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Planning and Sustainability
Sam Adams, Mayor | Susan Anderson, Director

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AIRPORT FUTURES

CHARTING A COURSE FOR PDX

CITY OF PORTLAND ADOPTED LAND USE PLAN

APPENDIX C

**Middle Columbia Corridor / Airport
Economic, Social, Environmental and Energy Analysis**

APRIL 2011



Airport Futures City Land Use Plan

ADOPTED BY CITY COUNCIL ON
APRIL 13, 2011

ORDINANCE NO. 184521
EFFECTIVE DATE: MAY 13, 2011

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Acknowledgements

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DISCLAIMER

As part of the Airport Futures project, City Council adopted only specified sections of the Middle Columbia Corridor/Airport Economic, Social, Environmental and Energy Analysis for the following land within the Portland International Airport Plan District and the Cascade Station/Portland International Center Plan District:

- 1. Port of Portland property located north of the Columbia Slough, and*
- 2. Land with zoning designations of residential or open space land uses.*

The recommendations for land with zoning designations of industrial, employment or commercial uses, and that is not owned by the Port of Portland, will be considered at a future date. The sections of this report that were not adopted are grayed out.

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Chapter 1 – Introduction

This report was prepared as part of the Airport Futures project. Airport Futures is a comprehensive, multi-objective collaborative effort between the City of Portland, Port of Portland, and the Portland-Vancouver metropolitan community to create an integrated long-range development plan for the Portland International Airport. Airport Futures addresses a broad set of issues, including industries, neighborhoods, recreation and natural resources.

1.a Overview of Statewide Land Use Goal 5 and the ESEE Analysis

As part of the Airport Futures 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 *Middle Columbia Corridor/Airport Natural Resource Inventory* (Sept. 2010) report (published separately) presents the location, extent, quantity and quality of significant natural resources in the study area. 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 Middle Columbia Corridor/Airport study area. The specific program will be established through adoption of the Portland International Airport Plan District (here after referred to as the Airport Plan District).

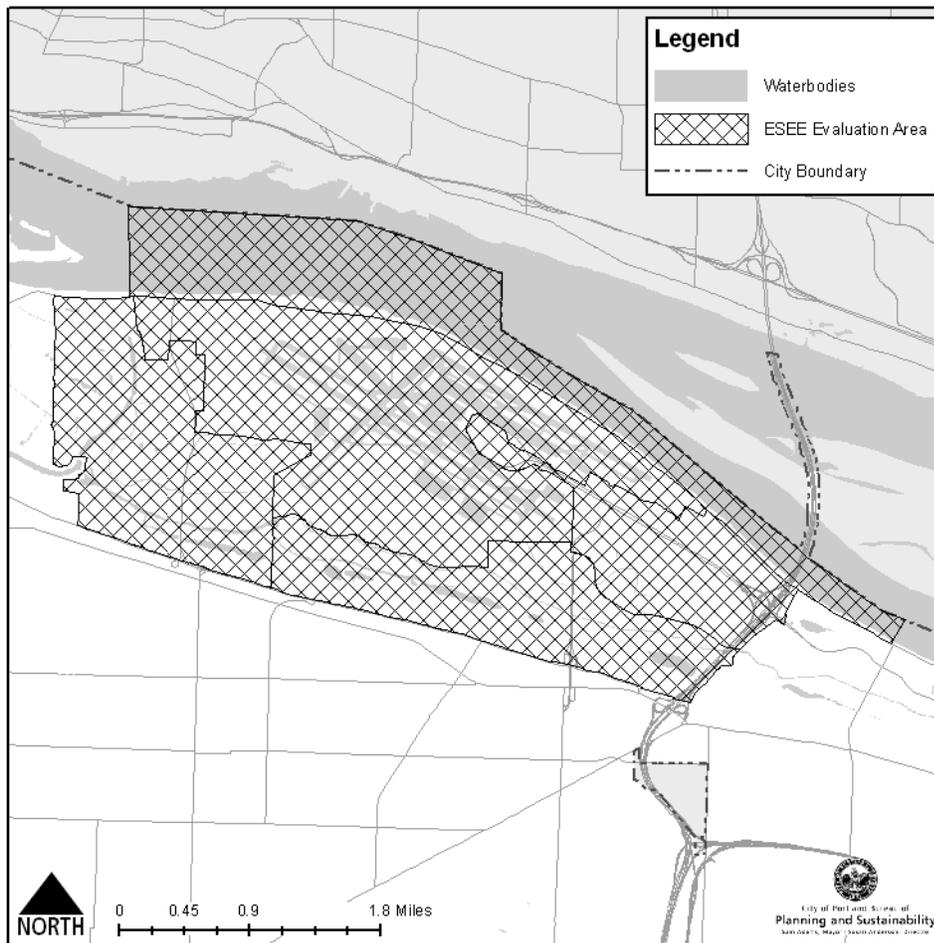
The ESEE analysis involves evaluating the potential tradeoffs associated with different levels of natural resource protection that could be established by the City. As required by the Goal 5 rule (OAR 660-015-0000(5)), the evaluation process involves identifying the consequences of allowing, limiting 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 that are identified in inventory and determined to be significant. 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 is being performed for the areas addressed in the Middle Columbia Corridor/Airport Natural Resources Inventory. The ESEE evaluation area is 11,138 acres in size, 58% of which contains of significant natural resource areas.

Map 1: Airport Futures ESEE Evaluation Area



1.b Organization of this Report

The Middle Columbia Corridor/Airport 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 Middle Columbia Corridor/Airport Natural Resources Inventory – The proposed draft of the *Middle Columbia Corridor/Airport Natural Resources Inventory: Riparian Corridors and Wildlife Habitat* (Sept. 2010) 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 ESEE evaluation area. 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 for the ESEE Analysis.

Chapter 5: Middle Columbia Corridor/Airport ESEE Analysis – This chapter presents the general ESEE analysis. The analysis is qualitative and performed for the evaluation area 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 inventoried significant natural resources. The economic, social, environmental and energy consequences are analyzed and first presented separately, including program recommendations for each of the four factors. Following, the four separate analyses are aggregated into an overall recommended general ESEE decision for the entire evaluation area. This overall recommended decision is intended to optimize the ESEE consequences to meet multiple objectives, as called for by the City’s River Renaissance Vision and which is a stated purpose of the Airport Futures project itself.

Chapter 6: Inventory Site Supplemental ESEE Analyses – The Middle Columbia Corridor/Airport Natural Resources Inventory study area is divided into sub-areas called “inventory site” or “sites.” Some of the inventory sites contain unique conditions that warrant additional site-specific ESEE analysis. These supplemental ESEE analyses either confirm or propose modifications the general ESEE decisions 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. Other regulatory or non-regulatory tools may be presented in the ESEE recommendations.

1.c Oregon's Statewide Land Use Program

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. 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 regulations, for example) when planning for development.

To address Goals 5, 6, and 7, cities and counties must use inventories to inform development of their local compliance programs. Goal 5 requires 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 Middle Columbia Corridor/Airport area.

- **Goal 9, Economic Development** – Goal 9 requires comprehensive plans and policies 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 within 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.

1.d State Aviation Policies and Regulations

Oregon Aviation Plan (2000)

In addition to the State Planning goals, there are state-wide policies and goals related to aviation and that are relevant to this project. The *Oregon Aviation Plan* was adopted by the Oregon Department of Aviation in 2000 and identifies a primary state aviation system and system needs. The *Oregon Aviation Plan* is intended to provide guidance for the safe and efficient operation of a convenient and economically viable system of airports. Additionally, it requires that land use compatibility efforts be made to reduce accident risks to aircraft operations and to land uses. According to the *Oregon Aviation Plan*, those efforts should be consistent with the *Oregon Airport Compatibility Guidebook*, which was published in 2003 by the Oregon Department of Aviation. Its purpose is to serve as a resource for planners, local officials, and citizens regarding airport land use compatibility issues. It provides non-mandatory guidance about how local governments might implement land management techniques to improve airport land use compatibility. The Plan recommends policies to guide the state in protecting, maintaining, and developing the airport system.

Oregon Revised Statutes - Local Government Airport Regulation (1997)

Oregon Revised Statute (ORS) 836.600-630 was adopted in recognition of the importance of the network of airports to the economy of the state and the safety and recreation of its citizens. The policy of the State of Oregon is to encourage and support the continued operation and vitality of Oregon's airports through a number of provisions. Local governments are directed to authorize a specific list of typical airport uses and activities (e.g. air passenger and freight services, flight instruction, general aviation, etc.). The statute also addresses wildlife hazards by prohibiting new water impoundments within a certain distance of runways.

Oregon Administrative Rules - Airport Planning Rule (1991)

Oregon Administrative Rule (OAR) 660-013-0000, also known as the *Airport Planning Rule (APR)* refines the provisions for local government airport regulation contained in Statewide Planning Goal 12 (Transportation) and the *Transportation Planning Rule*. The APR establishes a series of local government requirements pertaining to aviation facility planning which, according to the rule's purpose statement, "...are intended to promote a convenient and economic system of airports in the state and land use planning to reduce risks to aircraft operations and nearby land uses." The APR implements Oregon Revised Statutes 836.600 through 836.630. Under this section, local comprehensive plans and land use regulations must "encourage and support the continued operation and vitality of airports."

The APR outlines facility planning requirements for local governments related to the adoption of comprehensive plan and land use regulations for each aviation facility subject to ORS 836.600 through 836.630, including all required maps, uses, and projections for future facility needs.

The APR directs local governments to adopt land use regulations to carry out the requirements of the APR and requires that local governments adopt an Airport Safety Overlay Zone. The purpose of an Airport Safety Overlay Zone is to promote aviation safety by prohibiting structures, trees, and other objects that encroach into navigable airspace around the airport.

The APR includes a list of the land use compatibility requirements for public use airports, outlining the actions local governments must take to improve compatibility. For example, actions include prohibiting new residential development and public assembly uses within the runway protection zone (RPZ) and limiting certain uses within the noise impact boundary (65 Day Night Level or DNL).

1.e Metro's Urban Growth Management Functional Plan

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* (UGMFP).

The UGMFP 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 UGMFP has been acknowledged by the Oregon Department of Land Conservation and Development, making it a part of the state land use planning program. Metro area cities and counties achieve compliance with the UGMFP by updating comprehensive plans and land use ordinances to meet regional requirements. Metro has also authorized, in some instances, local jurisdictions to use other regulatory and non-regulatory tools to achieve compliance. The comprehensive plans and ordinances of the cities and counties within the Metro Urban Growth Boundary must comply with remaining state goals not covered by the UGMFP.

Nine titles in the UGMFP are derived from or relate to State Planning Goals and the rest are procedural. Titles pertaining most directly to the Middle Columbia Corridor/Airport inventory area and this ESEE Analyses are Titles 3 and 13, which address natural resources management and watershed health, and Title 4 which addresses management and protection of industrial and other employment areas. These titles and associated compliance obligations are summarized below.

Title 3 – Water Quality, Flood Management and Fish and Wildlife Conservation

The goal of Metro's *Water Quality, Flood Management, and Fish and Wildlife Conservation (Title 3)* was established to protect the region's health and public safety by reducing flood and landslide hazards, controlling soil erosion and reducing pollution of the region's waterways. (Note: Fish and Wildlife Conservation was ultimately addressed in Title 13 as described below.) Title 3 has been acknowledged by the Oregon Department of Land Conservation and Development as in compliance with the associated elements of Goal 6 and the portions of Goal 7.

Title 3 contains performance standards related to streams, rivers and wetlands. The purpose of these standards is to protect and enhance water quality. Title 3 establishes and maps Water Quality Resource Areas (WQRA) along rivers, streams, and wetlands, and the performance standards are intended to prevent encroachment into vegetated corridors along these water bodies. The WQRA width varies depending on the slope of the land adjacent to the water body. The WQRA width is 50 feet generally, and 200 feet where slopes exceed 25 percent. The performance standards limit encroachment, require erosion and sediment control, planting of native vegetation on the stream banks when new development occurs, and prohibition of the storage of new uses of uncontained hazardous material in water quality areas.

Title 3 also established and mapped Flood Hazard Management Areas and requirements, including a regional requirement to balance cut and fill in areas identified on *Title 3* maps.

In 2002, Metro deemed the City of Portland in compliance with the flood hazard and erosion control requirements of Title 3. Compliance was based primarily on the establishment of new erosion control regulations (Title 10 Erosion Control) and balanced cut and fill requirements in Title 24, Buildings Regulations. 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 the Willamette Greenway water quality

overlay zone, along with other City programs such as the stormwater management program. Metro found the City in substantial compliance with Title 3 in December 2002.

Title 13 – Nature in Neighborhoods

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 stated 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.

Also 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 (initial endorsement in 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. The baseline condition reflected Title 3 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 included scenarios in which 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 regulatory and non-regulatory measures to protect important natural resources in the region. Metro listed a number of non-regulatory measures; noting 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. 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 (2007). 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.

Table 1: Title 13 Method for Identifying Habitat Conservation Areas ("HCA")				
Table 3.07-13a: Method for Identifying HCA				
<i>Fish and wildlife habitat classification</i>	<i>High Urban development value¹</i>	<i>Medium Urban development value²</i>	<i>Low Urban development value³</i>	<i>Other areas: Parks and Open Spaces, no design types outside UGB</i>
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				
<i>Fish and wildlife habitat classification</i>	<i>High Urban development value¹</i>	<i>Medium Urban development value²</i>	<i>Low Urban development value³</i>	<i>Other areas: Parks and Open Spaces, no design types outside UGB</i>
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.

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.

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." As such, Title 13 is expressly intended to provide a minimum regional baseline level of protection for significant resources:

This program:

- D. *Establishes minimum requirements and is not intended to repeal or replace existing requirements of city and county comprehensive plans and implementing ordinances to the extent those requirements already meet the minimum requirements of this title, nor is it intended to prohibit cities and counties from adopting and enforcing fish and wildlife habitat protection and restoration programs that exceed the requirements of this title.*

Metro also addressed Wildlife Hazard Management Areas in Title 13 – Section 3.07.1340 Performance Standards and Best Management Practices for Habitat Conservation Areas:

The following performance standards and best management practices apply to all cities and counties that choose to adopt or rely upon their comprehensive plans and implementing ordinances to comply, in whole or in part, with Metro Code Section 3.07.1330(B)(2):

9. *Any activity within Habitat Conservation Areas that is required to implement a Federal Aviation Administration (FAA) - compliant Wildlife Hazard Management Plan (WHMP) on property owned by the Port of Portland within 10,000 feet of an Aircraft Operating Area, as defined by the FAA, shall be allowed provided that mitigation for any such projects is completed in compliance with mitigation requirements adopted pursuant to subsections (B)(1), (B)(2)(c), and (B)(3) of this section. In addition, habitat mitigation for any development within Habitat Conservation Areas on property owned by the Port of Portland within 10,000 feet of an Aircraft Operating Area, as defined by the FAA, shall be permitted at any property located within the same 6th Field Hydrologic Unit Code subwatershed as delineated by the United States Department of Agriculture's Natural Resources Conservation Service (NRCS) without having to demonstrate that on-site mitigation is not practicable, feasible, or appropriate.*

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 protect, conserve and restore established Habitat Conservation Areas. Cities and counties may adopt or amend regulations and may employ non-regulatory tools to achieve compliance. Local jurisdictions may also establish compliance programs for specific areas. This compliance option is called a "District Plan" in Title 13. It is anticipated that the products of the Airport Futures Project will be submitted to Metro to serve as a Title 13 District Plan for the portion of the city addressed by the project. In establishing programs to protect, conserve and restore 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 Title 13 process and are not required to complete additional steps outlined in state rules for compliance with Goal 5. However, 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 Middle Columbia Corridor/Airport study area, the City may establish regulatory and non-regulatory mechanisms to protect, conserve and restore significant riparian corridors and fish and wildlife habitat. 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.

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. RSIAs are those areas near the region's most significant transportation facilities for the movement of freight and other areas most suitable for movement and storage of goods. The industrial and employment lands within the Middle Columbia Corridor/Airport study area are RSIAs located near the Portland International Airport, I-205, I-84 and rail corridors.

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.

Regional Transportation Plan (2004)

The *Regional Transportation Plan* (RTP) is a 20-year blueprint to ensure the region's ability to travel throughout the region as it grows. A key goal of the RTP is to support revitalization and job creation in downtowns, main streets and employment areas. In industrial and employment areas, the RTP emphasizes providing critical freight access to the interstate highway system. Providing new street connections to support industrial area access and commercial delivery activities will help current and emerging industrial areas remain competitive.

An airport is considered by the RTP to be an "intermodal transit facility." These types of facilities serve as hubs for various passenger modes and as the transfer points between modes. Language related to airports also figures prominently in RTP Policy 15, Regional Freight System including Objective D; to "work with the private sector, local jurisdictions, Oregon Department of Transportation and other public agencies to: develop the regional Intermodal Management System and Congestion Management System, including maximizing use of ship, rail, air and truck for a multi-modal freight system.

Portland adopted a Transportation System Plan (TSP) in 2006. The TSP is the long-range plan to guide transportation investments in Portland. Policy 6.36 Northeast Transportation District addresses lands in the Middle Columbia Corridor/Airport study area. The Northeast District policy is to support the efficient use of land in Northeast Portland by focusing development and redevelopment where there will be a reduction in reliance on the automobile. Objectives include:

- A. Encourage automobile and truck through-traffic to use major arterials near the edges of the district to reduce peak-period traffic impacts and to preserve neighborhood livability.
- D. Encourage the use of I-84 and I-205 for primary access to the Columbia South Shore, Portland International Airport, and Portland International Center; encourage the use of NE Airport Way (east of I-205) and Portland Boulevard/Killingsworth (south of the Columbia Slough) as the secondary access from the interstate system.
- F. Work with Tri-Met and businesses to encourage the use of alternatives to automobiles, particularly in the Columbia Corridor, through transit service improvements and incentives and transportation demand management techniques such as flexible work hours, telecommuting, carpooling, bicycling, and vanpooling.

1.f City Plans and Programs

The City has established a number of policies and plans that address natural resources, industrial development, airport uses and other topics relevant to this analysis. Key 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.

All 12 goals of the Comprehensive Plan pertain to the *Middle Columbia Corridor/Airport Natural Resources Inventory* study area and must be considered when evaluating the tradeoffs of different program choices in the Middle Columbia Corridor/Airport area. The Comprehensive Plan goals are:

- Goal 1: Metropolitan Coordination
- Goal 2: Urban Development
- Goal 3: Neighborhoods
- Goal 4: Housing
- Goal 5: Economic Development
- Goal 6: Transportation
- Goal 7: Energy
- Goal 8: Environment
- Goal 9: Citizen Involvement
- Goal 10: Plan Review and Administration
- Goal 11: Public Facilities
- Goal 12: Urban Design

Below are summaries of citywide policies and objectives that pertain most directly to the *Middle Columbia Corridor/Airport Natural Resources Inventory* and *ESEE Analysis*:

Goal 2 – Urban Development: Maintain Portland's role as the major regional employment, population and cultural center through public policies that encourage expanded opportunity for housing and jobs, while retaining the character of established residential neighborhoods and business centers.

Key policies of Goal 2 include:

- *Open Space* - Provide opportunities for recreation and visual relief by preserving Portland's parks, golf courses, trails, parkways and cemeteries. Establish a loop trail that encircles the city, and promote the recreational use of the city's rivers, creeks, lakes and sloughs.
- *Industrial Sanctuaries* - Provide industrial sanctuaries. Encourage the growth of industrial activities in the city by preserving industrial land primarily for manufacturing purposes.
- *Utilization of Vacant Land* - Provide for full utilization of existing vacant land except in those areas designated as open space.

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 5 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.
- *Columbia South Shore* - Encourage the development of the Columbia South Shore as an industrial employment center which attracts a diversity of employment opportunities while protecting significant environmental resources and maintaining the capacity of the area infrastructure to accommodate future development.

Goal 6 – Transportation: Develop a balanced, equitable, and efficient transportation system that provides a range of transportation choices; reinforces the livability of neighborhoods; supports a strong and diverse economy; reduces air, noise, and water pollution; and lessens reliance on the automobile while maintaining accessibility.

Key policies of Goal 6 include:

- *Multimodal Freight System* – Develop and maintain a multimodal freight transportation system for the safe, reliable and efficient movement of freight, within and through the City.
 - Address freight access and mobility needs when conducting multimodal transportation studies or designing transportation facilities.
 - Work with community stakeholders to minimize adverse impacts of freight activity on the environment and residential and mixed-use neighborhoods.
- *Multimodal Passenger Service* – Participate in coordinated planning, development, and interconnection of Portland, regional, and intercity transportation services for passenger travel.
 - Support continuation of Portland International Airport as the multimodal passenger air facility hub by encouraging direct connections for all modes, including light rail transit, buses, taxis, and airport shuttles.

- *Transit-Oriented Development* – Reinforce the link between transit and land use by encouraging transit-oriented development and supporting increased residential and employment densities along transit streets, at existing and planned light rail transit stations, and at other major activity centers.
- *Pedestrian Transportation* – Plan and complete a pedestrian network that increases the opportunities for walking to shopping and services, schools and parks, employment, and transit.
- *Public Transportation* – Develop a public transportation system that conveniently serves City residents and workers 24 hours a day, seven days a week and can become the preferred form of travel to major destinations, including the Central City, regional and town centers, main streets, and station communities.

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.

Key policies of Goal 8 include:

- *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.
- *Portland International Airport Noise Impact Area* – Ensure compatible land use designations and development within the noise impacted area of the Portland International Airport while providing public notice of the level of aircraft noise and mitigating the potential impact of that noise within the area.

River Renaissance Vision and Strategy

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. The Vision includes integral themes, some of which pertain tributaries of the Willamette River and their watersheds:

- Clean and Healthy River – Acknowledge that the Willamette River is part of a connected ecosystem that includes a system of natural functions integral to maintaining the health of the river. Work with communities and government agencies throughout the watershed to advance and coordinate watershed protection, restoration, and cleanup actions that are critical to ensuring a functioning urban ecosystem. Manage watershed health and urban uses in a manner that is mutually supportive.

- Improve water quality in the river and tributaries through innovative stormwater management and control of sewage flows to the river.
 - Encourage environmentally-friendly building techniques and designs to use resources efficiently and minimize adverse impacts.
 - Do our part to recover wild native salmon populations in the river and its tributaries.
 - Restore and protect streamside habitat and floodplain areas. Plant native vegetation and control invasive species along waterways and throughout the watershed.
 - Improve habitat conditions in Johnson, Tryon, and Fanno Creeks, the Columbia Slough, and the smaller westside streams.
 - Advance our scientific knowledge of clean and healthy river systems and their restoration in an urban environment.
- Prosperous Working Harbor – Promote Portland as a hub for ship, barge, railroad, highway, and air transportation and as a Pacific Northwest gateway to the changing global marketplace.
 - Provide efficient and economical freight movement for the region’s industries and commerce.
 - Invest in the harbor’s industrial districts; a cornerstone of our regional economy.
 - Explore and adopt new technologies, designs, and industrial practices that support habitat restoration and the improvement of water quality.
 - Integrate regional freight-transportation and industrial objectives into river protection and enhancement activities.
 - Promote Portland as a leader in sustainable business.
 - Consider the needs of, and impacts on, the working harbor as we plan for river protection and enhancement.
 - Portland's Front Yard – Draw on the river as a place to reconnect with our history and the soul of our city.
 - Acquire lands for new and expanded parks and natural areas. Assemble an open space system that focuses on, and radiates from, the river.
 - Create opportunities for access to the water’s edge, for boating, fishing, swimming, and other river recreation activities.
 - Connect new and existing neighborhoods to and across the river, through rails, trails, bikeways, streets, view corridors, and water-based transit systems.
 - Provide safe and convenient pedestrian and bicycle access to trails and roads and across bridges.

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.

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 *Middle*

Columbia Corridor/Airport Natural Resources Inventory, this report and the Airport Plan District 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 following three main goals with associated objectives:

- 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.

Stormwater Management Manual (SWMM):

The SWMM is a technical document, implemented through the city zoning code, that outlines the City of Portland's stormwater management requirements.

The city's approach to stormwater management emphasizes the use of vegetated surface facilities to treat and infiltrate stormwater onsite with vegetated surface facilities. The SWMM is a multi-objective strategy that provides a number of benefits, including but not limited to pollution reduction, volume and peak flow reduction, and groundwater recharge. These benefits play a critical role in protecting stormwater infrastructure and improving watershed health. The SWMM complements and supports the City's *Portland Watershed Management Plan*, *System Plan*, *Revegetation Program*, *Greenstreets Program*, and other City standards and practices. The SWMM was updated in 2008.

Environmental Overlays and other Zoning Tools

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 and Sustainability 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)

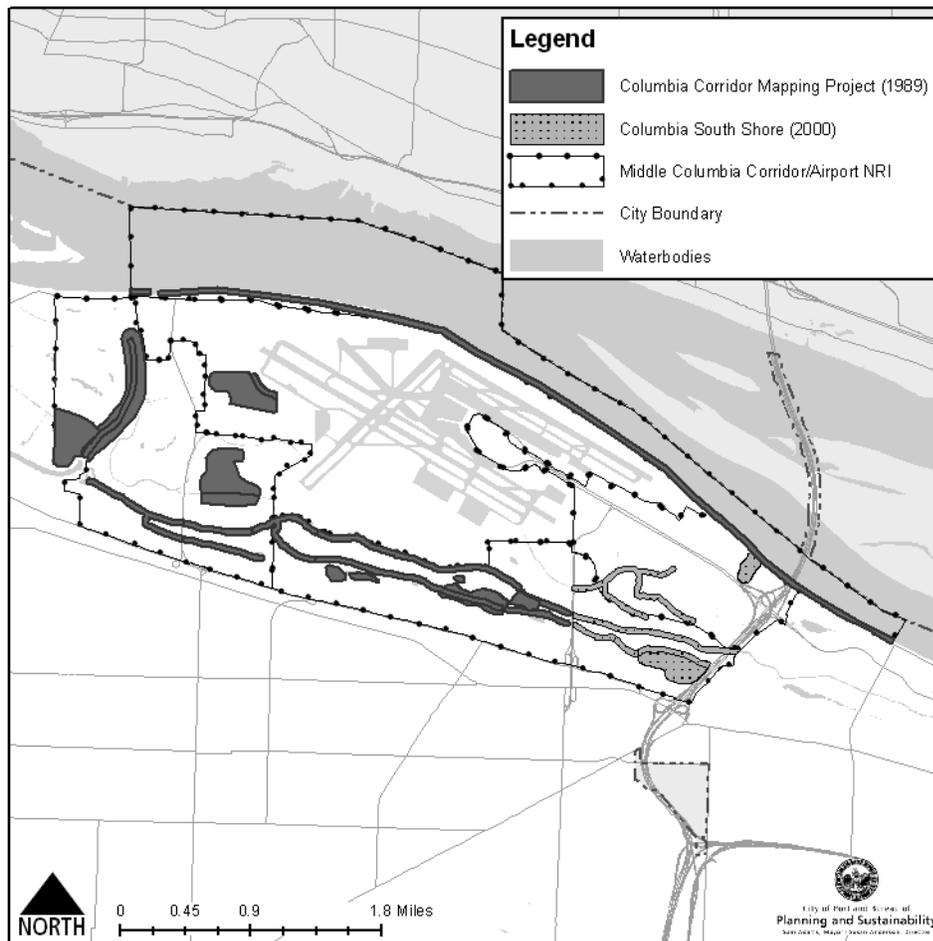
Two types of environmental overlay zones are applied within the city: the environmental conservation overlay zone (c-zone) and the environmental protection overlay zone (p-zone). Within the c-zone, development is allowed if it meets standards or criteria to avoid adversely affecting natural resources 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.

In addition to environmental overlay zones, other zoning tools can be used to conserve and protect natural resources. Plan Districts are area-specific zoning codes that may include provisions related to natural resource management. The Cascade Station/PIC Plan District is located within the Middle Columbia Corridor/Airport study area and contains provisions related to stormwater management. Natural Resource Management Plans (NRMPs) are another mechanism to coordinate natural resource enhancement and mitigation activities. NRMPs apply to environmentally sensitive areas. They establish goals and provisions allowing, limiting or prohibiting specific projects or activities within the plan area.

The Environmental Overlay Zone and other zoning tools are key components 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.

The Columbia Corridor Industrial/Environmental Mapping Project (1989) was the first Goal 5 processes undertaken by the City that established environmental overlay zones in the Middle Columbia Corridor/Airport area (Map 2). In 2000, the Columbia South Shore Natural Resources Protection Plan updated the environmental zoning code for a portion of the Middle Columbia Corridor/Airport area.

Map 2: City Adopted Resources Sites



The ESEE analysis presented in this report builds on previously conducted Goal 5 processes and adopted ESEE analyses. However, the Middle Columbia Corridor/Airport landscape and the local, regional, state and federal policies affecting natural resources have evolved since City's adoption of the previous 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 Middle Columbia Corridor/Airport inventory and new ESEE analysis.

Agreements

Another tool they city has used to manage natural resources are agreements with property owners. The intent of the agreement tool is to develop a customized program for natural resource protection and mitigation for a specific site. In some instances the agreement could be designed to achieve a similar level of resource protection and mitigation as would have been achieved using an environmental overlay zone. In other instances, the agreement could involve different sorts of approaches than would typically be achieved through implementing the overlay zone e.g., off-site mitigation or "out-of-kind" mitigation. One advantage to the agreement tool is to provide more certainty in anticipated results than an environmental land use review, while also providing flexibility in the approach, timing and location of resource protection and mitigation.

Agreements may be applied along with or in lieu of environmental overlay zones. The City has used two legal agreement mechanisms so far: 1) development agreements between the city and a private property owner; 2) Intergovernmental Agreements, or IGAs, between public agencies. In either case, natural resources are identified, future development impacts and land management activities detailed, and appropriate mitigation for impacts to natural resources agreed upon.

This tool can be appropriate for large parcels of land under a single ownership that contain diverse, extensive and/or unique natural resource areas. Under these circumstances an agreement can provide the opportunity to manage natural resources comprehensively based on long-term, anticipated development and desired future resource conditions. It provides certainty to the property owner because it can eliminate the need to review and identify mitigation requirements for each individual project. The agreement provides certainty to the City and the public as well. An agreement generally contains monitoring and maintenance requirements for the life of the agreement, which provides certainty to the city and the community that resource protection and mitigation will be carried and as has the best chance of successful.

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 through the course of the ESEE analysis.

Federal Aviation Regulations

Federal Aviation Regulation (FAR) Part 139 is Certification and Operations: Land Airports Serving Certain Air Carriers. FAR Part 139 requires the FAA to issue airport operating certificates to ensure safety in air transportation. To obtain an operating certificate, an airport must agree to certain operational and safety standards and provide for such things as firefighting and rescue equipment. These standards are based upon the type of aircraft at the airport and include dimensional standards for runways and taxiways, and a variety of safety and object free areas. This includes a requirement for wildlife hazard management.

To comply with FAR Part 139 the Port of Portland completed a Wildlife Hazard Assessment and Wildlife Hazard Management Plan (WHMP). The purpose of the WHMP is to develop an integrated and adaptive program to effectively manage risk at the Portland International Airport by reducing the probability of occurrence of wildlife/aircraft collisions. It is recognized that the risk of wildlife strikes at the airport can never be completely eliminated, given the eco-regional location of the airport both on the Pacific Flyway and at the confluence of two major river systems. However, the intent of the WHMP is to manage risk to an acceptable level using non-lethal means wherever possible.

While terrestrial wildlife can pose a risk to aircraft, exclusion fencing has reduced the risk to a manageable level. Avian wildlife continues to pose a high risk to aircraft and is the focus of the current WHMP. There are a number of management tools the Port uses to reduce risk at the airport including short-term (intensive hazing) and long-term (habitat modifications) approaches. For purposes of the WHMP, the Port divided the airfield and surrounding lands into "management areas" based on the types of habitat and current land uses present. For the ten management areas, the WHMP includes a habitat description, wildlife species of concern, wildlife use, and management actions to minimize risk.

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 Columbia Slough, do not meet water quality standards for temperature and bacteria. The Columbia Slough also does not meet standards for biological oxygen demand, nutrients, pH, pesticides and heavy metals.

The Oregon Environmental Quality Commission adopted Oregon Administrative Rule (OAR) Chapter 340, Division 42, commonly referred to as the Total Maximum Daily Load (TMDL) rule. The rule defines the Department of Environmental Quality’s (DEQ) responsibilities for developing, issuing, and implementing TMDLs as required by the federal Clean Water Act (CWA). The OAR describes the public policy of the State of Oregon to protect, maintain and improve the quality of waters of the state for beneficial uses and to provide for prevention, abatement and control of water pollution. To achieve and maintain water quality standards, the DEQ may impose limitations and controls including TMDLs, allocations for point sources and load allocations for nonpoint sources

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.

National Pollution Discharge Elimination System (NPDES):

As authorized by the Clean Water Act, the NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters, including the Willamette River and its tributaries. There are different types of NPDES permits depending on the activity that results in a discharge. The City of Portland permits stormwater discharge per the NPDES program. In addition, the City itself has a NPDES permit, MS-4 permit, to discharge municipal stormwater to surface waters.

Endangered Species Act

Beginning in 1998, National Oceanic and Atmospheric Administration’s (NOAA) National Marine Fisheries Service (NMFS) listed a number of Pacific Northwest salmon and steelhead as either threatened or endangered in Washington, Oregon, Idaho, and California. Fish species listed for the Lower Columbia River Evolutionary Significant Unit (ESU) include steelhead trout, Chinook salmon, Coho salmon, chum salmon and green sturgeon¹. Portland’s Willamette and Columbia rivers, Columbia Slough, Johnson, Tryon and Fanno creeks, and several smaller tributary streams are inhabited by several of these species. Other fish species that spend critical portions of their life cycles in the Lower Columbia River have been proposed to be listed and are under consideration: Pacific lamprey, coastal cutthroat and eucaloon. A number of other terrestrial plant and animal species found in Portland are identified under the Endangered Species Act.

After the 1998 listing of steelhead trout in the Lower Columbia River ESU the City of Portland began developing a comprehensive, coordinated citywide response for City Council adoption (Resolution No. 35715). The City Council established an intent 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 management 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.

¹ Green sturgeon are listed as threatened, with proposed critical habitat in the Lower Columbia River.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA), originally passed in 1918, established the United States' commitment to implement four bilateral treaties, or conventions, for the protection of a shared migratory bird resource. The MBTA protects over 800 species of birds. Portland joined four other U.S. cities in 2003 in establishing a local commitment to help protect migratory birds and enhance their habitats within urban environments by participating in the Urban Conservation Treaty for Migratory Birds. The U.S. Fish and Wildlife selected Portland as a pilot project city due to its location along the Pacific Flyway. As such, habitats in Portland provide critical resting, feeding and nesting habitat for numerous types of migratory and resident birds. Over 200 migratory bird species migrate through Portland every year.

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

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. Superfund:

- establishes prohibitions and requirements concerning closed and abandoned hazardous waste sites;
- assigns liability to persons responsible for releases of hazardous waste at identified sites; and
- establishes a trust fund to provide for cleanup when no responsible party can be identified.

In Oregon, the Department of Environmental Quality (DEQ) implements Superfund. The Superfund cleanup process is complex. It involves the steps taken to assess potentially contaminated sites, place them on the National Priorities List, and establish and implement appropriate cleanup plans. Within the Middle Columbia Corridor/Airport Natural Resources Inventory study area are 17 confirmed contaminated sites, 29 suspected contaminated sites, and 27 cleanup or no further action sites (data updated in January 2008). More information is available through DEQ (<http://www.deq.state.or.us/lq/ECSI/ecsi.htm>). It is important to note that many areas along the Columbia River and Columbia Slough have some level of contamination and also have natural resources that provide important functions.

Federal Emergency Management Agency (FEMA)

The Flood Emergency Management Agency (FEMA) maintains and updates flood information for most major waterways in the nation, including the Columbia River and Columbia Slough. FEMA maps the area that has a 1% chance of being flooded each year; this area is used to establish the 100-year floodplain. The 100-year floodplain is the standard used by most Federal and state agencies for floodplain management and to determine the need for flood insurance. Within Portland, FEMA updated the Flood Insurance Rate Maps (FIRM), which depicts the 100-year floodplain, in 2004. The City is using the 2004 FIRM 100-year floodplain plus the 1996 flood inundation area (as mapped by the US Army Corps of Engineers) as the flood area within the *Middle Columbia Corridor/Airport Natural Resources Inventory* (Sept. 2010) report.

In general, development must be built above elevation that has a 1% of being flood each year. This could be achieved many different ways including placing fill within the 100-year floodplain to raise the elevation. Fill activities within the 100-year floodplain must be balanced with an excavation within the same 100-year floodplain; this is often referred to as *balanced cut and fill*. In most of Portland, balanced cut and fill is triggered when an applicant applies for a site development permit to place fill within the 100-year floodplain.

Within the area managed by the Multnomah County Drainage District (MCDD), the floodplain is controlled through a system of levees and pumps. Development within the managed floodplain does not have to demonstrate balanced cut and fill.

Chapter 2 – Summary of Middle Columbia Slough/ Airport 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 *Middle Columbia Corridor/Airport Natural Resources Inventory* (Sept. 2010), published separately, contains the inventory for the evaluation area. 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.

The natural resource feature data are the primary inputs to the GIS inventory models for riparian corridor and wildlife habitat. The Bureau improved the regional natural resource feature GIS data by:

- Remapping more than 160 miles of stream centerlines; adding 70 stream miles to the maps.
- Mapping smaller vegetation units (1/2 acre minimum), and classifying forest, woodland, shrubland and herbaceous vegetation over a wider area (using the National Vegetation Classification System). Land that is either not vegetated or sparsely vegetated is not mapped as part of the vegetation data.²
- Updating the City's flood area data for use in the inventory, including incorporation of the 2004 FEMA 100-year floodplain.

² Sparse vegetation is defined as areas with a predominance of boulders, gravel, cobble, talus, consolidated rock and/or soil with unconsolidated, low-structure vegetation.

- Utilizing Light Detection and Ranging (LiDAR) is a method for precisely measuring the elevation of the Earth's surface, and objects on the surface (trees, buildings, etc.)

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 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 sites, 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.

The citywide inventory also includes up-to-date plant and wildlife species lists. Metro’s regional vertebrate species list has been refined to include species whose natural range includes Portland. Some species may be present in small numbers, experiencing declines, or have occurred historically but are now extirpated from the City. “Special Status Species” is a City term that includes fish and wildlife species that are officially listed under the Endangered Species Act by the NOAA Fisheries or the U.S. Fish and Wildlife Service (Candidate, Threatened, Endangered, Species of Concern), and/or classified by the Oregon Department of Fish and Wildlife as Threatened, Endangered, State Sensitive, or State Strategy species. The City’s Special Status Species list for wildlife also includes species that have been identified by entities or programs other than state or federal government agencies.

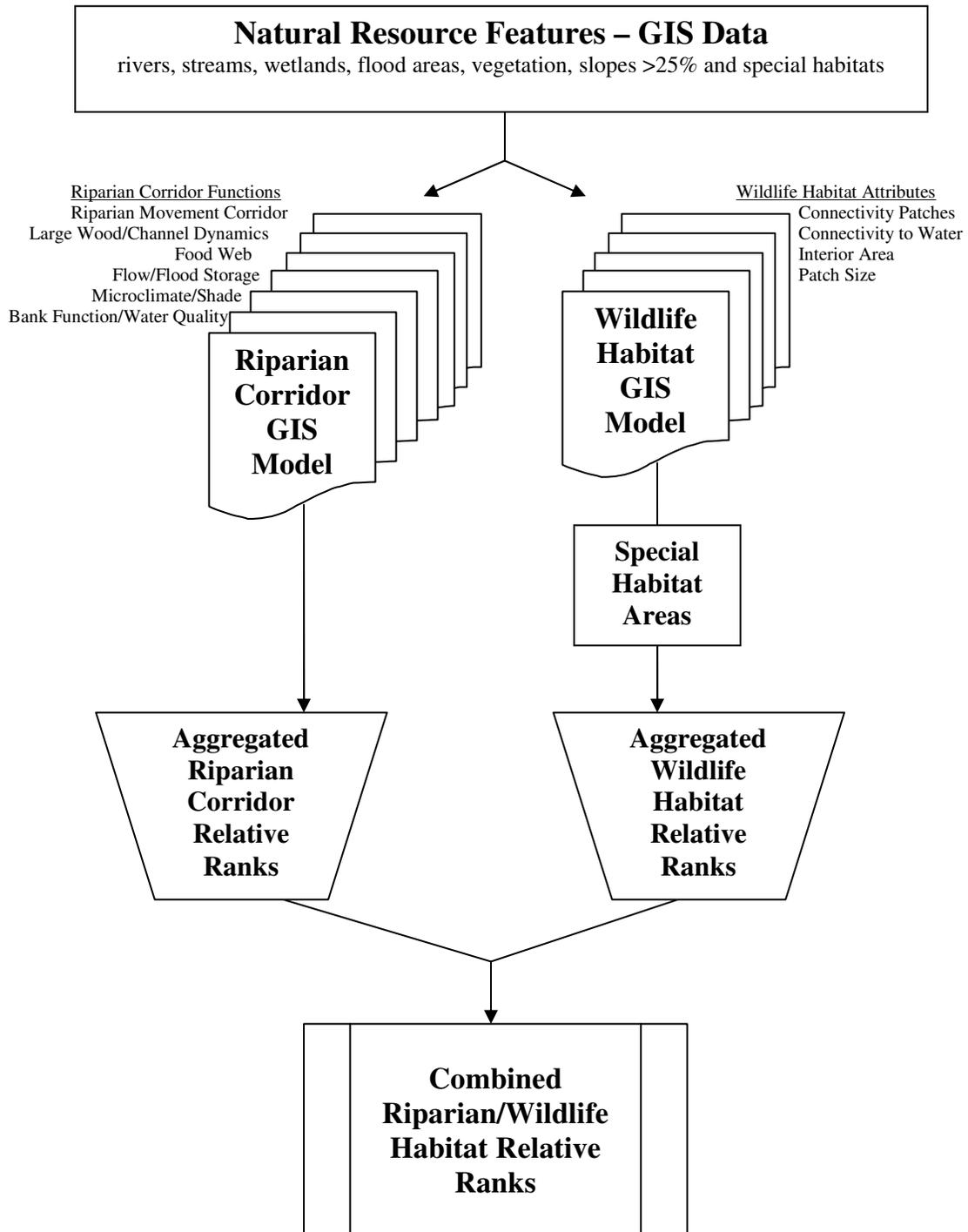
4. Produced combined ranks and maps based on GIS model results and information on Special Habitat Areas.

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 *Middle Columbia Corridor/Airport 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 Middle Columbia Corridor/Airport area.

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 *Middle Columbia Corridor/Airport Natural Resources Inventory* (Sept. 2010) be deemed ecologically and regionally and locally significant. Official determination(s) of significance will take place at the time of Airport Plan District adoption by the City Council and acceptance of the Airport Plan District by Metro as “in substantial compliance” with the Title 13 inventory.

6. Compiled Inventory Site Descriptions

The Middle Columbia Corridor/Airport area 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 *Middle Columbia Corridor/Airport Natural Resources Inventory* study area is divided into sites as described in the next section.

Middle Columbia Corridor/Airport Inventory Sites

The Bureau of Planning delineated six new inventory sites for the *Middle Columbia Corridor/Airport Natural Resources Inventory* (Map 3). Consistent with more recent City inventories, the 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 – no gaps between inventory sites.
- 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 Columbia Corridor Industrial/Environmental Mapping Project (1989) and Columbia South Shore Natural Resources Management Plan (2000). For this process, the Bureau of Planning and Sustainability uses the more general term “inventory site,” as the Middle Columbia Corridor/Airport inventory sites contain both natural resources and fully developed areas.

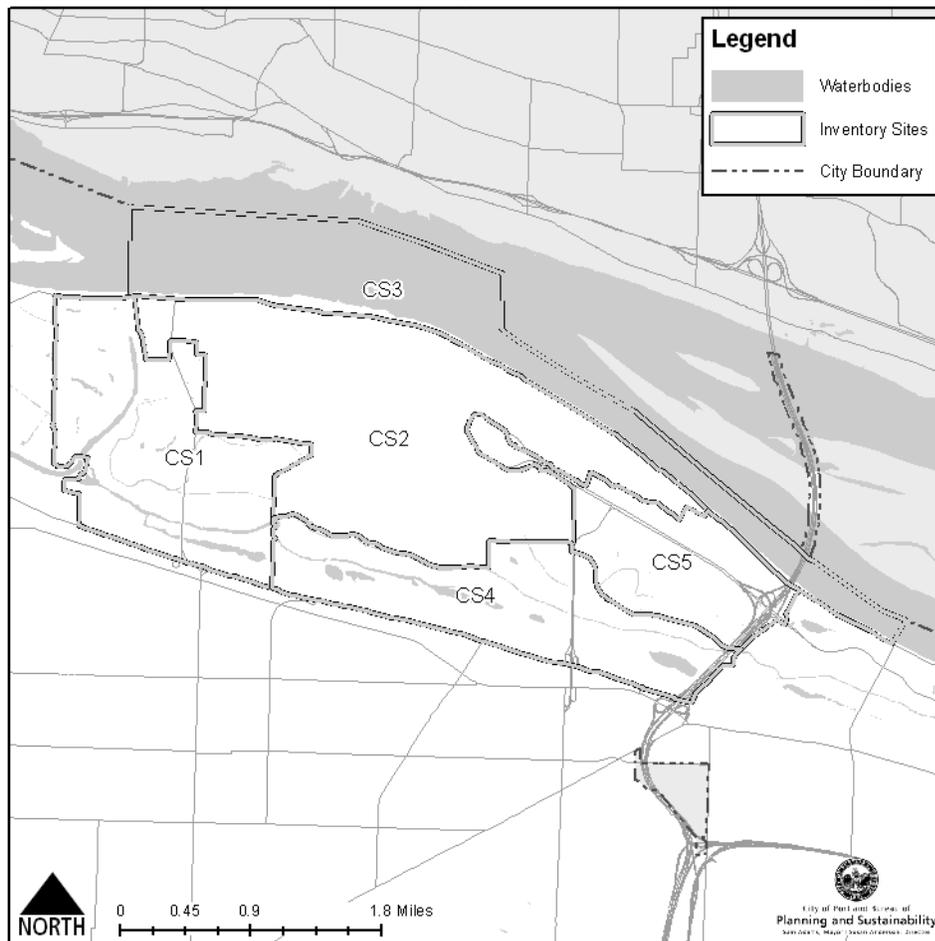
Inventoried Natural Resources

The Middle Columbia Corridor/Airport ESEE study area contains 11,138 acres of significant natural resources; this represents approximately 58% of the evaluation area (Map 4). For a full inventory of natural resources in the study area, please refer to the *Middle Columbia Corridor/Airport Natural Resources Inventory* (Sept. 2010). Below is a summary of some of the key natural resource areas:

Middle Slough

The Middle Slough, a section of the main arm of the Columbia Slough, flows for 4 miles through the study area. The Middle Slough and associated waterways are completely surrounded by levees and are within the Multnomah County Drainage District (MCDD). The Middle Slough and riparian area serve as a wildlife travel corridor along the Lower Columbia River, Pacific Flyway, and other migratory bird pathways. More than 25 species of ducks, geese, swans, and raptors winter in the region, and neotropical migrant shorebirds and songbirds stop over in spring and fall; some migrant songbirds and waterfowl remain throughout the summer to nest in riparian areas surrounding the slough. The Middle Slough is also home to American beaver, muskrat, northern river otter, several amphibian species, painted and western pond turtles, and 12 native fish species. The entire Columbia Slough is water quality limited for temperature, dissolved oxygen, eutrophication (nutrients, pH, chlorophyll-a), total suspended solids, bacteria and toxics in the sediment (DDT/DDE, dieldrin, dioxins, PCBs and lead). However, the Middle Slough has cooler water temperatures compared with the Upper Slough and Lower Slough, most likely because cool groundwater inflows.

Map 3: Middle Columbia Corridor/Airport Natural Resources Inventory Sites



Whitaker Slough

Approximately 2 ½ miles of the Whitaker Slough, a southern arm of the Middle Slough, is located in the study area. A narrow strip of riparian vegetation, two to three trees deep, surrounds Whitaker Slough. The dominant tree species include black cottonwood and red alder along with a heavily mixed understory of planted native trees and shrubs as well as invasive plants like Himalayan blackberry and Japanese knotweed. Wildlife using Whitaker Slough and the riparian area include beaver, nutria, coyote, Great Blue Heron, Great Horned Owl, goldfinch, black cap chickadee, Oregon junco, American robin, violet-green swallow, Cooper’s hawk and American widgeon. Migratory birds using Whitaker Slough include Western Tanager, Cassin’s Vireo, and Black-throated Gray Warbler. Fish found in Whitaker Slough include Three-spined Stickleback, Mosquitofish, and Prickly Sculpin.

Whitaker Ponds

Whitaker Ponds consist of two ponds and surrounding riparian vegetation totaling about 14 acres just east of NE 47th Avenue. The forested banks of Whitaker Ponds are predominantly black cottonwood and red alder along with a heavily mixed understory of planted native trees and shrubs. The ponds provide habitat for turtles, wintering waterfowl, songbirds, nesting great horned owls, and other wildlife species. Whitaker Ponds has active groundwater upwelling areas, with visible springs, that helps keep the water temperatures cool during the summer.

Buffalo Slough

Buffalo Slough is a one-mile southern arm of the Columbia Slough in the vicinity of NE 33rd Drive. Buffalo Slough, like much of the southern arms of the slough, has significant areas of groundwater upwelling; cool water is a basic requirement for many aquatic species. The riparian area consists of

a strip of trees one to two trees deep, predominantly comprised of black cottonwood, with an understory of Himalayan blackberry and English holly. Buffalo Slough and the surrounding vegetation provide habitat for a host of species including: American robin, marsh wren, redwing blackbird, Oregon junco, song sparrow, Anna's hummingbird, mourning dove, mallard, ringneck duck, American widgeon, deer, coyote, river otter, beaver, carp and nutria.

Peninsula Canal

Peninsula Drainage Canal is a roughly 1.5 mile long isolated slough segment and is one of two known significant populations of Western painted turtles within the City of Portland. Western pond turtle and northern red-legged frog have been documented by ODFW using the canal, as well as bull frog and carp. The area also provides habitat for numerous wildlife and provides connectivity to the Columbia River, Columbia Slough and small wetlands located near the canal include Blue Heron Meadows Wetland.

Subaru Wetland

Subaru Wetland is a 50-acre juncus/willow wetland and is surrounded by the Broadmoor Golf Course. Wetland vegetation includes cottonwood, ash, red osier dogwood, willow, Himalayan blackberry and rushes. Subaru Wetland is located near and provides wildlife connectivity to other small wetlands, drainageways, Peninsula Canal and the Columbia River. The wetland and vegetation provides habitat for song birds, waterfowl, woodpeckers, raptors and shorebirds, mammals and aquatic species including: common yellowthroat, song sparrow, robin, mourning dove, Vaux's swift, scrub jay, mallard, bufflehead, varied thrush, savannah sparrows, Virginia rail, common snipe, deer, nutria, beaver and coyote. The use of fertilizers and pesticides and bird hazing at Broadmoor Golf Course may have negative impacts to water quality and habitat of the wetland and drainageways.

Secondary Drainageways

Located throughout the Columbia Slough watershed are numerous secondary drainageways. Drainageways are open linear depressions, whether constructed or natural, that functions for the collection and drainage of surface water, subsurface flow or groundwater and may be permanently or temporarily inundated. In the Columbia Slough watershed, drainageways have been relocated, reconfigured or even created over the past 100 years to allow for development – first agricultural, then industrial, commercial and residential. Although altered, these drainageways provide the critical watershed functions of the hydrologic system. They also provide habitat for numerous terrestrial, avian and aquatic wildlife species.

Uplands

Unique to the Middle Columbia Corridor/Airport study area are uplands consisting of relatively large areas of sparse herbaceous vegetation that provide functions similar to that of a native prairie or grassland. Within the Metro region native prairie habitat has dropped to less than 1% of historic extent. Much of the upland grasslands in the study area are managed by the Port of Portland to reduce habitat that attracts wildlife species of concern (e.g. Canada goose; European starling). The upland grasslands also provide habitat for species that do not pose a risk to aviation safety including: Western meadowlarks, streaked horned lark, savannah sparrow, American pipit, Lazuli bunting, barn swallow, cliff swallow, Western kingbird, red-winged blackbird and yellow-headed blackbird.

Golf Courses

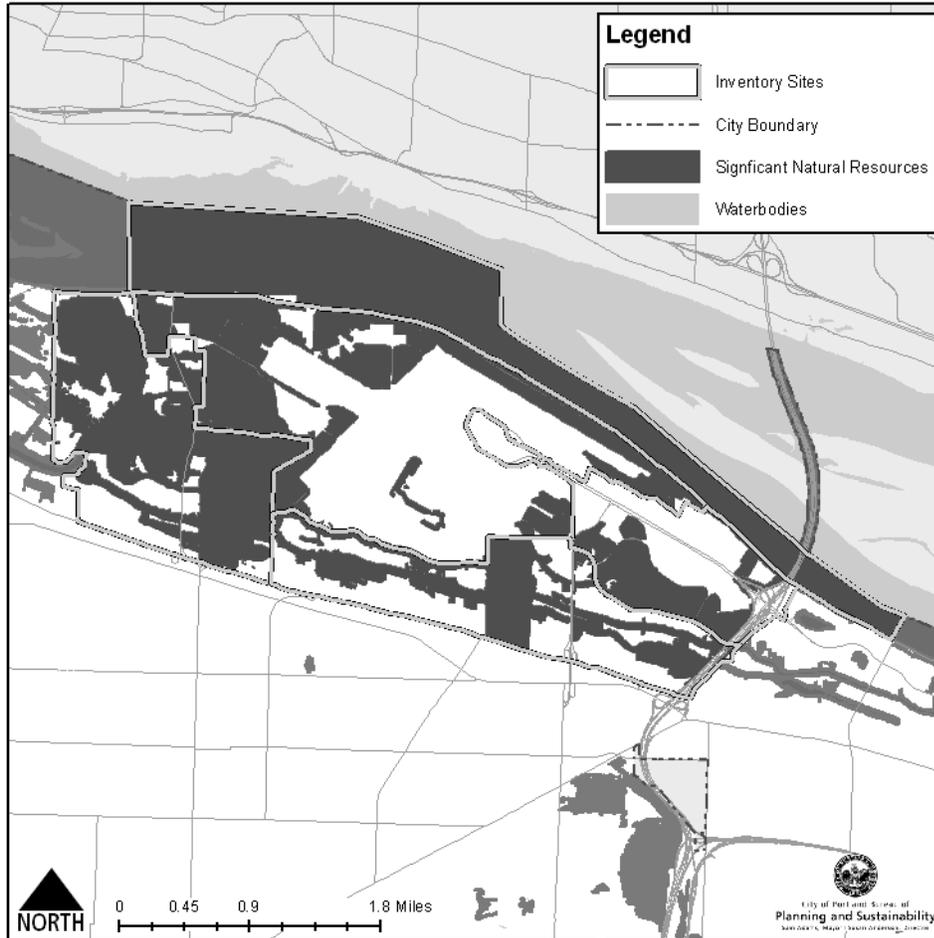
There are four golf courses within the study area. Drainageways, wetlands and riparian tree canopy are found at each golf course. A high concentration and diversity of migratory birds can be found utilizing trees in the golf courses as stopover habitat. Bat species, including *Myotis lucifugus*, *Eptesicus fuscus*, *Lasionycteris noctivagans*, and *Lasiurus cinereu*, nest and roost in riparian trees and drink and forage over open water bodies. The golf courses also provide a wildlife connectivity corridor between other habitat such as Subaru Wetland, CRCI Wetland, Middle Slough, Buffalo Slough and Whitaker Slough.

Columbia River

The Columbia River is a migration channel for anadromous salmonids including Chinook, Coho, chum, sockeye, and steelhead. Near shore, shallow water areas and areas of sandy substrate, such as Broughton Beach which is located just east of the Metro boat launch, are utilized by juvenile salmonids during migration to the Pacific Ocean. The Columbia River is designated by NOAA

Fisheries as Critical Habitat for listed salmonids. The Columbia River is also part of the Pacific Flyway, which is a significant corridor for migratory birds. Broughton Beach and other shallow-water/sandy areas are used by shore birds, songbirds and migratory birds including streaked horned lark, red-necked grebe in shallow water, short-eared Owls, and western meadowlarks. Piscivorous diving birds use the near shore water for foraging: horned grebe, eared grebe, western grebe and common loon.

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 Middle Columbia Corridor/Airport area (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. 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

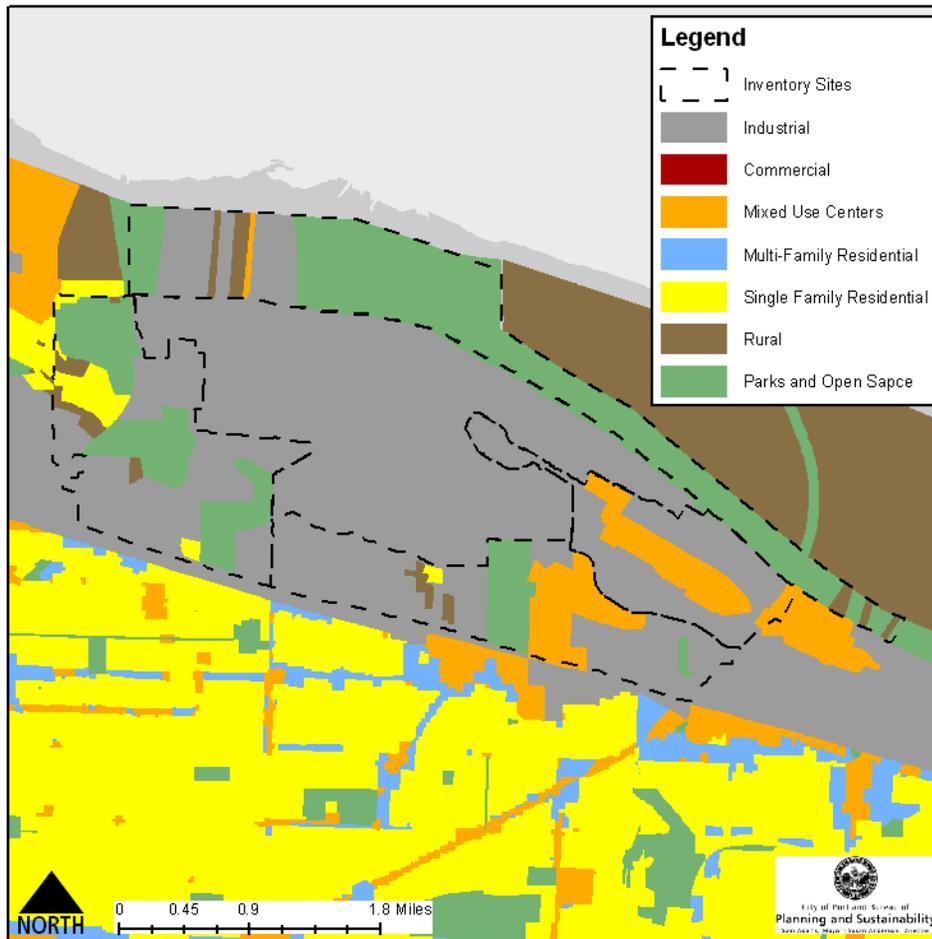
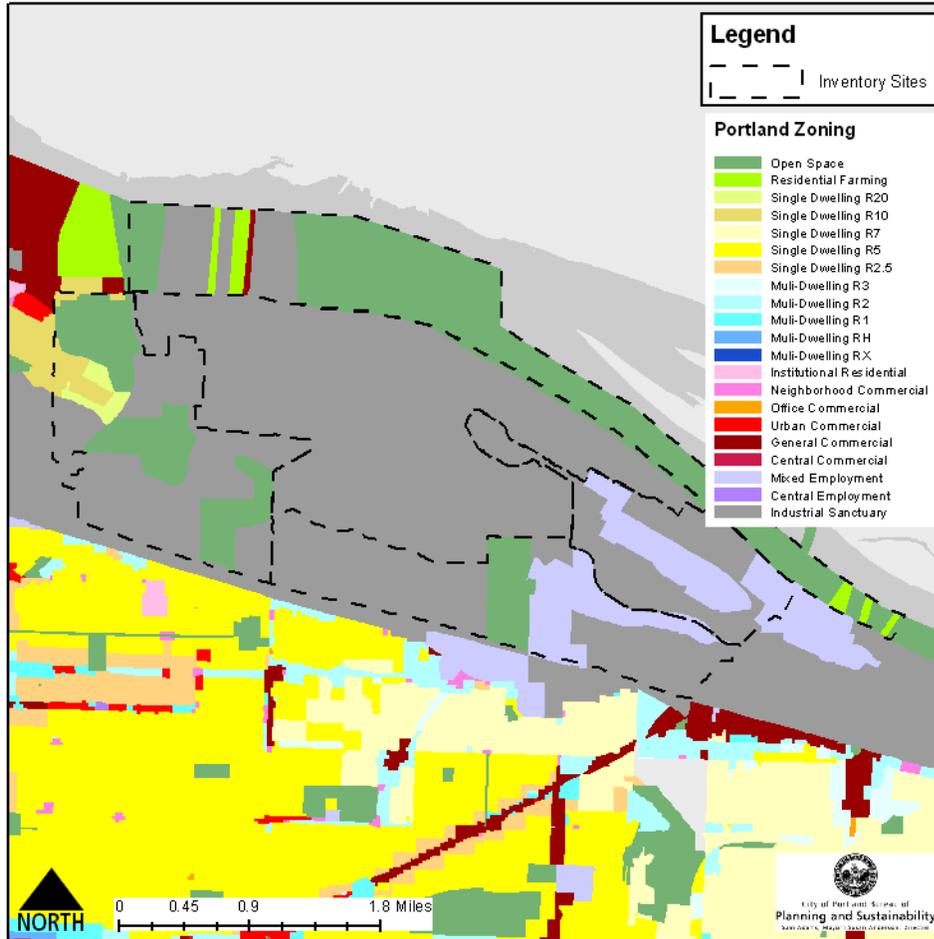


Table 2: Metro Generalized Regional Zones	
Regional Zone	Generalized Regional Zone
IL Light Industrial – districts permitting warehousing and light processing and fabrication activities. May allow some commercial	IND Industrial
IH Heavy Industrial – districts permitting light industrial and more intensive 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.	MUC Mixed Use Centers
MUC1 Mixed Use Center 1 – combines residential and employment uses in town centers, main streets and corridors.	
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.	
MRF3 Multi-family 3 – housing accommodating densities ranging from 50 to 100 units per acre.	
MRF4 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 Middle Columbia Corridor/Airport area, industrial uses are associated with the majority of the land area; other uses include employment, commercial, residential, and open space. The *Middle Columbia Corridor/Airport Natural Resources Inventory* identifies significant resources within each of these zones.

Map 6: City of Portland Base Zones



Metro Generalized Regional Zone	Metro Regional Zone	City Base Zone in the Middle Columbia Corridor/Airport Area	City Zone Description
IND	IH	IG2	General industrial uses on larger lots; prevents other conflicting uses
	IL	EG2	Industrial-related businesses on larger lots
COM	CC/MUC	CG	Full range commercial retail and service businesses; allows mixed-use; auto accommodating
MUC	MUC1	CM	Combined commercial and housing; pedestrian oriented development; limited wholesale allowed
SFR	SFR2/3	R10	Limited density single-dwelling residential; 4.4 units per acre (10,000 square feet)
	SFR1	R20	Limited density single-dwelling residential; 2.2 units per acre (20,000); allows agricultural uses
	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 in Middle Columbia Corridor/Airport area

IG2 – General Industrial 2 provides area where most industrial uses may locate, with other uses are restricted to prevent potential conflicts and to preserve land for industry. Sites generally have large lots with medium and low building coverage and buildings are usually set back from 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.

Most of the land in the Middle Columbia Corridor/Airport study area is zoned for industrial uses (4,485 acres, 65%). The largest property owner is the Port of Portland, which operates the Portland International Airport. The remaining industrial areas are located near Columbia Blvd., Cornfoot Rd., 33rd Ave. and east of I-205 and include warehousing, manufacturing and wholesale trade.

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 in Middle Columbia Corridor/Airport area

EG2 – The General Employment 2 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. Sites generally have large lots with medium and low building coverage and buildings are usually set back from the street. and an irregular or large block pattern. 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 EG2 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.

There are three areas zoned for employment in the study area. Cascade Station is located just west of I-205 and along the light rail line. Land uses in Cascade Station are primarily commercial including big-box retail and hotels. Immediately east of I-205, along Airport Wy., is another employment area with similar land use as Cascade Station – big-box retail, hotel and restaurant. The third area is along NE 82nd Ave., south of Alderwood Dr. Land uses vary here but generally include less commercial than the other two areas; light manufacturing, wholesale trade and construction are some of the industrial uses.

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 in Middle Columbia Corridor/Airport area

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. 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.

There is one site zoned for commercial uses in the study area. That site is located along the Columbia River, just west of Broughton Beach., and is developed.

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 in Middle Columbia Corridor/Airport area

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 unit 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; staging areas for public utility installation; and radio frequency transmission facilities.

Within the study area there are five locations zoned for residential farming: two in the Blue Heron Meadows neighborhood, one along Elrod Dr., and two near 66th and 63rd Avenue along the slough. All these areas, except in Blue Heron Meadows, are large single-family residential lots with existing structures. In the Blue Heron Meadows neighborhood, the lots are larger with few existing structures.

R20 – The Limited Density Single-dwelling Residential zone is intended for limited residential development in areas with long term service limitations and significant development constraints. Single-dwelling residential is the primary use. The maximum density is generally 2.2 units per acres. Agricultural uses are allowed by right. Group living, basic utilities, community service facility, schools, colleges, medical centers, religious institutions, rail lines and utility corridors are conditional uses. The same temporary activities described for the RF zone are allowed in the R20 zone.

In the Blue Heron Meadows neighborhood, a number of the larger parcels are zoned R20. Most of these sites are developed with single family uses. There may be some existing agricultural uses on a few of the sites.

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.

In the Blue Heron Meadows neighborhoods, the smaller parcels located around the wetland are zoned R10 and are currently developed with single family residential uses.

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 in Middle Columbia Corridor/Airport area

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.

Open space makes up the second largest base zone in the study area. Most of the area zoned for open space is the Columbia River and shore, except for a moorage facility near 33rd Ave. There are also four golf courses in the study area: Columbia Edgewater, Riverside, Broadmoor and Colwood. There is also a parcel of Johnson Lake owned by the City of Portland that is zoned open space.

	Acres within ESEE Evaluation Area	Acres of Significant Resources
Industrial/Employment	4,903	1,996
Commercial	15	14
Residential	266	179
Open Space	1,686	1,636
Total	6,870	3,825

Table 5: Uses Permitted by City of Portland Base Zones
 (Highlighted columns are zones within the Middle Columbia Corridor/Airport area)

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]					
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]					
Rail Lines And Utility Corridors	Y	Y	Y	Y	Y	Y

Y = Yes, Allowed

CU = Conditional Use Review Required

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.

L = Allowed, But Special Limitations

N = No, Prohibited

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]							
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]							
Community Service	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]							
Rail Lines And Utility Corridors	CU							

Y = Yes, Allowed

CU = Conditional Use Review Required

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.

L = Allowed, But Special Limitations

N = No, Prohibited

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

Use Categories	OS	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]					
Community Service	CU [5]	CU [1]					
Parks And Open Areas	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]					
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]						
Railroad Lines And Utility Corridors	CU						

Y = Yes, Allowed

CU = Conditional Use Review Required

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.

L = Allowed, But Special Limitations

N = No, Prohibited

3.c Conflicting Uses Impacts

This section describes the common impacts associated with conflicting uses generally, and within the areas addressed by the *Middle Columbia Corridor/Airport Natural Resources Inventory*. 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/employment³, 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 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 bottomland hardwood forests, require specific soil, water and sun exposure to survive and are slow growing, taking many years to become established. These vegetation assemblages still exist along the Columbia Slough, Buffalo Slough, Whitaker Slough and numerous secondary drainageways and wetlands. Removal not only reduces habitat functions as discussed previously, but also would contribute to the decline in these unique vegetation types and potentially extirpation within the city.

³ 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.

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, drainageways⁴, rivers, and floodplains (e.g. piping, widening, armoring, 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)

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, morning glory, 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.

⁴ Drainageways are also sometimes referred to as 'ditches' in the *Middle Columbia Corridor/Airport Natural Resources Inventory* (2009)

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. Some industrial uses are permitted with limitations or as conditional uses commercial zones.

Industrial and employment zones constitute roughly 4,903 acres, 71 percent, of the area in the ESEE evaluation area. Within the industrial and employment zoned areas, there are 1,998 acres (41%) of significant natural resources. Typical industrial activities that occur in the Middle Columbia Corridor/Airport area include transportation, warehousing, manufacturing and wholesale trade.

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 from 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. Industries that discharge warm-water effluent are required to obtain a discharge permit through the Oregon Department of Environmental Quality.

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 evaluation area contamination of Columbia Slough sediments and soil from historic and current industrial and agricultural uses is prevalent.

In the study area, the largest industrial use is the Portland International Airport. Over the years, land in and around the airport has been altered for development and to reduce habitat that attracts wildlife species of concern (e.g. Canada goose; European starling). This has resulted in extensive fill of secondary drainageways and wetlands, removal of tall vegetation and other habitat and vegetation alterations. This has also resulted in creation of sparsely vegetated uplands that provide habitat for some grassland-associated species.

Commercial Uses

Commercial uses are prohibited in all single-dwelling residential 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 15 acres, <1 percent, of the ESEE evaluation area in the Middle Columbia Corridor/Airport area. Approximately 14 acres of significant natural resources are commercial zones. Within the Middle Columbia Corridor/Airport area there is one site zoned for commercial use and it is development.

Commercial uses are also by right or with limitations or as a conditional within industrial and employment zones. Within the study area much of the commercial development includes big-box retail and hotels, which have similar disturbances as industrial and employment uses.

There are also smaller retail and other commercial use. Disturbance associated with these types of 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.

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 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 and commercial zones. It is allowed as a conditional use in all other employment and industrial zones.

Residential zones make up 266 acres, 4 percent, of the ESEE evaluation area of the Middle Columbia Corridor/Airport area. Approximately 179 acres of significant natural resources are located in residential zones.

In the Middle Columbia Corridor/Airport area, residential areas are primarily located in the Blue Heron Meadows neighborhood and in two locations along the Columbia Slough.

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.

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 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 constitute 1,686 acres, 25 percent. There are 1,636 acres of significant resources located in the OS zone combined in the Middle Columbia Corridor/Airport area.

Most of the area zoned for open space is the Columbia River and shore, except for a moorage facility near 33rd Ave. There are also four golf courses in the study area: Columbia Edgewater, Riverside, Broadmoor and Colwood. There is also a parcel of Johnson Lake owned by the City of Portland that is zoned open space.

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) and General Commercial (CG). In the Middle Columbia Corridor/Airport area, there are areas zoned for residential farming in the Blue Heron Meadows neighborhood and along the Columbia Slough.

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), and General Industrial 2 (IG2), and is prohibited in all other zones. Currently there are no mining operations in the Middle Columbia Corridor/Airport area.

Mining has the most severe 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 Middle Columbia Corridor/Airport area is a major transportation hub which contributes to the economic value of the area. Rail lines distribute goods regionally. The Union Pacific Railroad corridor is located immediately south of the study area between Columbia Blvd. and Lombard St.

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 inventoried wildlife habitat (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 within 150 feet of a water body or 25 feet from the edge of wildlife habitat, 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 Middle Columbia Corridor/Airport ESEE Analysis, the City elects to use the same methodology as Metro for identifying the impact area: 150 feet from water bodies, and 25 feet from wildlife habitat (including Special Habitat Areas). The City proposes to also include all land within 10,000 feet of the Portland International Airport in the impact area. Within this area, the Wildlife Hazard Management Plan addresses landscaping, stormwater management and habitats that attract wildlife species that pose a risk to aircraft safety.

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 are 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, best management practices, 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 Middle Columbia Corridor/Airport area (section 5.d.6).

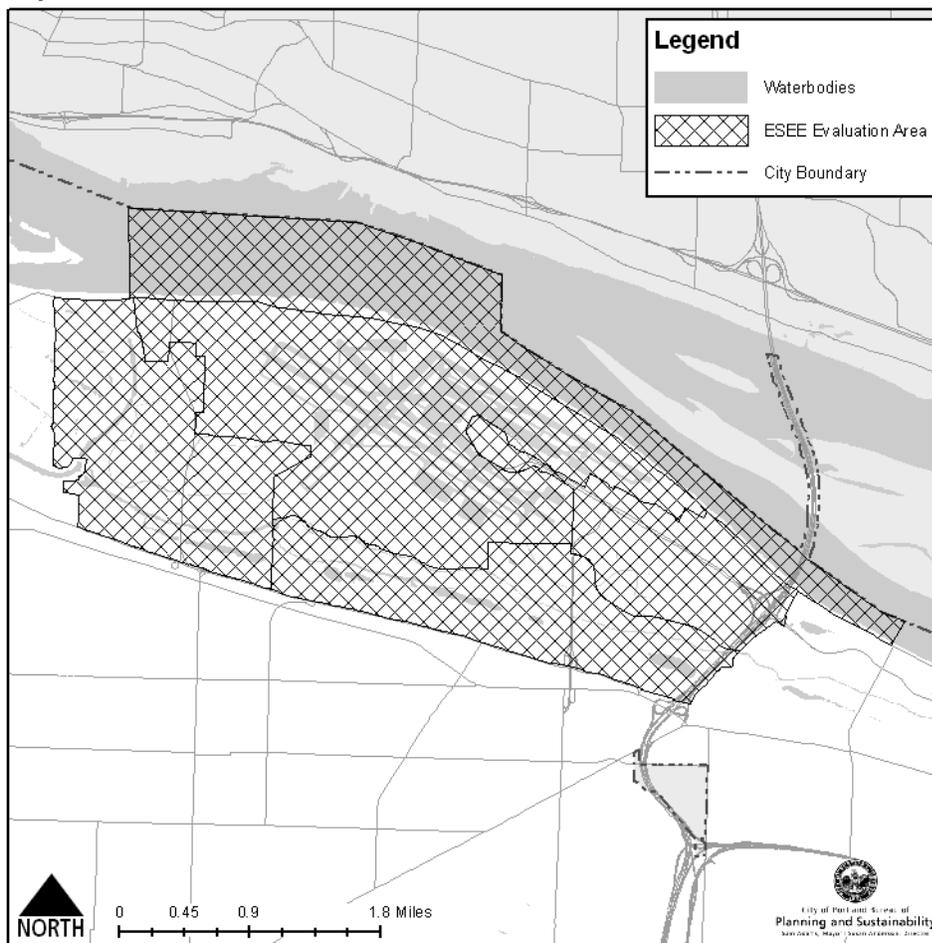
Chapter 5 – Middle Columbia Corridor/Airport ESEE Analysis

The ESEE analysis for the Middle Columbia Corridor/Airport study area is comprised of two key sequential elements: First is a general ESEE analysis for the Middle Columbia Corridor/Airport area as a whole. Second, supplemental ESEE analyses have been produced for each inventory site identified in the proposed draft *Middle Columbia Corridor/Airport Resource Inventory: Riparian Corridors and Wildlife Habitat* (Sept. 2010). These elements of the ESEE analysis are summarized below.

General Middle Columbia Corridor/Airport ESEE Analysis

The first step involves conducting a general ESEE analysis for the Middle Columbia Corridor/Airport study area. The general ESEE is intended to provide the baseline program decision for the study area as a whole. The general ESEE analysis outlines the broad consequences of allowing, limiting, or prohibiting conflicting uses in areas containing significant natural resources. Significant natural resources are identified and mapped in the draft *Middle Columbia Corridor/Airport Resource Inventory: Riparian Corridors and Wildlife Habitat*. The inventory assigns these resources scores and ranks to reflect the relative level of ecological functions and values they provide (see Chapter 2 of the inventory report for more detail on the methodology).

Map 7: ESEE Evaluation Area



The general ESEE consequences for the Middle Columbia Corridor/Airport study area are presented using qualitative descriptions and simple ratings to show whether the potential impacts of the different program choices are expected to be generally positive, negative, or neutral/negligible. While quantitative

information may be considered, the ESEE process is primarily a qualitative exercise. The qualitative descriptions within the general ESEE analysis provide the basis for the proposed City decision.

Site-specific Supplemental ESEE Analysis

Within each of the inventory sites there are unique conditions that warrant additional ESEE analysis. The site-specific ESEE analyses supplement and in some instances modify the general Middle Columbia Corridor/Airport ESEE analysis, recommendations and decision. The supplemental analyses addresses specific landscape features and conflicting uses contained within individual inventory sites in more detail than in the general ESEE analysis. The supplemental ESEE analyses confirm where the general ESEE decision would apply and where the general decision should be modified. The overall 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
- Potential Implementation Tools
- Relationship to Metro's ESEE decision
- Draft Environmental Overlay Zone Maps

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 to 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.).

For the purposes of the Middle Columbia Corridor/Airport ESEE Analysis, there are varying degrees of limitations on conflicting uses under consideration:

- *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).
- *Limit (avoid, minimize, mitigate)* – Proposed development would need to meet development standards, or would be subject to a land use review, alternatives analysis, and discretionary approval criteria. Where a land use review is required, 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.
- *Limit (mitigate only)* – Specific activities, called out in the ESEE analysis, would not be required to avoid or minimize impacts to natural resources. Impacts to natural resources must be mitigated.

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)				
<i>Fish and wildlife habitat classification</i>	<i>High Urban development value¹</i>	<i>Medium Urban development value²</i>	<i>Low Urban development value³</i>	<i>Other areas: Parks and Open Spaces, no design types outside UGB</i>
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				
<i>Fish and wildlife habitat classification</i>	<i>High Urban development value¹</i>	<i>Medium Urban development value²</i>	<i>Low Urban development value³</i>	<i>Other areas: Parks and Open Spaces, no design types outside UGB</i>
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.

Metro also addressed Wildlife Hazard Management Areas in Title 13 – Section 3.07.1340 Performance Standards and Best Management Practices for Habitat Conservation Areas. Any activity within Habitat Conservation Areas that is required to implement a Federal Aviation Administration (FAA) - compliant Wildlife Hazard Management Plan (WHMP) on property owned by the Port of Portland within 10,000 feet of an Aircraft Operating Area, as defined by the FAA, shall be allowed provided that mitigation for any such projects is completed in compliance with mitigation requirements adopted pursuant to subsections (B)(1), (B)(2)(c), and (B)(3) of this section. In addition, habitat mitigation for any development within Habitat Conservation Areas on property owned by the Port of Portland within 10,000 feet of an Aircraft Operating Area, as defined by the FAA, shall be permitted at any property located within the same 6th Field Hydrologic Unit Code subwatershed as delineated by the United States Department of Agriculture’s Natural Resources Conservation Service (NRCS) without having to demonstrate that on-site mitigation is not practicable, feasible, or appropriate.

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 Middle Columbia Corridor/Airport area. The City will accomplish this by comparing its ESEE analyses and recommendations to Metro's ESEE decision for the Middle Columbia Corridor/Airport area, 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 Middle Columbia Corridor/Airport ESEE

This section presents the general ESEE analysis for the Middle Columbia Corridor/Airport area. 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 Middle Columbia Corridor/Airport area 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 Airport Futures 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 Middle Columbia Corridor/Airport area.

The general ESEE analysis is intended to establish a baseline decision for the Middle Columbia Corridor/Airport area. The ESEE consequences, recommendations, and decision are intended to reflect conditions specific to the Middle Columbia Corridor/Airport area, though they may also be 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 Middle Columbia Corridor/Airport area.

5.c.1 Economic Analysis

This section examines the economic consequences of allowing, limiting or prohibiting conflicting uses for the Middle Columbia Corridor/Airport study area. The economic consequences are expressed as the qualitative and relative costs, benefits, and impacts of the three program choices – allow, limit or prohibit the conflicting use. The analysis relies on current information and specified assumptions relating to:

- 1) The economic goods and services provided by the conflicting uses (i.e. development); and
- 2) The ecosystem services provided by existing significant natural resources in the Middle Columbia Corridor/Airport study area.

Goods and Services provided by Conflicting Uses in the Middle Columbia Corridor/Airport Study Area

Generally, the conflicting uses in the study area provide local and regional economic benefits associated with industrial development, commerce, employment, local commercial enterprises, transportation infrastructure, housing, and parks and recreation, and other neighborhood amenities.

The value of land depends on many factors including development potential (e.g. current and future use, location), employment potential, availability of infrastructure, zoning/regulations, lot size and shape, physical terrain and other property constraints (e.g., contamination) or amenities. Most of the land in the study area is zoned for industrial uses and the value of industrial development is high. The land being evaluated in this ESEE contains industries and businesses near the Portland International Airport, rail, and I-5, I-205 and I-84. There is generally good access to infrastructure including sewer and water. The study area is in close proximity to population centers in Portland and Vancouver, which provide an employment base.

Constraints on development in the study area include the scarcity of large, vacant, developable sites, the cost to clean up contamination and redevelop brownfield sites, and other development costs, including infrastructure upgrades, site design, permitting and mitigation.

In 1989, the Portland Development Commission (PDC) established the Airport Way Urban Renewal Area as an industrial sanctuary. The City Council adopted the Airport Way Development Plan to guide public policy for the urban renewal area. The main goal of the plan was to develop a major employment center by attracting and supporting investments, and leading to the potential creation of 20,000 new jobs by 2010.

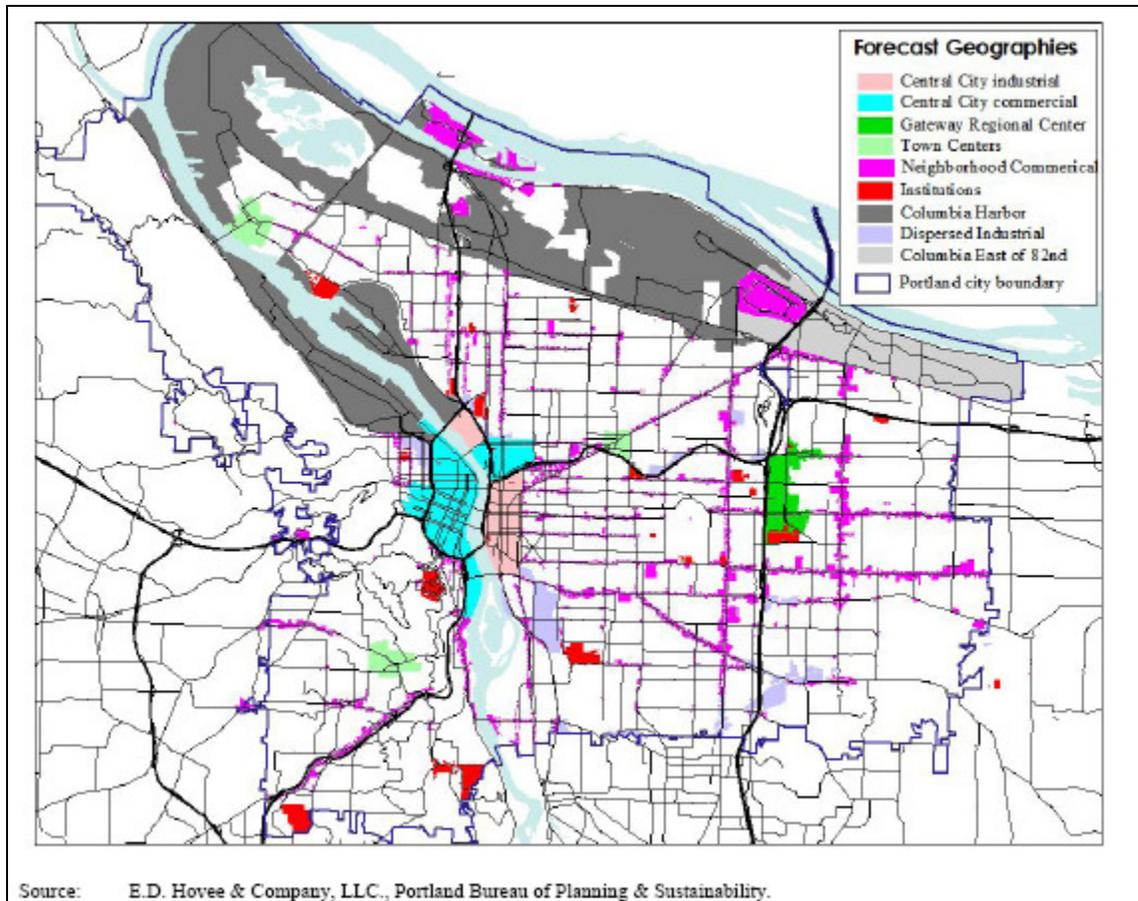
Below is a summary of the current economic goods and services in the Middle Columbia Corridor/Airport study areas.

Industry and Business

The information presented in this subsection is from the *City of Portland Economic Opportunities Analysis* (E.D. Hovee, 2009) and *Portland Airport Futures: Economic Development Inventory* (E.D. Hovee, 2009).

Portland is considered a small to medium-sized hub in the national and international business and trade community. The city, region and state maintain robust economic development strategies to attract and maintain business in Portland. About 25% of the City's job base is within three industrial districts (Map 8): Columbia Harbor, which includes industrial areas west of NE 82nd Avenue and the Portland Harbor (Willamette River), has by far the largest share of employment with nearly 64,000 jobs, or 16% of the City's job base. Columbia East, which includes industrial areas east of NE 82nd Avenue, has about 16,700 jobs. Dispersed industrial areas, which reflect historic land use patterns and cluster around highway interchanges, also contribute to the industrial job base of the city.

Map 8: Economic Districts in Portland



Metro’s 2009 long-term forecasts address a seven-county region, including Clackamas, Clark, Columbia, Multnomah, Skamania, Washington, and Yamhill counties. Metro forecasts an annual job growth rate for this region ranging from 1.5% per year to 1.9%. The City of Portland’s projected share of this regional growth is 0.9% to 1.6%.

While Portland currently has approximately 40% share of the region’s employment, its capture rate has declined over time as higher rates of both population and employment growth move out from the region’s historic core. From 2000-2006, the City captured only 11% of the region’s net additional jobs and Portland share of regional job growth is declining.

Part of the declining share of regional job growth is the tightening land supply for industrial and employment development. Demand analyses conducted for the *City of Portland Economic Opportunities Analysis* (HOVEE, 2009) and found that the largest unmet land need is for industrial land. The analysis was conducted for low, medium and high potential growth rates. Using the medium growth rate scenario, land needs in the Columbia Harbor Industrial District are estimated to reach 250 acres in the next 5 years, and 880 acres over the next 35 years. For the Columbia East Industrial District the medium growth based land need is estimated to reach 110 acres in the next 5 years and 250 acres over the next 35 years. The analysis also shows that while the Columbia Harbor Industrial District remains strongly oriented to manufacturing and distribution, service employment has been the dominant source of job growth in recent years.

The bulk of the City’s vacant industrial land is within the Columbia Harbor and Columbia East industrial districts. The Columbia Harbor has roughly 1,900 acres of vacant land; the Columbia East of 82nd has roughly 370 acres. Approximately 75% of this land has some type of development constraint. Many properties are contaminated and would require clean-up prior to developing the site. Some sites are at least partially within a city environmental overlay zones, which require new

development to avoid or minimize impacts on identified natural resources, and mitigate for unavoidable impacts on these resources. For these reasons, full build-out of the existing vacant land within the next 35 years is unlikely.

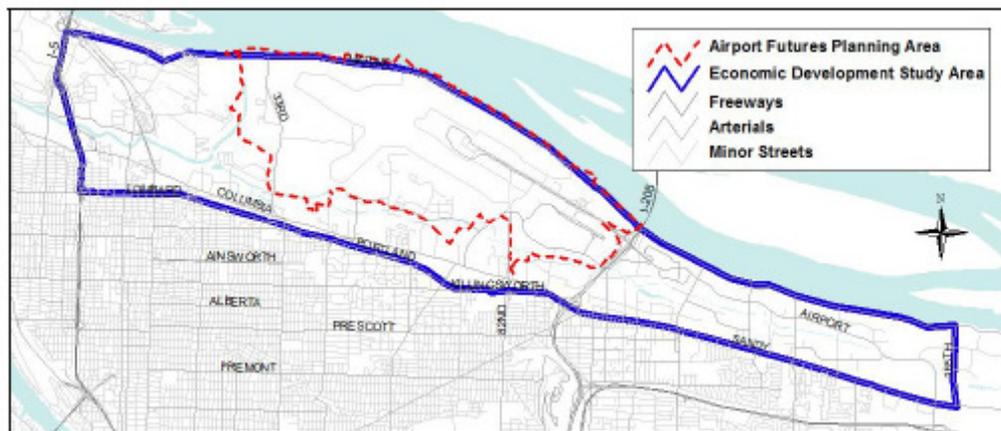
The *City of Portland Economic Opportunities Analysis* (HOVEE, 2009) indicates that Columbia Harbor has the widest uncertainty in future land demand, from 230 to 1,230 acres. Columbia Harbor contains more vacant land than any other geography; however, much of it is expected to be constrained by the costs to address contamination and/or environmental regulations.

Columbia Harbor is a unique geography because of its role in the regional transportation system. Regional transportation land demand plays a large role in the amount of land available for industrial development. Transportation infrastructure includes airport runway, railyard and marine terminal expansion. Airport runway land requirements are estimated at 50 additional acres over the next 35 years. (Railyard and marine terminal land requirements are estimated at 200 and 390 acres respectively.) Without the regional transportation demand, Columbia Harbor is projected to contain sufficient available vacant industrial acreage for both the low and medium growth scenarios, but is projected to be short about 170 acres in the high scenario. When regional transportation needs are included, a potential industrial land shortage is projected for all growth scenarios: about 100 acres in the low scenario, 600 acres in the medium scenario, and over 800 acres in the high scenario. Without additional regional transportation land, the high growth scenario would require 4% of Columbia Harbor’s developed land to redevelop. No redevelopment would be required to accommodate the low and medium growth scenarios. When regional transportation needs are included, the required redevelopment rate increases to 2%, 14% and 19% for the low, medium and high growth demand scenarios. The redevelopment need would be reduced if additional industrial land were annexed to the City (e.g., West Hayden Island).

Columbia East is expected to have an industrial land shortage for both the mid and high scenarios based on the strong growth rate it experienced between 2000 and 2006¹. To meet the projected demand would require a redevelopment rate of 10-20% to accommodate the medium and high growth scenarios.

An economic development inventory was conducted for the *Airport Futures Planning Area* (Map 9), which is similar to the Middle Columbia Corridor/Airport study area.

Map 9: Airport Futures Planning Area



Source: Bureau of Planning & Sustainability, Port of Portland, Metro RLIS Lite, and E. D. Hovee & Company.

The *Airport Futures Planning Area* includes portions of the Columbia Harbor and Columbia East industrial districts.

¹ 2000-2006 is the period on which job distribution across forecast geographies is founded.

The main economic value of the land within the *Airport Futures Planning Area* is as a traded sector district. Traded sector districts, which also include the Central City, provide Portland has an opportunity to grow the city's economic base. The other main economic value of this area is that it is a West Coast trade and transportation gateway and Oregon's multimodal distribution hub. For the state, the existence of this area reduces transportation costs for producers and consumers. For the region, these districts anchor the large distribution industry.

In the planning area, more than 200 businesses provide more than 10,300 jobs – 25% of the total employment of the larger economic development study area. The largest single industry sectors, transportation and warehousing, provide roughly 6,200 jobs. The average annual wage per job is just under \$38,700. In comparison, the average wage for all employment in the seven-county metro area is \$42,600. The largest property owners are the Port of Portland, the City of Portland and the four golf courses (Columbia Edgewater Country Club, Riverside Country Club, Broadmoor Golf Course and Colwood Golf Course.) Leased properties, both on and off-airport, total roughly 570 acres.

As of 2007, the Portland International Airport (PDX) was the 34th busiest airport in the U.S., located in the nation's 23rd largest and 21st fastest growing metropolitan area, serving an estimated 14.65 million passengers. Passenger travel, demographics and behavior indicate that the majority of air travel to Portland is for leisure (vacation or visiting family/friends). Business travel accounts for about one-third (33%) of passenger activity. Less immediately visible but of great importance to the metro area is the volume and value of air freight passing through PDX. In 2007, air freight exports from PDX totaled 519 million kilograms with a value of \$97.8 billion. Computer and electronic products represent the primary export commodity, valued at nearly \$52 billion. Other major exports are machinery, transport equipment, and primary metals. By weight, machinery and parts account for about one-quarter of the tonnage. Imports through PDX totaled an estimated \$78.6 billion as of 2007. As with exports, the number one imported commodity was computer and electronic products; followed by machinery, primary metals, chemicals, and fabricated metal products. Because of the import/export business, PDX is linked both to Pacific Rim countries, such as Japan, and high-tech European countries such as Germany and Italy.

Many of the industries and business located in the *Airport Futures Planning Area* are dependent on PDX, such as airport hotels and freight forwarders. Other businesses less dependent on PDX, are located in the Columbia Corridor because of good highway access and availability of large, competitively-priced industrial sites or modern business and industrial park space.

Out of 7,419 industrial and commercial zoned acres in the planning area, the vast majority of land area (98%) is industrial with 2% for commercial use. No commercial parcels exceed 10 acres in size, while 115 industrial sites are 10 acres or larger, including 25 properties that are 40 acres or larger. Assessed land values average more than \$16.80 per square foot for commercial property and just over \$5.90 for industrial property. Development intensity is somewhat low for both commercial and industrial uses compared to other areas of the city and metro region. This is attributable, in part, to the needs of the airport and other related transportation-logistics firms. These uses require large sites with significant land area for functions such as runways, truck maneuvering and storage.

There are roughly 3,380 acres of vacant or lesser improved² land in the *Airport Futures Planning Area*. Approximately 702 acres of land identified as vacant is owned by the Port of Portland. This includes properties considered as "strategic reserve," to be retained in Port ownership for future expanded airport operations. Properties in "strategic reserve," are, in reality, not readily available for new long-term development. However, some of these properties may be suitable for leased uses, at least on an interim basis. An estimated 585 acres (covering 188 parcels) are identified as vacant and in non-Port, private ownerships. Most of parcels range from 11 to a maximum of 25 acres in size. The four existing golf courses comprise another 707 acres. The golf courses are considered vacant or lesser improved and could be considered for future industrial development, however the existing Comprehensive Plan designates the golf courses for Open Space uses, as does the Zoning Code. The Comprehensive Plan designations and base zones would have to be amended in order to convert the golf courses to another type of land use. Finally, an estimated 1,387 acres (608 parcels)

² Lesser improved means that the assessed value of improvements (e.g., buildings) is less than 50% of the land value.

are indicated as relatively lesser improved, including two properties that are 50 acres or greater in size.

An assessment of the economic development potential of eight vacant or lesser improved areas is summarized in Table # below. Factors include the suitability of each area for desired industrial development and other factors such as readiness for industrial development, access transportation options, and financial feasibility. The assessment addressed six sites: Airfield, Southwest Quadrant (SW Quad), 33rd Ave Field, Deicing Field, Fuel Farm West and Portland International Center (PIC) (Map 10).

Map 10: Economic Assessment Areas

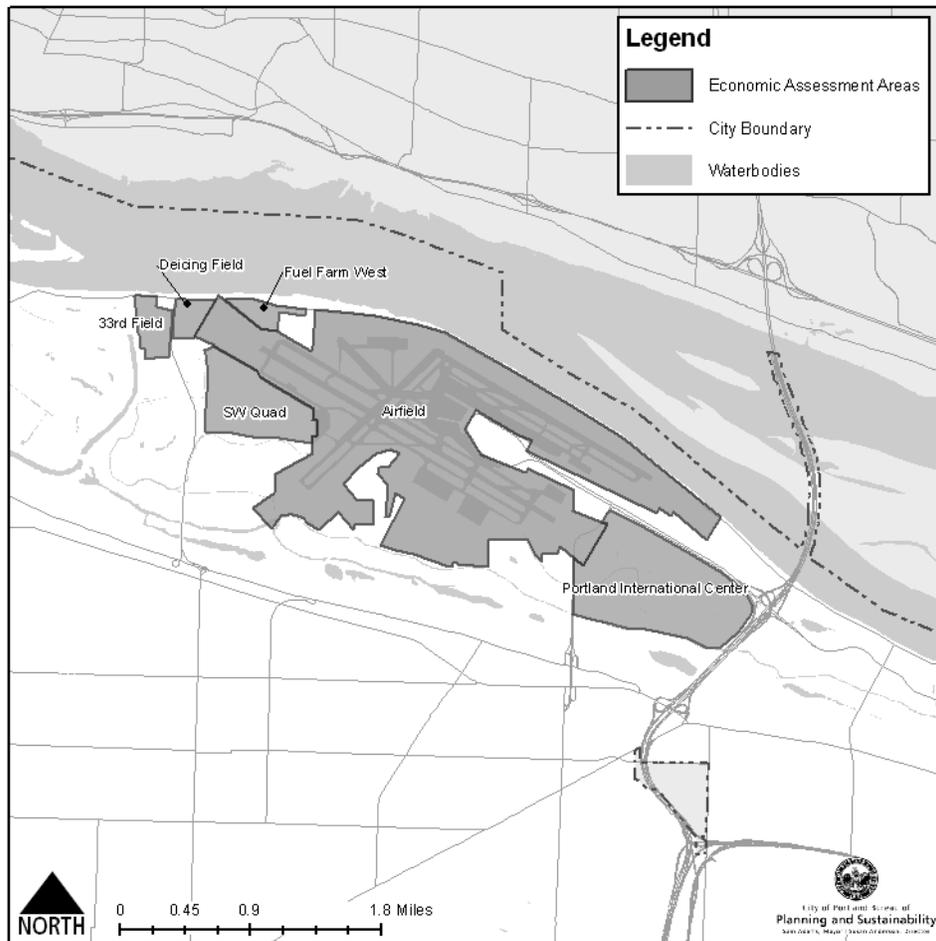


Table 6: Economic Assessment Areas						
	Airfield	Portland International Center	Southwest Quadrant	33rd Ave Field	Deicing Field	Fuel Farm West
Zoning	Industrial	Industrial	Industrial	Industrial	Industrial	Industrial
Regionally Significant Industrial Area	Yes	Yes	Yes	Yes	Yes	Yes
Size (acres)	553	197	186	54	36	39
Current Use	Aviation activity	Vacant; managed to reduce wildlife hazards	Vacant; managed to reduce wildlife hazards. airfield buffer	Vacant; managed to reduce wildlife hazards. airfield buffer	Deicing facilities; vacant; managed to reduce wildlife hazards. airfield buffer	Partially vacant; fuel tanks; stockpiles; managed to reduce wildlife hazards. airfield buffer
Possible Uses	no change	In 19XX, City Council adopted policies to ensure development (e.g. Post Office; warehouse and distribution; some office and retail, airport uses)	Runway dependent uses (e.g. cargo, aircraft maintenance)	Target industrial (e.g. sustainable industries, manufacturing)	Target industrial (e.g. sustainable industries, manufacturing)	Runway dependent uses (e.g. general aviation FBO)
Suitability for Desired Uses						
Aviation Dependent	yes	no	yes	no	no	Yes
PDC Target Cluster Recruitment ¹	no	yes	no	yes	maybe	maybe
Meet industrial land shortfall	no	yes	no	yes	maybe	maybe
Development Readiness	active airfield	shovel ready - mostly	fill/ infrastructure needed	fill/infrastructure needed including upgrades to MCDD facilities	infrastructure needed including upgrades to MCDD facilities	infrastructure needed including upgrades to MCDD facilities
Timeframe for availability	NA	Now	< 5 years	< 2 years	< 2 years	< 2 years
Natural Resources Inventory Ranking Resources (acres)						
Site Investments to Date	All infrastructure in place >\$1B	All infrastructure in place >\$75M	Fill and drainage to reduce wildlife hazard and increase development readiness.>\$4M	Wildlife habitat management (e.g. goose deterrents)	Wildlife habitat management (e.g. grading, vegetation, etc.) \$20M	Wildlife habitat management (e.g. grading, vegetation, etc.)
Transportation Access	Access to Runways	Access to Airport Way/I-205 and 82nd. Light Rail	Access to runways; access to 33rd Ave./Columbia Boulevard	Access to 33rd	Access to 33rd	Access to Runways; access to Marine Drive is a potential issue

¹ PDC's target clusters: Activewear/Outdoor Gear; Biosciences; Cleantech; Advanced Manufacturing; Software.

² Port Estimates and does not include land acquisition or ongoing maintenance

The Airfield is the active airfield of the Portland International Airport. Uses are regulated by the Federal Aviation Administration and industrial development, other than runway-dependent activities, are not allowed in the Airfield.

Based on these factors, the site most ready for industrial development in the near-term is the Portland International Center (PIC). In 1999 Portland City Council adopted the Cascade Station/PIC Plan District which targeted this area for industrial and employment development. All necessary infrastructure is in place, including utilities, water, sewer, public transit and access to I-205 via Airport Way.

33rd Ave Field, Deicing Field, Fuel Farm West and SW Quad will require significant investment for infrastructure improvements and for fill to increase site elevation prior to development. These requirements and associated costs make these locations less ready for industrial development in the near-term. Although these areas have significant development potential and are zoned for industrial uses, the City has not established recent area-specific development objectives for these sites as it has for PIC. In the long-term, Fuel Farm West and SW Quad are suitable for runway-dependent uses because they have direct access to the runways. 33rd Ave Field and the Deicing Field are suitable for target industrial uses such as manufacturing.

In summary, industrial businesses in the Middle Columbia Corridor/Airport study area, including the Portland International Airport, provide a significant economic base for Portland and the metro region. National and international commerce is supported by the Portland International Airport. The businesses in the study area employ thousands of workers and pay a competitive wage. Portland's largest unmet land need is industrial lands. There are vacant and lesser improved sites available for future industrial development in the study area; however, many are constrained by brownfields or environmental regulations. Under a medium growth scenario, considering redevelopment opportunities, there is likely sufficient land available to meet job growth needs. However, few parcels exceed 25 acres in size. Also, existing contamination and clean-up requirements, and development costs associated with site design, permitting and environmental mitigation may affect development or redevelopment rates, at least in the near-term. There is a projected future deficit of land available for transportation infrastructure within the larger Columbia Harbor and Columbia East industrial districts.

Open Space Uses

There are 1,686 acres zoned for Open Space Uses: 1,040 acres are the Columbia River and 640 acres include the four golf courses (Columbia Edgewater Country Club, Riverside Country Club, Broadmoor Golf Course and Colwood Golf Course.)

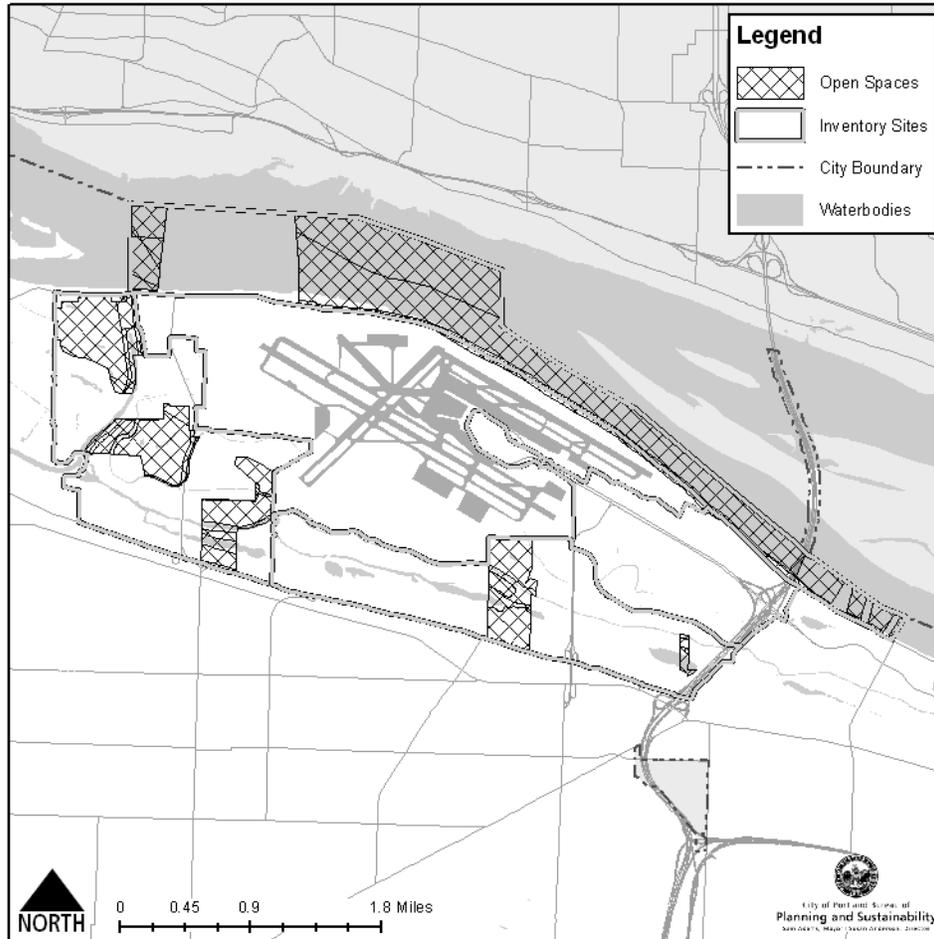
The Columbia River is an important recreational amenity in the metropolitan area. The river is used by paddlers, boaters and fishermen. The banks of the river and trails located along the banks, provide walking, biking and viewing areas. These amenities contribute to tourism in Portland.

The Columbia River is also the main shipping channel for goods transported by water. The industry sector "transport by water" contributes to the local, regional, and national economies in numerous ways. It provides employment and income to individuals, tax revenue to local and state governments, and revenue to businesses which handle freight. In 2007, an estimated \$540 million in direct economic output by this industry sector generated an additional nearly \$248 million in indirect output and nearly \$117 million in induced output for a total estimated economic output of nearly \$905 million from transport by water (ENTRIX Inc., History and Economic Role of Portland Harbor and Marine Related Development, DRAFT Oct 2009).

There four golf courses located in the study, which provide jobs and promote tourism in the city. Complimentary businesses, such as restaurants and hotels, often locate near the golf courses. There are no specific studies done on the impact of golf on Oregon's or Portland's economy. However, in February 2010 a report was prepared by GOLF 20/20 that studied the economic impact of golf on Washington State's economy. In Washington, the golf industry contributes approximately \$1.2 billion annually to the state's economy. Roughly \$680 million is attributed to core industries such as construction, operations, retail and manufacturing; and \$516 million is attributed to enabled industries such as real-estate, media and hospitality. This data is not directly transferable to Oregon or

Portland, but provides an order of magnitude and context for understanding the impact of golf on the economy.

Map 11: Open Space



Neighborhoods

Relatively little area is zoned for residential uses in the Middle Columbia Corridor/Airport study area, less than 4%. There are two existing small residential areas and one larger neighborhood in the study area (Map 12).

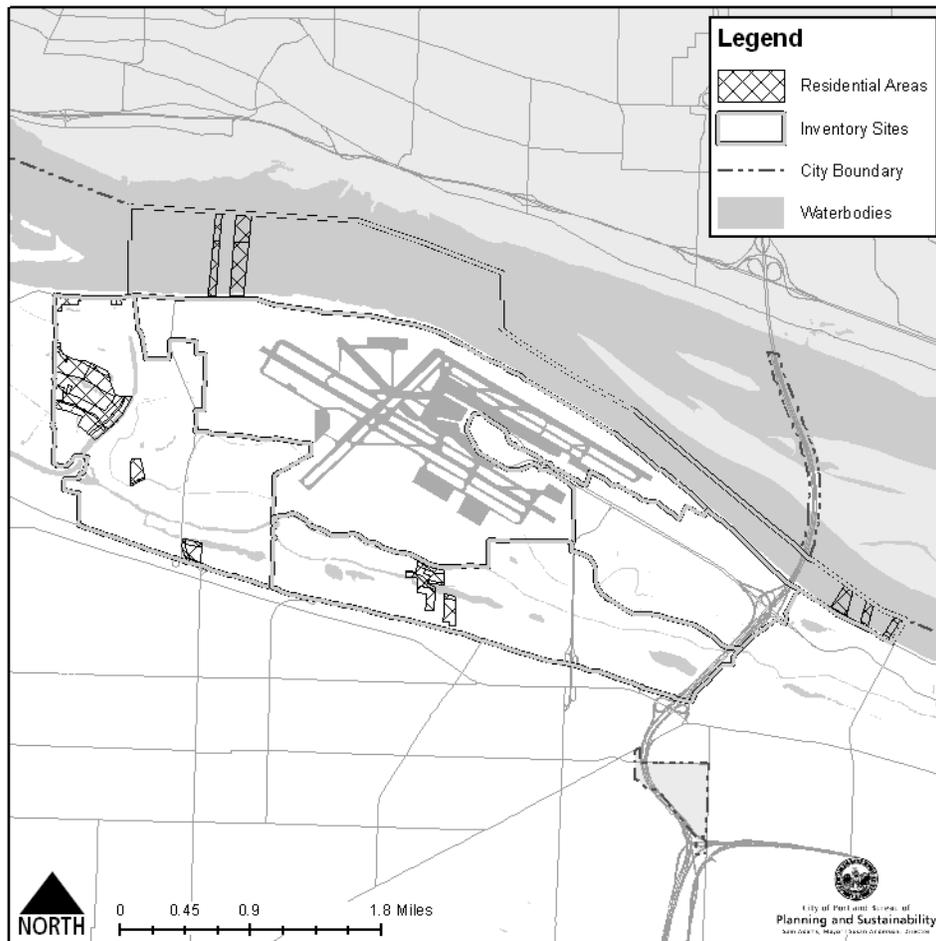
Portions of the Blue Heron Meadows neighborhood, west of 13th Avenue, are within the study area. The neighborhood provides single-dwelling housing options in close proximity to open spaces, natural areas and recreational opportunities. Many of the parcels have views of wetlands and other waterways. Roughly 15 of the neighborhoods are zoned residential farm/forest and have been farmed recently or are currently farmed. There are no commercial uses in the neighborhood within the study area, however the neighborhood is located in close proximity to commercial, industrial and employment opportunities.

A small residential area located along NE 63rd spans Whitaker Slough in the Cully Neighborhood. The area includes approximately 50 parcels and provides single-dwelling housing options. The lots are generally large and most are zoned residential farm/forest. Some parcels front the Columbia Slough or Whitaker Slough. There are no commercial uses in the residential area, however it is located in close proximity to commercial, industrial and employment opportunities.

There are two other areas existing residential areas: one along NE 33rd and Columbia Boulevard; and one along Elrod Road next to the Riverside Golf Course. Both contain primarily single-dwelling residences located on relatively large lots and are in close proximity to commercial, industrial and employment opportunities.

In addition to the areas zoned for residential uses, there are a few houses located along the Columbia Slough and Whitaker Slough and some floating homes on the Columbia River. These areas are generally zoned for industrial and employment land uses.

Map 12: Residential Areas



Ecosystem Goods and Services provided by Natural Resources in the Middle Columbia Corridor/Airport Study Area

Natural resources provide ecosystem goods and services, which in turn provide economic and social value. Ecosystem services include water conveyance, purification, and flood control, air cooling and purification, carbon sequestration, soil fertilization and pollination. Ecosystem goods include commodities like food, fuel, fisheries, timber, minerals, etc. Ecosystem goods also include supporting recreation and tourism. Ecosystem services have not been evaluated specifically for the Middle Columbia Corridor/Airport study area, however, the following information sources provide information relevant to this analysis::

- ECONorthwest, *Economic Arguments for Protecting the Natural Resources of the East Buttes Area in Southeast Portland*, 2009.
- Bergstrom, Loomis and Brown, *Defining, Valuing and Providing Ecosystem Goods and Services*, Natural Resources Journal, 2007.
- Banzhaf and Boyd, *What Are Ecosystem Services? The Need for Standardized Environmental Accounting Units*, 2006.
- Anielski and Wilson, *Counting Canada's Natural Capital: Assessing the Real Value of Canada's Boreal Ecosystems*, Pembina Institute, 2005.
- Olewiler, N., *The Value of Natural Capital in Settled Areas of Canada*, Published by Ducks Unlimited Canada and the Nature Conservancy of Canada, 2004.

Below is a general description of the ecosystem services provided by natural resources identified in the *Middle Columbia Corridor/Airport Natural Resources Inventory* (2010).

Rivers, streams, drainageways, and wetlands are important components of the drainage and overall hydrologic system in the study area, providing capacity for surface flow, groundwater discharge and flood storage. Vegetated areas also intercept and infiltrate rainwater and reduce stormwater runoff, which protects public and private investments and reduces future private and public expenditure in stormwater management infrastructure (ECONorthwest, 2009). Slowing the rate of stormwater runoff reduces peak flows and volumes to the Columbia Slough. The Columbia Slough experiences bank slumping and erosion, which is exacerbated by increased stormwater runoff from impervious surfaces. The future costs to repair bank failure can be reduced by maintaining vegetated areas.

Water bodies and associated riparian areas are also critical for survival of aquatic and terrestrial wildlife species. Riparian vegetation shades and cools the water contributing towards maintenance of dissolved oxygen levels and as required to meet Clean Water Act rules for temperature loading. Riparian areas are used by wildlife for foraging, nesting, breeding/rearing young, migrate and dispersal. Maintaining and enhancing habitat will help prevent further decline and support recovery of federal or state listed fish and wildlife species at risk, and will help the City meet federal and state regulations. Maintaining large structure riparian vegetation can reduce costs associated with regulatory compliance and maintenance costs associated with bank slumping and erosion.

Wildlife habitat, including upland grasslands identified in the study area, are utilized by species at risk for foraging, migration, dispersal, nesting and breeding. Maintaining habitat reduces the risk of further species listings and associated costs. Maintaining one habitat area alone may not prevent a listing; however, considered cumulatively, each habitat area plays a role in preventing future listings, and in recovery of listed species.

The existence of trees, greenspaces and other natural resources have been positively correlated with residential property values in Portland (ECONorthwest, 2009). Natural resources contribute to the quality of neighborhoods, to 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). Other indirect "quality of life" values associated with natural resources 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. This can reduce energy costs to cool buildings located adjacent to vegetated areas, particularly where large trees shade a portion of the building (ECONorthwest, 2009; Anielski and Wilson, 2005). Reducing heat island can also contribute to more healthful air quality conditions. Reducing local air and water temperatures, maintaining flood area, sequestering carbon and other greenhouse gases, and supporting wildlife and plant diversity all help manage the local effects of global climate change.

Table 6 presents key ecosystem goods and services provided by significant riparian corridors and wildlife habitat resource features and functions identified in the *Middle Columbia Corridor/Airport Natural Resources Inventory* (2010).

Table 7: Ecosystem Goods and Services

Natural Resource Features Functions

Rivers, streams, drainageways, wetlands, ground water and flood area

- Water conveyance and supply
- Water purification
- Bank stabilization and erosion control
- Flood control and mitigation
- Nutrient cycling and food web
- Microclimate and shade
- Habitat and wildlife movement

Riparian forest, woodland, shrubland and herbaceous vegetation

Upland tree canopy and vegetated habitats

- Water storage and purification
- Microclimate
- Habitat and wildlife movement

Ecosystem Goods and Services

- Soils stabilization; reduced bank erosion and bank stabilization costs
- Flood storage; reduced flood management costs
- Stormwater conveyance, filtering, and disposal; reduced infrastructure costs
- Surface and groundwater water quality; reduced risk to public health
- Air temperature moderation; reduced energy demand for cooling; reduced costs from public health impacts of urban heat island effect
- Carbon sequestration
- Water temperature moderation which supports commercial and recreational fisheries
- Supports and aquatic and terrestrial communities; reduced costs associated with Endangered Species Act compliance for listed species; prevents costs associated with future species listings
- Irrigation; revenue from local agriculture
- Recreation; revenue from tourism
- Stormwater conveyance and filtering; reduced infrastructure costs
- Stabilizes soils and slopes; minimized landslide hazards; minimized slope stabilization costs
- Air temperature moderation; reduced energy demand for cooling; reduced costs from public health impacts of urban heat island effect
- Carbon storage and sequestering
- Reduced landslide hazards
- Supports biological communities; reduced costs associated with Endangered Species Act compliance for listed species; prevents costs associated with future species listings
- Recreation; revenue from tourism

Some benefits from natural resources occur beyond the immediate resource area. For example, the capacity of a wetland to filter surface water and recharge groundwater may benefit an entire watershed. When benefits occur off-site, the property 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 sequestration, rainwater interception and evapotranspiration functions. Another complicating factor when determining the economic value of natural resources is that many natural resources have “irreversibility” properties. If the resource is eliminated there may be little or no chance of regeneration in any meaningful timeframe, if ever. Therefore the cost of losing natural resources also includes the opportunity costs, or the cost of future choices foregone.

Historic natural resources in the Middle Columbia Corridor/Airport study area have been eliminated over time as a result of extensive development over the past 200 years. Many of the remaining natural resources have been degraded by disturbance, invasive species and contamination. Within the Middle Columbia Corridor/Airport study area, flooding, flow and conveyance of water is actively managed by the Multnomah County Drainage District. Roughly 21 miles of levee minimize the risk of flooding. Multiple pumps move water from secondary drainageways to the Columbia Slough and from the Middle to the Lower Columbia Slough. This management alters the ecosystem functions provided by the flood area and the streams and drainageways. For example, to maintain flow conveyance within the secondary drainageways, large structure riparian vegetation (trees and shrubs) is often removed to allow maintenance equipment to reach the channel.

The extent of development in the study area affects the ecosystem services provided by the remaining natural resources. That said, these remaining natural resources continue to provide important ecosystem benefits, made that much more valuable due to limited resource supply.

Economic Consequences by Natural Resource Rank and Land Use Type

To evaluate the potential economic consequences of different natural resource protection program options, three scenarios are assessed: allowing, limiting and prohibiting conflicting uses that would adversely affect significant natural resources in the Middle Columbia Corridor/Airport study area. Each of these program choices would result in different mixes of positive and negative economic consequences as related 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 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 outright 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 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

The *natural resource* consequences of allowing, limiting or prohibiting conflicting uses is similar for all conflicting uses. The difference between the uses is the intensity or extent of the consequence. Table 8.a outlines the general natural resource consequences of allowing, limiting or prohibiting conflicting uses. Table 8.b provides an explanation of different intensity or extent of the natural resource consequences by conflicting use.

Table 8: Economic Consequences for Conflicting Uses

	Allow		Limit		Prohibit	
Industrial Employment	<p>Would maintain the local and regional economic benefits of industrial development (e.g. commerce, land improvements, employment). At the Portland International Airport, annual air freight imports and exports are valued at more than \$175 billion (2007).</p> <p>Would maintain the supply of land for future industrial development and generation of employment opportunities. Would maintain large undeveloped areas maintained by the Port of Portland as reserves for airport-related development.</p> <p>Development would incur costs to replace certain ecosystem services provided by natural resources (e.g., stormwater treatment, heating and cooling, noise buffering), but would not incur additional costs to avoid, minimize or mitigate for natural resources impacts.</p>	+	<p>Would maintain most of the local and regional economic benefit of industrial development (e.g. commerce, land improvement, employment), including the air freight import/export business.</p> <p>Development could incur design costs to avoid and minimize adverse impacts to natural resource functions, including ecosystem services.</p> <p>Development would incur costs related to mitigating for impacts on natural resource functions and values, including ecosystem services (e.g. stormwater management; heating/cooling, noise buffering).</p> <p>Airport-related development could incur costs related to avoiding, minimizing and mitigation for impacts to natural resource functions and values. This may reduce/delay air freight growth opportunities.</p>	+/-	<p>Would reduce the economic benefit derived from development of industrial areas (e.g. commerce, land improvement, employment), including the air freight import/export business.</p> <p>Development may incur additional design costs to avoid impacts on natural resources or ecosystem services.</p> <p>Development would not incur additional costs to minimize or mitigate for impacts on natural resources or ecosystem services.</p> <p>Airport-related development would incur costs related to avoiding impacts to natural resource functions and values. This would likely reduce opportunities for air freight growth.</p>	-
Commercial*	<p>Would maintain local economic benefit, including commerce, land improvements, employment, of commercial development in areas like Cascade Station.</p> <p>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.</p>	+	<p>Would maintain most of the local economic benefits associated with commercial development (e.g. commerce, land improvements, employment) in areas like Cascade Station.</p> <p>Development could incur design costs to avoid and minimize adverse impacts to natural resource functions, including ecosystem services.</p> <p>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).</p>	+/-	<p>Would reduce the economic benefit derived from commercial uses (e.g. land development, employment) in areas like Cascade Station.</p> <p>Development may incur additional design costs to avoid impacts on natural resources or ecosystem services.</p> <p>Development would not incur additional costs to minimize or mitigate for impacts on natural resources or ecosystem services.</p>	-
Residential	<p>Would maintain economic benefits associated with residential development.</p> <p>Would degrade environmental amenities that benefit residential land values (e.g. noise buffering, screening).</p> <p>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.</p>	+/-	<p>Would maintain most of the economic benefits associated with residential development, given existing flexible development standards designed to help prevent impacts on natural resources..</p> <p>Would increase value of residential development by conserving environmental amenities and associated ecosystem services.</p> <p>Development may incur design costs to avoid and minimize adverse impacts to natural resource functions, including ecosystem services, but given the predominance of large lots and relative build out of neighborhoods like Blue Heron Meadows, it may be feasible to avoid resources without additional costs.</p> <p>Development would incur costs related to mitigating for impacts on resource functions and values, including ecosystem services (e.g. stormwater management; heating/cooling).</p>	+/-	<p>Could reduce economic benefit derived from residential uses where allowed housing density cannot be clustered or transferred to land outside the natural resource area.</p> <p>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.</p> <p>Would maintain the value of existing residential development by conserving environmental amenities.</p> <p>Development may incur additional design costs to avoid impacts on natural resources. Development would not incur additional costs to minimize or mitigate for impacts on natural resources or ecosystem services.</p>	+/-
Open Space	<p>Would maintain the economic benefits of the shipping channel.</p> <p>Would maintain economic benefits derived from active open space uses (e.g. local tourism, employment at golf courses).</p> <p>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.</p> <p>Development of active open space uses could affect the quality and usage of adjacent and nearby open spaces used for passive recreation, and the desirability of nearby residential areas.</p>	+/-	<p>Would maintain the economic benefits of the shipping channel.</p> <p>Would maintain most of the economic benefit derived from active open space (e.g. local commerce, employment at golf courses).</p> <p>Development could incur design costs to avoid and minimize adverse impacts to natural resource functions, including ecosystem services.</p> <p>Development could incur costs related to mitigating for impacts on resource functions and values, including ecosystem services (e.g. stormwater management; heating/cooling).</p> <p>Development could take place but may be designed to avoid or mitigate effects the quality of adjacent and nearby open spaces used for passive recreation and the desirability of nearby residential areas.</p>	+/-	<p>Could reduce some of the economic benefits of the shipping channel.</p> <p>Could reduce the economic benefit derived from some potential active open space uses (e.g. community center).</p> <p>Development may incur additional design costs to avoid impacts on natural resources or ecosystem services.</p> <p>Development would not incur additional costs to minimize or mitigate for impacts on natural resources or ecosystem services.</p> <p>Would help maintain the quality of adjacent open spaces used for passive recreation and the desirability of nearby residential areas.</p>	+/-

*Currently there is one site zoned for commercial uses and it is developed. There are no other commercially zoned properties in the study area. The consequences of to commercial development within commercial base zones is there for very minimal within the study area. However, there are commercial uses on properties zoned as industrial or employment and those uses were considered when documenting potential consequences.

Table 9.a: Economic Consequences for Natural Resources – All Conflicting Uses

Resource Ranks	Allow	Limit	Prohibit
High, Medium & SHA	<p>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.</p> <p>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, ESA), resulting in potential liability and associated costs.</p> <p>Would increase chance for future ESA listings of upland grassland associated species in the study area, resulting in additional regulatory costs and liabilities.</p> <p>Would reduce opportunities for resource enhancement (lost opportunities may have future economic costs).</p>	<p>Would maintain most of the economic benefit derived from multiple ecosystem services. Near the streams, drainageways and wetlands, the ecosystem services related to water quality and public health could be reduced somewhat.</p> <p>Could complicate but would not likely preclude the City’s ability to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL, ESA).</p> <p>Would, by requiring mitigation, help reduce risk of future ESA listings of grassland associated species in the study area, and associated regulatory costs.</p> <p>Would preserve some opportunities for natural resource enhancement (lost opportunities may have future economic costs).</p>	<p>Would maintain all economic benefits derived from multiple ecosystem services provided by existing natural resources.</p> <p>Would aide in the City’s compliance with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL, ESA), preventing liability and associated costs.</p> <p>Would, by preventing encroachment, help reduce risk of future ESA listings of grassland associated species in the study area, and associated regulatory costs.</p> <p>Would preserve opportunities for natural resource enhancement (lost opportunities may have future economic costs).</p>
Low	<p>Existing ecosystem services provided by low ranking natural resources are limited, therefore development would have a negligible impact on economic benefit.</p> <p>Would reduce opportunities for resource enhancement (lost opportunities may have future economic costs).</p>	<p>Existing ecosystem services provided by low ranking natural resources are limited, therefore development would have a negligible impact on economic benefit.</p> <p>Would preserve some opportunities for natural resource enhancement (lost opportunities may have future economic costs).</p>	<p>Existing ecosystem services provided by low ranking natural resources are limited, therefore development would have a negligible impact on economic benefit.</p> <p>Would preserve opportunities for natural resource enhancement (lost opportunities may have future economic costs).</p>

Table 9.b: Economic Consequences for Natural Resources – By Conflicting Use

<p>Industrial/ Employment</p>	<p>5,425 acres (73%)</p>	<p style="text-align: center;">High</p> <p>In general, industrial and employment land uses are associated with greater negative impacts on natural resources than other land uses due to the intensity of development (e.g., area requirements for structures, access, and freight loading/maneuvering, and light, noise, vibration disturbance). Given the predominance of industrial and employment land in the study area, additional such development can be expected to result in cumulative, negative effects to overall ecosystem health in the Columbia Slough Watershed.</p>
<p>Commercial</p>	<p>15 acres (<1%)</p>	<p style="text-align: center;">Moderate - High</p> <p>Impacts of commercial uses can range from extensive to moderate.. In the study area, only one site is zoned for commercial use, however, commercial uses are generally allowed in industrial and employment areas. In the study area commercial development has typically consisted of large-format retail, hotels and associated parking. These types of commercial development are similar to industrial development in terms of building/development foot print – both types of development are land intensive. Other types of commercial development may be able to design sites to avoid impacting natural resources.</p>
<p>Residential</p>	<p>266 acres (4%)</p>	<p style="text-align: center;">Moderate</p> <p>Impacts associated with residential uses vary; however, they are generally less than impacts associated with industrial, employment and commercial development. This is due to lesser land coverage and opportunities for residential development to cluster or otherwise design sites to avoid impacts on natural resources.</p>
<p>Open Space</p>	<p>1,685 acres (23%)</p>	<p style="text-align: center;">Low</p> <p>Impacts associated with Open Space uses vary, depending on the whether uses are active (e.g. golf course) or passive (e.g. canoeing). However, development associate with open space uses is generally less intensive than other uses because there is often less impervious area, and there are often opportunities to avoid or minimize impacts to natural resources.</p>

Recommendations Based on Economic Analysis

Based solely on the economic consequences analysis of allowing, limiting or prohibiting development in natural resources areas, the following general recommendations are intended to optimize the economic values described in the narrative and tables above. The economic, social, environmental and energy recommendations are optimized in combination in section 5.d.5 *General Middle Columbia Corridor/Airport ESEE Results* to produce an overall general recommendation for the Middle Columbia Corridor/Airport study area. **Note – Sections that are grayed out were not adopted by City of Portland City Council.**

Table 10: Economic Recommendations						
Base Zone	Uses and Resources	Summary of Consequences			Recommendation	Rationale
		Allow	Limit	Prohibit		
Industrial Employment (Port of Portland property)	Conflicting Use	+	+/-	-	Allow, except limit within areas containing high and medium ranking riparian resources	Water bodies and associated riparian areas provide the full array of ecosystem goods and services described. Development with these areas would degrade the quality of those goods and services, many of which cannot be replaced or take a long time to replace. Given limited amount of area adjacent to water bodies and areas containing significant trees canopy relative to the amount of industrial and employment land in the study area it should generally be feasible to avoid most of these high and medium ranking resource areas. Limiting conflicting uses within high and medium ranking riparian corridors is recommended to reduce costs to replace critical hydrologic and water quality related ecosystem services, and to advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act and Endangered Species Act).
	High Ranking Resources/SHA	-	+/-	+		
	Conflicting Use	+	+/-	-	Allow	Limiting conflicting uses in these areas would require development to avoid, minimize, or mitigate for adverse impacts on the resources. This could add to the cost of development. However, maintaining the ecosystem goods and services on site would reduce infrastructure requirements. The economic goods and services provided by regionally significant industrial and employment uses, particularly uses dependant on being located within or near the Portland International Airport, are optimized by allowing conflicting uses in upland areas containing natural resources and areas of low ranking natural resources. Development would incur costs to replace impacted ecosystem services. Uses and value of nearby recreational and residential areas may be adversely affected.
	Medium Ranking Resources	-	+/-	+		
Conflicting Use	+	+/-	-	Allow		
Low Ranking Resources	o	+	+			
Industrial Employment (Non-Port of Portland property)	Conflicting Use	+	+/-	-	Allow, except limit within areas containing high and medium ranking riparian resources	Water bodies and associated riparian areas provide the full array of ecosystem goods and services described. Development with these areas would degrade the quality of those goods and services, many of which cannot be replaced or take a long time to replace. Given limited amount of area adjacent to water bodies and areas containing significant trees canopy relative to the amount of industrial and employment land in the study area it should generally be feasible to avoid most of these high and medium ranking resource areas. Limiting conflicting uses within high and medium ranking riparian corridors is recommended to reduce costs to replace critical hydrologic and water quality related ecosystem services, and to advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act and Endangered Species Act).
	High Ranking Resources/SHA	-	+/-	+		
	Conflicting Use	+	+/-	-	Allow	Limiting conflicting uses in these areas would require development to avoid, minimize, or mitigate for adverse impacts on the resources. This could add to the cost of development. However, maintaining the ecosystem goods and services on site would reduce infrastructure requirements. The economic goods and services provided by regionally significant industrial and employment uses, particularly uses dependant on being located within or near the Portland International Airport, are optimized by allowing conflicting uses in upland areas containing natural resources and areas of low ranking natural resources. Development would incur costs to replace impacted ecosystem services. Uses and value of nearby recreational and residential areas may be adversely affected.
	Medium Ranking Resources	-	+/-	+		
Conflicting Use	+	+/-	-	Allow		
Low Ranking Resources	o	+	+			
Commercial	Conflicting Use	+	+/-	-	Allow, except limit within areas containing high and medium ranking riparian resources	The goods and services provided by commercial uses could be fully realized by allowing conflicting uses in areas containing upland natural resources and in areas of low ranking natural resources. Existing ecosystem services are very limited in low-ranked resource areas; therefore the economic impact of commercial development would be negligible. Some loss of future natural resources enhancement would occur.
	High Ranking Resources /SHA	-	+/-	+		
	Conflicting Use	+	+/-	-	Allow	Water bodies and associated riparian areas provide the full array of ecosystem goods and services described. Development with these areas would degrade the quality of those goods and services, many of which cannot be replaced or take a long time to replace. Limiting conflicting uses within high and medium ranking riparian corridors is recommended to reduce costs to replace critical hydrologic and water quality related ecosystem services, and to advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act and Endangered Species Act).
	Medium Ranking Resources	-	+/-	+		
Conflicting Use	+	+/-	-	Allow		
Low Ranking Resources	o	+	+			

Table 10: Economic Recommendations						
Base Zone	Uses and Resources	Summary of Consequences			Recommendation	Rationale
		Allow	Limit	Prohibit		
Residential	Conflicting Use High Ranking Resources /SHA	+/- -	+/- +/-	+/- +	<i>Limit, except Strictly Limit</i> within 50ft of the top-of-bank of open streams, drainageways and wetlands	Limiting conflicting uses in these areas would require development to avoid or minimize adverse impacts on the resources. This could add to the cost of development; however, given the relative size of the lots clustering development and modifying site design may allow for development to avoid impacting natural resources. Maintaining some of the ecosystem goods and services on site would reduce infrastructure, heating and cooling, and mitigation costs and could minimize similar costs to adjacent properties. Mitigation for impacts would be required. Strictly limiting conflicting within 50ft of streams, drainageways and wetland is recommended to reduce costs to replace critical hydrologic and water quality related ecosystem services, and to advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act and Endangered Species Act).
	Conflicting Use Medium Ranking Resources	+/- -	+/- +	+/- +		
	Conflicting Use Low Ranking Resources	+/- 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. Some loss of future natural resources enhancement would occur.
Open Space	Conflicting Use High Ranking Resources /SHA	+/- -	+/- +/-	+/- +	<i>Limit, except Strictly Limit</i> within 50ft of the top-of-bank of open river, streams, drainageways and wetlands	The goods and services provided by open space uses and significant natural resources can be optimized by limiting open space uses in high ranked resource areas. The ecosystem goods and services provided may provide economic benefits (e.g. property value) to adjacent properties. Limiting conflicting uses in these areas would require development to avoid or minimize adverse impacts on the resources. . This could add to the cost of development; however, open space development generally can be designed to avoid impacts to natural resources. Public trails could be allowed if designed to prevent adversely affecting natural resource values and functions, and if the public benefit outweighs impacts. Mitigation would be required. Strictly limiting conflicting within 50ft of streams, drainageways and wetland is recommended to reduce costs to replace critical hydrologic and water quality related ecosystem services, and to advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act and Endangered Species Act).
	Conflicting Use Medium Ranking Resources	+/- -	+/- +	+/- +		
	Conflicting Use Low Ranking Resources	+/- 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. Some loss of future natural resources enhancement would occur.

5.c.2 Social Analysis

This section examines the social consequences of allowing, limiting or prohibiting conflicting uses for the Middle Columbia Corridor/Airport study area. 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 and stream/drainageway bank stability functions. Trees and vegetative cover provide slope stability, prevent bank erosion and slumping, while conserving fish and wildlife habitat. Vegetation captures rainwater and helps maintain permeable soils that absorb, hold and filter stormwater. There are costs to property owners associated with localized erosion and bank slumping and water and sediment quality.

Water Quality and Quantity

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 established Regional Water Quality Resource Areas maps and regulations through adoption of Title 3 of the Urban Growth Management Functional Plan (1998). 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 and the Port of Portland are Designated Management Agencies. The Oregon Department of Environmental Quality (DEQ) established Total Maximum Daily Loads (TMDL) for the Columbia Slough in 1998 and established a temperature TMDL for the Willamette Basin as a whole, including the Columbia Slough, in 2006. The primary tool to reduce temperature in streams and drainageways is shading provided by riparian vegetation. Metro's more recent adoption of Title 13 Nature in Neighborhoods (2005) was intended in part to supplement Title 3 in helping to improve water quality and meet Clean Water Act requirements.

Areas of significant riparian tree canopy contribute to meeting the TMDL for temperature, while also providing stormwater capture and uptake. Currently a narrow vegetated corridor one to two trees deep runs along most of the Columbia Slough and Whitaker Slough in the study area. Along the slough at Colwood Golf Course, Whitaker Ponds, and Johnson Lake there are large stands of mature trees. Some of the wetlands in the study area, including Subaru Wetland and CRCI Wetland, are also densely vegetated with trees and thick shrubland understory. There are specific areas that lack significant tree canopy, including:

- Columbia Slough north bank between NE Alderwood Rd and NE 47th Ave
- Buffalo Slough east of NE 33rd Ave
- Elrod Slough south of Riverside Golf Course
- Peninsula Canal east bank
- Portland International Center ditches east of NE Alderwood Rd
- Numerous secondary drainageways throughout the study area

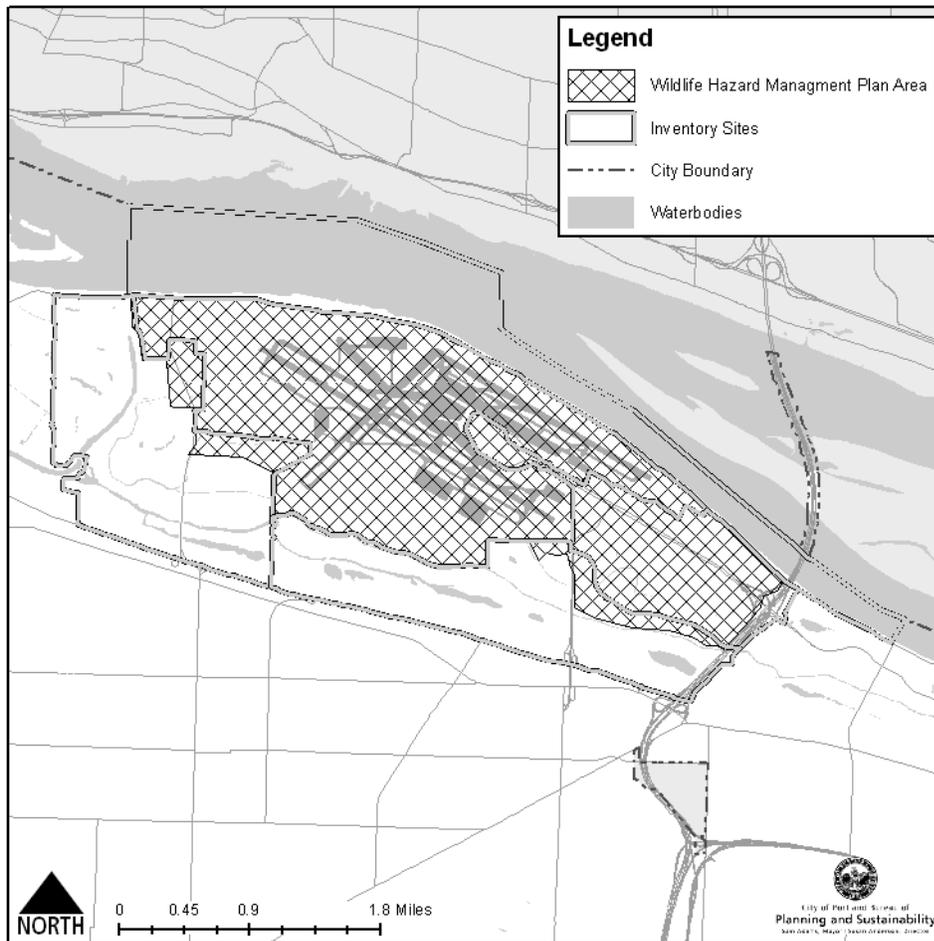
Another important contributing factor to in-stream water temperatures is groundwater. Whitaker and Buffalo Slough both receive cool groundwater from the south. The groundwater helps to keep summer in-stream water temperatures lower than the main arm of the Columbia Slough. Vegetated areas, both natural and landscaped, located throughout the watershed infiltrate rainwater, which reduces runoff and recharges groundwater.

Wildlife Hazard

The Port of Portland completed a Wildlife Hazard Management Plan (2009) to address public safety risks associated with wildlife/aircraft collisions at the Portland International Airport. The intent of the Wildlife Hazard Management Plan is to manage risk to an acceptable level using non-lethal means wherever possible. While terrestrial wildlife (i.e. coyotes) can pose a risk to aircraft, exclusion fencing around the airport airfield has reduced the risk to a manageable level. Avian wildlife continues to pose a high risk to aircraft safety. The Port uses multiple tools to reduce risk at the airport including short-term (intensive hazing) and long-term (habitat modifications) approaches. Many of the natural resource areas around the airport, and the airfield itself, attract wildlife of concern.

Roughly 1,000 acres of low-structure or herbaceous vegetation directly surrounds the Portland International Airport, both in the airfield and outside the perimeter fence (Map 7). Although these areas do not represent native grasslands or prairie, the combination of size, vegetation type, sandy fill and management activities of these areas cause them to mimic some characteristics of a native grassland or prairie. As a result they provide habitat for, and are used by, grassland-associated species, some of which do pose a risk to aircraft safety.

Map 13: Wildlife Hazard Management Plan Area

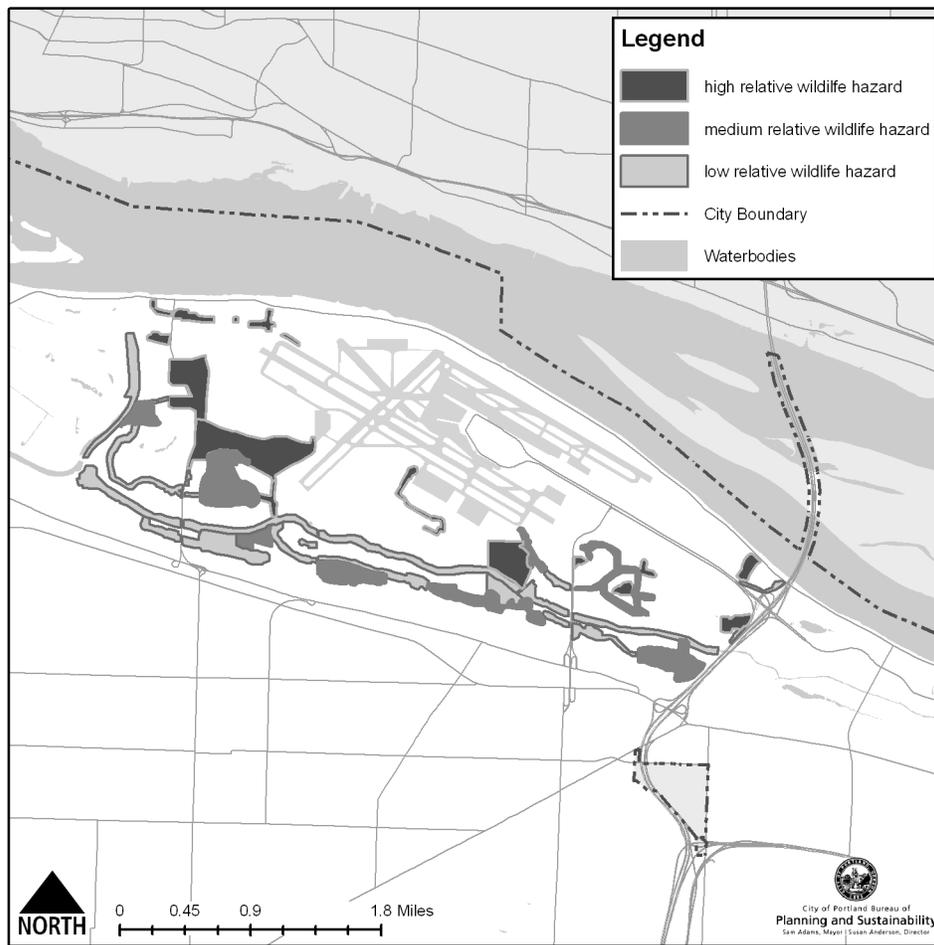


The highest risk occurs within the airfield, which is the land within the perimeter fence and the Runway Protection Zones. Rodent populations are robust in the grassy areas. The predominant species is gray-tailed vole; other species include vagrant shrew, deer mouse, and Townsend's vole. Because these small mammals provide a prey base for coyotes and many of high risk avian species, they present an indirect risk to aircraft safety. High risk avian species include six species of gulls, Canada and cackling geese, red-tailed hawk, osprey, barn owl, great-horned owl, mallard, European starling and American crow. Port management activities on the airfield include bird hazing using vehicles, horns, sirens, lasers, paintballs, and pyrotechnics; physically removing nests; performing egg intervention; and habitat modification including reducing surface area ponding and performing vegetation management. With the adoption of the Airport Futures Plan, the City will apply Portland International Airport Landscaping Standards to reduce wildlife hazard risk. In addition, the Port applies large scale applications of rodenticide and insecticide are implemented annually on the airfield to reduce the prey base that attracts hazardous wildlife.

Grassy areas outside the airfield (security perimeter fence and Runway Protection Zones) also attract wildlife that pose a risk to aircraft safety. The grasslands provide habitat for generalist species such as moles, voles, and other small mammals. Predators such as coyotes and raptors use the lands extensively as hunting grounds. Other bird species use the upland grasslands and do not pose a risk to aircraft safety including a population of Western meadowlarks, a state-listed species of concern, which occurs year round and has bred successfully in the study area. There are four areas of relatively large upland grassland habitat outside the airfield: Portland International Center (PIC), Southwest Quad (SW Quad), Deicing Field/Fuel Farm Field and 33rd Avenue. Each of these areas are mowed and disced to prevent establishment of dense grasses and herbaceous cover (Map #). This maintenance regime is intended to deter flocks of Canada geese, a high risk species for bird strikes at the airport. The process of mowing and discing creates a disturbance regime that is similar to historic Columbia River annual flooding and as a result provides habitat for species that do not pose a risk to aircraft safety: western meadow lark, merlin, streaked horned lark, western meadow lark, savannah sparrow, American pipit, Lazuli bunting, barn swallow, cliff swallow, Western kingbird, red-winged blackbird and yellow-headed blackbird.

In addition to the grasslands on and off the airfield, the Port of Portland and City have identified specific natural resource areas that pose a high to medium risk because they attract wildlife species of concern (Map 14).

Map 14: Wildlife Hazards



Human Health and Welfare

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).

Within the Middle Columbia Corridor/Airport study area there are multiple locations where the public has access to natural areas. The Columbia Slough and Whitaker Slough provide opportunities for canoeing and kayaking and there are trails along sections of the slough. Some of the trails are located near businesses and provide an opportunity for employees to experience nature. The Columbia Slough Watershed Council headquarters is at Whitaker Ponds, located on NE 47th Avenue, and provides public access to Whitaker Slough and trails. The four golf courses also provide access to natural areas. Colwood and Broadmoor Golf Course are open to the public. Both span the Columbia Slough main arm and southern arms and have wetlands on the property. There are viewing opportunities from many of the roads in the study area; from Marine Drive people can view the Columbia River, Government Island, Hayden Island and Mt. Hood.

Historic, Heritage and Cultural Values

The Columbia River and Columbia Slough are important to the history, heritage and culture of the region.

Portlanders place a high value on 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 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.

There is a long history of human inhabitation in the study area. A short summary of the history and current cultural values, focusing on natural resources, is provided below. It is intended to illustrate the long history humans have had with the Columbia Slough watershed and some of the cultural values humans place on the natural resources.

Native American Historic and Cultural Values

The Portland-Vancouver metropolitan region was inhabited for thousands of years prior to the arrival of European settlers in the late 1700's. The study area rests on traditional village sites of the Multnomah, Kathlamet, Clackamas, Bands of Chinook, Tualatin, Kalapuya, Molalla and many other Tribes. Members of these tribes established both year-round and seasonal encampments along the Columbia River and Columbia Slough because of the abundant natural resources and sources of food (including fish, wildlife and native plants).

The Portland area saw the highest Native American population densities in the Columbia River Basin. It is estimated that at the time of the Lewis and Clark expedition in 1805, the permanent winter population of Native peoples in the Columbia Slough area was roughly 9,800 residents and the spring and summer camps resulted in up to 18,000 residents¹. Because of the plentiful resources, the area also became a special destination for tribes throughout the entire Pacific Northwest. The Portland area was a frequent gathering place, with thousands of people traveling to, and through the area to trade goods and visit relatives.

Chinookan-speaking peoples inhabited the Columbia River corridor from the Pacific coast inland to The Dalles area. The area now known as the Columbia South Shore was particularly desirable because of its location between the Columbia River and the Columbia Slough. Proximity to the Slough was important for canoe access, fishing, hunting, movement of trade goods and transport of building materials. Chinookans also traveled extensively and regularly met at The Dalles to trade with interior peoples. They used salmon and native plants for food, medicine, shelter and trade items. Wapato, (a root vegetable) was especially valuable in trade. The shorelines of lakes, ponds and wetlands in the study area likely had extensive Wapato beds.

¹ It should be noted that the Lewis and Clark expedition occurred after smallpox epidemics, generated by previous European settlers during the 1700s, and had already ravaged the population. It is estimated that the prior native population was significantly higher than what Lewis and Clark encountered.

The Neerchokioo village, mentioned in Clark's journal, was located in the study area just west of what is now called Government Island:

[The Neerchokioo village was located] "on the Main Lard Shore a short distance below the last Island we landed at a village of 25 [houses] This village contains about 200 men of the Skil-loot nation We recognized the man who over took us last night, he invited us to a lodge in which he had some part and gave us a roundish roots about the size of a small Irish potato which they roasted in the embers until they became soft, this root they call Wap-pa-to It has an agreeable taste and answer very well in place of bread. We purchased about 4 bushels of this root and divided it to our party."

In addition to salmon and wapato, sturgeon, eulachon, elk, deer, greens, berries and camas, were historically important foods and trade goods of the Lower Columbia River Chinookans.

In addition to the oral histories, physical evidence of village sites has been discovered in the study area. These cultural resources can be easily buried, disturbed, or destroyed by natural causes or through human activity. Low-lying areas have flooded frequently over time, sometimes destroying historic buildings and landscapes naturally. The exact location of remaining areas of significance (including ancestral burial ground and village sites) are not published to protect them from disturbance and/or looting.

Current Native American Perspectives

Native American tribes across the US were significantly affected by European settlement and a series of territorial and federal policy decisions designed to eradicate and later assimilate Native Americans into western culture. In Portland during the 1800's and 1900's, tribal members were forcibly relocated from their villages along the Columbia River to the nearby Warm Springs, Grande Ronde and Siletz reservations. In the 1950's, the national Federal Relocation Policy forced Native Americans across the US to relocate to urban areas, mainly to seven major US cities including Portland.

Today, the Portland metropolitan area, which includes Multnomah County and parts of three other counties, has the 9th largest urban Native American population in the United States with roughly 38,000 people, some of whom are members of local tribes but many are descendents of tribes relocated here during the 1950's (US Census, 2000). There are at least 380 different tribes represented in Portland. Each tribe has their own unique culture, some with expressed interest in the natural resources found in the study area, particularly the use of traditional plants, fish and wildlife.

The Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, the Confederated Tribes and Bands of the Yakama Indian Nation have federal treaty rights to fish and gather native plants in the Columbia and Willamette Rivers. Additionally, the Confederated Tribe of Grande Ronde and Confederated Tribes of Siletz Indians have cultural and historic rights to the Willamette River. In 2002, the Columbia River Inter-Tribal Fish Commission stated that "without salmon returning to our rivers and streams, we would cease to be Indian people." Under the treaty obligations, the United States government is required to ensure the availability of salmon for fishing for Native American tribes. By supporting the goal of conserving and restoring salmon runs, the City of Portland contributes to meeting the United States treaty obligations.

The most recent City effort recognizing the cultural significance of the Columbia South Shore area was the *Cultural Resources Protection Plan for the Columbia South Shore* (1996). Three confederate tribes, Grand Ronde, Warm Springs and Siletz, and the American Indian Association of Portland actively participated in studying cultural resources in the Columbia South Shore; the eastern half of the study area, east of NE 82nd Avenue, is within the Columbia South Shore.

The *Cultural Resources Protection Plan* discusses present-day cultural values related to natural resources in the study area:

1. System of Place – There is an important relationship between tribes, people and the land. The land holds memory and stories that form cultural identity. Many traditional activities take place seasonally and are connected to gathering specific food sources. One way to preserve

- the heritage of Native Americans is to provide for traditional food gathering opportunities along the Columbia Slough.
2. Seven Generations – This philosophy considers impact of current activities and land use decisions on future generations and the interconnectedness of people, land and wildlife. Preserving traditional lands along the Columbia Slough and Columbia River and restoring native plants and animals, makes those lands and resources available for future generations.

Recently, local non-profit community organization Native American Youth and Family Center (NAYA) made further progress to reestablish the Native American community's connection to the Columbia Slough by purchasing a vacated public school site. The school site, located within the Airport Futures study area between Columbia Boulevard and Whitaker Ponds, is especially significant because it is near the traditional Neerchokioo village mentioned in Clark's journal. By securing this location, NAYA provides not only community gathering space, but access to the Columbia Slough and offers direct opportunities for the Native community to build a deeper connection to the history and traditions of local tribes. By operating at this location NAYA is also able to meet the deep cultural need to be located on historically significant lands. NAYA's presence in the Columbia South Shore area furthers the goals identified in the *Cultural Resources Protection Plan for the Columbia South Shore*.

Post European Settlement – Brief History and Cultural Values

Beginning in the early 1800's, European settlement occurred at the confluence of the Willamette and Columbia rivers due to the abundant natural resources and opportunities for trade. In the 1820's, Anthony Whitaker, Thomas Cully, and Lewis Love established donation land claims and businesses in the Columbia Slough watershed. Lewis Love made a fortune cutting and shipping lumber to downtown Portland from the Lower Columbia Slough area. In 1902, the U.S. Congress passed the *Reclamation Act*, enabling citizens to raise funds to build levees and drain and fill wetlands for flood control and development. The 1903 Olmsted 40 -mile loop trail vision was a trail that encompassed Portland and provided its residents access to open spaces in areas such as the Columbia Slough.

The Columbia Slough watershed was initially developed for agriculture and timber harvests. In 1907, the Seattle Portland & Spokane Railroad excavation occurred next to Smith and Bybee Lakes and shortly afterward, the Swift Interests stockyard and meatpacking plant began to operate on the south side of the Columbia River's Oregon Slough. Other stockyard and meatpacking businesses followed.

Between 1917 and 1919, landowners in the floodplain formed the Multnomah County Drainage District #1, Peninsula Drainage District #1, and Peninsula Drainage District #2 for flood control purposes. In a 1918 letter to the U. S. Army Corps of Engineers, the Board of Supervisors of Multnomah County Drainage District No. 1 wrote:

(T)he sole object of the proposed district improvement is to make productive by creating conditions favorable to its full use for agricultural purposes...Such an improvement will be an aid to the development of the enclosed and adjacent lands for industrial and commercial purposes and can in no way interfere with such development.

Drainageways and ditches were built and natural channels were deepened in the Columbia Slough Watershed. Levees were built to keep the Columbia River and the Columbia Slough from flooding levee-protected areas. City engineers dug the City Canal (Peninsula Canal) in an effort to improve water quality, which was affected by the flat elevation and tidal effects that trapped sanitary and industrial wastes in the Lower Slough after levee construction. However, the canal provided little water quality improvement in the Lower Slough as a result of the same elevation and tidal effects.

In the 1930's a resort was built on Johnson Lake, featuring boating, dancing, and swimming.

In 1940, the Portland Airport opened in northeast Portland adjacent to the slough after the previous airport outgrew its location on Swan Island. The new airport was developed in part with Depression-era Works Progress Administration funds. Also during the 1940's, Japanese-Americans and Native Americans were moved from their homes to wartime relocation camps, many were temporarily housed at Portland's Livestock Exposition Center (Expo Center).

World War II's jobs drew people to Portland. The Kaiser Company, owner of the Oregon Shipbuilding Corporation, bought a 650-acre parcel of leveed land between the Columbia Slough and Columbia River and constructed the new town of Vanport, the largest public housing project in the U.S. at the time. Vanport was also located near the Expo Center.

The Vanport Flood occurred on Sunday, May 30, 1948. Heavy rains, snowmelt, and warm weather contributed to unusually high water levels in northwest rivers for several weeks. Floodwaters broke through the railroad embankment/levee on the west edge of Vanport. Within two hours, Vanport was destroyed, and approximately 16,900 residents were displaced. The next day, the Denver Avenue levee east of Vanport gave way. Levees all along the Columbia River broke, and the entire floodplain, from the Sandy River to the Willamette, was inundated. Vanport was never rebuilt. In the aftermath of the flood, the levees were reconstructed and, in some cases, reinforced and raised to withstand a 100-year flood event. Instead of reinforcing the Peninsula Canal levee, the ends of the canal were plugged.

Until the 1950's, sewage in the watershed was either treated in septic systems or cesspools or pumped directly to the Columbia Slough. There are accounts of mill workers refusing to handle logs stored in the Columbia Slough because of the sanitary and slaughterhouse waste in the waterway. In 1952, Portland built the Columbia Boulevard Wastewater Treatment Plant, the City's first sewer treatment plant, along the Columbia Slough.

The next major flood took place in 1964 and the Lower Slough, Rivergate and Smith and Bybee Wetlands area were inundated. As a result of the flood, the mid-dike levee located at NE 142nd was conceived and constructed in following years. The mid-dike levee sectioned off the Middle and Upper Columbia Slough and provided additional protection to the floodplain.

In the late 1980's the City of Portland began to use zoning regulations to protect natural resources in the Columbia Slough watershed; it was the first area of Portland to have environmental overlay zones put in place. The intent was to "protect, conserve, enhance, restore, and maintain significant natural and manmade features of public value, including river corridors, streams, lakes and islands, domestic water supply watersheds, flood water storage areas, natural shorelines and unique vegetation, wildlife and fish habitats, significant geological features...". The City also established the Columbia South Shore drinking water wells, which have a current capacity of approximately 100 million gallons per day.

In 1990's a number of activities took place in the Columbia Slough watershed that focused on natural resources:

- The Columbia Slough Watershed Council began to form, based on the model established by the Oregon Legislature. The Council includes residents; business owners; landowners; environmental advocates; recreation representatives; state, local and federal governments; and tribes. In 2003, the council developed the Columbia Slough Watershed Action Plan to establish a unified approach to protect, enhance and restore natural resources in the watershed.
- In response to a threatened lawsuit by Northwest Environmental Advocates, the City began a comprehensive study and cleanup of the Columbia Slough, called the Columbia Slough Water Quality and Sediment Project. Citizens and technical experts met monthly to direct sampling and proposed cleanup measures.
- Portland received \$10 million Environmental Protection Agency (EPA) Columbia Slough Revitalization Grant.
- Metro and the City acquired the Whitaker Ponds Natural Area. The site was cleaned up and the City of Portland's Columbia Slough watershed education program began, providing school-based and site-based education for thousands of children.
- The Port of Portland initiated a program to control and reduce deicing materials in stormwater runoff to the Columbia Slough.
- Portland's Mid-County Sewer Project was completed. This project provided sanitary sewer service to areas east of NE 42nd Avenue, which previously was served predominantly by individual septic and cesspool systems.

In 1996, another flood impacted the region and the watershed. Waters reached a high-water mark of 29.8 feet NGDV. The Lower Columbia Slough watershed flooded in areas without levees. The Upper and Middle Slough experienced more than 100 slope failures within the waterway as a result of extended pumping. Erosion affected the Columbia River levees in Multnomah County Drainage District #1 and Peninsula Drainage District # 2 area and repairs were required.

The City of Portland adopted the first Portland Watershed Management Plan in 2005. The plan addressed natural resources across the city and established goals for hydrology, water quality, habitat and biologic communities.

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 Middle Columbia Corridor/Airport study area. Public open spaces and natural areas such as the Columbia Slough waterway and Whitaker Ponds afford passive recreational opportunities including canoeing, wildlife viewing, and picnicking. More active recreation associated with the Columbia River, such as motorized boating and swimming, is available. Public golf courses in the study area also provide recreation opportunities and access to nature.

The 40-mile Loop, an idea that began in 1903, includes more than 140 miles of connected trails throughout Portland. Trails along the Columbia River and portions of the Columbia Slough are part of the 40-mile Loop and provide walking and biking opportunities.

Natural resources 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 Columbia Slough or resources within or near their facilities to encourage employees to exercise and to improve pride and morale. There are numerous businesses located along the Columbia Slough, Whitaker Slough and Buffalo Slough that do or could provide access and education to employees about the resources. 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 health care costs, improves quality of life, and may help adults live longer (Nieman, 1998). Activities such as walking in forested areas 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 Middle Columbia Corridor/Airport study area provide an opportunity for Portlanders to learn about environmental science, natural history, and cultural history of the Columbia River, Columbia Slough 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. Whitaker Ponds is utilized by schools year-round as a living laboratory. 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).

Employment Opportunities

In the Middle Columbia Corridor/Airport study area major employment opportunities are provided on land zoned for industrial and employment uses (there is very little commercially zoned land in the study area). As noted in the Economic section, roughly 200 businesses providing more than 10,300 jobs are located in the study area 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 construction including new construction, redevelopment and remodeling of warehouses, office buildings and other structures.

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 industrial and employment uses could reduce the amount, range and income level of employment opportunities in the Middle Columbia Corridor/Airport study area.

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.

The existence of trees, greenspaces and other natural resources have been positively correlated with residential property values in Portland (ECONorthwest, 2009). Natural resources contribute to the quality of neighborhoods, to 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 value of both uses (e.g. noise reduction). Portland is generally known nationally and internationally as a *green* city and a desirable place to live, which has a positive impact on aspects of the local and regional economy.

Overall, there is relative little area, 266 acres, zoned for residential housing within the Middle Columbia Corridor/Airport study area. This represents less than 4% of the Middle Columbia Corridor/Airport study area. Residential areas exist in the Blue Heron Meadows neighborhood, in two small residential areas located along the Columbia Slough, and in floating homes along the Columbia River. It is assumed that strictly limiting or limiting conflicting residential uses in the Middle Columbia Corridor/Airport study area 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 Middle Columbia Corridor/Airport study area.

Visual Amenities, Screening and Buffering

Vegetated landscapes, parks and playgrounds, golf courses, 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 environment 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. 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, airports, new and old structures, workplaces, museum, restaurants and stores, parks and golf courses, and other gathering spaces. Portland is often identified by pictures of the cityscape, Mt. Hood and the Columbia and Willamette rivers.

In the Middle Columbia Corridor/Airport study area, views of local and regional features including the Columbia River, Mt. St. Helens and Mt. Hood, Whitaker Ponds, industrial areas, and bridges contribute to the scenic character of this area and of city as a whole. Natural resources can soften or buffer the appearance, noise, and other impacts of urbanization. In the study area there are a few small residential neighborhoods. Blue Heron Meadows is the largest neighborhood in the study. It is buffered from nearby industrial uses by natural resources including Blue Heron Wetland, Peninsula Canal and large trees along the golf course.

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 Middle Columbia Corridor/Airport study area because of the location of the Portland International Airport in relation to the small residential areas adjacent to industrial uses along the Columbia Slough and Whitaker Slough. The waterways and riparian vegetation can create a buffer between these uses. Trees and vegetated areas can also add soothing sounds of wind and bird song.

Social Consequences by Natural Resource Rank and Land Use Type

To evaluate the potential economic consequences of different natural resource protection program options, three scenarios are assessed: allowing, limiting and prohibiting conflicting uses that would adversely affect significant natural resources in the Middle Columbia Corridor/Airport study area. Each of these program choices would result in different mixes of positive and negative economic consequences as related 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 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 outright 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 addresses 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

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 Middle Columbia Corridor/Airport study area.

The *natural resource* consequences of allowing, limiting or prohibiting conflicting uses is similar for all conflicting uses. The difference between the uses is the intensity or extent of the consequence. Table 11.a outlines the general natural resource consequences of allowing, limiting or prohibiting conflicting uses. Table 11.b provides an explanation of different intensity or extent of the natural resource consequences by conflicting use.

Table 11: Social Consequences for Conflicting Uses						
	Allow		Limit		Prohibit	
<p>Industrial</p> <p>Employment</p> <p>Commercial</p>	<p>Would maintain industrial and employment opportunities in close proximity to employment bases.</p> <p>Would contribute to and foster historical and cultural values related to industrial uses.</p> <p>Would not affect Port of Portland’s ability to manage wildlife and reduce public safety risk associated with wildlife/aircraft strikes.</p> <p>Would reduce most natural resource screening and buffering, which could result in conflicts with nearby residential neighborhoods and open space uses.</p> <p>Would reduce resource-related amenities that contribute to a pleasant and healthful working environment.</p>	+/-	<p>Would maintain most industrial and employment opportunities.</p> <p>Would maintain historical and cultural values related to industrial uses.</p> <p>Would maintain most community and employee health benefits associated with natural resources, particularly air and water quality by avoiding or mitigating for impacts.</p> <p>Would preserve Port of Portland’s ability to manage wildlife and reduce public safety risk associated with wildlife/aircraft strikes; would require mitigation for some habitat management activities, which could contribute to social benefits on- or off-site.</p> <p>Would preserve some benefits provided by natural buffers and screening between land uses which can help prevent conflicts with nearby residential neighborhoods and open spaces uses.</p> <p>Would preserve some resource-related amenities that contribute to a pleasant and healthful working environment.</p>	+/-	<p>Would preclude some industrial and employment opportunities.</p> <p>Could reduce historical and cultural value related to industrial uses.</p> <p>Would preserve community and employee health benefits associated with natural resources, particularly air and water quality, and reduce urban heat island effect.</p> <p>Would reduce Port of Portland’s ability to manage wildlife and reduce public safety risk associated with wildlife/aircraft strikes; would require mitigation for some habitat management activities.</p> <p>Would preserve benefits provided by natural buffers and screening between land uses and prevent conflicts with nearby residential areas and open spaces uses.</p> <p>Would preserve resource-related amenities that contribute to a pleasant and healthful working environment.</p>	+/-
Residential	<p>Would maintain limited housing options and opportunities within resource areas.</p> <p>Would reduce community health and safety benefits associated with natural resources, particularly air and water quality.</p> <p>Would make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors and habitat areas (e.g., Titles 3 and 13, Clean Water Act/ TMDL,ESA).</p> <p>Would reduce benefits of natural screening and buffering between land uses, potentially reducing neighborhood livability or housing opportunities on abutting sites.</p> <p>Would reduce visual amenities and neighborhood character, including local access to nature, provided by natural resources.</p>	-	<p>Would maintain most housing options and opportunities (particularly where clustering is possible.) Mitigation for unavoidable impacts on natural resources would maintain neighborhood amenities.</p> <p>Would maintain most community health benefits associated with natural resources, particularly air and water quality by avoiding or mitigating for impacts.</p> <p>Would complicate but should not preclude strategies to comply with regional, state and federal requirements pertaining to riparian corridors and habitat areas (e.g., Titles 3 and 13, Clean Water Act/ TMDL,ESA).</p> <p>Would preserve some benefits of natural screening and buffering between land uses and help maintain neighborhood livability.</p> <p>Would preserve some visual amenities and neighborhood character, including local wildlife, provided by natural resources.</p>	+	<p>May reduce some limited housing opportunities and options.</p> <p>Would maintain community health benefits associated with natural resources, particularly air and water quality.</p> <p>Would support compliance with regional, state and federal requirements pertaining to riparian corridors and habitat areas (e.g., Titles 3 and 13, Clean Water Act/ TMDL, ESA).</p> <p>Would preserve benefits of natural screening and buffering between land uses and sustain neighborhood livability.</p> <p>Would preserve visual amenities and neighborhood character, including wildlife, provided by natural resources.</p>	+
Open Space	<p>Maintain options for active open space uses that require resource alteration or removal (e.g. community centers, ball fields).</p> <p>Would result in degradation of resources that contribute to the aesthetic and passive recreation value of some open space areas (e.g., canoeing).</p> <p>Reduce some health and safety benefits associated with natural resources, particularly air and water quality, and would contribute to urban heat island effect and reduce quality of open space uses</p> <p>Reduce some benefits of natural screening and buffering between land uses and degrade quality of open space areas.</p>	+/-	<p>Would preserve most options for active open spaces uses that require resource alteration or removal (e.g. community centers, ball fields).</p> <p>Would preserve some of the resources that contribute to the aesthetic and passive recreation value of some open space areas (e.g., canoeing). Mitigation should offset unavoidable impacts.</p> <p>Would maintain most health benefits associated with natural resources, particularly air and water quality, and would limit impacts on urban heat island effect.</p> <p>Would preserve most benefits of natural screening and buffering between land uses and help maintain the quality of open space areas.</p>	+	<p>Would reduce social benefits related to active open spaces uses that require resource alteration or removal (e.g. community centers).</p> <p>Would preserve the resources that contribute to the aesthetic and passive recreation value of some open space areas (e.g., canoeing).</p> <p>Would maintain health benefits associated with natural resources, particularly are and water quality, and would not increase urban heat island effect.</p> <p>Would preserve benefits of natural screening and buffering between land uses and sustain the quality of open space areas.</p>	+/-

Table 12.a: Social Consequences for Natural Resources – All Conflicting Uses						
Resource Ranks	Allow		Limit		Prohibit	
High, Medium & SHA	<p>Would reduce some recreational and educational values of high and medium ranking natural resources and Special Habitat Areas.</p> <p>Would contribute to the loss of the historic cultural values related to natural resource; including preserving natural resources of cultural importance to Native Americans.</p> <p>Would reduce community and employee health and safety benefits associated with natural resources, particularly air and water quality, and would contribute to urban heat island effect.</p> <p>Could make it difficult for the City to comply with regional, state and federal requirements pertaining to riparian corridors and habitat areas (e.g., Titles 3 and 13, Clean Water Act/ TMDL,ESA).</p> <p>Would reduce the scenic values and neighborhood character, including local wildlife, associated with high and medium ranking natural resources and Special Habitat Areas.</p>	-	<p>Would preserve most of the recreational and educational values of medium ranking natural resources.</p> <p>Would maintain most of the historic cultural values related to natural resource; including preserving natural resources of cultural importance to Native Americans. These values are difficult to mitigate for.</p> <p>Would maintain most health benefits associated with natural resources, particularly air and water quality, and could complicate but should not preclude strategies to comply with regional, state and federal requirements pertaining to riparian corridors (e.g., Titles 3 and 13, TMDL).</p> <p>Would preserve some scenic values, neighborhood character, and local wildlife, associated with high and medium ranking natural resources and Special Habitat Areas</p>	+/-	<p>Would preserve the recreational and educational values of high and medium ranking natural resources and Special Habitat Areas.</p> <p>Would contribute to preserving the historic cultural values related to natural resource; including preserving natural resources of cultural importance to Native Americans. These values are difficult to mitigate for.</p> <p>Would reserve the health and welfare benefits, particularly air and water quality, associated with high and medium ranking natural resources and Special Habitat Areas.</p> <p>Would aide in the City’s compliance with regional, state and federal requirements pertaining to riparian corridors and habitat areas (e.g., Titles 3 and 13, Clean Water Act/ TMDL,ESA).</p> <p>Would preserve the scenic value and neighborhood character, including local wildlife, associated with high and medium ranking natural resources and Special Habitat Areas.</p>	+
Low	<p>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.</p>	o	<p>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.</p>	o	<p>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.</p>	o

Table 12.b: Social Consequences for Natural Resources – By Conflicting Use		
Conflicting Use	Extent within Study Area	Intensity of Consequences
Industrial/ Employment	5,425 acres (73%)	<p>High</p> <p>In general, greater negative impacts to natural resources are associated with industrial and employment land uses than other land uses due to the intensive nature of development (e.g., area requirements for structures, access, and freight loading/maneuvering). The predominance of industrial and employment land in the study area could result in cumulative, negative effects to overall ecosystem health and social benefits provided by natural resources in the Columbia Slough Watershed.</p>
Commercial	15 acres (<1%)	<p>Moderate - High</p> <p>Impacts of commercial uses vary. In the study area, there is one site zoned for commercial use. However, commercial uses are generally allowed in industrial and employment areas. In the study area commercial development has typically consisted of large-format retail, hotels and associated parking. These types of commercial development are similar to industrial development in terms of building/development foot print – both types of development are land intensive. Other types of commercial development may have opportunities to modify site designs to avoid impacting natural resources.</p>
Residential	266 acres (4%)	<p>Moderate</p> <p>Impacts associated with residential uses vary; however, they are generally less than impacts associated with industrial, employment and commercial development. This is due to lesser land coverage needs and the ability of residential development to cluster or modify site design to avoid impacting natural resources.</p>
Open Space	1,685 acres (23%)	<p>Low</p> <p>Impacts associated with Open Space uses vary, depending on the whether the uses are active (e.g. ball field) or passive (e.g. hiking, canoeing). However, development associate with open space uses is generally less intensive than other uses because there is often less impervious area, and there are generally opportunities to avoid or minimize impacts to natural resources.</p>

Recommendations Based on Social Analysis

Based solely on the social consequences analysis of allowing, limiting or prohibiting development in natural resources areas, the following general recommendations are intended to optimize the social values described in the narrative and tables above. The economic, social, environmental and energy recommendations are optimized in combination in section 5.d.5 *General Middle Columbia Corridor/Airport ESEE Results* to produce an overall general recommendation for the Middle Columbia Corridor/Airport study area. **Note – Sections that are grayed out were not adopted by City of Portland City Council.**

Base Zone		A	L	P	Recommendation	Rationale
Industrial Employment (Port of Portland property)	Conflicting Use High/SHA	+/- -	+/- +/-	+/- +		<p>Limiting conflicting uses required to comply with a FAA approved Wildlife Hazard Management Plan ensure that the Port of Portland can appropriately manage and reduce risks associated with wildlife/aircraft collisions while also requiring mitigation for impacts to high-ranked natural resources and Special Habitat Areas. This recommendation is consistent with the Metro Title 13 provision related to airport implementation of a FAA approved Wildlife Hazard Management Plan.</p> <p>Limiting conflicting uses in all other areas containing high-and medium-ranked natural resources and Special Habitat Areas, and strictly limiting conflicting uses within 50 feet of water bodies would optimize social values in the ESEE analysis study area. This approach would help reduce impacts of development on critical ecosystem services that contribute to public health and safety (e.g., stormwater management, water quality). It would also help preserve the educational, historic and cultural values associated with natural resources and industrial uses, and will help maintain buffers between land uses that benefits industrial uses. It would also protect important cultural resources along the Columbia Slough and Columbia River. Mitigation would be required for unavoidable impacts on natural resources. This approach would advance the City’s compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act, Endangered Species Act). Limiting in medium ranking resource areas is intended to balance the social values provided by nature resource and social values (e.g. employment) provided by industrial development.</p>
	Conflicting Use Medium	+/- +/-	+/- +/-	+/- +		

Base Zone		A	L	P	Recommendation	Rationale
Industrial Employment (Port of Portland property)	Conflicting Use Low	+/- o	+/- o	+/- o	<i>Allow</i>	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 social values given limited benefits associated with low-ranked resources.
Industrial Employment Commercial (Non-Port of Portland property)	Conflicting Use High/SHA	+/- -	+/- +/-	+/- +	<i>Limit, except strictly limit within 50 ft of the top of-bank of open streams, drainageways and wetlands</i>	<p>Limiting conflicting uses required to comply with a FAA approved Wildlife Hazard Management Plan ensure that the Port of Portland can appropriately manage and reduce risks associated with wildlife/aircraft collisions while also requiring mitigation for impacts to high-ranked natural resources and Special Habitat Areas. This recommendation is consistent with the Metro Title 13 provision related to airport implementation of a FAA approved Wildlife Hazard Management Plan.</p> <p>Limiting conflicting uses in all other areas containing high-and medium-ranked natural resources and Special Habitat Areas, and strictly limiting conflicting uses within 50 feet of water bodies would optimize social values in the ESEE analysis study area. This approach would help reduce impacts of development on critical ecosystem services that contribute to public health and safety (e.g., stormwater management, water quality). It would also help preserve the educational, historic and cultural values associated with natural resources and industrial uses, and will help maintain buffers between land uses that benefits industrial uses. It would also protect important cultural resources along the Columbia Slough and Columbia River. Mitigation would be required for unavoidable impacts on natural resources. This approach would advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act, Endangered Species Act). Limiting in medium ranking resource areas is intended to balance the social values provided by nature resource and social values (e.g. employment) provided by industrial development.</p>
	Conflicting Use Medium	+/- +/-	+/- +/-	+/- +		

Table 13: Social Recommendations						
Base Zone		A	L	P	Recommendation	Rationale
Industrial Employment Commercial (Non-Port of Portland property)	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 social values given limited benefits associated with low-ranked resources.
Residential Open Space	Conflicting Use High/SHA	- -	+/- +/-	+/- +	<i>Strictly Limit</i>	<p>Strictly limiting conflicting uses in residential and open space zones recognizes the importance of the social values provided by natural resources to the public, to residential uses and to open space uses including screening and buffering between land uses. This decision also recognizes that residential and open space uses may have more flexibility to avoid natural resources than many industrial, employment and commercial uses have.</p> <p>Strictly limiting conflicting uses will advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act).</p>
	Conflicting Use Medium	- -	+ +/-	+/- +	<i>Limit, except Strictly Limit within 50ft of the top-of- bank of a stream, drainageway, or wetland</i>	<p>Limiting conflicting uses in residential zones is intended to maintain the social benefits provided by residential uses, open space uses and natural resources. Impacts to natural resources would be mitigated.</p> <p>Strictly limiting conflicting uses within 50' of the Columbia Slough, stream centerline, or wetland would preserve critical ecosystem services that contribute to public health and safety (e.g., stormwater management, flood hazard reduction), preserve educational, historic and cultural values associated with natural resource, and will advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act).</p>
	Conflicting Use Low	- o	+ o	+/- o	<i>Allow</i>	An Allow decision would contribute to the social values provided by uses allowed in residential and open space uses and would have a negligible impact on social values given the limited benefits associated with low-ranked resources.

5.d.3 Environmental Analysis

This 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. However, human welfare depends in part on vital ecosystem services provided by natural resources such as fresh air, clean water, slope stability, food supply, shade, and access to nature. Fish and wildlife also depend on having adequate amounts and quality of habitat, even in urban areas.

The *Middle Columbia Corridor/Airport Natural Resources Inventory* (2010) details the environmental functions provided by riparian corridors and wildlife habitat areas within the Middle Columbia Corridor/Airport study area. A brief summary of environmental functions provided by natural resources in the study area 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 drainageways and wetlands cool which is important to fish and other aquatic species.

The Columbia Slough is water quality limited for in-stream temperature, as well as other parameters. The Oregon Department of Environmental Quality has set shade targets for the slough. Existing tree canopy, as well as overhanging shrubs, contributes to meeting the shade targets. In larger rivers like the Columbia River, riparian shading can provide local shading and microclimate benefits particularly where there are 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.

In some locations, the Columbia Slough experiences bank slumping and erosion. Existing riparian vegetation helps to reduce this effect of stormwater runoff. The Columbia Slough is also water quality limited for a number of parameters, many of which are transported to the slough via stormwater. In the Middle and Upper Columbia Slough, upland soil contains legacy pollutants (e.g. DDT) which can be transported to the water ways when vegetation is cleared, the soil is disturbed and stormwater picks up soil particles. Other urban pollutants (e.g. oil and brake dust from cars) can be filtered from stormwater by vegetation.

- **Stream flow moderation and flood storage** – Waterways, floodplains, and wetlands provide conveyance and/or storage of stream flows, floodwaters, and groundwater discharge. Trees and vegetation intercept precipitation and promote infiltration which tempers the stream flow fluctuations or “flashiness” that often occurs in urban watersheds.

In the Middle Columbia Corridor/Airport study area, the flow and conveyance of the Columbia Slough and secondary drainageways, and floodplain of the Columbia Slough and Columbia River are managed by the Multnomah County Drainage District (MCDD) using a system of levees and pumps. This reduces the types and level of ecological functions typically provided by an active flood area. However, the Columbia Slough and secondary drainageways remain vital to the hydrologic system of the watershed.

- **Large wood and channel dynamics** – Streams, riparian wetlands, floodplains and standing or downed large trees and woody vegetation contribute to the natural changes in location, configuration, and structure of stream channels over time.

The system of levees in the study area limits channel dynamics of the Columbia Slough and Columbia River. MCDD also actively removes large wood and other vegetation if it reduces flow and conveyance of the Columbia Slough or secondary drainageways. Large wood can remain in place in wetlands and some secondary drainageways if it does not impede flow and volume capacity.

- **Organic inputs, food web and nutrient cycling** – Water bodies, wetlands and nearby vegetation provide food and nutrients for aquatic and terrestrial species (e.g., plants, leaves, twigs, seeds, berries, and insects) and are part of an ongoing chemical, physical and biological nutrient cycling system.

The riparian areas and water ways in the study area contribute organic inputs to the slough, wetlands and secondary drainageways, and to the food web and nutrient cycling in the watershed. For large rivers like the Columbia River, riparian vegetation can provide localized organic inputs particularly where there area shallow water areas near the bank.

- **Wildlife habitat/corridors** – Vegetation, water bodies and associated landscape features (e.g. downed logs) provide wildlife habitat functions such as food, cover, breeding and nesting opportunities, and migration corridors. Native and non-native vegetation patches and corridors support local native wildlife and migratory species, some of which are listed by federal or state wildlife agencies. 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.

The Middle Columbia Slough/Airport study area contains resource features that qualify for the designation of Special Habitat Areas in the natural resource inventory, including portions of the Columbia Slough, a number of wetlands, and certain upland habitat areas. The study area is located along the Pacific Flyway for migratory birds. The natural resources in the study area provide important habitat for those birds, as well as other migratory wildlife. Some of these areas provide habitat for federal and state federally listed and Oregon Natural Heritage ranked wildlife species, referred to by the City as 'at risk species'. Large upland grassy areas in the study area are utilized by grassland-associated species, some of which are also state and/or federally listed. The Columbia River provides habitat for listed anadromous salmonids and beaches along the river also provide habitat for migratory shorebirds.

Some habitat around the Portland International Airport attracts specific wildlife species that pose a risk for collisions with aircraft. Not only is this of concern for public safety, wildlife mortality is high when a collision occurs. The Port of Portland, actively manages the airfield and Port owned properties to reduce the risk of wildlife/aircraft collisions.

- **Unique resources** – The natural resource inventory identifies unique resources, some natural and some not, that contribute to watershed health across the city.

In the Middle Columbia Corridor/Airport study area, unique resources include the southern arms of the Columbia Slough receive cold ground inputs. The cold ground water contributes to cool in-stream water temperature, which is a basic requirement of many aquatic wildlife species. The I-205 bridge provides nesting opportunities for Peregrine falcons.

As discussed in the economic and social analyses, natural resources provide social amenities and economic benefits. Social amenities include recreation, education, buffering/screen of land uses, health and welfare, and scenery. Economic benefits include infrastructure-type services and avoided costs, prevention of loss due to floods and erosion, and reduced heating and cooling needs.

Much of the natural resources in the Middle Columbia Corridor/Airport study area provide important ecological functions even though they may be impacted by past and current development, contaminated, or affected by invasive species. New development and redevelopment provide an opportunity for clean-up of contamination and enhancement of natural resources.

Environmental Consequences by Land Use Type

To evaluate the potential economic consequences of different natural resource protection program options, three scenarios are assessed: allowing, limiting and prohibiting conflicting uses that would adversely affect significant natural resources in the Middle Columbia Corridor/Airport study area. Each of these program choices would result in different mixes of positive and negative economic consequences as related 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 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 outright 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 addresses 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

For the environmental analysis, the consequences associated with industrial, employment and commercial development addressed together. This is appropriate because the impacts of the different program options on these uses would generally be similar in the study area.

The *natural resource* consequences of allowing, limiting or prohibiting conflicting uses is similar for all conflicting uses. The difference between the uses is the intensity or extent of the consequence. Table 14.a outlines the general natural resource consequences of allowing, limiting or prohibiting conflicting uses. Table 14.b provides an explanation of different intensity or extent of the natural resource consequences by conflicting use.

Table 14: Environmental Consequences for Conflicting Uses						
	Allow		Limit		Prohibit	
Industrial Employment Commercial	<p>Would reduce stormwater management and water quality benefits provided by natural resources.</p> <p>Would reduce air quality and cooling benefits provided by natural resources.</p> <p>Due to the intensive nature of industrial and employment land use and the extent of land zoned for these uses, these consequences could be significant in the study area.</p> <p>Would reduce opportunities for natural resource enhancement.</p> <p>Would result in no change in development potential.</p>	+/-	<p>Would maintain most stormwater management and water quality benefits provided by natural resources.</p> <p>Would maintain most air quality and cooling benefits provided by natural resources.</p> <p>Would preserve some opportunities for resource enhancement.</p> <p>Would result in minimal change in development potential.</p>	+/-	<p>Would maintain stormwater management and water quality benefits provided by natural resources.</p> <p>Would maintain air quality and cooling benefits provided by natural resources.</p> <p>Would reduce development potential on industrial lands in close proximity to the Portland International Airport, I-205 and rail. Could increase the environmental impacts associated with transporting goods over land.</p>	+/-
Residential	<p>Would reduce stormwater management and water quality benefits provided by natural resources.</p> <p>Would degrade environmental amenities that benefit residential uses, including air quality, cooling, and noise buffering.</p> <p>Would reduce opportunities for natural resource enhancement.</p> <p>Would result in no change in development potential.</p>	+/-	<p>Would maintain most stormwater management and water quality benefits provided by natural resources.</p> <p>Would maintain most of the environmental amenities that benefit residential uses, including air quality, cooling, noise buffering, and wildlife habitat</p> <p>Would preserve some opportunities for resource enhancement.</p> <p>Would result in minimal change in development potential.</p>	+/-	<p>Would maintain stormwater management and water quality benefits provided by natural resources.</p> <p>Would maintain the environmental amenities that benefit residential uses, including air quality, cooling, and noise buffering.</p> <p>Would reduce residential development potential, however due to the relatively limited land zoned for residential uses, and the predominance of larger lots the impact would be nominal for the study area as a whole.</p>	+/-
Open Space	<p>Would reduce stormwater management and water quality benefits provided by natural resources.</p> <p>Development of active open space uses could affect the quality and usage of adjacent and nearby open spaces used for passive recreation, and the desirability of nearby residential areas.</p> <p>Would reduce opportunities for natural resource enhancement.</p> <p>Would result in no change in development potential.</p>	+/-	<p>Would maintain most of the stormwater management and water quality benefits provided by natural resources.</p> <p>Would maintain most of the environmental amenities that benefit residential uses, including air quality, cooling, noise buffering, and wildlife habitat</p> <p>Would preserve some opportunities for resource enhancement.</p> <p>Would result in minimal change in development potential.</p>	+	<p>Would maintain stormwater management and water quality benefits provided by natural resources.</p> <p>Would preserve opportunities for resource enhancement.</p> <p>Would reduce some development potential for active open space uses</p>	+/-

Table 15.a: Environmental Consequences for Natural Resources – All Conflicting Uses						
Resource Ranks	Allow		Limit		Prohibit	
High, Medium & SHA	<p>Would result in loss of significant environmental functions. All environmental functions would be impacted by conflicting uses within area of high and medium 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, ESA, TMDL).</p> <p>Development could affect environmental functions in nearby resource areas (e.g. noise, light, runoff).</p> <p>Would educe opportunities for natural resource enhancement (lost opportunities could have future impacts on adjacent natural resources).</p>	-	<p>Would maintain most environmental functions in areas containing high and medium 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, ESA).</p> <p>Development could affect environmental functions in nearby resource areas area (e.g. noise, light, runoff).</p> <p>Mitigation could enhance overall resource function on a site or in the study area.</p> <p>Would preserve some opportunities for natural resource enhancement (lost opportunities may have future impacts on adjacent natural resources).</p>	+/-	<p>Would maintain environmental functions of high and medium 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, ESA).</p> <p>Would preserve opportunities for environmental enhancement</p>	+
Low	<p>Reduce already limited environmental functions.</p> <p>Development would likely affect environmental functions in nearby resource areas (e.g. noise, light, runoff).</p> <p>Would educe opportunities for natural resource enhancement (lost opportunities may have future impacts on adjacent natural resources).</p>	-	<p>Would maintain most environmental functions.</p> <p>Development could affect environmental functions in nearby higher value resource (e.g. noise, light, runoff).</p> <p>Development could affect some environmental functions in nearby resource areas outside the development disturbance area (e.g. noise, light, runoff).</p> <p>Would preserve most opportunities for natural resource enhancement (lost opportunities may have future impacts on adjacent natural resources).</p>	+/-	<p>Would maintain environmental functions of low ranking natural resources.</p> <p>Would preserve opportunities for environmental enhancement</p>	+

Table 15.b: Environmental Consequences for Natural Resources – By Conflicting Use		
Conflicting Use	Extent within Study Area	Intensity of Consequences
Industrial/ Employment	5,425 acres (73%)	<p>High</p> <p>In general, greater negative impacts to natural resources are associated with industrial and employment land uses than other land uses due to the intensive nature of development (e.g., area requirements for structures, access, and freight loading/maneuvering). The predominance of industrial and employment land in the study area could result in cumulative, negative effects to overall ecosystem health in the Columbia Slough Watershed.</p>
Commercial	15 acres (<1%)	<p>Moderate - High</p> <p>Impacts of commercial uses vary. In the study area, there is one site zoned for commercial use. However, commercial uses are generally allowed in industrial and employment areas. In the study area commercial development has typically consisted of large-format retail, hotels and associated parking. These types of commercial development are similar to industrial development in terms of building/development foot print – both types of development are land intensive. Other types of commercial development may have opportunities to modify site designs to avoid impacting natural resources.</p>
Residential	266 acres (4%)	<p>Moderate</p> <p>Impacts associated with residential uses vary; however, they are generally less than impacts associated with industrial, employment and commercial development. This is due to lesser land coverage needs and the ability of residential development to cluster or modify site design to avoid impacting natural resources.</p>
Open Space	1,685 acres (23%)	<p>Low</p> <p>Impacts associated with Open Space uses vary, depending on the whether the uses are active (e.g. ball field) or passive (e.g. hiking, canoeing). However, development associate with open space uses is generally less intensive than other uses because there is often less impervious area, and there are generally opportunities to avoid or minimize impacts to natural resources.</p>

Recommendations Based on Environmental Analysis

Based solely on the environmental consequences analysis of allowing, limiting or prohibiting development in natural resources areas, the following general recommendations are intended to optimize the environmental values described in the narrative and tables above. The economic, social, environmental and energy recommendations are optimized in combination in section 5.d.5 *General Middle Columbia Corridor/Airport ESEE Results* to produce an overall general recommendation for the Middle Columbia Corridor/Airport study area. **Note – Sections that are grayed out were not adopted by City of Portland City Council.**

Base Zone		A	L	P	Recommendation	Rationale
Industrial Employment (Port of Portland property)	Conflicting Use High/SHA	+/- -	+/- +/-	+/- +	<i>Strictly Limit</i>	Strictly limiting uses in industrial zones would prevent impacts from these high intensity land uses on high and medium ranked natural resources, preserve opportunities for natural resource enhancement and advance the City’s compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act, Endangered Species Act).
	Conflicting Use Medium	+/- -	+/- +/-	+/- +		
	Conflicting Use Low	+/- -	+/- +/-	+/- +	<i>Limit</i>	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.
Industrial Employment Commercial (Non-Port of Portland property)	Conflicting Use High/SHA	+/- -	+/- +/-	+/- +	<i>Strictly Limit</i>	Strictly limiting uses in industrial zones would prevent impacts from these high intensity land uses on high and medium ranked natural resources, preserve opportunities for natural resource enhancement and advance the City’s compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act, Endangered Species Act).
	Conflicting Use Medium	+/- -	+/- +/-	+/- +	<i>Strictly Limit</i>	Strictly limiting uses in industrial zones would prevent impacts from these high intensity land uses on high and medium ranked natural resources, preserve opportunities for natural resource enhancement and advance the City’s compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act, Endangered Species Act).
	Conflicting Use Low	+/- -	+/- +/-	+/- +	<i>Limit</i>	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.
Residential	Conflicting Use High/SHA	+/- -	+/- +/-	+/- +	<i>Strictly Limit</i>	Strictly limiting uses in institutional and residential zones would prevent impacts from these moderate intensity land uses on high and medium ranked natural resources, preserve opportunities for natural resource enhancement, and advance the City’s compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act, Endangered Species Act).
	Conflicting Use Medium	+/- -	+/- +	+/- +		
	Conflicting Use Low	+/- -	+/- +	+/- +	<i>Limit</i>	Limiting uses in 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	+/- -	+/- +	+/- +	<i>Strictly Limit</i>	Strictly limiting uses in open space zones would prevent impacts from low to moderate intensity land uses on high and medium ranked natural resources,

Base Zone		A	L	P	Recommendation	Rationale
Open Space	Conflicting Use Medium	+/- -	+/- +	+/- +		preserve opportunities for natural resource enhancement, and advance the City's compliance with regional, state and federal regulations (Titles 3 and 13, Clean Water Act, Endangered Species 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, infrastructure (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 Middle Columbia Corridor/Airport study area provide an energy-efficient location for businesses that move goods. Air, road, rail and water transportation infrastructure are located in close proximity to industries and businesses in the Middle Columbia Corridor/Airport study area, which helps reduce transportation-related energy consumption. Industries that rely on air for transportation of cargo are located within the study area and in close proximity to the Portland International Airport.

The availability of jobs near housing reduces commuter miles and energy consumption. The industries and businesses in the Middle Columbia Corridor/Airport study area 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 Middle Columbia Corridor/Airport study area there are multiple forms of transportation that are important to commerce. The Portland International Airport, 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 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). Soil, water bodies and vegetation filter pollutants from the water, improving water quality and reducing the need for treatment.

Within the Middle Columbia Corridor/Airport study area much of the infrastructure is hardscaped and includes roads, rail, stormwater and sewer pipes, etc. Green infrastructure in the Middle Columbia Corridor/Airport study area includes the Columbia Slough, secondary drainageways, wetlands (e.g. Subaru Wetland) and riparian and upland vegetation. Much of the green infrastructure is impacted by past development, adjacent land uses and land management activities however, they still provide the infrastructure functions described.

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.

Most the Middle Columbia Corridor/Airport study area is zoned for industrial and employment uses. The cumulative impacts of build-out of this area could increase the heat island affect within the study area. This could result in additional cooling needs for structures.

Energy Consequences by Land Use Type

To evaluate the potential economic consequences of different natural resource protection program options, three scenarios are assessed: allowing, limiting and prohibiting conflicting uses that would adversely affect significant natural resources in the Middle Columbia Corridor/Airport study area. Each of these program choices would result in different mixes of positive and negative economic consequences as related 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 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 outright 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 addresses 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

For the energy analysis, the consequences of allowing, limiting or prohibiting industrial or employment development are sufficiently similar to be addressed together. These types of development have similar stormwater management and heating and cooling needs; clearing and grading for site preparation are similar.

The *natural resource* consequences of allowing, limiting or prohibiting conflicting uses is similar for all conflicting uses. The difference between the uses is the intensity or extent of the consequence. Table 17.a outlines the general natural resource consequences of allowing, limiting or prohibiting conflicting uses. Table 17.b provides an explanation of different intensity or extent of the natural resource consequences by conflicting use.

Table 17: Energy Consequences for Conflicting Uses						
	Allow		Limit		Prohibit	
Industrial Employment	<p>Could reduce regional transportation infrastructure needs by consolidating development in close proximity to existing air, rail, water and road infrastructure.</p> <p>May reduce additional transportation energy demand by maintaining employment opportunities in close proximity to the employment base.</p> <p>Would require energy for land preparation and construction of stormwater management and other infrastructure facilities</p> <p>May require additional energy for heating and cooling, particularly due to the extent of industrial and employment lands in the study area</p>	+/-	<p>May reduce energy needs associated with new infrastructure facilities and heating and cooling by maintain some green infrastructure on site.</p> <p>Potentially some increase in transportation energy demand by limiting industrial land supply and creating longer distances between jobs and work, and between infrastructure and heavy industry.</p> <p>Reduce energy demand for landscaping if native vegetation is retained or restored.</p>	+/-	<p>By retaining existing green intrastate there would be no additional energy demands related to stormwater infrastructure and heat and cooling.</p> <p>Could increase in transportation energy demand by reducing industrial land supply and creating longer distances between jobs and work, and between infrastructure and heavy industry.</p>	+/-
Commercial*	<p>May reduce additional transportation energy demand by maintaining employment opportunities in close proximity to the employment base.</p> <p>Would require energy for land preparation and construction of stormwater management and other infrastructure facilities</p> <p>May require additional energy for heating and cooling, particularly for commercial uses located in industrial and employment areas</p> <p>Could increase energy consumption required to maintaining non-native landscaping.</p>	+/-	<p>May reduce energy needs associated with new infrastructure facilities and heating and cooling by maintain some green infrastructure on site.</p> <p>Potentially some increase in transportation energy demand by limiting developable land supply and creating longer distances between jobs and work.</p> <p>Could reduce energy demand for landscaping if native vegetation is retained or restored.</p>	+/-	<p>By retaining existing green intrastate there would be no additional energy demands related to stormwater infrastructure and heat and cooling.</p> <p>Could increase in transportation energy demand by reducing industrial land supply and creating longer distances between jobs and work.</p>	+/-
Residential	<p>May reduce additional transportation energy demand by providing residential opportunities in close proximity to employment centers.</p> <p>Would require land preparation and construction of stormwater management and other infrastructure facilities, including infrastructure to provide buffer between non-compatible land uses.</p> <p>May require additional energy for heating and cooling, particularly for residential uses located adjacent to industrial and employment areas.</p> <p>Could increase energy consumption required to maintaining non-native landscaping.</p>	+/-	<p>May reduce energy needs associated with new infrastructure facilities and heating and cooling by maintain some green infrastructure on site, including maintaining buffers between non-compatible land uses.</p> <p>Could achieve energy efficiency if development is “clustered” to avoid natural resources.</p> <p>Could reduce energy demand for landscaping if native vegetation is retained or restored.</p>	+	<p>By retaining existing green intrastate there would be no additional energy demands related to stormwater infrastructure, heat and cooling or buffering between non-compatible land uses.</p> <p>Could increase transportation energy demand by reducing residential opportunities close to population and employment centers, but this consequences could be lessened if development is “clustered” to maintain housing density.</p>	+
Open Space	<p>May reduce additional transportation energy demand by providing residential opportunities in close proximity to population centers and existing transportation infrastructure.</p> <p>Could reduce infrastructure requirements to provide buffer between non-compatible land uses; open spaces could provide the buffer.</p> <p>Would require land preparation and construction of stormwater management and other infrastructure facilities, including infrastructure to provide buffer between non-compatible land uses.</p> <p>Could increase energy consumption required to maintaining non-native landscaping.</p>	+/-	<p>May reduce energy needs associated with new infrastructure facilities and heating and cooling by maintain some green infrastructure on site, including maintaining buffers between non-compatible land uses.</p> <p>May reduce transportation energy demand by maintaining recreational opportunities close to population centers and existing transportation infrastructure.</p> <p>Could reduce energy demand for landscaping if native vegetation is retained or restored.</p>	+	<p>By retaining existing green intrastate there would be no additional energy demands related to stormwater infrastructure, heat and cooling or buffering between non-compatible land uses.</p> <p>Could increase transportation energy demand by reducing recreational opportunities close to population and existing transportation infrastructure, but this consequence varies depending on the types of open space use – active (e.g. community center) or passive (e.g. walking trail).</p>	-

*Currently there is one site zoned for commercial uses and it is developed. There are no other commercially zoned properties in the study area. The consequences of to commercial development within commercial base zones is there for very minimal within the study area. However, there are commercial uses on properties zoned as industrial or employment and those uses were considered when documenting potential consequences.

Resource Ranks	Allow		Limit		Prohibit	
High, Medium & SHA	Would reduce the energy benefits derived from natural resources. Multiple benefits would be impacted by development of conflicting uses in areas of high and medium 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 and medium ranked natural resources and Special Habitat Areas Mitigation or enhancement requirements could increase some of the energy benefits provided by natural resources. Would reduce some opportunities for natural resource enhancement	+/-	Would maintain energy functions provided by natural resources. Would maintain opportunities for resource enhancement. Could 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 development in low-ranked natural resources would be negligible. Would preserve some opportunities for natural resource enhancement (lost opportunities may have future economic costs).	+	Impact on energy benefits derived from prohibiting development in low-ranked natural resource areas would be negligible. Would preserve some opportunities for natural resource enhancement (lost opportunities may have future economic costs).	+

Conflicting Use	Extent within Study Area	Intensity of Consequences
Industrial/ Employment	5,425 acres (73%)	High In general, greater negative impacts to natural resources are associated with industrial and employment land uses than other land uses due to the intensive nature of development (e.g., area requirements for structures, access, and freight loading/maneuvering). The predominance of industrial and employment land in the study area could result in cumulative, negative effects to overall ecosystem health and energy benefits in the Columbia Slough Watershed.
Commercial	15 acres (<1%)	Moderate - High Impacts of commercial uses vary. In the study area, there is one site zoned for commercial use. However, commercial uses are generally allowed in industrial and employment areas. In the study area commercial development has typically consisted of large-format retail, hotels and associated parking. These types of commercial development are similar to industrial development in terms of building/development foot print – both types of development are land intensive. Other types of commercial development may have opportunities to modify site designs to avoid impacting natural resources.
Residential	266 acres (4%)	Moderate Impacts associated with residential uses vary; however, they are generally less than impacts associated with industrial, employment and commercial development. This is due to lesser land coverage needs and the ability of residential development to cluster or modify site design to avoid impacting natural resources.
Open Space	1,685 acres (23%)	Low Impacts associated with Open Space uses vary, depending on whether the uses are active (e.g. ball field) or passive (e.g. hiking, canoeing). However, development associated with open space uses is generally less intensive than other uses because there is often less impervious area, and there are generally opportunities to avoid or minimize impacts to natural resources.

Recommendations Based on Energy Analysis

Based solely on the energy consequences analysis of allowing, limiting or prohibiting development in natural resources areas, the following general recommendations are intended to optimize the energy values described in the narrative and tables above. The economic, social, environmental and energy recommendations are optimized in combination in section 5.d.5 *General Middle Columbia Corridor/Airport ESEE Results* to produce an overall general recommendation for the Middle Columbia Corridor/Airport study area. **Note – Sections that are grayed were not adopted by City of Portland City Council.**

Base Zone		A	L	P	Recommendation	Rationale
Industrial Employment (Port of Portland property)	Conflicting Use High/SHA	+/- -	+/- +/-	- +	<i>Limit, except Strictly Limit within 50' of a stream centerline, and within 50' of a wetland</i>	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 study area. 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	+/- +	- +	<i>Allow</i>	Allowing conflicting uses would prevent increases in transportation energy demand while energy impacts on low ranked resources would be negligible.
Industrial Employment Commercial (Non-Port of Portland property)	Conflicting Use High/SHA	+/- -	+/- +/-	- +	<i>Limit, except Strictly Limit within 50' of a stream centerline, and within 50' of a wetland</i>	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 study area. 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	+/- +	- +	<i>Allow</i>	Allowing conflicting uses would prevent increases in transportation energy demand while energy impacts on low ranked resources would be negligible.
Residential	Conflicting Use High/SHA	+/- -	+ +/-	- +	<i>Limit, except Strictly Limit within 50' of a stream centerline, and within 50' of a wetland</i>	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 study area. 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	+ +	- +	<i>Allow</i>	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	+/- -	+ +/-	- +	<i>Limit, except Strictly Limit within 50' of a stream centerline, and within 50' of a wetland</i>	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 study area. 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	+ +	- +	<i>Allow</i>	Allowing conflicting uses would prevent increases in transportation energy demand while energy impacts on low ranked resources would be negligible.

5.d.5 General Middle Columbia Corridor/Airport ESEE Results

Tables 19, 20 and 21 present the results of the general economic, social, environmental and energy analyses conducted for the Middle Columbia Corridor/Airport study area. The tables include results of the analyses performed for each of the ESEE factors, and the overall 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 natural resources identified in the Middle Columbia Corridor/Airport Natural Resource Inventory by relative ranking (High/SHA; Medium; Low). Following these tables, Table 22 presents a summary of the overall recommended ESEE decisions for all of the different resource ranks.

This section also outlines specific recommendations for activities required by the Port of Portland Wildlife Hazard Management Plan.

The section concludes with a recommended general ESEE decision for the Impact Areas.

Note – Sections that are grayed out were not adopted by City of Portland City Council.

Base Zone	Economic	Social	Environmental	Energy	Decision
Industrial Employment (Port of Portland property)	<i>Limit</i>	<i>Limit, except strictly limit within 50 ft of the top-of-bank of open streams, drainageways and wetlands</i>	<i>Strictly Limit</i>	<i>Limit, except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands</i>	Limit, except Strictly Limit within 50ft top-of-bank of open streams, drainageways and wetlands
Industrial Employment (Non-Port of Portland property)	<i>Limit</i>	<i>Limit, except strictly limit within 50 ft of the top-of-bank of open streams, drainageways and wetlands</i>	<i>Strictly Limit</i>	<i>Limit, except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands</i>	Limit, except Strictly Limit within 50ft top-of-bank of open streams, drainageways and wetlands
Commercial	<i>Limit</i>	<i>Limit, except strictly limit within 50 ft of the top-of-bank of open streams, drainageways and wetlands</i>	<i>Strictly Limit</i>	<i>Limit, except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands</i>	Strictly Limit
Residential	<i>Limit, except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands</i>	<i>Strictly Limit</i>	<i>Strictly Limit</i>	<i>Limit, except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands</i>	Strictly Limit
Open Space	<i>Limit, except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands</i>	<i>Strictly Limit</i>	<i>Strictly Limit</i>	<i>Limit, except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands</i>	Strictly Limit

Table 21: ESEE Results for Medium Ranked Significant Resources					
Base Zone	Economic	Social	Environmental	Energy	Decision
Industrial Employment (Port of Portland property)	<i>Allow</i> , except <i>limit</i> within areas containing high and medium ranking riparian resources	<i>Limit</i> , except <i>strictly limit</i> within 50 ft of the top-of-bank of open streams, drainageways and wetlands	<i>Strictly Limit</i>	<i>Limit</i> , except <i>Strictly Limit</i> within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow , except Strictly Limit with 50ft of top-of-bank of open streams, drainageways and wetlands; and Limit within areas of medium ranking riparian corridors and forest and woodland vegetation further than 50ft from open water bodies.
Industrial Employment (Non-Port of Portland property)	<i>Allow</i>, except <i>limit</i> within areas containing high and medium ranking riparian resources	<i>Limit</i>, except <i>strictly limit</i> within 50 ft of the top-of-bank of open streams, drainageways and wetlands	<i>Strictly Limit</i>	<i>Limit</i>, except <i>Strictly Limit</i> within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow, except Strictly Limit with 50ft of top-of-bank of open streams, drainageways and wetlands; and Limit within areas of medium ranking riparian corridors and forest and woodland vegetation further than 50ft from open water bodies.
Commercial	<i>Allow</i>, except <i>limit</i> within areas containing high and medium ranking riparian resources	<i>Limit</i>, except <i>strictly limit</i> within 50 ft of the top-of-bank of open streams, drainageways and wetlands	<i>Strictly Limit</i>	<i>Limit</i>, except <i>Strictly Limit</i> within 50ft of the top-of-bank of open streams, drainageways and wetlands	Limit, except Strictly Limit within 50ft top-of-bank of open streams, drainageways and wetlands
Residential	<i>Limit</i> , except <i>Strictly Limit</i> within 50ft of the top-of-bank of open streams, drainageways and wetlands	<i>Limit</i> , except <i>Strictly Limit</i> within 50ft of the top-of-bank of open streams, drainageways and wetlands	<i>Strictly Limit</i>	<i>Limit</i> , except <i>Strictly Limit</i> within 50ft of the top-of-bank of open streams, drainageways and wetlands	Limit , except Strictly Limit within 50ft top-of-bank of open streams, drainageways and wetlands
Open Space	<i>Limit</i> , except <i>Strictly Limit</i> within 50ft of the top-of-bank of open streams, drainageways and wetlands	<i>Limit</i> , except <i>Strictly Limit</i> within 50ft of the top-of-bank of open streams, drainageways and wetlands	<i>Strictly Limit</i>	<i>Limit</i> , except <i>Strictly Limit</i> within 50ft of the top-of-bank of open streams, drainageways and wetlands	Limit , except Strictly Limit within 50ft top-of-bank of open streams, drainageways and wetlands

Table 22: ESEE Results for Low Ranked Significant Resources

Base Zone	Economic	Social	Environmental	Energy	Decision
Industrial Employment (Port of Portland property)	Allow	Allow	Limit	Allow	Allow
Industrial Employment Commercial (Non-Port of Portland property)	Allow	Allow	Limit	Allow	Allow
Residential	Allow	Allow	Limit	Allow	Allow
Open Space	Allow	Allow	Limit	Allow	Allow

Table 23: General ESEE Decision for the Middle Columbia Corridor/Airport Study Area

Base Zone	Significant Natural Resources		
	High Ranked/ Special Habitat Area	Medium Ranked	Low Ranked
Industrial Employment (Port of Portland property)	<i>Limit</i> , except <i>Strictly Limit</i> within 50ft of the top-of-bank of open streams, drainageways and wetlands	<i>Allow</i> , except <i>Strictly Limit</i> with 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Industrial Employment (Non-Port of Portland property)	<i>Limit</i>, except <i>Strictly Limit</i> within 50ft of the top-of-bank of open streams, drainageways and wetlands	<i>Allow</i>, except <i>Strictly Limit</i> with 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Commercial	<i>Strictly Limit</i>	<i>Limit</i>, except <i>Strictly Limit</i> within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Residential	Strictly Limit	Limit , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Open Space	Strictly Limit	Limit , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow

Land within 50 feet of water bodies

The recommendation to strictly limit conflicting uses within 50 feet of the Columbia River, Columbia Slough, streams or drainageways, and wetlands reflects the critical functions provided by stream and drainage channels, banks and the land adjacent to streams, drainageways and wetlands. Land within 50 feet of rivers, sloughs, streams and drainageways and wetlands is significant 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 generally 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, employment, residential or open space use opportunities in the Middle Columbia Corridor/Airport study area.

Activities required to implement a FAA approved Wildlife Hazard Management Plan

The Portland International Airport is required by the Federal Aviation Administration to appropriately manage wildlife habitat to reduce the public safety risks of wildlife/aircraft collisions. The Port of Portland has completed a Wildlife Hazard Management Plan (2009) to address public safety risks associated with wildlife/aircraft collisions at the Portland International Airport. The intent of the Wildlife Hazard Management Plan is to manage risk to an acceptable level using non-lethal means wherever possible. There are a number of management tools the Port uses to reduce risk at the airport including short-term (intensive hazing) and long-term (habitat modifications) approaches

It is recommended that activities required to implement a FAA approved Wildlife Hazard Management Plan be allowed or limited only by requiring on-site or off-site mitigation for adverse impacts on inventoried natural resources. The City would not require that adverse impacts be avoided or minimized prior to considering mitigation requirements.

This approach is consistent with the Title 13 of Metro's Urban Growth Management Functional Plan. Title 13 Section 4.A.9, which can be adopted by cities and counties, states that:

Any activity within Habitat Conservation Areas that is required to implement a Federal Aviation Administration (FAA) - compliant Wildlife Hazard Management Plan (WHMP) on property owned by the Port of Portland within 10,000 feet of an Aircraft Operating Area, as defined by the FAA, shall be allowed provided that mitigation for any such projects is completed in compliance with mitigation requirements adopted pursuant to subsections (B)(1), (B)(2)(c), and (B)(3) of this section.

5.d.6 Implementation Tools

Unless otherwise stated, the ESEE decision will be implemented through the application of environmental overlay zones. The limit decision will be implemented with an environmental conservation overlay zone and the strictly limit decision will be implemented with an environmental protection overlay zone. The *Portland International Airport Plan District* may contain specific code provisions that also implement the limit decision and apply in either of the environmental zones. Other tools that may be appropriate to implement the ESEE decision include but are not limited to intergovernmental agreements, development agreements, conservation easements, land acquisition, and/or establishment of priority off-site mitigation or resource enhancement target areas.

Within the environmental overlay zoning code, 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.

For activities required to implement a FAA-approved wildlife hazard management plan it is recommended that zoning code provisions be established to specify that such activities may take place within environmental overlay zones and that mitigation to compensate for adverse impacts on natural resources is required. Code standards and mitigation requirements for impacts to natural resource functions could be located in the plan district or natural resources management plan. This approach could also be achieved through a development agreement or other appropriate tools.

5.d.7 Impact Area Recommendations

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.

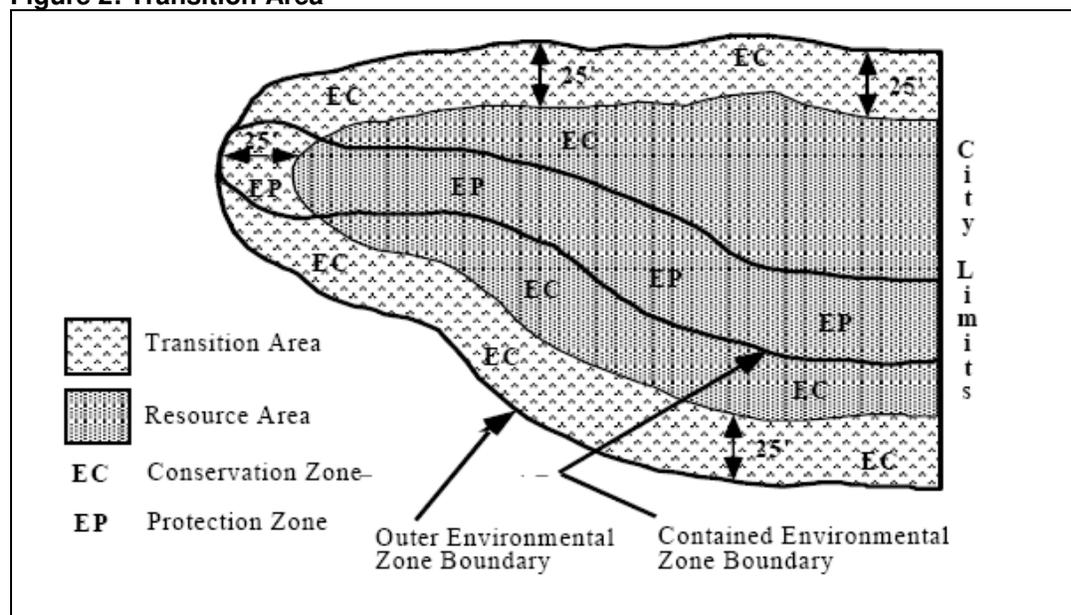
This approach is consistent with the most recent City adopted ESEE analysis conducted for the Pleasant Valley Plan District in 2004, where the decision was to allow conflicting uses within the impact area and use other tools to improve overall watershed health. Impact areas provide an important opportunity for landowner education, stewardship and restoration. Best management practices and low impact development activities could be targeted in impact areas.

It is recommended that the City establish an exception to the *allow* decision for Impact Areas in the Middle Columbia Corridor/Airport study area. 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 through the application of environmental protection or environmental conservation overlay zones. 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 2: Transition Area



The City's environmental zone regulations help provide a buffer for significant resources through the application of certain development standards on properties with environmental overlay zones on a portion of the lot. The development standards include:

- Requiring a setback from environmental protection overlay zone
- Allowing minimum front and street building setbacks to be reduced to avoid significant resources
- Requiring planted buffers for specified multi-family, commercial and industrial parking areas
- Establishing spacing and directional requirements for exterior lighting
- Requiring 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 recommended Middle Columbia Corridor ESEE decision is to limit or strictly limit conflicting uses. The transition area would 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 additional 25 foot transition area.

As Metro points out in the Title 13 ESEE analysis, significant natural resources are affected cumulatively by development activities throughout the full extent of a watershed. Although it is not feasible to address entire watersheds through the Goal 5 process, 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
- Tree Protection and Replacement
- Revegetation and community stewardship program
- Green Building Program
- Willing seller acquisition

5.e Recommended Overlay Zoning Maps

A set of draft maps that depict the recommended zoning are provided with each of the inventory site ESEE analysis in Chapter 6. Unless otherwise stated in the ESEE analysis, these draft zoning maps are intended to illustrate how the Bureau of Planning and Sustainability proposes to apply these ESEE decisions in the Middle Columbia Corridor/Airport study area. The draft zoning maps show the proposed location of the recommended environmental protection and environmental conservation overlay zones to address significant natural resource within the Middle Columbia Corridor/Airport ESEE study area. Final zoning maps will be adopted as part of the Airport Futures Land Use Plan.

The Bureau of Planning and Sustainability 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 Middle Columbia Corridor/Airport study area. 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 Middle Columbia Corridor/Airport study area, 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.

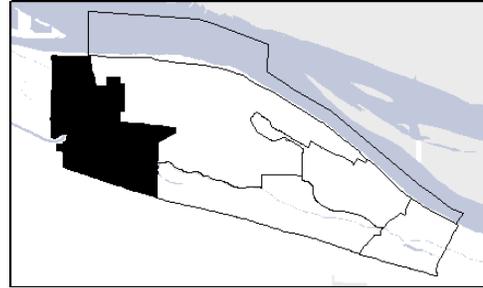
Boundary smoothing

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.

Inventory Site CS1: Buffalo Slough and Peninsula Canal



Site Description: The Buffalo Slough/Peninsula Canal inventory site is 1,287 acres in size. The site includes industrial land uses around the Columbia Slough including the Multnomah County Drainage District Headquarters; three golf courses (Broadmoor, Riverside and Columbia Edgewater); residential land uses west of Peninsula Canal and vacant lands. A roughly 1.5-mile long section of the Columbia Slough main arm, extending from the main cross levee to the confluence of Whitaker Slough, Buffalo Slough and Peninsula Canal, traverses this site. The site also contains 5.7 miles of secondary drainageways, including Elrod Slough, and 9 wetlands. The site contains approximately 271 acres of impervious area, including 10.3 miles of roads.

Quarter Sections:

1N1E01c
 1N1E02a-d
 1N1E11a, b and d
 1N1E12a-d
 1N1E13a and b
 1N1E14a
 1N2E07b

Conflicting Uses by City Base Zones:

Zone	Acres	Existing Conflicting Uses	Potential Conflicting Uses
IG2	692	Portland International Airport terminal, office, retail, industrial, commercial, roads/freeway, levee	office, retail, hotel, entertainment, industrial, commercial, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
R10 R20	96	Blue Heron Meadows residential neighborhood, other residential, agriculture	residential, agricultural, institutional, broadcast facilities, rail line and utility corridors, temporary uses
RF	52	Blue Heron Meadows residential neighborhood, other residential, industrial and agriculture	residential, agricultural, institutional, mining, broadcast facilities, rail line and utility corridors, temporary uses
OS	447	Golf courses, levee	commercial, institutional, agricultural, mining, broadcast facilities, rail line and utility corridors, temporary uses

Summary of Natural Resources: The site contains approximately 1.5-miles of the Columbia Slough main arm, Buffalo Slough and Peninsula Canal. The site also contains 5.7 miles of secondary drainageways, including Elrod Slough, and 9 wetlands equaling 121 acres. The 341-acre flood area includes 74 acres of open water, 231 acres of vegetated flood area and 36 acres of non-vegetated flood area. Vegetated areas at least ½ acre include approximately 52 acres of forest or dense tree canopy, 207 acres of woodland, 53 acres of shrubland and 510 acres of herbaceous cover. The natural resources in the inventory provide multiple ecosystem functions which are evaluated and ranked in the *Middle Columbia Corridor/Airport Natural Resources Inventory* (2010). Table 24 provides a summary of the ranked resources; Map 3 depicts ranked natural resource feature.

Table 24: Summary of Significant Resources and Ranks in CS1: Buffalo Slough and Peninsula Canal

Total Inventory Site = 1,287 acres				
	High	Medium	Low	Total
Riparian Resources*				
acres	233	178	237	647
percent total inventory site area	18	14	18	50
Wildlife Habitat*				
acres	0	155	5	160
percent total inventory site area	0	12	<1	13
Special Habitat Areas**				
acres	696			
percent total inventory site area	54			
Wildlife Habitat - adjusted by Special Habitat Areas ***				
acres	696	13	<1	709
percent total inventory site area	54	1	<1	55
Combined Total****				
acres	727	77	78	882
percent total inventory site area	57	6	6	69
*High-ranked riparian resources, Special Habitat Areas, and wildlife habitat includes the Willamette River				
** Special Habitat Areas rank high for wildlife habitat				
*** Because riparian resources, Special Habitat Areas, and wildlife habitat overlap, the results cannot be added together to determine the combined results.				

Below are excerpts from the natural resources description for CS1: Buffalo Slough and Peninsula Canal in the *Middle Columbia Corridor/Airport Natural Resources Inventory* (Sept. 2010) report.

Middle Columbia Slough

The site contains approximately 3.5 miles of the Columbia Slough main channel, referred to here as the Middle Slough. The portion of the Middle Slough within the site is characterized by a low gradient channel and extensive macrophyte growth that impacts flow and water quality. The riparian area adjacent to the Middle Slough is generally one to two trees in width. These areas are generally bottomland hardwood forest comprised of black cottonwood and red alder. Other native vegetation species present include Douglas-fir, western red cedar, snowberry, red-flowering currant, red-osier dogwood, Indian plum, Oregon grape, Nootka and swamp rose, and vine maple. Invasive plant species found throughout in the riparian area include Himalayan blackberry, Japanese knotweed and reed canary grass.

The Middle Slough and associated waterways are completely surrounded by levees and are contained within MCDD. The width of the Middle Slough waterway varies in general from 30-100 feet and the depth from 6 to 8 feet NGVD. The Columbia Slough is water quality limited for multiple parameters including bacteria, temperature, dissolved oxygen and biochemical oxygen demand (BOD), eutrophication (phosphorus, chlorophyll a, pH), heavy metals and total suspended solids.

The Middle Slough provides habitat for numerous fish and wildlife species including Willow Flycatchers, belted kingfishers, great blue herons, common merganser, Western painted turtle, river otter, nutria and beaver are some of the wildlife species that routinely use this riparian area. Habitat in the Middle Slough

is affected by nearby development. Industrial development, including buildings, loading areas and parking lots, encroach into the riparian area fragmenting habitat and reducing shade potential from riparian vegetation.

Buffalo Slough

Buffalo Slough is a one-mile southern arm of the Columbia Slough in the vicinity of NE 33rd Drive and is designated a Special Habitat Area (CS14.A and B). The western portion of Buffalo Slough is surrounded by industrial development and has a narrow area of riparian vegetation. The middle of Buffalo Slough is bordered by the Broadmoor Golf Course, there is industrial develop to the east and south and a Port of Portland mitigation site to the north.

The Buffalo Slough is a low gradient water way, which in conjunction with culverts at road crossings and the relative lack of shading, can cause water to become stagnant, especially in the summer, resulting in warm water temperatures, algae and macrophyte growth, and reduced dissolved oxygen concentrations. Sediment testing confirmed that contaminant levels were found to be fairly low and uniform throughout the entire Columbia Slough. However, studies show a potential risk to humans who consume fish caught in Buffalo Slough due to bioaccumulation of toxic organic chemicals.

The vegetated riparian area around Buffalo Slough is very narrow, except at the Port of Portland Buffalo Street Mitigation Site. Plant species include black cottonwood, pin oak, willow (spp.), paper birch, black locust, English laurel, butterfly bush, Scots broom, and Himalayan blackberry. Wildlife observed include: American robin, marsh wren, redwing blackbird, Oregon junco, song sparrow, Anna's hummingbird, mourning dove, mallard, ringneck duck, American widgeon and nutria.

The Port of Portland Buffalo Street Mitigation Site is located between the eastern end of Buffalo Slough and Columbia Slough. The mitigation site has been designated a Special Habitat Area (CS15) because it meets multiple criteria: migratory stopover habitat for avian species; wildlife connectivity corridor between Buffalo Slough and the Columbia Slough; utilized by species of concern; and provides upland grassland/meadow habitat.

Subaru Wetland

Subaru Wetland is a 50-acre juncus/willow wetland and is surrounded by the Broadmoor Golf Course and is designated a Special Habitat Area (CS13). The wetland dominated by Himalayan blackberry. Red osier dogwood, willow and rushes are also present. The wetland and vegetation provides food, roost, perch and nesting sites for song birds, waterfowl, woodpeckers, raptors and shorebirds. During site visits the following birds were observed: common yellowthroat, song sparrow, robin, mourning dove, Vaux's swift, scrub jay, mallard, bufflehead, varied thrush, savannah sparrows, Virginia rail, and common snipe (1989, 2009). Several deer and nutria and/or beaver trails run across the wet shrubland, and numerous slides have been worn into the banks of Broadmoor Canal, indicating that wildlife is accessing the waterway. Coyote scat was observed in the more open portion of the shrubland. Interspersion with other natural areas is high because Subaru Wetland is located near other small wetlands, drainageways, Peninsula Canal and the Columbia River.

A smaller wetland is located to the north of Subaru Wetland. The unnamed wetland is forested, primarily with black cottonwood, willow and Oregon ash and also contains areas of herbaceous vegetation and invasive species such as Himalayan blackberry.

Elrod Slough

Elrod Slough drains areas north of Broadmoor Golf Course and west and south of Riverside Golf Course. It connects with Subaru Wetlands, Port of Portland mitigation sites, the forested wetland on property owned by the Oregon Department of Corrections and drainageways to the north. The dominant tree species along Elrod Slough are black cottonwood and mixed conifer-hardwood trees. Elrod Slough and associated riparian vegetation provide resting, roosting, nesting, foraging and shelter opportunities for birds and mammals. Red-tailed hawk, barn owl, great horned owl, great blue heron, European starling,

mallard, Canada goose, gulls, and American crow are known to use Elrod Slough and surrounding vegetation. A portion of Elrod Slough is located on Portland International Airport property. The airport actively manages this area to reduce wildlife strike risks. Management includes bird hazing with noise, physically removing nests, performing egg intervention, reducing surface ponding, and managing vegetation.

Corrections Forested Wetland (CRCI)

Located to the west of the Department of Corrections on NE 33rd, is a forest wetland, a stretch of Elrod Slough and riparian vegetation. The wetland, known as the CRCI Wetland, and riparian area is an active Bureau of Environmental Services revegetation site. The forested area is composed primarily of black cottonwood, red alder, and Oregon ash, including several large, well established trees. Snowberry and Douglas spiraea are the main understory shrub species along with a small amount of the following weedy species: Himalayan blackberry, English ivy, spurge laurel, and English holly. The interior of this site supports a dense, native shrubland, a somewhat rare occurrence in the slough. Dry herbaceous areas of the site contain mixed grasses including reed canary grass. Wetter herbaceous areas contain primarily slough sedge, Dewey's sedge, common rush, small-fruited bulrush, and cattail. During 2009 site visits, wildlife observed included: tree frogs, goldfinch, song sparrow, black-capped chickadee, northern flicker, American crow, brown creeper, red-tail hawk, mallard, wood duck, and cormorant. Deer tracks and coyote scat were also seen.

Secondary Drainageways and Fazio Fields

Located along NE 33rd Drive, north of Subaru Wetlands, are five secondary drainageways, all hydrologically connected, and open fields, called Fazio Fields, which were formerly agricultural lands. The secondary drainageways currently provide surface water and groundwater conveyance from undeveloped and developed lands. Riparian vegetation is primarily herbaceous but also includes red-osier dogwood, willow and Himalayan blackberry. There are also cottonwood snags that have nest cavities and insect hunting holes. Wildlife species observed include: American kestrel, Bald eagle, bushtit, European starling, great horned owl, red-winged blackbird, western meadowlark, deer, coyote and nutria.

Peninsula Drainage Canal

Peninsula Drainage Canal is a roughly 1.5 mile long isolated slough segment designated a Special Habitat Area (CS12). The forested area along the northwest bank of the canal is a high quality black cottonwood forest with a Pacific willow and red-osier dogwood understory. Several snags are present and there is some large wood in the channel. The southwestern bank of the canal is occupied by an open cottonwood forest. The understory contains red-osier dogwood, Himalayan blackberry, as well as some English ivy and reed canary grass. The east side of the canal is almost completely reed canary grass with a few swamp roses.

Peninsula Drainage Canal supports one of two known significant populations of Western painted turtles within the Columbia Slough Watershed in the City of Portland. Avian species known to use the site: American wigeon, Anna's humming bird, bald eagle, cackling goose, common merganser, Eurasian wigeon, greater white-fronted goose, green-winged teal, loggerhead shrike, northern flicker, northern pintail, northern shoveler, olive-sided flycatcher, purple martin, red-tailed hawk, ringneck duck, raverner's goose, swainson's hawk, tree swallow, western meadowlark, willow flycatcher and white-breasted nuthatch. Extensive signs of beaver have been observed. Western painted turtle, western pond turtle and northern red-legged frog have been documented by ODFW using the canal, as well as bull frog and carp.

Blue Heron Meadows

Until 1999, this area was primarily used for agriculture including row-crop fields and pastures. In 1999/2000 much of the agricultural uses ended and residential development began around the wetlands. Blue Heron Meadows wetland is located in a subdivision east of Peninsula Canal and south of Edgewater

Country Club. The wetland is designated a Special Habitat Area (CS11). The eastern side of the wetland is woodland consisting black cottonwood/red alder and shrubland containing red-osier dogwood, Douglas spiraea, willow, cattails, and common rush. Areas identified as shrubland contain a mixture of species including Douglas spiraea, red-osier dogwood, and willow. Several species of wetland emergents are found around the pond edges. Along the north and west of the wetland complex is heavily vegetated woodland with black cottonwood, red alder, and Oregon ash. Primary understory components were red-osier dogwood and reed canary grass with Himalayan blackberry along the south side of the drainage channel continuing all the way to NE 13th Ave. and spreading into the open shrubland to the west. The large field that encompasses the northern half of the survey site is still used for agricultural purposes. Portions of this field are seasonally covered with shallow standing water.

In April 2009, tree frogs and red-winged blackbirds were heard around the ponds, and mallards and Canada geese were observed on site. Deer tracks were also observed and residents confirmed that a group of five deer regularly use the site along with garter snakes, nutria, and coyotes.

Freightliner Wetlands

To the south of Blue Heron Meadows wetland is a wetland, a secondary drainageway and associated vegetated areas informally referred to as Freightliner Wetlands (also called Merritt Wetlands) and Gertz Ditch. The vegetation south and east of the wetland is composed mostly of black cottonwood, red alder, and ash. On higher ground, particularly toward the southern portion of the survey site, western red cedar, grand fir, and Douglas-fir are present. Understory shrubs include; Douglas spiraea, red-osier dogwood, willow species. Himalayan blackberry is also present, however mostly in areas with a high edge-to-area ratio (e.g. wind rows, property line plantings). Where present, ground cover is generally a mixture of rushes, bulrushes, moss, and creeping buttercup. English ivy is also present localized patches. Wildlife observed during spring 2009 site visits include: black-capped chickadee, yellow-rumped warbler, mallard, Canada geese, and a tree frog.

Golf Courses

There are three golf courses located in the inventory site: Columbia Edgewater, Riverside and Broadmoor. Golf courses, while highly manicured landscapes, provide some of the largest contiguously vegetated areas within the city. The complex of habitat features at Broadmoor Golf Course (Middle Slough, Buffalo Slough, Subaru Wetland, Broadmoor Canal and riparian tree canopy) and at Riverside Golf Course (Elrod Slough, wetlands and riparian trees) provide habitat for bats. Columbia Edgewater Country Club was not surveyed for bat use; however, it is reasonable to expect that bats use riparian trees for roosting and open water bodies for foraging and drinking. Golf courses, particularly riparian corridors with tree canopy, are utilized by a high concentration and diversity of migratory birds as they travel along the Pacific Flyway and Columbia River. It is likely that the trees located throughout the golf courses are also used by a high concentration of migratory birds. All three golf courses are located in close proximity to the Columbia River. Columbia Edgewater is located with 300 feet of the river, while the others are roughly 1 mile of the river.

Previous City Adopted ESEE Analysis: Natural resources in inventory site CS1: Buffalo Slough and Peninsula Canal were addressed in *Inventory and Analysis of Wetlands, Water Bodies and Wildlife Habitat Areas for the Columbia Corridor* (1989).

Inventory and Analysis of Wetlands, Water Bodies and Wildlife Habitat Areas for the Columbia Corridor (1989)

Resource sites 27, 28, 29, 25, 36, 42 and 43 address natural resources in inventory site CS1: Buffalo Slough and Peninsula Canal. These resource sites correspond with identified water features and associated riparian vegetation.

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.

There 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 such as the 40-mile Loop trail. 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.

Natural resources located in the Columbia Corridor are of high cultural and historic value.

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 open waterways and riparian areas. Strictly limit uses within wetlands. This decision resulted in application of the environmental conservation overlay zone to the Columbia Slough, Buffalo Slough, Elrod Slough and one other secondary drainageway near Fazio Field; the environmental protection overlay zone was applied to Peninsula Canal and Subaru wetlands and surrounding riparian vegetation.

Supplemental ESEE Analysis: The Middle Columbia Corridor/Airport general ESEE analysis and decision presented in the previous section and summarized in Table 25 below apply to inventory site CS1: Buffalo Slough and Peninsula Canal except for the modifications described in Table 26. **Note – Sections that are grayed out were not adopted by City of Portland City Council.**

Table 25: General ESEE Decision for the Middle Columbia Corridor/Airport Study Area			
Base Zone	Significant Natural Resources		
	High Ranked/ Special Habitat Area	Medium Ranked	Low Ranked
Industrial Employment (Port of Portland property)	<i>Limit</i> , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow , except Strictly Limit with 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Industrial Employment (Non-Port of Portland property)	<i>Limit</i> , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow , except Strictly Limit with 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Commercial	Strictly Limit	Limit , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Residential	Strictly Limit	Limit , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Open Space	Strictly Limit	Limit , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow

It is recommended that activities required to implement a FAA approved Wildlife Hazard Management Plan be allowed, or limited only by requiring on-site or off-site mitigation for adverse impacts on inventoried natural resources. The City would not require that adverse impacts be avoided or minimized prior to considering mitigation requirements. This approach could be achieved by establishing zoning provisions specifying that necessary wildlife hazard management activities may take place within environmental overlay zones, with mitigation. Standards and mitigation requirements could be located in the plan district or natural resources management plan. This approach could also be achieved through a development agreement or other appropriate tools.

Table 26: Supplemental ESEE Analysis for Site CS1: Buffalo Slough and Peninsula Canal	
Feature	Columbia Edgewater, Riverside and Broadmoor golf courses
Riparian Corridor/ Wildlife Habitat Relative Rank	High and/or Special Habitat Area
Characteristics	<ul style="list-style-type: none"> ▪ Open space base zone ▪ Active golf course activities ▪ Stream, drainageways and wetlands providing riparian corridor functions and wildlife habitat ▪ Tree canopy provides habitat for bat species and migratory birds
General ESEE Decision	<i>Strictly limit</i> conflicting uses in high ranking resource areas
ESEE Implications	<p>The vegetated areas of the golf courses are proposed to be designated as Special Habitat Areas because diverse concentrations of migratory birds use the tree canopy as stopover habitat; bat species roost in riparian trees and drink from and forage over open water bodies; and the golf courses provide connectivity between other habitat areas. The predominance of use by these species, and of riparian and habitat functions on the golf courses, generally are provided by the open water bodies and by vegetation located within 300 feet of the water bodies. The turf grass associated with the golf courses does not support grassland-associated species and provides limited habitat for generalist species.</p> <p>Golf courses provide employment, tourism and recreation opportunities in Portland. They also provide access to open spaces and natural resources. Strictly limiting conflicting uses throughout the entire area of each golf course would significantly reduce the ability of the golf course to provide these uses and would not meet city goals for recreation and access to open space. It is possible to manage the riparian corridors to maintain existing functions and mitigate for any open space development activities (e.g. paths, expanded paving area) on-site.</p>
Site-Specific ESEE Decision	<p>Within Columbia Edgewater, Riverside and Broadmoor golf courses:</p> <ul style="list-style-type: none"> ▪ <i>Strictly limit</i> conflicting uses within high ranking <u>riparian</u> resource areas and any land within 50ft of the top-of-bank of streams, drainageways and wetlands; ▪ <i>Limit</i> conflicting uses within medium and low ranking <u>riparian</u> resource areas between 50ft and 300ft from streams, drainageways and wetlands; and ▪ <i>Allow</i> conflicting uses in resource areas that are not ranked as providing riparian corridor functions.
Feature	Wetlands and drainageways located in Fazio Fields – City of Portland City Council is currently considering this recommendation as it applies to Port or Portland owned land only.
Riparian Corridor/ Wildlife Habitat Relative Rank	High and medium relative rank
Characteristics	<ul style="list-style-type: none"> ▪ Industrial base zone ▪ The wetlands and drainageways identified in the Port Wildlife Hazard Management Plan as attracting wildlife species of concern

General ESEE Decision	<i>Limit, except Strictly Limit</i> within 50ft of the top-of-bank of open streams, drainageways and wetlands
ESEE Implications	There are two drainageways located in Fazio Fields that attract wildlife species of concern and are identified in the Port of Portland Wildlife Hazard Management Plan as posing a significant risk. The Port of Portland’s recommended action is to pipe the water features and mitigate off-site. <i>Limiting</i> instead of <i>strictly limiting</i> conflicting uses would allow the Port to determine the appropriate management actions and would require mitigation for negative impacts to the wetlands and drainageways.
Site-Specific ESEE Decision	Within Fazio Fields <i>limit</i> conflicting uses within 50ft of the top-of-bank of the two centrally located, east-west flowing drainageways. The limit decision includes mitigation without an analysis of avoiding and minimizing impacts to natural resources.
Feature	Port of Portland mitigation sites
Riparian Corridor/ Wildlife Habitat Relative Rank	High and/or Special Habitat Area
Characteristics	<ul style="list-style-type: none"> ▪ Industrial base zones ▪ Active mitigation sites, maintained by the Port of Portland ▪ Riparian areas along the Columbia Slough providing multiple functions and wildlife habitat connectivity
General ESEE Decision	<i>Limit, except Strictly Limit</i> within 50ft top-of-bank of open streams, drainageways and wetlands
ESEE Implications	The Port of Portland mitigated for impacts to natural resources at 2 locations within the inventory site. It is intent that the mitigation sites be maintained in perpetuity to provide riparian corridor functions and/or wildlife habitat. To support maintaining natural resource functions in perpetuity, it is appropriate to provide a strict level of environmental protection.
Site-Specific ESEE Decision	<i>Strictly Limit</i> conflicting uses within Port of Portland mitigation sites.

The proposed decision for inventory site CS1: Buffalo Slough and Peninsula Canal is generally consistent with the previous ESEE analyses to strictly limit uses within wetlands and surrounding riparian vegetation. The proposed decision provides a greater level of protection to open drainageways, including the Columbia Slough, Buffalo Slough, Elrod Slough and other secondary drainageways. This is consistent with the City’s approach to protect open channels and riparian vegetation throughout Portland.

Metro ESEE Decision: Metro analyzed the natural resource features within site CS1: Buffalo Slough and Peninsula Canal. 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. Differences are primarily a result of the City

- updates to the stream, wetland, flood area and vegetation data;
- mapping smaller vegetation units - ½ acre as compared to 1 acre; and

- 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 relates to criteria refinements that acknowledge local hydrologic and bank functions within a drainage district. Metro’s ESEE decision was to designate all vegetated flood area as a Habitat Conservation Area (HCA) and to limit conflicting uses in these areas. The City’s criteria have been refined to reflect the fact that within a drainage district the areas below base flood elevation are protected from flooding by the levee system. Because these areas do not flood, the City does not assign scores to these areas for floodplain-associated functions. In addition, the natural channel dynamics of these drainages are affected by drainage district management activities including removal of large wood from the drainage ways. Where such areas are not providing any of the other functions recognized in the inventory, they are not identified as significant natural resources and are therefore not subject to the City’s ESEE analysis.

Total Area = X acres	Title 13 Habitat Conservation Areas	City’s Significant Natural Resources
High	133	727
Medium	373	77
Low	66	78
Total	572	882

Implementation Tools

The recommended ESEE decisions can be implemented using a number of tools including: application of environmental overlay zones, establishment of specific code provisions in a plan district or natural resources management plan, and/or other appropriate tools. Below is an explanation of how the tools are proposed to be applied within Inventory Site CS1: Buffalo Slough and Peninsula Canal.

Environmental Overlay Zones

The primary tool recommended for implementing the ESEE decision is application of the environmental protection (p) overlay to areas where conflicting uses are to be *strictly limited* and environmental conservation (c) overlay to areas where conflicting uses are to be *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.

	Total Acres	Existing Conservation Overlay	Existing Protection Overlay	Proposed Conservation Overlay	Proposed Protection Overlay
IG2	692	126	69		
OS	447	53	21		
R10	52	3			
R20	44	2	7		
RF	52	2	3		

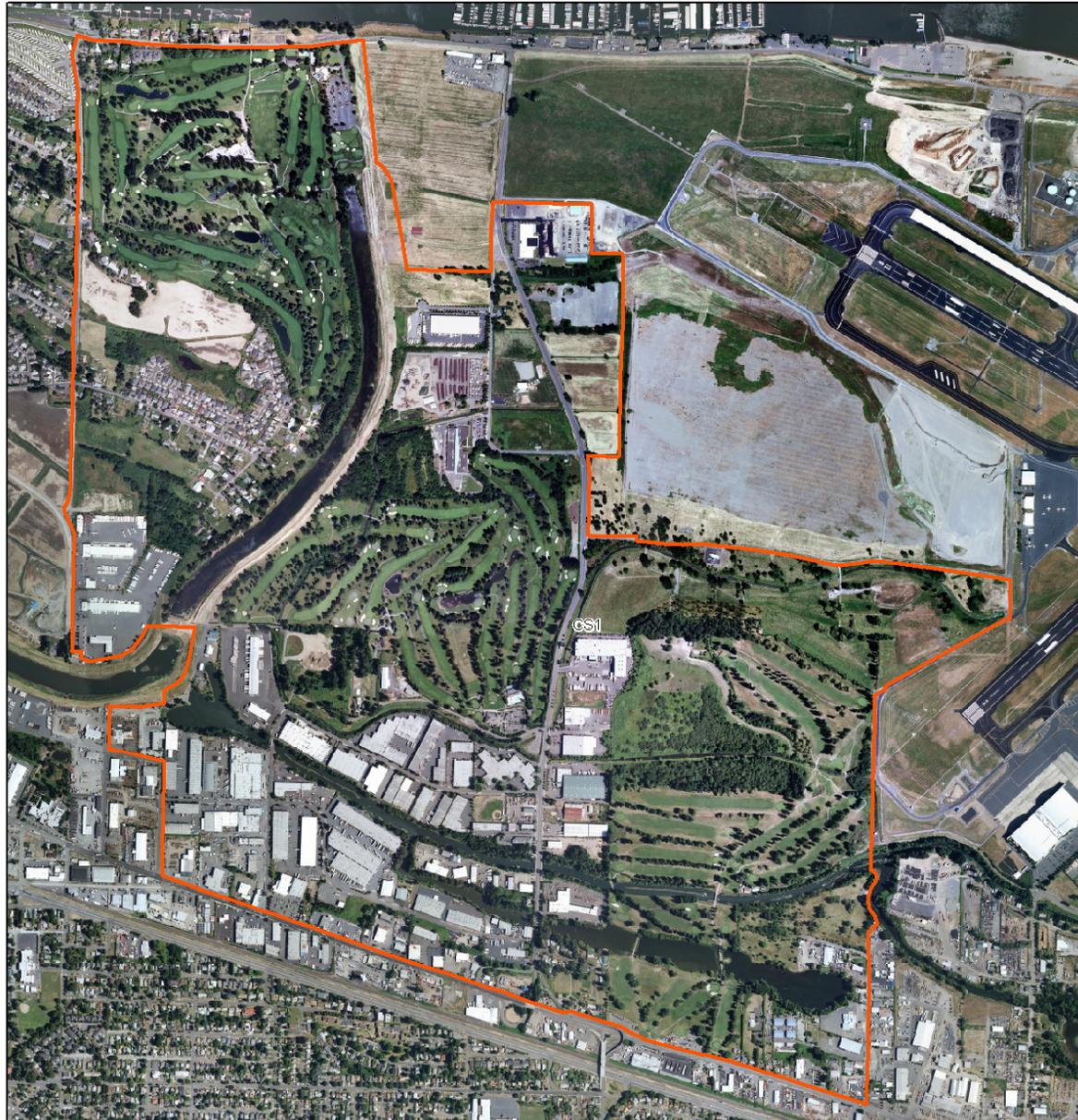
* The statistics are forthcoming as an addendum to the Middle Columbia Corridor/Airport Economic, Social, Environmental and Energy Analysis Recommended Draft. The statistics will include only those portions of the recommendation being forwarded to Portland City Council at this time.

Other Zoning Code Provisions

Activities required to implement a FAA approved Wildlife Hazard Management Plan would be identified in a plan district or natural resources management plan. Managing wildlife hazards typically includes converting the resources from one habitat type to another or by removing the resource. These activities would not be required to avoid or minimize impacts on natural resources. Mitigation for impacts on natural resources would be required. Specific standards and mitigation requirements would be identified in the code.

MAPS:

- 1) Aerial, site boundary
- 2) Adopted resource sites and existing environmental overlay zones
- 3) Combined Riparian Corridor/Wildlife Habitat Relative Ranks
- 4) Metro Title 13 HCAs
- 5) Proposed environmental overlay zones

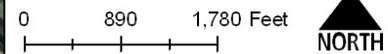


Site CS1 - Map 1
Buffalo Slough/Peninsula Canal

2009 Aerial Photography

 Proposed Inventory Site

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.



Middle Columbia Corridor/Airport ESEE - Final Report



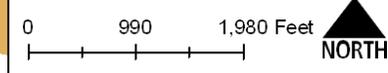
Site CS1 - Map 5
Buffalo Slough/Peninsula Canal

Recommend Environmental Overlay Zone Updates

- Inventory Site
- Environmental Overlay Zones**
- Recommended Updates**
- protection zone
- conservation zone
- Existing/No Change**
- protection zone
- conservation zone
- Water features**
- wetlands and waterbodies
- open channel
- piped



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Middle Columbia Corridor/Airport ES&E - Final Report

Inventory Site CS2: Portland International Airport



Site Description: This site is the Portland International Airport and Air National Guard. The land is managed intensively to reduce safety risks, which includes maintaining the vegetation at an appropriate height and modifying habitat to reduce wildlife attractants. The site contains a portion of McBride Slough, remnant wetlands, two water features, one known as Keyhole Wetland and a secondary drainageway that provides stormwater conveyance for Oregon Air National Guard, and upland grassland that provides habitat for Streaked Horned Lark and other Special Status Species.

Quarter Sections:

- 1N1E01a, b, c and d
- 1N1E12a, b and c
- 1N2E05c and d
- 1N2E06b, c and d
- 1N2E07a, b, c and d
- 1N2E08a, b, c and d
- 1N2E09a, b, c and d
- 1N2E17b, c and d
- 1N2E18a

Conflicting Uses by City Base Zones:

Zone	Acres	Existing Conflicting Uses	Potential Conflicting Uses
IG2	2,278	Portland International Airport, Oregon Air National Guard, roads, levee	office, retail, hotel, entertainment, industrial, commercial, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
OS	43	Marine Drive, levee	commercial, institutional, agricultural, mining, broadcast facilities, rail line and utility corridors, temporary uses

Summary of Natural Resources: The site contains 1.2 miles of secondary drainageways and 5 acres of wetland. The 188-acre flood area includes <1 acres of open water, 64 acres of vegetated flood area and 124 acre of non-vegetated flood area. The Multnomah County Drainage District (MCDD) maintains the levees and water levels in the Columbia Slough to provide flood protection and stormwater conveyance. The management of the Columbia Slough waterways riparian reduces flooding and affects the riparian functions. The inventory models have been adjusted to reflect a lesser level of function than assigned to more active flood areas in the rest of the City. Vegetated areas at least ½ acre include approximately <1 acres of forest or dense tree canopy, 8 acres of woodland and 1,074 acres of herbaceous cover. The natural resources in the inventory provide multiple ecosystem functions which are evaluated and ranked in the *Middle Columbia Corridor/Airport Natural Resources Inventory* (2010). Table 30 provides a summary of the ranked resources; Map 3 depicts ranked natural resource feature.

Table 30: Summary of Ranked Resources in CS2: Portland International Airport				
Total Inventory Site = 2,322 acres				
	High	Medium	Low	Total
Riparian Resources*				
acres	7	53	107	166
percent total inventory site area	<1	2	5	7
Wildlife Habitat*				
acres	0	3	0	3
percent total inventory site area	0	<1	0	<1
Special Habitat Areas*				
acres	803			
percent total inventory site area	35			
Wildlife Habitat - adjusted by Special Habitat Areas **				
acres	803	<1	0	803
percent total inventory site area	35	<1	0	35
Combined Total***				
acres	804	25	33	862
percent total inventory site area	35	1	1	37
* High-ranked riparian resources, Special Habitat Areas, and wildlife habitat includes the Columbia River				
** Special Habitat Areas rank high for wildlife habitat				
* Because riparian resources, Special Habitat Areas, and wildlife habitat overlap, the results cannot be added together to determine the combined results.				

Below are excerpts from the natural resources description for CS2: Portland International Airport in the *Middle Columbia Corridor/Airport Natural Resources Inventory* (Sept. 2010) report.

Upland Grassland

Site CS2 includes approximately 2,000 acres of relatively flat, contiguous, open area; roughly 1,000 acres of which consists of low herbaceous vegetation or sparsely vegetated areas directly surrounding the Portland International Airport (PDX). Although the vegetation communities within this inventory site are not representative of a native grassland or prairie, the combination of the size of the open area, vegetation type, sandy fill and management activities causes the site to mimic some characteristics of a native grassland or prairie. The cumulative effect of all the grassy and sparsely vegetated areas, and absence of vertical structures, creates a contiguous 1,000-acre flat grassland-like habitat adjacent to the Columbia River that attracts a high diversity and concentration of migratory and grassland-associated wildlife species. The upland grasslands are designated Special Habitat Areas (CS24.A and B). Below is a summary of the different upland grassland areas around the airport:

33rd Fields

Located west of NE 33rd Avenue is a 54-acre field comprised primarily of weedy herbaceous and shrubby vegetation, including Himalayan blackberry. There six wetlands, all less than ½-acre in size, located in the field. The field and wetlands are utilized by numerous wildlife species including: western meadow lark, great blue heron, American Kestrel, and Golden-crowned Sparrow. The Port has employed different treatments to 33rd Field intended to reduce the site's attractiveness for migrating geese, which pose a high risk to aircraft safety. Currently, sediment fencing is installed at regular intervals to break up the landscape and deter geese from circling or landing in the field. The treatment has been successful at reducing geese use.

Southwest Quadrant

Between Elrod Slough and the south runway is an area known as the Southwest Quadrant (SW Quad). The SW Quad is a roughly 150-acre open field that is sparsely vegetated with grasses and weedy vegetation located over the filled area. Historically the area contained wetlands that attracted many high risk species. In 1995 and 2004, the Port filled the wetlands, mitigated for the impacts on Government Island and at Vanport Wetlands, and brought in additional fill to help drain the fields. Currently, due to its high risk location immediately adjacent to the approach path for Runway 10R, the field is mowed and disced annually, or as necessary, to prevent dense grass and herbaceous cover from becoming established. This maintenance regime is intended as a deterrent to flocks of Canada geese, a high risk species for bird strikes at the airport. The sparse grassy vegetation, sandy fill and management activities create upland habitat that supports a suite of species, including at risk species. Streaked horned lark utilize the site for breeding and wintering. In 2008 courtship activities of two males and a female streaked horned lark were observed in SW Quad (Port of Portland AIRMAN data, 2008). In 2009, three breeding territories of streaked horned larks were documented in the SW Quad and at least one pair successfully raised young (Oregon State University, 2009). SW Quad meets the Special Habitat Area criterion (S) area vital to an at risk species. Other at risk species that utilize SW Quad include: peregrine falcon and Western meadow lark. Migratory species such as American pipit, Western kingbird, and lapland longspur also use the site.

Deicing Field and Fuel Farm West

These two fields are located outside the Runway Protection Zone at the west end of the South Runway. Herbaceous vegetation on these undeveloped properties is mowed once or twice a year. Invasive weeds such as thistle, teasel and Himalayan blackberry are common. Targeted weed species are sprayed as needed.

These areas provide habitat for generalist species such as moles, voles, and other small mammals. Predators such as coyotes and raptors use them extensively for hunting grounds. A population of Western meadowlarks, a City of Portland special status species, occurs year round and has bred successfully in the area (Appendix D: Special Status Species in Portland). Other at risk species that use these locations include: Peregrine falcon, purple martin and Swainson's hawk. Special status species not at risk include Northern harrier, short-eared owl, and common yellowthroat. Non-special status birds that use the upland grassland habitat include savannah sparrow, lazuli bunting, barn swallow, cliff swallow, Western kingbird, and red-winged blackbird.

Airfield

The airfield includes land located entirely within the airport perimeter fence and Runway Protection Zones. The airfield includes large grassy areas at the ends and outer edges of the three runways. The airfield is vegetated with non-native grasses and regularly managed to meet Federal Aviation Administration (FAA) requirements for wildlife management and vertical restrictions. The undeveloped areas inside the airport perimeter fence and Runway Protection Zone are seeded with a grass mix that is dominated by non-native fescue. Invasive weeds such as thistle, teasel and Himalayan blackberry are common. Targeted weed species are sprayed as needed. The airfield is mowed regularly to maintain the grass height between 6-10 inches as per FAA regulations.

Numerous insect-eating bird species, mice, moles, and voles use these areas for foraging, and raptors use them for hunting grounds. High risk species found in the airfield include six species of gulls, Canada and cackling geese, red-tailed hawk, osprey, barn owl, great-horned owl, mallard, short-eared owl, northern harrier, American kestrel, peregrine falcon, great blue heron, Thayer's gull, European starling and American crow. Some City of Portland *at risk* species that do not pose a high risk to aviation safety and occur on the airfield include streaked horned lark, Western meadowlark,

merlin, purple martin and Vaux's swift. A wintering flock of approximately 25 horned larks has been documented in this area; the flock included streaked horned larks, an Endangered Species Act candidate species. There is one documented sighting of recently fledged dependent young streaked horned lark on the north side of the airfield in June 2008. Western meadowlarks, another City of Portland at risk species, regularly occur on the airfield.

Coyotes forage in the grasslands and also pose a risk to aircraft. Rodent populations are robust in the grassy areas. The predominant species is gray-tailed vole; other species include vagrant shrew, deer mouse, and Townsend's vole. Because these small mammals provide a prey base for coyotes and many of the high risk avian species listed above, they present an indirect risk to aircraft safety.

The Port of Portland currently employs comprehensive strategies to actively manage all wildlife that pose a risk to safe aircraft operations. Coyote exclusion fencing has been installed around the airfield perimeter fencing which greatly reduces the occurrence of coyotes on the airfield. Other management activities include bird hazing using vehicles, horns, sirens, lasers, paintballs, and pyrotechnics; physically removing nests; performing egg intervention; and habitat modification including reducing surface area ponding and performing vegetation management while applying PDX Landscaping Standards. In addition, large scale applications of rodenticide and insecticide are implemented annually on the airfield to reduce the prey base that attracts hazardous wildlife.

McBride Slough

Within the site is a roughly 250 linear foot segment of McBride Slough, a secondary drainageway. The portion of McBride Slough within this inventory site is inside the perimeter fence of the airport airfield. McBride Slough is remnant of historical drainageways that likely reformed each year following seasonal flooding from the Columbia River. The channels of McBride Slough are deeply incised, with steep banks. The riparian area around much of McBride Slough is dominated by grasses and Himalayan blackberry with some areas of willow and red-osier dogwood. The routine bank mowing reduces structural diversity of vegetation and wildlife habitat. Between mowing events the riparian vegetation provides habitat for Tree Swallow, Common Yellowthroat, Golden-crowned Sparrow and other migratory songbirds.

Other Secondary Drainageways

There are two water features located at the Oregon Air National Guard base. The western water feature is called Keyhole Wetland and the eastern is informally known as the ORANG Stormwater Conveyance Ditch. During development of airfield infrastructure existing drainageways were reconfigured to their current alignment and provide stormwater management for the ORANG base. Riparian vegetation associated with these drainageways primarily consists of Himalayan blackberry with some larger structure woody vegetation. The width of the shrubby riparian vegetation ranges from roughly 10 to 40 feet. Waterfowl and coyotes currently use the drainageways and riparian vegetation. Both waterfowl and coyotes pose a risk to aviation safety. The Army Corps of Engineers and Division of State Lands have determined that the drainageways do not meet the criteria as jurisdictional wetlands.

Previous City Adopted ESEE Analysis: Natural resources in inventory site CS2: Portland International Airport were addressed in *Inventory and Analysis of Wetlands, Water Bodies and Wildlife Habitat Areas for the Columbia Corridor* (1989).

Inventory and Analysis of Wetlands, Water Bodies and Wildlife Habitat Areas for the Columbia Corridor (1989)

Resource site 24 address natural resources in inventory site CS2: Portland International Airport. The resource site correspond with identified water features and associated riparian vegetation.

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.

There 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 such as the 40-mile Loop trail. 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.

Natural resources located in the Columbia Corridor are of high cultural and historic value.

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 open waterways and riparian areas. This decision resulted in application of the environmental conservation overlay zone to the Columbia Slough and Whitaker Slough.

Supplemental ESEE Analysis: The Middle Columbia Corridor/Airport general ESEE analysis and decision presented in the previous section and summarized in Table 31 below apply to inventory site CS2: Portland International Airport except for the modifications described in Table 32. **Note – Sections that are grayed out adopted by City of Portland City Council.**

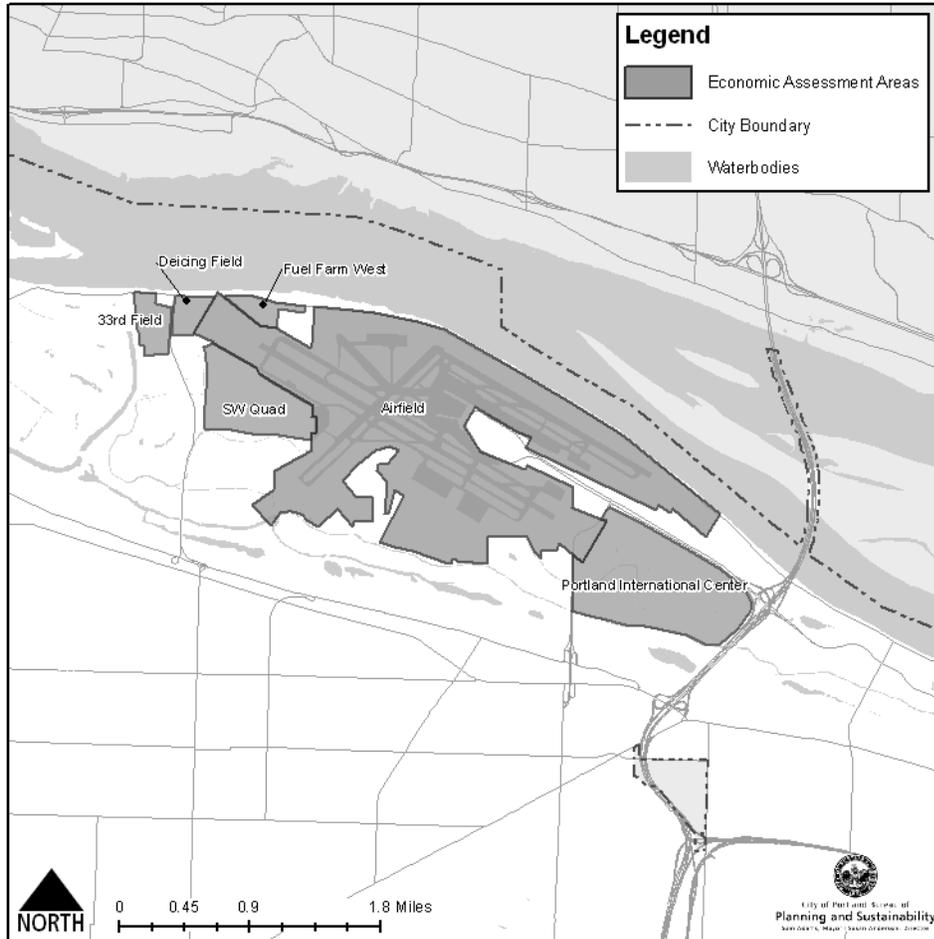
Table 31: General ESEE Decision for the Middle Columbia Corridor/Airport Study Area			
Base Zone	Significant Natural Resources		
	High Ranked/ Special Habitat Area	Medium Ranked	Low Ranked
Industrial Employment (Port of Portland property)	Limit , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow , except Strictly Limit with 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Industrial Employment (Non-Port of Portland property)	Limit, except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow, except Strictly Limit with 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Commercial	Strictly Limit	Limit, except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Residential	Strictly Limit	Limit , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Open Space	Strictly Limit	Limit , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow

It is recommended that activities required to implement a FAA approved Wildlife Hazard Management Plan be allowed, or limited only by requiring on-site or off-site mitigation for adverse impacts on inventoried natural resources. The City would not require that adverse impacts be avoided or minimized prior to considering mitigation requirements. This approach could be achieved by establishing zoning provisions specifying that necessary wildlife hazard management activities may take place within environmental overlay zones, with mitigation. Standards and mitigation requirements could be located in the plan district or natural resources management plan. This approach could also be achieved through a development agreement or other appropriate tools.

Supplemental Economic Analysis

An assessment of the economic development potential of six vacant or lesser improved areas was completed by the Bureau of Planning and Sustainability and the Port of Portland. The assessment looked at the suitability of each area for desired industrial development and other factors such as readiness for industrial development, transportation access, and financial feasibility. The assessment addressed six sites: Airfield, Southwest Quadrant (SW Quad), 33rd Ave Field, Deicing Field, Fuel Farm West and Portland International Center (PIC) (Map 15). The sixth location, Portland International Center (PIC), is located in inventory site CS5: Airport Way.

Map 15: Economic Assessment Areas



	Airfield	Portland International Center	Southwest Quadrant	33rd Ave Field	Deicing Field	Fuel Farm West
Zoning	Industrial	Industrial	Industrial	Industrial	Industrial	Industrial
Regionally Significant Industrial Area	Yes	Yes	Yes	Yes	Yes	Yes
Size (acres)	553	197	186	54	36	39
Current Use	Aviation activity	Vacant; managed to reduce wildlife hazards	Vacant; managed to reduce wildlife hazards. airfield buffer	Vacant; managed to reduce wildlife hazards. airfield buffer	Deicing facilities; vacant; managed to reduce wildlife hazards. airfield buffer	Partially vacant; fuel tanks; stockpiles; managed to reduce wildlife hazards. airfield buffer
Possible Uses	no change	In 19XX, City Council adopted policies to ensure development (e.g. Post Office; warehouse and distribution; some office and retail, airport uses)	Runway dependent uses (e.g. cargo, aircraft maintenance)	Target industrial (e.g. sustainable industries, manufacturing)	Target industrial (e.g. sustainable industries, manufacturing)	Runway dependent uses (e.g. general aviation FBO)
Suitability for Desired Uses						
Aviation Dependent	yes	no	yes	no	no	Yes
PDC Target Cluster Recruitment ¹	no	yes	no	yes	maybe	maybe
Meet industrial land shortfall	no	yes	no	yes	maybe	maybe
Development Readiness	active airfield	shovel ready - mostly	fill/ infrastructure needed	fill/infrastructure needed including upgrades to MCDD facilities	infrastructure needed including upgrades to MCDD facilities	infrastructure needed including upgrades to MCDD facilities
Timeframe for availability	NA	Now	< 5 years	< 2 years	< 2 years	< 2 years
Natural Resources Inventory Ranking Resources (acres)						
Site Investments to Date	All infrastructure in place >\$1B	All infrastructure in place >\$75M	Fill and drainage to reduce wildlife hazard and increase development readiness.>\$4M	Wildlife habitat management (e.g. goose deterrents)	Wildlife habitat management (e.g. grading, vegetation, etc.) \$20M	Wildlife habitat management (e.g. grading, vegetation, etc.)
Transportation Access	Access to Runways	Access to Airport Way/I-205 and 82nd. Light Rail	Access to runways; access to 33rd Ave./Columbia Boulevard	Access to 33rd	Access to 33rd	Access to Runways; access to Marine Drive is a potential issue

¹ PDC's target clusters: Activewear/Outdoor Gear; Biosciences; Cleantech; Advanced Manufacturing; Software.

² Port Estimates and does not include land acquisition or ongoing maintenance

Based on the analysis, the site most ready in the near-term for industrial development is PIC. PIC has all infrastructure in place, includes public transit and access to I-205 via Airport Way, in 1999 Portland City Council adopted the Cascade Station/PIC Plan District which targeted this area for industrial and employment development, and the Portland Development Commission identifies PIC as a target for cluster recruitment. The following is an excerpt from the 2005 Update to the Plan.

In 1999, the City adopted a vision that calls for Cascade Station/Portland International Center (CS/PIC) to be developed into a vibrant mixed-use employment center. It is to be developed in a way that takes advantage of the two light rail stations built in CS/PIC as part of the extension of MAX to Portland International Airport. Its northern subarea is to be a distinctive urban setting with well-designed office, retail, and hospitality uses around the light rail stations and along the Park Blocks. Its southern subarea will have job-rich industrial and employment uses also designed to support transit use. The development is to capitalize on its proximity to the Portland International Airport by having airport-related uses and buildings that complement airport design. At build-out, CS/PIC is to create over 7,000 jobs and further encourage the already active light rail ridership.

The Airfield is the active airfield of the Portland International Airport. Uses are regulated by the Federal Aviation Administration and industrial development other than runway-dependent activities will not be allowed in the Airfield. The Airfield is not suitable for other types of industrial development such as manufacturing, biosciences, etc. The Portland International Airport contributes significantly to the regional economy. In 2006, the Port of Portland performed a study of the *Local and Regional Economic Impacts of the Port of Portland* that found:

- 17,409 total jobs – 9,867 direct jobs; 4,986 jobs induced in the region to support the purchase of goods/services by the direct employees; 2,556 indirect jobs generated by local purchases by firms directly dependent on the airport
- 39,950 estimated visitor industry jobs supported in the Portland area due to expenditures by the 3.4 million visitors to the region who arrive via PDX
- \$825.8 million in direct, induced and indirect personal income and consumption of expenditures
- \$3.3 billion in business sales generated by airport activity; including \$870 million of business revenue generated by air cargo activity
- 260.1 million pounds of air cargo shipped with a total value of \$10.5 billion
- The Federal Government received \$224.6 million in airport-specific taxes from activity at the Portland International Airport
- State and local government received \$83.5 million in tax revenue from airport activities

33rd Ave Field, Deicing Field, Fuel Farm West and SW Quad will require significant investment in infrastructure and fill prior to development, making these locations less ready than PIC for industrial development in the near-term. Fuel Farm West and SW Quad are suitable for runway-dependent uses because they have direct access to the runways. Runway dependent activities could include aircraft maintenance, fueling facilities or general aviation. 33rd Ave Field and the Deicing Field may be suitable for targeted industrial uses such as manufacturing or cleantech.

The development costs range from \$1 to \$7.7 million, depending on multiple factors including infrastructure, fill and potential mitigation for impacts to natural resources. Mitigation accounts for 16%-32% of the total development costs for these sites.

Supplemental Social Analysis

The Port of Portland employs comprehensive strategies to actively manage all wildlife that pose a risk to safe aircraft operations. High risk wildlife species include six species of gulls, Canada and cackling geese, red-tailed hawk, osprey, barn owl, great-horned owl, mallard, European starling, American crow, short-eared owl, northern harrier, American kestrel, peregrine falcon, great blue heron, and coyote. Wildlife management is more frequent and intensive within the active airfield than outside the airfield perimeter fence and runway protection zones. Coyote exclusion fencing has been installed around the perimeter fencing, which greatly reduces the occurrence of coyotes on the airfield. Other management activities include bird hazing using vehicles, horns, sirens, lasers, paintballs, and pyrotechnics; managing vegetation; and reducing surface area ponding. In addition, large scale applications of rodenticide and insecticide are implemented annually on the airfield to reduce the prey base that attracts hazardous wildlife.

Table 31: Supplemental ESEE Analysis for Site CS2: Portland International Airport	
Feature	Portland International Airport Airfield
Riparian Corridor/ Wildlife Habitat Relative Rank	High and/or Special Habitat Area
Characteristics	<ul style="list-style-type: none"> ▪ Industrial base zone ▪ Active airfield of the Portland International Airport ▪ Upland grassland habitat utilized by grassland-associated species and some at risk species ▪ Drainageways and wetlands
General ESEE Decision	<i>Limit</i> , except <i>Strictly Limit</i> within 50ft of the top-of-bank of open streams, drainageways and wetlands
ESEE Implications	<p>The economic consequences of limiting conflicting uses within the Portland International Airport airfield would have negative impacts on the regional economy and transportation by limiting airport-dependent development which must locate within the airfield. The public health and safety consequences of limiting conflicting uses within the airfield are negative because it could impede the Port of Portland ability to efficiently manage and respond to wildlife hazards. Allowing development and wildlife hazard management within the airfield would better support the regional economy, transportation needs and ensure public health and safety.</p> <p>Limiting conflicting uses within 50ft of the top-of-bank of wetlands and secondary streams and drainageways within the airfield would require future development to avoid and minimize impacts to natural resources where practicable, and mitigate for unavoidable impacts. Specific code provisions to allow habitat modifications within appropriate off-site mitigation would support wildlife hazard management within drainageways, wetlands and their riparian areas.</p> <p>The exception is the main arm and southern arm of the Columbia Slough. The environmental consequences of <i>limiting</i> conflicting uses within the Columbia</p>

	Slough and Whitaker Slough, and associated riparian areas, would reduce the City's ability to comply with requirements under the Clean Water Act and would not support citywide goals to improve watershed health. The Columbia Slough is water quality limited for multiple parameters including temperature. The Oregon Department of Environmental Quality has set shade targets for the Columbia Slough to meet Total Maximum Daily Loads for water temperature. Maintaining and enhancing riparian vegetation is the primary tool to meet the shade targets. A <i>strictly limit</i> decision for the high ranking resources and land within 50 feet of the open channel, both high or medium ranking resources, would better support citywide goals and ensure opportunities to meet regulatory requirements associated with the Clean Water Act.
Site-Specific ESEE Decision	Within the Portland International Airport airfield <i>allow</i> , except <i>limit</i> , within 50ft of the top-of-bank of open streams, drainageways and wetlands; and retain the general decision to strictly limit within 50 ft of the top-of-bank of the Middle Columbia Slough and Whitaker Slough. The limit decision includes mitigation without an analysis of avoiding and minimizing impacts to natural resources.
Feature	Wetlands and drainageways located at 33rd Avenue, Deicing Field and Fuel Farm West
Riparian Corridor/ Wildlife Habitat Relative Rank	High and/or Special Habitat Area
Characteristics	<ul style="list-style-type: none"> ▪ Industrial base zone ▪ The wetlands and drainageways identified in the Port Wildlife Hazard Management Plan as attracting wildlife species of concern
General ESEE Decision	<i>Limit</i> , except <i>Strictly Limit</i> within 50ft of the top-of-bank of open streams, drainageways and wetlands
ESEE Implications	The wetlands and drainageways located in the 33 rd Avenue, Deicing and Fuel Farm Fields are open water features with little vegetative cover that attract wildlife species of concern, particularly geese, ducks and herons. The Port of Portland's recommended actions to reduce risk associated with wildlife/aircraft collisions is to either convert vegetate the features to reduce visible open water or to fill/pipe the water features and mitigated off-site. <i>Limiting</i> instead of <i>strictly limiting</i> conflicting uses would allow the Port to determine the appropriate management actions and would require mitigation for negative impacts to the wetlands and drainageways.
Site-Specific ESEE Decision	Within 33 rd Avenue, Deicing and Fuel Farm Fields limit conflicting uses within 50ft of the top-of-bank of open streams, drainageways and wetlands. The limit decision includes mitigation without an analysis of avoiding and minimizing impacts to natural resources.

Metro ESEE Decision: Metro analyzed the natural resource features within site CS2: Portland International Airport. 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)).

Metro addresses Wildlife Hazard Management Plan areas in Title 13 Nature in Neighborhoods. Title 13 states that any activity that is required to implement a Federal Aviation Administration (FAA)-compliant

Wildlife Hazard Management Plan (WHMP) on property owned by the Port of Portland within 10,000 feet of an Aircraft Operating Area, as defined by the FAA, shall not have to avoid or minimize impacts to resources with habitat conservation areas. However, the Port must mitigate for impacts to habitat conservation areas that are a result of WHMP activities.

For this site, the City’s ESEE decision to allow or limit conflicting uses in areas containing ranked resources generally comports with Metro’s ESEE decision to limit conflicting uses in HCAs. The City’s ESEE decision to limit conflicting uses with the Wildlife Hazard Management Plan area is consistent with the Title 13 model ordinance. Differences are primarily a result of the City’s:

- updates to the stream, wetland, flood area and vegetation data;
- mapping smaller vegetation units - ½ acre as compared to 1 acre; and
- refinements to criteria developed evaluate the relative quality of riparian corridors and wildlife habitat.

Table 32: Comparison of Metro Title 13 Habitat Conservation area and the City’s Natural Resources Inventory Ranked Resources

Total Area = X acres	Title 13 Habitat Conservation Areas	City’s Significant Natural Resources
High	0	804
Medium	24	25
Low	35	33
Total	59	862

Implementation Tools

The recommended ESEE decisions can be implemented using a number of tools including: application of environmental overlay zones, establishment of specific code provisions in a plan district or natural resources management plan, and/or other appropriate tools. Below is an explanation of how the tools are proposed to be applied in Inventory Site CS2: Portland International Airport.

Environmental Overlay Zones

The primary tool recommended for implementing the ESEE decision is application of the environmental protection (p) overlay to areas where conflicting uses are to be *strictly limited* and environmental conservation (c) overlay to areas where conflicting uses are to be *limited*. Table 33 summarizes how the resulting decisions affects different land uses. Map 5 presents the recommended environmental overlay zones based on the ESEE decision.

Table 33: Environmental Conservation and Protection Overlay Zones within CS2: Portland International Airport

	Total Acres	Existing Conservation Overlay	Existing Protection Overlay	Proposed Conservation Overlay	Proposed Protection Overlay
IG2	2,278	2	0	308	5
OS	43	43	0	<1	<1

Other Zoning Code Provisions

Activities required to implement a FAA approved Wildlife Hazard Management Plan would be identified in a plan district or natural resources management plan. Managing wildlife hazards typically includes converting the resources from one habitat type to another or by removing the resource. These activities would not be required to avoid or minimize impacts on natural resources. Mitigation for impacts on

natural resources would be required. Specific standards and mitigation requirements would be identified in the code.

Other Implementation Tools

Other tools may be appropriate to achieve the intent of the ESEE decision. For example, intergovernmental or interagency agreements, development agreements, or other legal mechanisms could be established in lieu of an overlay zone to govern the implementation of comprehensive resource protection and mitigation strategies for large (>30 acres) vacant or lesser improved properties. Such strategies could be phased over a multi-year timeframe. Mitigation could be done in advance for extra credit, or phased with development.

The Port of Portland and City of Portland Bureau of Environmental Services have drafted an Intergovernmental Agreement (IGA) that, if approved by City Council and the Port Commission, would create a program for mitigation of upland grasslands and riparian resources in lieu of environmental conservation overlay zoning in the Portland International Center, Southwest Quadrant, 33rd Field, Deicing Field and Fuel Farm Field (Map 15). If the IGA is approved, the proposed environmental overlay zones will be removed from the official zoning maps.

MAPS:

- 1) Aerial, site boundary
- 2) Adopted resource sites and existing environmental overlay zones
- 3) Combined Riparian Corridor/Wildlife Habitat Relative Ranks
- 4) Metro Title 13 HCAs
- 5) Proposed environmental overlay zones

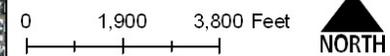


Site CS2 - Map 1
Portland International Airport

2009 Aerial Photography

 Proposed Inventory Site

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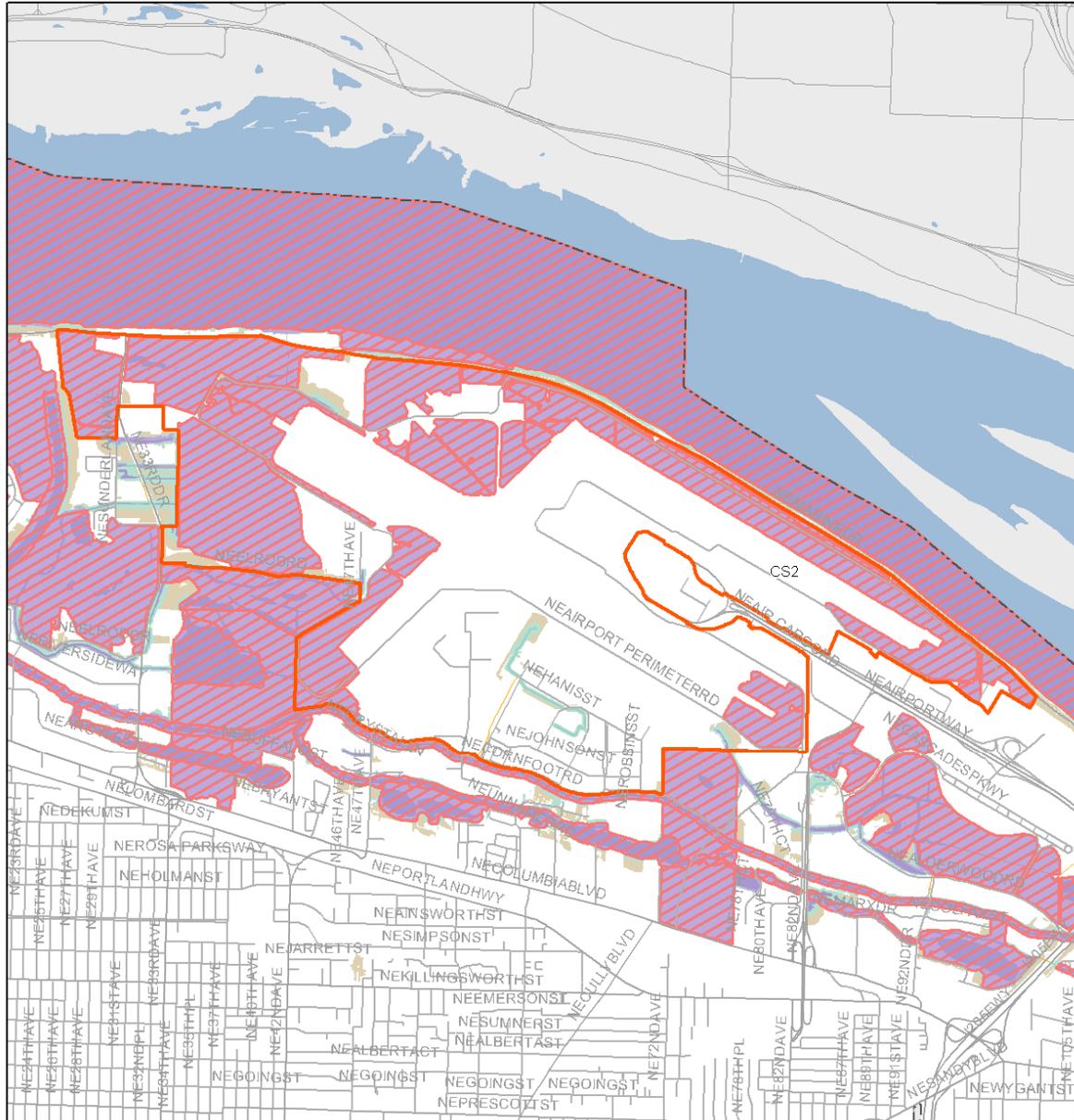
Middle Columbia Corridor/Airport ESEEE - Final Report



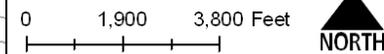
Site CS2 - Map 3
Portland International Airport

**City NRI Combined Riparian/
Wildlife Habitat Relative Ranks**

- Inventory Site
- Combined Relative Ranks**
 - Special Habitat Areas (high)
 - high relative rank
 - medium relative rank
 - low relative rank
- Water features**
 - wetlands and waterbodies
 - open channel
 - piped



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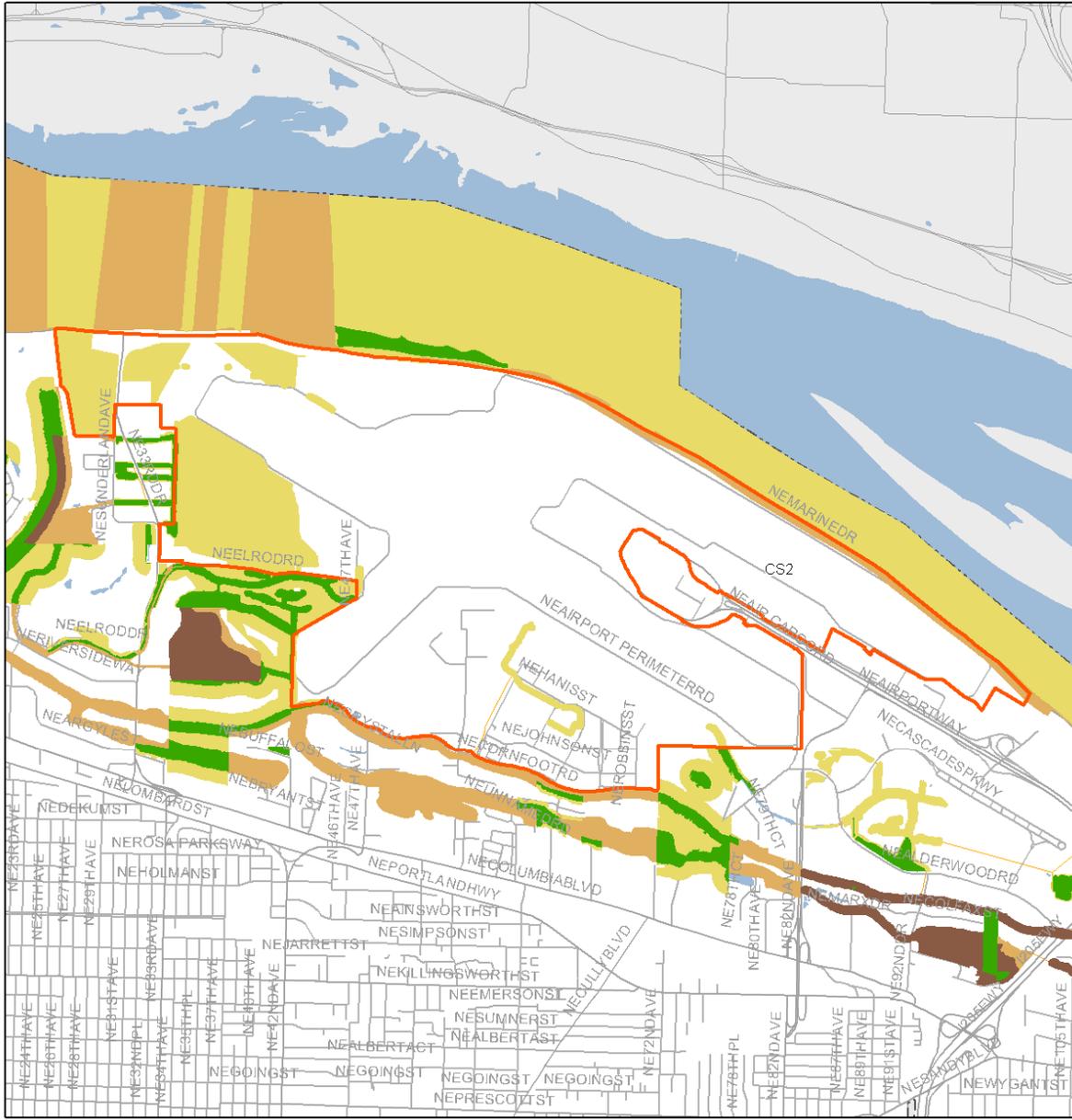
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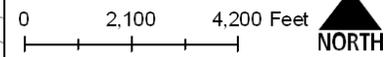
Site CS2 - Map 5
Portland International Airport

**Recommend Environmental
Overlay Zone Updates**

- Inventory Site
- Environmental Overlay Zones**
- Recommended Updates**
- protection zone
- conservation zone
- Existing/No Change**
- protection zone
- conservation zone
- Water features**
- wetlands and waterbodies
- open channel
- piped

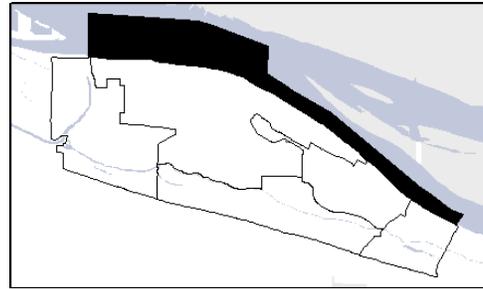


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Middle Columbia Corridor/Airport ESSEE - Final Report

Inventory Site CS3: Central Columbia River



Site Description: This site is primarily the Columbia River and its bank. A flood control levee that was built in 1919 by the USACE and MCDD separates the river from the historic floodplain. Marine Drive is located on top of the levee. The majority of the river bank is undeveloped and owned by the Port of Portland. There is a private marina and a public boat launch, Gleason Boat Ramp, located in the western section of the site. To the east of the Gleason Boat Ramp is Broughton Beach. The Columbia River is a migration channel for anadromous salmonids and is on the Pacific Flyway for migratory birds. Parts of the river are dredged to maintain a navigation channel for movement of goods.

Quarter Sections:

1N1E01a and b
 1N1E02a
 1N2E04c
 1N2E05b, c and d
 1N2E06a, b and d
 1N2E08a
 1N2E09a, b and d
 1N2E10c and d
 1N2E14b and c
 1N2E15a and b
 2N1E35b
 2N1E36c and d
 2N2E31c and d

Conflicting Uses by City Base Zones:

Table 35: Base Zones in Inventory Site CS3: Central Columbia River			
Zone	Acres	Existing Conflicting Uses	Potential Conflicting Uses
IG2	294	Floating homes, Marine Drive, levee	office, retail, hotel, entertainment, industrial, commercial, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
CG	14	Commercial (restaurant)	residential, commercial, industrial, institutional, agriculture, broadcast facilities, rail line and utility corridors, temporary uses
RF	82	Floating homes, Marine Drive, levee	residential, agricultural, institutional, mining, broadcast facilities, rail line and utility corridors, temporary uses
OS	1,040	Marine Drive, levee	commercial, institutional, agricultural, mining, broadcast facilities, rail line and utility corridors, temporary uses

Summary of Natural Resources: The Columbia River inventory site is 1,430 acres in size, 128 acres of which is terrestrial and the remaining 1,302 acres is the Columbia River. The majority of the river bank is undeveloped, except for a private marina and public boat launch (Gleason Boat Ramp). The river bank function is constrained by the levee along Marine Drive. The site contains approximately 62 acres of

impervious area, including 5.9 miles of roads, located the site. The 1,425-acre flood area includes 1,321 acres of open water, 62 acres of vegetated flood area and 42 acres of non-vegetated flood area. The Multnomah County Drainage District (MCDD) maintains the levees and water levels in the Columbia Slough to provide flood protection and stormwater conveyance. Vegetated areas at least ½ acre include approximately 1 acre of forest or dense tree canopy, 1 acre of shrubland and 68 acres of herbaceous cover. The natural resources in the inventory provide multiple ecosystem functions which are evaluated and ranked in the *Middle Columbia Corridor/Airport Natural Resources Inventory* (2010). Table 36 provides a summary of the ranked resources; Map 3 depicts ranked natural resource feature.

Table 36: Summary of Ranked Resources in CS3: Columbia River				
Total Inventory Site	= 1,430 acres			
Terrestrial*	= 88 acres			
Columbia River	= 1,302 acres			
	High	Medium	Low	Total
Riparian Resources*				
acres	1,322	49	20	1,391
percent total inventory site area	92	3	1	96
Wildlife Habitat*				
acres	0	0	0	0
percent total inventory site area	0	0	0	0
Special Habitat Areas*				
acres	1,325			
percent total inventory site area	93			
Wildlife Habitat - adjusted by Special Habitat Areas **				
acres	1,325	0	0	1,325
percent total inventory site area	93	0	0	93
Combined Total***				
acres	1,329	44	19	1,391
percent total inventory site area	93	3	1	97
* High-ranked riparian resources, Special Habitat Areas, and wildlife habitat includes the Willamette River				
** Special Habitat Areas rank high for wildlife habitat				
+ Because riparian resources, Special Habitat Areas, and wildlife habitat overlap, the results cannot be added together to determine the combined results.				

Below are excerpts from the natural resources description for CS3: Central Columbia River in the *Middle Columbia Corridor/Airport Natural Resources Inventory* (Sept. 2010) report.

Columbia River

The majority of the site, 1,302 acres, contains the Columbia River. The Columbia River is a 1,200 mile long river that drains a 259,000 square mile basin that includes territory in seven states (Oregon, Washington, Idaho, Montana, Nevada, Wyoming, and Utah) and portions of British Columbia in Canada. The Columbia River in this site is part of the upstream component of the Columbia tidal freshwater estuary. Columbia River flow is dominated by outflow from Bonneville Dam.

The Columbia River is the main shipping channel for goods transported by water. The industry sector “transport by water” contributes to the local, regional, and national economies in numerous ways. It provides employment and income to individuals, tax revenue to local and state governments, and revenue to businesses which handle freight. In 2007, an estimated \$540 million in direct economic output by this industry sector generated an additional nearly \$248 million in indirect output and nearly \$117 million in induced output for a total estimated economic output of nearly \$905 million from transport

by water (ENTRIX Inc., History and Economic Role of Portland Harbor and Marine Related Development, DRAFT Oct 2009).

The river bank is influenced by the location of the levee, which was built in 1919 to protect agricultural and residential uses located in the floodplain. In 1932, Marine Drive was built on top of the levee. A multiuse recreation path that is utilized by bikers and pedestrians is also located on top of the levee. Vegetation on the levee and at the toe of the levee is restricted to low structure species that will not compromise the structure of the levee. As a result the banks of the Columbia in this site are vegetated with grasses.

The river is a migration channel for anadromous salmonids including Chinook, Coho, chum, sockeye, and steelhead. Near shore, shallow water areas and areas of sandy substrate, such as Broughton Beach which is located just east of the Metro boat launch, are utilized by juvenile salmonids during migration to the Pacific Ocean. The Columbia River is designated by NOAA Fisheries as Critical Habitat for listed salmonids. The near-shore, shallow-water areas with sandy substrate are also important for lamprey. The Columbia River is also part of the Pacific Flyway, which is a significant corridor for migratory birds.

The Lower Columbia River is currently on Oregon's Clean Water Act 303(d) list because it does not meet water quality standards for temperature, PCBs, PAHs, DDT metabolites (DDE), and arsenic. In addition, the Environmental Protection Agency has established Total Maximum Daily Loads (TMDLs) for the Columbia River for dioxin and dissolved gas.

Broughton Beach

Broughton Beach is used by shore birds, songbirds and migratory birds. Piscivorous diving birds use the near shore water for foraging: horned grebe, eared grebe, western grebe and common loon. The sandy beach provides habitat for migratory shorebirds and songbirds. Streaked Horned Lark, a candidate under the Endangered Species Act, uses the beach as a transient and wintering habitat. Other sub-species of horned sark (*merrilli* and possibly *alpina*, *arctica*, and *lamprochroma*) also use the site for winter and migratory stop-over habitat. Other Special Status Species using the site include red-necked grebe in shallow water, short-eared Owls that hunt and roost in the vegetation above the beach, and western meadowlarks.

The Columbia River, including shallow water areas and beaches, and Broughton Beach are designated Special Habitat Areas (C and CS23).

Previous City Adopted ESEE Analysis: Natural resources in inventory site CS3: Central Columbia River were addressed in *Inventory and Analysis of Wetlands, Water Bodies and Wildlife Habitat Areas for the Columbia Corridor* (1989).

Inventory and Analysis of Wetlands, Water Bodies and Wildlife Habitat Areas for the Columbia Corridor (1989)

Resource site 71 address natural resources in inventory site CS3: Central Columbia River. The resource site corresponds with identified water features and associated riparian vegetation.

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.

There could be potential negative economic impacts on conflicting uses if development is required to avoid significant natural resource area. 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 such as the 40-mile Loop trail. 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. Natural resource areas provide a scenic background for urban activities.

Natural resources located in the Columbia Corridor are of high cultural and historic value.

Environmental Analysis

Water bodies provide for retention and detention of stormwater flows. 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.

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 natural resources 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 Columbia River and riparian area. This decision resulted in application of the environmental conservation overlay zone to the Columbia River and riparian area.

Supplemental ESEE Analysis: The Middle Columbia Corridor/Airport general ESEE analysis and decision presented in the previous section and summarized in Table 37 below apply to inventory site CS3: Central Columbia River except for the modifications described in Table 38. **Note – Sections that are grayed out were not adopted by City of Portland City Council.**

Table 37: General ESEE Decision for the Middle Columbia Corridor/Airport Study Area			
Base Zone	Significant Natural Resources		
	High Ranked/ Special Habitat Area	Medium Ranked	Low Ranked
Industrial Employment (Port of Portland property)	Limit , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow , except Strictly Limit with 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Industrial Employment (Non-Port of Portland property)	Limit , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow , except Strictly Limit with 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Commercial	Strictly Limit	Limit , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Residential	Strictly Limit	Limit , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Open Space	Strictly Limit	Limit , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow

It is recommended that activities required to implement a FAA approved Wildlife Hazard Management Plan be allowed, or limited only by requiring on-site or off-site mitigation for adverse impacts on inventoried natural resources. The City would not require that adverse impacts be avoided or minimized prior to considering mitigation requirements. This approach could be achieved by establishing zoning provisions specifying that necessary wildlife hazard management activities may take place within environmental overlay zones, with mitigation. Standards and mitigation requirements could be located in the plan district or natural resources management plan. This approach could also be achieved through a development agreement or other appropriate tools.

Table 38: Supplemental ESEE Analysis for Site CS3: Central Columbia River	
Feature	High ranked Columbia River, associated riparian area, and Broughton Beach – <i>City of Portland City Council is currently considering this recommendation as it applies to Port of Portland owned land and land with zoning designations of open space and commercial only.</i>
Riparian Corridor/ Wildlife Habitat Relative Rank	High and /or Special Habitat Area
Characteristics	<ul style="list-style-type: none"> ▪ Open space, industrial, commercial and residential base zones ▪ Regional and international navigation channel; distribution of goods ▪ Marine Drive levee; flood control ▪ Wildlife connectivity corridor for numerous wildlife species including salmonids, lamprey, and migratory birds
General ESEE Decision	<ul style="list-style-type: none"> ▪ <i>Limit</i>, except <i>Strictly Limit</i> conflicting uses within 50ft of the top-of-bank of open streams, drainageways and wetlands in industrial base zones ▪ <i>Strictly Limit</i> conflicting uses within all other base zones
ESEE Implications	<p>The Columbia River is a federally designated navigation channel for the movement of goods and services. The economic consequences of strictly limiting conflicting uses within the Columbia River and associated riparian areas would have negative impacts on the regional economy and transportation. A limit decision would require future development, as a dock, to avoid impacts on natural resources where practicable or mitigate for unavoidable impacts.</p> <p>Broughton Beach provides habitat for migratory species, water fowl and some at risk species including Streaked Horned Lark. The near-shore, shallow water habitat associated with Broughton Beach is likely utilized by juvenile salmonids. A strictly limit decision for Broughton Beach would aide in the recovered of federally listed species and reduce the risk of additional listings.</p>
Site-Specific ESEE Decision	<i>Limit</i> conflicting uses within the Columbia River and high ranking riparian areas, except <i>strictly limit</i> conflicting uses within Broughton Beach Special Habitat Area

The proposed decision for inventory site CS3: Central Columbia River is generally consistent with the city’s approach and policies for the Willamette River (The River Plan North Reach, 2010).

Metro ESEE Decision: Metro analyzed the natural resource features within site CS3: Central Columbia River. 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 allow or limit conflicting uses in areas containing ranked resources generally comports with Metro’s ESEE decision to limit conflicting uses in HCAs. Differences are primarily a result of the City

- updates to the stream, wetland, flood area and vegetation data;
- mapping smaller vegetation units - ½ acre as compared to 1 acre; and

- 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 relates to criteria refinements that acknowledge local hydrologic and bank functions within a drainage district. Metro’s ESEE decision was to designate all vegetated flood area as a Habitat Conservation Area (HCA) and to limit conflicting uses in these areas. The City’s criteria have been refined to reflect the fact that within a drainage district the areas below base flood elevation are protected from flooding by the levee system. Because these areas do not flood, the City does not assign scores to these areas for floodplain-associated functions. In addition, the natural channel dynamics of these drainages are affected by drainage district management activities including removal of large wood from the drainage ways. Where such areas are not providing any of the other functions recognized in the inventory, they are not identified as significant natural resources and are therefore not subject to the City’s ESEE analysis.

Total Area = X acres	Title 13 Habitat Conservation Areas	City’s Significant Natural Resources
High	1,317	1,329
Medium	33	44
Low	9	19
Total	1,359	1,392

Implementation Tools

The recommended ESEE decisions can be implemented using a number of tools including: application of environmental overlay zones, establishment of specific code provisions in a plan district or natural resources management plan, and/or other appropriate tools. Below is an explanation of how the tools are proposed to be applied in Inventory Site CS3: Central Columbia River.

Environmental Overlay Zones

The primary tool recommended for implementing the ESEE decision is application of the environmental protection (p) overlay to areas where conflicting uses are to be *strictly limited* and environmental conservation (c) overlay to areas where conflicting uses are to be *limited*. Table 40 summarizes how the resulting decisions affects different land uses. Map 5 presents the recommended environmental overlay zones based on the ESEE decision.

	Total Acres	Existing Conservation Overlay	Existing Protection Overlay	Proposed Conservation Overlay	Proposed Protection Overlay
CG	14	14	0		
IG2	294	288	0		
OS	1,040	1,040	0		
RF	82	80	0		

* The statistics are forthcoming as an addendum to the Middle Columbia Corridor/Airport Economic, Social, Environmental and Energy Analysis Recommended Draft. The statistics will include only those portions of the recommendation being forwarded to Portland City Council at this time.

Other Zoning Code Provisions

Activities required to implement a FAA approved Wildlife Hazard Management Plan would be identified in a plan district or natural resources management plan. Managing wildlife hazards typically includes converting the resources from one habitat type to another or by removing the resource. These activities would not be required to avoid or minimize impacts on natural resources. Mitigation for impacts on natural resources would be required. Specific standards and mitigation requirements would be identified in the code.

MAPS:

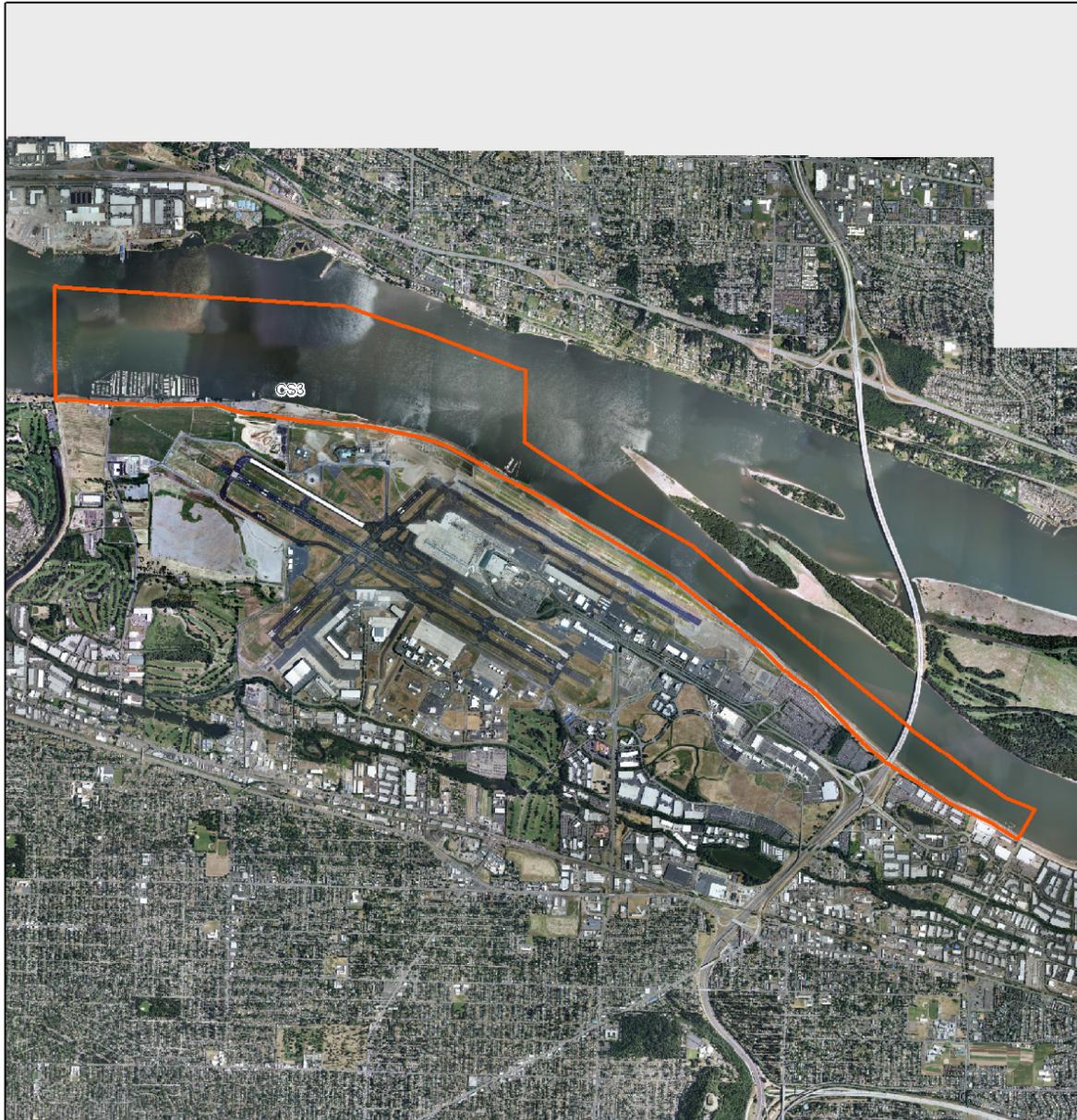
- 1) Aerial, site boundary
- 2) Adopted resource sites and existing environmental overlay zones
- 3) Combined Riparian Corridor/Wildlife Habitat Relative Ranks
- 4) Metro Title 13 HCAs
- 5) Proposed environmental overlay zones



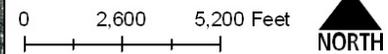
Site CS5 - Map 1
Central Columbia River

2009 Aerial Photography

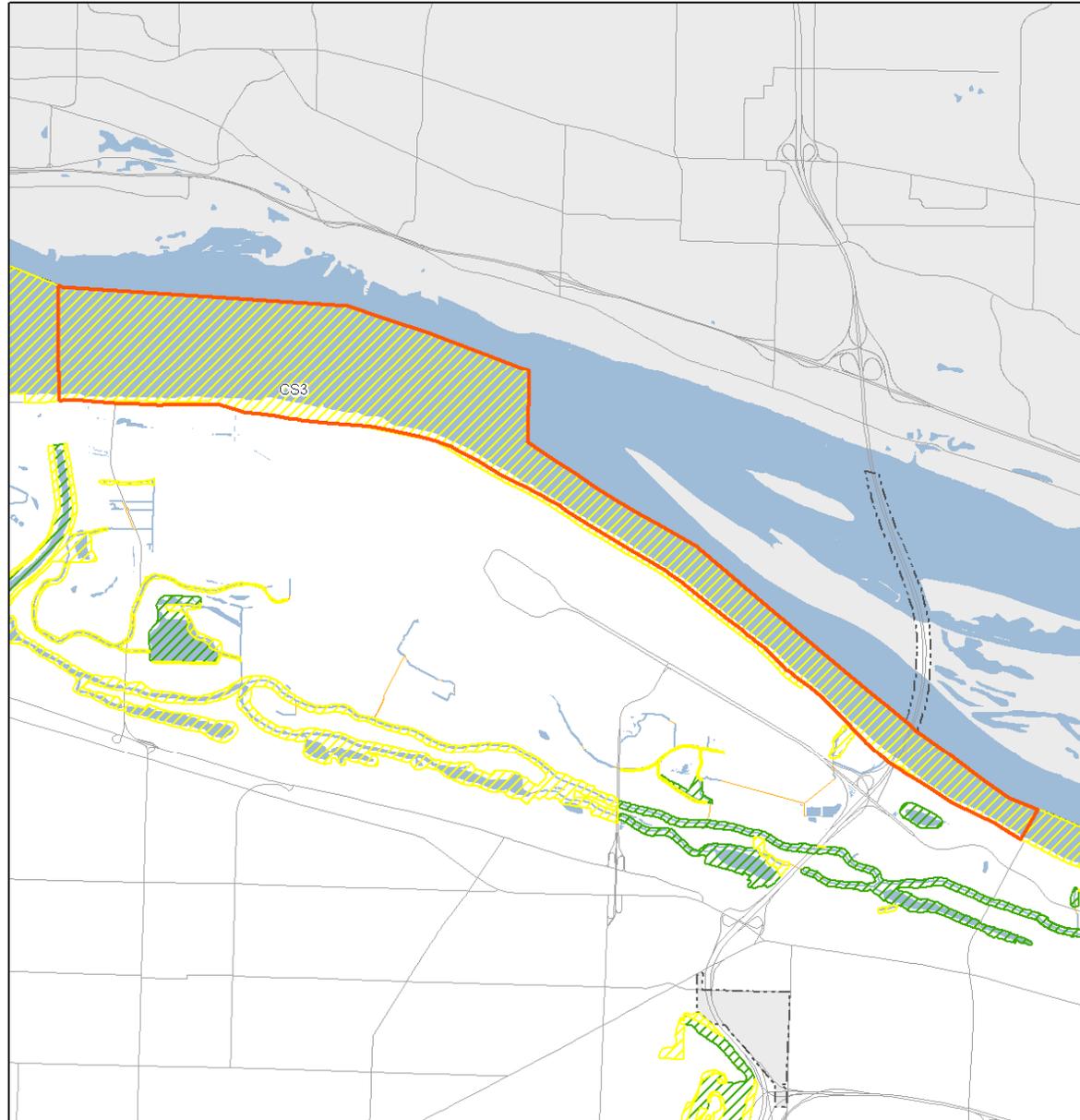
 Proposed Inventory Site



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Middle Columbia Corridor/Airport ESEE - Final Report



Site CS3 - Map 2
 Central Columbia River

Existing Environmental Overlay Zones

- Inventory Site
- Adopted Resource Inventory Site

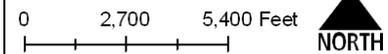
Existing environmental overlays

- protection zone
- conservation zone

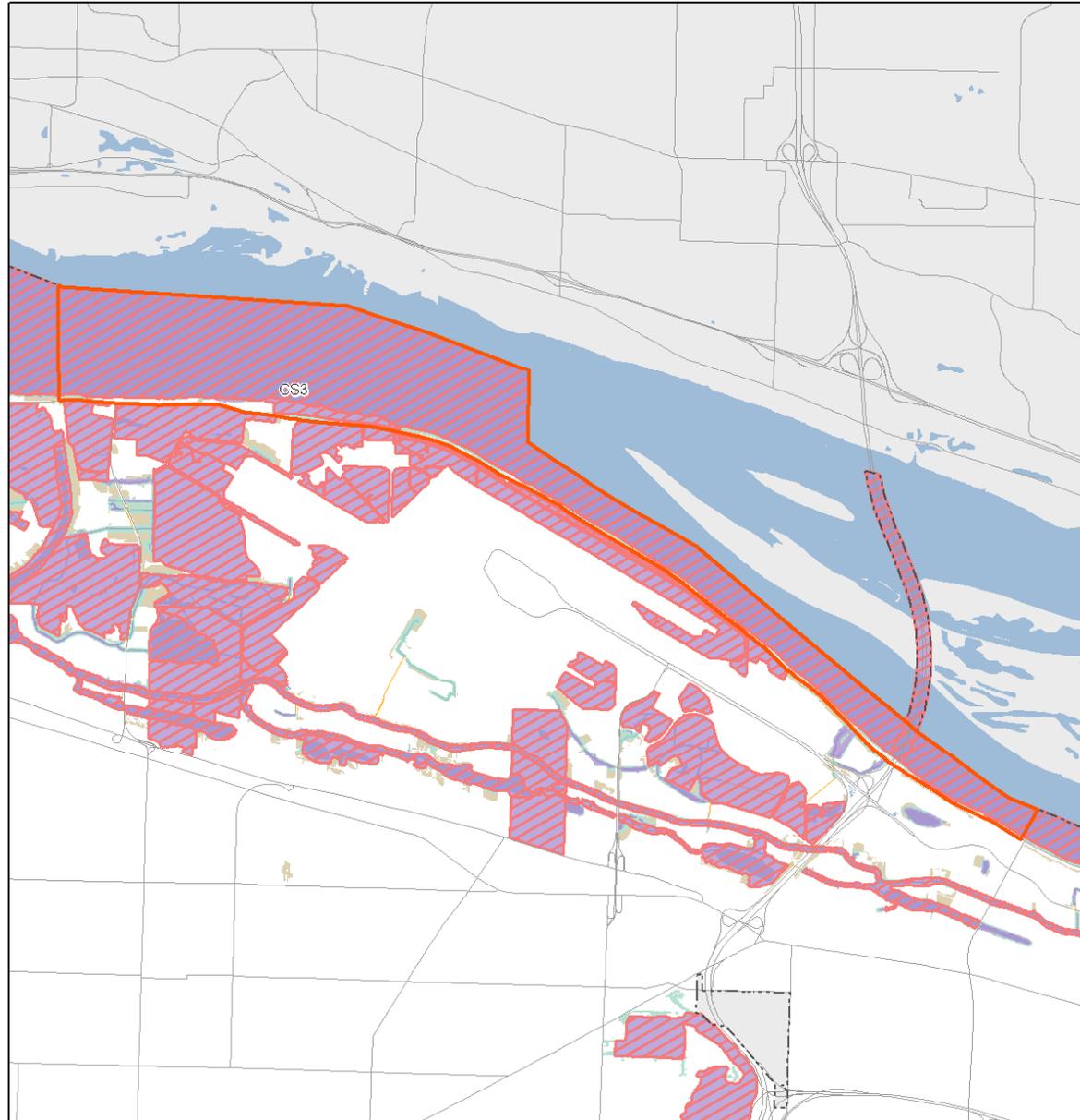
Water features

- wetlands and waterbodies
- open stream/drainageway
- piped segment

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.



Middle Columbia Corridor/Airport ESEE - Final Report

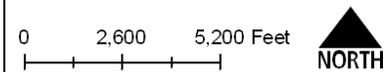


Site CS3 - Map 3
Central Columbia River

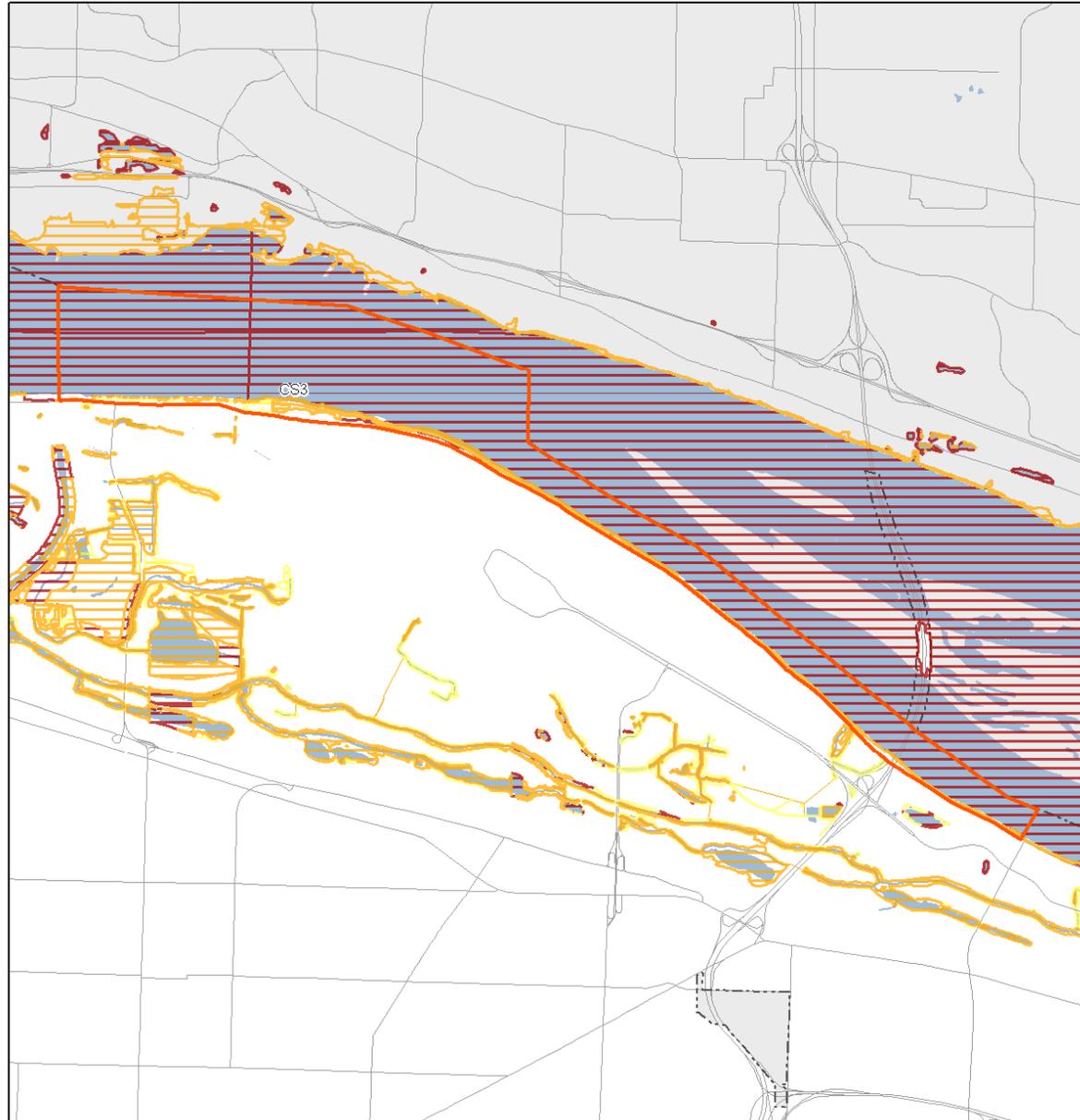
**City NRI Combined Riparian/
Wildlife Habitat Relative Ranks**

- Inventory Site
- Combined Relative Ranks**
- Special Habitat Areas (high)
- high relative rank
- medium relative rank
- low relative rank
- Water features**
- wetlands and waterbodies
- open channel
- piped

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Middle Columbia Corridor/Airport ESEE - Final Report



City of Portland Bureau of
Planning and Sustainability
 San Adams, Mayor | Susan Anderson, Director

Site CS3 - Map 4
 Central Columbia River

**Metro Title 13
 Habitat Conservation Areas**

Inventory Site

Habitat Conservation Areas

High

Moderate

Low

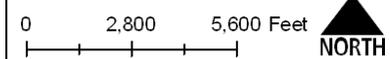
Water features

wetlands and waterbodies

open stream/drainageway

piped segment

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Middle Columbia Corridor/Airport ESEE - Final Report

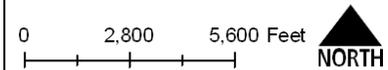


Site CS3 - Map 5
Central Columbia River

**Recommend Environmental
Overlay Zone Updates**

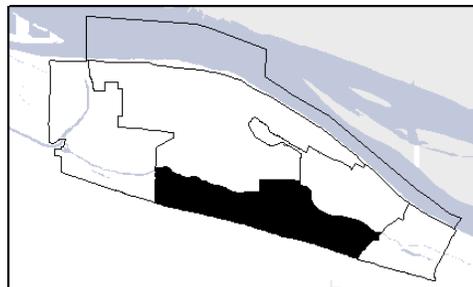
- Inventory Site
- Environmental Overlay Zones**
- Recommended Updates**
- protection zone
- conservation zone
- Existing/No Change**
- protection zone
- conservation zone
- Water features**
- wetlands and waterbodies
- open channel
- piped

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Middle Columbia Corridor/Airport ESEE - Final Report

Inventory Site CS4: Middle Slough and Whitaker Slough



Site Description: This site includes most of the main channel of the Middle Columbia Slough and Whitaker Slough, Whitaker Ponds and Johnson Lake. The site also contains a few wetlands and secondary drainageways, primarily found in and around the Colwood Golf Course. Narrow riparian gallery forest habitat, dominated by black cottonwood and Pacific willow, surrounds the open water features. The understory contains red osier dogwood and alder but is dominated by Himalayan blackberry and other invasive species. Much of the riparian areas have been revegetated by the Bureau of Environmental Services. The natural resources are generally degraded by extensive industrial development, Cornfoot Road and multiple culvert crossings.

Quarter Sections:

- 1N2E07c and d
- 1N2E15c
- 1N2E16a, b, c and d
- 1N2E17a, b, c and d
- 1N2E18a, b, c and d
- 1N2E21a

Conflicting Uses by City Base Zones:

Zone	Acres	Existing Conflicting Uses	Potential Conflicting Uses
IG2	706	Industrial, office, retail, commercial, roads/freeway, levee, recreation, education	office, retail, hotel, entertainment, industrial, commercial, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
EG2	202	Industrial, office, retail, commercial, roads/freeway, levee, recreation	office, retail, hotel, entertainment, industrial, commercial, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
R20	8	Single family residential, industrial and agriculture	residential, agricultural, institutional, broadcast facilities, rail line and utility corridors, temporary uses
RF	28	Single family residential, industrial and agriculture	residential, agricultural, institutional, mining, broadcast facilities, rail line and utility corridors, temporary uses
OS	153	Golf courses, levee	commercial, institutional, agricultural, mining, broadcast facilities, rail line and utility corridors, temporary uses

Summary of Natural Resources: The Middle Columbia Slough inventory site is 1,097 acres in size. There are approximately 501 acres of impervious area, including 17.2 miles of roads, located the site. A roughly 3.5-mile long section of the Columbia Slough main arm, the confluence of Whitaker Slough to I-205, Whitaker Slough, Whitaker Ponds and Johnson Lake are part of this site. There are also 26 acres of wetland and 2,220 linear feet of secondary drainageways, located in the site. The 173-acre flood area includes 66 acres of open water, 56 acres of vegetated flood area and 52 acres of non-vegetated flood

area. The Multnomah County Drainage District (MCDD) maintains the levees and water levels in the Columbia Slough to provide flood protection and stormwater conveyance. Vegetated areas at least ½ acre include approximately 98 acres of forest or dense tree canopy, 40 acres of woodland, 29 acres of shrubland and 214 acres of herbaceous cover. Table 42 provides a summary of the ranked resources; Map 3 depicts ranked natural resource feature.

Table 42: Summary of Ranked Resources in CS4: Middle Slough and Whitaker Slough				
Total Inventory Site	= 1,097 acres			
	High	Medium	Low	Total
Riparian Resources*				
acres	198	99	87	383
percent total inventory site area	18	9	8	35
Wildlife Habitat*				
acres	0	115	4	119
percent total inventory site area	0	10	<1	11
Special Habitat Areas**				
acres	322			
percent total inventory site area	29			
Wildlife Habitat - adjusted by Special Habitat Areas ***				
acres	322	18	3	342
percent total inventory site area	29	2	<1	31
Combined Total****				
acres	348	61	38	446
percent total inventory site area	32	6	4	42
* High-ranked riparian resources, Special Habitat Areas, and wildlife habitat includes the Willamette River				
** Special Habitat Areas rank high for wildlife habitat				
* Because riparian resources, Special Habitat Areas, and wildlife habitat overlap, the results cannot be added together to determine the combined results.				

Below are excerpts from the natural resources description for CS4: Middle Slough and Whitaker Slough in the *Middle Columbia Corridor/Airport Natural Resources Inventory* (Sept. 2010) report.

Middle Columbia Slough

The site contains approximately 3.5 miles of the Columbia Slough main channel; this section of the Columbia Slough is called the Middle Slough. The portion of the Middle Slough within the site is characterized by a low gradient channel and excess macrophyte growth that can impact flow and water quality. The riparian area adjacent to the Middle Slough is generally one to two trees in width. These areas are generally bottomland hardwood forest comprised of black cottonwood and red alder. Other native vegetation species present include Douglas-fir, western red cedar, snowberry, red-flowering currant, red-osier dogwood, Indian plum, Oregon grape, Nootka and swamp rose, and vine maple. Invasive plant species found throughout in the riparian area include Himalayan blackberry, Japanese knotweed and reed canary grass.

The Middle Slough and associated waterways are completely surrounded by levees and are contained within MCDD. The width of the Middle Slough waterway varies in general from 30-100 feet and the depth from 6 to 8 feet NGVD. The Columbia Slough is water quality limited for multiple parameters including bacteria, temperature, dissolved oxygen and biochemical oxygen demand (BOD), eutrophication (phosphorus, chlorophyll a, pH), heavy metals and total suspended solids.

The Middle Slough provides habitat for numerous fish and wildlife species including Willow Flycatchers, belted kingfishers, great blue herons, common merganser, Western painted turtle, river otter, nutria and beaver are some of the wildlife species that routinely use this riparian area. Habitat in the Middle Slough is affected by nearby development. Industrial development, including buildings, loading areas and parking lots, encroach into the riparian area fragmenting habitat and reducing shade potential from riparian vegetation.

Whitaker Slough

Whitaker Slough is a southern arm of the Middle Columbia Slough. Approximately 3.5 miles of Whitaker Slough, from the confluence with the Middle Slough to I-205, is located in this inventory site and is designated a Special Habitat Area (CS16.A-C). There are multiple ponds (e.g. Whitaker Ponds, Johnson Lake) and inlets that are hydrologically connected to Whitaker Slough. Whitaker Slough has significant areas of groundwater upwelling. The cool groundwater helps to moderate summer water temperatures. Cool water is a basic requirement for many aquatic species. The surrounding land uses are primarily industrial and commercial with a few remnant residences along the north bank of Whitaker Slough.

A narrow strip of riparian vegetation, two to three trees deep, surrounds Whitaker Slough. The dominant tree species include black cottonwood and red alder along with a heavily mixed understory of planted native trees and shrubs. Species present include: Douglas-fir, western red cedar, snowberry, red-flowering currant, red-osier dogwood, Indian plum, Oregon grape, Nootka and swamp rose, and vine maple. Some naturally-occurring western hazel, red-osier dogwood, and Pacific ninebark are additionally scattered in the understory. Invasive plant species found throughout in the riparian area including Himalayan blackberry, Japanese knotweed and reed canary grass.

Wildlife using Whitaker Slough and the riparian area include beaver, nutria, coyote, Great Blue Heron, Great Horned Owl, goldfinch, black cap chickadee, Oregon junco, American robin, violet-green swallow, Cooper's hawk and American widgeon. Migratory birds using Whitaker Slough include Western Tanager, Cassin's Vireo, and Black-throated Gray Warbler. Fish found in Whitaker Slough include Three-spined Stickleback, Mosquitofish, and Prickly Sculpin.

Whitaker Ponds

Whitaker Ponds consist of two ponds and surrounding riparian vegetation totaling about 14 acres just east of NE 47th Avenue and both are designated Special Habitat Areas (CS16.B). The western ponds and most of the eastern pond are owned and operated by City of Portland Bureau of Parks and Recreation and Metro Regional Government. The forested banks of Whitaker Ponds are predominantly black cottonwood and red alder along with a heavily mixed understory of planted native trees and shrubs. Species present include: Douglas-fir, western red cedar, snowberry, red-flowering currant, red-osier dogwood, Indian plum, Oregon grape, Nootka and swamp rose, and vine maple. Some naturally-occurring western hazel, red-osier dogwood, and Pacific ninebark are additionally scattered in the understory.

The ponds provide habitat for Western painted turtles, wintering waterfowl, songbirds, nesting great horned owls, and other wildlife species. During a spring 2009 site visit many birds were observed: great blue heron, goldfinch, black cap chickadee, Oregon junco, American robin, violet-green swallow, Cooper's hawk, ringneck duck, American widgeon, western merganser, mallard, and Canada goose. There was evidence of heavy beaver work on the cottonwoods on the north shore of east pond and on the red cedars just upslope. Coyote scat was also observed. Bat species that use Whitaker Ponds include California myotis, yuma myotis and silver-haired bat.

Whitaker Ponds has active groundwater upwelling areas, with visible springs, that helps keep the water temperatures cool during the summer. Cool water is a basic requirement for many aquatic species.

Colwood Golf Course

Colwood Golf Course is a 115-acre open-space site located along the Columbia Slough and Whitaker Slough. Stretches both the Middle Slough and Whitaker Slough flow through the golf course and there are four wetlands located here. The predominant vegetation type in the golf courses is maintained turf grasses with narrow strips of large trees. Several mature Oregon white oaks are present. The grassy areas are utilized by migratory geese and red tailed hawk.

There are wetlands located in the golf course that are surrounded by native, black cottonwood, ash, red alder, red-osier dogwood, and invasive vegetation, Himalayan blackberry. The two southern wetlands are adjacent to the Columbia Slough and have been designated Special Habitat Areas (CS16.B and CS17). The wetlands and associated vegetation provide foraging, nesting, perching and roosting habitat for flycatchers, warblers, woodpeckers, reptiles, and amphibians. Wildlife observed using the slough arms and the southern wetlands include American robin, marsh wren, redwing blackbird, Oregon junco, song sparrow, Anna's hummingbird, mourning dove, mallard, ringneck duck, American widgeon, Alaskan Geese beaver and nutria.

Golf courses, while highly manicured landscapes, provide some of the largest contiguously vegetated areas within the city. The complex of habitat features at Colwood Golf Course (Middle Slough, Whitaker Slough, multiple wetlands and riparian tree canopy) provide habitat for bat species. Golf courses, particularly riparian corridors with tree canopy, are utilized by a high concentration and diversity of migratory birds as they travel along the Pacific Flyway and Columbia River. It is likely that the trees located throughout the golf courses are also used by a high concentration of migratory birds.

The wetlands and arms of the slough are likely impacted by golf course maintenance including fertilizers, herbicides, pesticides and mowing.

Johnson Lake

Johnson Lake is a 42-acre remnant lake that is characteristic of historic lakes and wetlands in the Columbia Slough Watershed. It is the largest and most natural lake in Middle or Upper Columbia Slough. Johnson Lake discharges into Whitaker Slough. The lake experiences significant groundwater upwelling that introduces cold water into Whitaker Slough. Johnson Lake is designated a Special Habitat Area (CS16.C).

The forested areas surrounding Johnson Lake are composed of black cottonwood, red alder, and Oregon ash, some quite large. The understory is quite diverse with native shrubs including: red elderberry, snowberry, Pacific ninebark, western hazel, wild gooseberry, tall Oregon grape, Douglas spirea, red-osier dogwood, and black hawthorn. Johnson Lake and forested riparian area are important remnant habitats and home to nesting great horned owl, Osprey, numerous neotropical migratory songbirds and wintering waterfowl. Bird species found here include bufflehead, ring-necked duck, gadwall, American widgeon, lesser scaup, Wood Duck, Canvasback, Pied-billed Grebe, Double-crested Cormorant, goldfinch, scrub jay, song sparrow, American robin, European starling, downy woodpecker, mallard, juvenile bald eagle, and great blue herons and loons. Downed and floating logs in the pond provide turtle habitat.

Extending north from Johnson Lake is forest vegetation approximately 300 feet wide that provides a wildlife habitat corridor between the lake, Whitaker Slough and the Middle Slough. This is a high quality patch of ash-cottonwood forest with a snowberry-gooseberry understory and a nettle-fringecup herb layer. There are some bird cherry and holly trees within the site as well as ivy, wild clematis, and blackberry.

McBride Slough

Located to the west of NE 82nd Avenue is a secondary drainageway called McBride Slough. McBride Slough flows under NE 82nd where it connects up with another secondary drainageway called the PIC Ditches. Riparian vegetation west and south of McBride Slough is composed of black cottonwood and Oregon ash with a dense understory of snowberry and wild gooseberry. Several large oaks between 24-36 inches in diameter are present on the golf course edge of the forest. Ground cover is primarily moss

and nettles. The east and north riparian vegetation is primarily Himalayan blackberry and reed canary grass. During a site visit in March 2009, coyote, great horned owl, Cooper's hawk and red tailed hawk were observed.

Previous City Adopted ESEE Analysis: Natural resources in inventory site CS4: Middle Slough and Whitaker Slough were addressed in *Inventory and Analysis of Wetlands, Water Bodies and Wildlife Habitat Areas for the Columbia Corridor* (1989), *Natural Resources Protection Plan for the Columbia South Shore* (1993; 2000), and *Cascade Station/Portland International Center Plan District* (1999; 2007)

Inventory and Analysis of Wetlands, Water Bodies and Wildlife Habitat Areas for the Columbia Corridor (1989)

Resource sites 22, 23, 24, 25, 26, 34, 39, 40 and 41 address natural resources in inventory site CS4: Middle Slough and Whitaker Slough. These resource sites correspond with identified water features and associated riparian vegetation.

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.

There 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 such as the 40-mile Loop trail. 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.

Natural resources located in the Columbia Corridor are of high cultural and historic value.

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 open water bodies and riparian areas. The decision resulted in application of the environmental conservation overlay zone to the Columbia Slough, Whitaker Slough, Whitaker Ponds and Johnson Lake.

Natural Resources Protection Plan for the Columbia South Shore (1993, 2000)

The *Natural Resources Protection Plan for the Columbia South Shore* addressed resources located east of NE 82nd Avenue and north of Columbia Boulevard. Resource sites C, D, E, F and G are located in the study area and address the Columbia Slough, Whitaker Slough and Johnson Lake. Below is a summary of ESEE Analysis findings and decisions for the Columbia South Shore as they pertain to the study area.

Economic Analysis

Protection of natural resources in the Columbia South Shore will have both positive and negative economic impacts. Positive impacts will result from increased amenities, resulting in higher property values, attraction for tourist and related activities, more efficient use of public services and utility, and increased recreation potential. Negative impacts are greatest in industrial zones, where development potential is more limited by land area than floor-area ratios or number of units per give area. However, projected needs for industrial land in the City or even the Portland Metropolitan area is far less than the amount of land presently zoning for industrial uses and located out of hazard areas.

Social Analysis

Protection of natural resources will result in generally positive benefits of increased protection from natural disasters, decreased disaster relief costs, increased protection from incompatible land uses, increased sense of place, uniqueness, visual diversity and aesthetics, and greater education and recreational opportunities. Protection of natural resources could decrease safety for airplane approach (wintering waterfowl).

Environmental Analysis

For protection of water quality and quantity and wildlife habitat, a minimum of fifty feet from identified water bodies is necessary; although protection of land within 150 feet may be important for some water bodies. Protection of the water bodies will help stabilize flood flows, absorb impacts of sediment and other water-born pollutants and provide shading. The most important aspect of habitat and habitat protection within the Columbia Slough basin is water – sloughs, lakes, ponds, wetland and groundwater.

Energy Analysis

Considerable energy saving can be achieved through natural resources protection, particularly in terms of infrastructure provision and heating and cooling of structures. Transportation-related saving can also be substantial if alternative energy-efficient travel modes were integrated into the natural resource protection plan.

Decision

For resource sites C, D, E and G, strictly limit conflicting uses within the natural resource areas. This decision resulted in applying an environmental protection overlay zone to the Columbia Slough, Whitaker Slough and associated riparian vegetation. For resource site F, limit conflicting uses within the northeast corner of the site; strictly limit conflicting uses within the rest of the site. This resulted in

applying an environmental protection overlay zone to Johnson Lake and most of the Whitaker Slough and an environmental conservation overlay zone to 700 feet of the slough, just west of I-205, and the forested area between the main and southern arms of the slough.

Cascade Station/Portland International Center Plan District

The *Cascade Station/Portland International Center Plan District* was established in 1999. The purpose of the plan district was to encourage the development of a commercially viable mix of office, retail, hotel, entertainment and industrial employment uses while protecting significant environmental and archaeological features of the area. Protection of natural resources focused on stormwater management

The plan district states that design and development should create jobs and capitalize on unique infrastructure. Development should foster a vibrant mixed-use environment served by two major regional transportation facilities: the Portland International Airport and the Airport Light Rail. Development should be clustered around the plan district's two light rail stations, the Park Cllocks and key streets throughout the area. Some of the major issues identified for the plan district were:

- Maintaining the development opportunities provided for in the existing PUD granted to the Port of Portland in 1988
- Providing for certainty in the development of the area without discretionary approval;
- Coordinating with the City's Stormwater Management Manual for planting specifications
- Integrating environmentally sensitive stormwater management practices into the design standards of the plan district

As part of creating the plan district, other agreements and documents were approved that supported the goals of the plan district. For example, the Portland Development Commission provided a loan, up to \$14 million, to the Cascade Station Development Company to enforce a Development Agreement with that company for developing the land in Cascade Station/Portland International Center. There was also a Master Agreement put in place between the Port of Portland and the Cascade Station Development Company providing basic development standards and covenants, conditions and restrictions (CC&R's) to define the quality of development. These agreements address landscaping standards and water quality monitoring along with other items.

The *Cascade Station/Portland International Center Plan District* did not amend the ESEE decisions of the previous planning efforts: *Inventory and Analysis of Wetlands, Water Bodies and Wildlife Habitat Areas for the Columbia Corridor* (1989) and *Natural Resources Protection Plan for the Columbia South Shore* (1993; 2000).

Supplemental ESEE Analysis: The Middle Columbia Corridor/Airport general ESEE analysis and decision presented in the previous section and summarized in Table 43 below apply to inventory site CS4: Middle Slough and Whitaker Slough except for the modifications described in Table 44. **Note – Sections that are grayed out were not adopted by City of Portland City Council.**

Table 43: General ESEE Decision for the Middle Columbia Corridor/Airport Study Area			
Base Zone	Significant Natural Resources		
	High Ranked/ Special Habitat Area	Medium Ranked	Low Ranked
Industrial Employment (Port of Portland property)	<i>Limit</i> , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow , except Strictly Limit with 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Industrial Employment (Non-Port of Portland property)	<i>Limit</i> , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow , except Strictly Limit with 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Commercial	Strictly Limit	Limit , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Residential	Strictly Limit	Limit , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Open Space	Strictly Limit	Limit , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow

It is recommended that activities required to implement a FAA approved Wildlife Hazard Management Plan be allowed, or limited only by requiring on-site or off-site mitigation for adverse impacts on inventoried natural resources. The City would not require that adverse impacts be avoided or minimized prior to considering mitigation requirements. This approach could be achieved by establishing zoning provisions specifying that necessary wildlife hazard management activities may take place within environmental overlay zones, with mitigation. Standards and mitigation requirements could be located in the plan district or natural resources management plan. This approach could also be achieved through a development agreement or other appropriate tools.

Table 44: Supplemental ESEE Analysis for Site CS4: Middle Slough and Whitaker Slough	
Feature	Colwood Golf Course
Riparian Corridor/ Wildlife Habitat Relative Rank	High and/or Special Habitat Area
Characteristics	<ul style="list-style-type: none"> ▪ Open space base zone ▪ Active golf course activities ▪ Stream, drainageways and wetlands providing riparian corridor functions and wildlife habitat ▪ Tree canopy provides habitat for bat species and migratory birds
General ESEE Decision	<i>Strictly limit</i> conflicting uses in all high ranking resource areas
ESEE Implications	<p>The vegetated areas of the golf courses are proposed to be designated Special Habitat Areas because diverse concentrations of migratory birds use the tree canopy as stopover habitat; bat species roost in riparian trees and drink from and forage over open water bodies; and the provide connectivity between other habitat areas. The predominance of use by these wildlife species, and of riparian corridor and wildlife habitat functions within the golf course, is provided by the open water bodies and the vegetation located within 300 feet of the water bodies. The turf grass associated with the golf courses does not support grassland-associated species and provides limited habitat for generalist species.</p> <p>Golf courses provide recreation opportunities and access to open spaces and natural resources. Strictly limiting conflicting uses throughout the entire area of each golf course would significantly reduce the ability of the golf course to provide these recreational uses and would not meet city goals for recreation. It is possible manage the riparian corridors to maintain existing functions and mitigate for any open space development activities (e.g. paths, expanded paving area) on-site.</p>
Site-Specific ESEE Decision	<p>Within Colwood Golf Course:</p> <ul style="list-style-type: none"> ▪ <i>Strictly limit</i> conflicting uses within high ranking <u>riparian</u> resource areas and land within 50ft of the top-of-bank of streams, drainageways and wetlands; ▪ <i>Limit</i> conflicting uses within medium and low ranking <u>riparian</u> resource areas farther than 50ft from streams, drainageways and wetlands; and ▪ <i>Allow</i> conflicting uses in resource_areas that are not ranked for riparian corridor functions in the draft natural resource inventory.

The proposed decision for inventory site CS4: Middle Slough and Whitaker Slough is generally consistent with the previous ESEE analyses to limit or strictly limit uses within open waterways, wetlands and surrounding riparian vegetation. The proposed decision provides a greater level of protection to open drainageways, including the Columbia Slough and Whitaker Slough west of NE 82n Avenue and Whitaker Ponds. This is consistent with the City's approach to protect open channels and riparian vegetation throughout Portland.

Metro ESEE Decision: Metro analyzed the natural resource features within site CS1: Buffalo Slough and Peninsula Canal. 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. Differences are primarily a result of the City

- updates to the stream, wetland, flood area and vegetation data;
- mapping smaller vegetation units - ½ acre as compared to 1 acre; and
- 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 relates to criteria refinements that acknowledge local hydrologic and bank functions within a drainage district. Metro’s ESEE decision was to designate all vegetated flood area as a Habitat Conservation Area (HCA) and to limit conflicting uses in these areas. The City’s criteria have been refined to reflect the fact that within a drainage district the areas below base flood elevation are protected from flooding by the levee system. Because these areas do not flood, the City does not assign scores to these areas for floodplain-associated functions. In addition, the natural channel dynamics of these drainages are affected by drainage district management activities including removal of large wood from the drainage ways. Where such areas are not providing any of the other functions recognized in the inventory, they are not identified as significant natural resources and are therefore not subject to the City’s ESEE analysis.

Total Area = X acres	Title 13 Habitat Conservation Areas	City’s Significant Natural Resources
High	35	348
Medium	155	61
Low	49	38
Total	239	447

Implementation Tools

The recommended ESEE decisions can be implemented using a number of tools including: application of environmental overlay zones, establishment of specific code provisions in a plan district or natural resources management plan, and/or other appropriate tools. Below is an explanation of how the tools are proposed to be applied in Inventory Site CS4: Middle Slough and Whitaker Slough.

Environmental Overlay Zones

The primary tool recommended for implementing the ESEE decision is application of the environmental protection (p) overlay to areas where conflicting uses are to be strictly limited and environmental conservation (c) overlay to areas where conflicting uses are to 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.

	Total Acres	Existing Conservation Overlay	Existing Protection Overlay	Proposed Conservation Overlay	Proposed Protection Overlay
EG2	202	23	7	17	30
IG2	706	131	65	42	180
OS	153	33	7	57	40
R20	8	4	0	2	2
RF	28	8	0	4	7

Other Zoning Code Provisions

Activities required to implement a FAA approved Wildlife Hazard Management Plan would be identified in a plan district or natural resources management plan. Managing wildlife hazards typically includes converting the resources from one habitat type to another or by removing the resource. These activities would not be required to avoid or minimize impacts on natural resources. Mitigation for impacts on natural resources would be required. Specific standards and mitigation requirements would be identified in the code.

MAPS:

- 1) Aerial, site boundary
- 2) Adopted resource sites and existing environmental overlay zones
- 3) Combined Riparian Corridor/Wildlife Habitat Relative Ranks
- 4) Metro Title 13 HCAs
- 5) Proposed environmental overlay zones

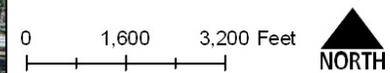


Site CS4 - Map 1
Middle Columbia Slough and
Whitaker Slough

2009 Aerial Photography

 Proposed Inventory Site

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.



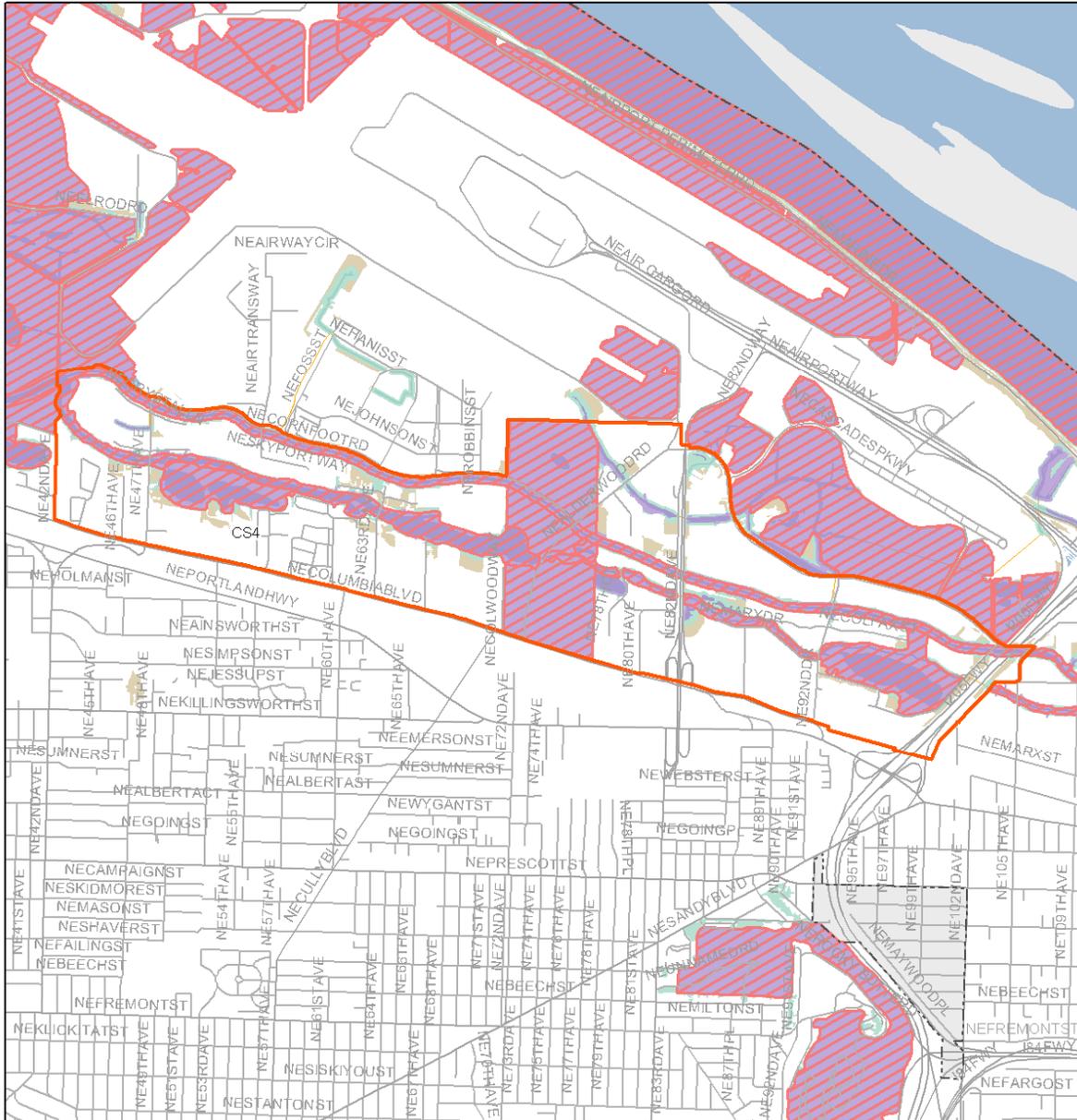
Middle Columbia Corridor/Airport ESEE - Final Report



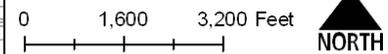
Site CS4 - Map 3
Middle Columbia Slough
and Whitaker Slough

City NRI Combined Riparian/
Wildlife Habitat Relative Ranks

- Inventory Site
- Combined Relative Ranks**
 - Special Habitat Areas (high)
 - high relative rank
 - medium relative rank
 - low relative rank
- Water features**
 - wetlands and waterbodies
 - open channel
 - piped



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City of Portland Bureau of
Planning and Sustainability
 San Adams, Mayor | Susan Anderson, Director

Site CS4 - Map 4
 Middle Columbia Slough
 and Whitaker Slough

**Metro Title 13
 Habitat Conservation Areas**

Inventory Site

Habitat Conservation Areas

High

Moderate

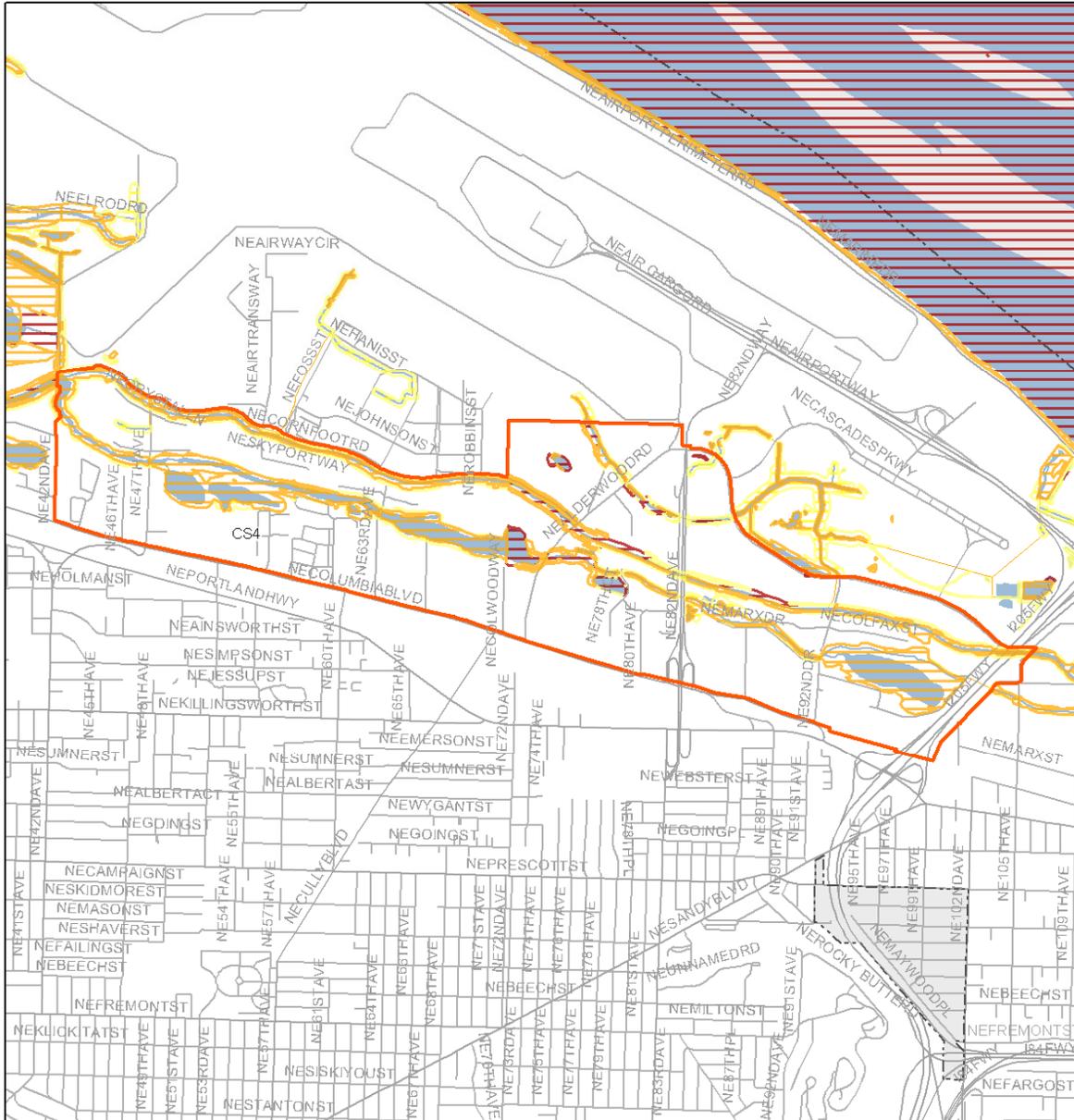
Low

Water features

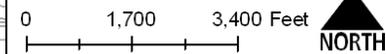
wetlands and waterbodies

open stream/drainageway

pipel segment

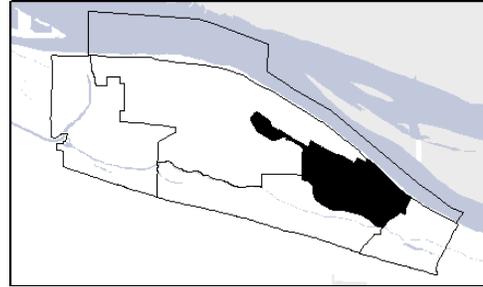


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Inventory Site CS5: Airport Way



Site Description: The Airport Way inventory site is 734 acres in size and is located between the Middle Columbia Slough and Columbia River. The site begins at the eastern edge of the I-205 right-of way, extends west down Airport Way, and ends at the airport terminal building (Map #). The site includes the Portland International Airport long-term and economy parking lots, hotels, car rental lots, and other commercial and aviation related uses along Airport Way and NE 82nd Avenue. The Portland International Center (PIC) is also within the site which includes IKEA and other commercial and industrial businesses. The PIC plan district limits development within riparian areas and allows development within the upland areas. The site includes a portion of I-205 and associated right-of-way including the on and off ramps for Airport Way, and the MAX light rail line and Cascade Station. There are upland and riparian natural resources located in the site as well as approximately 339 acres of impervious area, including 17.1 miles of roads.

Quarter Sections:

- 1N2E08a, b and d
- 1N2E09c and d
- 1N2E10c
- 1N2E15a, b and c
- 1N2E16a, b and d

Conflicting Uses by City Base Zones:

Zone	Acres	Existing Conflicting Uses	Potential Conflicting Uses
IG2	516	Portland International Airport terminal, office, retail, industrial, commercial, roads/freeway, levee	office, retail, hotel, entertainment, industrial, commercial, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
EG2	215	Retail, hotel, entertainment, commercial, roads/freeway, levee	office, retail, hotel, entertainment, industrial, commercial, agricultural, detention facilities, mining, broadcast facilities, rail line and utility corridors, temporary uses
OS	3	Marine Drive, levee	commercial, institutional, agricultural, mining, broadcast facilities, rail line and utility corridors, temporary uses

Summary of Natural Resources: The site contains 2.4 miles of secondary drainageways, including the PIC ditches, and 8 wetlands totaling 19 acres. There is no flood area within the site. The Multnomah County Drainage District (MCDD) maintains the water levels in the secondary drainageways to provide flood protection and stormwater conveyance for developed lands. Vegetated areas of at least ½ acre include approximately 8 acres of forest or dense tree canopy, 17 acres of woodland, 6 acres of shrubland and 233 acres of herbaceous cover. The natural resources in the inventory provide multiple ecosystem functions which are evaluated and ranked in the *Middle Columbia Corridor/Airport Natural Resources Inventory* (2010). Table 48 provides a summary of the ranked resources; Map 3 depicts ranked natural resource feature.

Table 48: Summary of Ranked Resources in CS5: Airport Way

Total Inventory Site = 734 acres				
	High	Medium	Low	Total
Riparian Resources*				
acres	32	51	64	147
percent total inventory site area	4	7	9	20
Wildlife Habitat*				
acres	0	22	0	22
percent total inventory site area	0	3	0	3
Special Habitat Areas*				
acres	199			
percent total inventory site area	27			
Wildlife Habitat - adjusted by Special Habitat Areas **				
acres	199	12	0	211
percent total inventory site area	27	2	0	29
Combined Total***				
acres	217	12	15	244
percent total inventory site area	30	2	2	34
** High-ranked riparian resources, Special Habitat Areas, and wildlife habitat includes the Willamette River				
** Special Habitat Areas rank high for wildlife habitat				
* Because riparian resources, Special Habitat Areas, and wildlife habitat overlap, the results cannot be added together to determine the combined results.				

Below are excerpts from the natural resources description for CS5: Airport Way in the *Middle Columbia Corridor/Airport Natural Resources Inventory* (Sept. 2010) report.

PIC Ditches and Wetlands

Within the site there are roughly 1.7 miles of secondary drainageways that collectively referred to by MCDD and the Port of Portland as the "PIC Ditches."¹ The PIC Ditches include remnants of historic drainageways and man-made agricultural ditches. The PIC Ditches provide ecosystem functions including: flow and hydrology, microclimate, nutrient cycling, food web and wildlife habitat. The PIC Ditches are actively maintained by the Multnomah County Drainage District (MCDD) for stormwater flow and conveyance. Maintenance includes mowing the bank, removing woody debris from the water and periodic dredging. The channels of the PIC Ditches are deeply incised, with steep banks. Much of the riparian area around the secondary drainageways is dominated by grasses, predominantly reed canary grass, and Himalayan blackberry with some areas of willow and red-osier dogwood. The banks are routinely mowed, reducing structural diversity and wildlife habitat. A Port of Portland mitigation site is located along the southern most secondary drainageway – PIC E-Zone Mitigation Site.

Just south of the IKEA parking lot and east of the Trimet MAX light rail tracks are three herbaceous wetlands and an associated drainageway. The northern two wetlands are 2.24 and 2.7 acres. Between the wetlands and Interstate 205 there are a few large trees. The predominant vegetation type in all three wetlands is reed canary grass. The following species were documented utilizing this area by Port of Portland staff between 2002 and 2009.

¹ Portions of the PIC Ditches are also known as Green Heron Slough.

PIC Grasslands

Within the *Cascade Station/Portland International Central Plan District* (PIC) there are roughly 240 acres of Special Habitat Area (SHA) CS24: Airport Upland Grasslands. In total, SHA CS24 encompasses roughly 1,000 acres of low herbaceous vegetation directly surrounding the Portland International Airport (PDX). Although the vegetation communities within this inventory site are not representative of a native grassland or prairie, the combination of the size of the open area, vegetation type, sandy fill and management activities causes the site to mimic some characteristics of a native grassland or prairie. As such, while this inventory site does not contain native grassland or prairie vegetation, the cumulative effect of all the grassy and sparsely vegetated areas around the airport, and absence of vertical structures, creates a contiguous 1,000-acre flat grassland-like habitat adjacent to the Columbia River that attracts a high diversity and concentration of migratory and grassland-associated wildlife species. Some of these species, such as savannah sparrows and European starlings, occur in great numbers in the inventory site; while other species, such as streaked horned larks and peregrine falcon occur in smaller numbers. Rare species that occur annually on migration include long-billed curlew and loggerhead shrike. While much of the resource function is attributed to the grasslands as a whole, there is some differentiation between different locations: Portland International Airport: 33rd Fields, Southwest Quadrant (SW Quad), Deicing Field, Fuel Farm, Airfield and PIC².

Vegetation varies more the PIC upland grasslands than in others, but is primarily made up of weedy herbaceous and shrubby plants. Invasive weeds such as thistle, teasel and Himalayan blackberry are common. The area is mowed once a year and targeted weed species are sprayed as needed.

PIC provides limited habitat for generalist species such as moles, voles, and other small mammals. Predators such as coyotes and raptors use them extensively for hunting grounds. A population of Western meadowlarks, a City of Portland special status species, occurs year round and has bred successfully at this site (Appendix D: Special Status Species in Portland). Non-special status birds that use the upland grassland habitat include savannah sparrow, American pipit, Lazuli bunting, barn swallow, cliff swallow, Western kingbird, red-winged blackbird and yellow-headed blackbird.

All of the upland grassland areas, including PIC, are part of one Special Habitat Area, CS24: Airport Upland Grasslands, because the habitats meet the criteria for migratory stopover (M), grassland-associated species use (G) and a connectivity corridor with the Columbia River (C). Some locations also meet the criterion for being vital for at risk species (S).

PIC E-zone Mitigation Site

Along NE Alderwood Road is a Port of Portland mitigation site. The PIC E-zone Mitigation Site is located along one of the PIC Ditches addressed in the previous section. The mitigation site is roughly [redacted] acres and is comprised of woodland containing black cottonwood, willow and ash. Reed canary grass, rushes and cattails are common at the water's edge. Wildlife observed in this section of the PIC Ditches and the surrounding riparian vegetation include American crow, American kestrel, Canada goose, European starling, great blue heron, great egret, great horned owl, mallard, pileated woodpecker, red-tailed hawk, western scrub jay, coyote and raccoon.

Economy Parking wetlands and drainageways

Two forested wetlands and associated drainageways are located in the Portland International Airport economy parking lot.

The western wetland and associated drainageways are vegetated with 50 to 60 year old cottonwood trees. The trees are routinely topped to comply with FAA regulations. The understory is dominated by Himalayan blackberry but willow and red-osier dogwood are also present. Emergent vegetation is present in the wetland. An unnamed remnant slough channel is present on the western part of the site. It is isolated from the Columbia River by the levee but is hydrologically connected to the Columbia Slough

² The other five upland grassland areas are located in inventory site CS2: Portland International Airport

via the Port's stormwater conveyance system. The wetland and drainageways provide ecosystem functions including: flow and hydrology, microclimate, nutrient cycling, food web and wildlife habitat. The wetlands and forest provide food, roosting, perching and nesting opportunities for waterfowl, shorebirds, songbirds, woodpecker and raptor. Reptile and amphibian utilization is also likely. Due to the proximity of the forest to the Columbia River, the area is likely used by migratory birds.

To the east, between Interstate 205 and the parking lot another forested area contains a drainageway and wetland that provide ecosystem functions including: flow and hydrology, microclimate, nutrient cycling, food web and wildlife habitat. The vegetation assemblage along the I-205 southbound off-ramp to Airport Way includes cottonwood with a predominantly Himalayan blackberry understory. During spring 2009 site visits, Cooper's hawk and coyote were observed in the forested area.

Previous City Adopted ESEE Analysis: Natural resources in inventory site CS5: Airport Way were addressed in three previous planning efforts: *Inventory and Analysis of Wetlands, Water Bodies and Wildlife Habitat Areas for the Columbia Corridor* (1989); *Natural Resources Protection Plan for the Columbia South Shore* (1993; 2000) and *Cascade Station/Portland International Center Plan District* (1999; 2007)

Inventory and Analysis of Wetlands, Water Bodies and Wildlife Habitat Areas for the Columbia Corridor (1989)

Resource sites 32, 33 and 34 address natural resources in inventory site CS5: Airport Way. These resource sites correspond with identified water features and associated riparian vegetation.

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.

There 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 such as the 40-mile Loop trail. 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.

Natural resources located in the Columbia Corridor are of high cultural and historic value.

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 applied resources site 32, 33 and 34.

Natural Resources Protection Plan for the Columbia South Shore (1993, 2000)

The *Natural Resources Protection Plan for the Columbia South Shore* addressed resources located east of NE 82nd Avenue and north of Columbia Boulevard. Resource sites A and B are located in the study area and address the PIC Ditches and the Economic Parking Forested Wetland. Below is a summary of ESEE Analysis findings and decisions for the Columbia South Shore as they pertain to the study area.

Economic Analysis

Protection of natural resources in the Columbia South Shore will have both positive and negative economic impacts. Positive impacts will result from increased amenities, resulting in higher property values, attraction for tourist and related activities, more efficient use of public services and utility, and increased recreation potential. Negative impacts are greatest in industrial zones, where development potential is more limited by land area than floor-area ratios or number of units per give area. However, projected needs for industrial land in the City or even the Portland Metropolitan area is far less than the amount of land presently zoning for industrial uses and located out of hazard areas.

Social Analysis

Protection of natural resources will result in generally positive benefits of increased protection from natural disasters, decreased disaster relief costs, increased protection from incompatible land uses, increased sense of place, uniqueness, visual diversity and aesthetics, and greater education and recreational opportunities. Protection of natural resources could decrease safety for airplane approach (wintering waterfowl).

Environmental Analysis

For protection of water quality and quantity and wildlife habitat, a minimum of fifty feet from identified water bodies is necessary; although protection of land within 150 feet may be important for some water bodies. Protection of the water bodies will help stabilize flood flows, absorb impacts of sediment and other water-born pollutants and provide shading. The most important aspect of habitat and habitat protection within the Columbia Slough basin is water – sloughs, lakes, ponds, wetland and groundwater.

Energy Analysis

Considerable energy saving can be achieved through natural resources protection, particularly in terms of infrastructure provision and heating and cooling of structures. Transportation-related saving

can also be substantial if alternative energy-efficient travel modes were integrated into the natural resource protection plan.

Decision

For resource sites A and B, limit conflicting uses within the natural resource areas.³ This decision resulted in maintaining the environmental conservation overlay zone for the PIC Ditches and Economic Parking Forested Wetland and surrounding riparian vegetation.

Cascade Station/Portland International Center Plan District

The *Cascade Station/Portland International Center Plan District* was established in 1999. The purpose of the plan district was to encourage the development of a commercially viable mix of office, retail, hotel, entertainment and industrial employment uses while protecting significant environmental and archaeological features of the area. Protection of natural resources focused on stormwater management.

The plan district states that design and development should create jobs and capitalize on unique infrastructure. Development should foster a vibrant mixed-use environment served by two major regional transportation facilities: the Portland International Airport and the Airport Light Rail. Development should be clustered around the plan district's two light rail stations, the Park Cllocks and key streets throughout the area. Some of the major issues identified for the plan district were:

- Maintaining the development opportunities provided for in the existing PUD granted to the Port of Portland in 1988
- Providing for certainty in the development of the area without discretionary approval;
- Coordinating with the City's Stormwater Management Manual for planting specifications
- Integrating environmentally sensitive stormwater management practices into the design standards of the plan district

As part of creating the plan district, other agreements and documents were approved that supported the goals of the plan district. For example, the Portland Development Commission provided a loan, up to \$14 million, to the Cascade Station Development Company to enforce a Development Agreement with that company for developing the land in Cascade Station/Portland International Center. There was also a Master Agreement put in place between the Port of Portland and the Cascade Station Development Company providing basic development standards and covenants, conditions and restrictions (CC&R's) to define the quality of development. These agreements address landscaping standards and water quality monitoring along with other items.

The *Cascade Station/Portland International Center Plan District* did not amend the ESEE decisions of the previous planning efforts: *Inventory and Analysis of Wetlands, Water Bodies and Wildlife Habitat Areas for the Columbia Corridor* (1989) and *Natural Resources Protection Plan for the Columbia South Shore* (1993; 2000).

³ The *Natural Resources Protection Plan for the Columbia South Shore* (1993; 2000) ESEE Analysis decision also includes applying a protection overlay zone to the Columbia Slough, which is located outside of inventory site CS5: Airport Way.

Supplemental ESEE Analysis: The Middle Columbia Corridor/Airport general ESEE analysis and decision presented in the previous section and summarized in Table 49 below apply to inventory site CS5: Airport Way except for the modifications described in Table 50. **Note – Sections that are grayed out were not adopted by City of Portland City Council.**

Table 49: General ESEE Decision for the Middle Columbia Corridor/Airport Study Area			
Base Zone	Significant Natural Resources		
	High Ranked/ Special Habitat Area	Medium Ranked	Low Ranked
Industrial Employment (Port of Portland property)	<i>Limit</i> , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow , except Strictly Limit with 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Industrial Employment (Non-Port of Portland property)	<i>Limit</i> , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow , except Strictly Limit with 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Commercial	Strictly Limit	<i>Limit</i> , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Residential	Strictly Limit	Limit , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow
Open Space	Strictly Limit	Limit , except Strictly Limit within 50ft of the top-of-bank of open streams, drainageways and wetlands	Allow

It is recommended that activities required to implement a FAA approved Wildlife Hazard Management Plan be allowed, or limited only by requiring on-site or off-site mitigation for adverse impacts on inventoried natural resources. The City would not require that adverse impacts be avoided or minimized prior to considering mitigation requirements. This approach could be achieved by establishing zoning provisions specifying that necessary wildlife hazard management activities may take place within environmental overlay zones, with mitigation. Standards and mitigation requirements could be located in the plan district or natural resources management plan. This approach could also be achieved through a development agreement or other appropriate tools.

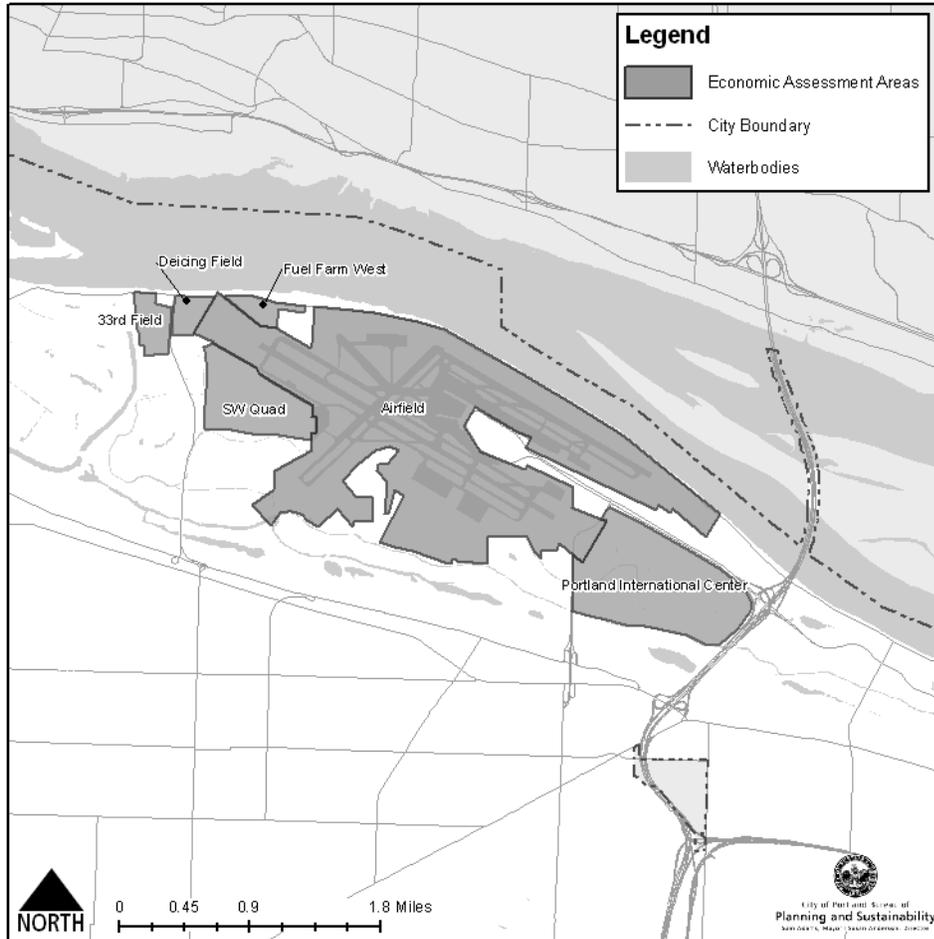
Supplemental Economic Analysis

An assessment of the economic development potential of six vacant or lesser improved areas was completed by the Bureau of Planning and Sustainability and the Port of Portland. The assessment looked at the suitability of each area for desired industrial development and other factors such as readiness for industrial development, access transportation options, and financial feasibility. The assessment addressed six sites: Airfield, Southwest Quadrant (SW Quad), 33rd Ave Field, Deicing Field, Fuel Farm West and Portland International Center (PIC) (Map 16). PIC is located in this inventory site and the other five areas are located in inventory site CS2: Portland International Airport.

Based on the analysis, the site most ready in the near-term for industrial development is PIC. PIC has all infrastructure in place, includes public transit and access to I-205 via Airport Way, in 1999 Portland City Council adopted the Cascade Station/PIC Plan District which targeted this area for industrial and employment development, and the Portland Development Commission identifies PIC as a target for cluster recruitment. The following is an excerpt from the 2005 Update to the Plan.

In 1999, the City adopted a vision that calls for Cascade Station/Portland International Center (CS/PIC) to be developed into a vibrant mixed-use employment center. It is to be developed in a way that takes advantage of the two light rail stations built in CS/PIC as part of the extension of MAX to Portland International Airport. Its northern subarea is to be a distinctive urban setting with well-designed office, retail, and hospitality uses around the light rail stations and along the Park Blocks. Its southern subarea will have job-rich industrial and employment uses also designed to support transit use. The development is to capitalize on its proximity to the Portland International Airport by having airport-related uses and buildings that complement airport design. At build-out, CS/PIC is to create over 7,000 jobs and further encourage the already active light rail ridership

Map 16: Economic Assessment Areas



	Airfield	Portland International Center	Southwest Quadrant	33rd Ave Field	Deicing Field	Fuel Farm West
Zoning	Industrial	Industrial	Industrial	Industrial	Industrial	Industrial
Regionally Significant Industrial Area	Yes	Yes	Yes	Yes	Yes	Yes
Size (acres)	553	197	186	54	36	39
Current Use	Aviation activity	Vacant; managed to reduce wildlife hazards	Vacant; managed to reduce wildlife hazards. airfield buffer	Vacant; managed to reduce wildlife hazards. airfield buffer	Deicing facilities; vacant; managed to reduce wildlife hazards. airfield buffer	Partially vacant; fuel tanks; stockpiles; managed to reduce wildlife hazards. airfield buffer
Possible Uses	no change	In 19XX, City Council adopted policies to ensure development (e.g. Post Office; warehouse and distribution; some office and retail, airport uses)	Runway dependent uses (e.g. cargo, aircraft maintenance)	Target industrial (e.g. sustainable industries, manufacturing)	Target industrial (e.g. sustainable industries, manufacturing)	Runway dependent uses (e.g. general aviation FBO)
Suitability for Desired Uses						
Aviation Dependent	yes	no	yes	no	no	Yes
PDC Target Cluster Recruitment ¹	no	yes	no	yes	maybe	maybe
Meet industrial land shortfall	no	yes	no	yes	maybe	maybe
Development Readiness	active airfield	shovel ready - mostly	fill/ infrastructure needed	fill/infrastructure needed including upgrades to MCDD facilities	infrastructure needed including upgrades to MCDD facilities	infrastructure needed including upgrades to MCDD facilities
Timeframe for availability	NA	Now	< 5 years	< 2 years	< 2 years	< 2 years
Natural Resources Inventory Ranking Resources (acres)						
Site Investments to Date	All infrastructure in place >\$1B	All infrastructure in place >\$75M	Fill and drainage to reduce wildlife hazard and increase development readiness.>\$4M	Wildlife habitat management (e.g. goose deterrents)	Wildlife habitat management (e.g. grading, vegetation, etc.) \$20M	Wildlife habitat management (e.g. grading, vegetation, etc.)
Transportation Access	Access to Runways	Access to Airport Way/I-205 and 82nd. Light Rail	Access to runways; access to 33rd Ave./Columbia Boulevard	Access to 33rd	Access to 33rd	Access to Runways; access to Marine Drive is a potential issue

¹ PDC's target clusters: Activewear/Outdoor Gear; Biosciences; Cleantech; Advanced Manufacturing; Software.

² Port Estimates and does not include land acquisition or ongoing maintenance

Table 50: Supplemental ESEE Analysis for Site CS5: Airport Way	
Feature	Upland grasslands, drainageways and wetlands located in the Portland International Center
Riparian Corridor/ Wildlife Habitat Relative Rank	High, Special Habitat Area
Characteristics	<ul style="list-style-type: none"> ▪ Industrial and employment base zone ▪ Cascade Station/Portland International Center Plan District ▪ Light rail ▪ Proximity to I-205, Columbia Boulevard and Portland International Airport ▪ Upland grassland habitat utilized by grassland-associated species and some at risk species ▪ Drainageways and wetlands
General ESEE Decision	<i>Limit</i> , except <i>Strictly Limit</i> within 50 ft of the top-of-bank of open streams, drainageways and wetlands
ESEE Implications	<p>The economic consequences of limiting conflicting uses within PIC upland grasslands would have negative economic impacts and does not support the policies and goals of the <i>Cascade Station/PIC Plan District</i> to target PIC for industrial and employment uses along the light rail line and in close proximity to the Portland International Airport. An allow decision for the upland grassy areas would better support the policies and goals of the <i>Cascade Station/PIC Plan District</i> while requiring future development to avoid impacts on streams and wetlands where practicable, or mitigate for unavoidable impacts.</p> <p>There are three wetlands, called the PIC Wetlands, located just south of IKEA. These wetlands are currently herbaceous wetlands that attract wildlife that pose a risk to aircraft safety. These wetlands are also identified by the Port as an opportunity to perform wetland mitigation for impacts to other wetlands on the airfield.</p> <p><i>Limiting</i> conflicting uses within 50 ft of the top-of-bank require development to avoid and minimize impacts to natural resources and mitigate for unavoidable impacts. The PIC Wetlands are comprised of three herbaceous wetlands and an associated drainageway. These wetlands provide a significant opportunity for habitat conversion to restore wetland functions and reduce attractants for wildlife species of concern.</p>
Site-Specific ESEE Decision	<i>Allow</i> conflicting uses within the PIC Upland Grassland Special Habitat Areas, except <i>limit</i> within 50ft of the top-of-bank of open streams, drainageways and wetlands, except <i>strictly limit</i> within 50ft of the top-of-bank of the PIC Wetlands.
Feature	Portland International Center E-zone Mitigation Site
Riparian Corridor/ Wildlife Habitat Relative Rank	High, medium and low
Characteristics	<ul style="list-style-type: none"> ▪ Port of Portland mitigation for impacts on natural resources ▪ Woodland vegetation assemblage surrounding an existing drainageway;

	supports a host of wildlife species <ul style="list-style-type: none"> ▪ Industrial base zone ▪ Public pedestrian trail
General ESEE Decision	<i>Limit</i> , except <i>Strictly Limit</i> within 50ft of the top-of-bank of open streams, drainageways and wetlands
ESEE Implications	The PIC E-zone Mitigation was required to mitigate for impacts on upland natural resources within an environmental overlay zone. After the mitigation was complete, a protection overlay zone was applied to the mitigation site to ensure long-term protection of the natural resources by strictly limiting conflicting uses. Changing from a strictly limit to a limit decision could have negative environmental consequences inconsistent with management of a mitigation site.
Site-Specific ESEE Decision	<i>Strictly limit</i> conflicting uses within Port of Portland mitigation sites.

The proposed decision for inventory site CS5: Airport Way is generally consistent with the previous ESEE analyses to limit conflicting uses within wetlands, streams, drainageways and riparian areas. The proposed decision upholds the previous decision to strictly limit conflicting uses within mitigation sites.

Metro ESEE Decision: Metro analyzed the natural resource features within site CS5: Airport Way. 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)).

Metro addresses Wildlife Hazard Management Plan areas in the provisions of Title 13 Nature in Neighborhoods. Title 13 states that any activity that is required to implement a Federal Aviation Administration (FAA)-compliant Wildlife Hazard Management Plan (WHMP) on property owned by the Port of Portland within 10,000 feet of an Aircraft Operating Area, as defined by the FAA, shall not have to avoid or minimize impacts to resources with habitat conservation areas. However, the Port must mitigate for impacts to habitat conservation areas that are a result of WHMP activities.

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 #) and Title 13 model ordinance regarding Wildlife Hazard Management Plan areas. Differences are primarily a result of the City

- updates to the stream, wetland, flood area and vegetation data;
- mapping smaller vegetation units - ½ acre as compared to 1 acre; and
- refinements to criteria developed evaluate the relative quality of riparian corridors and wildlife habitat.

Total Area = X acres	Title 13 Habitat Conservation Areas	City’s Significant Natural Resources
High	1	217
Medium	21	12
Low	40	15
Total	62	244

Implementation Tools

The recommended ESEE decisions can be implemented using a number of tools including: application of environmental overlay zones, establishment of specific code provisions in a plan district or natural resources management plan, and/or other appropriate tools. Below is an explanation of how the tools are proposed to be applied in Inventory Site CS5: Airport Way.

Environmental Overlay Zones

The primary tool recommended for implementing the ESEE decision is 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.

	Total Acres	Existing Conservation Overlay	Existing Protection Overlay	Proposed Conservation Overlay	Proposed Protection Overlay
EG2	215	0	0	1	1
IG2	516	15	8	47	30
OS	3	3	0	0	0

Other Zoning Code Provisions

Activities required to implement a FAA approved Wildlife Hazard Management Plan would be identified in a plan district or natural resources management plan. Managing wildlife hazards typically includes converting the resources from one habitat type to another or by removing the resource. These activities would not be required to avoid or minimize impacts on natural resources. Mitigation for impacts on natural resources would be required. Specific standards and mitigation requirements would be identified in the code.

Other Implementation Tools

Other tools may be appropriate to achieve the intent of the ESEE decision. For example, interagency agreements, development agreements, or other legal mechanisms could be established in lieu of an overlay zone to govern the implementation of comprehensive resource protection and mitigation strategies for large (>30 acres) vacant or lesser improved properties. Such strategies could be phased over a multi-year timeframe. Mitigation could be done in advance for extra credit, or phased with development.

The Port of Portland and City of Portland Bureau of Environmental Services have drafted an Intergovernmental Agreement (IGA) that, if approved by City Council and the Port Commission, would create a program for mitigation of upland grasslands and riparian resources in lieu of environmental conservation overlay zoning in the Portland International Center, Southwest Quadrant, 33rd Field, Deicing Field and Fuel Farm Field (Map 15). If the IGA is approved, the proposed environmental overlay zones will be removed from the official zoning maps.

MAPS:

- 1) Aerial, site boundary
- 2) Adopted resource sites and existing environmental overlay zones
- 3) Combined Riparian Corridor/Wildlife Habitat Relative Ranks
- 4) Metro Title 13 HCAs
- 5) Proposed environmental overlay zones

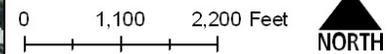


Site CS5 - Map 1
Airport Way

2009 Aerial Photography

 Proposed Inventory Site

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.



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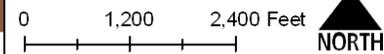
Site CS5 - Map 5
Airport Way

**Recommend Environmental
Overlay Zone Updates**

- Inventory Site
- Environmental Overlay Zones**
- Recommended Updates**
- protection zone
- conservation zone
- Existing/No Change**
- protection zone
- conservation zone
- Water features**
- wetlands and waterbodies
- open channel
- piped



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