuo and Sullivan, 2001b). Common green areas in neighborhoods can also increase community ties and support networks.

Studies have shown that exposure to natural environment enhances children's cognitive development by improving their awareness, attention, reasoning and observational skills (Louv, 2005).

Recreational and Educational Opportunities

Access to nature is an important community asset. In a 2004 City of Portland Parks and Recreation survey, park users identified a need for new natural wildlife areas for recreational purposes like bird watching and nature/wildlife observation (Godbe). Another study found that Portland homeowners would rather live near urban natural areas than other types of open space (Lutzenhiser, 2001).

Recreational and educational opportunities are afforded by natural resources that currently exist in the North Reach. Public open spaces and natural areas such as Kelley Point and Cathedral parks afford passive recreational opportunities, such as wildlife viewing, picnicking, and hiking, or more active recreation, such as motorized boat access, concerts, and biking.

Natural resources also provide important recreational and educational opportunities in private settings. Employees may use such areas to walk or jog during lunch or breaks, and employers may choose to provide educational information about the river or resources within or near their facilities to encourage employees to exercise and to improve pride and morale. Examples of privately owned resource areas that do or could provide important recreational and education opportunities include: Harborton Wetlands, South Rivergate Corridor, and North Doane Lake, Doane Creek and adjacent habitat areas. Some of these areas contain wetlands, open stream segments and/or riparian vegetation. Numerous wildlife including fish, turtles, birds and mammals use these areas.

Recreation has multiple health benefits. Exercise improves overall health which reduces public and private costs, improves quality of life, and may help adults live longer (Nieman, 1998). Activities such as walking in the woods give a boost the immune system (Sachs and Segal, 1994). In addition, the Centers for Disease Control strongly recommends improving access to places for physical activities such as biking or hiking trails to reduce the risk of cardiovascular disease, diabetes, obesity, selected cancers and musculoskeletal conditions.

Open spaces and natural areas in the North Reach provide an opportunity for Portlanders to learn about environmental science, natural history, and cultural history of the Willamette River and the Pacific Northwest. Natural areas and open spaces provide "living laboratories" for active educational programs. Many schools use natural areas as a focal point of interdisciplinary studies. This model of learning has been shown to improve critical thinking skills, achievement in standardized tests and improved student attitudes about learning and civility toward others (Leiberman and Hoody, 1998).

The University of Portland (UP) is located within the North Reach. The University has roughly 3,500 students and 316 professors. The University is ranked among the top 10 schools in the West by *U.S. News and World Report* and was also ranked among the top "best values" in the

region for offering an excellent education at a reasonable cost. The University is continuing to grow and a major expansion and renovation of the School of Engineering building began. There are also plans to incorporate riverfront properties into the campus and creating a connection between the campus above and below the bluff

Housing Opportunities

Housing can be a conflicting use with respect to natural resources. It is assumed that establishing limitations to protect natural resources may affect the scale, location or type of housing that can be provided, but may not necessarily affect the number of potential dwelling units. If a portion of a site is designated for natural resource conservation, housing can often be clustered to avoid the natural resources resulting in smaller lot sizes and/or dwelling units. This may have a long term affect on the mix of housing types and size available on the market; and may or may not affect the overall availability of housing.

Within the ESEE evaluation area of River North Reach there are 340 acres of residentially zoned land. This represents 20 percent of the North Reach ESEE evaluation area. Residential areas exist in the Linnton, Cathedral Park, University Park and Overlook neighborhoods. It is assumed that strictly limiting or limiting conflicting residential uses in the Willamette River North Reach would not affect the city's housing capacity or choices of different housing types primarily because very little of the city's housing capacity is located within the North Reach.

Employment Opportunities

Major employment opportunities are typically provided on land zoned for commercial, industrial and institutional uses. As noted in the Economic section, roughly 39,000 workers are employed by industries and businesses located in the Portland Harbor, and the industrial sector provides the highest earnings prospects for the workforce without a bachelor's degree. Access to higher wage jobs contributes to Portland having a relatively large middle class as compared to other large US cities.

Employment is also provided in conjunction with residential construction including new construction, redevelopment and remodeling.

Providing opportunities for employment in close proximity to local and regional employment bases in Portland and the City of Vancouver provides many social benefits including reduced commuting time, which allows families more time together. Limiting these uses could reduce the amount, range and income level of employment opportunities in the North Reach.

Historic, Heritage and Cultural Values

The Willamette and Columbia rivers are important to the culture of the area. The confluence of these major river systems is culturally and economically significant to multiple Native American Tribes. Fish and wildlife play key roles, currently and historically, in Native American religion and culture. The Columbia River Inter-Tribal Fish Commission stated in 2002 that "without salmon returning to our rivers and streams, we would cease to be Indian people." The United States has treaty obligations toward various Native American tribes. Those obligations require

the Unites States to ensure the availability of salmon for fishing. By supporting the goal of conserving and restoring salmon runs, the City of Portland contributes to meeting the United States treaty obligations as well as improving inter-cultural relationships.

European settlement occurred at the confluence of the Willamette and Columbia rivers due to the abundant natural resources and opportunities for trade. As Portland developed, the rivers played a key role in the economy. In the 1800's the Willamette River was used to move goods, particularly logs and agricultural products. In the mid-1900's shipbuilding was located in the Willamette River North Reach. The value Portlanders placed on the environment was reflect in city plans including the 1903 Olmsted vision for a 40-mile loop trail that encompassed Portland and provide it's residents access to open spaces. The 40-mile loop trail is still being realized today through a system of trails throughout the city.

Portlanders value the environment and quality of life. The Oregon state symbols reflect this value. The Oregon state bird is the Western Meadowlark, which is currently a state-listed Species of Concern and has been early extirpated from the city due to loss of native grasslands. Five runs of the state fish, the Chinook salmon, use the Columbia and Willamette rivers and all five are federally listed as Threatened or Endangered. The beaver is Oregon's state animal and still resides in many of Portland's waterways.

Portland's identification with nature and wildlife is reflected in many ways. The Audubon Society of Portland is over 100 years old and is the largest chapter of the national Audubon Society. Many Portlanders are avid bird-watchers. Local festivals including the Wild Arts Festival and Salmon Festival are attended by thousands of residents. The City is currently co-sponsoring a new event to celebrate the role of the Willamette River in Portland. The first "River Fest" was held in Portland in summer 2008.

Metro has recognized the importance of fish and wildlife and their habitats by adopting the regional "Nature in Neighborhoods" program in 2006. This program establishes regional baseline requirements to protect fish and wildlife habitat and water quality. The requirements focus on protecting, conserving and restoring natural resource functions and values in riparian corridors. Establishing this program reflects the importance of environmental quality to the residents of the Metro region, including Portlanders.

Visual Amenities

Neighborhood landscapes, parks and playgrounds, backyards and scenic views each contribute a "sense of place" and personal attachment to particular locations. People are socially connected to the entirety of the built and natural environmental by walking, biking and driving through areas with street trees, gardens, parks and other open spaces. Natural resources and open spaces create a sense of identity and visual variety in the city. Natural resources can also soften or buffer the appearance, noise, and other impacts of urbanization. Trees, open spaces and water bodies help define the visual appeal the Portland area. People also identify with urban landscapes including river harbors and marinas, new and old structures, workplaces, museum, restaurants and stores, parks and plazas, and other gathering spaces.

In the Willamette River North Reach, views of local and regional features including the river and adjacent industrial areas, various bridges, the Willamette Bluffs, Forest Park and Mt. St. Helens, contribute to the scenic character of this area and of city as a whole.

Screening and Buffering Incompatible Uses

Natural resources and open spaces create natural screens and buffers between incompatible land uses, separating them and reducing a broad array of impacts. For example, the US Department of Agriculture reports that a 100-foot wide and 45-foot tall patch of trees (approximately 1/10 an acre) can reduce noise levels by 50 percent (1998). Trees can also reduce the off-site impacts of lighting. Noise is a significant civic issue in the North Reach communities of St. Johns and Linnton, where residential and industrial uses are adjacent to one another. Trees can also add soothing sounds of wind and bird song.

In the Willamette River North Reach natural resource areas provide a buffer between river-related and other industrial uses, and residential uses in the St. Johns and Linnton neighborhoods.

Social Consequences by Land Use Type

To determine the consequences of development, three scenarios are assessed: allowing, limiting and prohibiting conflicting uses that would adversely affect significant natural resources in the North Reach. Each of these program choices would result in different mixes of positive and negative economic consequences as relates to conflicting uses and natural resources.

In evaluating the consequences of *allowing* conflicting uses it is assumed that all significant natural resources would be subject to development allowed by regulations that apply in the base zone. It is also assumed that mitigation for impacts on natural resources would not be required.

In evaluating the consequences of *limiting* conflicting uses it is assumed that rules would be established to limit the impacts of allowable development in areas containing significant natural resources. Areas containing significant natural resources would still be subject to some development, but development restrictions would exist in addition to base zone regulations. The City's current environmental overlay zoning program either *limits* or *strictly limits* the impacts conflicting uses on significant natural resources through the application of the environmental conservation (c) zone or the environmental protection (p) zone, respectively.

- *Within the c-zone*, development is required to avoid adversely affecting natural resources where practicable and to mitigate for unavoidable impacts.
- *Within the p-zone*, only a narrow set of uses or development types are allowed under specific circumstances. Development that is necessary to provide access is allowed. In the circumstance that the public benefits of the proposed development outweigh the impacts on natural resources, the development may be allowed out-right or with conditions. In either situation, mitigation for unavoidable impacts is required.

In evaluating the consequences of *prohibiting* conflicting uses it is assumed that rules would be established that preclude all allowable development in significant natural resource areas.

Tables 10 and 11 address the consequences of associated with the three programmatic approaches. Consequences are described, and further represented by these symbols:

- (+) more positive than negative consequences
- (-) more negative than positive consequences
- (+/-) development would have both positive and negative consequences; and/or positive and negative consequences are generally balanced
- (o) consequences would be neutral or negligible

For the social analysis, the consequences associated with industrial, employment and commercial uses are addressed together. This is appropriate because the potential social consequences of allowing, limiting or prohibiting these types of development on the conflicting uses and the natural resources are expected to be similar. For example, limiting conflicting uses within natural resources areas could reduce some social amenities related to employment opportunities in the North Reach.

Table 10: Social Consequences for Conflicting Uses

	Allow		Limit		Prohibit	
Industrial **Employment** **Commercial**	Would maintain industrial and employment opportunities in close proximity to employment bases. Would contribute to and foster historical and cultural values related to industrial uses. Would reduce health and safety benefits associated with natural resources, particularly air and water quality, and could make it difficult for the City to comply with regional, state and federal regulatory requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would reduce benefits of natural resource screening and buffering between land uses. Reduce resource-related amenities that contribute to a pleasant and healthful working environment.	+/-	Would maintain most industrial and employment opportunities. Would contribute to historical and cultural values related to industrial and employment uses. Would maintain most health benefits associated with natural resources, particularly air and water quality, and could complicate strategies to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve some benefits provided by natural buffers and screening between land uses. Would preserve some resource-related amenities that contribute to a pleasant and healthful working environment.	+/-	Would reduce some industrial and employment opportunities. Would not contribute to historical and cultural values related to industrial and employment uses. Would preserve benefits provided by natural buffers and screening between land uses. Would preserve health benefits associated with natural resources, particularly air and water quality. Would preserve resource-related amenities that contribute to a pleasant and healthful working environment.	+/-
Institutional	Would maintain most or all employment, cultural and educational opportunities provided educational and other institutions. Educational opportunities associated with natural resources could be adversely affected. Would reduce benefits of natural screening and buffering between land uses. Would reduce health and safety benefits associated with natural resources, particularly air and water quality, and could make it difficult for the City to comply with regional, state and federal regulatory requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would reduce visual amenities provided by natural resources. Would reduce resource-related amenities that contribute to a pleasant and healthful working environment.	+/-	Would maintain most or all employment, cultural and educational opportunities provided educational and other institutions. Educational opportunities associated with natural resources could be adversely affected. Would maintain most health benefits associated with natural resources, particularly air and water quality, and could complicate strategies to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve some benefits of natural screening and buffering between land uses. Would preserve some visual amenities provided by natural resources. Would reserve most resource-related amenities that contribute to a pleasant and healthful working environment.	+	Could reduce employment, educational and cultural opportunities associated with institutions if it is not feasible to design facilities to avoid significant natural resource areas. Would preserve health benefits associated with natural resources, particularly air and water quality. Would preserve benefits of natural screening and buffering between land uses. Would preserve visual amenities provided by natural resources. Would preserve resource-related amenities that contribute to a pleasant and healthful working environment.	+/-
Residential	Would maintain housing options and opportunities within resource areas. Would reduce health and safety benefits associated with natural resources, particularly air and water quality, and could make it for the City to comply with regional, state and federal regulatory requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would reduce benefits of natural screening and buffering between land uses, potentially reducing housing opportunities on abutting sites. Would reduce visual amenities and neighborhood character, including local access to nature, provided by natural resources.	+/-	Would maintain most housing options and opportunities (particularly where clustering is possible.) Would reduce opportunities for some housing types, particularly large detached dwellings, large street backs and large landscaped yards. Would maintain most health benefits associated with natural resources, particularly air and water quality, and could complicate strategies to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve some benefits of natural screening and buffering between land uses. Would preserve some visual amenities and neighborhood character, including local wildlife, provided by natural resources.	+	Would reduce some limited housing opportunities and options. Would maintain health benefits associated with natural resources. Would preserve benefits of natural screening and buffering between land uses. Would preserve visual amenities and neighborhood character, including wildlife, provided by natural resources.	+/-
Open Space	Would maintain options for active open space uses that require resource alteration or removal (e.g. community centers, ball fields).	+/-	Would preserve most options for more active open spaces uses that require resource alteration or removal (e.g. community centers, ball fields).	+	Would reduce social benefits related to more active open spaces uses that require resource alteration or removal (e.g. community centers).	+/-

Table 10: Social Consequences for Conflicting Uses

	Allow		Limit		Prohibit	
	Would reduce some health and safety benefits associated with natural resources. Would reduce some benefits of natural screening and buffering between land uses		Would maintain most health benefits associated with natural resources, particularly air and water quality. Would preserve most benefits of natural screening and buffering between land uses		Would maintain health benefits associated with natural resources. Would preserve benefits of natural screening and buffering between land uses	

Table 11: Social Consequences for Natural Resources

Conflicting Use	Resource Ranks	Allow		Limit		Prohibit	
Industrial **Employment** **Commercial**	High & SHA	Would reduce some recreational and educational values of high ranking natural resources and Special Habitat Areas. Would contribute to the loss of historic and cultural values related to natural resources. Would reduce important health and welfare benefits, particularly air and water quality, associated with high ranked natural resources and Special Habitat Areas, and could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would reduce the scenic values and neighborhood character, including local wildlife, associated with high ranking natural resources and Special Habitat Areas.	-	Would preserve most of the recreational and educational values of high ranking natural resources and Special Habitat Areas. Would maintain most of the historic and cultural values related to natural resources. Would maintain most health benefits associated with natural resources, particularly air and water quality, and could complicate strategies to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve some scenic values, neighborhood character, and local wildlife, associated with high ranking natural resources and Special Habitat Areas.	+/-	Would preserve the recreational and educational values of high ranking natural resources and Special Habitat Areas. Would preserve the historic and cultural values related to natural resources. Would reserve the health and welfare benefits, particularly air and water quality, associated with high ranking natural resources and Special Habitat Areas. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve the scenic value and neighborhood character, including local wildlife, associated with high ranking natural resources and Special Habitat Areas.	+
	Medium	Would reduce recreational, education and health values of medium ranking natural resources. Would reduce important health and welfare benefits, particularly air and water quality, associated with medium ranked natural resources and Special Habitat Areas, and could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would contribute to the loss of historic and cultural values related to natural resources. Would reduce scenic qualities of natural resources.	-	Would preserve most of the recreational and educational values of medium ranking natural resources. May contribute incrementally to reductions in historic and cultural values related to natural resources. Would maintain most health benefits associated with natural resources, particularly air and water quality, and could complicate strategies to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL).	+/-	Preserve the recreational and educational values of medium ranking natural resources. Preserve the historic and cultural values related to natural resources. Preserve the health and welfare and scenic values associated with medium ranking natural resources. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL).	+
	Low	The loss in social value associated with allowing development in low-ranked areas would be negligible. Many of these resource areas are developed floodplain which are subject to balanced cut and fill requirements.	o	The impact on social values associated with allowing limited development in low-ranked areas would be negligible. Many of these resource areas are developed floodplain which are subject to balanced cut and fill requirements.	o	The impact on social value associated with prohibiting development in low-ranked areas would be negligible. Many of these resource areas are developed floodplain which are subject to balanced cut and fill requirements.	o
Institutional **Residential**	High & SHA	Would reduce recreational and educational values of high ranking natural resources and Special Habitat Areas. Would contribute to the loss of some historic and cultural values related to natural resources. Would reduce important health and welfare benefits, particularly air and water quality, associated with high ranked natural resources and Special Habitat Areas, and could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would reduce the scenic values and neighborhood character, including local wildlife, associated with high ranking natural resources and Special Habitat Areas.	-	Would preserve most of the recreational and educational values of high ranking natural resources and Special Habitat Areas. Would maintain most of the historic and cultural values related to natural resources. Would maintain most health benefits associated with natural resources, particularly air and water quality, and could complicate strategies to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve most scenic values and neighborhood character, including local wildlife, associated with high ranking natural resources and Special Habitat Areas.	+/-	Would preserve the recreational and educational values of high ranking natural resources and Special Habitat Areas. Would preserve the historic and cultural values related to natural resources. Would preserve the health and welfare benefits, particularly air and water quality, associated with high ranking natural resources and Special Habitat Areas. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve the scenic values associated with high ranking natural resources and Special Habitat Areas.	+

Table 11: Social Consequences for Natural Resources

Conflicting Use	Resource Ranks	Allow		Limit		Prohibit	
	Medium	Would reduce recreational, education and health values of medium ranking natural resources. Would reduce important health and welfare benefits, particularly air and water quality, associated with medium ranked natural resources and Special Habitat Areas, and could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would contribute to the loss of some historic and cultural values related to natural resources. Loss of scenic qualities of natural resources.	-	Would preserve some or all of the recreational and educational values of medium ranked natural resources. May contribute incrementally to the loss of historic and cultural values related to natural resources. Would maintain most health benefits associated with natural resources, particularly air and water quality, and could complicate strategies to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL).	+/-	Would preserve the recreational and educational values of medium ranking natural resources. Would preserve the historic and cultural values related to natural resources. Preserve the health and welfare and scenic values associated with medium ranking natural resources. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL).	+
	Low	The loss in social value associated with allowing development in low-ranked areas would be negligible.	o	The impact on social values associated with allowing limited development in low-ranked areas would be negligible.	o	The impact on social value associated with prohibiting development in low-ranked areas would be negligible.	o
Open Space	High & SHA	Would reduce recreational, education and health and safety values of high ranked natural resources and Special Habitat Areas, and could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would contribute to the loss of some historic and cultural values related to natural resources. Would reduce scenic values associated with high ranking natural resources and Special Habitat Areas.	-	Would preserve most of the recreational, educational and health and safety values of high ranked natural resources and Special Habitat Areas, and could complicate strategies to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Title 3, TMDL). Would maintain most of the historic and cultural values related to natural resources. Would preserve most of the scenic values associated with high ranking natural resources and Special Habitat Areas.	+/-	Preserve the recreational and educational values of high ranked natural resources and Special Habitat Areas. Preserve the historic and cultural values related to natural resources. Preserve the health and welfare benefits, particularly air and water quality, associated with high ranked natural resources and Special Habitat Areas. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Preserve the scenic values associated with high ranking natural resources and Special Habitat Areas.	+
	Medium	Would reduce some recreational, education and health values of medium ranked natural resources. Would contribute to the loss of historic and cultural values related to natural resources. Would reduce scenic qualities of natural resources.	-	Would preserve most of the recreational and educational values of medium ranked natural resources. May contribute incrementally to the loss of historic and cultural values related to natural resources. Would maintain most health benefits associated with natural resources, particularly air and water quality.	+	Preserve the recreational and educational values of medium ranked natural resources. Preserve the historic and cultural values related to natural resources. Preserve the health and welfare and scenic values associated with medium ranked natural resources. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL).	+
	Low	The loss in social value associated with allowing development in low-ranked areas would be negligible.	o	The impact on social values associated with allowing limited development in low-ranked areas would be negligible.	o	The impact on social value associated with prohibiting development in low-ranked areas would be negligible.	o

Recommendations Based on Social Analysis

Table 12: Social Recommendations

Base Zone		A	L	P	Recommendation	Rationale
Industrial Employment Commercial	Conflicting Use High/SHA	+/- -	+/- +/-	+/- +	Limit, except Strictly Limit within 50' of a stream centerline, and within 50' of a wetland	Limiting conflicting uses in industrial, employment and commercial zones is intended to balance the social values provided by both natural resources and conflicting uses in the North Reach. Mitigation would be required for unavoidable impacts on natural resource values and functions. Strictly limiting conflicting uses within 50' of a river, stream centerline or wetland would help preserve critical ecosystem services that contribute to public health and safety (e.g., stormwater management, flood hazard reduction), and will advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act).
	Conflicting Use Medium	+/- +/-	+/- +/-	+/- +		
	Conflicting Use Low	+/- o	+/- o	+/- o	Allow	An Allow decision would contribute to the social values provided by uses allowed in industrial, employment and commercial zones and would have a negligible impact on the social values provided by low-ranked resources.
Institutional	Conflicting Use High/SHA	+/- -	+/- +/-	+/- +	Strictly Limit	Strictly limiting conflicting uses in institutional zones recognizes the importance of the social values provided by natural resources to the public and to the institutional uses themselves. This decision also recognizes that institutional uses may have more flexibility to avoid natural resources though long-term master planning than many industrial, employment and commercial uses have. Strictly limiting conflicting uses would advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act).
	Conflicting Use Medium	+/- -	+ +/-	+/- +	Limit, except Strictly Limit within 50' of a stream centerline, and within 50' of a wetland	Limiting conflicting uses in institutional zones is intended to maintain the social benefits provided by institutional uses and natural resources. Strictly limiting conflicting uses within 50' of a river, stream centerline, or wetland would preserve critical ecosystem services that contribute to public health and safety (e.g., stormwater management, flood hazard reduction), and will advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act).

Table 12: Social Recommendations						
Base Zone		**A**	**L**	**P**	**Recommendation**	**Rationale**
	Conflicting Use Low	+/- o	+ o	+/- o	Allow	An Allow decision would contribute to the social values provided by uses allowed in institutional zones and would have a negligible impact on the social values provided by low-ranked resources.
Residential	Conflicting Use High/SHA	+/- -	+/- +/-	+/- +	Strictly Limit	Strictly limiting conflicting uses in residential zones recognizes the importance of the social values provided by natural resources to the public and to the residential uses themselves. This decision also recognizes that residential uses may have more flexibility to avoid natural resources than many industrial, employment and commercial uses have. Strictly limiting conflicting uses will advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act).
	Conflicting Use Medium	+/- -	+ +/-	+/- +	Limit, except Strictly Limit within 50' of a stream centerline, and within 50' of a wetland	Limiting conflicting uses in residential zones is intended to maintain the social benefits provided by residential uses and natural resources. Strictly limiting conflicting uses within 50' of a river, stream centerline, or wetland would preserve critical ecosystem services that contribute to public health and safety (e.g., stormwater management, flood hazard reduction), and will advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act).
	Conflicting Use Low	+/- o	+ o	+/- o	Allow	An Allow decision would contribute to the social values provided by uses allowed in residential zones and would have a negligible impact on the social values provided by low-ranked resources.
Open Space	Conflicting Use High/SHA	+/- -	+ +/-	+/- +	Strictly Limit	Strictly limiting conflicting uses in open space zones recognizes the importance of the social values provided by natural resources to the public and to the open space uses themselves. This decision also recognizes that open space uses may have more flexibility to avoid natural resources than many industrial, employment and commercial uses have. Strictly limiting conflicting uses will advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act).

Table 12: Social Recommendations						
Base Zone		**A**	**L**	**P**	**Recommendation**	**Rationale**
	Conflicting Use Medium	+/- -	+ +	+/- +	Limit, except strictly Limit within 50' of a stream centerline, and within 50' of a wetland	Limiting conflicting uses open space zones is intended to maintain the social benefits provided by open space uses and natural resources. Strictly limiting conflicting uses within 50' of a river, stream centerline, or wetland would preserve critical ecosystem services that contribute to public health and safety (e.g., stormwater management, flood hazard reduction), and will advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act).
	Conflicting Use Low	+/- o	+ o	+/- o	Allow	An Allow decision would contribute to the social values provided by uses allowed in open space zones and would have a negligible impact on the social values provided by low-ranked resources.

5.d.3 Environmental Analysis

The environmental portion of the ESEE analysis outlines the environmental consequences of allowing, limiting or strictly limiting conflicting uses. The natural environment in urban areas is altered and disturbed by human activities. Human welfare depends in part of vital ecosystem services such as fresh air, clean water, food supply, shade, species diversity and access to nature. Fish and wildlife also depend on having adequate amounts and quality of habitat, even in urban areas. The *Willamette River Natural Resources Inventory* (July 2008) details the environmental functions provided by significant riparian corridors and wildlife habitat areas within the North Reach. A summary of environmental functions is provided below:

- **Microclimate and shade –** Open water bodies and wetlands, and surrounding trees and woody vegetation are associated with localized air cooling, increased humidity, and soil moisture. Shading from riparian vegetation also helps keep water in streams and wetlands cool which is important to fish and other aquatic species. In larger rivers like the Willamette riparian shading can provide local benefits particularly where there area shallow water areas near the bank.
- **Bank stabilization and control of sediments, nutrients and pollutants –** Trees, vegetation, roots and leaf litter intercept precipitation, hold soils, banks and steep slopes in place, slow surface water runoff, take up nutrients, and filter sediments and pollutants found in surface water.
- **Stream flow moderation and flood storage –** Waterways and floodplains provide for conveyance and storage of stream flows and floodwaters, while trees and vegetation intercept precipitation and promote infiltration which tempers stream flow fluctuations or "flashiness" that often occurs in urban watersheds.
- **Large wood and channel dynamics –** Streams, riparian wetlands, floodplains and large trees and woody vegetation contribute to the natural changes in location and configuration of stream channels over time.
- **Organic inputs, food web and nutrient cycling –** Water bodies, wetlands and nearby vegetation provide food for aquatic species (e.g., plants, leaves, twigs, and insects) and are part of an ongoing chemical, physical and biological nutrient cycling system.
- **Wildlife habitat/corridors –** Vegetation, water bodies and other landscape features (e.g. downed logs) provides wildlife habitat functions including food, cover, breeding and nesting opportunities, and migration corridors. Native and locally unique vegetation, such as native Oregon white oak/Pacific madrone assemblages, support local native wildlife as well as migratory species. Vegetated corridors along waterways, between waterways and uplands, and between upland habitats allow wildlife to migrate and disperse among different habitat areas, and provide access to water. Vegetation creates a buffer between human activities and wildlife. Noise, light, pollution and domestic animals all impact wildlife and vegetation can reduce those impacts.
- **Urban structures –** Some urban structures, such as bridges, can provide important habitat for wildlife. Peregrine falcons nest on many of Portland's bridges including the St. Johns, BNFS Railroad and the Fremont bridges located in the Willamette River North Reach.

As discussed in the economic and social analyses, environmental functions provide amenities and economic benefits. Social amenities include recreation, education, buffering/screen of land

uses, health and welfare, and scenery. Economic benefits include reduced infrastructure costs, prevention of loss due to floods and landslides, and reduced heating and cooling needs.

Much of the natural resources in the North Reach are impacted by past and current development. Some of the resources are also contaminated. New development and redevelopment provide an opportunity for clean-up of contamination and enhancement of natural resources.

Environmental Consequences by Land Use Type

To determine the consequences of development, three scenarios are assessed: allowing, limiting and prohibiting conflicting uses that would adversely affect significant natural resources in the North Reach. Each of these program choices would result in different mixes of positive and negative economic consequences as relates to conflicting uses and natural resources.

In evaluating the consequences of *allowing* conflicting uses it is assumed that all significant natural resources would be subject to development allowed by regulations that apply in the base zone. It is also assumed that mitigation for impacts on natural resources would not be required.

In evaluating the consequences of *limiting* conflicting uses it is assumed that rules would be established to limit the impacts of allowable development in areas containing significant natural resources. Areas containing significant natural resources would still be subject to some development, but development restrictions would exist in addition to base zone regulations The City's current environmental overlay zoning program either *limits* or *strictly limits* the impacts conflicting uses on significant natural resources through the application of the environmental conservation (c) zone or the environmental protection (p) zone, respectively.

- *Within the c-zone*, development is required to avoid adversely affecting natural resources where practicable and to mitigate for unavoidable impacts.
- *Within the p-zone*, only a narrow set of uses or development types are allowed under specific circumstances. Development that is necessary to provide access is allowed. In the circumstance that the public benefits of the proposed development outweigh the impacts on natural resources, the development may be allowed out-right or with conditions. In either situation, mitigation for unavoidable impacts is required.

In evaluating the consequences of *prohibiting* conflicting uses it is assumed that rules would be established that preclude all allowable development in significant natural resource areas.

Tables 13 and 14 address the consequences of associated with the three programmatic approaches for conflicting uses and for natural resources. Consequences are described, and further represented by these symbols:

- (+) more positive than negative consequences
- (-) more negative than positive consequences
- (+/-) development would have both positive and negative consequences; and/or positive and negative consequences are generally balanced
- (o) consequences would be neutral or negligible

For the environmental analysis, the consequences associated with industrial, employment and commercial development addressed together and the consequences associated with institutional

and residential development are addressed together. This is appropriate because the development impacts are similar between the uses with regards to stormwater management, heat and cooling, clearing and grading, impervious surface and landscaping.

Table 13: Environmental Consequences for Conflicting Uses

	Allow		Limit		Prohibit	
Industrial **Employment** **Commercial**	Would reduce stormwater management and water quality benefits provided by natural resources. Would reduce air quality and cooling benefits provided by natural resources. Would increase wildfire hazards, particularly on steep slopes. Would reduce opportunities for natural resource enhancement. No change in development potential.	+/-	Would maintain most stormwater management and water quality benefits provided by natural resources. Would maintain most air quality and cooling benefits provided by natural resources. Would limit increases in wildfire hazard Would preserve some opportunities for resource enhancement. Minimal change in development potential.	+/-	Would maintain stormwater management and water quality benefits provided by natural resources. Would maintain air quality and cooling benefits provided by natural resources. Would reduce wildfire hazards, particularly on steep slopes. Would reduce development potential on industrial lands in close proximity to the Portland Harbor. Could increase the environmental impacts associated with transporting goods over land.	+/-
Institutional **Residential**	Would reduce stormwater management and water quality benefits provided by natural resources. Would reduce air quality and cooling benefits provided by natural resources. Would increase wildfire hazards, particularly on steep slopes. Would reduce opportunities for natural resource enhancement. No change in development potential.	+/-	Would maintain most stormwater management and water quality benefits provided by natural resources. Would maintain most air quality and cooling benefits provided by natural resources. Would limit increases in wildfire hazards. Would preserve some opportunities for resource enhancement. Minimal change in development potential.	+/-	Would maintain stormwater management and water quality benefits provided by natural resources. Would maintain air quality and cooling benefits provided by natural resources. Would reduce wildfire hazards, particularly on steep slopes. Would reduce development potential.	+/-
Open Space	The environmental consequences of allowing open space uses in low-ranked resource areas, on the conflicting uses themselves, would be minimal. Would reduce opportunities for natural resource enhancement. No change in development potential	+/-	The environmental consequences of allowing limited conflicting uses in low-ranked resource areas, on the conflicting uses themselves, would be negligible.. Would preserve some opportunities for resource enhancement. Minimal change in development potential.	+	The environmental consequences of prohibiting limited conflicting uses in low-ranked resource areas, on the conflicting uses themselves, would be negligible. Would reduce development potential.	+/-

Table 14: Environmental Consequences for Natural Resources

	Resource Ranks	Allow		Limit		Prohibit	
Industrial **Employment** **Commercial**	High & SHA	Would result in loss of significant environmental functions. All environmental functions would be impacted by of conflicting uses within area of high ranked natural resources and Special Habitat Areas (impacts are greater for these high intensity uses). Could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Development would likely affect environmental functions in nearby resource areas (e.g. noise, light, runoff). Would reduce opportunities for natural resource enhancement (lost opportunities may have future impacts on adjacent natural resources)..	-	Would maintain most environmental functions in areas containing high ranked natural resources and Special Habitat Areas, or through mitigation on- or off-site. Could complicate strategies to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Development could affect environmental functions in nearby resource areas area (e.g. noise, light, runoff). Mitigation could enhance existing resource quality and function. Would preserve some opportunities for natural resource enhancement	+/-	Would maintain environmental functions of high ranked natural resources and Special Habitat Areas. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve opportunities for environmental enhancement	+
	Medium	Would result in loss environmental functions. A range of environmental functions would be impacted by of conflicting uses within area of medium ranked natural resources (impacts are greater for these high intensity uses). Could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Development would likely affect environmental functions in nearby resource areas (e.g. noise, light, runoff). Would reduce opportunities for natural resource enhancement (lost opportunities may have future impacts on adjacent natural resources).	-	Would maintain most environmental functions in areas containing medium ranked natural resources, or through mitigation on- or off-site. Could complicate strategies to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Development could affect environmental functions in nearby resource areas (e.g. noise, light, runoff). Mitigation could enhance overall resource function on a site or in the reach. Would preserve some opportunities for natural resource enhancement	+/-	Would maintain environmental functions of medium ranked natural resources. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve opportunities for environmental enhancement (lost opportunities may have future impacts on adjacent natural resources).	+
	Low	Would reduce already limited environmental functions. Development would likely affect environmental functions in nearby resource areas (e.g. noise, light, runoff). Would reduce opportunities for natural resource enhancement (lost opportunities may have future impacts on adjacent natural resources).	-	Would maintain most environmental functions. , Development could affect environmental functions in nearby higher value resource (e.g. noise, light, runoff). Development could affect some environmental functions in nearby resource areas outside the development disturbance area (e.g. noise, light, runoff). Would preserve most opportunities for natural resource enhancement.	+	Would maintain environmental functions. Would preserve opportunities for environmental enhancement.	+

Table 14: Environmental Consequences for Natural Resources

	Resource Ranks	Allow		Limit		Prohibit	
Institutional **Residential**	High & SHA	Would result in loss of most environmental functions in areas containing high ranked natural resources and Special Habitat Areas. Could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would reduce opportunities for natural resource enhancement (lost opportunities may have future impacts on adjacent natural resources).	-	Would maintain most environmental functions in areas containing high ranked natural resources and Special Habitat Areas. Could complicate strategies to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Mitigation could improve existing resource quality and function. Would preserve most opportunities for natural resource	+/-	Would maintain environmental functions of high ranking natural resources and Special Habitat Areas. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve opportunities for natural resource enhancement	+
	Medium	Would result in loss of a range of environmental functions in areas containing medium ranked natural resources. Could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would reduce opportunities for natural resource enhancement.	-	Would maintain most environmental functions in areas containing medium ranking natural resources. Could complicate strategies to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Mitigation could improve existing resource quality and function. Would preserve most opportunities for environmental enhancement (lost opportunities may have future impacts on adjacent natural resources).	+	Would maintain environmental functions of medium ranked natural resources. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve opportunities for environmental enhancement (lost opportunities may have future impacts on adjacent natural resources).	+
	Low	Would reduce already limited environmental functions. Would educe opportunities for resource enhancement.	-	Would maintain limited environmental functions. Mitigation could improve existing resource quality and function. Would preserve some opportunities for environmental enhancement.	+	Would maintain environmental functions of low ranked natural. Protect opportunities for natural resource enhancement (lost opportunities may have future impacts on adjacent natural resources).	+
Open Space	High & SHA	Would result in loss of environmental functions in areas containing high ranked natural resources and Special Habitat Areas. Could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would reduce opportunities for natural resource enhancement.	-	Would maintain most environmental functions in areas containing high ranked natural resources and Special Habitat Areas. Could complicate strategies to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Mitigation could improve existing resource quality and function. Would preserve most opportunities for environmental enhancement (lost opportunities may have future impacts on adjacent natural resources).	+/-	Would maintain environmental functions of high ranked natural resources and Special Habitat Areas. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve opportunities for natural resource enhancement (lost opportunities may have future impacts on adjacent natural resources).	+
	Medium	Would result in loss of environmental functions. A range of environmental functions would be impacted by of conflicting uses within area of medium ranked natural resources. Could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would reduce opportunities for natural resource enhancement.	-	Would maintain most environmental functions in areas containing medium ranking natural resources. Could complicate strategies to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Mitigation could improve existing resource quality and function. Would preserve most opportunities for natural resource enhancement (lost opportunities may have future impacts on adjacent natural resources).	+	Would maintain environmental functions of medium ranked natural. Would aide in the City's compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL). Would preserve opportunities for natural resourcel enhancement (lost opportunities may have future impacts on adjacent natural resources).	+

Table 14: Environmental Consequences for Natural Resources

	Resource Ranks	Allow		Limit		Prohibit	
	Low	Would reduce already limited environmental functions. Would reduce opportunities for natural resource enhancement.	-	Maintain some environmental functions. Loss of environmental functions within the development disturbance area. Mitigation could improve existing resource quality and function. Would preserve some opportunities for environmental enhancement.	+	Would maintain environmental functions of low ranked natural resources. Would preserve opportunities for natural resource enhancement (lost opportunities may have future impacts on adjacent natural resources).	+

Recommendations Based on Environmental Analysis

Table 15: Environmental Recommendations

Base Zone		A	L	P	Recommendation	Rationale
Industrial Employment Commercial	Conflicting Use High/SHA	+/- -	+/- +/-	+/- +	Strictly Limit	Strictly limiting uses in industrial zones would prevent impacts from these high intensity land uses on high and medium ranked natural resources and will advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act).
	Conflicting Use Medium	+/- -	+/- +/-	+/- +		
	Conflicting Use Low	+/- -	+/- +/-	+/- +	Limit,	Limiting uses in industrial, employment and commercial zones would prevent some impacts from these intensive land uses on low ranked natural resources. Development would be required to mitigate for unavoidable impacts on natural resources and may offer opportunities for resource enhancement.
Institutional Residential	Conflicting Use High/SHA	+/- -	+/- +/-	+/- +	Strictly Limit	Strictly limiting uses in institutional and residential zones would prevent impacts from these moderate intensity land uses on high ranked natural resources and will advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act)..
	Conflicting Use Medium	+/- -	+/- +	+/- +	Limit, except Strictly Limit within 50' of a stream centerline, and within 50' of a wetland	Limiting uses in institutional and residential zones would prevent some impacts from these moderate intensity land uses in the North Reach. Development would be required to mitigate for unavoidable impacts on natural resources and may offer opportunities for resource enhancement. Strictly limiting uses within 50' of a river, stream centerline or wetland will help maintain critical riparian corridor values and functions and will advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act).
	Conflicting Use Low	+/- -	+/- +	+/- +	Limit	Limiting uses in institutional and residential zones would prevent some impacts from these intensive land uses on low ranked natural resources. Development would be required to mitigate for unavoidable impacts on natural resources and may offer opportunities for resource enhancement.
Open Space	Conflicting Use High/SHA	+/- -	+/- +	+/- +	Strictly Limit	Strictly limiting uses in open space zones would prevent impacts from low to moderate intensity land uses on high ranked natural resources and will advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act)..

Table 15: Environmental Recommendations						
Base Zone		**A**	**L**	**P**	**Recommendation**	**Rationale**
	Conflicting Use Medium	+/- -	+ +	+/- +	Limit, except Strictly Limit within 50' of a stream centerline, and within 50' of a wetland	Limiting uses in open space zones would prevent some impacts on natural resource values and functions. Development would be required to mitigate for unavoidable impacts on natural resources and may offer opportunities for resource enhancement. Strictly limiting uses within 50' of a river, stream centerline or wetland will help maintain critical riparian corridor values and functions and will advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act).
	Conflicting Use Low	+/- -	+ +	+/- +	Limit	Limiting uses in open space zones would prevent some impacts from these intensive land uses on low ranked natural resources. Development would be required to mitigate for unavoidable impacts on natural resources and may offer opportunities for resource enhancement.

5.d.4 Energy Analysis

This analysis outlines the energy consequences of allowing, limiting or prohibiting conflicting uses. The analysis focuses on the following topics: transportation, water, sewer, stormwater, and the heating and cooling of structures. A general discussion of these topics is provided below.

Transportation

Energy expenditures for transportation relate primarily to travel distances from origin to destination and mode of transportation used. Both variables can be affected by natural resource protection in terms of the location of development and routing of transportation facilities. The industrial lands in the Willamette River North Reach provide an energy-efficient location for businesses that move goods. Marine and rail transportation are more energy efficient than truck transportation and industries and businesses in the North Reach have access to multi-modal freight hubs, which helps reduce transportation-related energy consumption.

The availability of jobs near housing reduces commuter miles and energy consumption. The industries and businesses in the North Reach provide employment opportunities within close proximity to neighborhoods in the cities of Portland and Vancouver. The regional availability of alternative modes of transportation, such as buses, light rail, and walking and cycling routes, can also help reduce transportation-related energy consumption.

Designing transportation routes and facilities to avoid adversely affecting natural resources could increase or decrease the size or length of an infrastructure facility, and could affect the distance or travel time between origin and destination, for both people and goods. Within the North Reach there are multiple forms of transportation that are important to commerce. Railroads and streets connect to the regional transportation infrastructure to move goods throughout the region.

Infrastructure

Infrastructure services require energy to construct, operate and maintain. Efficient site design, e.g., clustered housing and other facilities, enables the provision of adequate sewer, stormwater, and water services while reducing overall demand for infrastructure (e.g., shorter lines, more efficient stormwater and wastewater treatment). Efficient site design can also allow development to avoid significant natural resources, although in some instances additional infrastructure may be needed to avoid the resource. Development located away from flood and slope hazards can eliminate the need for additional structural components or hazard control structures.

Natural resources can be considered part of the infrastructure of the City. Trees and other vegetation intercept rain and snow, which reduces stormwater runoff and the need for stormwater management in the form of pipes and detention ponds. Rivers, streams, wetlands and flood areas provide hydrologic functions including providing a location for water to flow and storing floodwaters. When water bodies are filled, channelized or otherwise altered, additional infrastructure is needed to move water through the urban landscape (e.g. pipes) and to control

flooding. Soil, water bodies and vegetation filter pollutants from the water, improving water quality and reducing the need for treatment.

Within the Willamette River North Reach much of the infrastructure is hardscaped and includes roads, rail, stormwater and sewer pipes, etc. Green infrastructure in the North Reach includes vegetated slopes along the bluff, wetlands (e.g. South Rivergate Corridor) and open streams channels and riparian vegetation. Much of the green infrastructure is impacted by past development and adjacent land uses.

Heating and Cooling

Energy demand for heating and cooling structures can be affected by site design, building form, and presence of trees, vegetation or water bodies. The orientation of buildings and use of vegetation to maximize solar heating in the winter and shading in the summer reduce both heating and cooling needs. The retention of trees, vegetation and water bodies, and the planting of new trees and vegetation reduce ambient air temperature and maintains local humidity, which can also help cooling needs Vegetation can also create a windbreak that can slow or divert cold winter winds reducing heat loss. Construction techniques that reduce the surface to volume ratio of a building (e.g., common wall), can also help reduce heating and cooling needs.

Because there is little vegetation remaining the North Reach, the existing heating and cooling benefits are limited. Vast areas of impervious surface and areas devoid of large structure vegetation, add to heating and cooling needs.

Energy Consequences by Land Use Type

To determine the consequences of development, three scenarios are assessed: allowing, limiting and prohibiting conflicting uses that would adversely affect significant natural resources in the North Reach. Each of these program choices would result in different mixes of positive and negative economic consequences as relates to conflicting uses and natural resources.

In evaluating the consequences of *allowing* conflicting uses it is assumed that all significant natural resources would be subject to development allowed by regulations that apply in the base zone. It is also assumed that mitigation for impacts on natural resources would not be required.

In evaluating the consequences of *limiting* conflicting uses it is assumed that rules would be established to limit the impacts of allowable development in areas containing significant natural resources. Areas containing significant natural resources would still be subject to some development, but development restrictions would exist in addition to base zone regulations. The City's current environmental overlay zoning program either *limits* or *strictly limits* the impacts conflicting uses on significant natural resources through the application of the environmental conservation (c) zone or the environmental protection (p) zone, respectively.

- *Within the c-zone*, development is required to avoid adversely affecting natural resources where practicable and to mitigate for unavoidable impacts.
- *Within the p-zone*, only a narrow set of uses or development types are allowed under specific circumstances. Development that is necessary to provide access is allowed. In the circumstance that the public benefits of the proposed development outweigh the impacts on natural resources, the development may be allowed out-right or with conditions. In either situation, mitigation for unavoidable impacts is required.

In evaluating the consequences of *prohibiting* conflicting uses it is assumed that rules would be established that preclude all allowable development in significant natural resource areas.

Tables 16 and 17 address the consequences of associated with the three programmatic approaches for conflicting uses and for natural resources. Consequences are described, and further represented by these symbols:

- (+) more positive than negative consequences
- (-) more negative than positive consequences
- (+/-) development would have both positive and negative consequences; and/or positive and negative consequences are generally balanced
- (o) consequences would be neutral or negligible

For the energy analysis, the consequences of allowing, limiting or prohibiting the following types of development are sufficiently similar to be addressed together:

- Industrial and Employment: both types of development have similar stormwater management and heating and cooling needs; clearing and grading for site preparation are are similar
- Institutional and Residential: these types of development have similar stormwater management and heating and cooling needs; site preparation often include retention of some on-site vegetation and open water bodies

Table 16: Energy Consequences for Conflicting Uses

	Allow		Limit		Prohibit	
Industrial **Employment**	Would require land preparation and construction of stormwater management and other infrastructure facilities Would require energy for heating and cooling Would reduce transportation energy demand by maintaining employment opportunities in close proximity to the employment base. Could increase energy demand to maintain non-native landscaping.	+/-	Could reduce energy impacts of land preparation, new infrastructure facilities, transportation, and heating and cooling by requiring low-impact, sustainable development design, and alternative/innovative transportation options. Potentially some increase in transportation energy demand by reducing industrial land supply and creating longer distances between jobs and work. Would reduce energy demand for landscaping if native vegetation is retained or restored.	+/-	No additional energy demand for development. Would maintain heating and cooling benefits for existing uses. Could increase in transportation energy demand by reducing industrial land supply and creating longer distances between jobs and work, and between freight infrastructure and heavy industry.	-
Commercial	Would require land preparation and construction of stormwater management and other infrastructure facilities Would require energy for heating and cooling Would reduce transportation energy demand by maintaining employment opportunities in close proximity to the employment base. Could increase energy consumption required to maintain non-native landscaping.	+/-	Could reduce energy impacts of land preparation, new infrastructure facilities, transportation, and heating and cooling by requiring low-impact, sustainable development design, and alternative/innovative transportation options. Potentially some increase in transportation energy demand by reducing industrial land supply and creating longer distances between jobs and work. Would reduce energy demand for landscaping if native vegetation is retained or restored.	+/-	No additional energy demand for development. Would maintain heating and cooling benefits for existing uses. Could increase in transportation energy demand by reducing industrial land supply and creating longer distances between jobs and work.	-
Institutional **Residential**	Would require land preparation and construction of stormwater management and other infrastructure facilities, including structures to reduce risk landslides and erosion on steep slopes. Would reduce natural heating and cooling provided by resources. Could reduce transportation energy demand by providing institutional and residential facilities close to population and employment centers. Could increase energy consumption required to maintain non-native landscaping	+/-	Would limit energy impacts of land preparation and construction of stormwater management and other infrastructure facilities, including structures to reduce risk landslides and erosion on steep slopes. Could achieve energy efficiency if development is “clustered” to avoid natural resources. Could reduce transportation energy demand by providing institutional and residential facilities close to population and employment centers. Would preserve some natural heating and cooling benefits of natural resources. Would reduce energy demand for landscaping if native vegetation is retained or restored.	+	No additional energy demand for development Would maintain heating and cooling benefits for existing uses. Could increase transportation energy demand by reducing institutional and residential facilities close to population and employment centers.	-
Open Space	Would require land preparation and construction of stormwater management and other infrastructure facilities, including structures to reduce risk landslides and erosion on steep slopes. Could require heating and cooling of buildings. Could reduce transportation energy demand by providing recreational facilities close to population centers. Could increase energy consumption required to maintain non-native landscaping	+/-	Would limit energy impacts of land preparation and construction of stormwater management and other infrastructure facilities, including structures to reduce risk landslides and erosion on steep slopes. Would preserve some natural heating and cooling benefits of natural resources. Could reduce transportation energy demand by providing recreational facilities close to population centers. Would reduce energy demand for landscaping if native vegetation is retained or restored.	+	No additional energy demand for development Would maintain heating and cooling benefits for existing uses. Could increase transportation energy demand by reducing open space and recreational facilities close to population and employment centers.	-

Table 17: Energy Consequences for Natural Resources

	Resource Ranks	Allow		Limit		Prohibit	
Industrial Employment	High & SHA	Would reduce the energy benefits derived from natural resources. Multiple benefits would be impacted by development of conflicting uses in areas of high ranked natural resources and Special Habitat Areas (impacts are greater for these high intensity uses). Would reduce opportunities for natural resource enhancement.	-	Would maintain most of the energy functions provided by high ranked natural resources and Special Habitat Areas Mitigation or enhancement requirements could increase some of the energy benefits provided by natural resources. Could reduce some opportunities for natural resource enhancement.	+/-	Would maintain energy functions provided by natural resources. Would maintain opportunities for resource enhancement. Would eliminate potential enhancement through development.	+
	Medium	Would reduce the energy benefits derived from natural resources. A range of benefits would be impacted by development of conflicting uses in areas of medium ranked natural resources (impacts are greater for these high intensity uses). Would reduce opportunities for natural resource enhancement.	-	Would maintain most of the energy functions provided by medium ranked natural resources (more benefits are lost with this land use due to the land intensive nature of development). Mitigation or enhancement requirements could increase some of the energy benefits provided by natural resources. Could reduce some opportunities for natural resource enhancement.	+	Would maintain energy functions provided by natural resources. Would maintain opportunities for resource enhancement. Would eliminate potential enhancement through development.	+/-
	Low	The impact on energy benefits derived from allowing development in low-ranked natural resources would be negligible. Would reduce opportunities for natural resource enhancement.	o	The impact on energy benefits derived from allowing limited development in low-ranked natural resources would be negligible. Could reduce some opportunities for natural resource enhancement.	o	Impact on energy benefits derived from prohibiting development in low-ranked natural resource areas would be negligible. Would maintain opportunities for resource enhancement. Would eliminate potential enhancement through development.	o
Commercial	High & SHA	Would reduce the energy benefits derived from natural resources. Multiple benefits would be impacted by development of conflicting uses in areas of high ranked natural resources and Special Habitat Areas. Would reduce opportunities for natural resource enhancement.	-	Would maintain most of the energy functions provided by high ranked natural resources and Special Habitat Areas (more benefits are lost with this land use due to the land intensive nature of development). Mitigation or enhancement requirements could increase some of the energy benefits provided by natural resources. Could reduce some opportunities for natural resource enhancement.	+/-	Would maintain energy functions provided by natural resources. Would maintain opportunities for resource enhancement. Would eliminate potential enhancement through development.	+
	Medium	Would reduce the energy benefits derived from natural resources. A range of benefits would be impacted by development of conflicting uses in areas of medium ranked natural resources. Would reduce opportunities for natural resource enhancement.	-	Maintain a range of the energy functions provided by medium ranked natural resources (more benefits are lost with this land use due to the land intensive nature of development). Mitigation or enhancement requirements could increase the energy benefits provided by natural resources. Could reduce some opportunities for natural resource enhancement.	+	Would maintain energy functions provided by natural resources. Would maintain opportunities for resource enhancement. Would eliminate potential enhancement through development.	+/-

Table 17: Energy Consequences for Natural Resources

	Resource Ranks	Allow		Limit		Prohibit	
	Low	Impact on energy benefits derived from low-ranked natural resources would be negligible. Would reduce opportunities for natural resource enhancement.	o	The impact on energy benefits derived from allowing limited development in low-ranked natural resources would be negligible. Could reduce some opportunities for natural resource enhancement.	o	Impact on energy benefits derived from prohibiting development in low-ranked natural resource areas would be negligible. Would maintain opportunities for resource enhancement. Would eliminate potential enhancement through development.	o
Institutional **Residential**	High & SHA	Would reduce the energy benefits derived from natural resources. Multiple benefits would be impacted by development of conflicting uses in areas of high ranked natural resources and Special Habitat Areas. Would reduce opportunities for natural resource enhancement.	-	Would maintain most of the energy functions provided by high ranked natural resources and Special Habitat Areas (more benefits are lost with this land use due to the land intensive nature of development). Mitigation or enhancement requirements could increase the energy benefits provided by natural resources. Could reduce some opportunities for natural resource enhancement.	+/-	Would maintain energy functions provided by natural resources. Would maintain opportunities for resource enhancement. Would eliminate potential enhancement through development.	+
	Medium	Would reduce the energy benefits derived from natural resources. A range of benefits would be impacted by development of conflicting uses in areas of medium ranked natural resources. Would reduce opportunities for natural resource enhancement.	-	Maintain a range of the energy functions provided by medium ranked natural resources (more benefits are lost with this land use due to the land intensive nature of development). Mitigation or enhancement requirements could increase the energy benefits provided by natural resources. Could reduce some opportunities for natural resource enhancement.	+	Would maintain energy functions provided by natural resources. Would maintain opportunities for resource enhancement. Would eliminate potential enhancement through development.	+/-
	Low	Impact on energy benefits derived from low-ranked natural resources would be negligible. Would reduce opportunities for natural resource enhancement.	o	The impact on energy benefits derived from allowing limited development in low-ranked natural resources would be negligible. Could reduce some opportunities for natural resource enhancement.	o	Impact on energy benefits derived from prohibiting development in low-ranked natural resource areas would be negligible. Would maintain opportunities for resource enhancement. Would eliminate potential enhancement through development.	o
Open Space	High & SHA	Would reduce the energy benefits derived from natural resources. Multiple benefits would be impacted by development of conflicting uses in areas of high ranked natural resources and Special Habitat Areas.	-	Would maintain most of the energy functions provided by high ranked natural resources and Special Habitat Areas (more benefits are lost with this land use due to the land intensive nature of development). Mitigation or enhancement requirements could increase the energy benefits provided by natural resources. Could reduce some opportunities for natural resource enhancement.	+/-	Would maintain energy functions provided by natural resources. Would maintain opportunities for resource enhancement. Would eliminate potential enhancement through development.	+

Table 17: Energy Consequences for Natural Resources

	Resource Ranks	Allow		Limit		Prohibit	
	Medium	Would reduce the energy benefits derived from natural resources. A range of benefits would be impacted by development of conflicting uses in areas of medium ranked natural resources.	-	Maintain a range of the energy functions provided by medium ranked natural resources (more benefits are lost with this land use due to the land intensive nature of development). Mitigation or enhancement requirements could increase the energy benefits provided by natural resources. Could reduce some opportunities for natural resource enhancement.	+	Would maintain energy functions provided by natural resources. Would maintain opportunities for resource enhancement. Would eliminate potential enhancement through development.	+/-
	Low	Impact on energy benefits derived from low-ranked natural resources would be negligible.	o	The impact on energy benefits derived from allowing limited development in low-ranked natural resources would be negligible. Could reduce some opportunities for natural resource enhancement.	o	Impact on energy benefits derived from prohibiting development in low-ranked natural resource areas would be negligible. Would maintain opportunities for resource enhancement. Would eliminate potential enhancement through development.	o

Recommendations Based on Energy Analysis

Table 18: Energy Recommendations						
Base Zone		**A**	**L**	**P**	**Recommendation**	**Rationale**
Industrial Employment Commercial	Conflicting Use High/SHA	+/- -	+/- +/-	- +	Limit, except Strictly Limit within 50' of a stream centerline, and within 50' of a wetland	Limiting conflicting uses allowed in industrial, employment and commercial zones will preserve most energy benefits provided by natural resources while preventing increased transportation energy demand if such uses and associated jobs had to locate outside the North Reach. Strictly limiting conflicting uses within 50' of a river, stream centerline, or wetland would preserve shade and microclimate effects of riparian vegetation and water bodies.
	Conflicting Use Medium	+/- -	+/- +	- +/-		
	Conflicting Use Low	+/- o	+/- o	- o	Allow	Allowing conflicting uses would prevent increases in transportation energy demand while energy impacts on low ranked resources would be negligible.
Institutional Residential	Conflicting Use High/SHA	+/- -	+ +/-	- +	Limit except Strictly Limit within 50' of a stream centerline, and within 50' of a wetland	Limiting conflicting uses allowed in institutional and residential zones will preserve most energy benefits provided by natural resources while preventing increased transportation energy demand if jobs and housing associated with these uses shifted to areas outside the North Reach. Strictly limiting conflicting uses within 50' of a river, stream centerline, or wetland would preserve shade and microclimate effects of riparian vegetation and water bodies.
	Conflicting Use Medium	+/- -	+ +	- +/-		
	Conflicting Use Low	+/- o	+ o	- o	Allow	Allowing conflicting uses would prevent increases in transportation energy demand while energy impacts on low ranked resources would be negligible.
Open Space	Conflicting Use High/SHA	+/- -	+ +/-	- +	Limit, except Strictly Limit within 50' of a stream centerline, and within 50' of a wetland	Limiting conflicting uses allowed in open space zones will preserve most energy benefits provided by natural resources while preventing increased transportation energy demand if recreational opportunities associated were required to located in areas outside the North Reach. Strictly limiting conflicting uses within 50' of a river, stream centerline, or wetland would preserve shade and microclimate effects of riparian vegetation and water bodies.
	Conflicting Use Medium	+/- -	+ +	- +/-		
	Conflicting Use Low	+/- o	+ o	- o	Allow	Allowing conflicting uses would prevent increases in transportation energy demand while energy impacts on low ranked resources would be negligible.

5.d.5 General Willamette River North Reach ESEE Results

Tables 19, 20 and 21 present the results of the general economic, social, environmental and energy analyses conducted for the North Reach. The tables include results of the analyses performed for each of the ESEE factors, and the final recommended program decision that is intended to optimize the ESEE consequences across the four factors. Separate tables are provided to show the ESEE recommendations for the different relative ranks assigned to the natural resource identified in the Willamette Natural Resource Inventory (High/SHA; Medium; Low). Following these tables, Table 22 presents a summary of the final recommended ESEE decisions for all of the different resource ranks. The section concludes with a recommended general ESEE decision for the Impact Areas. As was explained on page 4, these recommendations apply only to those sites within the North reach, but outside of the area governed by the Willamette River Greenway, Goal 15.

Table 19: ESEE Results for High Ranked Significant Resources and Special Habitat Areas

Base Zone	Economic	Social	Environmental	Energy	Decision
Industrial	Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	**Limit**, except strictly limit within 50' of a stream centerline or wetland
Employment	Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	**Limit**, except strictly limit within 50' of a stream centerline or wetland
Commercial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	**Limit**, except strictly limit within 50' of a stream centerline or wetland
Institutional	Limit, except strictly limit within 50' of a stream centerline or wetland	Strictly Limit	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	**Strictly Limit**
Residential	Strictly Limit	Strictly Limit	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	**Strictly Limit**
Open Space	Strictly Limit	Strictly Limit	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	**Strictly Limit**

Table 20: ESEE Results for Medium Ranked Significant Resources					
Base Zone	**Economic**	**Social**	**Environmental**	**Energy**	**Decision**
Industrial	Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	**Limit**, except strictly limit within 50' of a stream centerline or wetland
Employment	Limit	Limit , except strictly limit within 50' of a stream centerline or wetland	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	**Limit**, except strictly limit within 50' of a stream centerline or wetland
Commercial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	**Limit**, except strictly limit within 50' of a stream centerline or wetland
Institutional	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	**Limit**, except strictly limit within 50' of a stream centerline or wetland
Residential	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	**Limit**, except strictly limit within 50' of a stream centerline or wetland
Open Space	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	**Limit**, except strictly limit within 50' of a stream centerline or wetland

Table 21: ESEE Results for Low Ranked Significant Resources					
Base Zone	**Economic**	**Social**	**Environmental**	**Energy**	**Decision**
Industrial	Allow	Allow	Limit	Allow	**Allow**
Employment	Allow	Allow	Limit	Allow	**Allow**
Commercial	Allow	Allow	Limit	Allow	**Allow**
Institutional	Allow	Allow	Limit	Allow	**Allow**
Residential	Allow	Allow	Limit	Allow	**Allow**
Open Space	Allow	Allow	Limit	Allow	**Allow**

Table 22: General ESEE Decision for All Significant Natural Resources			
Base Zone	Significant Natural Resources		
	High Ranked/ Special Habitat Area	Medium Ranked	Low Ranked
Industrial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Employment	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Commercial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Institutional	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Residential	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Open Space	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow

Note: Exceptions to "limit" decisions for land within 50 feet of streams and wetlands reflects the critical functions provided by streambanks and the land adjacent to streams and wetlands. Land within 50 feet of streams and wetlands provides multiple functions that contribute significantly to the economic and social values and energy needs of the City, as well as providing critical environmental functions. Protecting these areas is also important to achieve compliance with multiple regional, state and federal regulations including Metro Titles 3 and 13, and the federal Clean Water Act and Endangered Species Act. To achieve these objectives, conflicting uses within 50 feet of streams and wetlands should be strictly limited. Strictly limiting conflicting uses within 50 feet of streams and wetlands is not expected, in most instances, to significantly reduce current or future industrial or employment opportunities in the North Reach.

The ESEE decision will implemented through the application of environmental overlay zones. The environmental protection overlay provides the highest level of protection by strictly limiting development to that for which there are no other suitable sites in the City of Portland. The environmental conservation overlay provides a moderate level of protection by limiting allowed development to that which is environmentally sensitive. Within the environmental conservation overlay other development must demonstrate that impacts to natural resources are avoided the extent practicable, impacts that do occur are minimized and that unavoidable impacts are mitigated.

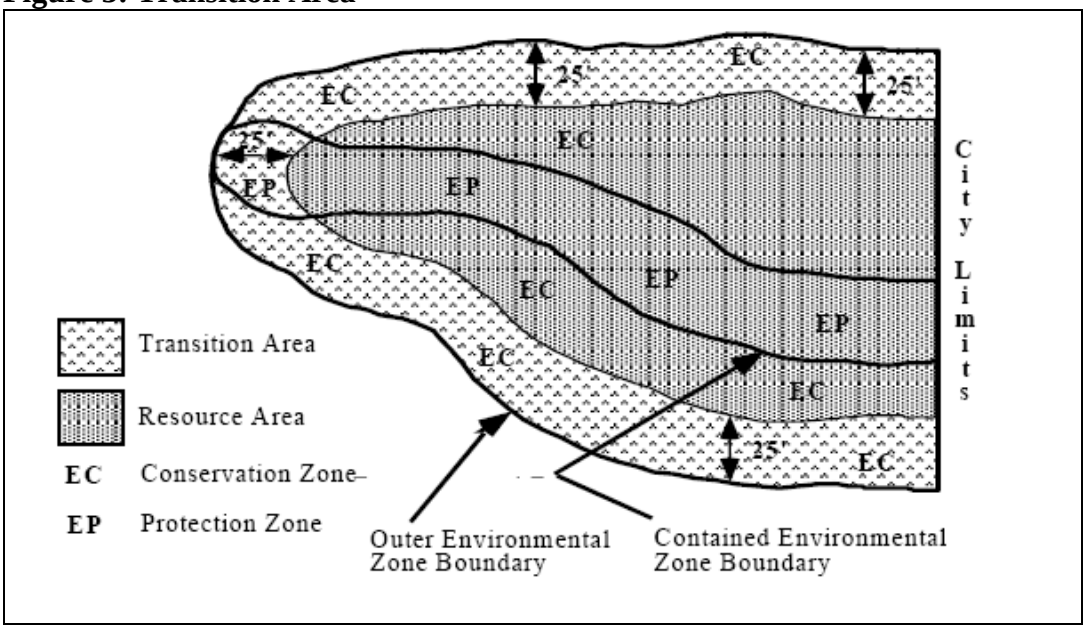
5.d.6 Impact Area Conclusions

The City is electing to rely, generally, on Metro's ESEE decision to *allow* conflicting uses in Impact Areas. In the Impact Area and throughout Portland's watersheds the City is employing a range of tools to protect and enhance natural resources. For example, in the City of Portland any new development or redevelopment that includes impervious surfaces (e.g. structures, driveways) must meet the requirements of the Stormwater Management Manual. Other tools include low impact development, best management practices, education and restoration. This approach is consistent with the most recent City adopted ESEE analysis conducted for the Pleasant Valley Plan District in 2004, where the decision was to allow conflicting uses within the impact area and use other tools to improve overall watershed health. Impact areas provide an important opportunity for landowner education, stewardship and restoration. Best management practices and low impact development activities could be targeted in impact areas.

It is, however, recommended that the City establish one exception to the *allow* decision for Impact Areas in the North Reach. The City of Portland's existing environmental overlay zoning program establishes a 25-foot transition area around natural resource where conflicting uses are to be limited or strictly limited. Portland Zoning Code section 33.430.080 states: "Resources and functional values within transition areas are not significant, but they provide a buffer for the significant resources and functional values within the resource area. The transition area is measured as the first 25 feet inward from an environmental zone boundary except as follows (see Figure 3):

A. Where part of an environmental zone boundary is also the City limits, there is not transition area
B. Where environmental zone boundaries are contained within other environmental zone boundaries, there is no transition area.
C. Where environmental zone boundaries abut other environmental zone boundaries, transition areas are only measured from the combined outer-most boundaries of the environmental zones."

Figure 3: Transition Area



The City's environmental zone regulations help provide a buffer for significant resources through the application of certain development standards that:

- Require a setback from environmental protection overlay zone
- Allow minimum front and street building setbacks to be reduced to avoid significant resources
- Require planted buffers for specified multi-family, commercial and industrial parking areas
- Establish spacing and directional requirements for exterior lighting
- Require landscaped buffers for exterior storage and display areas

Therefore, consistent with the existing environmental program, it is recommended that a transition area be added to natural resource areas for which the North Reach ESEE decision is to limit or strictly limit conflicting uses. The transition area will extend 25 feet outward from edge of the resource area to which the ESEE decision applies. In other words, if the ESEE decision is to apply environmental overlay zoning to a natural resources area, the overlay boundary will be drawn to include the 25 foot transition area.

As Metro points out in their ESEE analysis, significant natural resources are affected cumulatively by development activities throughout the full extent of a watershed. Although it is not reasonable to address entire watersheds within the Goal 5 processes, the City will continue to take actions to improve the watershed conditions and functions in the broader impact area within the North Reach. Such activities will include:

- Implementation and advancement of:
  - Stormwater Management Program
  - Erosion Control Program
  - Revegetation and community stewardship program
  - Green Building Program
  - Willing seller acquisition

- Compliance with Title 13 requirements to encourage and remove barriers to Habitat Friendly Development Practices. Title 13 states that each city and county shall identify provision in their comprehensive plan and implementation ordinances that prohibit or limit the use of habitat-friendly development practices and adopt amendments that remove such barriers. Habitat-friendly development practices include using pervious paving materials, utilizing open drainage system to manage stormwater, extending vegetation cover through wildlife connectivity corridors, and locating landscaping near existing natural resources.

5.e Recommended Overlay Zoning Maps

A set of draft maps that depict the recommended zoning have been produced to illustrate how the Bureau of Planning proposes to apply these ESEE decisions in the North Reach. The draft zoning decisions and maps are provided with each of the inventory site ESEE analysis in chapter 6. The draft zoning maps show the proposed location of the recommended environmental protection and environmental conservation overlay zones to address significant natural resource outside of the Willamette Greenway but within the North Reach study area.

The Bureau of Planning developed a mapping protocol to translate the ESEE decisions for different resource ranks and base zones into zoning maps that are clear and consistent and that will establish a cohesive, implementable resource protection program throughout the North Reach. It is important to note that the existing environmental zoning program allows for corrections and further refinement of overlay zone boundaries based on site-specific information during the land use permit process.

The mapping protocol elements are outlined below.

Transition Areas
The Environmental Overlay Zone chapter of the Portland Zoning Code (Ch. 33.430) establishes a "transition zone" that extends inward 25 feet from environmental zone boundaries. Development that complies with base zone requirements is allowed within the 25-foot transition area. To create the transition area in the North Reach, the environmental zone overlay maps include an additional 25 feet extending outward from the resource area.

Holes
In cases where a relatively small area is ranked differently than the surrounding larger area, a single program decision may be applied to the entire natural resources area. For example, a small area of herbaceous vegetation may be located completely within a larger area of forest canopy. In this situation, the programmatic decision for the forest canopy may be applied to the herbaceous vegetation as well. This approach provides programmatic continuity and a consistent management approach for areas of significant natural resources.

Slivers
Where small, narrow slivers of mapped natural resources are ranked differently than adjacent ranked resource areas, a single programmatic decision may be applied to the entirety of the natural resources area. If the edge of a mapped area sliver abuts or is very close to the edge of another feature (e.g., property line, right-of-way), the environmental overlay zone boundary be drawn to coincide with the other feature boundary.

Boundary smoothing
In some instances the boundary of the inventoried resource areas are winding and sinuous, reflecting the outputs from GIS models and landcover data collected at different scales. These boundaries may be smoothed somewhat to produce environmental overlay zoning maps that are sufficiently accurate and usable at the appropriate scales. This process helps ensure zoning boundaries are not more precise than the underlying data supports.

Map Error Corrections

In some cases during the development of the environmental overlay zoning maps, small scale errors were discovered in inventory maps. As a result, the final zoning map proposal may include boundaries that deviate slightly from the inventory maps, where a correction is supported by other data or field verification. The inventory maps will be updated periodically to reflect improved data and changes on the ground.

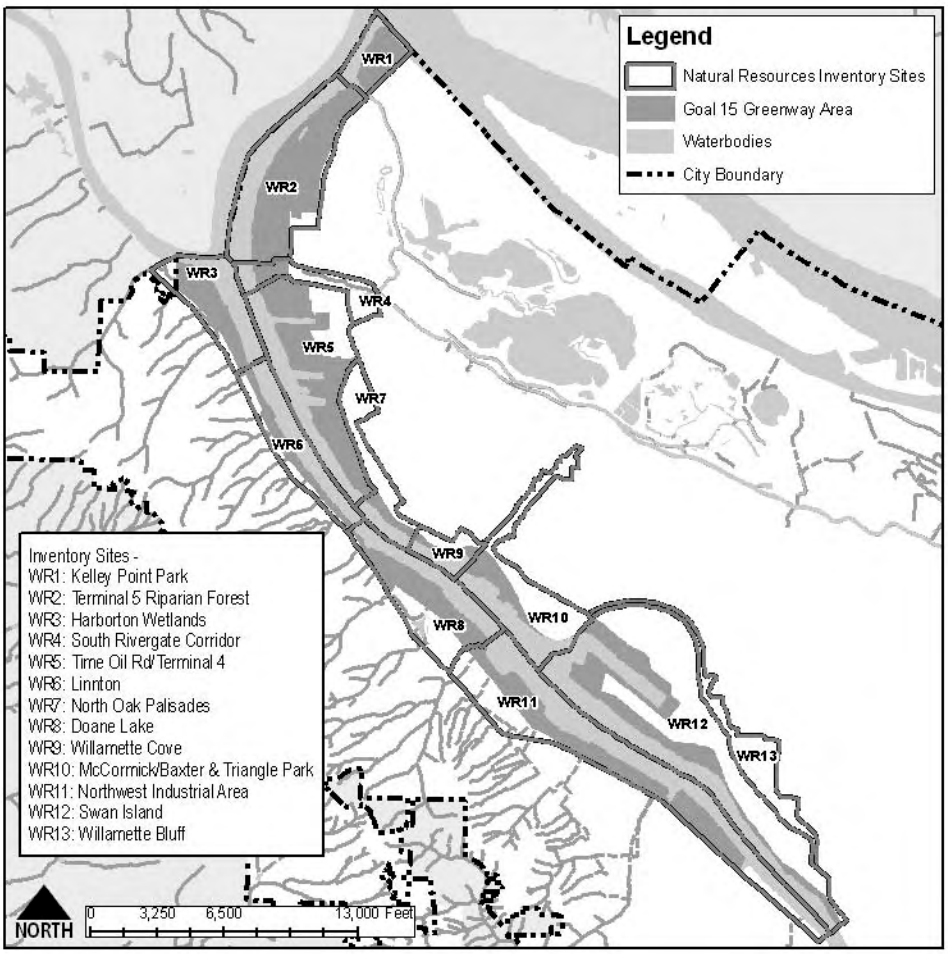
Chapter 6 – ESEE Analyses for Willamette River Inventory Sites

The general Willamette River North Reach ESEE analysis provides a recommendation regarding under what circumstances conflicting uses should be allowed, limited or prohibited within significant natural resource areas. The general ESEE recommendation is intended to establish a baseline decision for the North Reach as a whole.

The North Reach has been divided into inventory sites and the natural resources, along with other site-specific conditions, were described in the *Willamette River Natural Resources Inventory for Riparian Corridors and Wildlife Habitat* (October 2008). Portions of each inventory site are within the Willamette Greenway and are not subject to this ESEE analysis (see Map 9). Inventory sites that contain natural resources and contain lands outside of the Willamette Greenway are:

- WR3: Harborton Wetlands
- WR4: South Rivergate Corridor
- WR5: Time Oil/Terminal 4
- WR6: Linnton
- WR7: North Oak Palisades/Cathedral Park
- WR8: Doane Lake
- WR9: Willamette Cove
- WR10: McCormick/Baxter and Triangle Park
- WR11: Northwest Industrial Area
- WR12: Swan Island
- WR13: Willamette Bluff

Map 9: North Reach Natural Resources Inventory Sites



Within some of the inventory sites there are unique conditions that warrant additional ESEE analysis to supplement and in some instances modify the general ESEE analysis, recommendations and decision. The supplemental analyses focuses on specific landscape features contained within individual inventory sites that are not adequately evaluated by the general analysis. The supplemental ESEE analyses confirm where the general ESEE recommended decision would apply and where the general decision should be modified. The final recommended ESEE decision for each inventory site presents the circumstances in which conflicting uses would be allowed, limited or prohibited. Draft recommended environmental overlay zoning maps are presented to illustrate how the decision would be implemented for each site.

The site-specific supplemental ESEE analyses provide the following information:

- Site description
- Quarter sections
- Conflicting uses by city base zones
- Summary of natural resources
- Previous city-adopted ESEE analysis (if applicable)
- Supplemental ESEE analysis
- Relationship to Metro's ESEE decision
- Environmental Overlay Zone (includes zoning map)

Inventory Site WR3: Harborton Wetlands

Site Description: Inventory site WR3: Harborton Wetlands site is located on the west bank of the Willamette River at the confluence of Multnomah Channel. The western boundary is generally formed by Highway 30 between the southern property line of Owens Corning Roofing and Asphalt and the Portland City boundary. The site includes areas within the City limits and the Multnomah County urban service area boundary. The majority of the inventory site east of Highway 30 and the northern portion of Highway 30, roughly 280 acres, has been evaluated under Goal 15 and is not addressed by this ESEE analysis; this area is identified by River General (g) or River Industrial (i) overlay zones (Map 2). The remainder of the site totaling 60 acres, including portions of Highway 30 and the northern portion of Harborton Wetland within Multnomah County, are evaluated as part of this ESEE analysis.

Quarter Sections:

2N1W33a
2N1W34a, b, c and d
2N1W35c
1N1W03a

Conflicting Uses by City Base Zones:

Table 23: Base Zones in WR3: Harborton Wetlands ESEE Evaluation Area

Zone	Acres	Existing Conflicting Uses	Potential Conflicting Uses
IH	35	industrial, utility corridor, rail line, residential, institutional	residential, commercial, industrial, institutional, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
R10	5	residential	residential, agricultural, institutional, broadcast facilities, rail line and utility corridors, temporary uses
RF	20	marina	residential, agricultural, institutional, mining, broadcast facilities, rail line and utility corridors, temporary uses
OS	<1	Forest Park	commercial, institutional, agricultural, mining, broadcast facilities, rail line and utility corridors, temporary uses

Summary of Natural Resources: Located at the junction of the Willamette River and Multnomah Channel, the 60-acre ESEE evaluation area of this site contains both aquatic and terrestrial resources and provides important habitat linkages along the Willamette River, to Forest Park and Sauvie Island, and across the Willamette to the South Rivergate Corridor. The site contains forested wetland complexes near the junction of the Willamette River and Multnomah Channel, a tributary streams (i.e. Miller Creek), and upland vegetation.

Table 24: Summary of Natural Resource Features in Site WR3: Harborton Wetlands	
	ESEE Evaluation Area (60 acres)
Open Stream Channel (miles)	**1,980**
Wetlands (acres)	**12**
Flood Area (acres)*	**19**
Vegetated (acres)	13
Non-vegetated (acres)	3
Open Water (acres)	3
Vegetated Areas >= ½ acre (acres)+	**29**
Forest (acres)	13
Woodland (acres)	5
Shrubland (acres)	1
Herbaceous (acres)	10
Impervious Surface (acres)	**15**

* The flood area includes the FEMA 100-year floodplain plus the adjusted 1996 flood inundation area.

+ The vegetation classifications are applied in accordance with the National Vegetation Classification System specifications developed by The Nature Conservancy. The data within the primary study area and within 300 feet of all open water bodies in Portland is draft and is currently being updated based 2006 aerial photography.

The Multnomah Channel, beach and near-shore shallow water areas provide important habitat for salmonids that are listed as threatened species under the Endangered Species Act, including Lower Columbia River Chinook salmon and Lower Columbia River steelhead trout (ODFW, 2005). The open water habitat also provides feeding areas for birds such as ducks, cormorants, gulls, herons; and mammals such as river otter and mink. Insectivores such as swallows and bats also forage over the water. A wildlife migration corridor crosses the river in this reach providing a connection between Forest Park and Smith and Bybee Lakes.

The Harborton Wetlands site provides the largest example of remnant black cottonwood-ash bottomland forest within the North Reach. This is one of the last ash bottomland forest remnants along the Willamette River within Portland. Pacific willow is common along the riverbanks, and other trees found in this association are red alder, big-leaf maple, black hawthorn, and western red cedar (rare). The shrub layer is relatively sparse, containing red osier dogwood, Sitka and Scouler's willow in wetter areas, and red elderberry, Indian plum, snowberry, and Himalayan blackberry on the drier uplands. The herbaceous layer contains reed canarygrass, water-starwort, bittercress, sword and licorice ferns and some bracken fern, and stinging nettle. The wetland is also a functioning floodplain, which serves as a potential off-channel rearing site for juvenile salmon. The wetland abuts the Burlington Northern rail corridor. The rail corridor provides some riparian functions including water storage, however these functions are constrained by the rail use.

Miller Creek, a free-flowing, year-round stream with documented use by salmon and steelhead, is also located in the northernmost portion of the site. Recent replacement of the culvert under

Highway 30 improved fish passage.[1] The Miller Creek basin is approximately 770 acres and supports a diverse mix of wildlife including a substantial red-legged frog population. There are five other unnamed tributary streams, originating in Forest Park, piped through the site. Some of these streams have segments of open channel located between Highway 30, the rail corridor and industrial development. The open channel segments range in length from 80 feet to nearly 2,000 feet.

St. Helens Road and the Burlington Northern rail corridor pose a major obstacle to wildlife traveling between this site and Forest Park. Wildlife road kills in this part of Linnton are relatively common. Road and rail activity create noise which can also disturb wildlife. Streams flowing through this site originate in Forest Park; however, they flow through culverts under St. Helens Road and in some instances remain piped until they discharge into the Willamette River.

Upland vegetation, including large, dense stands of trees, exists between Highway 30 and the rail line. The residential areas in the northwestern portion of the site also contain tree canopy that is associated with Forest Park.

Table 25 provides a summary of the ranked resources located with the portion of the site evaluated by this ESEE Analysis. Map 3 depicts ranked natural resource feature.

Table 25: Summary of Significant Resources and Ranks in WR3: Harborton Wetlands ESEE Evaluation Area

Area Evaluated by ESEE Analysis = 60 acres				
	High	**Medium**	**Low**	**Total**
Riparian Resources*				
acres	21	9	6	36
percent of ESEE evaluation area	34	16	10	60
Wildlife Habitat*				
acres	0	16	0	16
percent of ESEE evaluation area	0	27	0	27
Special Habitat Areas*				
acres	12			
percent of ESEE evaluation area	20			
Combined Total**				
acres	21	10	5	35
percent of ESEE evaluation area	35	17	9	60

* High-ranked riparian resources, wildlife habitat, and Special Habitat Areas the Willamette River

** Because riparian resources, wildlife habitat, and Special Habitat Areas overlap, the results cannot be added together to determine the combined area.

[1] Sea-run cutthroat trout, Lower Columbia River Coho salmon, and Lower Columbia River steelhead have been documented in the creek below the culvert (City of Portland, 1991).

Previous City Adopted ESEE Analysis: A portion of the site was addressed in the *Economic, Social, Environmental and Energy Analysis and Recommendations for Natural, Scenic and Open Space Resources within the Multnomah County Unincorporated Urban Areas* report (2002). Resource Site 105-A: Linnton includes lands on both sides of Highway 30, between Harborton Drive and Newberry Road intersections. Below is a summary of findings and decisions.

Economic Analysis

Due to extensive wetlands in the floodplain and steeply sloping parcels in upland, agriculture, mining and additional rail lines and utility corridor uses are not compatible with the resource areas of this site. High quality resources within the site include portions of Miller Creek, Multnomah Channel and associated wetlands, tributaries and riparian vegetation, and upland forested areas. These resources provide water purification services, flood attenuation and storage functions, stormwater management, microclimate and shade, air purification, and fish and wildlife habitat.

The potential economic benefits provided by conflicting uses should they be allowed within significant resource areas is generally low. Allowing or limiting conflicting uses with significant resources areas has potentially negative consequences for ecosystem services. In addition, there are added costs of developing within resource areas of this site (e.g. balanced cut-and-fill within the flood area) and those costs generally offset the potential economic benefits of development.

Social Analysis

Access to Multnomah Channel and Forest Park, and the existence of fish, wildlife and vegetation, provide educational and recreational benefits. Housing opportunities are limited due to physical constraints, availability of vacant lots and water supply infrastructure limitations. Employment opportunities are limited to institutional and agricultural uses; the existing marina provides employment opportunities. The lowland areas along Multnomah Channel provide historic and cultural values that date back to pre-Euroamerican settlement. The hillside and lowland contribute to scenic values and the environmentally friendly image of the region; the Willamette River Scenic Waterway, identified by the City of Portland and State of Oregon, extends into Multnomah Channel and part of the site. The urban forest help reduce air quality problems and the resulting health impacts.

Significant social values associated with the site include: recreational and education opportunities; historic and culture values; value related to visual variety and image; screening and buffering values; and health and welfare values. These values support limiting and in some cases prohibiting conflicting uses in significant resource areas.

Environmental Analysis

The *Inventory of Natural, Scenic and Open Space Resources for Multnomah County Unincorporated Urban Areas* (2002) report contains a detailed discussion of the environmental values of the site.

Fully allowing conflicting uses would result in the lost of significant environmental resources and resources values. Limiting conflicting uses control impacts but does not prevent degradation and loss of resources and values. Prohibiting conflicting uses would protect environmental resources and values.

Energy Analysis

Transportation within the site involves moving people between homes, employment, commercial areas and other services. The site is located within seven miles of several major employment areas including Downtown Portland and North Portland. Automobiles are the main form of transportation. One bus line serves the area. The Burlington Northern rail line runs through the site but does not stop. Water infrastructure is at capacity and new residential development is unlikely until substantial capital improvements are made. Forest and riparian vegetation at the site provides shade for nearby homes and buildings in the summer reducing energy demands for cooling in the summer and creates a wind break reducing heating loss in the winter.

The energy consequences of allowing conflicting uses in significant resources areas are negative. Limiting and in some cases prohibiting conflicting uses in significant resource areas can reduce heating and cooling energy needs and infrastructure-related energy use. The effect of resource protection on energy use related to infrastructure and transportation depends primarily on whether a proposed uses will be required to locate outside the site.

Decision

Strictly limit or limit conflicting use in areas containing wetlands and associated vegetation and forested areas west of Highway 30 (map 2). This decision resulted in application of the environmental protection overly zone to Harborton Wetlands, except where the wetland abuts the Burlington North Railroad or the marina where the environmental conservation overlay zone was applied.

The City also applied a conservation zone to a portion of the site, extending from the intersection of Alderview Road and Highway 30 south approximately 1,500 feet. The area is adjacent to Site 104: Harborton Wetlands inventoried as part of *the Northwest Hills Natural Areas Protection Plan* (1991). This area was not addressed in the document. The conservation zone includes shrubland vegetation within the highway right-of-way. The vegetation extends down the slope from Forest Park and provides a buffer between the highway and significant natural resources and values provided by the forest.

Supplemental ESEE Analysis: The Willamette River North Reach general ESEE analysis and decision presented the previous section and summarized in Table 26 below apply to inventory site WR 3: Harborton Wetlands, except for the modifications described in Table 27.

Table 26: Willamette River North Reach General ESEE Decision

Base Zone	Significant Natural Resources		
	High Ranked/ Special Habitat Area	Medium Ranked	Low Ranked
Industrial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Employment	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Commercial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Institutional	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Residential	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Open Space	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow

Table 27: Supplemental ESEE Analysis for Site WR3: Harborton Wetlands	
Feature	**Herbaceous vegetation patch within the interior of the Harborton Wetland**
WRNRI/ North Reach Combined Riparian/Wildlife Habitat Relative Rank	Medium
Characteristics	▪ Residential base zone ▪ Completely surrounded by a regionally significant wetland ▪ Provides important wildlife habitat values associated with the wetland • Provides water storage during flood events
Willamette River North Reach General ESEE Decision	Limit conflicting uses in medium ranked resource areas in residential base zones
ESEE Implications	Applying a *limit* decision to this resource feature could result in encroachment into the wetland resource. The ecosystem services (e.g. flood water attenuation) and environmental values provided by the vegetation and the surrounding wetland would be negatively affected by such encroachment and mitigation for lost functions would be difficult. The economic consequences of strictly limiting conflicting uses would be minimal given existing protections for the wetland.
Site-Specific ESEE Decision	*Strictly limit* conflicting uses in the medium ranked herbaceous vegetation patch within the interior of the Harborton wetland
Feature	**Non-vegetated rail corridors and non-vegetated, paved roads within 50 feet of stream centerlines or the Harborton wetland**
WRNRI/ North Reach Combined Riparian/Wildlife Habitat Relative Rank	High, Medium, Special Habitat Area
Characteristics	▪ Residential base zone ▪ Provides distribution opportunities for nearby industrial uses • Contribution to riparian functions is somewhat impaired.
Willamette River North Reach General ESEE Decision	• *Strictly limit* conflicting uses within 50 feet of a stream centerline or wetland, except limit where wetland abuts the Burlington North Railroad. • *Strictly limit* conflicting uses in high ranking resource areas in residential base zones
ESEE Implications	Non-vegetated rail lines and paved roads include Highway 30 and the Burlington North Railroad and are adjacent or close to significant natural resources. The economic consequences of strictly limiting conflicting uses where established rail lines and paved roads exist would be negative due to the potential impacts on transportation and commerce. A limit decision would require future development, such as road widening, to avoid impacts on the natural resources where practicable or mitigate for unavoidable impacts.
Site-Specific ESEE Decision	*Limit* conflicting uses in high and medium ranked non-vegetated rail corridors and paved roads in this site.

Feature	Short (<50 feet) open stream segments and land within 50 feet of the stream centerline
WRNRI/ North Reach Combined Riparian/Wildlife Habitat Relative Rank	Medium
Characteristics	• Industrial base zone • Provides industrial and employment opportunities • Contribution to overall riparian functions is somewhat constrained.
Willamette River North Reach General ESEE Decision	*Strictly limit* conflicting uses within 50 feet of a stream centerline
ESEE Implications	The short stream segments at this site are located between Highway 30 and the rail corridor and industrial area. While these stream segments still provide important water conveyance, storage and other riparian corridor functions they are constrained by highway, rail and industrial uses. The economic consequences of strictly limiting conflicting uses would be negative due to potential impacts on transportation, commerce and industrial development. As such, the negative economic consequences of strictly limiting conflicting uses would outweigh the environmental, social or energy benefits. A limit decision would require development to avoid causing adverse impacts to natural resources areas where practicable. Unavoidable impacts would need to be mitigated.
Site-Specific ESEE Decision	*Limit* conflicting uses in areas containing short (<50 feet) open stream segments and land within 50 feet of the stream centerline

The proposed decision for this site is consistent with the previous ESEE for site 105-A: Linnton (*Economic, Social, Environmental and Energy Analysis and Recommendations for Natural, Scenic and Open Space Resources within the Multnomah County Unincorporated Urban Areas* report, 2002) to strictly limit conflicting uses within the wetland and surrounding vegetation, except limit conflicting uses within the rail corridor. The proposed decision to strictly limit conflicting uses on open steam channels is different than the previous decision to allow conflicting uses, except strictly conflicting uses surrounding Miller Creek.

Metro ESEE Decision: Metro analyzed the natural resource features within site WR3: Harborton Wetlands. Metro's ESEE decision was to limit conflicting uses within Habitat Conservation Areas (HCA) and allow conflicting uses within areas containing significant natural resources not designated as HCA. HCAs are comprised of Class I and II riparian corridors identified in Metro's inventory of regionally significant riparian corridors and wildlife habitat (Title 13 Section (2)(B)).

For this site, the City's ESEE decision to limit or strictly limit conflicting uses in areas containing high or medium ranked resources generally comports with Metro's ESEE decision to limit conflicting uses in HCAs (see Table 28 and Map 4). Differences occur primarily at the edges of the mapped resources areas and are a result of the City

- mapping smaller vegetation units - ½ acre as compared to 1 acre;
- differentiating between forest and woodland vegetation types; and/or
- refinements to criteria developed evaluate the relative quality of riparian corridors and wildlife habitat.

One difference between the City's and Metro's ESEE decisions is an area of upland habitat located between Highway 30 and the rail line, near the northwestern portion of the site. Metro's ESEE decision was to allow conflicting within upland wildlife habitat areas, except in areas that will be brought into the regional Urban Growth Boundary in the future. The City's ESEE decision is to limit conflicting uses for the area of medium ranked resource within the residential base zone. Table 28 compares the acres of Habitat Conservation Area to the City's significant natural resource areas (Map 4).

Table 28: Comparison of Metro Title 13 Habitat Conservation area and the City's Natural Resources Inventory Ranked Resources in WR3: Harborton Wetland ESEE Evaluation Area

Total Area = 60 acres	Title 13 Habitat Conservation Areas	City's Significant Natural Resources
High	16	21
Medium	4	10
Low	6	5
Total	**26**	**35**

Environmental Overlay Zones

The ESEE decisions are implemented through application of the environmental protection (p) overlay to areas where conflicting uses should be strictly limited and environmental conservation (c) overlay to areas where conflicting uses should be moderately limited. Tables 29 summarize how the resulting decisions affects different land uses. Map 5 presents the recommended environmental overlay zones based on the ESEE decision.

Table 29: Environmental Conservation and Protection Overlay Zones within Site WR3: Harborton Wetlands ESEE Evaluation Area

	Total Acres	Existing Conservation Overlay	Existing Protection Overlay	Proposed Conservation Overlay	Proposed Protection Overlay
IH	35	0	0	9	4
R10	3	0	0	3	<1
RF	20	1	17	2	19
OS	<1	0	0	0	0

DRAFT

Site WR3 - Map 1
Harborton Wetlands

2007 Aerial Photography

Proposed WRNRI* Site

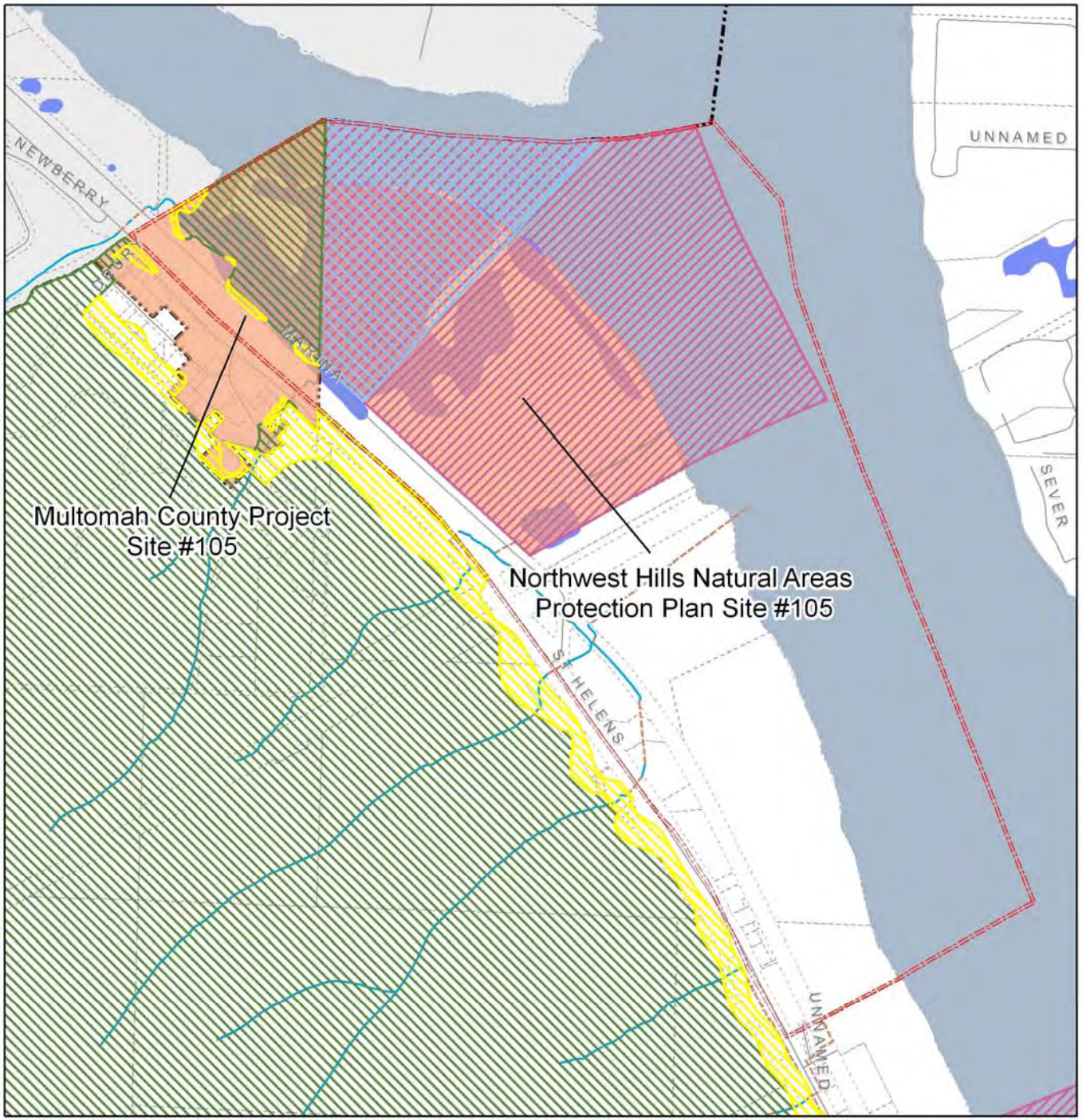
City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 630 1,260 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



DRAFT

Site WR3 - Map 2
Harborton Wetlands

City Adopted Natural Resource Inventory Sites and Existing Environmental Overlays

- Adopted Resource Inventory Sites
- Proposed WRNRI* Site

Existing Resource Overlays

- Environmental protection zone
- Environmental conservation zone
- Greenway natural zone
- Greenway water quality zone
- Greenway natural/water quality zone

Streams

- Open Channel
- Stormwater/Combined Pipe

- Wetlands
- Taxlots
- Streets
- City Boundary

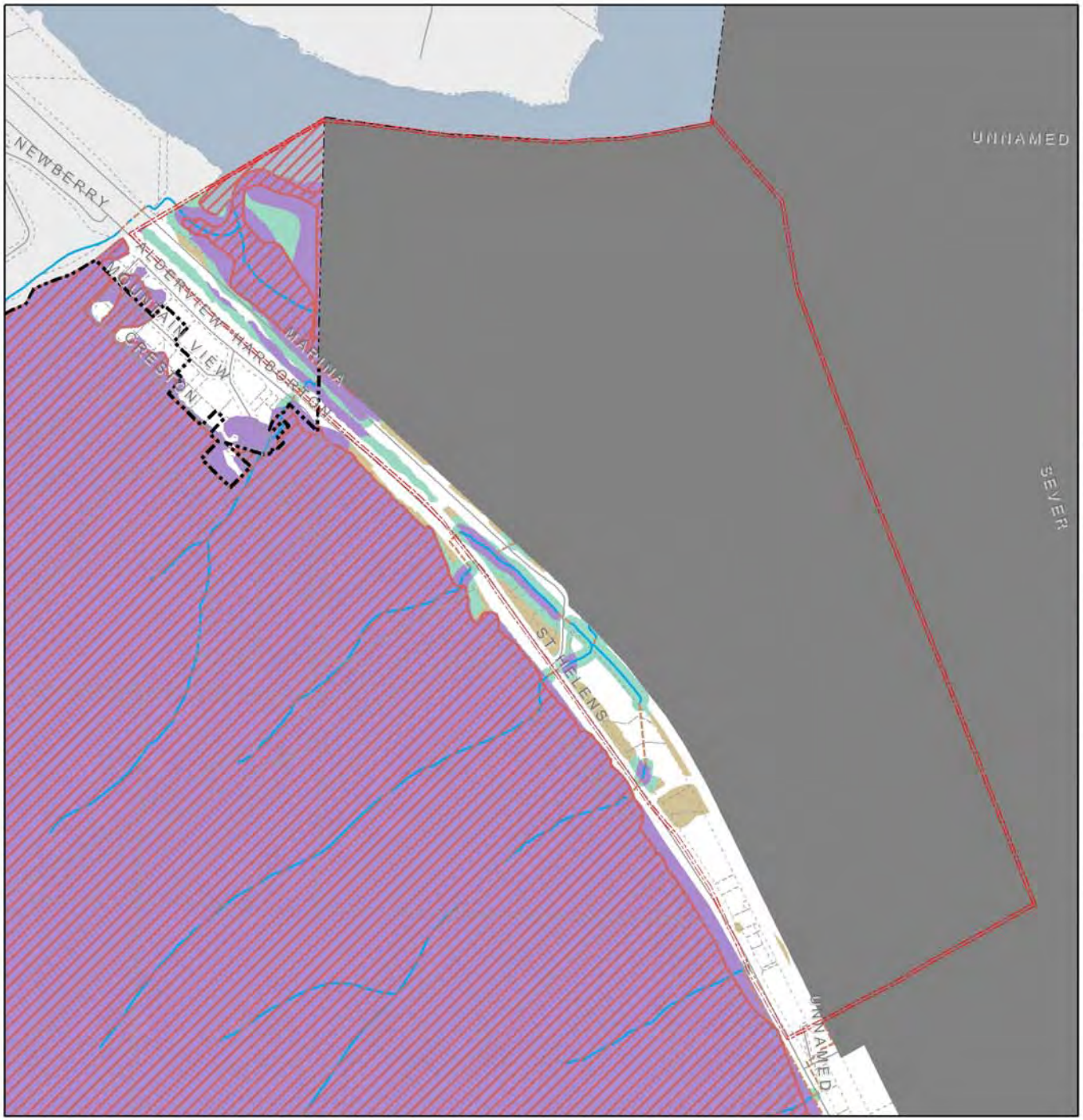
* Willamette River Natural Resources Inventory

The information on the map was derived from digital data-bases on the City of Portland, Bureau of Planning GIS. Care was taken in the creation of this map but it is provided "as is". The City of Portland cannot accept any responsibility for error, omissions, or positional accuracy, and therefore, there are no warranties which accompany this product. However, notification of any errors will be appreciated.

NORTH

0 590 1,180 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



DRAFT

Site WR3 - Map 3
Harborton Wetlands

Combined Riparian/Wildlife Habitat Relative Ranks

Combined Relative Ranks

- High Relative Rank/SHAs
- High Relative Rank
- Medium Relative Rank
- Low Relative Rank

Streams

- Open Channel
- Stormwater/Combined Pipe
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Taxlots
- Streets
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 580 1,160 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

DRAFT

Site WR3 - Map 4
Harborton Wetlands

Metro Title 13
Habitat Conservation Areas

Habitat Conservation Areas
- High
- Moderate
- Low

Streams
- Open Channel
- Stormwater/Combined Pipe

Wetlands

Goal 15 Willamette Greenway Area

Proposed WRNRI* Site

City Boundary

Streets

Taxlots

* Willamette River Natural Resources Inventory

NORTH

0 580 1,160 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

DRAFT

Site WR3 - Map 5
Harborton Wetlands

Proposed Environmental Overlay Zones

Proposed Environmental Overlays
- protection zone
- conservation zone

Streams
- Open Channel
- Stormwater/Combined Pipe

- Wetlands
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Streets
- Taxlots
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 630 1,260 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

Inventory Site WR4: South Rivergate Corridor

Site Description: The South Rivergate inventory site is 176 acres in size. The site consists of an east-west corridor more than one mile long, averaging 1,000 feet wide, and following a Portland General Electric (PGE) power line easement. The site is located between the Willamette River and N. Lombard Avenue. Time Oil Road travels parallel to the site to the south, then crosses through the site towards the west end. Approximately 62 acres of the site, to the west of N Time Oil Road, is within the Willamette River Watershed; this portion of the site has been evaluated under Goal 15 and is not addressed by this ESEE analysis (Map 3). The eastern half of the site, approximately 114 acres, is evaluated as part of this ESEE analysis.

Quarter Sections:

2N1W34a
2N1W35a, b and d
2N1W36b and c

Conflicting Uses by City Base Zones:

Table 30: Base Zones in WR4: South Rivergate Corridor ESEE Evaluation Area

Zone	Acres	Existing Conflicting Uses	Potential Conflicting Uses
IH	114	utility facilities and rail line	residential, commercial, industrial, institutional, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses

Summary of Natural Resources: There are three wetlands/drainageways and associated riparian vegetation east of N Time Oil Road. The drainageways provide a hydrologic connection via a pipe under N Lombard Avenue between the wetlands and the Columbia Slough. During the summer an aquatic vegetation mat forms on most of the wetlands, so that the ratio of open water to submergent/emergent wetland vegetation varies through the course of the year. Emergent vegetation along the margins of the ponds includes broad-leaved cattail, reed canarygrass, common rush, jointed rush, bulrush, nut sedge, water-plantain, wapato, and sedge species.

Table 31: Summary of Natural Resource Features in Site WR4: South Rivergate Corridor ESEE Evaluation Area	
	ESEE Evaluation Area (114 acres)
Open Stream Channel (miles)	**1.4**
Wetlands (acres)	**24**
Flood Area (acres)*	**57**
Vegetated (acres)	40
Non-vegetated (acres)	15
Open Water (acres)	2
Vegetated Areas >= ½ acre (acres)+	**64**
Forest (acres)	<1
Woodland (acres)	28
Shrubland (acres)	10
Herbaceous (acres)	25
Impervious Surface (acres)	**38**

* The flood area includes the FEMA 100-year floodplain plus the adjusted 1996 flood inundation area.

+ The vegetation classifications are applied in accordance with the National Vegetation Classification System specifications developed by The Nature Conservancy. The data within the primary study area and within 300 feet of all open water bodies in Portland is draft and is currently being updated based 2006 aerial photography.

Bordering the wetlands are grassland and meadow areas typically comprised of invasive herbaceous growth including teasel, Canadian thistle, bird's-foot trefoil, purple loosestrife, and reed canarygrass. Upland shrub communities consist of Himalayan blackberry, willows (Hooker's, Pacific, Scouler's, and Sitka), red osier dogwood, and Douglas spirea. The area between the wetlands is dominated by Pacific willow, but includes other willow species such as Hooker's, Scouler's, and Sitka. Young black cottonwood, red elderberry, Douglas spirea, red osier dogwood, Himalayan blackberry, and reed canarygrass are also fairly common species in this community. This area and portions of the western section are selectively managed by PGE to control the growth of tree species so that they do not interfere with the overhead power lines.

The presence of multiple seasonal and year-round wetlands, is unique within the Willamette River study area. The mosaic of aquatic and terrestrial habitat types and the connection between the Willamette River, Lower Columbia Slough, St. Johns Landfill and Smith and Bybee wetlands complex creates important forage, nesting, and resting or stopover opportunities for birds, reptiles, amphibians, and mammals. Water birds observed at the site include double-crested cormorant, great blue heron, herring gull, mallard, hooded and common mergansers, and gadwall. Raptors detected include northern harrier, merlin, red tailed hawk, bald eagle, and American peregrine falcon. A wide variety of songbirds also use the site.

The site contains one of the largest Western painted turtle populations in the Willamette Valley. The estimated size of the adult population is 70 turtles. Also identified during field surveys were northwestern garter snake, common garter snake, long toed salamander, Pacific chorus (tree) frog, and bull frog. Turtles migrate between the ponds east and west of Time Oil Road, particularly during two seasonal intervals, before nesting and before over wintering.

The Union Pacific Railroad crosses the site at numerous locations. Time Oil Road also runs along the wetlands and crosses the site. Due to the proximity to the wetlands and drainageways, the rail lines and road provide some riparian functions including water storage, however these functions are constrained by the rail and road use. The rail lines and roads also pose a considerable threat to turtles and other wildlife that move between the various habitats.

An active flood area associated with the Willamette River and the Lower Columbia Slough covers most of the site. Much of the flood area is comprised of wetlands, drainageways and surrounding riparian vegetation, which provide multiple riparian functions including seasonal flood storage. Some of the flood area is located further from water bodies and provides a flood storage function only during large flood events; these areas provide no other riparian functions.

Table 32 provides a summary of the ranked resources located with the portion of the site evaluated by this ESEE Analysis. Map 3 depicts ranked natural resource feature.

Table 32: Summary of Significant Resources and Ranks in WR4: South Rivergate Corridor ESEE Evaluation Area

Area Evaluated by ESEE Analysis = 114 acres				
	High	**Medium**	**Low**	**Total**
Riparian Resources*				
acres	40	19	10	69
percent of ESEE evaluation area	35	17	8	60
Wildlife Habitat*				
acres	0	24	0	24
percent of ESEE evaluation area	0	21	0	21
Special Habitat Areas*				
acres	64			
percent of ESEE evaluation area	57			
Combined Total**				
acres	64	4	3	71
percent of ESEE evaluation area	57	3	3	63

* High-ranked riparian resources, wildlife habitat, and Special Habitat Areas the Willamette River

** Because riparian resources, wildlife habitat, and Special Habitat Areas overlap, the results cannot be added together to determine the combined area.

Previous City Adopted ESEE Analysis: A portion of the site was addressed in the *Inventory and Analysis of Wetlands, Water Bodies and Wildlife Habitat Areas for the Columbia Corridor* (1989). Resource Site 51 includes lands between Bonneville Way/Lombard Street and N Time Oil Road. Below is a summary of findings and decisions.

Economic Analysis

From a regional perspective, there is sufficient land supply over a 20-year period (through 2005) to meet the needs for industrial land. However, there may be a shortage of unconstrained large parcels of industrially zone lands, 30-acres or greater. The protection of significant natural resources would have a negative economic impact on larger parcels of land but should have little adverse economic impacts.

The could be potential negative economic impacts on conflicting uses if development is required to avoid significant natural resource area, such as wetlands. Usable land area could be reduced. However, the retention of wetlands, water bodies and natural resource areas can be used as a marketing tool to identify the area as containing amenities, making it a unique and desirable development opportunity.

Social Analysis

The Columbia Corridor represents a major recreational opportunity. Smith and Bybee Wetlands and the 40-mile Loop trail are located near the site. To support City recreation-related policies, it is important to support development that does not conflict with existing recreational activities and will encourage future opportunities.

Wetlands provide an "outdoor classroom" for viewing wildlife and natural processes. Urban wetlands are more easily available to a greater number of people than those in rural areas, so have a greater education value. Further, natural resource areas provide a scenic background for urban activities.

Existing vegetation associated with wetlands can be used a buffer for noise. Noise attenuation in wetland areas is primarily accomplished by distance separating the noise source from the receiver.

Environmental Analysis

Wetlands and water bodies provide for retention and detention of stormwater flows. In addition to acting as a ponding area or location for standing water, wetland soils and vegetation can absorb water, gradually releasing it over time and reducing initial storm runoff peak flows and recharging groundwater supplies. Wetlands also act as natural water purification mechanism, removing silt and absorbing many pollutants, such as nutrients.

Wetlands and riparian habitats can be among the most biologically productive areas providing food, water and shelter for a great variety of birds, mammals and other wildlife. Wetlands are a habitat for at least one-third of the nation's threatened or endangered species.

Energy Analysis

The presence of wetlands usually requires a greater land area for a given amount of industrial activity, resulting in potentially greater travel distances. This is offset by the proximity of multiple modes of transportation including road, rail and marine that are within or near the site. In addition, urban wetlands provide educational and recreational opportunities for a large population reducing travel distance to reaches these amenities.

The stormwater management provided by the natural resources reduces infrastructure needs. The water storage capacity reduces the risk associated with flood events.

Decision

Limit conflicting uses within the natural resource areas. This decision resulted in application of the environmental conservation overlay zone to the wetlands, drainageways and surrounding riparian vegetation. The environmental conservation overlay zone was also applied to the Union Pacific Railroad lines and Time Oil Road.

Supplemental ESEE Analysis: The Willamette River North Reach general ESEE analysis and decision presented in the previous section and summarized in Table 33 below apply to inventory site WR4: South Rivergate Corridor except for the modifications described in Table 34.

Table 33: Willamette River North Reach General ESEE Decisions

Base Zone	Significant Natural Resources		
	High Ranked/ Special Habitat Area	Medium Ranked	Low Ranked
Industrial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Employment	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Commercial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Institutional	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Residential	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Open Space	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow

Table 34: Supplemental ESEE Analysis for Site WR4: South Rivergate Corridor	
Feature	**Non-vegetated rail corridors and non-vegetated, paved roads within 50 feet of a stream centerline or wetland**
WRNRI/ North Reach Riparian Corridor/Wildlife Habitat Relative Rank	High, Medium, Special Habitat Area
Characteristics	▪ Industrial base zone ▪ Provide distribution opportunities for nearby industrial uses ▪ Portions are located within the flood area ▪ Contribution to water conveyance, flood storage, channel dynamics and other functions are somewhat impaired
Willamette River North Reach General ESEE Decision	*Strictly limit* conflicting uses within 50 feet of a stream centerline or wetland
ESEE Implications	The economic consequences of strictly limiting conflicting uses where established rail lines and paved roads exist would be negative due to the potential impacts on transportation and commerce. A limit decision would require future development, such as road widening, to avoid impacts on nearby streams and wetlands where practicable, or mitigate for unavoidable impacts.
Site-Specific ESEE Decision	Limit conflicting uses in high or medium ranked non-vegetated areas within the non-vegetated rail corridor and non-vegetated, paved roads within high ranked resources areas
Feature	**Herbaceous vegetation within the flood area that is not within the designated Special Habitat Area**
WRNRI/ North Reach Riparian Corridor/Wildlife Habitat Relative Rank	Medium
Characteristics	▪ Industrial base zone ▪ Provides water storage function during large flood events but does not provide other significant riparian or wildlife habitat functions ▪ Provides development opportunities for existing utilities
Willamette River North Reach General ESEE Decision	Limit conflicting uses in medium ranked resources areas in industrial base zones
ESEE Implications	The economic consequences of allowing conflicting uses within areas of herbaceous flood area would be positive (e.g. industrial development and employment opportunities). The environmental, social and energy consequences of allowing conflicting uses would be negligible as other City regulations require balanced cut-and-fill within the flood area
Site-Specific ESEE Decision	Allow conflicting uses in medium ranked flood areas covered with herbaceous vegetation

The proposed decision for this site is generally consistent with the previous ESEE analyses to limit conflicting uses within wetlands, drainageways and riparian areas. The proposed general ESEE decision is to provide more protections to the wetlands and drainageways than the previous environmental overlay zoning by strictly limiting conflicting uses. The modifications presented in Table # are also consistent with the previous ESEE analysis to apply a limit decision to the non-vegetated rail lines and Time Oil road and to allow conflicting uses in the areas providing solely a flood storage function.

Metro ESEE Decision: Metro analyzed the natural resource features within site WR4: South Rivergate Corridor. Metro's ESEE decision was to limit conflicting uses within Habitat Conservation Areas (HCA) and allow conflicting uses within areas containing significant natural resources not designated as HCA. HCAs are comprised of Class I and II riparian corridors identified in Metro's inventory of regionally significant riparian corridors and wildlife habitat (Title 13 Section (2)(B)).

For this site, the City's ESEE decision to limit or strictly limit conflicting uses in areas containing high or medium ranked resources generally comports with Metro's ESEE decision to limit conflicting uses in HCAs (see Table # and Map #). Differences occur primarily at the edges of the mapped resources areas and are a result of the City

- mapping smaller vegetation units - ½ acre as compared to 1 acre;
- differentiating between forest and woodland vegetation types; and/or
- refinements to criteria developed evaluate the relative quality of riparian corridors and wildlife habitat.

One difference between the City's and Metro's ESEE decisions pertains to an upland wildlife habitat area located near the intersection of N Time Oil Rd and N Rivergate Blvd. The base zone is industrial. Metro's ESEE decision was to allow conflicting within upland wildlife habitat areas, except within areas that are brought into the regional Urban Growth Boundary in the future. The City's ESEE decision is to strictly limit conflicting uses in high ranked Special Habitat Areas in the industrial base zone. Table 35 compares the acres of Habitat Conservation Area to the City's significant natural resource areas.

Table 35: Comparison of Metro Title 13 Habitat Conservation area and the City's Natural Resources Inventory Ranked Resources

Total Area = 114 acres	Title 13 Habitat Conservation Areas	City's Significant Natural Resources
High	0	65
Medium	47	4
Low	3	3
Total	**50**	**71**

Environmental Overlay Zones

The ESEE decisions are implemented through application of the environmental protection (p) overlay to areas where conflicting uses should be strictly limited and environmental conservation (c) overlay to areas where conflicting uses should be moderately limited. Table 36 summarizes how the resulting decisions affects different land uses. Map 5 presents the recommended environmental overlay zones based on the ESEE decision.

Table 36: Environmental Conservation and Protection Overlay Zones within Site WR4: South Rivergate Corridor ESEE Evaluation Area

	Total Acres	Existing Conservation Overlay	Existing Protection Overlay	Proposed Conservation Overlay	Proposed Protection Overlay
IH	114	77	0	31	41

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Site WR4 - Map 1
South Rivergate Corridor

2007 Aerial Photography

Proposed WRNRI* Site

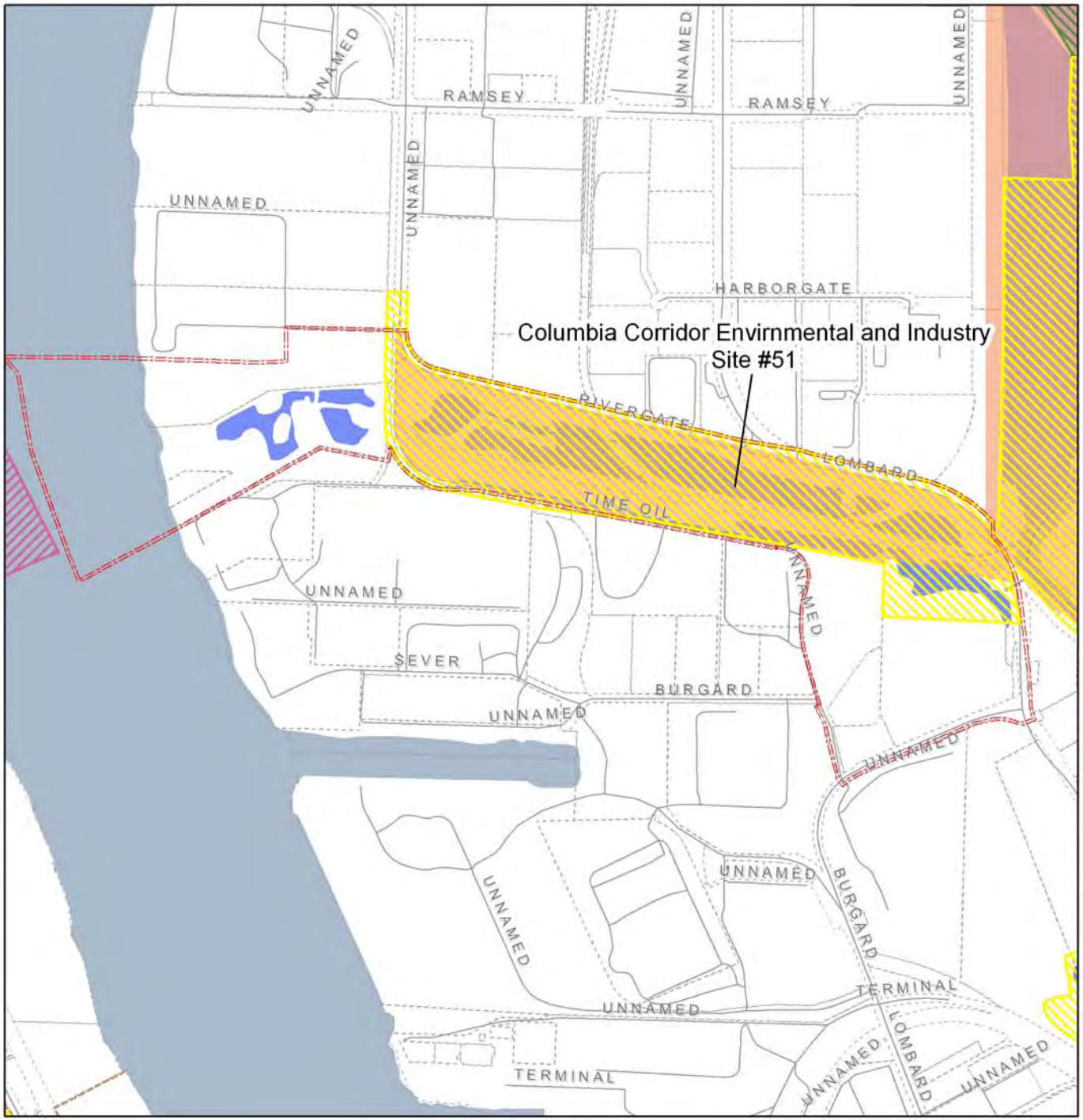
City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 710 1,420 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



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Site WR4 - Map 2
South Rivergate Corridor

City Adopted Natural Resource Inventory Sites and Existing Environmental Overlays

- Adopted Resource Inventory Sites
- Proposed WRNRI* Site

Existing Resource Overlays

- Environmental protection zone
- Environmental conservation zone
- Greenway natural zone
- Greenway water quality zone
- Greenway natural/water quality zone

Streams

- Open Channel
- Stormwater/Combined Pipe

- Wetlands
- Taxlots
- Streets
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 660 1,320 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

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Site WR4 - Map 3
South Rivergate Corridor

Combined Riparian/Wildlife Habitat Relative Ranks

Combined Relative Ranks

- High Relative Rank/SHAs
- High Relative Rank
- Medium Relative Rank
- Low Relative Rank

Streams

- Open Channel
- Stormwater/Combined Pipe

- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Taxlots
- Streets
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 650 1,300 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

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Site WR4 - Map 4
South Rivergate Corridor

Metro Title 13
Habitat Conservation Areas

Habitat Conservation Areas
- High
- Moderate
- Low

Streams
- Open Channel
- Stormwater/Combined Pipe

Wetlands

Goal 15 Willamette Greenway Area

Proposed WRNRI* Site

City Boundary

Streets

Taxlots

* Willamette River Natural Resources Inventory

NORTH

0 650 1,300 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

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Site WR4 - Map 5
South Rivergate Corridor

Proposed Environmental Overlay Zones

Proposed Environmental Overlays

- protection zone
- conservation zone

Streams

- Open Channel
- Stormwater/Combined Pipe

- Wetlands
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Streets
- Taxlots
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 650 1,300 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

Inventory Site WR5: Time Oil Rd/Terminal 4

Site Description: This 766-acre site is located between Time Oil Rd to the north and Cathedral Park to the south. The eastern site boundary follows Bradford Street. The terrestrial portion of this site is approximately 525 acres in size and contains more than 21,000 linear feet of bank along the Willamette. Approximately 634 acres, 83 percent, of the site is located south of N Terminal Rd and has been evaluated under Goal 15 Willamette River Greenway and is not addressed by this ESEE analysis (Map 3). The northeastern portion of the site, 132 acres, is evaluated as part of this ESEE analysis.

Quarter Sections:

2N1W34a and d
2N1W35a, b, c and d
1N1W02a, b, c and d
1N1W11a
1N1W12b

Conflicting Uses by City Base Zones:

Table 37: Base Zones in WR5: Time Oil Rd/Terminal 4 ESEE Evaluation Area

Zone	Acres	Existing Conflicting Uses	Potential Conflicting Uses
IH	132	industrial, rail line	residential, commercial, industrial, institutional, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses

Summary of Natural Resources: The Willamette River, its banks and flood area comprise most of the natural resources within this site. The beaches and vegetated banks of the Willamette River provide connectivity along the river between the wetlands in the South Rivergate Corridor to the north and Cathedral Park and Willamette Cove to the south.

A small upland area of bottomland forest, dominated by black cottonwood trees, is located along NE Lombard Road between N Burgard Rd and N Bradford St. The forested area is located on a steep slope extending south from the South Rivergate Corridor site.

A significant portion of the northern half of the site is flood area, much of which is developed. During 1996 floods, much of this area was inundated by the waters of the Willamette River and Columbia Slough. Roughly 30 acres of flood area, dominated by herbaceous vegetation, is located near Time Oil Road. This area provides a more direct flood storage and hydrologic functions because it is impervious than does the fully developed flood area.

Table 38: Summary of Natural Resource Features in Site WR5: Time Oil Rd/Terminal 4	
	ESEE Evaluation Area (132 acres)
Open Stream Channel (linear feet)	**0**
Wetlands (acres)	**0**
Flood Area (acres)*	**97**
Vegetated (acres)	3
Non-vegetated (acres)	94
Open Water (acres)	0
Vegetated Areas >= ½ acre (acres)+	**11**
Forest (acres)	3
Woodland (acres)	0
Shrubland (acres)	1
Herbaceous (acres)	7
Impervious Surface (acres)	**107**

* The flood area includes the FEMA 100-year floodplain plus the adjusted 1996 flood inundation area.

+ The vegetation classifications are applied in accordance with the National Vegetation Classification System specifications developed by The Nature Conservancy. The data within the primary study area and within 300 feet of all open water bodies in Portland is draft and is currently being updated based 2006 aerial photography.

Table 39 provides a summary of the ranked resources located with the portion of the site evaluated by this ESEE Analysis. Map 3 depicts ranked natural resource feature.

Table 39: Summary of Significant Resources and Ranks in WR5: Time Oil Rd/Terminal 4 ESEE Evaluation Area				
Area Evaluated by ESEE Analysis = 132 acres				
	High	**Medium**	**Low**	**Total**
Riparian Resources*				
acres	0	3	94	97
percent of ESEE evaluation area	0	3	71	73
Wildlife Habitat*				
acres	0	0	2	2
percent of ESEE evaluation area	0	0	2	2
Special Habitat Areas*				
acres	<1			
percent of ESEE evaluation area	<1			
Combined Total**				
acres	<1	3	94	97
percent of ESEE evaluation area	<1	3	71	73

* High-ranked riparian resources, wildlife habitat, and Special Habitat Areas the Willamette River

** Because riparian resources, wildlife habitat, and Special Habitat Areas overlap, the results cannot be added together to determine the combined area.

Previous City Adopted ESEE Analysis: None

Site-Specific ESEE Analysis: The Willamette River North Reach general ESEE analysis and decision presented in the previous section and summarized in Table 40 below apply to inventory site WR5: Time Oil Road/Terminal 4 except for the specific modifications described in Table 41.

Table 40: Willamette River North Reach General ESEE Decision

Base Zone	Significant Natural Resources		
	High Ranked/ Special Habitat Area	Medium Ranked	Low Ranked
Industrial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Employment	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Commercial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Institutional	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Residential	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Open Space	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow

Table 41: Supplemental ESEE Analysis for Site WR5: Time Oil Road/Terminal 4	
Feature	**Herbaceous vegetation within the flood area**
WRNRI/ North Reach - Relative Riparian Corridor/Wildlife Habitat Rank	Medium
Characteristics	▪ Industrial base zone ▪ Landscape features provides water storage during large flood events but does not provide other significant riparian corridor or wildlife habitat functions. • Provides industrial development opportunities
Willamette River North Reach General ESEE Decision	Limit conflicting uses in medium ranked resources areas in industrial base zones
ESEE Implications	The economic consequences of allowing conflicting uses within areas of herbaceous flood area are positive (e.g. industrial development and employment opportunities) and the environmental, social and energy consequences of allowing conflicting uses would be minimal because there are other City regulations that require balanced cut-and-fill within the flood area to maintain flood storage capacity.
Site-Specific ESEE Decision	Allow conflicting uses in medium ranked vegetated flood area

Metro ESEE Decision: Metro analyzed the natural resource features within site WR5: Time Oil Road/Terminal 4. Metro's ESEE decision was to limit conflicting uses within Habitat Conservation Areas (HCA) and allow conflicting uses within areas containing significant natural resources not designated as HCA. HCAs are comprised of Class I and II riparian corridors identified in Metro's inventory of regionally significant riparian corridors and wildlife habitat (Title 13 Section (2)(B)). Within this site, there are no Class I or II riparian corridors within the area being addressed in this ESEE anlaysis (see Table 42 and Map 4). Metro's ESEE decision for this site was to allow conflicting uses within Class III riparian corridors and all upland habitats. The City's ESEE decision to allow conflicting uses in areas containing low ranked resources and medium ranked vegetated flood area generally with Metro's ESEE decision to allow conflicting uses outside of areas designated HCAs.

Table 42: Comparison of Metro Title 13 Habitat Conservation area and the City's Natural Resources Inventory Ranked Resources in WR5: Time Oil Rd/Terminal 4 ESEE Evaluation Area		
Total Area = 132	**Title 13 Habitat Conservation Areas**	**City's Significant Natural Resources**
High	0	<1
Medium	<1	3
Low	<1	94
Total	**<1**	**97**

Environmental Overlay Zones

The ESEE decisions are implemented through application of the environmental protection (p) overlay to areas where conflicting uses should be strictly limited and environmental conservation (c) overlay to areas where conflicting uses should be moderately limited. Tables 43 summarize how the resulting decisions affects different land uses. Map 5 presents the recommended environmental overlay zones based on the ESEE decision.

Table 43: Environmental Conservation and Protection Overlay Zones within Site WR5: Time Oil Rd/Terminal 4 ESEE Evaluation Area

	Total Acres	Existing Conservation Overlay	Existing Protection Overlay	Proposed Conservation Overlay	Proposed Protection Overlay
IH	132	1	0	2	0

Planning

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Site WR5 - Map 1
Time Oil Rd/Terminal 4

2007 Aerial Photography

Proposed WRNRI* Site

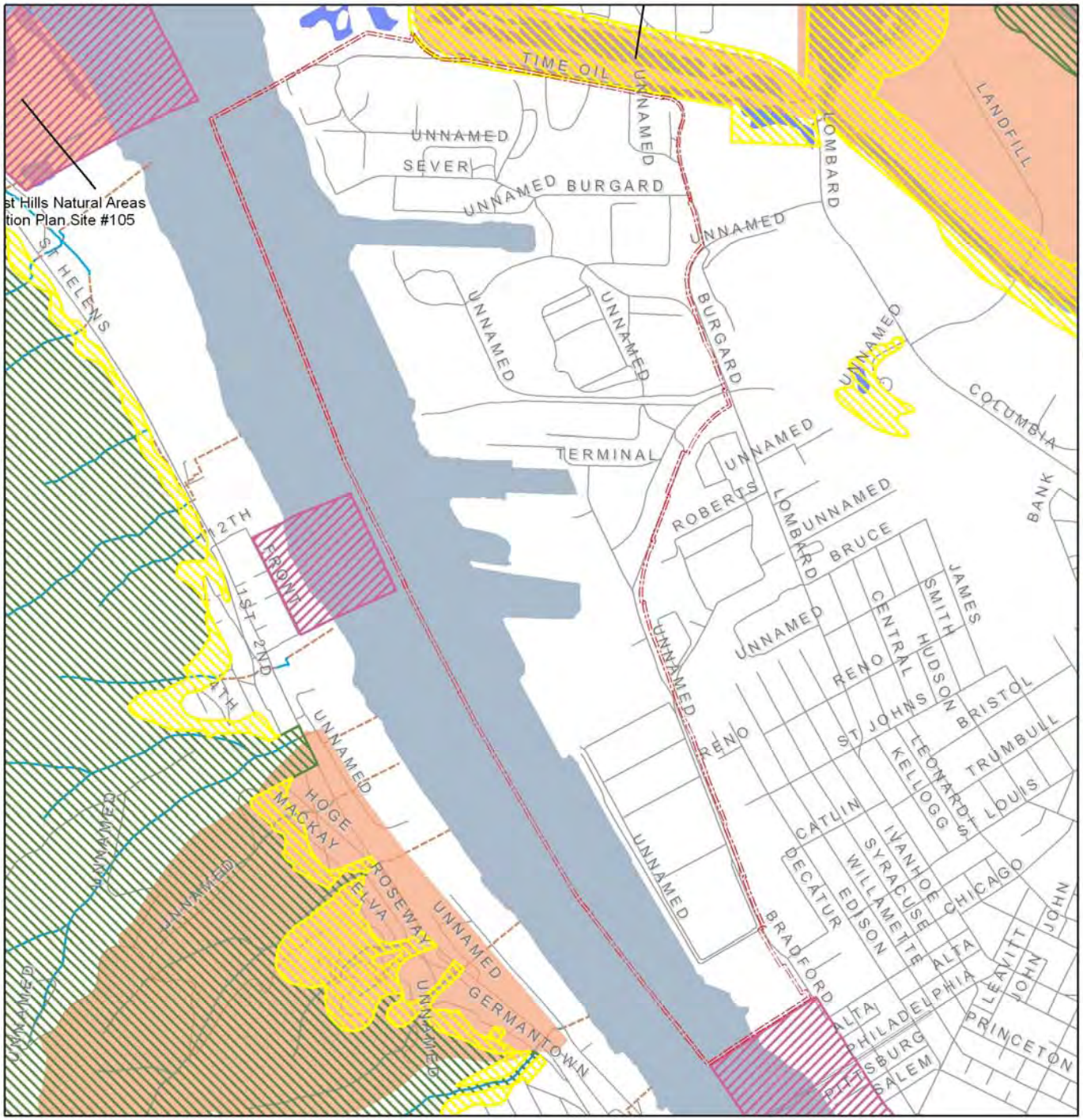
City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 1,100 2,200 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



Planning

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Site WR5 - Map 2
Time Oil Rd/Terminal 4

City Adopted Natural Resource Inventory Sites and Existing Environmental Overlays

Adopted Resource Inventory Sites

Proposed WRNRI* Site

Existing Resource Overlays

Environmental protection zone

Environmental conservation zone

Greenway natural zone

Greenway water quality zone

Greenway natural/water quality zone

Streams

Open Channel

Stormwater/Combined Pipe

Wetlands

Streets

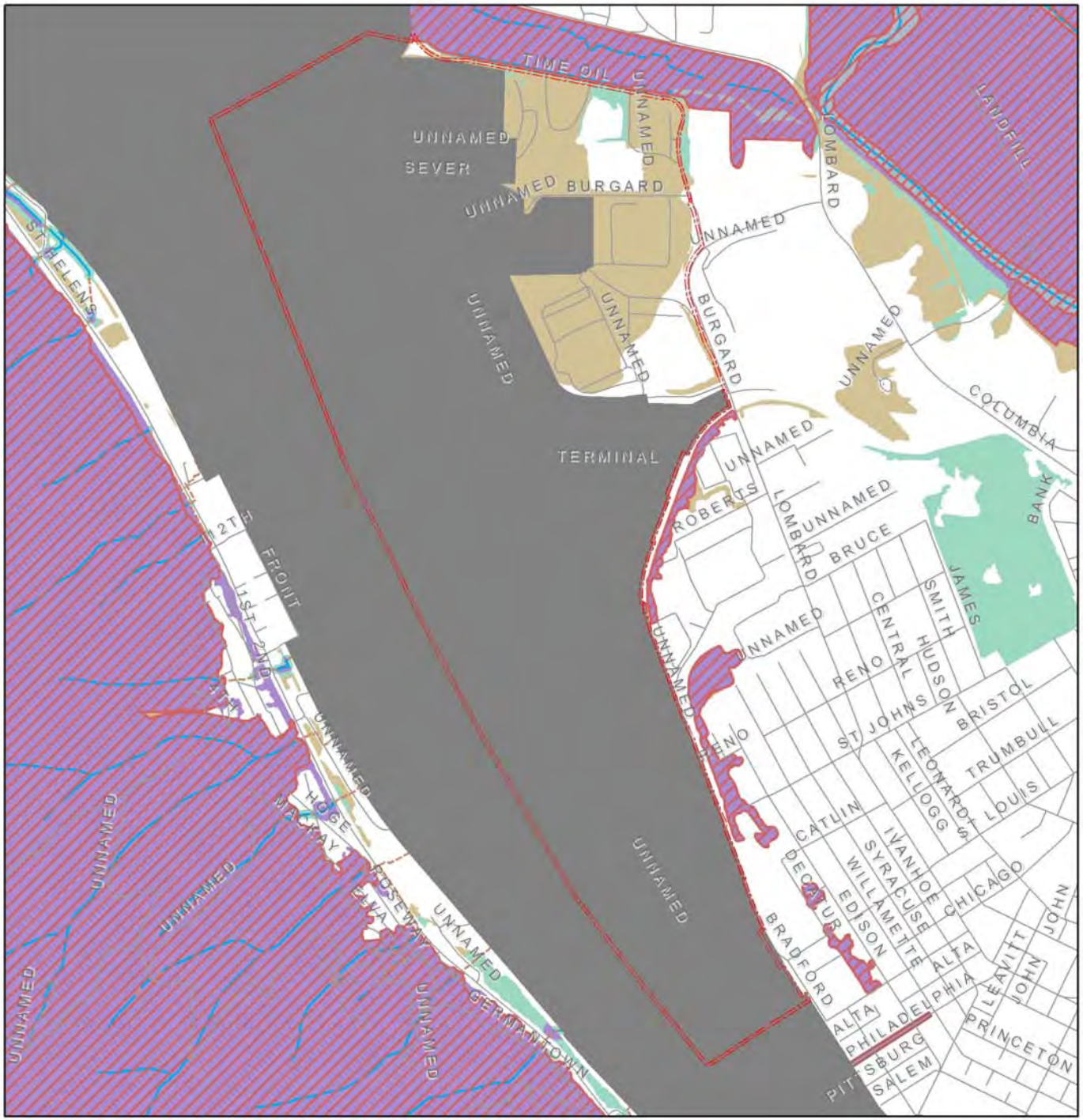
City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 1,000 2,000 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



Planning

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Site WR5 - Map 3
Time Oil Rd/Terminal 4

Combined Riparian/Wildlife Habitat Relative Ranks

Combined Relative Ranks

- High Relative Rank/SHAs
- High Relative Rank
- Medium Relative Rank
- Low Relative Rank

Streams

- Open Channel
- Stormwater/Combined Pipe

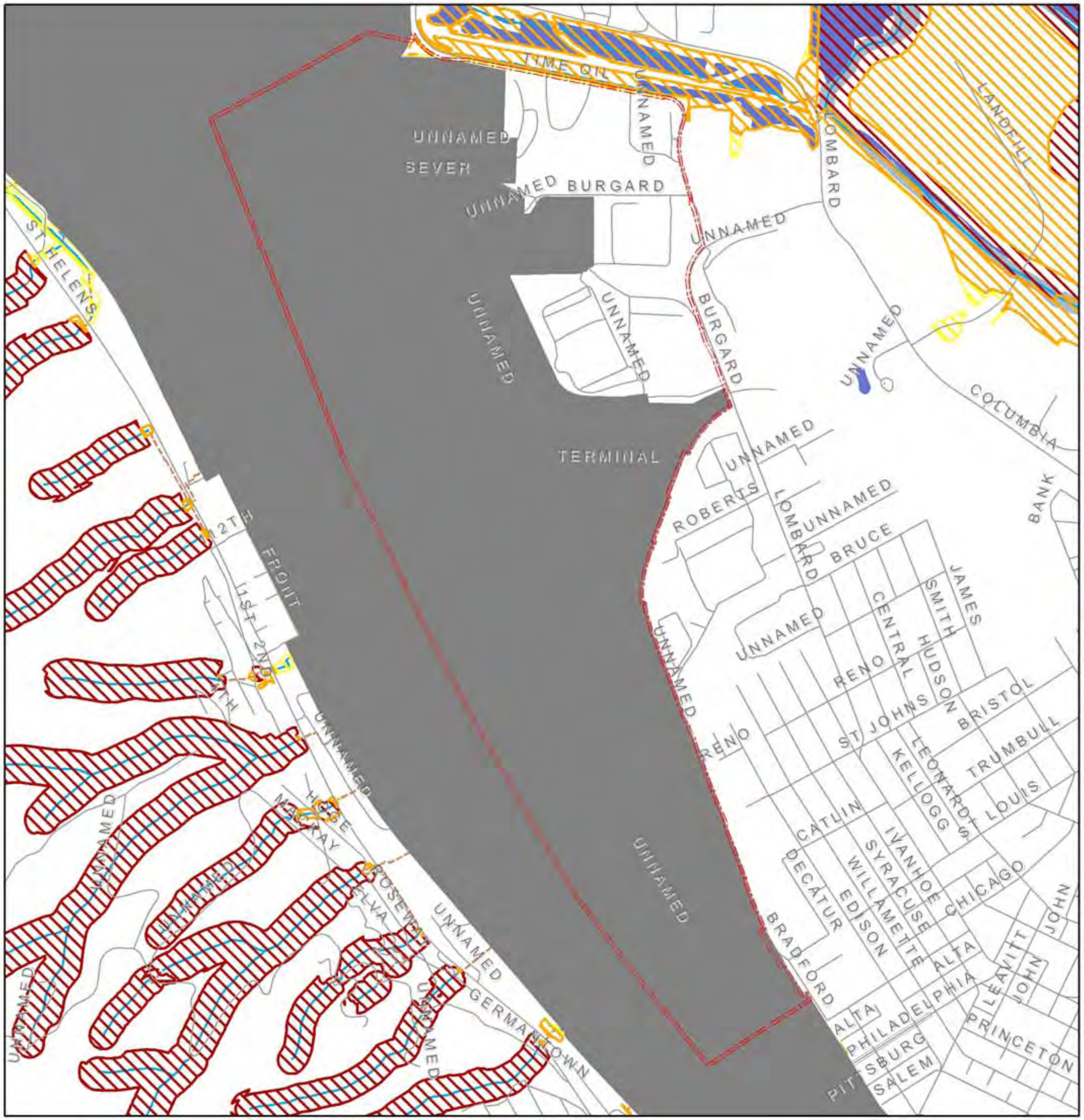
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Streets
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 1,000 2,000 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



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Site WR5 - Map 4
Time Oil Rd/Terminal 4

Metro Title 13
Habitat Conservation Areas

Habitat Conservation Areas
- High
- Moderate
- Low

Streams
- Open Channel
- Stormwater/Combined Pipe
- Wetlands
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- City Boundary
- Streets

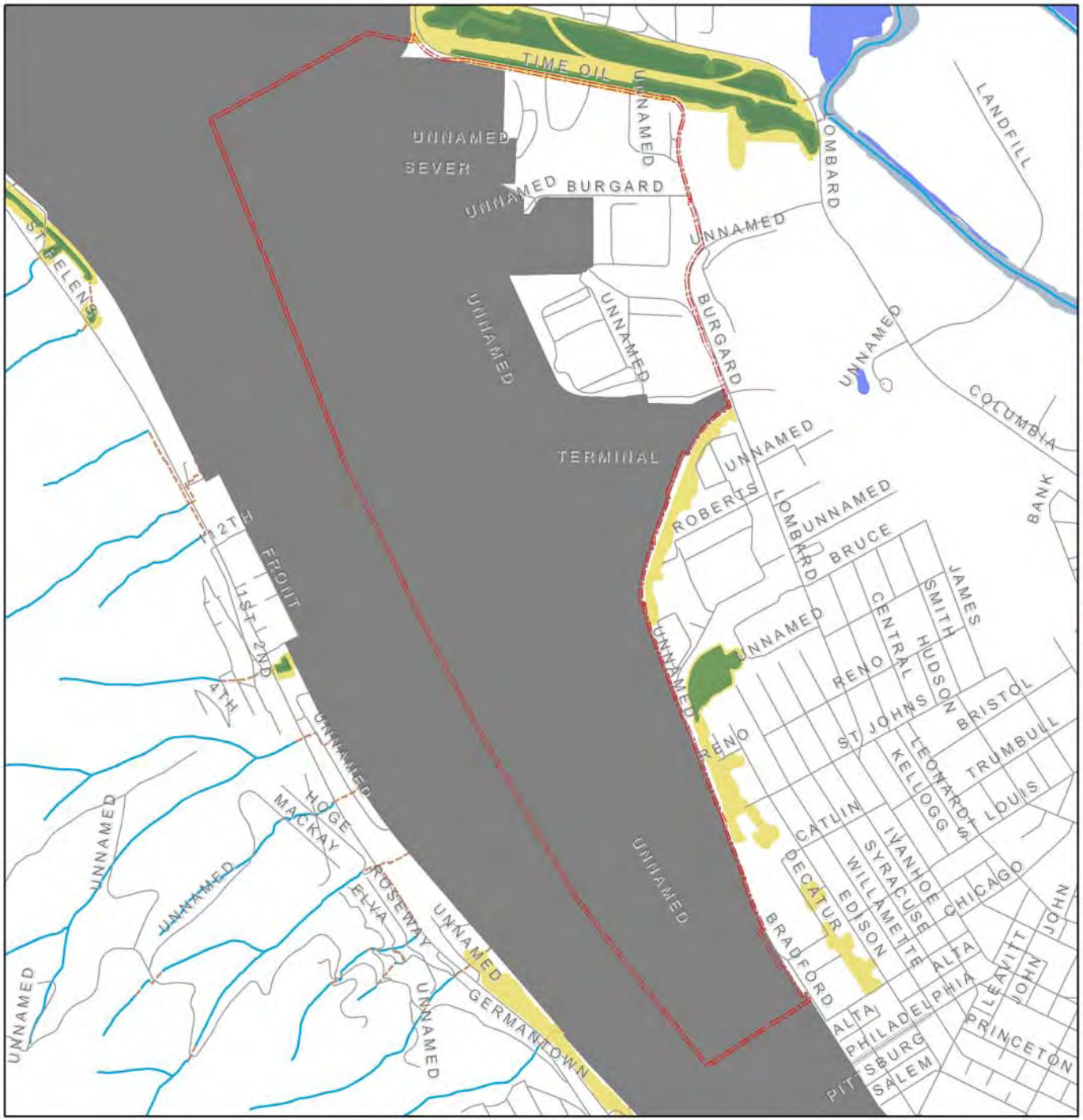
* Willamette River Natural Resources Inventory

The information on the map was derived from digital databases on the City of Portland, Bureau of Planning GIS. Care was taken in the creation of this map but it is provided "as is". The City of Portland cannot accept any responsibility for error, omissions, or positional accuracy, and therefore, there are no warranties which accompany this product. However, notification of any errors will be appreciated.

NORTH

0 1,000 2,000 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



Planning

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Site WR5 - Map 5
Time Oil Rd/Terminal 4

Proposed Environmental Overlay Zones

Proposed Environmental Overlays

- protection zone
- conservation zone

Streams

- Open Channel
- Stormwater/Combined Pipe

- Wetlands
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Streets
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 1,000 2,000 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

Inventory Site WR6: Linnton

Site Description: This 323-acre inventory site is located between Highway 30 and the Willamette River, south of site WR3 Harborton Wetlands, and north of the St. Johns Bridge. The site consists primarily of industrial and commercial development. Map 1 shows an aerial view of the Linnton inventory site. The majority of the inventory site, approximately 256 acres, east of the Burlington Northern rail corridor, has been evaluated under Goal 15 and is not addressed by this ESEE analysis; this area is identified by River General (g) or River Industrial (i) overlay zones (Map 3). The remainder of the site (67 acres), including portions of Highway 30 and surrounding lands, are evaluated as part of this ESEE analysis.

Quarter Sections:

2N1W35c
1N1W03a
1N1W02b, c and d
1N1W11a and b

Conflicting Uses by City Base Zones:

Table 44: Base Zones in WR6: Linnton ESEE Evaluation Area

Zone	Acres	Existing Conflicting Uses	Potential Conflicting Uses
IH	54	industrial, rail line	residential, commercial, industrial, institutional, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
EG1	6	industrial, commercial, institutional, rail line	residential, commercial, industrial, institutional, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
CG	7	commercial, rail line	residential, commercial, industrial, institutional, agricultural, detention facilities, broadcast facilities, rail line and utility corridors, temporary uses

Summary of Natural Resources: There are areas of vegetation located between Highway 30 and the railroad corridor. Most of this area is narrow and tree canopy is dispersed throughout; containing a mix of cottonwood, alder and maple trees. The dominant ground cover is Himalayan blackberry, sword fern and English ivy. At the southwestern end of the site there is a wider area between the highway and railroad that contain dense tree canopy on a steep slope dominated by cottonwood and alder trees, blackberries and Scot's broom, and sword fern ground cover. This vegetation patches is approximately 7 acres in size and provides upland wildlife habitat.

Table 45: Summary of Natural Resource Features in Site WR6: Linnton	
	ESEE Evaluation Area (67 acres)
Open Stream Channel (linear feet)	**528**
Wetlands (acres)	**0**
Flood Area (acres)*	**0**
Vegetated (acres)	0
Non-vegetated (acres)	0
Open Water (acres)	0
Vegetated Areas >= ½ acre (acres)+	**15**
Forest (acres)	8
Woodland (acres)	3
Shrubland (acres)	3
Herbaceous (acres)	1
Impervious Surface (acres)	**37**

* The flood area includes the FEMA 100-year floodplain plus the adjusted 1996 flood inundation area.

+ The vegetation classifications are applied in accordance with the National Vegetation Classification System specifications developed by The Nature Conservancy. The data within the primary study area and within 300 feet of all open water bodies in Portland is draft and is currently being updated based 2006 aerial photography.

Eight piped streams flow through the inventory site. Two contain open channel segments surrounded by vegetation. The northern open channel segment is approximately 200 feet long. The southern open channel segment is roughly 30 feet long. These channels are contained by concrete and riprap banks and metal grates that cover the streams. Both flow from upstream under Highway 30 via pipes and culverts, then return to pipes prior to discharging to the Willamette.

Table 43 provides a summary of the ranked resources located with the portion of the site evaluated by this ESEE Analysis. Map 3 depicts ranked natural resource feature.

Table 46: Summary of Significant Resources and Ranks in WR6: Linnton ESEE Evaluation Area				
Area Evaluated by ESEE Analysis = 67 acres				
	High	**Medium**	**Low**	**Total**
Riparian Resources*				
acres	1	2	10	13
percent of ESEE evaluation area	1	3	15	18
Wildlife Habitat*				
acres	0	8	0	8
percent of ESEE evaluation area	0	11	0	11
Special Habitat Areas*				
acres	<1			
percent of ESEE evaluation area	<1			
Combined Total**				
acres	1	8	3	12
percent of ESEE evaluation area	2	12	5	19

* High-ranked riparian resources, wildlife habitat, and Special Habitat Areas the Willamette River

** Because riparian resources, wildlife habitat, and Special Habitat Areas overlap, the results cannot be added together to determine the combined area.

Previous City Adopted ESEE Analysis: None

Site-Specific ESEE Analysis: The Willamette River North Reach general ESEE analysis and decision presented in the previous section and summarized in Table 47 below apply to inventory Site WR6: Linnton except for the modifications described in Table 48.

Table 47: Willamette River North Reach General ESEE Decisions

Base Zone	Significant Natural Resources		
	High Ranked/ Special Habitat Area	Medium Ranked	Low Ranked
Industrial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Employment	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Commercial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Institutional	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Residential	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Open Space	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow

Table 48: Supplemental ESEE Analysis for Site WR6: Linnton	
Feature	**Non-vegetated rail corridors and non-vegetated, paved roads within 50 feet of a stream centerline**
WRNRI/ North Reach Combined Riparian/Wildlife Habitat Relative Rank	Medium
Characteristics	• Industrial base zone • Provide distribution opportunities for nearby industrial uses • Contribution to streamflow conveyance, flood storage, channel dynamics and other riparian functions is somewhat impaired
Willamette River North Reach General ESEE Decision	Strictly limit conflicting uses within 50 feet of a stream centerline
ESEE Implications	The economic consequences of strictly limiting conflicting uses where established rail lines and paved roads exist would be negative due to the potential impacts on transportation and commerce. A limit decision would require future development, such as road widening, to avoid impacts on these natural resources areas where practicable or mitigate for unavoidable impacts.
Site-Specific ESEE Decision	Apply a limit decision to medium ranked non-vegetated rail corridors and paved roads within 50 feet of a stream centerline
Feature	**Short (<50 feet) open stream segments and land within 50 feet of the stream centerline**
WRNRI/ North Reach Combined Riparian/Wildlife Habitat Relative Rank	Medium
Characteristics	• Industrial base zone • Provides industrial and employment opportunities • Provides a water storage and flow function and impacts channel migration
Willamette River North Reach General ESEE Decision	Strictly limit conflicting uses within 50 feet of a stream centerline
ESEE Implications	The short stream segments at this site are located between Highway 30 and the rail corridor and industrial area. While these stream segments still provide important water conveyance, storage and other riparian corridor functions they are constrained by highway, rail and industrial uses. The economic consequences of strictly limiting conflicting uses would be negative due to potential impacts on transportation, commerce and industrial development. As such, the negative economic consequences of strictly limiting conflicting uses would outweigh the environmental, social or energy benefits. A limit decision would require development to avoid causing adverse impacts to natural resources areas where practicable. Unavoidable impacts would need to be mitigated.

Site-Specific ESEE Decision	Apply a limit decision to short (<50 feet) open stream segments and land within 50 feet of the stream centerline
Feature	**Small areas of woodland vegetation located more than 50 feet from a stream centerline, where the vegetation and the stream are separated by Highway 30**
WRNRI/ North Reach Combined Riparian/Wildlife Habitat Relative Rank	Medium
Characteristics	• Industrial and employment base zone • The riparian functions provided by these vegetated areas are impaired because they are separated from the stream by a large highway.
Willamette River North Reach General ESEE Decision	Limit conflicting uses within medium ranked resources areas
ESEE Implications	The economic consequences of limiting conflicting within these small woodland areas would be negative due to the potential impacts on future industrial development and employment. Allowing the uses would have a minimal impact on the environmental, social, and energy values provided by this vegetation.
Site-Specific ESEE Decision	Allow conflicting uses in these medium ranked resource areas

Metro ESEE Decision: Metro analyzed the natural resource features within site WR3: Harborton Wetlands. Metro's ESEE decision was to limit conflicting uses within Habitat Conservation Areas (HCA) and allow conflicting uses within areas containing significant natural resources not designated as HCA. HCAs are comprised of Class I and II riparian corridors identified in Metro's inventory of regionally significant riparian corridors and wildlife habitat (Title 13 Section (2)(B)).

For this site, the City's ESEE decision to limit or strictly limit conflicting uses in areas containing high or medium ranked resources generally comports with Metro's ESEE decision to limit conflicting uses in HCAs (see Table 48 and Map 4). Differences occur primarily at the edges of the mapped resources areas and are a result of the City

- mapping smaller vegetation units - ½ acre as compared to 1 acre;
- differentiating between forest and woodland vegetation types; and/or
- refinements to criteria developed evaluate the relative quality of riparian corridors and wildlife habitat.

One difference between the City's and Metro's ESEE decisions pertains to an area of upland wildlife habitat located between Highway 30 and the rail line, near the southern portion of the site. Metro's ESEE decision was to allow conflicting uses within upland wildlife habitat areas, except within areas that are brought into the Urban Growth Boundary in the future. The City's ESEE decision is to limit conflicting uses for the area of medium ranked resource within the industrial base zone.

Table 48: Comparison of Metro Title 13 Habitat Conservation area and the City's Natural Resources Inventory Ranked Resources in WR6: Linnton ESEE Evaluation Area		
Total Area = 67	**Title 13 Habitat Conservation Areas**	**City's Significant Natural Resources**
High	0	1
Medium	1	8
Low	1	3
Total	**2**	**12**

Environmental Overlay Zones

The ESEE decisions are implemented through application of the environmental protection (p) overlay to areas where conflicting uses should be strictly limited and environmental conservation (c) overlay to areas where conflicting uses should be moderately limited. Tables 49 summarize how the resulting decisions affects different land uses. Map 5 presents the recommended environmental overlay zones based on the ESEE decision.

Table 49: Environmental Conservation and Protection Overlay Zones within Site WR6: Linnton ESEE Evaluation Area					
Site = 75 acres	**Total Acres**	**Existing Conservation Overlay**	**Existing Protection Overlay**	**Proposed Conservation Overlay**	**Proposed Protection Overlay**
IH	64	0	0	11	<1
EG1	5	0	0	<1	<1
CG	6	0	0	0	0

Planning

DRAFT

Site WR6 - Map 1
Linnton

2007 Aerial Photography

Proposed WRNRI* Site

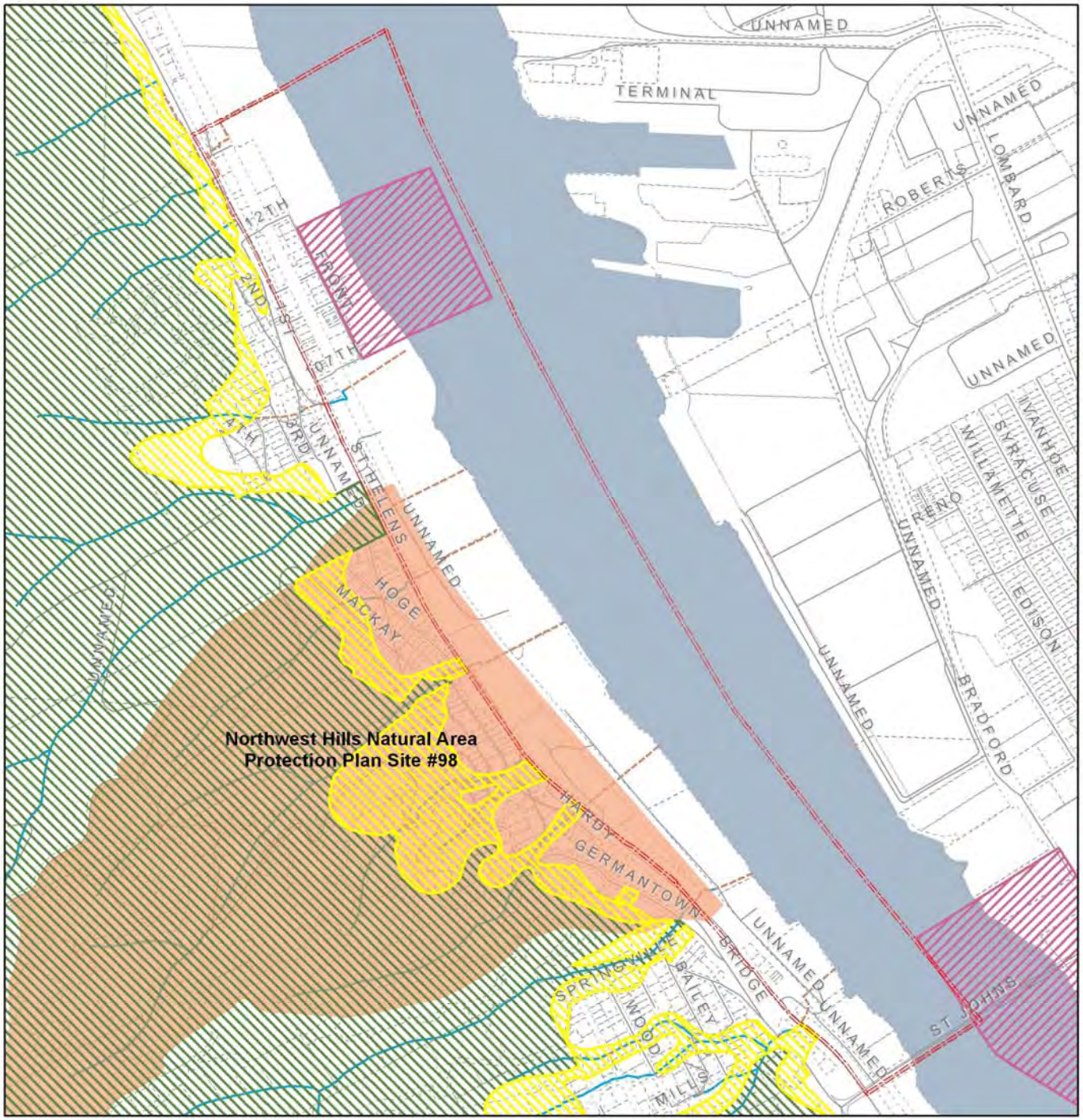
City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 810 1,620 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



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Site WR6 - Map 2
Linnton

City Adopted Natural Resource Inventory Sites and Existing Environmental Overlays

Adopted Resource Inventory Sites

Proposed WRNRI* Site

Existing Resource Overlays

Environmental protection zone

Environmental conservation zone

Greenway natural zone

Greenway water quality zone

Greenway natural/water quality zone

Streams

Open Channel

Stormwater/Combined Pipe

Wetlands

Taxlots

Streets

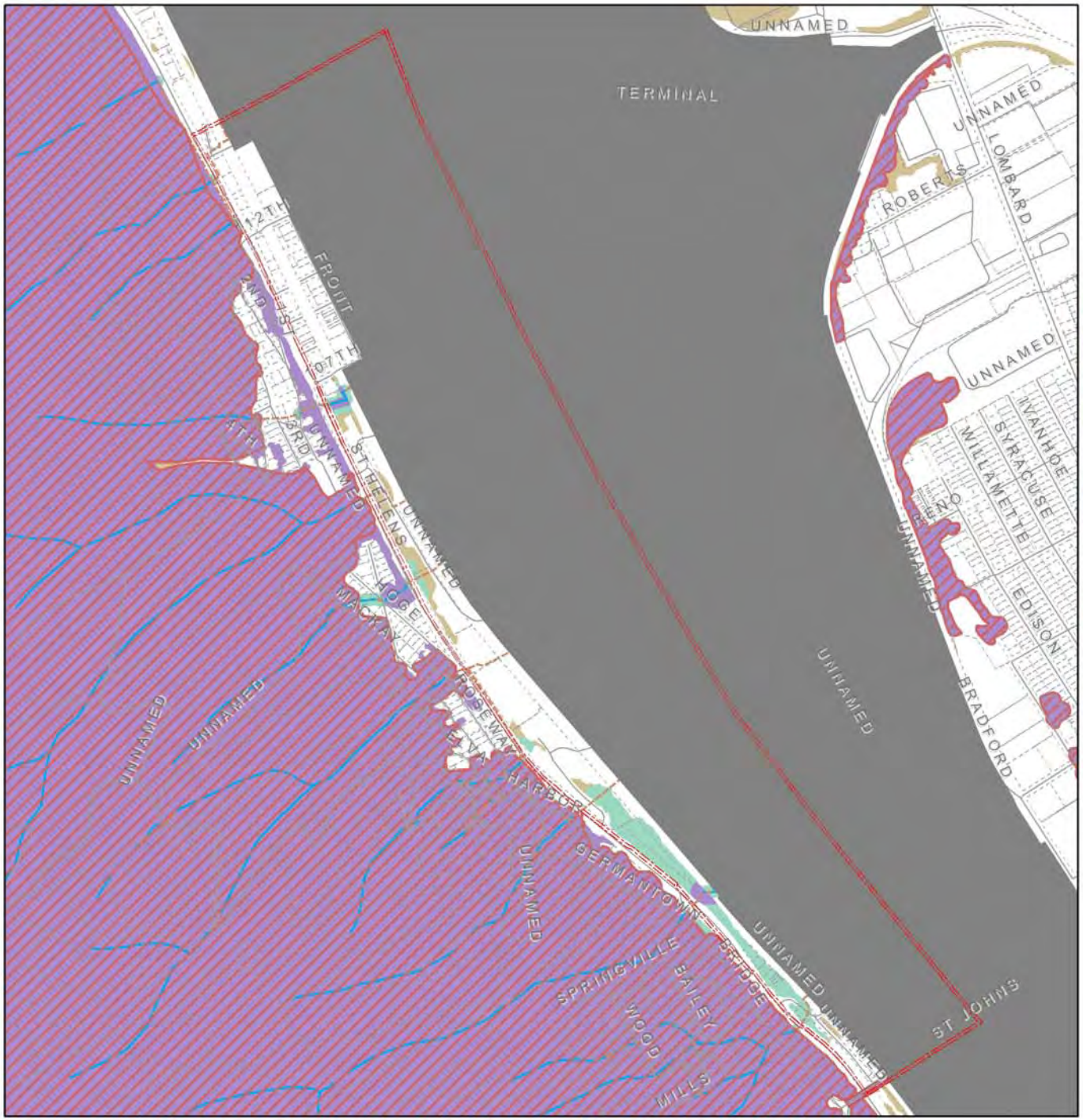
City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 740 1,480 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



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Site WR6 - Map 3
Linnton

Combined Riparian/Wildlife Habitat Relative Ranks

Combined Relative Ranks

- High Relative Rank/SHAs
- High Relative Rank
- Medium Relative Rank
- Low Relative Rank

Streams

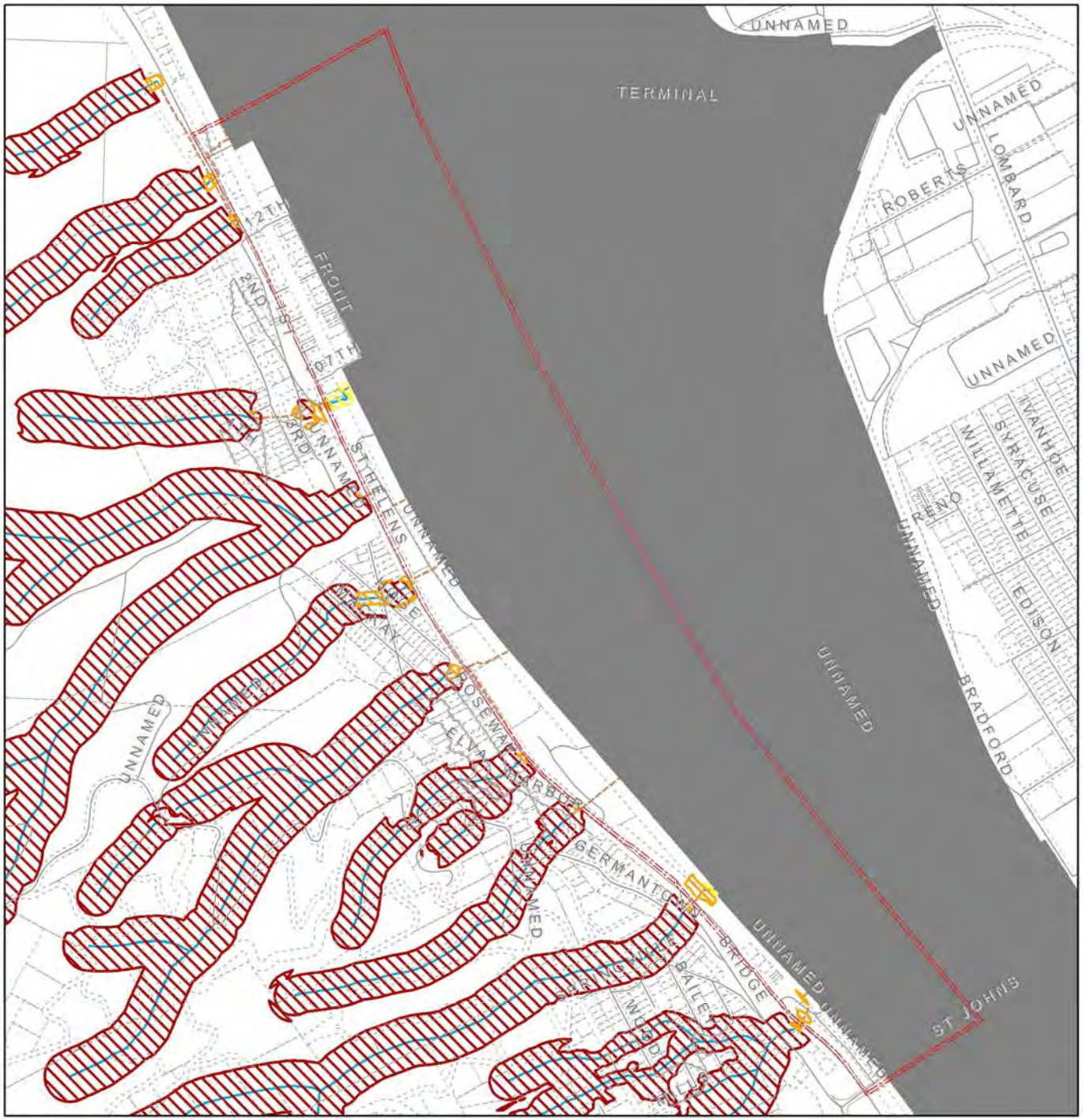
- Open Channel
- Stormwater/Combined Pipe
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Taxlots
- Streets
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 740 1,480 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



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Site WR6 - Map 4
Linnton

Metro Title 13
Habitat Conservation Areas

Habitat Conservation Areas
- High
- Moderate
- Low

Streams
- Open Channel
- Stormwater/Combined Pipe

Wetlands

Goal 15 Willamette Greenway Area

Proposed WRNRI* Site

City Boundary

Streets

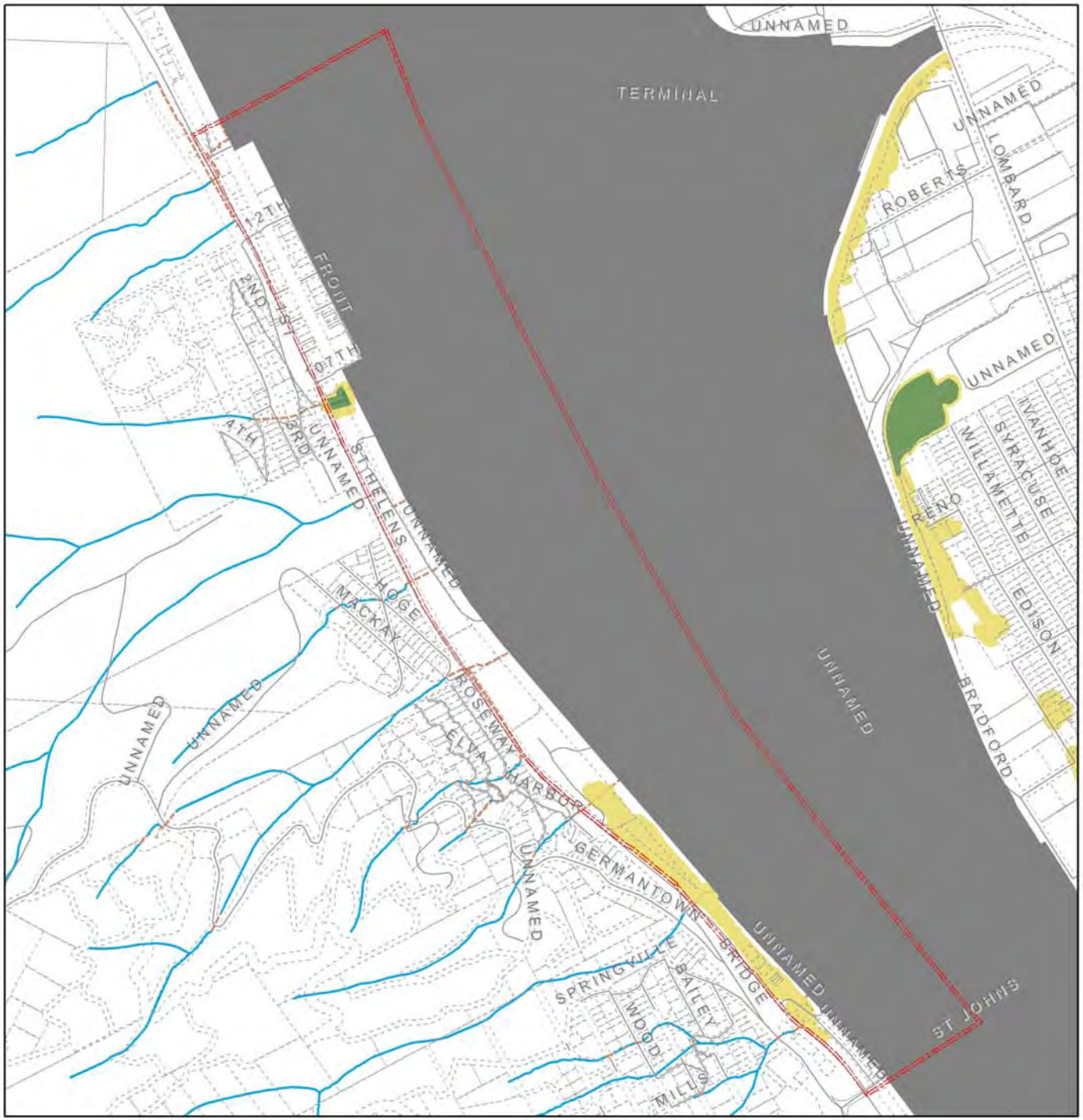
Taxlots

* Willamette River Natural Resources Inventory

NORTH

0 740 1,480 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



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Site WR6 - Map 5
Linnton

Proposed Environmental Overlay Zones

Proposed Environmental Overlays

- protection zone
- conservation zone

Streams

- Open Channel
- Stormwater/Combined Pipe

- Wetlands
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Streets
- Taxlots
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 740 1,480 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

Inventory Site WR7: North Oak Palisades/Cathedral Park

Site Description: The site is located between Chimney and Pier Park to the northeast and Cathedral Park in the southwest. The northwest and western site boundaries follow N Bradford St from Lombard Ave to Cathedral Park. Lombard Ave, Weyerhauser Ave and Edison St. generally form the northeast boundary from the intersection of N Bradford St and Lombard Ave to Cathedral Park. The Willamette River, its banks and half of Cathedral Park, from N Bradford St westward, have been evaluated under Goal 15 and are not addressed by this ESEE analysis (totaling roughly 80 acres); this area is identified by River General (g) and River Recreational (e) overlay zones (Map 3). The remaining 171 acres are included in this ESEE analysis.

Quarter Sections:

2N1W35d
1N1W02a and d
1N1W01b and c
1N1W11a
1N1W12b and c

Conflicting Uses by City Base Zones:

Table 50: Base Zones in WR7: North Oak Palisades ESEE Evaluation Area

Zone	Acres	Existing Conflicting Uses	Potential Conflicting Uses
IH IG2	97	industrial, commercial, rail line	residential, commercial, industrial, institutional, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
EG1 EG2 EX	46	industrial, commercial, residential, rail line	residential, commercial, industrial, institutional, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
R1	8	multi-dwelling and single-dwelling residential	residential, institutional, broadcast facilities, rail line and utility corridors, temporary uses
R5	11	single-dwelling residential	residential, institutional, broadcast facilities, rail line and utility corridors, temporary uses
OS	9	Cathedral Park	commercial, institutional, agricultural, mining, broadcast facilities, rail line and utility corridors, temporary uses

Summary of Natural Resources: Site WR7: North Oak Palisades/Cathedral Park contains steep slopes, and the area above Bradford St, from St. Johns Bridge to the northwest site boundary, is within the Potential Landslide Hazard area (City of Portland, 2002). Four upland vegetated areas exist along Roberts Railroad Bluff, Weyerhauser Avenue, and Edison and Decatur Streets. These areas contain native Oregon white oak and Pacific madrone, which are

characteristic of the foothill savanna/oak woodland community type. A mixture of medium aged Douglas fir, Bigleaf maple, black cottonwood, and Scouler willow also occur within the woodland patches. These areas contain a mix of large trees that are approximately 95 to 120 years old. The northern most, 6-acre, area of upland forest vegetation is nearly 100% closed canopy containing Bigleaf maple, black cottonwood, and Douglas fir. The other vegetated areas have fairly open tree canopy, with cover ranging from 30 to 45 percent. The open canopy has allowed an invasive and disturbance-based shrub and herbaceous understory to develop on the moderately dry and exposed ridge. The understory throughout the woodland contains large areas of disturbance, including many intersecting areas of compacted and eroding dirt trails, debris piles, and small excavated pits which contained surface water at the time of the surveys. The upland habitats are fragmented by the railroad, residential development and roads.

Table 51: Summary of Natural Resource Features in Site WR7: North Oak Palisades	
	ESEE Evaluation Area (171 acres)
Open Stream Channel (linear feet)	**0**
Wetlands (acres)	**0**
Flood Area (acres)*	**0**
Vegetated (acres)	0
Non-vegetated (acres)	0
Open Water (acres)	0
Vegetated Areas >= ½ acre (acres)+	**41**
Forest (acres)	10
Woodland (acres)	11
Shrubland (acres)	10
Herbaceous (acres)	10
Impervious Surface (acres)	**106**

* The flood area includes the FEMA 100-year floodplain plus the adjusted 1996 flood inundation area.

+ The vegetation classifications are applied in accordance with the National Vegetation Classification System specifications developed by The Nature Conservancy. The data within the primary study area and within 300 feet of all open water bodies in Portland is draft and is currently being updated based 2006 aerial photography.

The bluff woodlands are one of the only sources of local cover for bird and small mammal species that use the area. Acorns and oak galls, as well as insects found on trees, are a good food source, while tree cavities in the oak provide nesting habitat for birds such as swallows, wrens, and great horned owls. The vegetated areas along the bluffs provide habitat connectivity between Pier and Chimney Parks to the north-northeast of the Roberts Railroad Bluff, to the Willamette River via Cathedral Park, and to Willamette Cover via a nearly continuous stretch of vegetated riverbank and beaches. The upland habitat corridor along the bluff extends southward to the Fremont Bridge. The bluffs also provide recreation and scenic resource benefits and opportunities.

Bird species observed at the site included dark-eyed junco, song and house sparrows, starlings, American robin, and golden-crowned kinglet. Several raccoon tracks and mole holes were also found on the site. It is likely that raptors such as red-tailed hawks may hunt this site while utilizing the updrafts of warm air that form along the bluff face.

The Willamette River Natural Resource Inventory for the North Reach identifies and evaluates the riparian and wildlife habitat resources contained within this site. Much of the resources are designated as Special Habitat Area due to the presence of Oregon white oaks and the importance of the vegetated bluffs as a significant wildlife habitat corridor.

Table 52 provides a summary of the ranked resources located with the portion of the site evaluated by this ESEE Analysis. Map 3 depicts ranked natural resource feature.

Table 52: Summary of Significant Resources and Ranks in WR7: North Oak Palisades ESEE Evaluation Area

Area Evaluated by ESEE Analysis = 171 acres				
	High	**Medium**	**Low**	**Total**
Riparian Resources*				
acres	0	0	0	0
percent of ESEE evaluation area	0	0	0	0
Wildlife Habitat*				
acres	0	0	11	11
percent of ESEE evaluation area	0	0	7	7
Special Habitat Areas*				
acres	20			
percent of ESEE evaluation area	12			
Combined Total**				
acres	20	0	2	22
percent of ESEE evaluation area	12	0	1	13

* High-ranked riparian resources, wildlife habitat, and Special Habitat Areas the Willamette River

** Because riparian resources, wildlife habitat, and Special Habitat Areas overlap, the results cannot be added together to determine the combined area.

Previous City Adopted ESEE Analysis: None

Site-Specific ESEE Analysis: The Willamette River North Reach general ESEE analysis and decision presented in the previous section and summarized in Table 53 below apply to inventory site WR7: North Oak Palisades/Cathedral Park except for the modifications described in Table 54.

Table 53: Willamette River North Reach General ESEE Decision

Base Zone	Significant Natural Resources		
	High Ranked/ Special Habitat Area	Medium Ranked	Low Ranked
Industrial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Employment	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Commercial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Institutional	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Residential	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Open Space	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow

Table 54: Supplemental ESEE Analysis for Site WR7: North Oak Palisades/Cathedral Park	
Feature	**Six—acre forested areas at Weyerhauser Ave. (aka Crown Cork and Baltimore Woods)**
WRNRI/ North Reach – Combined Riparian/Wildlife Habitat Relative Rank	High/Special Habitat Area
Characteristics	• Industrial and employment base zones • Contains native Oregon white oak, Pacific Madrone and other mature trees • Forest patch is generally round, providing rare interior habitat area and reducing edge effect • Contributes to upland wildlife habitat connectivity between Chimney/Pier Park and Cathedral Park
Willamette River North Reach General ESEE Decision	Limit conflicting uses in high ranked resource areas in industrial and employment base zones
ESEE Implications	A decision to limit conflicting uses could result in encroachment into part or all of the resource area. It would not be feasible to mitigate for the environmental and social values (e.g. rare and declining Oregon white oaks, wildlife habitat corridor, scenic, recreational, and educational opportunities) provided by this relatively large forest patch. A strict limitation on conflicting uses would protect these important and unusual resources while allowing continued use and development on more than two-thirds of the property.
Site-Specific ESEE Decision	Strictly limit conflicting uses in the six-acre forest at Weyerhauser Ave
Feature	**Oak Palisades along Decatur St.**
WRNRI/ North Reach – Combined Riparian/Wildlife Habitat Relative Rank	High/Special Habitat Area
Characteristics	• Residential base zone • Narrow non-developed area containing native Oregon white oak and other mature trees • Provides upland wildlife habitat connectivity to Cathedral Park • Areas of compacted and eroding dirt trails and debris piles
Willamette River North Reach General ESEE Decision	Strictly limit conflicting uses in high ranked resource areas in residential base zones
ESEE Implications	The potential negative economic consequences of strictly limiting conflicting uses outweigh the positive environmental and social values provided by these relatively small narrow habitat patches. Moderately limiting conflicting uses would prevent adverse impacts on the economic, social, environmental, and energy related values

	provided by the upland habitat where practicable, and would require mitigation for unavoidable impacts.
Site-Specific ESEE Decision	Limit conflicting uses in high ranked resource areas in residential base zones along Decatur St

Metro ESEE Decision: Metro analyzed the natural resource features within site WR3: Harborton Wetlands. Metro's ESEE decision was to limit conflicting uses within Habitat Conservation Areas (HCA) and allow conflicting uses within areas containing significant natural resources not designated as HCA. HCAs are comprised of Class I and II riparian corridors identified in Metro's inventory of regionally significant riparian corridors and wildlife habitat (Title 13 Section (2)(B)).

For this site, the City's ESEE decision to limit or strictly limit conflicting uses in areas containing high ranked upland resources areas is different from Metro's ESEE decision to allow conflicting uses in upland wildlife habitat areas (see Table 55 and Map 4).

Table 55: Comparison of Metro Title 13 Habitat Conservation area and the City's Natural Resources Inventory Ranked Resources in WR7: North Oak Palisades ESEE Evaluation Area

Total Area = 171	Title 13 Habitat Conservation Areas	City's Significant Natural Resources
High	0	20
Medium	0	0
Low	0	2
Total	**0**	**22**

Environmental Overlay Zones

The ESEE decisions are implemented through application of the environmental protection (p) overlay to areas where conflicting uses should be strictly limited and environmental conservation (c) overlay to areas where conflicting uses should be moderately limited. Tables 56 summarize how the resulting decisions affects different land uses. Map 5 presents the recommended environmental overlay zones based on the ESEE decision.

Table 56: Environmental Conservation and Protection Overlay Zones within Site WR7: North Oak Palisades ESEE Evaluation Area

Site = 171 acres	Total Acres	Existing Conservation Overlay	Existing Protection Overlay	Proposed Conservation Overlay	Proposed Protection Overlay
IH IG2	97	0	0	8	5
EG1 EG2 EX	46	0	0	11	1
R1	8	0	0	2	0
R5	11	0	0	1	0
OS	9	0	0	0	0

Planning

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Site WR7 - Map 1
North Oak Palisades

2007 Aerial Photography

Proposed WRNRI* Site

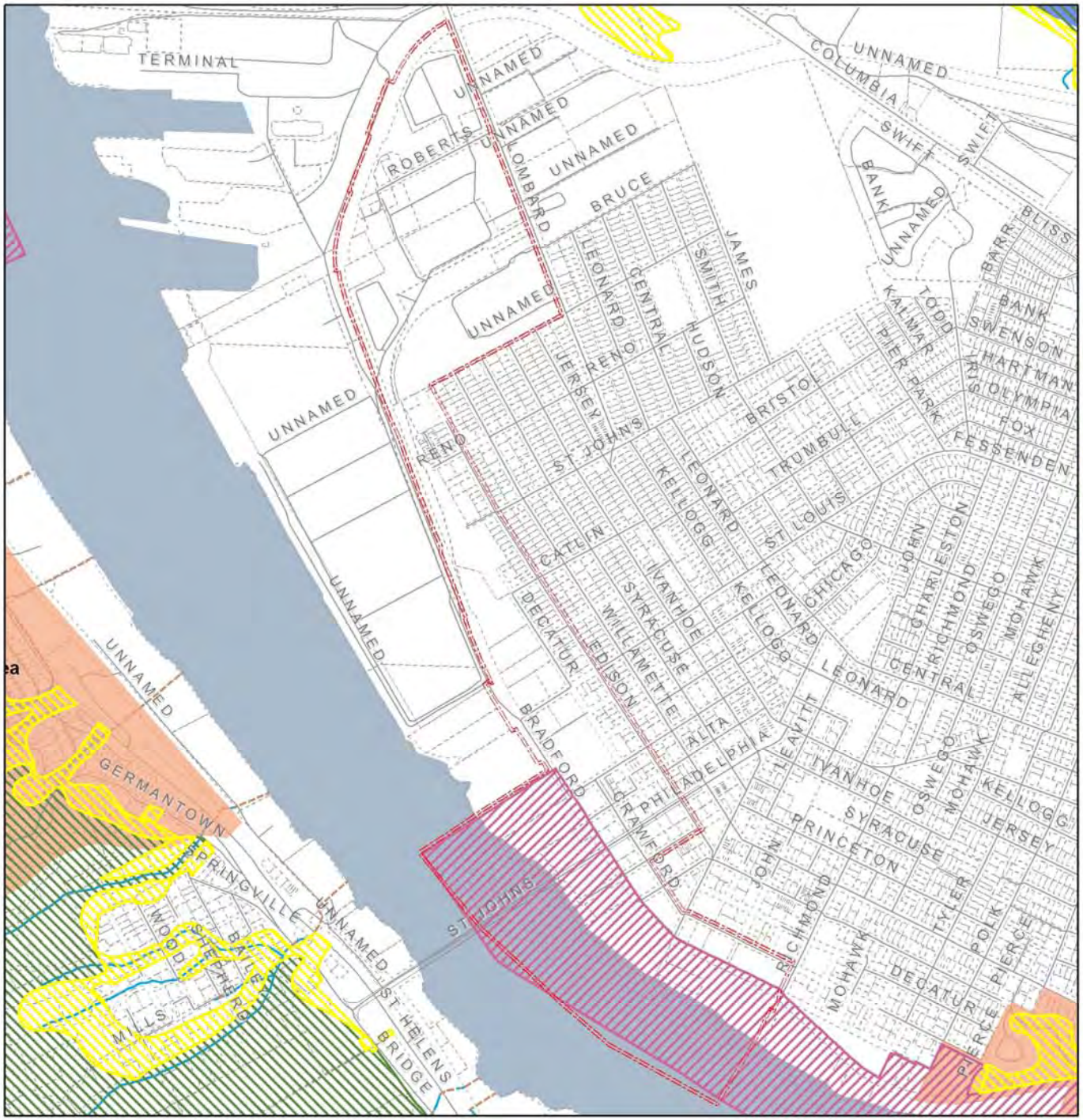
City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 870 1,740 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



Planning DRAFT

Site WR7 - Map 2
North Oak Palisades

City Adopted Natural Resource Inventory Sites and Existing Environmental Overlays

- Adopted Resource Inventory Sites
- Proposed WRNRI* Site

Existing Resource Overlays

- Environmental protection zone
- Environmental conservation zone
- Greenway natural zone
- Greenway water quality zone
- Greenway natural/water quality zone

Streams

- Open Channel
- Stormwater/Combined Pipe

- Wetlands
- Taxlots
- Streets
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 790 1,580 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

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Site WR7 - Map 3
North Oak Palisades

Combined Riparian/Wildlife Habitat Relative Ranks

Combined Relative Ranks

- High Relative Rank/SHAs
- High Relative Rank
- Medium Relative Rank
- Low Relative Rank

Streams

- Open Channel
- Stormwater/Combined Pipe

- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Taxlots
- Streets
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 790 1,580 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

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Site WR7 - Map 4
North Oak Palisades

Metro Title 13
Habitat Conservation Areas

Habitat Conservation Areas
- High
- Moderate
- Low

Streams
- Open Channel
- Stormwater/Combined Pipe

Wetlands

Goal 15 Willamette Greenway Area

Proposed WRNRI* Site

City Boundary

Streets

Taxlots

* Willamette River Natural Resources Inventory

NORTH

0 790 1,580 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

Planning

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Site WR7 - Map 5
North Oak Palisades

Proposed Environmental Overlay Zones

Proposed Environmental Overlays

- protection zone
- conservation zone

Streams

- Open Channel
- Stormwater/Combined Pipe

- Wetlands
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Streets
- Taxlots
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 790 1,580 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

Inventory Site WR8: Doane Lake

Site Description: This 481-acre inventory site is located on the west bank of the Willamette River, extending from the St. Johns Bridge at the northwest end to NW 61st Avenue and the southeastern boundary of the property currently owned by Schnitzer Steel at the southeastern end of the site. The Burlington Northern Railroad Bridge is located approximately in the middle of the site. Most of the site, approximately 340 acres, east of Front Avenue and the Burlington Northern rail corridor, has been evaluated under Goal 15 Willamette River Greenway, and is not addressed by this ESEE analysis; this area is identified by River General (g) or River Industrial (i) overlay zones (Map #). The remainder of the site, roughly 145 acres, including a portion of Highway 30, Doane Creek and Doane Lake, are evaluated as part of this ESEE analysis (Map 2).

Quarter Sections:

1N1W11a and d
1N1W12b, c and d
1N1W13a, b, c and d
1N1E18b and c

Conflicting Uses by City Base Zones:

Table 57: Base Zones in WR8: Doane Lake ESEE Evaluation Area

Zone	Acres	Existing Conflicting Uses	Potential Conflicting Uses
IH	145	industrial, rail line	residential, commercial, industrial, institutional, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses

Summary of Natural Resources: North Doane Lake and Doane Creek are part of a habitat corridor extending from Forest Park to the Willamette River. Doane Creek flows in an open channel for roughly 1,600 feet north of North Doane Lake and east of the rail line; then it is piped for approximately 2,200 feet to the Willamette River.

Table 58: Summary of Natural Resource Features in Site WR8: Doane Lake	
	ESEE Evaluation Area (145 acres)
Open Stream Channel (miles)	**1**
Wetlands (acres)	**7**
Flood Area (acres)*	**0**
Vegetated (acres)	0
Non-vegetated (acres)	0
Open Water (acres)	0
Vegetated Areas >= ½ acre (acres)+	**68**
Forest (acres)	9
Woodland (acres)	6
Shrubland (acres)	9
Herbaceous (acres)	44
Impervious Surface (acres)	**51**

* The flood area includes the FEMA 100-year floodplain plus the adjusted 1996 flood inundation area.

+ The vegetation classifications are applied in accordance with the National Vegetation Classification System specifications developed by The Nature Conservancy. The data within the primary study area and within 300 feet of all open water bodies in Portland is draft and is currently being updated based 2006 aerial photography.

North Doane Lake is a low lying wetland complex located due west of the railroad bridge, and is bounded on all sides by 25-foot railroad embankments. North Doane Lake is fed by an unnamed seasonal stream that originates in Forest Park and crosses under St. Helens Road in culverts. The complex includes approximately 20 acres of forested, scrub/shrub, and emergent wetland, and open water. North Doane Lake, Doane Creek and the surrounding vegetation provide important habitat connectivity between Forest Park and the Willamette River.

Surrounding North Doane Lake is a diverse, multi-layered forest of black cottonwood, Oregon ash, Pacific willow, cherry, red alder, and black hawthorn. Downed wood and snags are abundant. Scrub-shrub wetlands are transitional habitats that often occupy former wet-prairie areas associated with freshwater wetland depressions and alluvial and riparian bottomlands. These willow shrub thickets provide insectivorous species such as warblers, flycatchers and swallows food, cover, and nesting habitat. Small mammals and snakes are commonly found within emergent wetlands, which in turn attract coyotes and raptors such as northern harriers, red tail hawks and owls, which feed upon small mammals and snakes. Approximately 100 yards to the north of North Doane Lake, at the west end of the railroad corridor, the seasonal Doane Creek passes through a north-south oriented stream channel covered by a gallery of 20 to 30-year old red alder trees. Himalayan blackberry and English ivy dominate the understory.

The railroad corridor is approximately 150 feet wide and is separated from the river and associated beaches by NW Front Avenue. Mammals, such as deer, use the vegetation located adjacent and parallel to the rail corridor as a migration route from Forest Park to the river;

however, trains and cars on Highway 30 and NW Front Ave pose a risk to animals, especially amphibians and reptiles.

Numerous wildlife species were observed within this site during field investigations in winter/spring 2000. The complex and varied habitats that are present here provide natural habitat and cover for birds and small mammals. A large variety of birds were observed including great blue heron, doublecrested cormorant, dark eyed junco, scrub jay, rufous-sided towhee, hooded merganser, American coot, red-winged blackbird, Bewicks wren, Townsend's warbler, white-breasted nuthatch, varied thrush, mourning dove, American goldfinch, fox and song sparrow, and golden-crowned kinglet. Active beaver use was noted in several places within the site, and signs of small mammal use including pocket gopher, raccoon, and nutria were noted. Signs of deer were also noted.

Studies of the area show that Northern red-legged frogs, a sensitive species in Oregon, have used North Doane Lake as breeding habitat in the past 15 years (ODFW, 1996). An inventory done in March 2002 did not find any Northern red-legged frogs or egg masses in North Doane Lake. However, the report stated that due to abnormally high water, the conditions may not have been optimal for Northern red-legged frogs at these particular locations (Environmental Science & Assessment, LLC, 2002). During the 2002 inventory Western painted turtle, a state-listed sensitive species, was found in the lake. It is likely that several other species of reptiles and amphibians occur in North Doane Lake, including garter snakes and northwestern salamanders, which commonly feed on red-legged frogs at certain life stages.

Immediately south of the railroad berm is West Doane Lake and the Historic Drainage Ditch. At one time West Doane Lake received runoff from Forest Park and was hydrologically connected to the Historic Drainage Ditch, which flowed to the Willamette River via an outfall. In 1980, during construction of NW Front Avenue, the culvert between the Historic Drainage Ditch and the Willamette River was blocked. The pipe between West Doane Lake and the Historic Drainage Ditch was also blocked. Today the Historic Drainage Ditch does not have the characteristics of a stream or a wetland and the primary vegetation present is Himalayan Blackberry. West Doane Lake is a pond with surrounding shrubland and herbaceous vegetation. West Doane Lake is also contaminated from historic industrial land uses.

There are three other tributary streams located near the northern half of the site that flow from Forest Park under Highway 30. Two of the streams are combined in to an open channel for approximately 1,250 feet before being piped to the Willamette River. The other stream is open for two short segments between Highway 20 and the rail corridor and industrial development.

Table 59 provides a summary of the ranked resources located with the portion of the site evaluated by this ESEE Analysis. Map 3 depicts ranked natural resource feature.

Table 59: Summary of Significant Resources and Ranks in WR8: Doane Lake ESEE Evaluation Area				
Area Evaluated by ESEE Analysis = 145 acres				
	High	**Medium**	**Low**	**Total**
Riparian Resources*				
acres	18	8	10	36
percent of ESEE evaluation area	13	5	7	25
Wildlife Habitat*				
acres	0	19	0	19
percent of ESEE evaluation area	0	13	0	13
Special Habitat Areas*				
acres	37			
percent of ESEE evaluation area	26			
Combined Total**				
acres	39	6	5	50
percent of ESEE evaluation area	27	4	3	34

* High-ranked riparian resources, wildlife habitat, and Special Habitat Areas the Willamette River
** Because riparian resources, wildlife habitat, and Special Habitat Areas overlap, the results cannot be added together to determine the combined area.

Previous City Adopted ESEE Analysis: A portion of the site was addressed in the *Northwest Hills Natural Areas Protection Plan* (1991): Resource Site 92: Doane Lake and 93: Doane Lake – North. Below is a summary of findings and decisions. Resource Site 92 includes the lands between the railway embankments, North Doane Lake, and West Doane Lake (see map 2). Resource Site 93 includes Doane Creek and land between Front Avenue and Highway 30.

Economic Analysis

Resource Site 92: Doane Lake: Resource protection would not result in negative economic consequences. Industrial use is not feasible or economic as the site landlocked by railway embankments and not accessible and large portions of the site is covered by pond and wetland areas. Approximately 14 acres of industrial land would be affected by environmental zones and industrial development in protected areas would be subject to review.

Resource Site 93: Doane Lake – North: Protection of the entire site would result in substantial negative economic consequences since most of the site is level and cleared of large structure vegetation. General and heavy industrial uses would be less affected by protection of the four-acre riparian area along Doane Creek.

Social Analysis

Resource Site 92: Doane Lake: Resource protection would result in positive social consequences if pedestrian access is improved in the future. The lack of public access to the site reduces or eliminates the site's potential recreational values.

Resource Site 93: Doane Lake – North: Scenic values of the forested riparian area would be protected by limiting conflicting uses.

Environmental Analysis

Resource Site 92: Doane Lake: Limiting conflicting uses would result in positive environmental consequences. Wildlife habitat including local wetlands would be protected from effects of local industrial use. The site has the potential to act as a habitat link between the Willamette River and Forest Park.

Resource Site 93: Doane Lake – North: Resource protection would result in positive environmental consequences. The riparian area would be protected from disturbance. Restrictions on industrial use of the open field would not have any positive effects on the already disturbed open field. The creek and adjacent cover would continue to provide wildlife habitat.

Energy Analysis

Resource Site 92: Doane Lake: Resource protection would not result in negative energy consequences.

Resource Site 93: Doane Lake – North: Limiting conflicting uses would result in positive energy consequences. Associated reductions in industrial energy consumption for heating and cooling systems, transportation or infrastructure use would result in energy savings.

Decision

Resource Site 92: Doane Lake: Strictly limit conflicting uses within North Doane Lake and limit conflicting uses in the unnamed creek that feed North Doane Lake and within West Doane Lake.

Resource Site 93: Doane Lake – North: Strictly limit conflicting uses with Doane Creek and limit conflicting uses within the riparian area.

This decision resulted in application of the environmental protection overly zone to North Doane Lake and Doane Creek; and the application of environmental conservation overlay zone to unnamed creek the feeds North Doane Lake, West Doane Lake and the riparian vegetation surrounding Doane Creek.

Site-Specific ESEE Analysis: The Willamette River North Reach general ESEE analysis and decision presented in the previous section and summarized in Table 60 below apply to inventory site WR8: Doane Lake except for the modifications described in Table 61.

Table 60: Willamette River North Reach General ESEE Decision

Base Zone	Significant Natural Resources		
	High Ranked/ Special Habitat Area	Medium Ranked	Low Ranked
Industrial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Employment	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Commercial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Institutional	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Residential	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Open Space	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow

Table 61: Supplemental ESEE Analysis for Site WR8: Doane Lake	
Feature	**Non-vegetated rail corridors and non-vegetated, paved roads within 50 feet of a stream centerline or a wetland**
WRNRI/ North Reach Combined Riparian/Wildlife Habitat Relative Rank	High, Medium, Special Habitat Area
Characteristics	• Industrial base zone • Provides distribution opportunities for nearby industrial uses • Contribution to streamflow moderation, flood storage and channel dynamics is limited.
Willamette River North Reach General ESEE Decision	Strictly limit conflicting uses within 50 feet of a stream centerline or 50 feet of a wetland
ESEE Implications	Non-vegetated rail lines and paved roads include Highway 30 and the Burlington North Railroad and are adjacent or close to significant natural resources. The economic consequences of strictly limiting conflicting uses where established rail lines and paved roads exist would be negative due to the potential impacts on transportation and commerce. A limit decision would require future development, such as road widening, to avoid adversely affecting nearby streams where practicable or mitigate for unavoidable impacts
Site-Specific ESEE Decision	Limit conflicting uses in medium ranked non-vegetated areas within the non-vegetated rail corridors and non-vegetated, paved roads
Feature	**Short (<50 feet) open stream segments located and land within 50 feet of the stream centerline**
WRNRI/ North Reach Combined Riparian/Wildlife Habitat Relative Rank	Medium
Characteristics	• Industrial base zone • Provides industrial and employment opportunities • Contributions to streamflow conveyance and storage and channel migration are somewhat constrained by a highway, rail corridor and industrial development
Willamette River North Reach General ESEE Decision	*Strictly limit* conflicting uses within 50 feet of a stream centerline
ESEE Implications	The short stream segments at this site are located between Highway 30 and the rail corridor and industrial area. While these stream segments still provide important water conveyance, storage and other riparian corridor functions they are constrained by highway, rail and industrial uses. The economic consequences of strictly limiting conflicting uses would be negative due to potential impacts on transportation, commerce and industrial development. As such, the negative economic consequences of strictly limiting conflicting uses would outweigh the

	environmental, social or energy benefits. A limit decision would require development to avoid causing adverse impacts to natural resources areas where practicable. Unavoidable impacts would need to be mitigated.
Site-Specific ESEE Decision	*Limit* conflicting uses in areas containing short (<50 feet) open stream segments and on land within 50 feet of the stream centerline.
Feature	**West Doane Lake**
WRNRI/ North Reach Combined Riparian/Wildlife Habitat Relative Rank	Medium
Characteristics	• Industrial base zone • Active clean-up of contamination • Provides industrial and employment opportunities • Contribution to riparian corridor functions, due to proximity to North Doane Lake
Willamette River North Reach General ESEE Decision	*Limit* conflicting uses in medium ranking resources areas
ESEE Implications	West Doane Lake is in close proximity to North Doane Lake. The shrubland vegetation, located between West Doane Lake and the rail road berm, provides some riparian corridor functions; those functions are limited by the rail road, industrial uses and contamination. The economic consequences of limiting conflicting uses are negative due to the potential impact on future industrial development. The impact on natural resources of allowing conflicting uses are minimal due to current impacts.
Site-Specific ESEE Decision	*Allow* conflicting uses in medium ranking resource areas surrounding West Doane Lake.

The general and supplemental site-specific ESEE decisions are generally consistent with the previous ESEE for sites 92 and 93 of the *Northwest Hills Natural Areas Protection Plan* (1991).

There are two substantive differences. The first pertains to the feature known as West Doane Lake, where some of the conflicting uses that were limited previously are now proposed to be allowed. The decision to allow conflicting uses reflects the fact that West Doane Lake is no longer a stream as both the upstream source and downstream discharge have been blocked. The remaining depression does not meet the definition of a wetland. The general ESEE decision for the North Reach is to allow conflicting uses that would affect the low ranked shrubland and herbaceous vegetation surrounding the depression.

The second substantive difference is the herbaceous and shrubland vegetation located between Doane Creek and the industrial development near the river. This area is designated a Special Habitat Area and City's general ESEE decision is to limit conflicting uses within Special Habitat Areas in industrial base zones. The previous ESEE decision was to allow conflicting uses in areas of high ranked upland habitat.

Metro ESEE Decision: Metro analyzed the natural resource features within site WR8: Doane Lake. Metro's ESEE decision was to limit conflicting uses within Habitat Conservation Areas (HCA) and allow conflicting uses within areas containing significant natural resources not designated as HCA. HCAs are comprised of Class I and II riparian corridors identified in Metro's inventory of regionally significant riparian corridors and wildlife habitat (Title 13 Section (2)(B)).

For this site, the City's ESEE decision to limit or strictly limit conflicting uses in areas containing high or medium ranked resources generally comports with Metro's ESEE decision to limit conflicting uses in HCAs (see Table 62 and Map 4). The differences occur primarily at the edges of the resources and are a result of the City

- mapping smaller vegetation units - ½ acre as compared to 1 acre;
- differentiating between forest and woodland vegetation types; and/or
- refinements to criteria that rank riparian corridor functions.

One substantive difference is the herbaceous and shrubland vegetation located between Doane Creek and the industrial development near the river. This area is designated a Special Habitat Area and City's general ESEE decision is to limit conflicting uses within Special Habitat Areas in industrial base zones. Metro's ESEE decision was to allow conflicting uses in areas of high ranked upland habitat.

Table 62: Comparison of Metro Title 13 Habitat Conservation area and the City's Natural Resources Inventory Ranked Resources in WR8: Doane Lake ESEE Evaluation Area

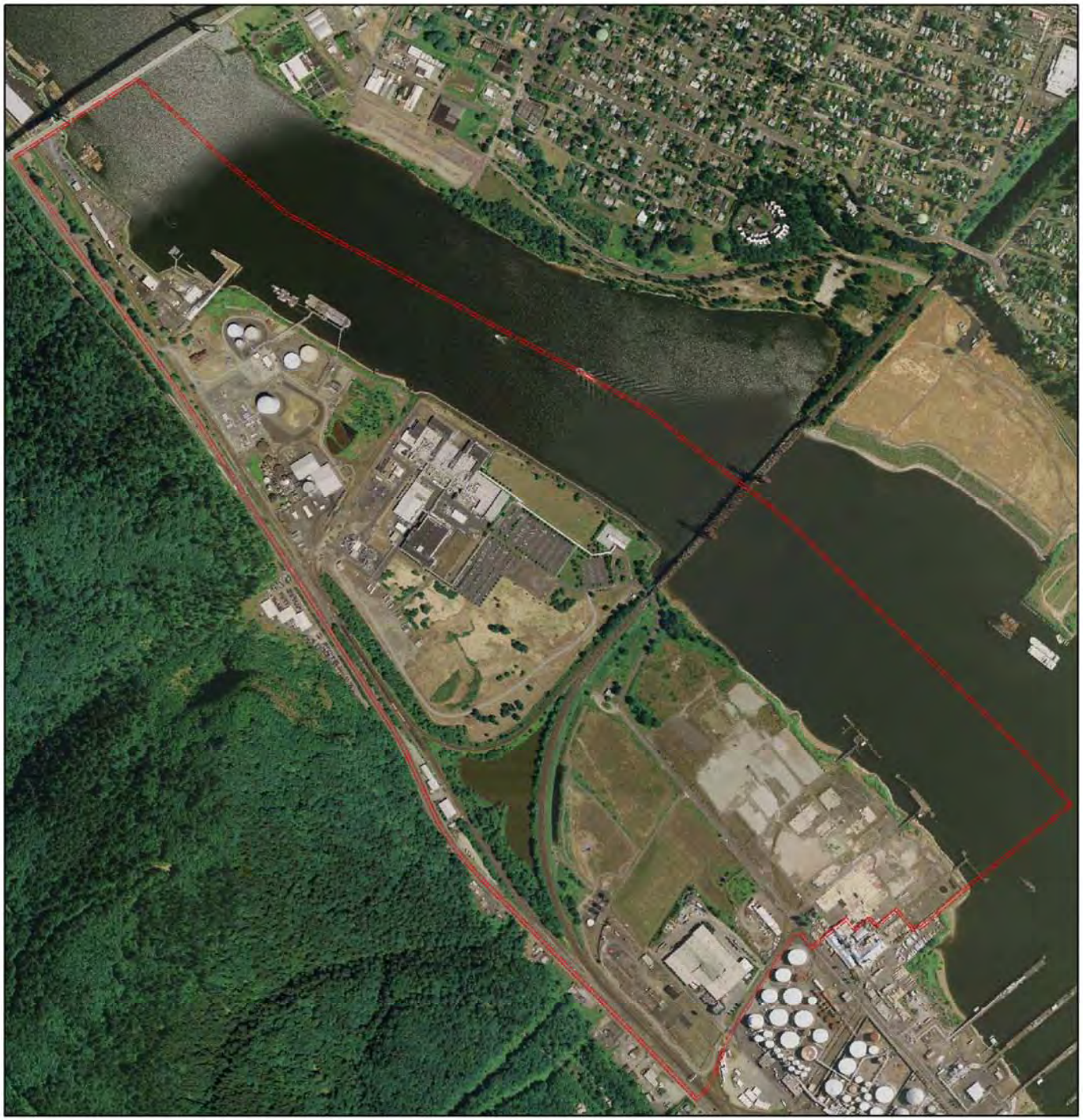
Total Area = 145	Title 13 Habitat Conservation Areas	City's Significant Natural Resources
High	0	39
Medium	17	6
Low	8	5
Total	**25**	**50**

Environmental Overlay Zones

The ESEE decisions are implemented through application of the environmental protection (p) overlay to areas where conflicting uses should be strictly limited, and environmental conservation (c) overlay to areas where conflicting uses should be moderately limited. Tables 63 summarize how the resulting decisions affects different land uses. Map 5 presents the recommended environmental overlay zones based on the ESEE decision.

Table 63: Environmental Conservation and Protection Overlay Zones within Site WR8: Doane Lake ESEE Evaluation Area

	Total Acres	Existing Conservation Overlay	Existing Protection Overlay	Proposed Conservation Overlay	Proposed Protection Overlay
IH	145	10	13	33	17



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Site WR8 - Map 1
Doane Lake

2007 Aerial Photography

Proposed WRNRI* Site

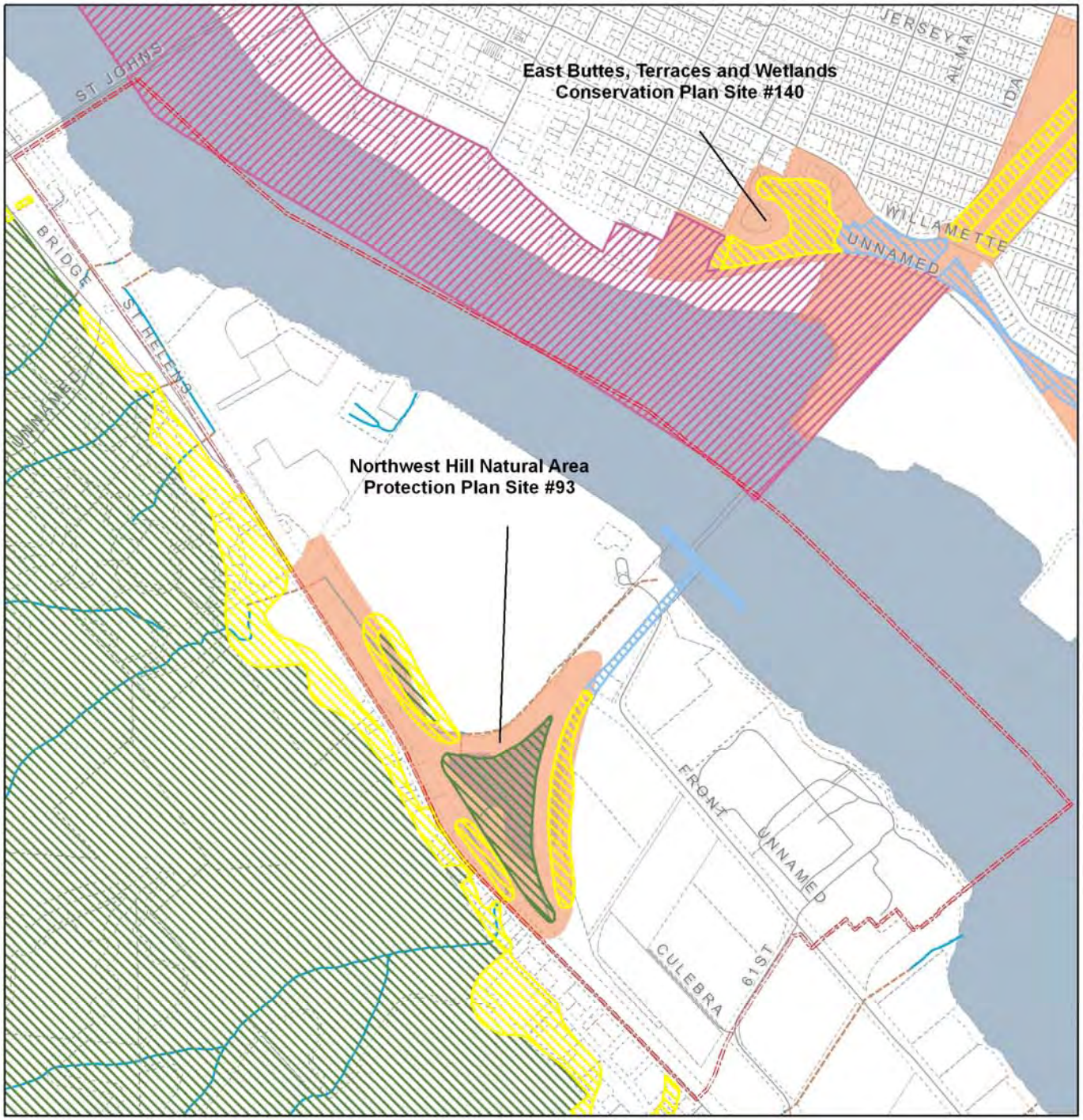
City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 740 1,480 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



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Planning

Site WR8 - Map 2
Doane Lake

City Adopted Natural Resource Inventory Sites and Existing Environmental Overlays

Adopted Resource Inventory Sites

Proposed WRNRI* Site

Existing Resource Overlays

Environmental protection zone

Environmental conservation zone

Greenway natural zone

Greenway water quality zone

Greenway natural/water quality zone

Streams

Open Channel

Stormwater/Combined Pipe

Wetlands

Taxlots

Streets

City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 675 1,350 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

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Site WR8 - Map 3
Doane Lake

Combined Riparian/Wildlife Habitat Relative Ranks

Combined Relative Ranks

- High Relative Rank/SHAs
- High Relative Rank
- Medium Relative Rank
- Low Relative Rank

Streams

- Open Channel
- Stormwater/Combined Pipe
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Taxlots
- Streets
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 675 1,350 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

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Site WR8 - Map 4
Doane Lake

Metro Title 13
Habitat Conservation Areas

Habitat Conservation Areas
- High
- Moderate
- Low

Streams
- Open Channel
- Stormwater/Combined Pipe

Wetlands

Goal 15 Willamette Greenway Area

Proposed WRNRI* Site

City Boundary

Streets

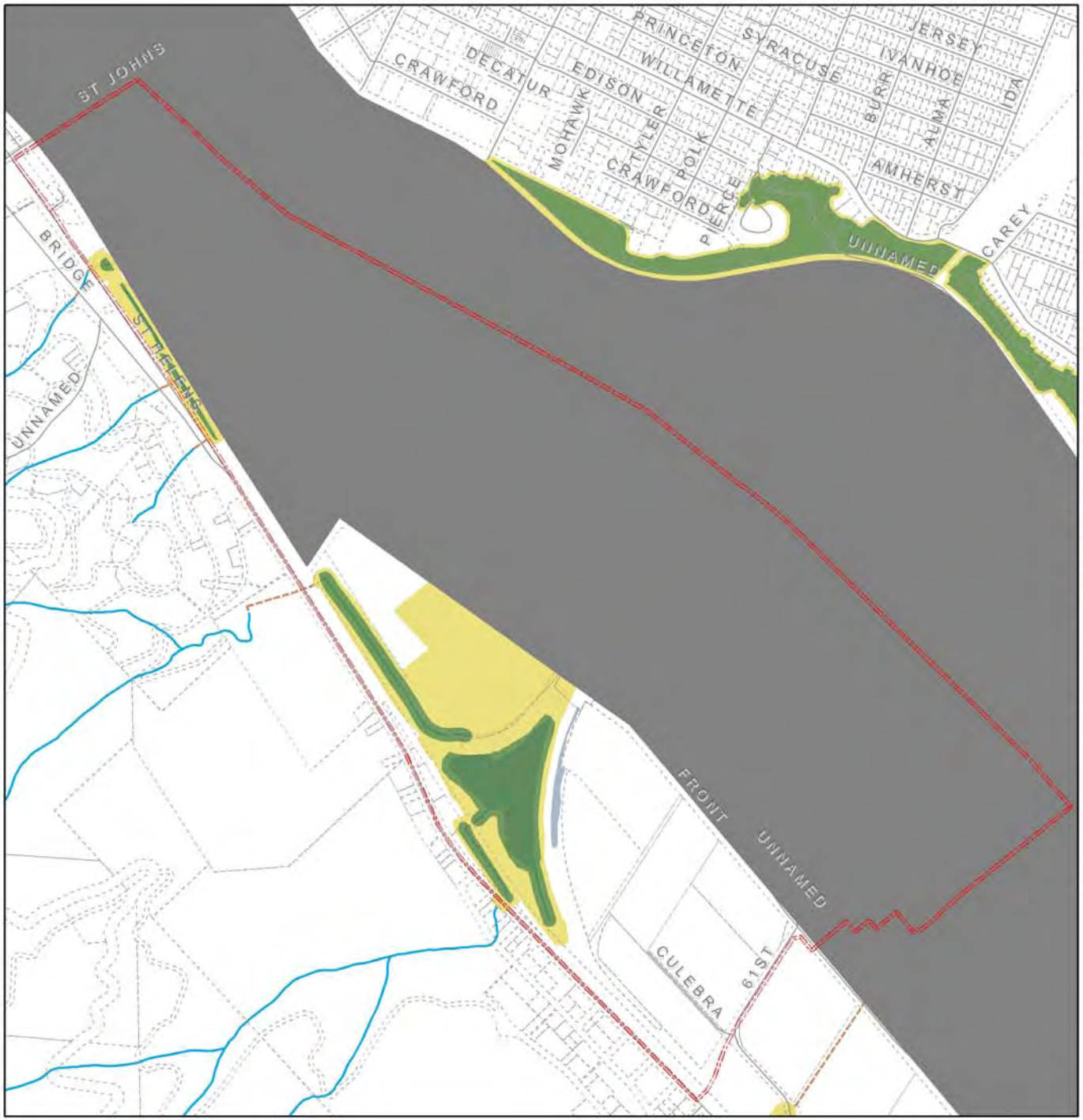
Taxlots

* Willamette River Natural Resources Inventory

NORTH

0 675 1,350 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



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Site WR8 - Map 5
Doane Lake

Proposed Environmental Overlay Zones

Proposed Environmental Overlays
- protection zone
- conservation zone

Streams
- Open Channel
- Stormwater/Combined Pipe

Wetlands

Goal 15 Willamette Greenway Area

Proposed WRNRI* Site

Streets

Taxlots

City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 675 1,350 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

Inventory Site WR9: Willamette Cove

Site Description: This 119-acre site is located between N Richmond Ave to the northwest and the Burlington Northern railroad bridge to the southeast. The northeastern boundary is formed by N Crawford St and Willamette Blvd. Residential uses exist in the upland portions of the site. The Willamette Cove property was acquired by Metro in 1996. The intended future use of the property is as an urban natural area with passive recreation opportunities. The area south of the Union Pacific Railroad corridor, totaling roughly 77 acres, has evaluated under Goal 15 and is not addressed by this ESEE analysis; this area is identified by River General (g) overlay zone. The remainder of the site, approximately 43 acres, north of the rail corridor, is evaluated as part of this ESEE analysis (Map 3).

Quarter Sections:

1N1W12a, b, c and d
1N1E07c

Conflicting Uses by City Base Zones:

Table 64: Base Zones in WR9: Willamette Cove ESEE Evaluation Area

Zone	Acres	Existing Conflicting Uses	Potential Conflicting Uses
EX	2	industrial, residential	residential, commercial, industrial, institutional, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
CN2	1	residential	residential, commercial, industrial, institutional, broadcast facilities, rail line and utility corridors, temporary uses
R2	3	residential	residential, institutional, broadcast facilities, rail line and utility corridors, temporary uses
R5	25	residential	residential, institutional, broadcast facilities, rail line and utility corridors, temporary uses
OS	12	rail line	commercial, institutional, agricultural, mining, broadcast facilities, rail line and utility corridors, temporary uses

Summary of Natural Resources: Site WR9: Willamette Cove provides important connectivity between the Willamette River, Cathedral Park and the North Oak Palisades site to the west, nearshore riparian habitat at the McCormick/Baxter site to the east, and the upland bluffs that extend south to the Fremont Bridge. The dominant vegetation type in the site is forest, woodland and shrubland with some associated herbaceous cover.

Table 65: Summary of Natural Resource Features in Site WR9: Willamette Cove	
	ESEE Evaluation Area (43 acres)
Open Stream Channel (linear feet)	**0**
Wetlands (acres)	**0**
Flood Area (acres)*	**0**
Vegetated (acres)	0
Non-vegetated (acres)	0
Open Water (acres)	0
Vegetated Areas >= ½ acre (acres)+	**25**
Forest (acres)	9
Woodland (acres)	7
Shrubland (acres)	6
Herbaceous (acres)	3
Impervious Surface (acres)	**8**

* The flood area includes the FEMA 100-year floodplain plus the adjusted 1996 flood inundation area.

+ The vegetation classifications are applied in accordance with the National Vegetation Classification System specifications developed by The Nature Conservancy. The data within the primary study area and within 300 feet of all open water bodies in Portland is draft and is currently being updated based 2006 aerial photography.

The site contains a unique assemblage of vegetative community types within a relatively small area. The forest and woodland areas contain a mix of native and non-native large trees. Within areas dominated by shrubs species include trailing blackberry, elderberry, butterfly bush, and sumac. The grasslands are dominated by many invasive grass and herb species but also contain native species including red columbine and fowl mannagrass. In conjunction with the river, the variety of plant communities creates a habitat mosaic that supports a diverse group of resident and migratory birds, small mammals, reptiles, amphibians, invertebrates, and fish. The quality of food sources is more likely to be sustained year-round with so many habitat types in proximity to each other, making this an important forage area for most species found here.

The complex of habitats in this reach attracts a varied collection of bird species year round. Terrestrial bird species observed include scrub jay, spotted towhee, downy woodpecker, fox and song sparrow, black-capped chickadee, bushtit, flicker, sharp-shinned hawk, red-tailed hawk, and northern harrier. River birds included great blue heron, common merganser, and double-crested cormorant. Small mammals included raccoon, beaver, woodrat, pocket gopher, and field mice. The area does have sufficient forage to attract deer, and the railroad may serve as a migration corridor for them. Several common species of reptiles and amphibians including garter snakes and Pacific chorus (tree) frogs may be found here.

There is an extensive trail system within the southern half of this site. Use of the trail system, including use by dogs, can impact wildlife use of the adjacent habitat areas.

Table 66 provides a summary of the ranked resources located with the portion of the site evaluated by this ESEE Analysis. Map 3 depicts ranked natural resource feature.

Table 66: Summary of Significant Resources and Ranks in WR9: Willamette Cove ESEE Evaluation Area				
Area Evaluated by ESEE Analysis = 43 acres				
	High	**Medium**	**Low**	**Total**
Riparian Resources*				
acres	0	1	7	8
percent of ESEE evaluation area	0	1	16	17
Wildlife Habitat*				
acres	0	0	11	11
percent of ESEE evaluation area	0	0	26	26
Special Habitat Areas*				
acres	21			
percent of ESEE evaluation area	49			
Combined Total**				
acres	21	0	2	23
percent of ESEE evaluation area	49	0	4	53

* High-ranked riparian resources, wildlife habitat, and Special Habitat Areas the Willamette River

** Because riparian resources, wildlife habitat, and Special Habitat Areas overlap, the results cannot be added together to determine the combined area.

Previous City Adopted ESEE Analysis: A portion of the site was addressed in the *East Buttes, Terraces and Wetlands Conservation Plan* (1993). Resource Site 140: Overlook Bluff includes half of site WR9: Willamette Cove from the extension of N Polk Ave east. Site 140 also includes lands along the Burlington Northern Railroad to the north and the bluffs known as Waud Bluff and Mocks Crest south to Overlook Park; these areas are not contained in WR9: Willamette Cove. Below is a summary of findings and decisions for Site 140.

Economic Analysis

Limiting or prohibiting conflicting uses on the forest bluffs would have positive economic consequences including protection of local residential and business property values and tax revenues and would protect the slope and reduce potential risks landslides. Guiding development away from hazardous areas would reduce infrastructure and public facility infrastructure costs.

Prohibiting conflicting uses on the vegetated bluffs would preclude new development and expansion opportunities. Much of the bluff is zoned open space, which prohibits housing, commercial and industrial uses. The rail corridor is for all practical purposes fully developed. The steep slopes and weak, silt loam soils make most develop activities in all zones generally unfeasible. However unfeasible new development or expansion may be, prohibiting all such actions could have negative economic consequences. Limiting such actions allows significantly greater flexibility for development and use of the site and not likely to have economic impacts.

Social Analysis
The protection of the Overlook Bluff area is consistent with city policies that emphasize the scenic and recreational beauty and value of lands along N Willamette Blvd. Protecting the natural resources that are located in existing parks and open spaces will have a positive impact on neighborhood livability. Overlook Bluff provides views of the Willamette River and Forest Park. Further, positive social consequences would result from the retention of forest cover and the avoidance of possible public health and safety hazards associated with erosion, slumping and landslides.

Environmental Analysis
Limiting or prohibiting conflicting uses will protect the site's natural resources and values as identified in the inventory. The inventory includes the following information regarding natural resources and values:

> ***Functional Values:*** *food, water, cover and territory for wildlife; groundwater recharge and discharge; slope stabilization; sediment and erosion control; and air and water quality protection*
>
> ***Resource Quantity and Quality:*** *The Overlook Bluff supports a oak/madrone forest community rare within Portland…. Other tree species along the bluff are bigleaf maple, black cottonwood, pacific dogwood, bitter cherry, red alder, willows and the occasional Douglas fir and western red cedar…. The bluff is exposed to intensive human use at its top and at its base but is otherwise unmanaged and relatively undisturbed…. This lack of management means that snags, down woody debris and other structure habitat features are more common. The oak/madrone forest community supports a range of wildlife species…. The Burlington Northern rail corridor…follows a ravine that provides wildlife habitat and corridor values, in essence linking the Willamette River Greenway with the Columbia Slough habitat area.*

Energy Analysis
The forest provides a tempering effect on climate and reduces energy needs for heating and cooling of nearby residences. Trees shade buildings in the summer, reducing energy demands for cooling. Plants also absorb sunlight and transpire during the grown seasons, reducing ambient air temperatures. Trees and shrubs also act as a wind break during the winter, reducing building heat loss and resulting in lower energy needs for heating. On balance, protection of forest vegetation would have positive energy consequences locally.

Decision
Limit conflicting uses along the forested slopes of Overlook Bluff and the rail corridor. This decision resulted in application of the environmental conservation overly zone to the Edgewater Condominium properties above the railroad corridor.

Previous City Adopted Willamette Greenway Program. Portions of the site were addressed in the Willamette Greenway Plan (1987). Greenway natural (n) and water quality (q) overlay zones were applied to the bluff and riparian areas (Map 2).

Site-Specific ESEE Analysis: The Willamette River North Reach general ESEE analysis and decision presented in the previous section and summarized in Table 67 below apply to inventory site WR9: Willamette Cove except for the modifications described in Table 68.

Table 67: Willamette River North Reach General ESEE Decisions

Base Zone	Significant Natural Resources		
	High Ranked/ Special Habitat Area	Medium Ranked	Low Ranked
Industrial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Employment	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Commercial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Institutional	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Residential	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Open Space	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow

Table 68: Supplemental ESEE Analysis for Site WR9: Willamette Cove	
Feature	**Non-vegetated rail corridor within the Special Habitat Area**
WRNRI/ North Reach Relative Rank	High, Special Habitat Area
Characteristics	• Residential and open space base zones • Provides distribution opportunities for nearby industrial uses • Activities within this area have a direct affect on adjacent habitat areas.
Willamette River North Reach General ESEE Decision	Strictly limit conflicting uses in high ranking resource areas in residential and open space base zones
ESEE Implications	The economic consequences of applying a strictly limit decision to established rail lines in this site would be negative due to the potential impacts on transportation and commerce. A limit decision would prevent adverse impacts on the environmental, social, and energy values by the non-vegetated right-of-way where practicable. Unavoidable impacts would be mitigated.
Site-Specific ESEE Decision	Limit conflicting uses in high ranked areas within the non-vegetated rail corridor

The previous ESEE analysis for Resource Site 140: Overlook Bluff (*East Buttes, Terraces and Wetlands Conservation Plan -1993*) and the Willamette Greenway (1987) applied a limit decision to portions of the vegetated bluff at WR9: Willamette Cove. The proposed ESEE decision to strictly limit conflicting uses on the bluffs designated Special Habitat Area, would limit development to that which is necessary for access to the Willamette River or that which provides a public benefit. A strictly limit decision would allow for consistent management of the east-side escarpment that extends for roughly 7-miles parallel to the Willamette River.

Several City documents support additional protection of these upland natural resources:

- Portland Watershed Management Plan: In 2006, City Council adopted the Portland Watershed Management Plan which describes the approach to evaluate conditions in the City's urban watersheds and implement projects to improve watershed health. The plan discusses the importance of upland, terrestrial habitats and wildlife connectivity between upland and riparian habitats. The *Willamette River Characterization Report* (2004), a supporting document for the Plan, discusses the importance of the bluff habitat for local and migrating wildlife.

- Portland Zoning Code: "Significant Trees" are identified in the Portland Zone Code Table 630-1. Oregon white oak (*Quercus garryana*) is included in that table. The table is used in conjunction with the Tree Preservation Standards (Section 33.630) to protect established trees canopy during the land division process.

- Urban Conservation Treaty for Migratory Birds: In 2003, Portland joined several other U.S. cities to protect migratory birds and enhance their habitats within city environments through participation in the Urban Conservation Treaty for Migratory Birds. The acknowledged that migratory birds are an important element of the urban ecosystem and are indicators of the health of the urban environment. Upland forested and woodland areas provide critical migratory stopover, feeding and nesting habitat for the birds.

Consistent management of the entire bluff is also needed to wildfire and landslide hazards.

Metro ESEE Decision: Metro analyzed the natural resource features within site WR9: Willamette Cove. Metro's ESEE decision was to limit conflicting uses within Habitat Conservation Areas (HCA) and allow conflicting uses within areas containing significant natural resources not designated as HCA. HCAs are comprised of Class I and II riparian corridors identified in Metro's inventory of regionally significant riparian corridors and wildlife habitat (Title 13 Section (2)(B)).

For this site, the City's ESEE decision to limit or strictly limit conflicting uses in areas containing high ranked upland resources areas is different from Metro's ESEE decision to allow conflicting uses in upland wildlife habitat areas. Table 69 compares the acres of Habitat Conservation Area to the City's significant natural resource areas (Map 4).

Table 69: Comparison of Metro Title 13 Habitat Conservation area and the City's Natural Resources Inventory Ranked Resources in WR9: Willamette Cove ESEE Evaluation Area

Total Area = 43	Title 13 Habitat Conservation Areas	City's Significant Natural Resources
High	<1	21
Medium	0	0
Low	0	2
Total	**<1**	**23**

Environmental Overlay Zones

The ESEE decisions are implemented through application of the environmental protection (p) overlay to areas where conflicting uses should be strictly limited and environmental conservation (c) overlay to areas where conflicting uses should be moderately limited. Tables 70 summarize how the resulting decisions affects different land uses. Map 5 presents the recommended environmental overlay zones based on the ESEE decision.

Table 70: Environmental Conservation and Protection Overlay Zones within Site WR9: Willamette Cove ESEE Evaluation Area

Site = 43 acres	**Total Acres**	**Existing Conservation Overlay**	**Existing Protection Overlay**	**Proposed Conservation Overlay**	**Proposed Protection Overlay**
EX	2	0	0	0	0
CN2	1	0	0	0	0
R2	3	0	0	<1	0
R5	25	7	0	2	9
OS	12	0	0	4	8

Planning

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Site WR9 - Map 1
Willamette Cove

2007 Aerial Photography

Proposed WRNRI* Site

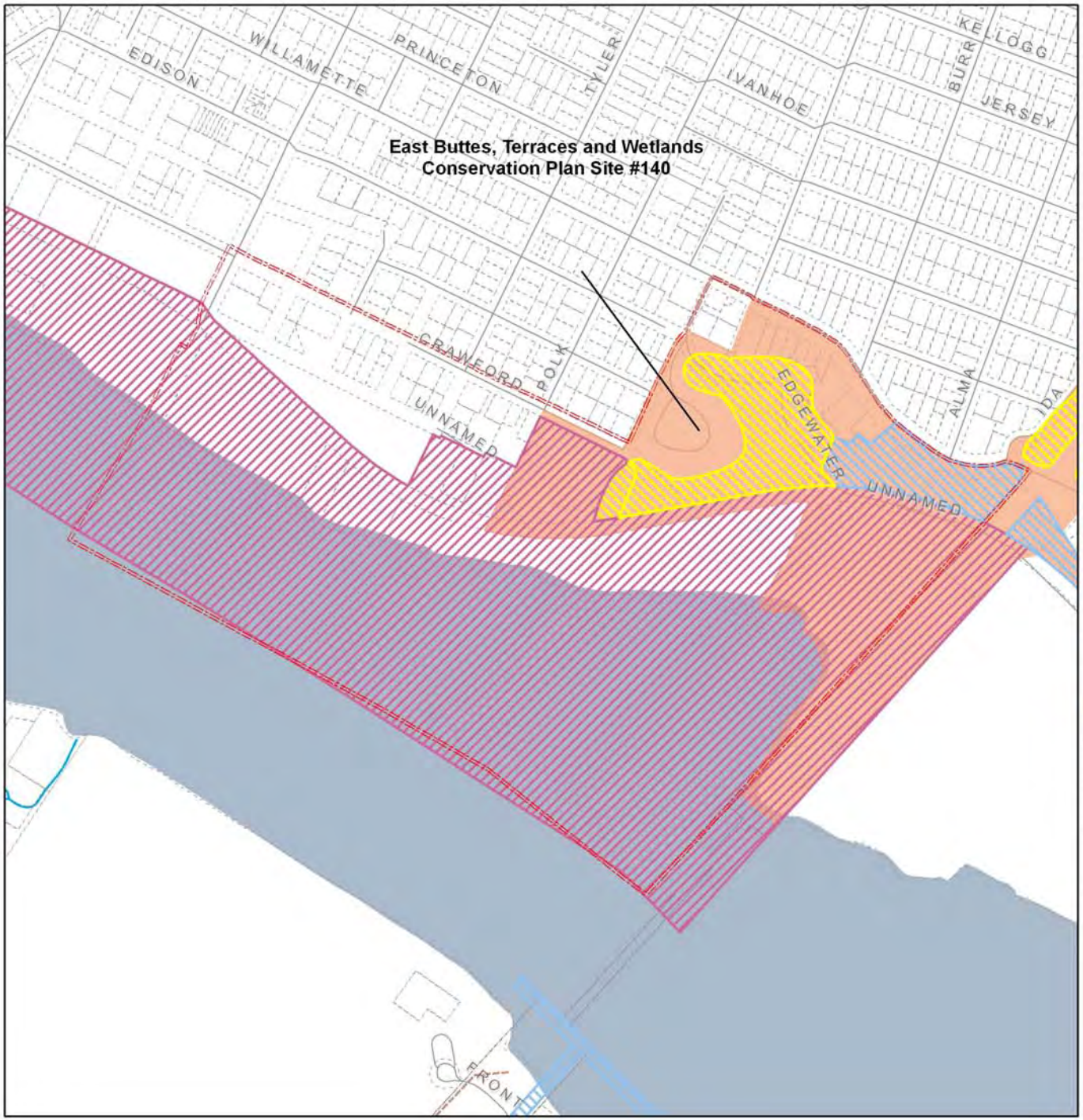
City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 410 820 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



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Site WR9 - Map 2
Willamette Cove

City Adopted Natural Resource Inventory Sites and Existing Environmental Overlays

Adopted Resource Inventory Sites

Proposed WRNRI* Site

Existing Resource Overlays

Environmental protection zone

Environmental conservation zone

Greenway natural zone

Greenway water quality zone

Greenway natural/water quality zone

Streams

Open Channel

Stormwater/Combined Pipe

Wetlands

Taxlots

Streets

City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 380 760 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

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Site WR9 - Map 3
Willamette Cove

Combined Riparian/Wildlife Habitat Relative Ranks

Combined Relative Ranks

- High Relative Rank/SHAs
- High Relative Rank
- Medium Relative Rank
- Low Relative Rank

Streams

- Open Channel
- Stormwater/Combined Pipe
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Taxlots
- Streets
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 380 760 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

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Site WR9 - Map 4
Willamette Cove

Metro Title 13
Habitat Conservation Areas

Habitat Conservation Areas
- High
- Moderate
- Low

Streams
- Open Channel
- Stormwater/Combined Pipe

Wetlands

Goal 15 Willamette Greenway Area

Proposed WRNRI* Site

City Boundary

Streets

Taxlots

* Willamette River Natural Resources Inventory

NORTH

0 380 760 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

Planning

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Site WR9 - Map 5
Willamette Cove

Proposed Environmental Overlay Zones

Proposed Environmental Overlays

- protection zone
- conservation zone

Streams

- Open Channel
- Stormwater/Combined Pipe

- Wetlands
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Streets
- Taxlots
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 380 760 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

Inventory Site WR10: McCormick/Baxter and Triangle Park

Site Description: The McCormick/Baxter and Triangle Park site is approximately 475 acres in size and is located on the east bank of the Willamette River between the Burlington Northern railroad bridge and the southeast side of University of Portland, west of Swan Island. The site extends northeast along the Burlington Northern railroad corridor to the junction of the Burlington Northern railroad track and the Union Pacific railroad track, connecting Smith and Bybee Lakes and the Columbia Slough to the Willamette River. The area west of the Union Pacific Railroad corridor, 225 acres, was evaluated under Goal 15and is not addressed by this ESEE analysis; this area is identified by River General (g) overlay zone. The remainder of the site, 250 acres, east of the rail corridor, is evaluated as part of this ESEE analysis (Map 3).

Quarter Sections:

1N1E06d
1N1E07 a-d
1N1W12d
1N1E17b
1N1E18a-d

Conflicting Uses by City Base Zones:

Table 71: Base Zones in WR10: McCormick/Baxter and Triangle Park ESEE Evaluation Area

Zone	Acres	Existing Conflicting Uses	Potential Conflicting Uses
IH IG	73	industrial, rail line	residential, commercial, industrial, institutional, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
EG2	3	commercial	residential, commercial, industrial, institutional, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
CG	<1	single-dwelling residential	residential, commercial, industrial, institutional, agricultural, detention facilities, broadcast facilities, rail line and utility corridors, temporary uses
R1 R2 R2.5	120	institutional (University of Portland), multi-dwelling and single-dwelling residential	residential, institutional, broadcast facilities, rail line and utility corridors, temporary uses
R5	50	single-dwelling residential, institutional	residential, institutional, broadcast facilities, rail line and utility corridors, temporary uses
OS	3	Harbor View Property	commercial, institutional, agricultural, mining, broadcast facilities, rail line and utility corridors, temporary uses

Summary of Natural Resources: In the McCormick/Baxter and Triangle Park site existing natural resources include the banks and flood area of the Willamette River and the upland vegetation habitat areas along the bluff. Below is a summary of natural resource features located within this site.

Table 72: Summary of Natural Resource Features in Site WR10: McCormick/Baxter and Triangle Park	
	ESEE Evaluation Area (250 acres)
Open Stream Channel (linear feet)	**0**
Wetlands (acres)	**0**
Flood Area (acres)*	**3**
Vegetated (acres)	2
Non-vegetated (acres)	1
Open Water (acres)	<1
Vegetated Areas >= ½ acre (acres)+	**112**
Forest (acres)	44
Woodland (acres)	24
Shrubland (acres)	13
Herbaceous (acres)	31
Impervious Surface (acres)	**81**

* The flood area includes the FEMA 100-year floodplain plus the adjusted 1996 flood inundation area.

+ The vegetation classifications are applied in accordance with the National Vegetation Classification System specifications developed by The Nature Conservancy. The data within the primary study area and within 300 feet of all open water bodies in Portland is draft and is currently being updated based 2006 aerial photography.

The steep bluff begins north of this site near Chimney and Pier Parks and extends south-eastward through four inventory sites: WR7 North Oak Palisades, WR9 Willamette Cove, WR10 McCormick/Baxter and Triangle Park and WR13 Willamette Bluff. In total, the bluff is roughly 7 miles long, approximately 1.5 miles of which are within this site. The vegetated areas along the bluff provide a wildlife habitat corridor that generally parallels the river. This upland wildlife habitat, connect to the Willamette River at the University of Portland and at other locations along the bluff outside of this inventory site (e.g. Willamette Cove).

The bluffs are located up to 1000 feet east of the river in the vicinity of the McCormick/Baxter property. At the University of Portland, the bluffs meet the river before abruptly angling eastward around the Swan Island area. The slopes are vegetated throughout the majority of the site with a mix of vegetation types ranging from shrubland to woodland to forest with closed tree canopy. Forest cover is seldom wider than 500 feet, and average approximately 200 feet in width. A foothill savanna/oak woodland community exists on the upper slopes and terrace, with elements of the bottomland forest mixed in lower on the slopes. Oregon white oak, Pacific madrone, and occasional Ponderosa pine dominate the foothill savanna/ oak woodland community. This is a transition zone away from the moister bottomland forest on the floodplain. Bigleaf maple, Douglas fir, Western red cedar, and red alder also occur infrequently within this site. On the lower slopes, especially at the University of Portland where the bluffs are closer to the river, black cottonwood, bitter cherry, and Pacific dogwood are found. Tree canopy cover varies, averaging between 25 and 35 percent. Downed wood is common in the forested areas,

and trees tend to be younger due in part to occasional windthrow and landslides on these steep, exposed slopes. The shrub understory within the forested area is dominated by Himalayan blackberry and Scot's broom, but also contains several important native species such as red elderberry, western hazel, snowberry, serviceberry, and oceanspray. The herbaceous understory is largely composed of English ivy, clematis, and Oregon grape.

In 2001 a wildfire burned vegetation on the bluff. Near the railroad bridge, nearly all vegetation was destroyed except a few mature trees at the top of the slope. This area has been revegetated by the City. Near the University of Portland the understory burned and some large trees were lost, but most of the mature tree canopy survived the fire.

A rail corridor extends northeast from the Willamette River to the junction with the Union Pacific railway. The corridor is a narrow cut approximately 300 feet wide and 80 feet deep. Railroad tracks are located on the floor, flanked by steep, vegetated slopes averaging 40 degrees. Most of the vegetation within the site is located on the steep banks of the bluffs and the railroad corridor. The corridor follows a ravine that provides wildlife habitat and connectivity between the Willamette River, Smith and Bybee Wetlands and the Columbia Slough. The dominant tree species is the Bigleaf maple, approximately 30-40 years in age. Other occasional trees include Douglas fir, apple, cherry and hawthorn. Shrubs include western hazel, snowberry, oceanspray, Oregon grape, poison oak, thimbleberry, vine maple, Himalayan blackberry, laurel and holly. The herbaceous layer contains sword fern, lady fern, clematis and English ivy.

Table 73 provides a summary of the ranked resources located with the portion of the site evaluated by this ESEE Analysis. Map 3 depicts ranked natural resource feature.

Table 73: Summary of Significant Resources and Ranks in WR10: McCormick/Baxter and Triangle Park ESEE Evaluation Area

Area Evaluated by ESEE Analysis = 250 acres				
	High	**Medium**	**Low**	**Total**
Riparian Resources*				
acres	2	6	14	22
percent of ESEE evaluation area	1	2	6	9
Wildlife Habitat*				
acres	0	0	53	53
percent of ESEE evaluation area	0	0	21	21
Special Habitat Areas*				
acres	40			
percent of ESEE evaluation area	16			
Combined Total**				
acres	41	1	31	73
percent of ESEE evaluation area	17	<1	13	30

* High-ranked riparian resources, wildlife habitat, and Special Habitat Areas the Willamette River

** Because riparian resources, wildlife habitat, and Special Habitat Areas overlap, the results cannot be added together to determine the combined area.

Previous City Adopted ESEE Analysis: The bluff resource areas in this site were addressed in the *East Buttes, Terraces and Wetlands Conservation Plan* (1993). Resource Site 140: Overlook Bluff extended from N Polk Avenue in the north (located in inventory site WR 9: Willamette Cove) along Waud Bluff and Mocks Crest and Overlook Park and south to I-5. Site 140 also includes lands along the Burlington Northern Railroad corridor. Below is a summary of findings and decisions for Resource Site 140.

Economic Analysis

Limiting or prohibiting conflicting uses on the forest bluffs would have positive economic consequences including protection of local residential and business property values and tax revenues and would protect the slope and reduce potential risks landslides. Guiding development away from hazardous areas would reduce infrastructure and public facility infrastructure costs.

Prohibiting conflicting uses on the vegetated bluffs would preclude new development and expansion opportunities. Much of the bluff is zoned open space, which prohibits housing, commercial and industrial uses. The rail corridor is for all practical purposes fully developed. The steep slopes and weak, silt loam soils make most develop activities in all zones generally unfeasible. However unfeasible new development or expansion may be, prohibiting all such actions could have negative economic consequences. Limiting such actions allows significantly greater flexibility for development and use of the site and not likely to have economic impacts.

Social Analysis

The protection of the Overlook Bluff area is consistent with city policies that emphasize the scenic and recreational beauty and value of lands along N Willamette Blvd. Protecting the natural resources that are located in existing parks and open spaces will have a positive impact on neighborhood livability. Overlook Bluff provides views of the Willamette River and Forest Park. Further, positive social consequences would result from the retention of forest cover and the avoidance of possible public health and safety hazards associated with erosion, slumping and landslides.

Environmental Analysis

Limiting or prohibiting conflicting uses will protect the site's natural resources and values as identified in the inventory. The inventory includes the following information regarding natural resources and values:

> ***Functional Values:*** *food, water, cover and territory for wildlife; groundwater recharge and discharge; slope stabilization; sediment and erosion control; and air and water quality protection*
>
> ***Resource Quantity and Quality:*** *The Overlook Bluff supports a oak/madrone forest community rare within Portland. Ponderosa pine, a common tree east of the Cascades, is also present in the area of the University of Portland. Other tree species along the bluff are bigleaf maple, black cottonwood, pacific dogwood, bitter cherry,*

red alder, willows and the occasional Douglas fir and western red cedar…. The bluff is exposed to intensive human use at its top and at its base but is otherwise unmanaged and relatively undisturbed…. This lack of management means that snags, down woody debris and other structure habitat features are more common. The oak/madrone forest community supports a range of wildlife species…. The Burlington Northern rail corridor…follows a ravine that provides wildlife habitat and corridor values, in essence linking the Willamette River Greenway with the Columbia Slough habitat area.

Energy Analysis

The forest provides a tempering effect on climate and reduces energy needs for heating and cooling of nearby residences, university buildings and medial centers. Trees shade buildings in the summer, reducing energy demands for cooling. Plants also absorb sunlight and transpire during the grown seasons, reducing ambient air temperatures. Trees and shrubs also act as a wind break during the winter, reducing building heat loss and resulting in lower energy needs for heating. On balance, protection of forest vegetation would have positive energy consequences locally.

Decision

Limit conflicting uses along the forested slopes of Overlook Bluff and the rail corridor. This decision resulted in application of the environmental conservation overly zone to the bluffs along the Burlington Northern Railroad corridor and at the northwestern edge of the University of Portland.

Previous City Adopted Willamette Greenway Program. A portion of the bluff within this site was inventoried and evaluated as part of the City's Willamette Greenway program. The Greenway natural (n) overlay zone was applied to most of the steep slopes, including the rail line. Subsequently, the City applied the Willamette q zone to the area between the rail line and the river, near University of Portland, to comply with the water quality related requirements of Title 3 of Metro's Urban Growth Management Functional Plan.

Site-Specific ESEE Analysis: The Willamette River North Reach general ESEE analysis and decision presented in the previous section and summarized in Table 74 below apply to inventory site WR10: McCormick/Baxter and Triangle Park except for the modifications described in Tables 75.

Table 74: Willamette River North Reach General ESEE Decision

Base Zone	Significant Natural Resources		
	High Ranked/ Special Habitat Area	Medium Ranked	Low Ranked
Industrial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Employment	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Commercial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Institutional	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Residential	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Open Space	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow

Table 75: Supplemental ESEE Analysis for SiteWR10: McCormick/Baxter and Triangle Park	
Feature	**Designated Special Habitat Areas on the bluff within industrial base zones; except within the non-vegetated rail corridor**
WRNRI/ North Reach Relative Rank	High, Special Habitat Area
Characteristics	• Industrial base zone • Oregon white oak, Pacific madrone, and Ponderosa pine along steep slopes • Vegetation provides upland habitat and wildlife connectivity along and to the Willamette River • Provides views of Willamette River and Forest Park and views looking eastward across the river as well. • Wildfire and landslide hazards
Willamette River North Reach General ESEE Decision	Limit conflicting uses in high ranking resources areas and Special Habitat Areas in industrial base zones
ESEE Implications	A decision to limit conflicting uses could result in encroachment into part or all of the bluff resource areas in this site. It would not be feasible to mitigate for the environmental and social values (e.g. rare and declining Oregon white oaks, wildlife habitat, scenic, recreational and education opportunities) currently provided. The economic consequences of strictly limiting conflicting uses would be minimal due to the relative infeasibility of developing the steep slope. Guiding development away from hazardous areas (e.g. landslide, wildfire) would reduce infrastructure and public facility risks and costs.
Site-Specific ESEE Decision	Strictly limit conflicting uses in Special Habitat Areas along the upland bluffs in industrial base zones; except within non-vegetated rail corridors
Feature	**Oaks on the University of Portland campus that are adjacent to the bluff and provide wildlife connectivity to the bluff**
WRNRI/ North Reach Relative Rank	High, Special Habitat Area
Characteristics	• Residential base zone; University of Portland campus • Oregon white oaks and occasional Pacific madrone with a maintained turf grass understory • Used as a common area and park with benches, trails and a fence along the top of the bluff • Relatively flat topography • Views of Willamette River and Forest Park
Willamette River North Reach General ESEE Decision	Strictly limit conflicting uses in high ranking resources areas and Special Habitat Areas in residential base zones
ESEE Implications	The social consequences of strictly limiting development in these areas on the University of Portland campus are negative due to the potential increase in education, cultural and recreation opportunities of campus development. The

	potential environmental impacts of conflicting uses, while negative, are minimized because the natural resource functions are already affected by landscape maintenance and student and faculty use. A limit decision would require impacts on the natural resources to be avoided where practicable or mitigated.
Site-Specific ESEE Decision	Limit conflicting where Oregon white oaks on the University of Portland campus provide wildlife connectivity to the bluff, but are not on the bluff itself, and have landscaped, maintained turf grass understory
Feature	**Bluff near intersection of N Portsmouth Avenue and N McCosh Street**
WRNRI/ North Reach Relative Rank	High, Special Habitat Area
Characteristics	• Residential base zone • Bigleaf maple, Alder and Himalayan Blackberry provides upland habitat and wildlife connectivity along and to the Willamette River • Provides views of Willamette River and Forest Park and views looking eastward across the river as well • Wildfire and landslide hazards • University of Portland Conditional Use Master Plan (1994) designated a building footprint at the base of the slope • University of Portland is acquiring the Triangle Park property below the bluff and plans to expand the campus; an existing unnamed street provides access to the Triangle Park property at the base of the bluff
Willamette River North Reach General ESEE Decision	Strictly limit conflicting uses in high ranking resources areas and Special Habitat Areas in residential base zones
ESEE Implications	The University of Portland campus is located above the bluff and owns portions of the bluff. The 1994 Conditional Use Master Plan approved a building/parking lot at the base of the bluff. The University intends to purchase and build facilities below bluff at the Triangle Park property. The social and transportation consequences of strictly limiting development in this area are negative due to the potential educational, cultural, recreation and access opportunities of an improved link between the upper and future lower campus and the Willamette River. The potential environmental impacts of conflicting uses, while negative, are minimized due to the existing unnamed street that fragments the bluff vegetation and contributes to slope instability. A limit decision would require impacts on the natural resources to be avoided where practicable or mitigated.
Site-Specific ESEE Decision	Limit conflicting within the bluff surrounding the unnamed street connecting the campus to the Triangle Park property near the intersection of N Portsmouth Ave and N McCosh Street

The previous ESEE analysis for Resource Site 140: Overlook Bluff (*East Buttes, Terraces and Wetlands Conservation Plan -1993*) and the adoption of the Willamette Greenway (1987) established overlay zones to protect the vegetated bluffs at site WR10: McCormick/Baxter and Triangle Park. The overlay zones applied at that time were the environmental conservation overlay zone and the Greenway natural zone. These zones require development to avoid

significant resources where practicable and to mitigate for unavoidable adverse impacts on the resource. Some portions of vegetated bluff are not currently with an environmental or greenway overlay zone.

The proposed ESEE decision presented would modify the previous decision by strictly limiting conflicting uses that would affect the high ranked resource areas on the bluff in all base zones; except near the intersection of N Portsmouth Ave and N McCosh St where a limit decision would be applied. The decision to strictly limit conflicting uses on the bluffs would allow, through a review process, development to that is necessary for access or where the public benefit provided by the development is found to outweigh the adverse impacts on the resource. The limit decision would require development to avoid impacts on natural resources or mitigate.

Several City documents support additional protection of these upland natural resources:

- Portland Watershed Management Plan: In 2006, City Council adopted the Portland Watershed Management Plan which describes the approach to evaluate conditions in the City's urban watersheds and implement projects to improve watershed health. The plan discusses the importance of upland, terrestrial habitats and wildlife connectivity between upland and riparian habitats. The *Willamette River Characterization Report* (2004), a supporting document for the Plan, discusses the importance of the bluff habitat for local and migrating wildlife.

- Portland Zoning Code: "Significant Trees" are identified in the Portland Zone Code Table 630-1. Oregon white oak (*Quercus garryana*) is included in that table. The table is used in conjunction with the Tree Preservation Standards (Section 33.630) to protect established trees canopy during the land division process.

- Urban Conservation Treaty for Migratory Birds: In 2003, Portland joined several other U.S. cities to protect migratory birds and enhance their habitats within city environments through participation in the Urban Conservation Treaty for Migratory Birds. The acknowledged that migratory birds are an important element of the urban ecosystem and are indicators of the health of the urban environment. Upland forested and woodland areas provide critical migratory stopover, feeding and nesting habitat for the birds.

Consistent management of the entire bluff is also needed to wildfire and landslide hazards.

Metro ESEE Decision: Metro analyzed the natural resource features within site WR10: McCormick/Baxter and Triangle Park. Metro's ESEE decision was to limit conflicting uses within Habitat Conservation Areas (HCA) and allow conflicting uses within areas containing significant natural resources not designated as HCA. HCAs are comprised of Class I and II riparian corridors identified in Metro's inventory of regionally significant riparian corridors and wildlife habitat (Title 13 Section (2)(B)).

For this site, the upland bluff is generally not designated HCA except within roughly 200 feet of the Willamette River near the University of Portland see. The City's ESEE decision to strictly limit or limit conflicting uses in areas containing high ranked upland resources areas is different

from Metro's ESEE decision to allow conflicting uses in upland wildlife habitat areas. Table 76 compares the acres of Habitat Conservation Area to the City's significant natural resource areas (Map 4).

Table 76: Comparison of Metro Title 13 Habitat Conservation area and the City's Natural Resources Inventory Ranked Resources in WR10: McCormick/Baxter and Triangle Park ESEE Evaluation Area

Total Area = 250	Title 13 Habitat Conservation Areas	City's Significant Natural Resources
High	3	41
Medium	4	1
Low	1	31
Total	**8**	**73**

Environmental Overlay Zones

The ESEE decisions are implemented through application of the environmental protection (p) overlay to areas where conflicting uses should be strictly limited and environmental conservation (c) overlay to areas where conflicting uses should be moderately limited. Tables 77 summarize how the resulting decisions affects different land uses. Map 5 presents the recommended environmental overlay zones based on the ESEE decision.

Table 77: Environmental Conservation and Protection Overlay Zones within Site WR10: McCormick/Baxter and Triangle Park ESEE Evaluation Area

Site = 250 acres	Total Acres	Existing Conservation Overlay	Existing Protection Overlay	Proposed Conservation Overlay	Proposed Protection Overlay
IH IG	73	30	0	4	4
EG2	3	0	0	0	0
CG	<1	0	0	0	0
R1 R2 R2.5	120	3	0	11	19
R5	50	4	0	3	9
OS	3	0	0	<1	3

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Site WR10 - Map 1
McCormick/Baxter and Triangle Park

2007 Aerial Photography

Proposed WRNRI* Site

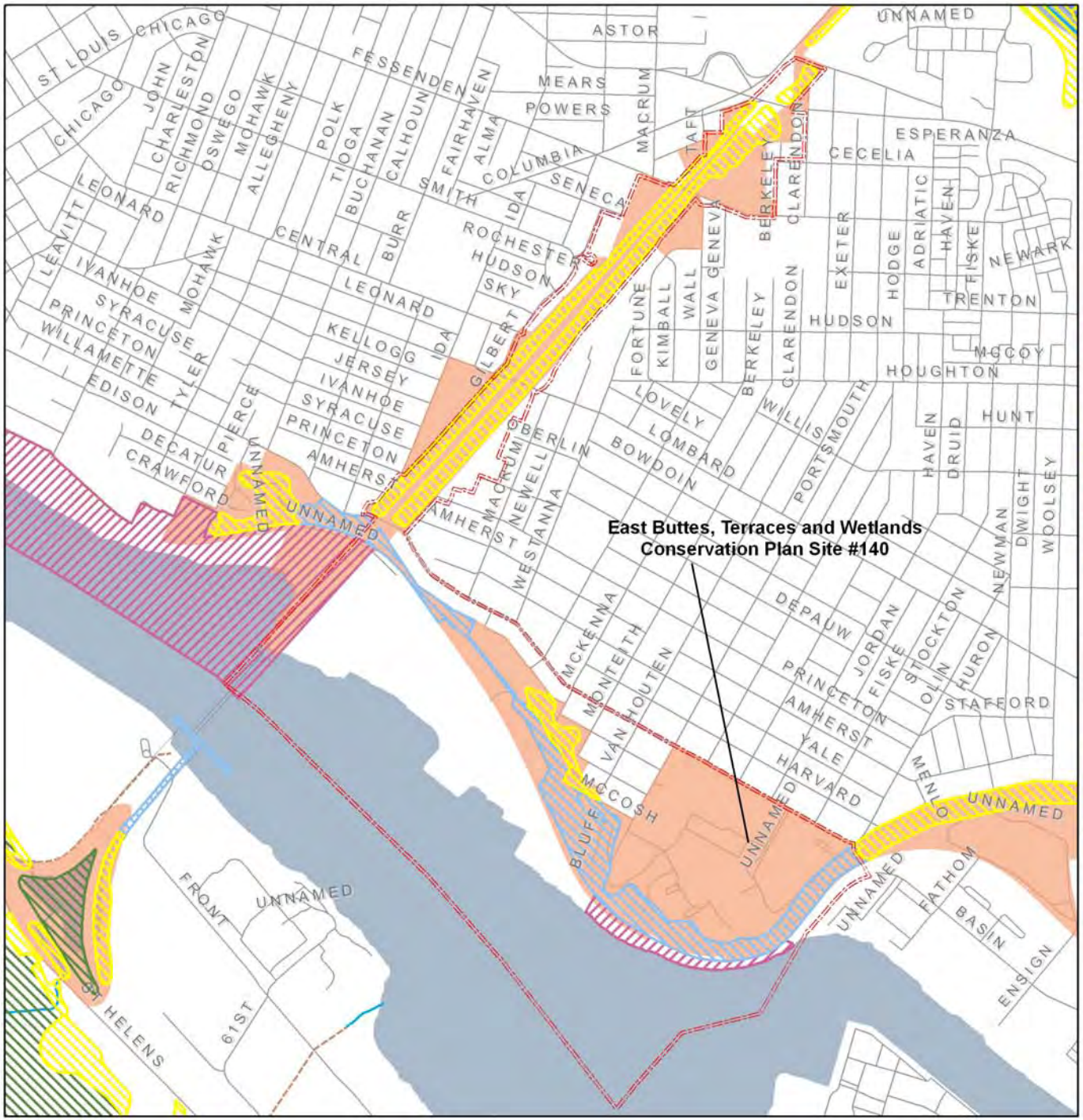
City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 1,000 2,000 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



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Site WR10 - Map 2
McCormick/Baxter and Triangle Park

City Adopted Natural Resource Inventory Sites and Existing Environmental Overlays

Adopted Resource Inventory Sites

Proposed WRNRI* Site

Existing Resource Overlays

Environmental protection zone

Environmental conservation zone

Greenway natural zone

Greenway water quality zone

Greenway natural/water quality zone

Streams

Open Channel

Stormwater/Combined Pipe

Wetlands

Streets

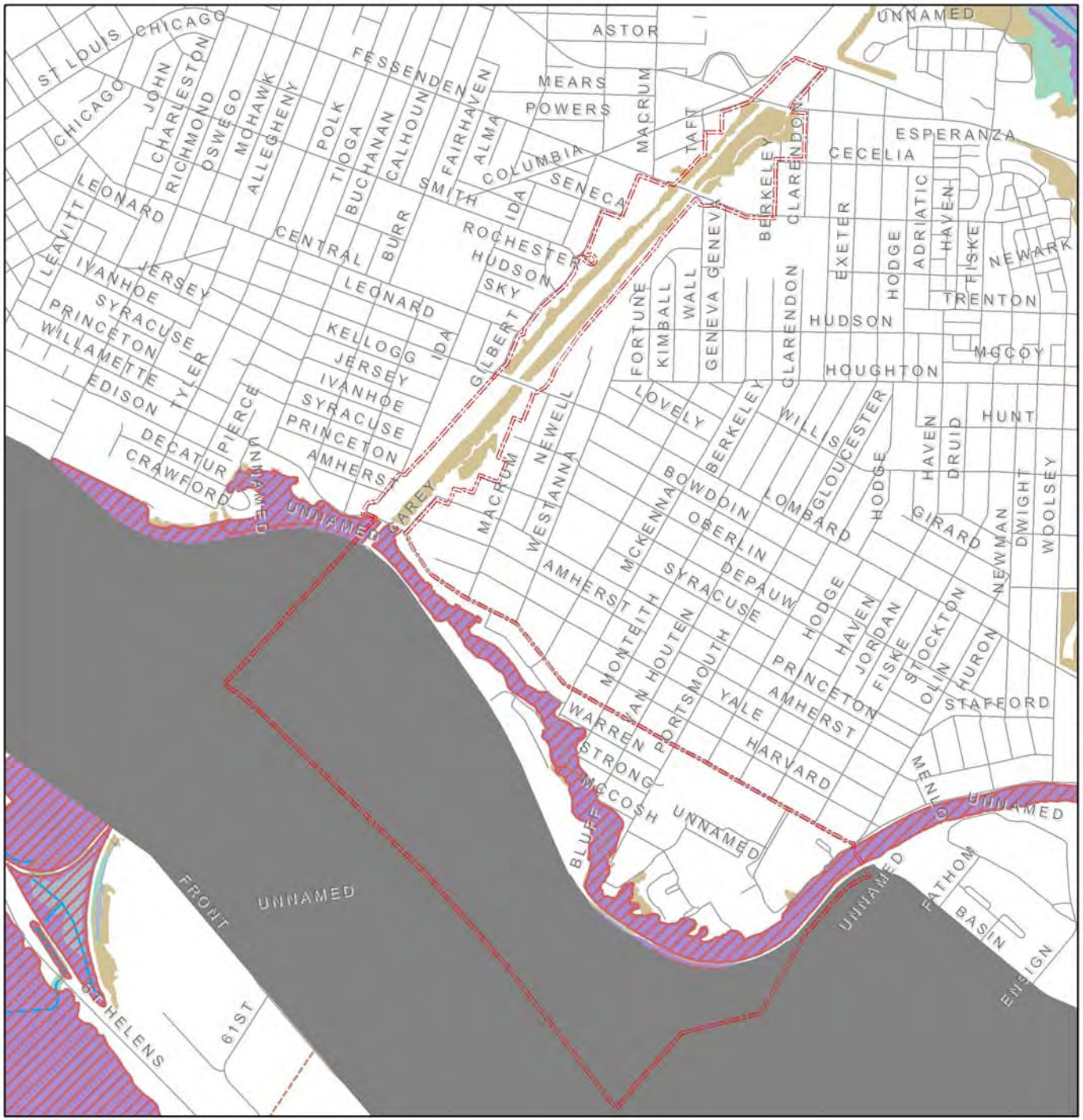
City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 975 1,950 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



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Site WR10 - Map 3
McCormick/Baxter and Triangle Park

Combined Riparian/Wildlife Habitat Relative Ranks

Combined Relative Ranks

- High Relative Rank/SHAs
- High Relative Rank
- Medium Relative Rank
- Low Relative Rank

Streams

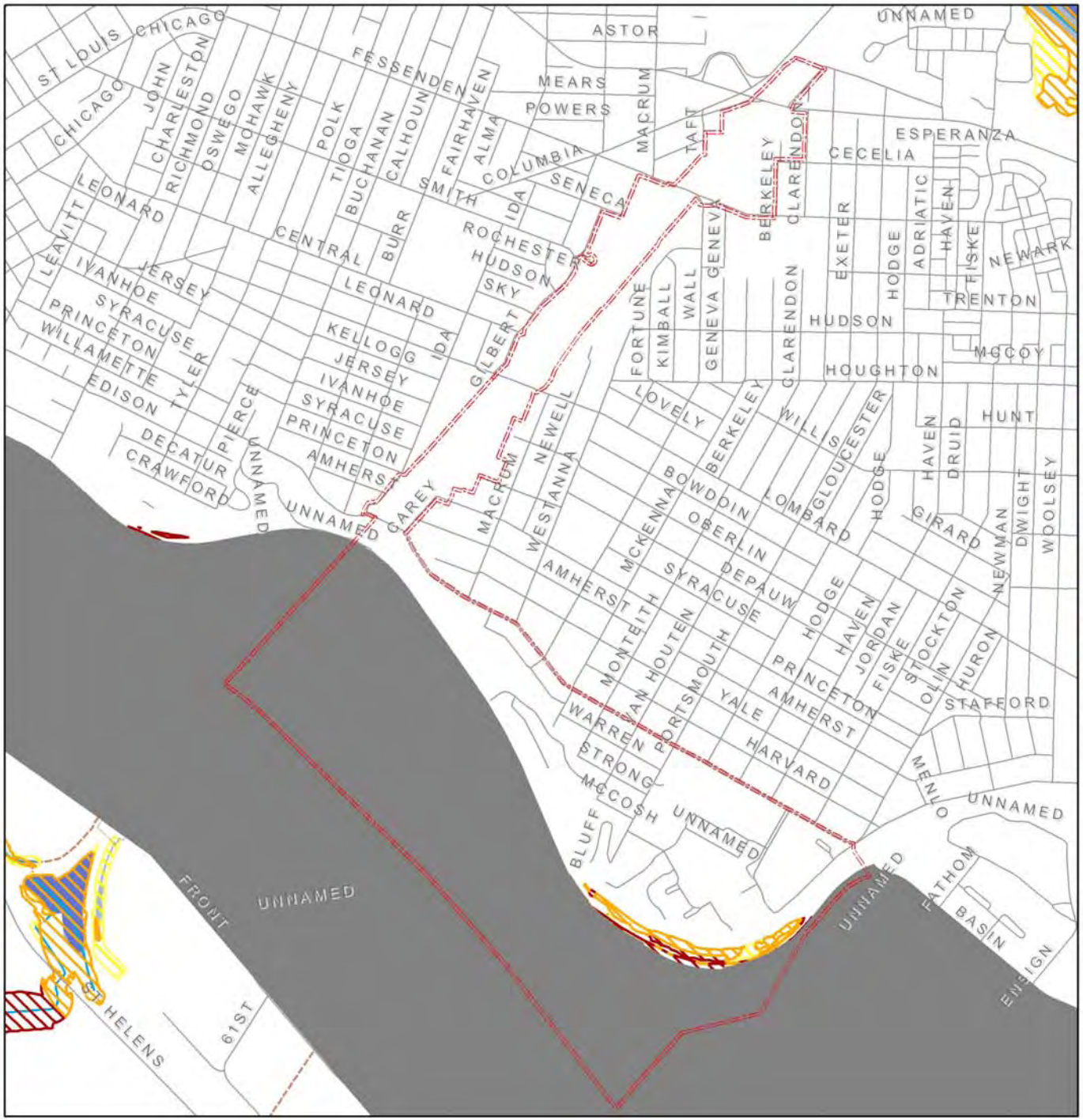
- Open Channel
- Stormwater/Combined Pipe
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Streets
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 970 1,940 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



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Site WR10 - Map 4
McCormick/Baxter and Triangle Park

Metro Title 13
Habitat Conservation Areas

Habitat Conservation Areas
- High
- Moderate
- Low

Streams
- Open Channel
- Stormwater/Combined Pipe

Wetlands

Goal 15 Willamette Greenway Area

Proposed WRNRI* Site

City Boundary

Streets

* Willamette River Natural Resources Inventory

NORTH

0 960 1,920 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

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Site WR10 - Map 5
McCormick/Baxter and Triangle Park

Proposed Environmental Overlay Zones

Proposed Environmental Overlays

- protection zone
- conservation zone

Streams

- Open Channel
- Stormwater/Combined Pipe

- Wetlands
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Streets
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 970 1,940 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

Inventory Site W11: Northwest Industrial Area

Site Description: The 963-acre inventory site is located on the west bank of the Willamette River with the northwest boundary formed by the southeast edge of site WR8 Doane Lake and the Broadway Bridge forming the boundary to the southeast. The site consists primarily of industrial uses, including two Port of Portland Terminals 1 and 2. The majority of the inventory site, roughly 670 acres, east of Front Avenue, has been evaluated under Goal 15 and is not addressed by this ESEE analysis; this area is identified by River General (g) or River Industrial (i) overlay zones (Map #). From the Port of Portland Terminal 1 property south, is included in the Central Reach of the River and will be evaluated in the Central Reach ESEE. The remainder of the site, approximately 180, is evaluated as part of this ESEE analysis (Map3).

Quarter Sections:

1N1E18b, c and d
1N1W13d
1N1E19a and b
1N1E20a, b, c and d
1N1E21c
1N1E29a
1N1E28a, b, c and d

Conflicting Uses by City Base Zones:

Table 78: Base Zones in WR11: Northwest Industrial Area ESEE Evaluation Area

Zone	Acres	Existing Conflicting Uses	Potential Conflicting Uses
IH	183	industrial, rail line	residential, commercial, industrial, institutional, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses

Summary of Natural Resources: The resources within this site are primarily developed flood area with some vegetation. The riparian corridor along the bank of the Willamette is fragmented by river dependent uses. No terrestrial wildlife connections exist between upland habitats in Forest Park and the Willamette River. There are six streams that are piped through the site and discharge to the river, offering little habitat except at the outfalls. One of these streams is Saltzman Creek and located in the northwestern portion of the site. Saltzman Creek is daylighted for approximately 175 feet after being piped under Highway 30. It is piped through the industrial area and then daylights again roughly 260 feet before discharging to the Willamette River. Balch Creek is also piped underneath this site and discharges to the Willamette.

At the confluence of both creeks, bathymetry shows shallow water areas with beach, mudflats and shrubland vegetation dominated by Himalayan blackberry. Another shallow water area is located at an inlet where an outfall discharges multiple streams, including Balch Creek, to the river. The substrate here primarily consists of sand and is exposed during low tide (ODFW, 2005). The vegetation type surrounding the outfall is herbaceous and the stream is not daylighted.

Table 79: Summary of Natural Resource Features in Site WR11: Northwest Industrial Area	
	ESEE Evaluation Area (183 acres)
Open Stream Channel (linear feet)	**200**
Wetlands (acres)	**0**
Flood Area (acres)*	**0**
Vegetated (acres)	0
Non-vegetated (acres)	0
Open Water (acres)	0
Vegetated Areas >= ½ acre (acres)+	**5**
Forest (acres)	0
Woodland (acres)	0
Shrubland (acres)	0
Herbaceous (acres)	5
Impervious Surface (acres)	**90**

* The flood area includes the FEMA 100-year floodplain plus the adjusted 1996 flood inundation area.

+ The vegetation classifications are applied in accordance with the National Vegetation Classification System specifications developed by The Nature Conservancy. The data within the primary study area and within 300 feet of all open water bodies in Portland is draft and is currently being updated based 2006 aerial photography.

This site contains small patches of shrubland and herbaceous vegetation, vegetated riprap and beaches. Aside from the two beaches in the northeastern third of the site, the banks of the river are steep and consist of fill and rock to the north, vegetated riprap in the middle, and pilings to the south.

Table 80 provides a summary of the ranked resources located with the portion of the site evaluated by this ESEE Analysis. Map 3 depicts ranked natural resource feature.

Table 80: Summary of Significant Resources and Ranks in WR11: Northwest Industrial Area ESEE Evaluation Area				
Area Evaluated by ESEE Analysis = 183 acres				
	High	**Medium**	**Low**	**Total**
Riparian Resources*				
acres	0	1	0	1
percent of ESEE evaluation area	0	<1	0	<1
Wildlife Habitat*				
acres	0	0	0	0
percent of ESEE evaluation area	0	0	0	0
Special Habitat Areas*				
acres	0			
percent of ESEE evaluation area	0			
Combined Total**				
acres	0	1	0	1
percent of ESEE evaluation area	0	<1	0	<1

* High-ranked riparian resources, wildlife habitat, and Special Habitat Areas the Willamette River

** Because riparian resources, wildlife habitat, and Special Habitat Areas overlap, the results cannot be added together to determine the combined area.

Previous City Adopted ESEE Analysis: None

Site-Specific ESEE Analysis: The Willamette River North Reach general ESEE analysis and decision are applicable to inventory site WR11: Northwest Industrial Area with the modifications described in Table 81. The general ESEE decisions are summarized in Table 82.

Table 81: Willamette River North Reach General ESEE Decision

Base Zone	Significant Natural Resources		
	High Ranked/ Special Habitat Area	Medium Ranked	Low Ranked
Industrial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Employment	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Commercial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Institutional	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Residential	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Open Space	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow

Table 82: Supplemental ESEE Analysis for Site WR11: Northwest Industrial Area	
Feature	**Non-vegetated rail corridors and non-vegetated paved, roads within 50 feet of Saltzman Creek centerline**
WRNRI/ North Reach Combined Riparian/Wildlife Habitat Relative Rank	Medium
Characteristics	• Industrial base zone • Provide distribution opportunities for nearby industrial uses • Contribution to stream flow conveyance, flood storage, and channel dynamics is somewhat impaired.
Willamette River North Reach General ESEE Decision	Strictly limit conflicting uses within 50 feet of a stream centerline
ESEE Implications	The economic consequences of strictly limiting conflicting uses where established rail lines and paved roads exist would be negative due to the potential impacts on transportation and commerce. A limit decision would require future development, such as road widening, to avoid impacts on these natural resources areas where practicable or mitigate for unavoidable impacts.
Site-Specific ESEE Decision	Limit conflicting uses in high and medium ranked non-vegetated areas within the non-vegetated rail corridors and non-vegetated, paved roads
Feature	**Short (<50 feet) open stream segments of Saltzman Creek, that are piped upstream and downstream, and land within 50 feet of the stream centerline**
WRNRI/ North Reach Combined Riparian/Wildlife Habitat Relative Rank	Medium
Characteristics	• Industrial base zone • Provides industrial and employment opportunities • Water conveyance, storage and other riparian functions are constrained due to extent of stream piping.
Willamette River North Reach General ESEE Decision	*Strictly limit* conflicting uses within 50 feet of a stream centerline
ESEE Implications	The short stream segments on this site are piped at either end. These uses provide important economic functions but reduce the overall riparian corridor function of the resource. The stream segment still provides important water conveyance, storage and other riparian corridor functions, however the negative economic consequences of strictly limiting conflicting uses would outweigh the environmental, social or energy benefits. A limit decision would require future impacts on these natural resources areas to be avoided where practicable or mitigated.

Site-Specific ESEE Decision	*Limit* conflicting uses in areas containing short (<50 feet) open stream segments and surrounding riparian areas

Metro ESEE Decision: Metro analyzed the natural resource features within site WR12: Northwest Industrial Area. Metro's ESEE decision was to limit conflicting uses within Habitat Conservation Areas (HCA) and allow conflicting uses within areas containing significant natural resources not designated as HCA. HCAs are comprised of Class I and II riparian corridors identified in Metro's inventory of regionally significant riparian corridors and wildlife habitat (Title 13 Section (2)(B)).

For this site, the City's ESEE decision to limit or strictly limit conflicting uses in areas containing high or medium ranked resources generally comports with Metro's ESEE decision to limit conflicting uses in HCAs (see Table 83 and Map 4). Differences occur primarily at the edges of the mapped resources areas and are a result of the City

- mapping smaller vegetation units - ½ acre as compared to 1 acre;
- differentiating between forest and woodland vegetation types; and/or
- refinements to criteria developed evaluate the relative quality of riparian corridors and wildlife habitat.

Table 83: Comparison of Metro Title 13 Habitat Conservation area and the City's Natural Resources Inventory Ranked Resources in WR11: Northwest Industrial Area ESEE Evaluation Area

Total Area = 183	Title 13 Habitat Conservation Areas	City's Significant Natural Resources
High	0	0
Medium	0	1
Low	1	0
Total	0	1

Environmental Overlay Zones

The ESEE decisions are implemented through application of the environmental protection (p) overlay to areas where conflicting uses should be strictly limited and environmental conservation (c) overlay to areas where conflicting uses should be moderately limited Tables 84 summarize how the resulting decisions affects different land uses. Map 5 presents the recommended environmental overlay zones based on the ESEE decision.

Table 84: Environmental Conservation and Protection Overlay Zones within Site WR11: Northwest Industrial Area ESEE Evaluation Area

Site = 183 acres	Total Acres	Existing Conservation Overlay	Existing Protection Overlay	Proposed Conservation Overlay	Proposed Protection Overlay
IH	183	0	0	1	0

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Site WR11 - Map 1
Northwest Industrial Area

2007 Aerial Photography

Proposed WRNRI* Site

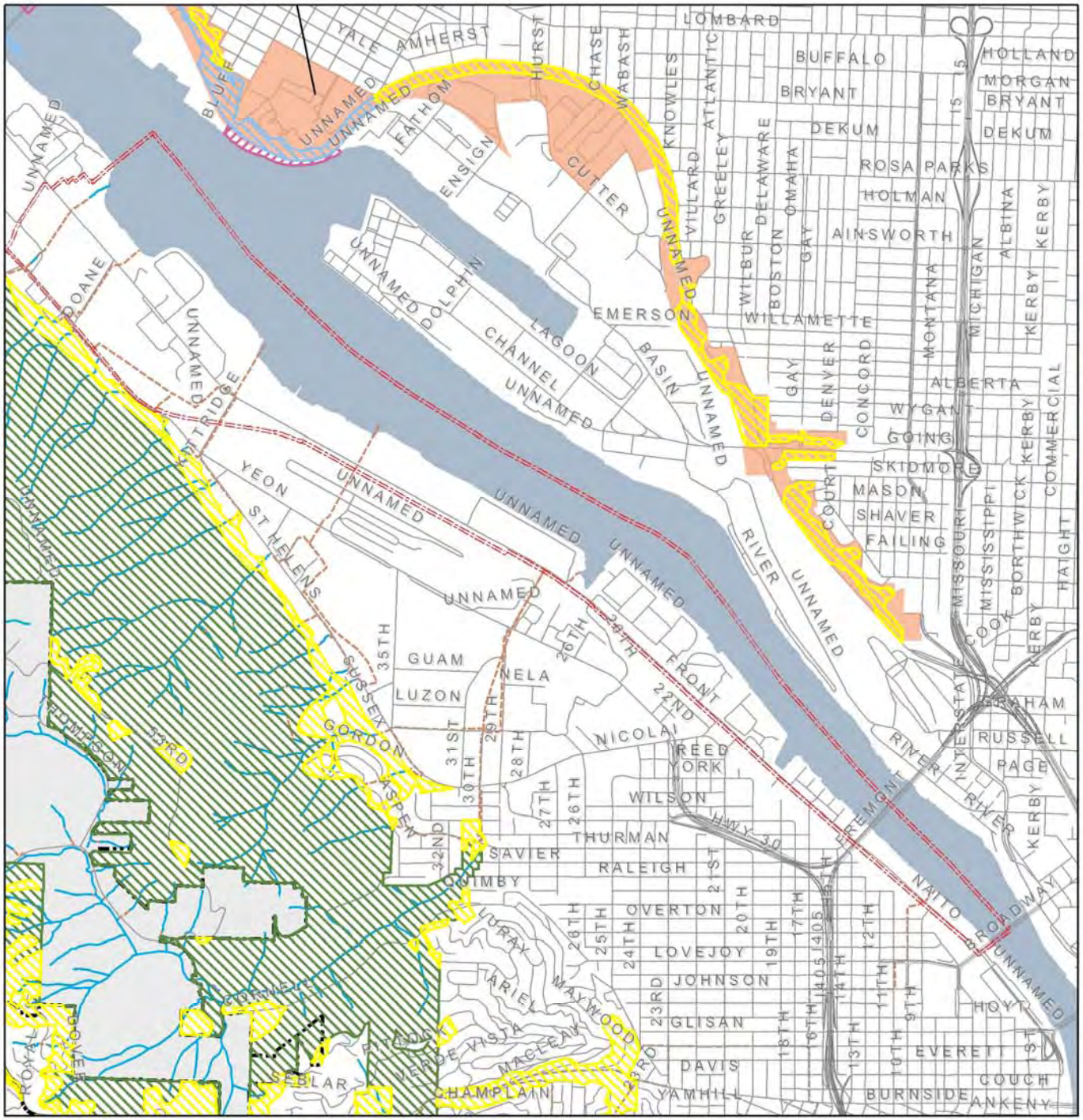
City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 1,800 3,600 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



Planning

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Site WR11 - Map 2
Northwest Industrial Area

City Adopted Natural Resource Inventory Sites and Existing Environmental Overlays

Adopted Resource Inventory Sites

Proposed WRNRI* Site

Existing Resource Overlays

Environmental protection zone

Environmental conservation zone

Greenway natural zone

Greenway water quality zone

Greenway natural/water quality zone

Streams

Open Channel

Stormwater/Combined Pipe

Wetlands

Streets

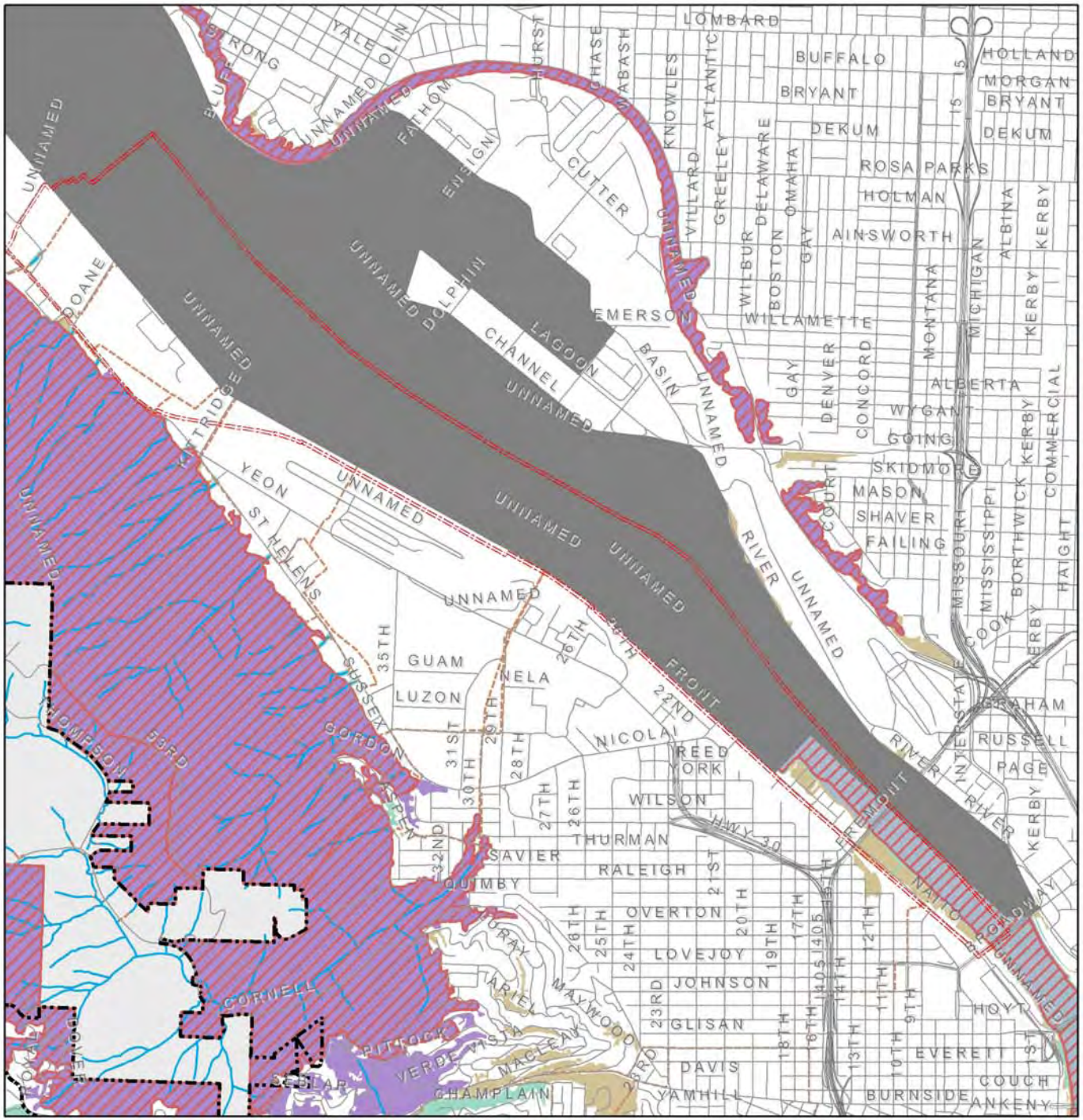
City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 1,750 3,500 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



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Site WR11 - Map 3
Northwest Industrial Area

Combined Riparian/Wildlife Habitat Relative Ranks

Combined Relative Ranks

- High Relative Rank/SHAs
- High Relative Rank
- Medium Relative Rank
- Low Relative Rank

Streams

- Open Channel
- Stormwater/Combined Pipe

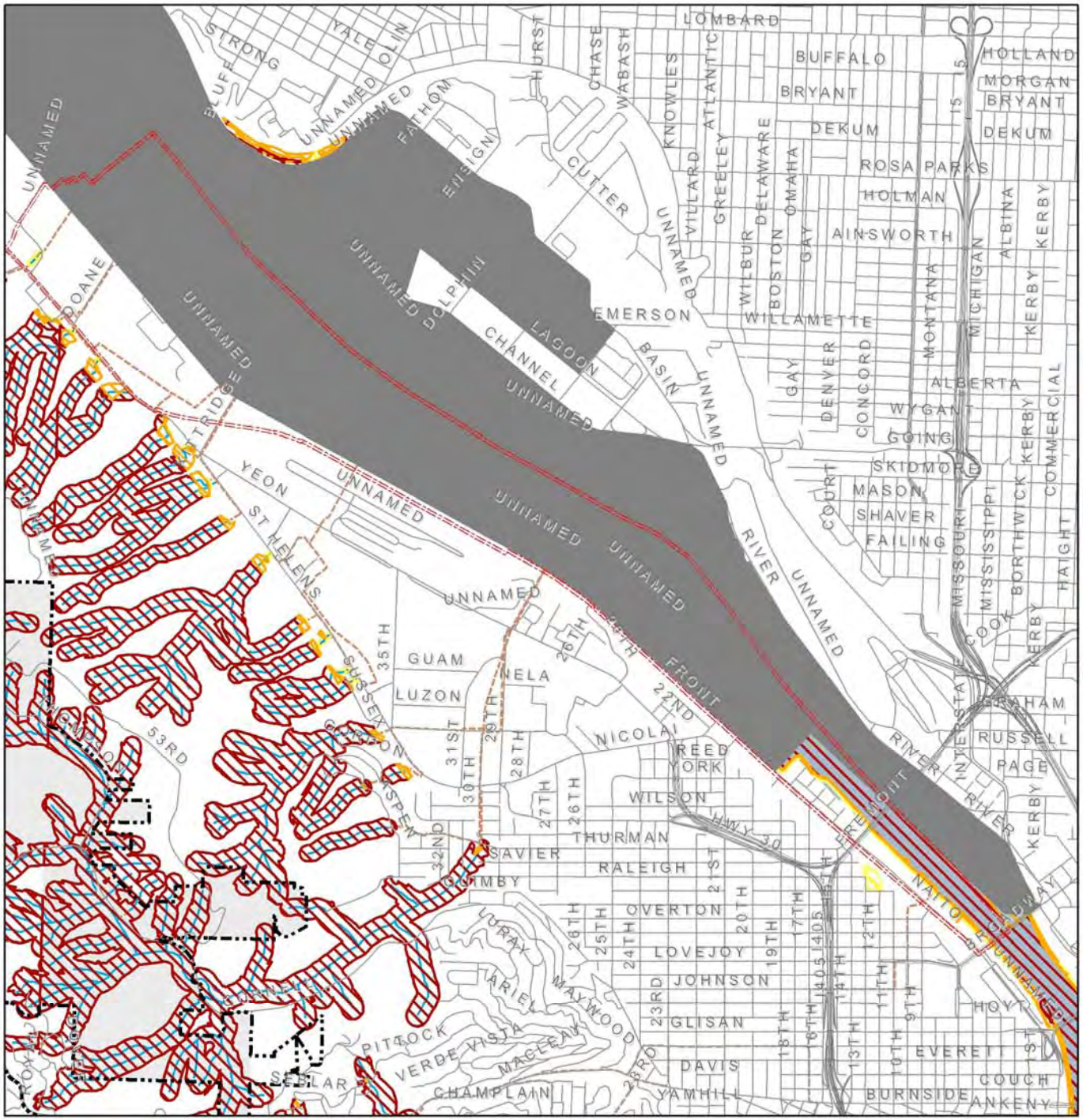
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Streets
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 1,750 3,500 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



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Site WR11 - Map 4
Northwest Industrial Area

Metro Title 13
Habitat Conservation Areas

Habitat Conservation Areas
- High
- Moderate
- Low

Streams
- Open Channel
- Stormwater/Combined Pipe

Wetlands

Goal 15 Willamette Greenway Area

Proposed WRNRI* Site

City Boundary

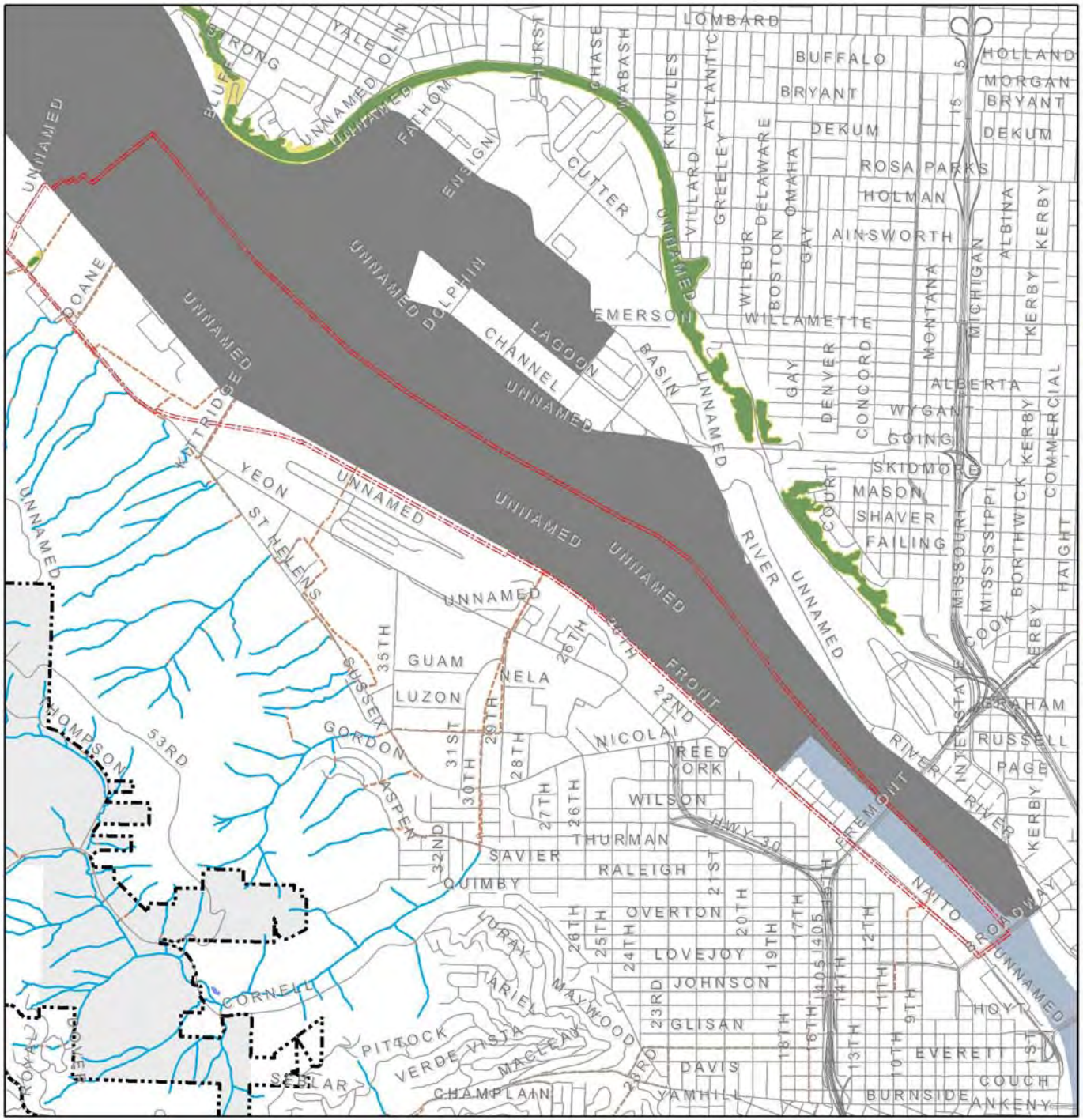
Streets

* Willamette River Natural Resources Inventory

NORTH

0 1,700 3,400 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



Planning

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Site WR11 - Map 5
Northwest Industrial Area

Proposed Environmental Overlay Zones

Proposed Environmental Overlays

- protection zone
- conservation zone

Streams

- Open Channel
- Stormwater/Combined Pipe

- Wetlands
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Streets
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 1,750 3,500 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

Inventory Site WR12: Swan Island

Site Description: The Swan Island inventory site is approximately 1,454 acres in size. The site is located below the Willamette Bluff and extends to the Broadway Bridge in the southeast. The northern, northeast and eastern boundary is the foot of the Willamette Bluff. The area adjacent to the Willamette River was, roughly 754 acres, evaluated under Goal 15 and is not addressed by this ESEE analysis; this area is identified by River Industrial (i), Recreational (r), and General (g) overlay zones. The remainder of the site, approximately 700 acres, is evaluated as part of this ESEE analysis (Map 3).

Quarter Sections:

1N1E16b and c
1N1E17a-d
1N1E18d
1N1E20a, b and d
1N1E21a-d
1N1E27b and c
1N1E28 a and d
1N1E34a and b

Conflicting Uses by City Base Zones:

Table 85: Base Zones in WR12: Swan Island ESEE Evaluation Area

Zone	Acres	Existing Conflicting Uses	Potential Conflicting Uses
IH IG1 IG2	669	industrial, rail line	residential, commercial, industrial, institutional, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
EG2	26	industrial, commercial	residential, commercial, industrial, institutional, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
OS	5	road rights-of-way	commercial, institutional, agricultural, mining, broadcast facilities, rail line and utility corridors, temporary uses

Summary of Natural Resources: Most of the natural resources within this site are associated with the Willamette River, its bank and the floodplain. These areas are within the Willamette Greenway. The riparian corridor along the bank is fragmented by river dependent uses. No terrestrial wildlife connections exist between upland habitats of the Willamette Bluff. The entire inventory site is largely developed – 54% of the inventory site contains impervious surfaces.

Small portions of the base of Willamette Bluff extend into the inventory site. These areas contain vegetation and some steep slopes. The City of Portland Wildlife Hazard Zone and Potential Landslide Hazard area apply to these slopes.

Table 86: Summary of Natural Resource Features in Site WR12: Swan Island	
	ESEE Evaluation Area (700 acres)
Open Stream Channel (linear feet)	**0**
Wetlands (acres)	**0**
Flood Area (acres)*	**11**
Vegetated (acres)	0
Non-vegetated (acres)	6
Open Water (acres)	5
Vegetated Areas >= ½ acre (acres)+	**14**
Forest (acres)	<1
Woodland (acres)	2
Shrubland (acres)	5
Herbaceous (acres)	7
Impervious Surface (acres)	**572**

* The flood area includes the FEMA 100-year floodplain plus the adjusted 1996 flood inundation area.

+ The vegetation classifications are applied in accordance with the National Vegetation Classification System specifications developed by The Nature Conservancy. The data within the primary study area and within 300 feet of all open water bodies in Portland is draft and is currently being updated based 2006 aerial photography.

Table 87 provides a summary of the ranked resources located with the portion of the site evaluated by this ESEE Analysis. Map 3 depicts ranked natural resource feature.

Table 87: Summary of Significant Resources and Ranks in WR12: Swan Island ESEE Evaluation Area				
Area Evaluated by ESEE Analysis = 700 acres				
	High	**Medium**	**Low**	**Total**
Riparian Resources*				
acres	5	0	6	11
percent of ESEE evaluation area	1	0	1	2
Wildlife Habitat*				
acres	0	0	<1	<1
percent of ESEE evaluation area	0	0	<1	<1
Special Habitat Areas*				
acres	7			
percent of ESEE evaluation area	1			
Combined Total**				
acres	7	0	6	13
percent of ESEE evaluation area	1	0	1	2

* High-ranked riparian resources, wildlife habitat, and Special Habitat Areas the Willamette River

** Because riparian resources, wildlife habitat, and Special Habitat Areas overlap, the results cannot be added together to determine the combined area.

Previous City Adopted ESEE Analysis: The bluff resource areas in this site were addressed in the *East Buttes, Terraces and Wetlands Conservation Plan* (1993). Resource Site 140: Overlook Bluff extended from N Polk Avenue in the north (located in inventory site WR 9: Willamette Cove) along Waud Bluff and Mocks Crest and Overlook Park and south to I-5. A small portion of Resource Site 140 is within inventory site WR12: Swan Island. Below is a summary of findings and decisions for Resource Site 140.

Economic Analysis

Limiting or prohibiting conflicting uses on the forest bluffs would have positive economic consequences including protection of local residential and business property values and tax revenues and would protect the slope and reduce potential risks landslides. Guiding development away from hazardous areas would reduce infrastructure and public facility infrastructure costs.

Prohibiting conflicting uses on the vegetated bluffs would preclude new development and expansion opportunities. Much of the bluff is zoned open space, which prohibits housing, commercial and industrial uses. The rail corridor is for all practical purposes fully developed. The steep slopes and weak, silt loam soils make most develop activities in all zones generally unfeasible. However unfeasible new development or expansion may be, prohibiting all such actions could have negative economic consequences. Limiting such actions allows significantly greater flexibility for development and use of the site and not likely to have economic impacts.

Social Analysis

The protection of the Overlook Bluff area is consistent with city policies that emphasize the scenic and recreational beauty and value of lands along N Willamette Blvd. Protecting the natural resources that are located in existing parks and open spaces will have a positive impact on neighborhood livability. Overlook Bluff provides views of the Willamette River and Forest Park. Further, positive social consequences would result from the retention of forest cover and the avoidance of possible public health and safety hazards associated with erosion, slumping and landslides.

Environmental Analysis

Limiting or prohibiting conflicting uses will protect the site's natural resources and values as identified in the inventory. The inventory includes the following information regarding natural resources and values:

> ***Functional Values:*** *food, water, cover and territory for wildlife; groundwater recharge and discharge; slope stabilization; sediment and erosion control; and air and water quality protection*
>
> ***Resource Quantity and Quality:*** *The Overlook Bluff supports a oak/madrone forest community rare within Portland. Ponderosa pine, a common tree east of the Cascades, is also present in the area of the University of Portland. Other tree species along the bluff are bigleaf maple, black cottonwood, pacific dogwood, bitter cherry,*

red alder, willows and the occasional Douglas fir and western red cedar…. The bluff is exposed to intensive human use at its top and at its base but is otherwise unmanaged and relatively undisturbed…. This lack of management means that snags, down woody debris and other structure habitat features are more common. The oak/madrone forest community supports a range of wildlife species…. The Burlington Northern rail corridor…follows a ravine that provides wildlife habitat and corridor values, in essence linking the Willamette River Greenway with the Columbia Slough habitat area.

Energy Analysis

The forest provides a tempering effect on climate and reduces energy needs for heating and cooling of nearby residences, university buildings and medial centers. Trees shade buildings in the summer, reducing energy demands for cooling. Plants also absorb sunlight and transpire during the grown seasons, reducing ambient air temperatures. Trees and shrubs also act as a wind break during the winter, reducing building heat loss and resulting in lower energy needs for heating. On balance, protection of forest vegetation would have positive energy consequences locally.

Decision

Limit conflicting uses along the forested slopes of Overlook Bluff and the rail corridor. This decision resulted in application of the environmental conservation overly zone to the bluffs along the Burlington Northern Railroad corridor and at the northwestern edge of the University of Portland.

Site-Specific ESEE Analysis: The Willamette River North Reach general ESEE analysis and decision presented in the previous section and summarized in Table 88 below apply to inventory site WR11: Swan Island except for the modifications described in Tables 89.

Table 88: Willamette River North Reach General ESEE Decision

Base Zone	Significant Natural Resources		
	High Ranked/ Special Habitat Area	Medium Ranked	Low Ranked
Industrial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Employment	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Commercial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Institutional	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Residential	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Open Space	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow

Table 89: Supplemental ESEE Analysis for SiteWR12: Swan Island

Feature	Designated Special Habitat Areas on the bluff within industrial base zones; except within the non-vegetated rail corridor
WRNRI/ North Reach Relative Rank	High, Special Habitat Area
Characteristics	• Industrial base zone • Woodland vegetation along steep slopes • Vegetation provides upland habitat and wildlife connectivity along and to the Willamette River • Wildfire and landslide hazards
Willamette River North Reach General ESEE Decision	Limit conflicting uses in high ranking resources areas and Special Habitat Areas in industrial base zones
ESEE Implications	A decision to limit conflicting uses could result in encroachment into part. It would not be feasible to mitigate for the environmental and social values (e.g. rare

	and declining Oregon white oaks, wildlife habitat, scenic, recreational and education opportunities) currently provided. The economic consequences of strictly limiting conflicting uses would be minimal due to the relative infeasibility of developing the steep slope. Guiding development away from hazardous areas (e.g. landslide, wildfire) would reduce infrastructure and public facility risks and costs.
Site-Specific ESEE Decision	Strictly limit conflicting uses in Special Habitat Areas along the upland bluffs in industrial base zones; except within non-vegetated rail corridors

The previous ESEE analysis for Resource Site 140: Overlook Bluff (*East Buttes, Terraces and Wetlands Conservation Plan -1993*) overlay zones to protect the vegetated bluffs at site WR12: Swan Island. The overlay zones applied at that time were the environmental conservation overlay zone, which requires development to avoid significant resources where practicable and to mitigate for unavoidable adverse impacts on the resource.

The proposed ESEE decision presented would modify the previous decision by strictly limiting conflicting uses that would affect the high ranked resource areas on the bluff in all base zones. The decision to strictly limit conflicting uses on the bluffs would allow, through a review process, development to that is necessary for access or where the public benefit provided by the development is found to outweigh the adverse impacts on the resource. The limit decision would require development to avoid impacts on natural resources or mitigate.

Several City documents support additional protection of these upland natural resources:

- Portland Watershed Management Plan: In 2006, City Council adopted the Portland Watershed Management Plan which describes the approach to evaluate conditions in the City's urban watersheds and implement projects to improve watershed health. The plan discusses the importance of upland, terrestrial habitats and wildlife connectivity between upland and riparian habitats. The *Willamette River Characterization Report* (2004), a supporting document for the Plan, discusses the importance of the bluff habitat for local and migrating wildlife.

- Portland Zoning Code: "Significant Trees" are identified in the Portland Zone Code Table 630-1. Oregon white oak (*Quercus garryana*) is included in that table. The table is used in conjunction with the Tree Preservation Standards (Section 33.630) to protect established trees canopy during the land division process.

- Urban Conservation Treaty for Migratory Birds: In 2003, Portland joined several other U.S. cities to protect migratory birds and enhance their habitats within city environments through participation in the Urban Conservation Treaty for Migratory Birds. The acknowledged that migratory birds are an important element of the urban ecosystem and are indicators of the health of the urban environment. Upland forested and woodland areas provide critical migratory stopover, feeding and nesting habitat for the birds.

Consistent management of the entire bluff is also needed to wildfire and landslide hazards.

Metro ESEE Decision: Metro analyzed the natural resource features within site WR11: Swan Island. Metro's ESEE decision was to limit conflicting uses within Habitat Conservation Areas (HCA) and allow conflicting uses within areas containing significant natural resources not designated as HCA. HCAs are comprised of Class I and II riparian corridors identified in Metro's inventory of regionally significant riparian corridors and wildlife habitat (Title 13 Section (2)(B)).

For this site, the upland bluff is not designated a HCA. The City's ESEE decision to strictly limit or limit conflicting uses in areas containing high ranked upland resources areas is different from Metro's ESEE decision to allow conflicting uses in upland wildlife habitat areas (see Table 90 and Map 4).

Table 90: Comparison of Metro Title 13 Habitat Conservation area and the City's Natural Resources Inventory Ranked Resources in WR12: Swan Island ESEE Evaluation Area

Total Area = 700	Title 13 Habitat Conservation Areas	City's Significant Natural Resources
High	3	7
Medium	2	0
Low	<1	6
Total	5	13

Environmental Overlay Zones

The ESEE decisions are implemented through application of the environmental protection (p) overlay to areas where conflicting uses should be strictly limited and environmental conservation (c) overlay to areas where conflicting uses should be moderately limited. Tables 91 summarize how the resulting decisions affects different land uses. Map 5 presents the recommended environmental overlay zones based on the ESEE decision.

Table 91: Environmental Conservation and Protection Overlay Zones within Site WR12: Swan Island ESEE Evaluation Area

Site = 700 acres	Total Acres	Existing Conservation Overlay	Existing Protection Overlay	Proposed Conservation Overlay	Proposed Protection Overlay
IH IG1 IG2	669	2	0	4	2
EG2	26	0	0	0	0
OS	5	<1	0	<1	<1

Planning

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Site WR12 - Map 1
Swan Island

2007 Aerial Photography

Proposed WRNRI* Site

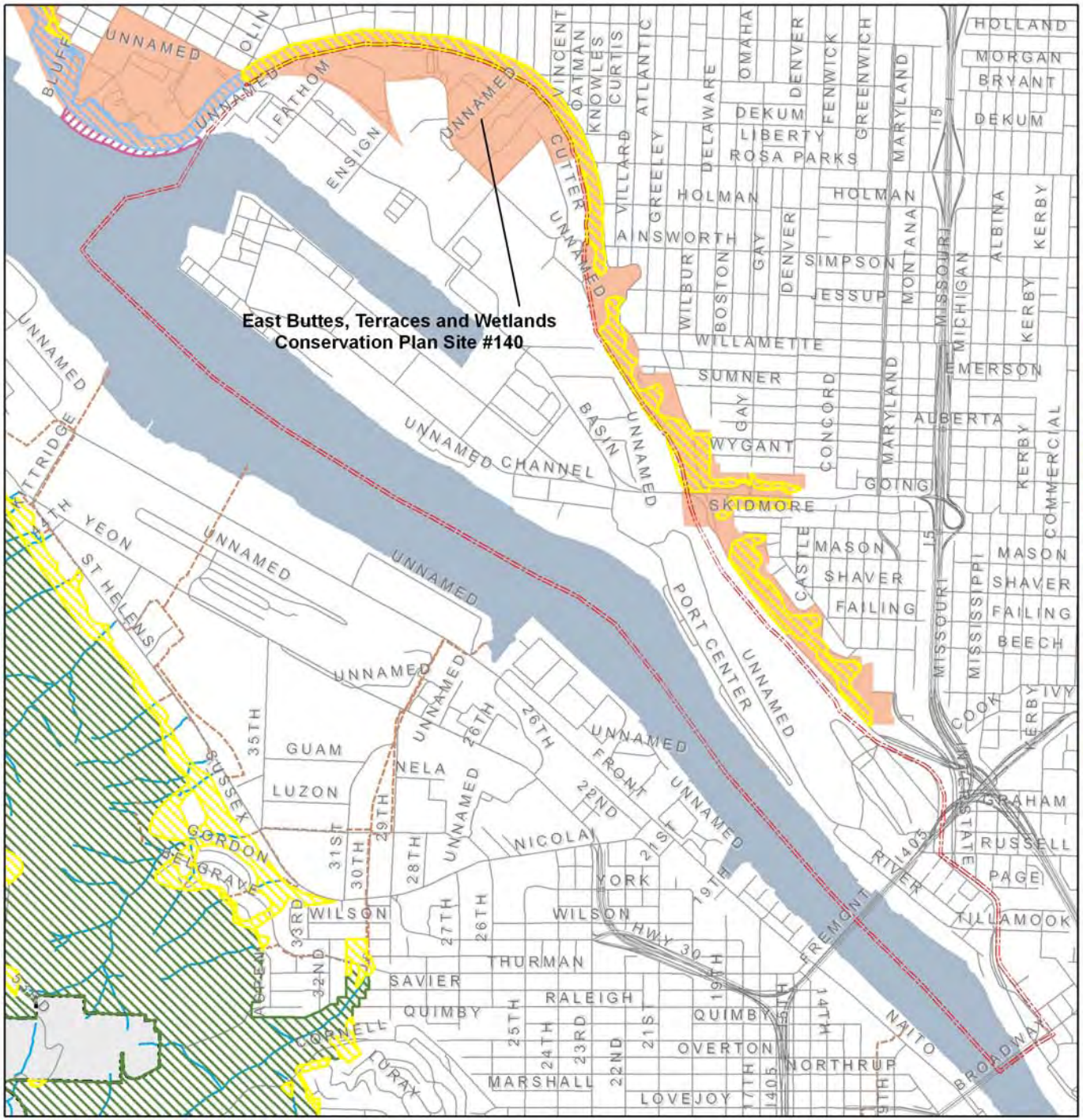
City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 1,500 3,000 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



DRAFT

Site WR12 - Map 2
Swan Island

City Adopted Natural Resource Inventory Sites and Existing Environmental Overlays

Adopted Resource Inventory Sites

Proposed WRNRI* Site

Existing Resource Overlays

Environmental protection zone

Environmental conservation zone

Greenway natural zone

Greenway water quality zone

Greenway natural/water quality zone

Streams

Open Channel

Stormwater/Combined Pipe

Wetlands

Streets

City Boundary

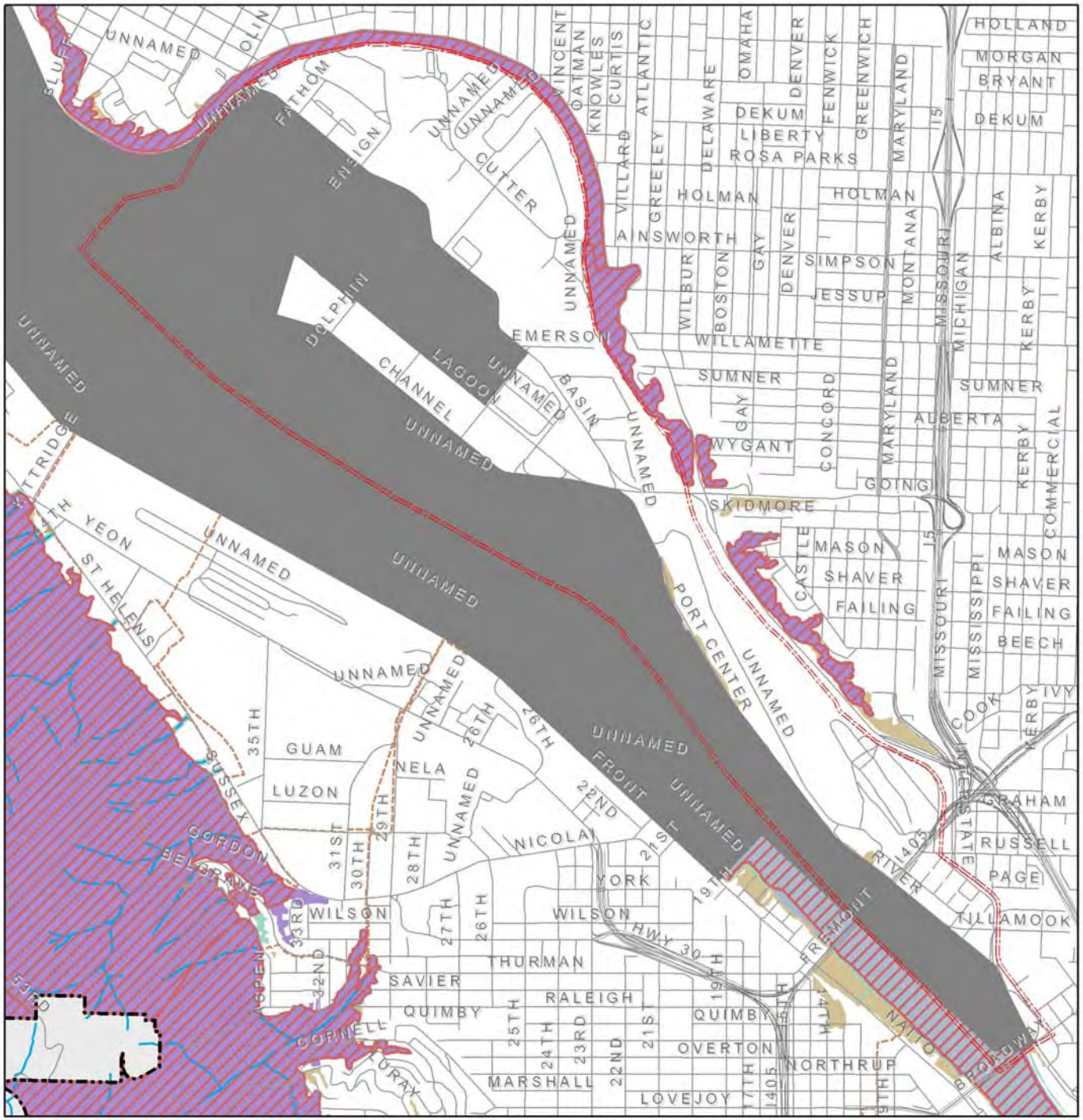
* Willamette River Natural Resources Inventory

The information on the map was derived from digital data-bases on the City of Portland, Bureau of Planning GIS. Care was taken in the creation of this map but it is provided "as is". The City of Portland cannot accept any responsibility for error, omissions, or positional accuracy, and therefore, there are no warranties which accompany this product. However, notification of any errors will be appreciated.

NORTH

0 1,500 3,000 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



DRAFT

Site WR12 - Map 3
Swan Island

Combined Riparian/Wildlife Habitat Relative Ranks

Combined Relative Ranks

- High Relative Rank/SHAs
- High Relative Rank
- Medium Relative Rank
- Low Relative Rank

Streams

- Open Channel
- Stormwater/Combined Pipe

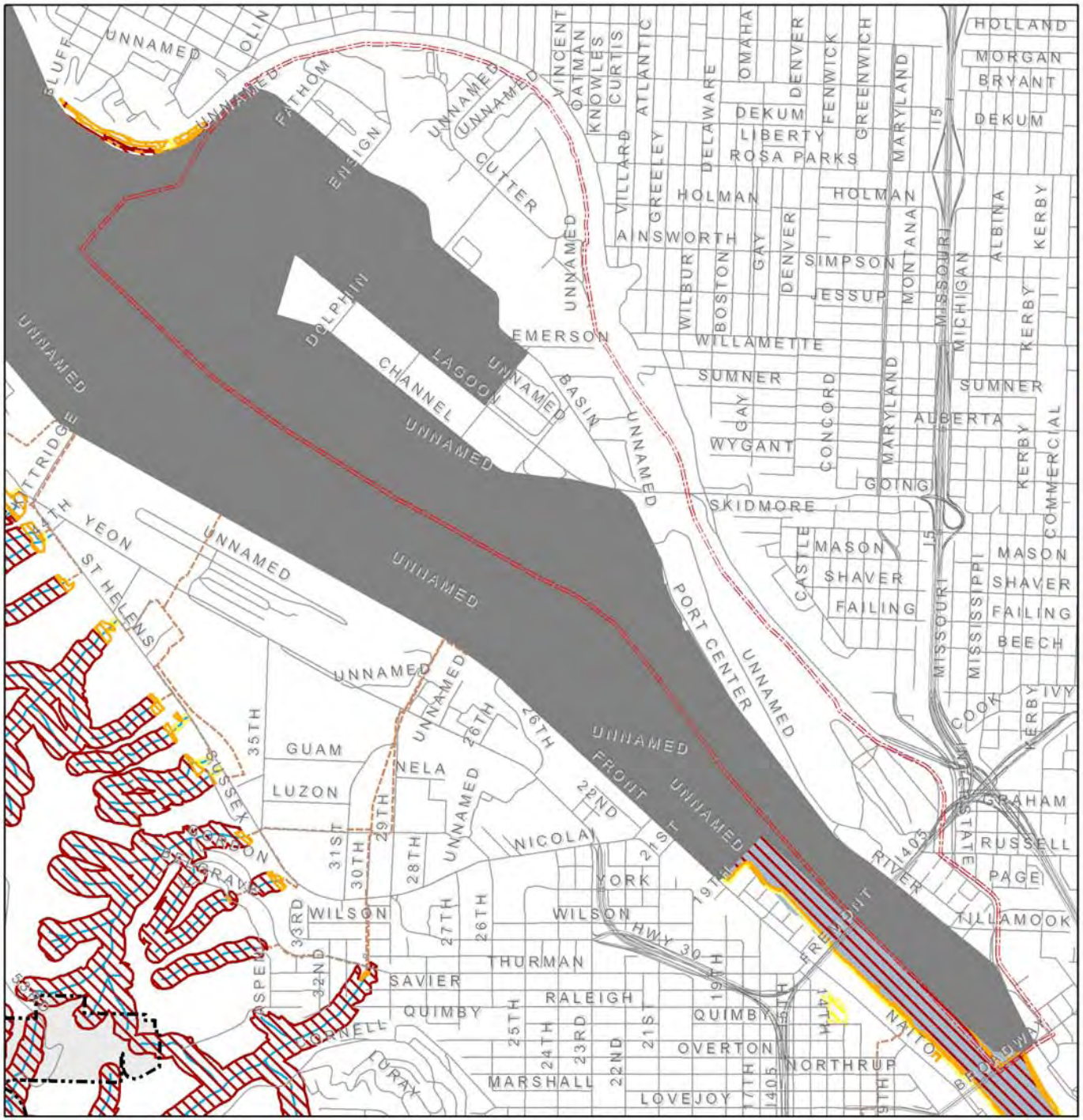
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Streets
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 1,500 3,000 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



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Site WR12 - Map 4
Swan Island

Metro Title 13
Habitat Conservation Areas

Habitat Conservation Areas
- High
- Moderate
- Low

Streams
- Open Channel
- Stormwater/Combined Pipe

Wetlands

Goal 15 Willamette Greenway Area

Proposed WRNRI* Site

City Boundary

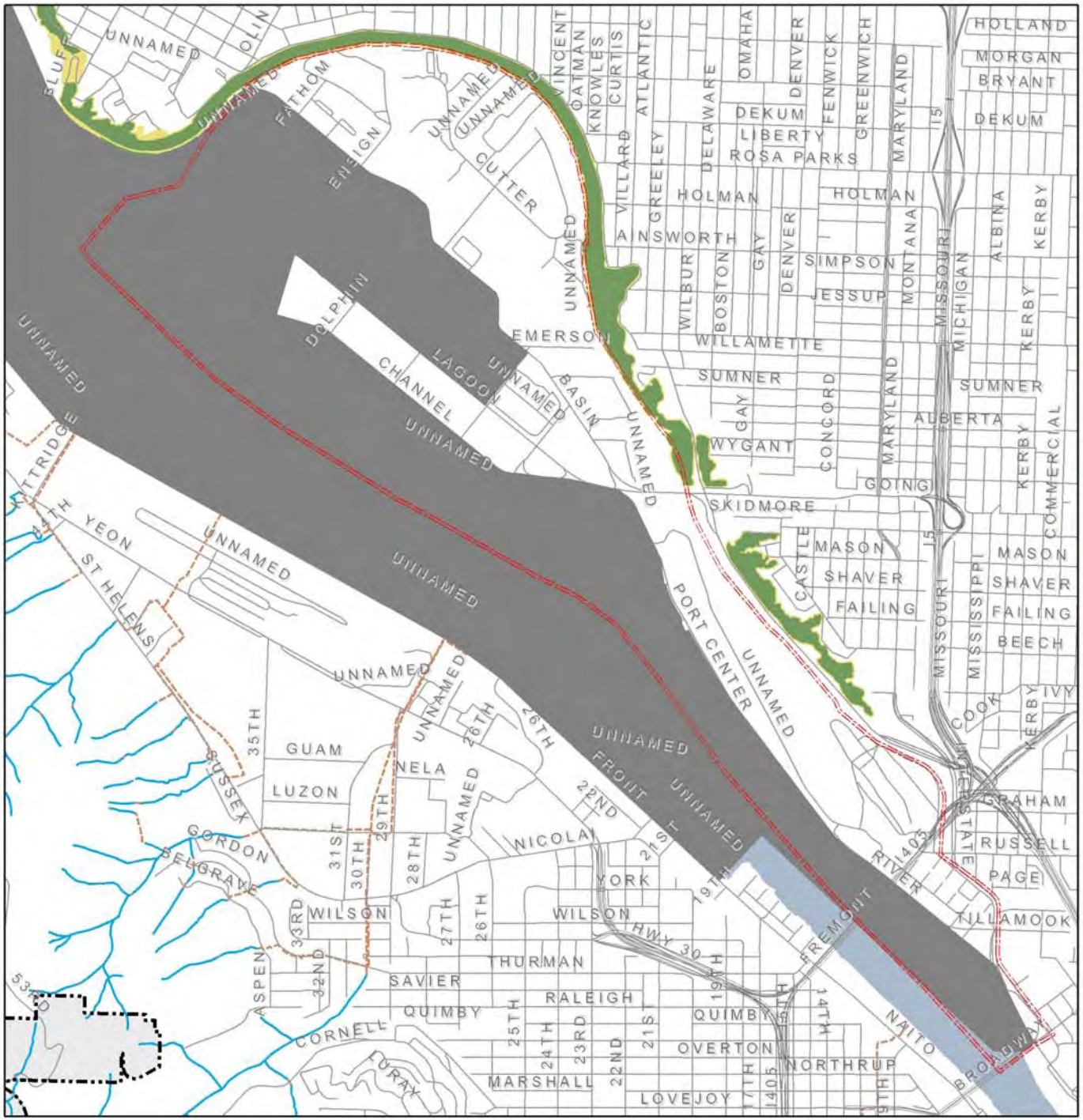
Streets

* Willamette River Natural Resources Inventory

NORTH

0 1,400 2,800 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



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Site WR12 - Map 5
Swan Island

Proposed Environmental Overlay Zones

Proposed Environmental Overlays

- protection zone
- conservation zone

Streams

- Open Channel
- Stormwater/Combined Pipe

- Wetlands
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Streets
- City Boundary

* Willamette River Natural Resources Inventory

NORTH

0 1,500 3,000 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

Inventory Site W13: Willamette Bluff

Site Description: This 258 acre upland site encompasses a forested bluff along the eastern river terrace, which contains a relatively intact strip of native oak stands and upland vegetation. The bluff generally follows N. Willamette Boulevard and N. Greeley Avenue from the University of Portland at the northwest end of the site to N. Interstate Avenue near the Fremont Bridge, at the southeast end of the site. The site is bordered to the southwest by the Mock's Bottom/Swan Island industrial area and includes Willamette Bluff, from the top of the bluff along N. Willamette Blvd to the bottom of the bluff at Swan Island. The entire site is located more than 1,000 feet from the Willamette River and is addressed as part of this ESEE analysis.

Quarter Sections:

1N1E17a and b
1N1E16a and c
1N1E21a, b, c and d
1N1E22c
1N1E28a
1N1E27b

Conflicting Uses by City Base Zones:

Table 92: Base Zones in WR13: Willamette Bluff ESEE Evaluation Area

Zone	Acres	Existing Conflicting Uses	Potential Conflicting Uses
IH IG1 IG2	30	industrial, rail line	residential, commercial, industrial, institutional, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
EG1 EX	7	industrial	residential, commercial, industrial, institutional, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
CO2 CN1	9	commercial (Adidas, Kaiser)	residential, commercial, industrial, institutional, broadcast facilities, rail line and utility corridors, temporary uses
IR	7	institutional (Kaiser)	residential, institutional, broadcast facilities, rail line and utility corridors, temporary uses
R1 R2 R2.5	8	multi-dwelling and single-dwelling residential	residential, institutional, broadcast facilities, rail line and utility corridors, temporary uses
R5	96	single-dwelling residential	residential, institutional, broadcast facilities, rail line and utility corridors, temporary uses
OS	101	open space, Madrona Park, Mocks Crest Property, Overlook Park, rail line	commercial, institutional, agricultural, mining, broadcast facilities, rail line and utility corridors, temporary uses

Summary of Natural Resources: This site contains one of the larger upland habitats in terms of acreage (258 acres, 3.6 miles in length) in the Willamette River corridor. This habitat patch is also generally narrow and lacks interior habitat. This site connects to the bluffs within the McCormick-Baxter/Triangle Park and Willamette Cove inventory sites located to the north (key resource features are shown in Maps 2 and 3). The bluffs are part of an upland vegetated corridor that extends, albeit intermittently, for approximately 7 miles from Chimney and Pier Parks in the St. Johns neighborhood to the Fremont Bridge.

Table 93: Summary of Natural Resource Features in Site WR13: Willamette Bluff

	ESEE Evaluation Area (258 acres)
Open Stream Channel (linear feet)	**0**
Wetlands (acres)	**0**
Flood Area (acres)*	**0**
Vegetated (acres)	0
Non-vegetated (acres)	0
Open Water (acres)	0
Vegetated Areas >= ½ acre (acres)+	**126**
Forest (acres)	39
Woodland (acres)	49
Shrubland (acres)	7
Herbaceous (acres)	31
Impervious Surface (acres)	**62**

* The flood area includes the FEMA 100-year floodplain plus the adjusted 1996 flood inundation area.

+ The vegetation classifications are applied in accordance with the National Vegetation Classification System specifications developed by The Nature Conservancy. The data within the primary study area and within 300 feet of all open water bodies in Portland is draft and is currently being updated based 2006 aerial photography.

Vegetation at this site is characterized by a foothill savanna/oak woodland forest community comprised of native white oak, Pacific madrone, and to a lesser extent, Ponderosa pine. This bluff contains one of the few remnants of the oak/madrone forest community in Portland. The large stand of Ponderosa pine, most common on the warmer south-facing slopes by the University of Portland, also is rare in the Portland region.

Douglas fir, big-leaf maple, and bitter cherry are interspersed with these species in some areas, and western red cedar, Pacific dogwood, and red alder occur infrequently. Black cottonwood occurs on the lower slopes primarily at the northern and southern ends of the site where the bluff is closest to the Willamette River. The forest understory includes western hazel, red elderberry, vine maple, snowberry, oceanspray, Oregon grape, serviceberry, and cottonwood saplings. The ground layer throughout most of this site is covered by invasive species such as English ivy and clematis; sword fern is present but increasingly uncommon. Forest tree cover ranges from 25 to 40 percent, shrub cover is about 15 percent, and ground cover is 100 percent. The age of the forest vegetation is approximately 30 to 50 years old.

Small shrub and grassland habitats are scattered between the forest patches on the bluff, generally in areas where the trees have been cleared for park uses or to maintain views. The shrub vegetation is dominated by Himalayan blackberry and Scot's broom. Grassland pockets are generally areas of grasses or lawns maintained as local parks. Although many of the dominant plant species in the upland community are exotic invasives, most of the plants found within this habitat type produce fruit, nuts, and seeds that provide high food value for birds and mammals. Voles, pocket mice, snakes, and lizards are common within grassland habitat, making them prime feeding areas for hawks, falcons, owls, and coyotes. Butterflies are commonly found in grassland habitats. Crows, robins, song sparrows, and other common resident ground feeding bird species are also found within this habitat type.

The remnant foothill savanna/oak woodland forest provides forage, perch, and limited nesting opportunities for wildlife. Avian fauna, passerines in particular, are the primary foragers at this site. A pair of peregrine falcons nests each year on the Fremont Bridge located just south of this site. Peregrines may forage on the avian prey within this site. Mammals occurring at this site include squirrel, raccoon, and porcupine.

Table 94 provides a summary of the ranked resources located with the portion of the site evaluated by this ESEE Analysis. Map 3 depicts ranked natural resource feature.

Table 94: Summary of Significant Resources and Ranks in WR13: Willamette Bluff ESEE Evaluation Area

Area Evaluated by ESEE Analysis = 258 acres				
	High	**Medium**	**Low**	**Total**
Riparian Resources*				
acres	0	0	2	2
percent of ESEE evaluation area	0	0	1	1
Wildlife Habitat*				
acres	0	0	53	53
percent of ESEE evaluation area	0	0	21	21
Special Habitat Areas*				
acres	87			
percent of ESEE evaluation area	33			
Combined Total**				
acres	87	0	12	99
percent of ESEE evaluation area	33	0	5	38

* High-ranked riparian resources, wildlife habitat, and Special Habitat Areas the Willamette River

** Because riparian resources, wildlife habitat, and Special Habitat Areas overlap, the results cannot be added together to determine the combined area.

Previous City Adopted ESEE Analysis: The bluff resources contained in this site were addressed in the *East Buttes, Terraces and Wetlands Conservation Plan* (1993). Resource Site 140: Overlook Bluff extended from N Polk Avenue in the north (located in inventory site WR 9: Willamette Cove) along Waud Bluff and Mocks Crest and Overlook Park and south to I-5. Site 140 also included lands along the Burlington Northern Railroad corridor. Below is a summary of findings and decisions for Resource Site 140.

Economic Analysis

Limiting or prohibiting conflicting uses on the forest bluffs would have positive economic consequences including protection of local residential and business property values and tax revenues and would protect the slope and reduce potential risks landslides. Guiding development away from hazardous areas would reduce infrastructure and public facility infrastructure costs.

Prohibiting conflicting uses on the vegetated bluffs would preclude new development and expansion opportunities. Much of the bluff is zoned open space, which prohibits housing, commercial and industrial uses. The rail corridor is for all practical purposes fully developed. The steep slopes and weak, silt loam soils make most develop activities in all zones generally unfeasible. However unfeasible new development or expansion may be, prohibiting all such actions could have negative economic consequences. Limiting such actions allows significantly greater flexibility for development and use of the site and not likely to have economic impacts.

Social Analysis

The protection of the Overlook Bluff area is consistent with city policies that emphasize the scenic and recreational beauty and value of lands along N Willamette Blvd. Protecting the natural resources that are located in existing parks and open spaces will have a positive impact on neighborhood livability. Overlook Bluff provides views of the Willamette River and Forest Park. Further, positive social consequences would result from the retention of forest cover and the avoidance of possible public health and safety hazards associated with erosion, slumping and landslides.

Environmental Analysis

Limiting or prohibiting conflicting uses will protect the site's natural resources and values as identified in the inventory. The inventory includes the following information regarding natural resources and values:

> ***Functional Values:*** *food, water, cover and territory for wildlife; groundwater recharge and discharge; slope stabilization; sediment and erosion control; and air and water quality protection*
>
> ***Resource Quantity and Quality:*** *The Overlook Bluff supports a oak/madrone forest community rare within Portland. Ponderosa pine, a common tree east of the Cascades, is also present in the area of the University of Portland. Other tree species along the bluff are bigleaf maple, black cottonwood, pacific dogwood, bitter cherry, red alder, willows and the occasional Douglas fir and western red cedar…. The bluff is exposed to intensive human use at its top and at its base but is otherwise*

> *unmanaged and relatively undisturbed…. This lack of management means that snags, down woody debris and other structure habitat features are more common. The oak/madrone forest community supports a range of wildlife species…. The Burlington Northern rail corridor…follows a ravine that provides wildlife habitat and corridor values, in essence linking the Willamette River Greenway with the Columbia Slough habitat area.*

Energy Analysis

The forest provides a tempering effect on climate and reduces energy needs for heating and cooling of nearby residences, university buildings and medial centers. Trees shade buildings in the summer, reducing energy demands for cooling. Plants also absorb sunlight and transpire during the grown seasons, reducing ambient air temperatures. Trees and shrubs also act as a wind break during the winter, reducing building heat loss and resulting in lower energy needs for heating. On balance, protection of forest vegetation would have positive energy consequences locally.

Decision

Limit conflicting uses along the forested slopes of Overlook Bluff and the rail corridor. This decision resulted in application of the environmental conservation overly zone to the bluffs throughout the site.

Site-Specific ESEE Analysis: The Willamette River North Reach general ESEE analysis and decision presented in the previous section and summarized in Table 95 below apply to inventory site W13: Willamette Bluff except for modifications described in Table 96.

Table 95: Willamette River North Reach General ESEE Decisions

Base Zone	Significant Natural Resources		
	High Ranked/ Special Habitat Area	Medium Ranked	Low Ranked
Industrial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Employment	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Commercial	Limit, except strictly limit within 50' of a stream centerline or wetland	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Institutional	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Residential	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow
Open Space	Strictly Limit	Limit, except strictly limit within 50' of a stream centerline or wetland	Allow

Table 96: Supplemental ESEE Analysis for SiteWR3: Willamette Bluff	
Key Feature	**Designated Special Habitat Areas on the bluffs within industrial and commercial base zones; except within the non-vegetated rail corridor**
WRNRI/ North Reach Relative Rank	High, Special Habitat Area
Characteristics	• Industrial and commercial base zone • Oregon white oak, Pacific madrone, and Ponderosa pine exist along steep slopes • Vegetation and undeveloped slopes provide upland habitat and wildlife connectivity along the Willamette River • Provides views of Willamette River and Forest Park and views looking eastward across the river as well. • Wildlife and landslide hazards
Willamette River North Reach General ESEE Decision	Limit conflicting uses in high ranking resources areas and Special Habitat Areas in industrial and commercial base zones
ESEE Implications	A decision to limit conflicting uses could result in partial or complete encroachment into the resource area. It would not be feasible to mitigate for the environmental and social values (e.g. rare and declining Oregon white oaks, wildlife habitat, scenic, recreational and education opportunities) provided by the bluff resource areas. The economic consequences of strictly limiting conflicting uses are minimal due to the relative infeasibility of developing the steep slope. Guiding development away from hazardous areas (e.g. landslide, wildfire) would reduce infrastructure and public facility costs.
Site-Specific ESEE Decision	Strictly limit conflicting uses in Special Habitat Area containing upland bluffs

The previous ESEE analysis for Resource Site 140: Overlook Bluff (*East Buttes, Terraces and Wetlands Conservation Plan -1993*) and the adoption of the Willamette Greenway (1987) established overlay zones to protect the vegetated bluffs at site WR13: Willamette Bluff. The overlay zones applied at that time were the environmental conservation overlay zone and the Greenway natural zone. These zones require development to avoid significant resources where practicable and to mitigate for unavoidable adverse impacts on the resource. Some portions of vegetated bluff are not currently with an environmental or greenway overlay zone.

The proposed ESEE decision presented would modify the previous decision by strictly limiting conflicting uses that would affect the high ranked resource areas on the bluff in all base zones. The decision to strictly limit conflicting uses on the bluffs would allow, through a review

process, development to that is necessary for access or where the public benefit provided by the development is found to outweigh the adverse impacts on the resource.

Several City documents support additional protection of these upland natural resources:

- Portland Watershed Management Plan: In 2006, City Council adopted the Portland Watershed Management Plan which describes the approach to evaluate conditions in the City's urban watersheds and implement projects to improve watershed health. The plan discusses the importance of upland, terrestrial habitats and wildlife connectivity between upland and riparian habitats. The *Willamette River Characterization Report* (2004), a supporting document for the Plan, discusses the importance of the bluff habitat for local and migrating wildlife.

- Portland Zoning Code: "Significant Trees" are identified in the Portland Zone Code Table 630-1. Oregon white oak (*Quercus garryana*) is included in that table. The table is used in conjunction with the Tree Preservation Standards (Section 33.630) to protect established trees canopy during the land division process.

- Urban Conservation Treaty for Migratory Birds: In 2003, Portland joined several other U.S. cities to protect migratory birds and enhance their habitats within city environments through participation in the Urban Conservation Treaty for Migratory Birds. The acknowledged that migratory birds are an important element of the urban ecosystem and are indicators of the health of the urban environment. Upland forested and woodland areas provide critical migratory stopover, feeding and nesting habitat for the birds.

Consistent management of the entire bluff is also needed to wildfire and landslide hazards.

Metro ESEE Decision: Metro analyzed the natural resource features within site WR13: Willamette Bluff. Metro's ESEE decision was to limit conflicting uses within Habitat Conservation Areas (HCA) and allow conflicting uses within areas containing significant natural resources not designated as HCA. HCAs are comprised of Class I and II riparian corridors identified in Metro's inventory of regionally significant riparian corridors and wildlife habitat (Title 13 Section (2)(B)).

For this site, the upland bluff is not designated HCA. The City's ESEE decision to strictly limit or limit conflicting uses in areas containing high ranked upland resources areas is different from Metro's ESEE decision to allow conflicting uses in upland wildlife habitat areas (see Table 97 and Map 4).

Table 97: Comparison of Metro Title 13 Habitat Conservation area and the City's Natural Resources Inventory Ranked Resources in WR13: Willamette Bluff ESEE Evaluation Area

Total Area = 258	Title 13 Habitat Conservation Areas	City's Significant Natural Resources
High	0	87
Medium	0	0
Low	0	12

Total	**0**	**99**

Environmental Overlay Zones

The ESEE decisions are implemented through application of the environmental protection (p) overlay to areas where conflicting uses should be strictly limited and environmental conservation (c) overlay to areas where conflicting uses should be moderately limited. Tables 98 summarize how the resulting decisions affects different land uses. Map 5 presents the recommended environmental overlay zones based on the ESEE decision.

Table 98: Environmental Conservation and Protection Overlay Zones within Site WR13: Willamette Bluff ESEE Evaluation Area

Site = 258 acres	**Total Acres**	**Existing Conservation Overlay**	**Existing Protection Overlay**	**Proposed Conservation Overlay**	**Proposed Protection Overlay**
IH IG1 IG2	30	5	0	1	5
EG1 EX	7	0	0	0	0
CO2 CN1	9	3	0	1	3
IR	7	0	0	<1	<1
R1 R2 R2.5	8	<1	0	<1	0
R5	96	23	0	8	18
OS	101	60	0	8	60

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Site WR13 - Map 1
Willamette Bluff

2007 Aerial Photography

Proposed WRNRI* Site

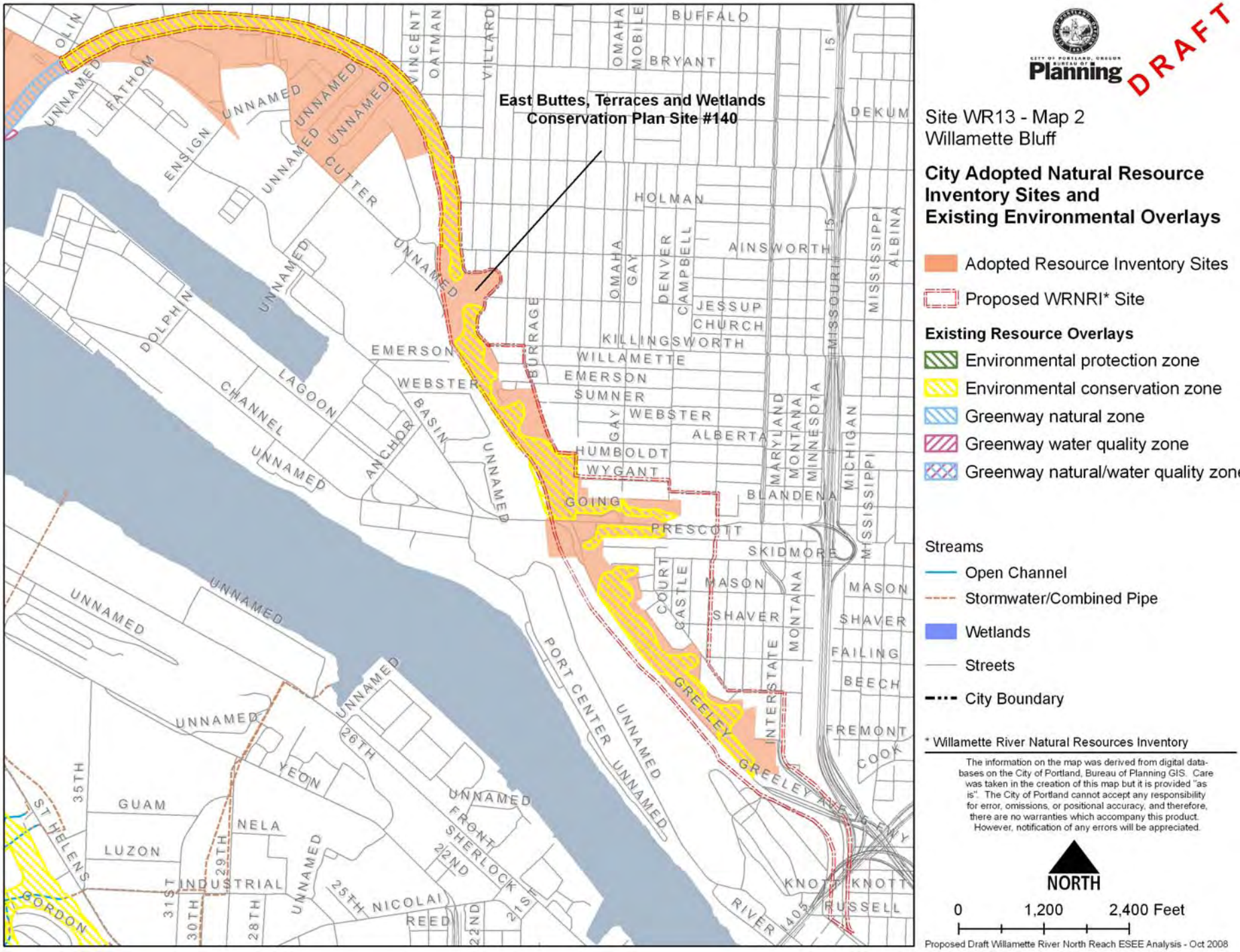
City Boundary

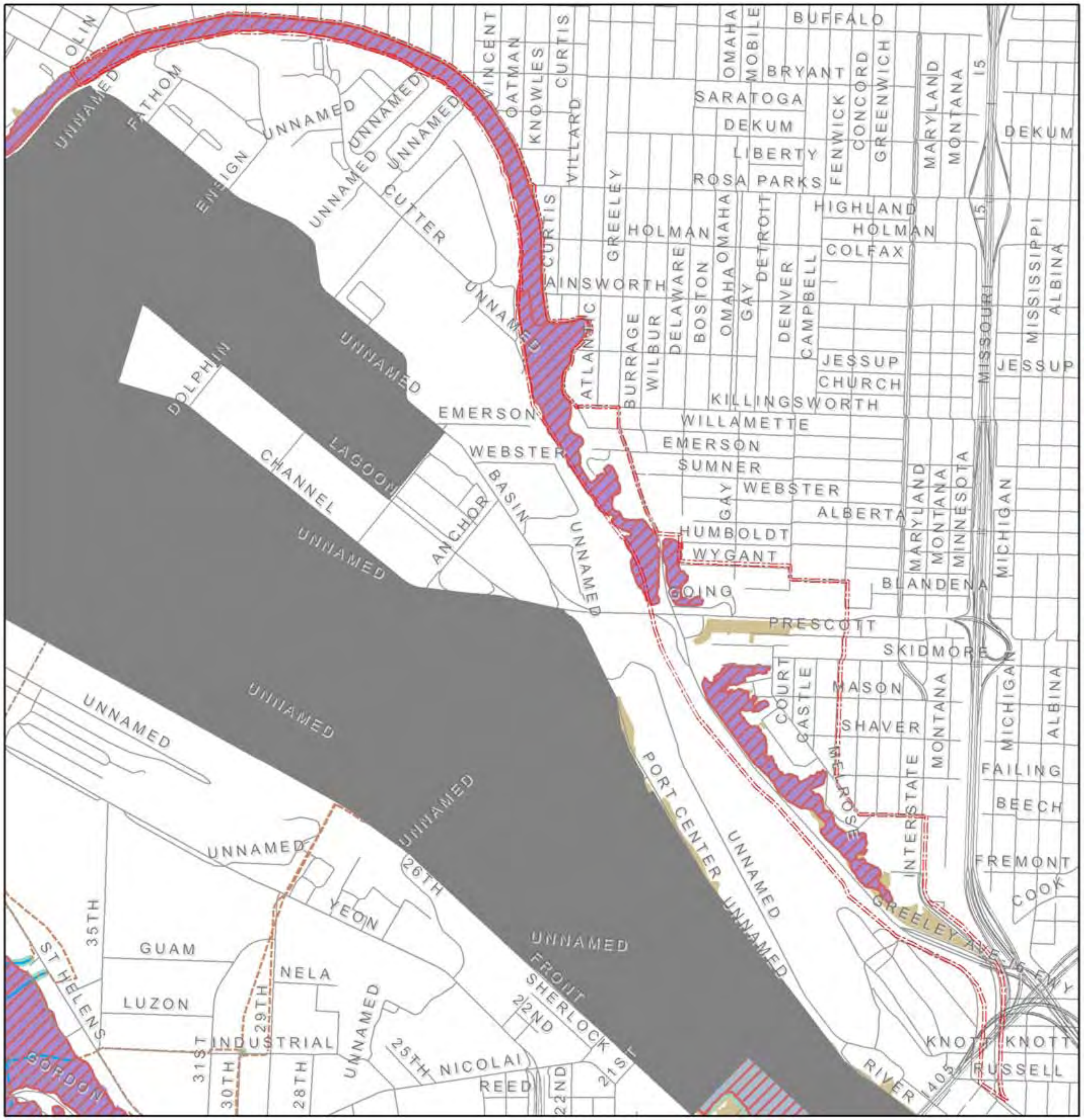
* Willamette River Natural Resources Inventory

NORTH

0 1,200 2,400 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008


East Buttes, Terraces and Wetlands
Conservation Plan Site #140
DRAFT
Planning
Site WR13 - Map 2
Willamette Bluff
City Adopted Natural Resource Inventory Sites and Existing Environmental Overlays
Adopted Resource Inventory Sites
Proposed WRNRI* Site
Existing Resource Overlays
Environmental protection zone
Environmental conservation zone
Greenway natural zone
Greenway water quality zone
Greenway natural/water quality zone
Streams
Open Channel
Stormwater/Combined Pipe
Wetlands
Streets
City Boundary
* Willamette River Natural Resources Inventory
The information on the map was derived from digital data-bases on the City of Portland, Bureau of Planning GIS. Care was taken in the creation of this map but it is provided "as is". The City of Portland cannot accept any responsibility for error, omissions, or positional accuracy, and therefore, there are no warranties which accompany this product. However, notification of any errors will be appreciated.
NORTH
0
1,200
2,400 Feet
Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008
BUFFALO
BRYANT
DEKUM
HOLMAN
AINSWORTH
JESSUP
CHURCH
KILLINGSWORTH
WILLAMETTE
EMERSON
SUMNER
WEBSTER
ALBERTA
HUMBOLDT
WYGANT
GOING
PRESCOTT
SKIDMORE
MASON
SHAVER
FAILING
BEECH
FREMONT
COOK
KNOTT
RUSSELL
EMERSON
WEBSTER
DOLPHIN
CHANNEL
LAGOON
ANCHOR
BASIN
CUTTER
ENSIGN
FATHOM
OLIN
VINCENT
OATMAN
VILLARD
OMAHA
MOBILE
DENVER
CAMPBELL
GAY
BURRAGE
MISSOURI
MISSISSIPPI
ALBINA
MARYLAND
MONTANA
MINNESOTA
MICHIGAN
COURT
CASTLE
INTERSTATE
PORT CENTER
GREELEY
FRONT
SHERLOCK
GUAM
LUZON
NELA
YEON
INDUSTRIAL
ST HELENS
GORDON
NICOLAI
REED
RIVER
UNNAMED
35TH
31ST
30TH
29TH
28TH
26TH
25TH
22ND
21ST
405



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Site WR13 - Map 3
Willamette Bluff

Combined Riparian/Wildlife Habitat Relative Ranks

Combined Relative Ranks

- High Relative Rank/SHAs
- High Relative Rank
- Medium Relative Rank
- Low Relative Rank

Streams

- Open Channel
- Stormwater/Combined Pipe
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Streets
- City Boundary

* Willamette River Natural Resources Inventory

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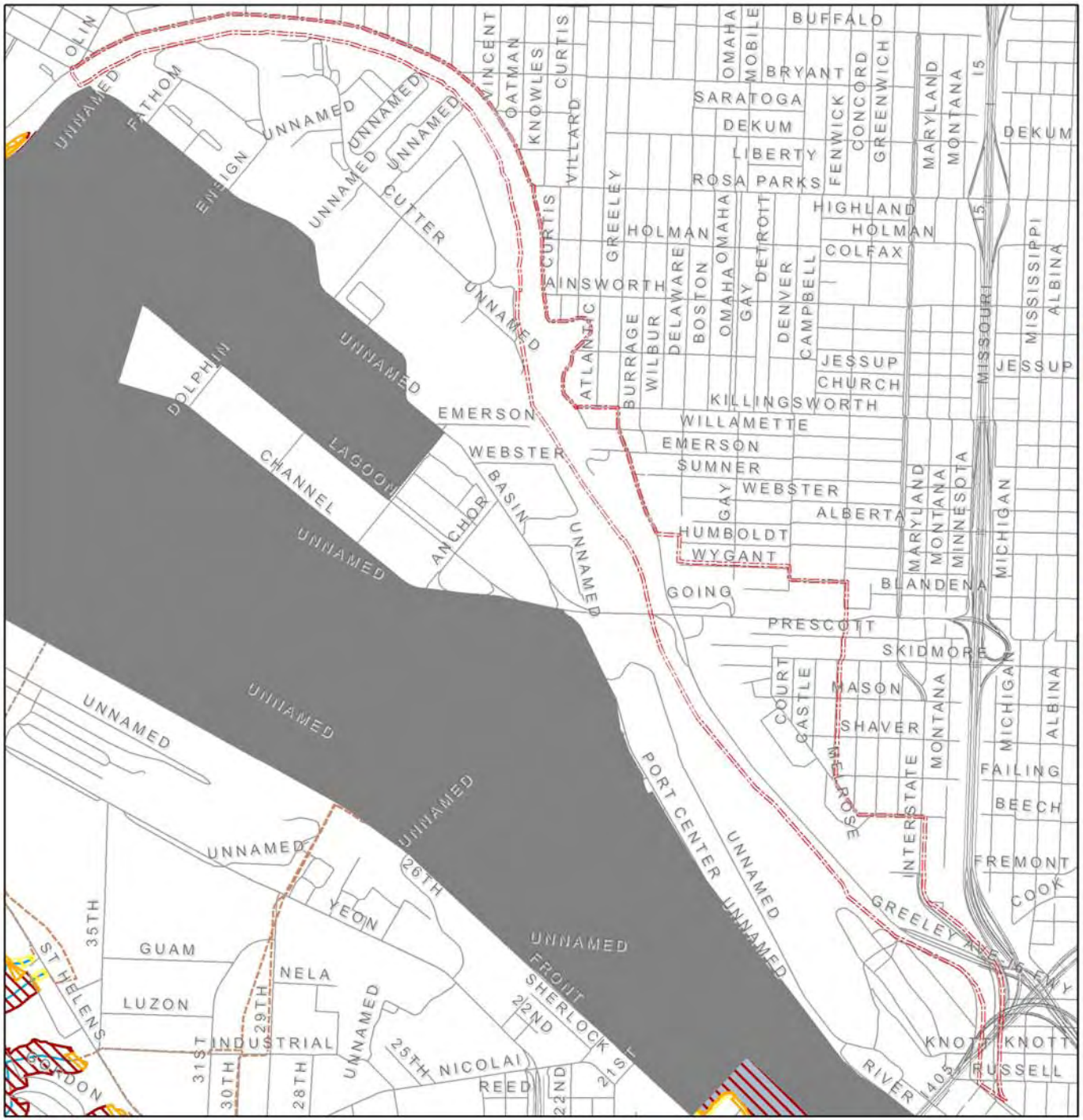
NORTH

0 1,200 2,400 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



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Site WR13 - Map 4
Willamette Bluff

Metro Title 13
Habitat Conservation Areas

Habitat Conservation Areas
- High
- Moderate
- Low

Streams
- Open Channel
- Stormwater/Combined Pipe

Wetlands

Goal 15 Willamette Greenway Area

Proposed WRNRI* Site

City Boundary

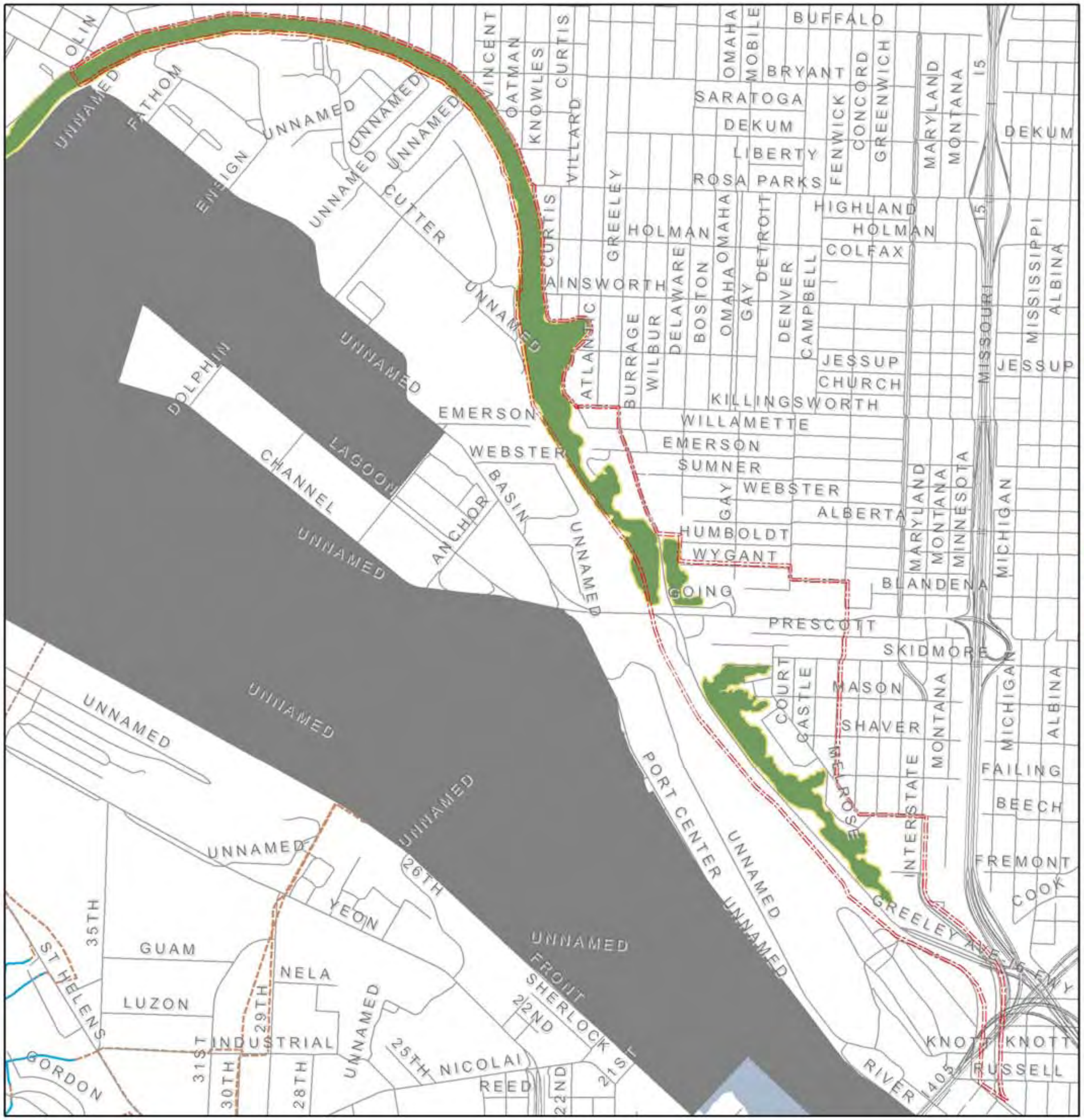
Streets

* Willamette River Natural Resources Inventory

NORTH

0 1,100 2,200 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008



DRAFT

Site WR13 - Map 5
Willamette Bluff

Proposed Environmental Overlay Zones

Proposed Environmental Overlays

- protection zone
- conservation zone

Streams

- Open Channel
- Stormwater/Combined Pipe
- Wetlands
- Goal 15 Willamette Greenway Area
- Proposed WRNRI* Site
- Streets
- City Boundary

* Willamette River Natural Resources Inventory

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NORTH

0 1,200 2,400 Feet

Proposed Draft Willamette River North Reach ESEE Analysis - Oct 2008

References

City of Portland Bureau of Planning. August 2002. Willamette River Title 3 Water Quality Compliance Project.

City of Portland Bureau of Planning. 2003. Portland Harbor Lands Study.

City of Portland Bureau of Planning. 2006. Comprehensive Plan Goals and Policies.

City of Portland Bureau of Planning. 2007. River Industrial Zoning Background and Issues Report. River Plan/North Reach.

City of Portland Bureau of Planning. October 2008. Willamette River Natural Resources Inventory: Riparian Corridors and Wildlife Habitat, Proposed Draft.

Godbe Research. 2004. Survey of residents and Park Users Conducted for the City of Portland Parks and Recreation.

Kuo, F.E. and W.C. Sullivan. 2001a. Aggression and violence in the inner city. Effects of environment via mental fatigue. *Environment and Behavior* 33:543-571.

Kuo, F.E. and W.C. Sullivan. 2001b. Environment and crime in the inner city. Does vegetation reduce crime? *Environment and Behavior* 33:543-571.

Leiberman, G.A. and L.L. Hoody. 1998. Closing the achievement gap: Executive Summary. State Education and Environment Roundtable, San Diego, CA.

Louv, R. 2005. Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder. Chapel, Hill N.C.

Lutzenhiser, M. and N.R. Netusil. 2001. The Effect of Open Spaces on a Home's Sale Price. *Contemporary Economic Policy* 19: 291-298.

Metro. 2005. Title 13 Nature in Neighborhoods. Exhibit C: Urban Growth Management Functional Plan.

Metro. 2005. Title 13 Nature in Neighborhoods. Exhibit F: Economic, Social, Environmental and Energy Analysis Phase 1.

Nieman, D.C. 1998. The exercise-health connection. Chapaign, IL: Human Kinetics Publishers.

Sachs and Segal. 1994. Mind and Body. New Woman. December 1994, pg 50.

Ulrich, R.S., R.F. Simons, B.D. Losito, E. Fiorito, M.A. Miles and M. Zelson. 1991. Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology*. 11:201-230.

RIVER PLAN / NORTH REACH ORGANIZATION

The River Plan / North Reach is organized into seven documents, as listed below. Volume 1 is available in printed form. The other volumes are available on CD or in print by special request.

VOLUME 1: PROPOSED RIVER PLAN / NORTH REACH
- VOLUME 1A: Policies, objectives, and recommendations
- VOLUME 1B: Code Amendments and Zoning Maps

VOLUME 2: ECONOMIC PROSPERITY BACKGROUND INFORMATION

VOLUME 3: WATERSHED HEALTH BACKGROUND INFORMATION
- VOLUME 3A: Willamette River Natural Resources Inventory: Riparian Corridors and Wildlife Habitat
- VOLUME 3B: Willamette River Natural Resources Inventory: Riparian Corridors and Wildlife Habitat - Appendices
- VOLUME 3C: Economic, Social, Environmental and Energy Analysis and Recommendations for Riparian Corridors and Wildlife Habitat

VOLUME 4: ACCESS BACKGROUND INFORMATION

Written Comments are due December 9, 2008 to:
Portland Planning Commission c/o Bureau of Planning
1900 SW 4th Avenue, Suite 7100
Portland, OR 97201
planningcommission@ci.portland.or.us
Fax: 503-823- 7800

RIVER PLAN / NORTH REACH EVENT SCHEDULE *(All dates subject to change)*

November 3, 2008 5:30 - 7:30 pm	Open House BES Water Lab 6543 N Burlington Avenue
December 3, 2008 Noon - 1:30, 5:30 - 7:30 pm	Open House Bureau of Planning 1900 SW 4th Avenue, Room 2500 B
December 9, 2008 6:00 - 10:00 pm	Planning Commission Public Hearing
January 13, 2008	Planning Commission Public Hearing (if needed) and Work Session
February 10, 2009	Planning Commission Work Session
Spring 2009	City Council (meetings to be scheduled)

All Planning Commission Meetings will be held at 1900 SW 4th Ave., Room 2500 A.

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