185657

METRO

ATTACHMENT 8

Title 13

Nature in Neighborhoods

Ordinance & Exhibits

185657

BEFORE THE METRO COUNCIL

AMENDING THE REGIONAL FRAMEWORK PLAN AND THE URBAN GROWTH MANAGEMENT FUNCTIONAL PLAN RELATING TO NATURE IN NEIGHBORHOODS	)))))	ORDINANCE NO. 05-1077C Introduced by Michael Jordan, Chief Operating Officer, with the concurrence of David Bragdon, Council President

WHEREAS, nature in neighborhoods is critical to maintaining and improving the high quality of life, livability, and standard of living enjoyed by the people of the Metro region; and

WHEREAS, the Metro Council has expressed, as one of four central goals for the region, the aspiration that, "The region's wildlife and people thrive in a healthy urban ecosystem," and identified this goal as a priority for action; and

WHEREAS, the Metro region places a high priority on the protection of its streams, wetlands, and floodplains to maintain access to nature, sustain and enhance native fish and wildlife species and their habitats, mitigate high storm flows and maintain adequate summer flows, provide clean water, and create communities that fully integrate the built and natural environment; and

WHEREAS, the Regional Framework Plan provides that Metro will adopt programs to maintain and improve water quality and to protect fish and wildlife habitat in the region; and

WHEREAS, Metro adopted Title 3 to the Urban Growth Management Functional Plan in 1998 to maintain and improve water quality and protect people and property from flood hazards; and

WHEREAS, Title 3 also provides for Metro to study and develop a program for the protection and conservation of fish and wildlife habitat; and

WHEREAS, the Metro Policy Advisory Committee, comprised of elected officials and other citizens representing the region's cities and counties, adopted a "Vision Statement" in 2000 ("MPAC Vision Statement") to guide, inform, and be the philosophical underpinnings for the study, identification, and development of a fish and wildlife habitat protection program; and

WHEREAS, the MPAC Vision Statement established an overall goal to conserve, protect, and restore a continuous ecologically viable streamside corridor system, from the streams' headwaters to their confluence with other streams and rivers, and with their floodplains in a manner that is integrated with the surrounding urban landscape; and

WHEREAS, the MPAC Vision Statement recognized that this vision would have to be achieved through conservation, protection, and appropriate restoration of streamside corridors through time; and

WHEREAS, the Nature in Neighborhoods initiative has been proposed in Resolution No. 05-3574, which provides for Metro to implement a coordinated regional program to ensure that the region's natural areas and greenspaces are restored and protected; and

WHEREAS, Metro has undertaken the development of a fish and wildlife habitat protection program as one element of the Nature in Neighborhoods initiative consistent with Statewide Planning Goal 5, which is intended "to protect natural resources and conserve scenic and historic areas and open spaces," and with Oregon Administrative Rules chapter 660, Division 23, adopted by the Land Conservation and Development Commission to implement Goal 5 (the "Goal 5 Rule"); and

WHEREAS, Metro analyzed city and county habitat protection programs and concluded that habitat protection standards varied widely from city to city, and that the most regionally consistent standards were those adopted by cities and counties to comply with Metro's Title 3 water quality standards; and

WHEREAS, Metro has completed a region-wide inventory of regionally significant fish and wildlife habitat comprising 80,000 acres that has been located and classified for its ecological value and mapped to provide an information base for the region; and

WHEREAS, Metro has conducted an analysis of the economic, social, environmental, and energy (ESEE) consequences of protecting or not protecting the inventoried habitat in two phases and has developed this fish and wildlife habitat protection program based on that analysis; and

WHEREAS, through the study and development of the fish and wildlife habitat protection program, Metro identified new scientific information relating to water quality, and is therefore also adopting much of this element of the Nature in Neighborhoods initiative pursuant to Statewide Planning Goal 6, which is intended, in relevant part, "to maintain and improve the quality of the . . . water . . . resources of the state;" and

WHEREAS, fish and wildlife depend on clean, clear water in order to thrive, and all actions that protect water from becoming polluted by increased sedimentation, increased temperature, excessive nitrogen and nutrient levels, toxic chemicals, and other such pollutants is necessarily and inseparably linked with providing healthy, ecologically viable and stable fish and wildlife habitat; and

WHEREAS, as stated in Exhibit C, this ordinance is in furtherance of a comprehensive program in the Metro region for water pollution control, as a matter of protecting the public health and safety;

WHEREAS, the Federal Water Pollution and Control Act Amendments of 1972, 33 U.S.C. §1251 et seq. (the "Clean Water Act"), directs the administrator of the United States Environmental Protection Agency "in cooperation with other Federal agencies, State water pollution control agencies, interstate agencies, and municipalities and industries involved, prepare or develop comprehensive programs for preventing, reducing, or eliminating the pollution of the navigable waters and ground waters and improving the sanitary condition of surface and underground waters. In the development of such comprehensive programs due regard shall be given to the improvements which are necessary to conserve such waters for the protection and propagation of fish and aquatic life and wildlife, recreational purposes, and the withdrawal of such waters for public water supply, agricultural, industrial, and other purposes." 33 U.S.C. §1252; and

WHEREAS, as stated in Exhibit C, this ordinance is in furtherance of a comprehensive program in the Metro region to conserve the region's waters for the protection and propagation of

fish and wildlife, recreation purposes, and the withdrawal of such waters for public water supply, agricultural, industrial, and other purposes, as required by the Clean Water Act; and

WHEREAS, the Endangered Species Act, 16 U.S.C. §1531 et seq., was enacted "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species . . . ." 16 U.S.C. §1531(b); and

WHEREAS, Metro has catalogued the endangered and threatened species within the Metro region and this ordinance is in furtherance of a comprehensive program to conserve the ecosystem upon which endangered and threatened species depend; and

WHEREAS, in adopting new functional plan requirements as part of the comprehensive Nature in Neighborhoods initiative, Metro is committed to protecting the interests of property owners by implementing Statewide Ballot Measure 37 through a fair, efficient, and open claims process to be adopted on or before the effective date of this Ordinance; and

WHEREAS, Metro recognizes that local governments' implementation of the new functional plan requirements of the Nature in Neighborhoods initiative may give rise to Measure 37 claims by property owners against local governments and Metro is willing to assume responsibility for addressing those claims; now therefore

THE METRO COUNCIL ORDAINS AS FOLLOWS:

SECTION 1. The Regionally Significant Fish and Wildlife Habitat Inventory Map (the "Inventory Map"), attached hereto as Exhibit A and hereby incorporated by reference into this ordinance, is hereby adopted.

SECTION 2. Metro has analyzed the economic, social, environmental, and energy (ESEE) consequences that could result from a decision to allow, limit, or prohibit uses that conflict with the resource sites identified on the Inventory Map, consistent with Statewide Planning Goal 5 and OAR 660, Division 23. 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 3.07-13b and 3.07-13c in Exhibit C to this ordinance. Sections 4 through 9 of this ordinance are hereby adopted to implement Metro's determination to allow some conflicting uses and to limit some conflicting uses pursuant to Statewide Planning Goal 5.

SECTION 3. All parts of Sections 4 through 9 of this ordinance that require the region's cities and counties to substantially comply with new requirements applicable to areas within the Metro Urban Growth Boundary on the date this ordinance is adopted are hereby also adopted to maintain and improve water quality pursuant to Statewide Planning Goal 6. In addition, all parts of Sections 4 through 9 of this ordinance that will require the region's cities and counties to substantially comply with new requirements applicable to areas that will be identified as regionally significant riparian habitat that is brought within the Metro Urban Growth Boundary after the date this ordinance is adopted are hereby also adopted to maintain and improve water quality pursuant to Statewide Planning Goal 6.

SECTION 4. The Regional Framework Plan is amended as provided in Exhibit B, which is attached and hereby incorporated by reference into this ordinance.

SECTION 5. The Urban Growth Management Functional Plan, Metro Code chapter 3.07, is amended to add Title 13, entitled "Nature in Neighborhoods," as provided in Exhibit C, which is attached and hereby incorporated by reference into this ordinance.

SECTION 6. The Urban Growth Management Functional Plan, Metro Code chapter 3.07, is further amended as provided in Exhibit D, which is attached and hereby incorporated by reference into this ordinance.

SECTION 7. The Title 13 Nature in Neighborhoods Model Ordinance, attached as Exhibit E, is hereby adopted and incorporated by reference into this ordinance.

SECTION 8. The Findings of Fact and Conclusions of Law in Exhibit F (the "Findings") are hereby adopted and incorporated by reference into this ordinance. The Findings explain how this ordinance complies with state law, the Regional Framework Plan, and the Metro Code. All attachments to the Findings are part of the Findings and are also hereby incorporated by reference into this ordinance.

SECTION 9. The provisions of this ordinance are separate and severable. In the event that any one or more clause, sentence, paragraph, section, subsection, or portion of this ordinance or the application thereof to any city, county, person, or circumstance is held invalid, illegal, or unenforceable in any respect, the validity, legality, and enforceability of the remaining provisions of this ordinance or its application to other cities, counties, persons, or circumstances shall not be affected.

SECTION 10. The map revisions described in Exhibit G are hereby approved. The Chief Operating Officer shall prepare final copies of all maps adopted with this ordinance to reflect the map revisions described in Exhibit G and all other provisions of this ordinance. The Chief Operating Officer shall also produce an updated Attachment 5 to Exhibit F to reflect these map revisions. The Chief Operating Officer shall complete the updated table and final maps, including quadrangle 1:28,000 scale Inventory and HCA maps, and make them available to the public not later than the effective date of this ordinance.

SECTION 11. This ordinance shall take effect 90 days after it is adopted.

ADOPTED by the Metro Council this _____ day of _____, 2005.

_____
David Bragdon, Council President

Attest:

Approved as to Form:

Christina Billington, Recording Secretary

Daniel B. Cooper, Metro Attorney

M:\attorney\confidential\07 Land Use\04 2040 Growth Concept\03 UGMFP\02 Stream Protection (Title 3)\02 Goal 5\02 Program\Ord 05-1077B\Ord 05-1077B 071405.doc

EXHIBIT A—ORDINANCE NO. 05-1077C

REGIONALLY SIGNIFICANT FISH AND WILDLIFE HABITAT INVENTORY MAP (the "Inventory Map")

Available for review in the Metro Council's files (see map labeled "Ordinance No. 05-1077B," but note that additional revisions were approved as described in Section 10 of the ordinance) or from the Metro Data Resource Center, 600 N.E. Grand Ave., Portland, OR 97232. Electronic and printed copies of maps, in any reasonable scale and size required, may be purchased from the Data Resource Center. This map may also be available via Metro's website at: **www.metro-region.org/nature**.

EXHIBIT B—ORDINANCE NO. 05-1077C

REGIONAL FRAMEWORK PLAN AMENDMENTS

NOTE: The Regional Framework Plan (RFP) was revised and updated by Ordinance No. 05-1086, approved by the Metro Council on August 18, 2005, and effective November 16, 2005. The following amendments are to the revised RFP adopted by Ordinance No. 05-1086.

Amendment 1. In the RFP Chapter entitled, "Summary of Growth Concept," the section entitled, "Open Spaces and Trail Corridors" shall be amended as follows:

Open Spaces and Trail Corridors

Recognition and protection of open spaces both inside the UGB and in rural reserves are reflected in the Growth Concept. The areas designated open space on the Concept map are parks, stream and trail corridors, wetlands and floodplains, largely undeveloped upland areas and areas of compatible very low-density residential development. Many of these natural features already have significant land set aside as open space. The Tualatin Mountains, for example, contain major parks such as Forest Park and Tryon Creek State Park and numerous smaller parks such as Gabriel Park in Portland and Wilderness Park in West Linn. Other areas are oriented toward wetlands and streams.

Designating these areas as open spaces has several effects. First, it removes these lands from the category of urban land that is available for development. The capacity of the UGB then has to be calculated without these areas, and plans to accommodate housing and employment have to be made without them. Second, these natural areas, along with key rural reserve areas, receive a high priority for purchase as parks and open space, through programs such as Metro's Open Spaces Acquisition program. Finally, ~~regulations should be~~ functional plan requirements have been developed~~,~~ to protect critical ~~natural areas that would not~~fish and wildlife habitat areas without conflicting with housing and economic goals. This will provide protection of environmentally critical ~~creek~~ areas, compatible ~~low-density~~ development of sensitive areas, and allow transfer of development rights from protected natural areas to other lands better suited for development.

Amendment 2. The "Fundamentals" section of RFP Chapter 1 entitled, "Land Use," shall be amended by inserting the following text after the paragraph referring to "Fundamental 2":

"Fundamental 3: Protect and restore the natural environment including fish and wildlife habitat, streams and wetlands, surface and ground water quality and quantity, and air quality."

Amendment 3. RFP Chapter 1 entitled, "Land Use," shall be amended by adding section 1.9.12, "Protection of Regionally Significant Fish and Wildlife Habitat," which shall provide as follows:

1.9.12 Conduct an inventory of regionally significant fish and wildlife habitat for all lands being considered for inclusion in the UGB, in order to:

a. Consider whether urbanization can occur consistent with policies that call for protection of regionally significant fish and wildlife habitat.

b. Limit future conflicts between urbanization and the protection of regionally significant fish and wildlife habitat by examining the impacts upon the ecological quality and integrity of such habitat whenever the Council has discretion to choose between potential lands to be added to the UGB.

Amendment 4. Section 1.10, entitled "Urban Design," shall be amended as follows:

1.10 Urban Design

It is the policy of the Metro Council to:

1.10.1 Support the identity and functioning of communities in the region through:

a. Recognizing and protecting critical open space features in the region.

b. Developing public policies that encourage diversity and excellence in the design and development of settlement patterns, landscapes and structures.

c. Ensuring that incentives and regulations guiding the development and redevelopment of the urban area promote a settlement pattern that:

i) Links any public incentives to a commensurate public benefit received or expected and evidence of private needs.

ii) Is pedestrian "friendly," encourages transit use and reduces auto dependence.

iii) Provides access to neighborhood and community parks, trails and walkways, and other recreation and cultural areas and public facilities.

iv) Reinforces nodal, mixed-use, neighborhood-oriented design.

v) Includes concentrated, high-density, mixed-use urban centers developed in relation to the region's transit system.

vi) Is responsive to needs for privacy, community, sense of place and personal safety in an urban setting.

vii) Facilitates the development and preservation of affordable mixed-income neighborhoods.

viii) Avoids and minimizes conflicts between urbanization and the protection of regionally significant fish and wildlife habitat.

1.10.2 Encourage pedestrian- and transit-supportive building patterns in order to minimize the need for auto trips and to create a development pattern conducive to face-to-face community interaction.

Amendment 5. RFP Chapter 3 entitled, "Parks, Natural Areas, Open Spaces And Recreational Facilities," shall be renamed, "Nature in Neighborhoods," and the policies therein shall be amended as follows:

3.1 Inventory of Park Facilities and Identification and Inventory of Regionally Significant Parks, Natural Areas, Open Spaces, Fish and Wildlife Habitat, Trails and Greenways

It is the policy of the Metro Council to:

3.1.1 Ensure coordinated protection and enhancement of natural functions such as water quality and wildlife habitat across jurisdictional boundaries by inventorying and identifying regionally significant parks, natural areas, open spaces, fish and wildlife habitat, vacant lands, trails and greenways at the watershed level using topographical, geologic and biologic functions and features, i.e., "landscape ecology."

3.1.2 Identify natural corridors that connect regionally significant parks, natural areas, open spaces, fish and wildlife habitat, trails and greenways. River and stream corridors, ridgelines, butte-tops, utility corridors, abandoned roads, and railroad rights-of-way will provide primary linkages.

3.1.3 Inventory lands outside the Urban Growth Boundary and Metro's jurisdictional boundary and identify them as prospective components of the Regional System when protection of these lands is determined to be of direct benefit to the region.

3.1.4 Identify urban areas which are deficient in natural areas and identify opportunities for acquisition and restoration.

3.1.5 Update the parks inventory (first completed in 1988) every five (5) years, including acreage, facilities, environmental education programs, cultural resources, existing school sites and other information as determined by Metro.

3.1.6 Inventory the urban forestry canopy, using appropriate landscape level techniques, such as remote sensing or aerial photo interpretation, on a periodic basis and provide inventory information to local jurisdictions.

3.2 Protection of Regionally Significant Parks, Natural Areas, Open Spaces, Fish and Wildlife Habitat, Trails and Greenways

It is the policy of the Metro Council to:

3.2.1 Continue developing a Regional System of Parks, Natural Areas, Open Spaces, Fish and Wildlife Habitat, Trails, and Greenways (the Regional System) to achieve the following objectives:

a) Protect the region's biodiversity;

b) Provide citizens opportunities for, primarily, natural resource dependent recreation and education;

c) Contribute to the protection of air and water quality and watershed health; and

d) Provide natural buffers and connections between communities.

3.2.2 Finance and coordinate protection and management of the Regional System across jurisdictional boundaries upon the advice of citizens, and in coordination with local governments and state and federal resource agencies and appropriate non-profit organizations.

3.2.3 Use strategies to protect and manage the Regional System ~~and regional Goal 5 resources~~ including, but not ~~be~~ limited to, acquisition, education, incentives, land use and environmental regulations. Implement these strategies regionally and coordinate and encourage these strategies to be implemented by local governments, special districts, businesses, non-profit organizations, and individuals.

3.2.4 Include lands inside and outside the UGB and Metro's jurisdiction in the Regional System when protection of these lands are determined to be of direct benefit to the region.

3.2.5 Collect and evaluate baseline data related to natural resource values of the ~~r~~Regional ~~s~~System to identify trends and to guide management decisions.

3.2.6 Seek to avoid fragmentation and degradation of components of the Regional System caused by new transportation and utility projects. If avoidance is infeasible, impacts shall be minimized and mitigated.

3.2.7 Work with the State of Oregon to update, reinvigorate and implement a Willamette River Greenway Plan for the metropolitan region, in conjunction with affected local governments.

3.2.8 Protect Fish and Wildlife Habitat to achieve the following objectives:

a. Performance objectives:

i) Preserve and improve streamside, wetland, and floodplain habitat and connectivity;

ii) Preserve large areas of contiguous habitat and avoid habitat fragmentation;

iii) Preserve and improve connectivity for wildlife between riparian corridors and upland wildlife habitat; and

iv) Preserve and improve special habitat of concern, including native oak habitats, native grasslands, wetlands, bottomland hardwood forests, and riverine islands.

b. Implementation objectives:

i) Increase the use of habitat-friendly development throughout the region; and

ii) Increase restoration and mitigation actions to compensate for adverse effects of new and existing development on ecological function.

3.3 Management of the Publicly-Owned Portion of the Regional System of Parks, Natural Areas, Open Spaces, Fish and Wildlife Habitat, Trails and Greenways

3.3.1 Assume management responsibility for elements of the publicly owned portion of the Regional System, as outlined in a functional plan to be developed.

3.3.2 Assume financial responsibility related to those portions of the publicly owned system which are managed by Metro.

3.3.3 Give local governments an opportunity to transfer existing publicly owned components of the Regional System to Metro and to acquire components of the Regional System with local resources.

3.3.4 Manage the publicly owned portion of the Regional System to protect fish, wildlife, and botanic values and to provide, primarily, natural resource dependent recreational and educational opportunities.

3.3.5 Acquire portions of the Regional System as financial resources allow by negotiating with willing sellers and using the power of eminent domain only in extraordinary circumstances.

3.3.6 Insure that public use is compatible with natural and cultural resource protection for components of the Regional System by creating Master/Management plans that strive to achieve that objective prior to formal public use.

3.3.7 Be responsive to recreation demands and trends identified in the State Comprehensive Outdoor Recreation Plan (SCORP), along with local government cooperators in the Regional System.

3.3.8 Develop master planning guidelines to assure consistency in the management of the Regional System.

3.3.9 Convene local government park providers to share information, review and analyze issues from time to time or in conjunction with the periodic update of the region-wide parks inventory and, if appropriate, develop recommendations related to:

a. Roles and responsibilities

b. Funding

c. Levels of service

d. Information needs

e. User trends and preferences

f. Technical assistance

g. Interagency coordination

h. Public involvement

i. Other topics as determined by Metro and local park providers

3.3.10 Pursue the identification and implementation of a long term, stable funding source to support the planning, acquisition, development, management and maintenance of the Regional System in cooperation with local governments.

3.4 Protection, Establishment and Management of a Regional Trails System
It is the policy of the Metro Council to:

3.4.1 Identify a Regional Trails System which shall be included in the Regional Transportation Plan.

3.4.2 Provide access to publicly owned parks, natural areas, open spaces, and greenways, where appropriate via the Regional Trails System.

3.4.3 Coordinate planning for the Regional Trails System with local governments, federal and state agencies, utility providers, and appropriate non-profit organizations.

3.4.4 Cooperate with citizens and other trail providers to identify and secure funding for development and operation of the Regional Trails System.

3.4.5 Encourage local governments to integrate local and neighborhood trail systems with the Regional Trails System.

3.5 Provision of Community and Neighborhood Parks, Open Spaces, Fish and Wildlife Habitat, Natural Areas, Trails and Recreation Programs
It is the policy of the Metro Council to:

3.5.1 Recognize that local governments remain responsible for the planning and provision of community and neighborhood parks, local open spaces, natural areas, sports fields, recreational centers, trails, and associated programs within their jurisdictions.

3.5.2 Encourage local governments to (i) adopt level of service standards for provision of parks, natural areas, trails, and recreational facilities in their local comprehensive plans; and (ii) locate and orient such parks, open spaces, natural areas, trails, etc., to the extent practical, in a manner which promotes non-vehicular access.

3.5.3 Encourage local governments to be responsive to recreation demand trends identified in the State Comprehensive Outdoor Recreation Plan (SCORP).

3.5.4 Encourage local governments to develop, adopt and implement Master Plans for local parks and trail systems, natural areas, and recreational programs.

3.5.5 Work in cooperation with local governments, state government, and private industry to establish a supplemental funding source for parks and open spaces acquisition, operations and maintenance.

3.5.6 Encourage local governments to identify opportunities for cooperation and cost efficiencies with non-profit organizations, other governmental entities, and local school districts.

3.5.7 Require that no urban reserve areas be brought into the UGB unless the Urban Reserve master plans demonstrate that planning requirements for the acquisition and protection of regionally significant fish and wildlife habitat and adequate land to meet or exceed locally adopted levels of service standards for the provision of public parks, natural areas, trails, and recreational facilities, be adopted in the local comprehensive plans.

3.5.8 Develop a functional plan in cooperation with local governments establishing the criteria which local governments address in adopting a locally determined "level of service standard," establishing region-wide goals for the provision of parks and open spaces in various urban design types identified in the 2040 Growth Concept and applying this to the portion of the region within the UGB and the urban reserves within Metro's jurisdiction when urban reserve conceptual plans are approved.

3.5.9 Work with local governments to promote a broader understanding of the importance of open spaces to the success of the 2040 Growth Concept and develop tools to assess open spaces on a parity with jobs, housing, and transportation targets in the Regional Framework Plan.

3.6 Participation of Citizens in Environmental Education, Planning, Stewardship Activities, and Recreational Services.

It is the policy of the Metro Council to:

3.6.1 Encourage public participation in natural, cultural and recreation resource management decisions related to the Regional System.

3.6.2 Provide educational opportunities to enhance understanding, enjoyment and informed use of natural, cultural, and recreational resources.

3.6.3 Provide and promote opportunities for the public to engage in stewardship activities on publicly owned natural resource lands and encourage cooperative efforts between Metro and private non-profit groups, community groups, schools and other public agencies.

3.6.4 Provide opportunities for technical assistance to private landowners for stewardship of components of the Regional System.

3.6.5 Work together with local governments with state, federal, non-profit and private partners to facilitate stewardship and educational opportunities on publicly owned natural resource lands.

3.6.6 Encourage local governments to provide opportunities for public involvement in the planning and delivery of recreational facilities and services.

3.6.7 Follow and promote the citizen participation values inherent in ~~RUGGO Goal 1, Objective 1~~Policy 1.13 and the Metro Citizen Involvement Principles.

Amendment 6. RFP Chapter 4 entitled, "Water Management," shall be renamed, "Watershed Health and Water Quality."

Amendment 7. The "Fundamentals" section of RFP Chapter 4 shall be amended by inserting the following text after the paragraph referring to "Fundamental 2":

"Fundamental 3: Protect and restore the natural environment including fish and wildlife habitat, streams and wetlands, surface and ground water quality and quantity, and air quality."

Amendment 8. Section 4.3 entitled, "Water Quality," shall be amended as follows:

4.3 Water Quality

It is the policy of the Metro Council to:

4.3.1 Protect, enhance, and restore the water quality of the region by:

a. Implementing and coordinating watershed-wide planning.

b. Promoting the protection of natural areas along waterways and encouraging continuous improvement of water quantity and quality through liaison with agencies that influence changes along streams, rivers and wetlands in the Metro region.

c. Establishing and maintaining vegetative corridors along streams.

d. Encouraging urban development practices that minimize soil erosion.

e. Implementing best management practices (BMPs).

f. ~~Maintaining vegetated buffers along riparian areas~~Establishing standards to conserve, protect, and enhance riparian fish and wildlife habitat.

g. Protecting wetlands values with sufficient buffers to maintain their water quality and hydrologic function.

Amendment 9. Section 4.6 entitled, "Fish and Wildlife Habitat Conservation," shall be deleted.

Amendment 10. The chart entitled, "Implementation Methods for the Regional Framework Plan," in RFP Chapter 8 entitled, "Implementation," shall be amended as follows:

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Implementation Method for the Regional Framework Plan

Regional Framework Policy	Implementation Recommendation(s) or Requirements
Land Use	
1.1 Urban Form	• Metro Code 3.07, Urban Growth Management Functional Plan (UGMFP), Titles 1, 2, 6, 11 and 13~~1~~ • MTIP program • TOD program
1.2 Built Environment	• Metro Code 3.07, UGMFP, Titles 1 through 7, 11 and 12 ~~Titles 1 through 7, 11, and 12~~ • Regional Transportation Plan
1.3 Housing and Affordable Housing	• Metro Code 3.01, Urban Growth Boundary and Urban Reserve Procedures • Metro Code 3.07, UGMFP Titles 1, 7 and 11
1.4 Economic Opportunity	• Metro Code 3.07, UGMFP, Titles 1 and 4 ~~Titles 1 and 4~~
1.5 Economic Vitality	• ~~Title 1 of the UGMFP~~ Metro Code 3.07, UGMFP, Title 1
1.6 Growth Management	• Metro Code 3.01 UGB Amendment Procedures3.01.005 UGB Amendment Procedures • 3.01.020 Legislative Amendment Criteria • Metro Code 3.06 Policy & Purpose: Designating Functional Planning Areas • Metro Code 3.07, ~~Urban Growth Management Functional Plan:~~UGMFP, Titles 1 to 7, 11 and 12
1.7 Urban/Rural Transition	• Metro Code Chapter 3.01, UGB Amendment Procedures • 3.01.005 UGB Amendment Procedures • 3.01.020 Legislative Amendment Criteria • Metro Code 3.06, Policy & Purpose: Designating Functional Planning Areas • Metro Code 3.07, ~~Urban Growth Management Functional Plan~~UGMFP, Title 5 ~~Title 5~~

Regional Framework Policy	Implementation Recommendation(s) or Requirements
Land Use	
1.8 Developed Urban Land	• Metro Code 3.01, UGB Amendment Procedures • 3.01.005 UGB Amendment Procedures • 3.01.020 Legislative Amendment Criteria • Metro Code 3.06, Policy & Purpose: Designating Functional Planning Areas • Metro Code 3.07, ~~Urban Growth Management Functional Plan~~UGMFP, Titles 1 to 7 ~~Titles 1 to 7~~
1.9 Urban Growth Boundary	• Metro Code 3.01, UGB Amendment Procedures • 3.01.005 UGB Amendment Procedures • 3.01.020 Legislative Amendment Criteria • Metro Code 3.07, UGMFP, Title 13
1.10 Urban Design	• Metro Code 3.07, ~~Urban Growth Management Functional Plan~~UGMFP, Titles 1 and 13 ~~Title 1~~
1.11 Neighbor Cities	• Metro Code 3.07, ~~Urban Growth Management Functional Plan~~UGMFP, Title 5 ~~Title 5~~ • Signed Intergovernmental Agreements
1.12 Protection of Agriculture	• Metro Code Chapter 3.01 UGB Amendment Procedures • 3.01.005 • 3.01.020 Legislative Amendment Criteria
1.13 Participation of Citizens	• Resolution No. 97-2433 • Metro Code 2.12 Office of Citizen Involvement
1.14 School and Local Government Plan and Policy Coordination	• Metro Code 3.01.005.c(4), 3.01.030.a, UGB Amendment Procedures • Metro Code 3.07, ~~Urban Growth Management Functional Plan~~UGMFP, Title 11
1.15 Centers	• Metro Code 3.07, ~~Urban Growth Management Functional Plan~~ UGMFP, Title 6 ~~Title 6~~
1.16 Residential Neighborhoods	• Metro Code 3.07, ~~Urban Growth Management Functional Plan~~UGMFP, Title 12 ~~Title 12~~

Regional Framework Policy	Implementation Recommendation(s) or Requirements
Transportation	
2.1 Public Involvement	• Transportation Planning Public Involvement Policy • Metro Code 2.12.010, Office of Citizen Involvement: Creation and Purpose Regional Transportation Plan Policy 1.0
2.2 Intergovernmental Coordination	• Regional Transportation Plan Policy 2.0 • Metro Code, 3.07, Title 5
2.3 Urban Form	Regional Transportation Plan Policy 3.0
2.4 Consistency between Land Use and Transportation Planning	Regional Transportation Plan Policy 4.0
2.5 Barrier-Free Transportation	Regional Transportation Plan Policy 5.0
2.6 Interim Job Access and Reverse Commute Policy	Regional Transportation Plan Policy 5.1
2.7 Transportation Safety and Education	Regional Transportation Plan Policy 6.0
2.8 Natural Environment	Regional Transportation Plan Policy 7.0
2.9 Water Quality	• Regional Transportation Plan Policy 8.0 • Metro Code, 3.07, Title 3
2.10 Clean Air	Regional Transportation Plan Policy 9.0
2.11 Energy Efficiency	Regional Transportation Plan Policy 10.0
2.12 Regional Street Design	Regional Transportation Plan Policy 11.0
2.13 Local Street Design	Regional Transportation Plan Policy 12.0
2.14 Regional Motor Vehicle System	Regional Transportation Plan Policy 13.0
2.15 Regional Public Transportation System	Regional Transportation Plan Policy 14.05
2.16 Public Transportation Awareness and Education	Regional Transportation Plan Policy 14.2
2.17 Public Transportation Safety and Environmental Impacts	Regional Transportation Plan Policy 14.2
2.18 Regional Public Transportation Performance	Regional Transportation Plan Policy 14.3
2.19 Special Needs Public	Regional Transportation Plan Policies 14.4, 14.5 and 14.6

Regional Framework Policy	Implementation Recommendation(s) or Requirements
Transportation	
Transportation	
2.20 Regional Freight System	Regional Transportation Plan Policy 15.0
2.21 Regional Freight System Investments	Regional Transportation Plan Policy 15.1
2.22 Regional Bicycle System Connectivity	Regional Transportation Plan Policy 16.0
2.23 Regional Bicycle System Mode Share and Accessibility	Regional Transportation Plan Policy 16.1
2.24 Regional Pedestrian System	Regional Transportation Plan Policy 17.0
2.25 Regional Pedestrian Mode Share	Regional Transportation Plan Policy 17.1
2.26 Regional Pedestrian Mode Share	Regional Transportation Plan Policy 17.2
2.27 Transportation System Management	Regional Transportation Plan Policy 18.0
2.28 Regional Transportation Demand Management	Regional Transportation Plan Policy 19.0
2.29 Regional Parking Management	• Regional Transportation Plan Policy 19.1 • Metro Code, 3.07, Title 2 Regional Parking Policy
2.30 Peak Period Parking	Regional Transportation Plan Policy 19.2
2.31 Transportation Funding	Regional Transportation Plan Policy 20.0
2.32 2040 Growth Concept Implementation	Regional Transportation Plan Policy 20.1
2.33 Transportation System Maintenance and Preservation	Regional Transportation Plan Policy 20.2
2.34 Transportation Safety	Regional Transportation Plan Policy 20.3

Regional Framework Policy		Implementation Recommendation(s) or Requirements
~~Parks and Open Spaces~~Nature in Neighborhoods		
3.1	Inventory of Park Facilities and Identification and Inventory of Regionally Significant Parks, Natural Areas, Open Spaces, Fish and Wildlife Habitat, Trails and Greenways	• Parks Inventory completed, 1998, 2004 • Natural Areas Inventory conducted, 1997 • Metro Code 3.07, UGMFP, Title 13
3.2	Protection of Regionally Significant Parks, Natural Areas, Open Spaces, Fish and Wildlife Habitat, Trails and Greenways	• Resolution 02-3253, Regional Greenspaces System Concept Map • Metro Code 3.07, UGMFP, Title 13
3.3	Management of the Publicly Owned Portion of the Regional System of Parks, Natural Areas, Open Spaces, Fish and Wildlife Habitat, Trails and Greenways	• Metro Code 3.07, UGMFP, Title 13
3.4	Protection, Establishment and Management of a Regional Trails System	Resolution 02-3192, Regional Trails Plan
3.5	Provision of Community and Neighborhood Parks, Open Spaces, Natural Areas, Fish and Wildlife Habitat, Trails and Recreation Programs	• MPAC Report to Council, April 2001 • Metro Code 3.07, UGMFP, Title 13
3.6	Participation of Citizens in Environmental Education, Planning, Stewardship Activities and Recreational Services	Parks and Greenspaces Annual Volunteer Program Report to Council, 2001, 2002, 2003 and 2004

Regional Framework Policy	Implementation Recommendation(s) or Requirements
~~Water Management~~**Watershed Health and Water Quality**	
4.1 Water Supply	~~Metro Code, 3.07, Urban Growth Management Functional Plan, Title 3 Water Quality, Flood Management and Fish and Wildlife Conservation~~ • Regional Water Supply Plan: Chapter XII Recommended Final Plan Concept and Implementation Actions • Metro Code, 3.07, UGMFP, Titles 3 and 13
4.2 Overall Watershed Management	• Regional Water Supply Plan: Chapter XII Recommended Final Plan Concept and Implementation Actions • Metro Code, 3.07, UGMFP, Titles 3 and 13
4.3 Water Quality	• Regional Water Supply Plan: Chapter XII Table XII • Metro Code, 3.07, UGMFP, Titles 3 and 13~~Title 3 Water Quality, Flood Management and Fish and Wildlife Habitat~~
4.4 Stormwater Management	~~Metro Code 3.07, Urban Growth Management Functional Plan,~~ • ~~Title 3 Water Quality, Flood Management and Fish and Wildlife Conservation~~ Regional Water Supply Plan: Chapter XII • Metro Code, 3.07, UGMFP, Titles 3 and 13
4.5 Urban Planning and Natural Systems	• Regional Water Supply Plan: Chapter XII • Metro Code, 3.07, UGMFP, Titles 3 and 13
~~4.6 Fish and Wildlife Habitat Conservation~~	~~Metro Code 3.07, Urban Growth Management Functional Plan~~ ~~Title 3, Water Quality, Flood Management and Fish and Wildlife Conservation~~

Regional Framework Policy	Implementation Recommendation (s) or Requirements
Natural Hazards	
5.1 Earthquake Hazard Mitigation Measures	Resolution 03-3352 – Intergovernmental Agreement for Regional Emergency Management
5.2 Flood Hazard Mitigation Measures	• Resolution 03-3352 – Intergovernmental Agreement for Regional Emergency Management • Metro Code, 3.07, UGMFP, Title 3
5.3 Landslide Hazard Mitigation Measures	Resolution 03-3352 – Intergovernmental Agreement for Regional Emergency Management
5.4 Volcanic Hazard Mitigation Measures	Resolution 03-3352 – Intergovernmental Agreement for Regional Emergency Management
5.5 Wildland-Urban Interface Fire Mitigation Measures	Resolution 03-3352 – Intergovernmental Agreement for Regional Emergency Management
5.6 Severe Weather Hazard Mitigation Measures	Resolution 03-3352 – Intergovernmental Agreement for Regional Emergency Management
5.7 Biological Hazard Mitigation Measures	Resolution 03-3352 – Intergovernmental Agreement for Regional Emergency Management
5.8 Other Hazard Mitigation Measures	Resolution 03-3352 – Intergovernmental Agreement for Regional Emergency Management
5.9 Natural Disaster Response Coordination	Resolution 03-3352 – Intergovernmental Agreement for Regional Emergency Management

Regional Framework Policy	Implementation Recommendation(s) or Requirements
Clark County	
6.1 Coordination with Clark County	• Resolution No. 03-3388, Endorsing a Bi-State Coordination Committee to discuss and make recommendations about Land Use, Economic Development, Transportation and Environmental Justice Issues of Bi-state Significance; Bi-State Coordination Committee Charter and Bylaws • Resolution 03-3352 – Intergovernmental Agreement for Regional Emergency Management

Regional Framework Policy	Implementation Recommendation(s) or Requirements
Management	
7.1 Citizen Participation	• Metro Code section 2.12.010 • (Office of Citizen Involvement)
7.2 Metro Policy Advisory Committee and Joint Policy Advisory Committee on Transportation	Metro Charter Section 27, MPAC by-laws
7.3 Applicability of Regional Framework Plan Policies	Metro Charter, Chapter II, Section 5(2), ORS 268.380(1)
7.4 Urban Growth Boundary Management Plan	Metro Code 3.01.005 *et seq.*, UGB and Urban Reserve Procedures
7.5 Functional Plans	• Metro Code 3.06.010 *et seq.* • Planning Procedure for Designating Functional Planning Areas and Activities • ORS 268.390
7.6 Periodic Review of Comprehensive Land Use Plans	Metro Code 3.01.005 *et seq.*, UGB and Urban Reserve Procedures
7.7 Implementation Roles	• ORS 268.380 • Metro Charter, Chapter II
7.8 Performance Measures	Title 9 of the UGMFP, Metro Code 3.07.910 *et seq.*
7.9 Monitoring and Updating	
7.10 Environmental Education	

Regional Framework Policy	Implementation Recommendation(s) or Requirements
Implementation	
8.1 Implementation	• Metro Charter, Chapter II, Section 5(2)(c) • Metro Code 3.01,UGB and Urban Reserve Procedures and 3.07, UGMFP
8.2 Regional Funding and Fiscal Policy	
8.3 Schools	
8.4 Administration	Title 8 of the UGMFP, Metro Code 3.07.810 *et seq.*
8.5 Enforcement	Title 8 of the UGMFP, Metro Code 3.07.810 *et seq.*

M:\attorney\confidential\07 Land Use\04 2040 Growth Concept\03 UGMFP\02 Stream Protection (Title 3)\02 Goal 5\02 Program\03 Ord 05-1077B\Ord 05-1077B Ex B RFP amend REVISED 091905.doc

EXHIBIT C—ORDINANCE NO. 05-1077C

METRO CODE CHAPTER 3.07
URBAN GROWTH MANAGEMENT FUNCTIONAL PLAN

TITLE 13: NATURE IN NEIGHBORHOODS

Section 1. Intent

The purposes of this program are to (1) conserve, protect, and restore a continuous ecologically viable streamside corridor system, from the streams' headwaters to their confluence with other streams and rivers, and with their floodplains in a manner that is integrated with upland wildlife habitat and with the surrounding urban landscape; and (2) to control and prevent water pollution for the protection of the public health and safety, and to maintain and improve water quality throughout the region. This program:

A. Will achieve its purpose through conservation, protection, and appropriate restoration of riparian and upland fish and wildlife habitat through time, using a comprehensive approach that includes voluntary, incentive-based, educational, and regulatory elements;

B. Balances and integrates goals of protecting and enhancing fish and wildlife habitat, building livable Region 2040 communities, supporting a strong economy, controlling and preventing water pollution for the protection of the public health and safety, and complying with federal laws including the Clean Water Act and the Endangered Species Act;

C. Includes provisions to monitor and evaluate program performance over time to determine whether the program is achieving the program's objectives and targets, to determine whether cities and counties are in substantial compliance with this title, and to provide sufficient information to determine whether to amend or adjust the program in the future; and

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.

Section 2. Inventory and Habitat Conservation Areas

The purpose of this section is to describe the geographic information system (GIS) data and maps that form the basis of Metro's fish and wildlife habitat protection and restoration program. This data and maps are referenced in various ways in this title, but may or may not be relevant within a city or county depending upon which implementation alternative the city or county chooses pursuant to subsection 3(B) of this title. The maps referred to in this title are representations of data contained within Metro's GIS system, operated by the Metro Data Resource Center, and references to such maps shall be interpreted as references to the maps themselves and to the underlying GIS data that the maps represent.

A. The Regionally Significant Fish and Wildlife Habitat Inventory Map (hereinafter the "Inventory Map"), attached hereto[1], identifies the areas that have been determined to contain regionally significant fish and wildlife habitat. The Inventory Map divides habitat into two general categories, riparian and upland wildlife, and further differentiates each habitat category into low, medium, and high value habitats.

B. The Habitat Conservation Areas Map, attached hereto[2], identifies the areas that are subject to the performance standards and best management practices described in Section 4 of this title, to the extent that a city or county chooses to comply with Section 3 of this title by using the Habitat Conservation Areas map, or a map that substantially complies with the Habitat Conservation Areas map. For such cities and counties, the Habitat Conservation Areas Map further identifies, subject to the map verification process described in subsections 3(G) and 4(D) of this title, which areas will be subject to high, moderate, and low levels of habitat conservation based on Metro Council's consideration of the results of the economic, social, environmental, and energy (ESEE) consequences of protecting or not protecting the habitat, public input, and technical review, and the Metro Council's subsequent decision to balance conflicting uses in habitat areas.

1. Table 3.07-13a describes how (1) Class I and II riparian habitat areas, and (2) Class A and B upland wildlife habitat areas within 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, located within the Metro boundary at the effective date of this title were designated as high, moderate, and low Habitat Conservation Areas.

2. Table 3.07-13b describes how Class I and II riparian habitat areas and Class A and B upland wildlife areas brought within the Metro UGB after the effective date of Ordinance No. 05-1077A will be designated as high, moderate, and low Habitat Conservation Areas. Section 6 of this title describes the procedures for how Table 3.07-13b and Section 4 of this title shall be applied in such areas.

C. Exempt International Marine Terminals

1. Marine dependent properties which would otherwise have been mapped as Habitat Conservation Areas do not appear on the Habitat Conservation Areas Map because the Metro Council concluded, based on its analysis of the economic, social, environmental, and energy implications of its decision, that the economic importance of such properties far outweighed the environmental importance of the properties as fish and wildlife habitat. The Metro Council applied the criteria described in subsection 2(C)(2) of this title to conclude that the following properties should not be considered Habitat Conservation Areas:

   a. The International Terminal property, located at 12005 N. Burgard Way, Portland, Oregon, 97203;

   b. Port of Portland Marine Terminal 4;

[1] On file in the Metro Council office.
[2] On file in the Metro Council office.

c. Port of Portland Marine Terminal 5; and

d. Port of Portland Marine Terminal 6.

2. The Metro Council may, at its discretion, consider and adopt ordinances to exempt from the provisions of this title any additional properties along the Willamette and Columbia Rivers, or portions of such properties, where it can be demonstrated that:

a. The property is currently developed for use as an international marine terminal capable of mooring ocean-going tankers or cargo ships; and

b. The property is substantially without vegetative cover.

Section 3. Implementation Alternatives for Cities and Counties

A. Under Oregon law, upon acknowledgment of this program by the Oregon Land Conservation and Development Commission (LCDC), cities and counties wholly or partly within the Metro boundary shall apply the requirements of this title with respect to areas identified as riparian habitat on the Inventory Map and areas identified as upland wildlife habitat on the Inventory Map, according to the compliance deadlines established in Section 1 of Title 8 of this functional plan (Metro Code Section 3.07.810), rather than applying the requirements of division 23 of chapter 660 of the Oregon Administrative Rules ("OAR"), promulgated by LCDC, except that:

1. A city or county shall apply the requirements of division 23 of OAR chapter 660 in order to adopt comprehensive plan amendments or land use regulations that (i) would otherwise require compliance with division 23 of OAR chapter 660 but for the adoption of this title (i.e. amendments or regulations adopted to protect Goal 5 resources), and (ii) will limit development in areas not identified as riparian habitat on the Inventory Map, unless such provisions (a) are part of a program intended to comply with subsection 3(B)(3) of this title and apply only to areas identified as upland wildlife habitat on the Inventory Map (i.e., they do not apply to areas not identified as habitat); or (b) apply to areas identified as Class A or B upland wildlife habitat on the Inventory Map that are brought within the UGB after the effective date of Ordinance No. 05-1077B. Such a city or county shall seek acknowledgement of such provisions from LCDC or treat such provisions as post-acknowledgement plan amendments under ORS chapter 197;

2. 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 chapter 660, shall not repeal such amendments or regulations, nor shall it amend such provisions in a manner that would allow any more than a de minimis increase in the amount of development that could occur in areas identified as upland wildlife habitat; and

3. After a city or county has demonstrated that it is in substantial compliance with the requirements of this title, if the city or county wishes to adopt comprehensive plan amendments or land use regulations applicable to areas identified as riparian habitat on the Inventory Map that have the effect of imposing greater limits on development than those imposed by provisions that are in substantial compliance with the requirements of this title, such a city or county shall comply with the provisions of division 23 of OAR chapter 660, and shall seek acknowledgement of such provisions from LCDC or treat such provisions as post-acknowledgement plan amendments under ORS chapter 197.

B. Each city and county in the region shall either:

1. Amend its comprehensive plan and implementing ordinances to adopt the Title 13 Model Ordinance and the Metro Habitat Conservation Areas Map, and demonstrate compliance with the provisions of (a) subsection 4(A)(5) of this title, related to enhanced fish and wildlife protection and management of publicly-owned parks and open spaces that have been designated as natural areas and are not intended for future urban development, and (b) subsection 4(A)(8) of this title, related to the restoration of Habitat Conservation Areas when developed property is undergoing significant redevelopment; or

2. Demonstrate that its existing or amended comprehensive plan and existing, amended, or new implementing ordinances substantially comply with the performance standards and best management practices described in Section 4, and that maps that it has adopted and uses substantially comply with the Metro Habitat Conservation Areas Map; or

3. Demonstrate that it has implemented a program based on alternative approaches that will achieve protection and enhancement of Class I and II riparian habitat areas, and of Class A and B upland wildlife habitat areas in territory added to the Metro UGB after the effective date of Ordinance No. 05-1077, substantially comparable with the protection and restoration that would result from the application of a program that complied with subsections 3(B)(1) or 3(B)(2) of this title. A city or county developing such a program:

a. Shall demonstrate that its alternative program will provide a certainty of habitat protection and enhancement to achieve its intended results, such as by using proven programs and demonstrating stable and continuing funding sources sufficient to support elements of the program that require funding;

b. May assert substantial compliance with this provision by relying on either or both the city's or county's comprehensive plan and implementing ordinances and on the use of incentive based, voluntary, education, acquisition, and restoration programs, such as:

i. An existing tree protection ordinance;

ii. A voluntary program for tree protection, tree replacement, and habitat restoration;

iii. Habitat preservation incentive programs, such as programs that provide reduced development or storm water management fees and property taxes in return for taking measures to protect and restore habitat (including, for example, the Wildlife Habitat Special Tax Assessment Program, ORS 308A.400 through 308A.430, and the Riparian Habitat Tax Exemption Program, ORS 308A.350 through 308A.383);

iv. Habitat-friendly development standards to reduce the detrimental impact of storm water run-off on riparian habitat;

v. A local habitat acquisition program; and

vi. Maintaining and enhancing publicly-owned habitat areas, such as by:

(A) Using habitat-friendly best management practices, such as integrated pest management programs, in all regionally significant habitat areas within publicly-owned parks and open spaces;

(B) Ensuring that publicly-owned parks and open spaces that have been designated as natural areas and are not intended for future urban development are managed to maintain and enhance the quality of fish and wildlife habitat that they provide;

(C) Pursuing funding to support local park, open space, and habitat acquisition and restoration, such as with local bond measures, System Development Charge (SDC) programs, Federal Emergency Management Act (FEMA) grants, or other funding mechanisms; or

4. District Plans.

a. Adopt one or more district plans that apply over portions of the city or county, and demonstrate that, for the remainder of its jurisdiction, the city or county has a program that complies with either subsection 3(B)(1) or 3(B)(2) of this title. If a city or county adopts one or more district plans pursuant to this paragraph, it shall demonstrate that, within each district plan area, the district plan complies with subsection 3(B)(3) of this title. District plans shall be permitted under this subsection only for areas within a common watershed, or which are within areas in adjoining watersheds that share an interrelated economic infrastructure and development pattern. Cities and counties that choose to develop district plans are encouraged to coordinate such district plans with other entities

whose activities impact the same watershed to which the district plan applies, including other cities and counties, special districts, state and federal agencies, watershed councils, and other governmental and non-governmental agencies.

b. The City of Portland shall develop a District Plan that complies with subsection 3(B)(4)(a), in cooperation with the Port of Portland, that applies to West Hayden Island; or

5. For a city or county that is a member of the Tualatin Basin Natural Resources Coordinating Committee (the "TBNRCC," which includes Washington County and the cities of Beaverton, Cornelius, Durham, Forest Grove, Hillsboro, King City, Sherwood, Tigard, and Tualatin), amend its comprehensive plan and implementing ordinances to comply with the maps and provisions of the TBNRCC Goal 5 Program, attached hereto[3] and incorporated herein by reference, adopted by the TBNRCC on April 4, 2005 (the "Tualatin Basin Program"), subject to the intergovernmental agreement entered into between Metro and the TBNRCC. All other provisions of this Section 3 of this title, as well as Section 6 of this title, shall still apply to each city and county that is a member of the TBNRCC. In addition, in order for a city or county that is a member of the TBNRCC to be in compliance with this functional plan, the following conditions must be satisfied:

a. Within the compliance timeline described in Paragraph 6 of the IGA, the TBNRCC and its members comply with the six steps identified in section B of Chapter 7 of the Tualatin Basin Program;

b. Clean Water Services approves and begins implementing its Healthy Streams Plan;

c. The TBNRCC members agree to renew and extend their partnership to implement the projects on the Healthy Streams Project List and target projects that protect and restore Class I and II Riparian Habitat, including habitat that extends beyond the Clean Water Services "vegetated corridors," and the TBNRCC shall continue to coordinate its activities with Metro and cooperate with Metro on the development of regional public information about the Nature in Neighborhoods Initiative;

d. The city or county has adopted provisions to facilitate and encourage the use of habitat-friendly development practices, where technically feasible and appropriate, in all areas identified as Class I and II riparian habitat areas on the Metro Regionally Significant Fish and Wildlife Habitat Inventory Map. Table 3.07-13c provides examples of the types of habitat-friendly development practices that shall be encouraged and considered;

e. The city or county has adopted provisions to allow for the reduction of the density and capacity requirements of Title 1 of the Urban Growth Management Functional Plan, Metro Code sections 3.07.110 to 170,

[3] On file in the Metro Council office.

consistent with Section 3(H) of this title. Particularly, the provisions shall (1) apply only to properties that were within the Metro urban growth boundary on January 1, 2002; (2) require the protection of regionally significant habitat on the property, such as via a public dedication or restrictive covenant; and (3) allow only for a reduction in the minimum number of units required to be built based on the amount of area protected as provided in part (2) of this paragraph. In addition, cities and counties will be required to report to Metro as provided in Section 3(H)(3) of this title;

f. The city or county complies with the provisions of subsections 3(B)(1) to 3(B)(3) of this title as those provisions apply to upland wildlife habitat in territory added to the Metro urban growth boundary after the effective date of this title. For example, (1) each city and county shall either adopt and apply Metro's Title 13 Model Ordinance to upland wildlife habitat in new urban areas, (2) substantially comply with the requirements of Section 4 of this title as it applies to upland wildlife habitat in new urban areas, or (3) demonstrate that it has implemented an alternative program that will achieve protection and enhancement of upland wildlife habitat in new urban areas comparable with the protection and restoration that would result from one of the two previous approaches described in this sentence; and

g. The TBNRCC and the city or county complies with the monitoring and reporting requirements of Section 5 of this title.

C. The comprehensive plan and implementing ordinances relied upon by a city or county to comply with this title shall contain clear and objective standards. A standard shall be considered clear and objective if it meets any one of the following criteria:

1. It is a fixed numerical standard, such as fixed distance (e.g. "50 feet") or land area (e.g. "1 acre");

2. It is a nondiscretionary requirement, such as a requirement that grading not occur beneath the dripline of a protected tree; or

3. It is a performance standard that describes the outcome to be achieved, specifies the objective criteria to be used in evaluating outcome or performance, and provides a process for application of the performance standard, such as a conditional use or design review process.

D. In addition to complying with subsection 3(C) of this section, the comprehensive plan and implementing ordinances that a city or county relies upon to satisfy the requirements of this title may include an alternative, discretionary approval process that is not clear and objective provided that the comprehensive plan and implementing ordinance provisions of such a process:

1. Specify that property owners have the choice of proceeding under either the clear and objective approval process, which each city or county must have pursuant to subsection 3(D) of this section, or under the alternative, discretionary approval process; and

2. Require a level of protection for, or enhancement of, the fish and wildlife habitat that meets or exceeds the level of protection or enhancement that would be achieved by following the clear and objective standards described in Section 3(D) of this title.

E. Use of Habitat-Friendly Development Practices In Regionally Significant Fish And Wildlife Habitat.

1. Each city and county in the region shall:

a. Identify provisions in the city's or county's comprehensive plan and implementing ordinances that prohibit or limit the use of the habitat-friendly development practices such as those described in Table 3.07-13c; and

b. Adopt amendments to the city's or county's comprehensive plan and implementing ordinances to remove the barriers identified pursuant to subsection 3(E)(1)(a) of this title, and shall remove such barriers so that such practices may be used, where practicable, in all regionally significant fish and wildlife habitat; provided, however that such practices shall not be permitted if their use is prohibited by an applicable and required State or Federal permit issued to a unit of local government having jurisdiction in the area, such as a permit required under the Clean Water Act, 33 U.S.C. §§1251 et seq., or the Safe Drinking Water Act, 42 U.S.C. §§300f et seq., and including conditions or plans required by such permit.

2. Metro shall provide technical assistance to cities and counties to comply with the provisions of this Section 3(E) of this title.

F. Cities and counties shall hold at least one public hearing prior to adopting comprehensive plan amendments, implementing ordinances, and maps implementing this title or demonstrating that existing city or county comprehensive plans, implementing ordinances, and maps substantially comply with this title. The proposed comprehensive plan amendments, implementing ordinances, and maps shall be available for public review at least 45 days prior to the public hearing.

G. The comprehensive plan provisions and implementing ordinances that each city or county amends, adopts, or relies on to comply with this title shall provide property owners with a reasonable, timely, and equitable process to verify the specific location of habitat areas subject to the provisions of the city's or county's comprehensive plan or implementing ordinances. It is the intent of this requirement that, in the majority of cases, the process be as simple and straightforward as possible and not result in a change that would require an amendment to the city's or county's comprehensive plan. Such process shall:

1. Allow a property owner, or another person with the property owner's consent, to confirm the location of habitat on a lot or parcel at any time, whether or not the property owner has submitted a specific request for a development permit, provided, however, that a city or county may impose a fee to cover the actual staff, equipment and other administrative costs of providing such a service;

2. As often as reasonably possible, provide a simple, default approach that allows a property owner to verify the location of habitat on a lot or parcel without having to hire an environmental consultant and without having to pay a significant processing or application fee;

3. Allow a property owner to present detailed documentation to verify the location of habitat on a lot or parcel, such as information collected and analyzed by an environmental consultant; and

4. Ensure that the process provides adequate opportunities for appeals and a fair and equitable dispute resolution process, consistent with state law.

H. Reducing Regional Density and Capacity Requirements to Allow Habitat Protection.

1. Notwithstanding the provisions of Metro Code section 3.07.140(A)(2), cities and counties may approve a subdivision or development application that will result in a density below the minimum density for the zoning district if:

   a. The property lot or parcel was within the Metro UGB on January 1, 2002;

   b. An area of the property lot or parcel to be developed has been identified as regionally significant fish and wildlife habitat on the Metro Inventory Map or as a significant resource on a local Goal 5 riparian, wetlands, or wildlife resource inventory map that had been acknowledged by the LCDC prior to the effective date of Metro Ordinance No. 05-1077; and

   c. Such a decision will directly result in the protection of the remaining undeveloped regionally significant fish and wildlife habitat or significant resource located on the property lot or parcel, such as via a public dedication or a restrictive covenant.

2. The amount of reduction in the minimum density requirement that may be approved under this subsection 3(H) of this title shall be calculated by subtracting the number of square feet of regionally significant fish and wildlife habitat or significant resource that is permanently protected under subsection 3(H)(1)(c) of this title from the total number of square feet that the city or county otherwise would use to calculate the minimum density requirement for the property.

3. If a city or county approves a subdivision or development application that will result in a density below the minimum density for the zoning district pursuant to subsection 3(H)(1) of this title, then such city or county shall:

   a. Be permitted an offset against the capacity specified for that city or county in Table 3.07-1 of the Metro Code. The amount of such offset shall be calculated by subtracting the difference between the number of dwelling units that the city or county approved to be built pursuant to subsection 3(H)(1) of this title and the minimum number of dwelling units that would have otherwise been required to be built on the property

pursuant to the applicable minimum density requirements for the zoning district where the property is located; and

b. Report to Metro by April 15 of every year the number of approvals made pursuant to this subsection 3(H) of this title, including documentation that the factors in subsection 3(H)(1) had been satisfied for each such approval, and the capacity offsets that the city or county shall be afforded as a result of such approvals.

Section 4. 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 subsection 3(B)(2) of this title:

A. City and county comprehensive plans and implementing ordinances shall conform to the following performance standards and best management practices:

1. Habitat Conservation Areas shall be protected, maintained, enhanced, and restored as specified in this Section 4 of this title, and city and county development codes shall include provisions for enforcement of these performance standards and best management practices.

2. In addition to requirements imposed by this title, the requirements of Title 3 of the Urban Growth Management Functional Plan, Metro Code sections 3.07.310 to 3.07.360, as amended by Exhibit D to Ordinance No. 05-1077, shall continue to apply.

3. The performance standards and best management practices of this Section 4 of this title shall not apply:

a. When the application of such standards and practices would restrict or regulate farm structures or farming practices in violation of ORS 215.253 or ORS 561.191; or

b. In areas outside of the Metro UGB but within the Metro boundary at the effective date of this title:

i. When such standards and practices violate ORS 527.722 by prohibiting, limiting, regulating, subjecting to approval, or in any other way affecting forest practices on forestlands located outside of an acknowledged urban growth boundary, except as provided in ORS 527.722(2), (3) and (4); or

ii. Pursuant to ORS 196.107, in areas within Multnomah County and the Columbia River Gorge National Scenic Area, provided that Multnomah County has adopted and implements ordinances that are approved pursuant to sections 7(b) and 8(h) through 8(k)

of the Columbia River Gorge National Scenic Area Act, 16 U.S.C. §§ 544e(b) and 544f(h) through 544f(k).

4. The performance standards and best management practices of this Section 4 of this title shall not apply to any use of residential properties if, as of the local program effective date:

   a. Construction of the residence was completed in compliance with all applicable local and state laws and rules for occupancy as a residence or the residence had been occupied as a residence for the preceding ten years; and

   b. Such uses would not have required the property owner to obtain a land use approval or a building, grading, or tree removal permit from their city or county.

5. Habitat Conservation Areas within publicly-owned parks and open spaces that have been designated as natural areas and are not intended for future urban development shall be protected and managed so that the quality of fish and wildlife habitat that they provide is maintained and enhanced, and that habitat-friendly best management practices, such as integrated pest management programs, are used in such areas.

6. Invasive non-native or noxious vegetation shall not be planted in any Habitat Conservation Area. The removal of invasive non-native or noxious vegetation from Habitat Conservation Areas shall be allowed. The planting of native vegetation shall be encouraged in Habitat Conservation Areas.

7. Except as provided in subsection 4(A)(8) of this title, routine repair, maintenance, alteration, rehabilitation, or replacement of existing structures, roadways, driveways, utilities, accessory uses, or other development within Habitat Conservation Areas may be allowed provided that:

   a. The project is consistent with all other applicable local, state, and federal laws and regulations;

   b. The project will not permanently or irreparably result in more developed area within a Habitat Conservation Area than the area of the existing development; and

   c. Native vegetation is maintained, enhanced and restored, if disturbed; other vegetation is replaced, if disturbed, with vegetation other than invasive non-native or noxious vegetation; and the planting of native vegetation and removal of invasive non- native or noxious vegetation is encouraged.

8. Notwithstanding subsection 4(A)(7) of this title, when a city or county exercises its discretion to approve zoning changes to allow a developed property that contains a Habitat Conservation Area to (1) change from an industrial or heavy commercial zoning designation to a residential or mixed-use/residential designation, or (2) increase the type or density and intensity of development in

any area, then the city or county shall apply the provisions of this Section 4 of this title, or provisions that will achieve substantially comparable habitat protection and restoration as do the provisions of this Section 4 of this title. This provision will help to insure that, when developed areas are redeveloped in new ways to further local and regional urban and economic development goals, property owners should restore regionally significant fish and wildlife habitat as part of such redevelopment.

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 4(B)(1), 4(B)(2)(c), and 4(B)(3) of this title. 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 Unites States Department of Agriculture's Natural Resources Conservation Service (NRCS) without having to demonstrate that on-site mitigation is not practicable, feasible, or appropriate.

10. Within Habitat Conservation Areas located in Multnomah County Drainage District No. 1, Peninsula Drainage District No. 1, Peninsula Drainage District No. 2, and the area managed by the Sandy Drainage Improvement Company, routine operations, repair, maintenance, reconfiguration, rehabilitation, or replacement of existing drainage and flood control facilities, and existing related facilities, including any structures, pump stations, water control structures, culverts, irrigation systems, roadways, utilities, accessory uses (such as off-load facilities that facilitate water-based maintenance), erosion control projects, levees, soil and bank stabilization projects, dredging and ditch clearing within the hydraulic cross-section in existing storm water conveyance drainageways, or other water quality and flood storage projects applicable to existing facilities and required to be undertaken pursuant to ORS chapters 547 or 554 or Titles 33 or 44 of the Code of Federal Regulations, shall be allowed provided that:

    a. The project is consistent with all other applicable local, state, and federal laws and regulations;

    b. The project does not encroach closer to a surface stream or river, wetland, or other body of open water than existing operations and development;

    c. Disturbed areas are replanted with vegetation and no bare soils remain after project completion; the planting of native vegetation and removal of invasive non- native or noxious vegetation is encouraged; and invasive non-native or noxious vegetation shall not be planted; and

    d. Each district submits an annual report, to all local permitting agencies in which the district operates, describing the projects the district completed

in the previous year and how those projects complied with all applicable federal and state laws and requirements.

B. City and county comprehensive plans and implementing ordinances shall contain review standards applicable to development in all Habitat Conservation Areas that include:

1. Clear and objective development approval standards consistent with subsection 3(C) of this title that protect Habitat Conservation Areas but which allow limited development within High Habitat Conservation Areas, slightly more development in Moderate Habitat Conservation Areas, and even more development in Low Habitat Conservation Areas. Such standards shall allow (a) property owners to consider reduced building footprints and the use of minimal excavation foundation systems (e.g., pier, post or piling foundation), and (b) the flexible application of local code requirements that may limit a property owner's ability to avoid development in Habitat Conservation Areas, such as setback and landscaping requirements or limits on clustering and the transfer of development rights on-site. The habitat-friendly development practices described in Table 3.07-13c, which are intended to minimize the magnitude of the impact of development in Habitat Conservation Areas, shall be allowed, encouraged, or required to the extent that cities and counties can develop clear and objective standards for their use, unless their use is prohibited by an applicable and required State or Federal permit issued to a unit of local government having jurisdiction in the area, such as a permit required under the Clean Water Act, 33 U.S.C. §§1251 et seq., or the Safe Drinking Water Act, 42 U.S.C. §§300f et seq., and including conditions or plans required by such permit. The clear and objective development standards required by this paragraph also shall require that all development in Habitat Conservation Areas be mitigated to restore the ecological functions that are lost or damaged as a result of the development. Standards that meet the requirements of this subsection and subsection 3(C) of this title are provided in Section 7 of the Metro Title 13 Model Ordinance[4]; and

2. Discretionary development approval standards consistent with subsection 3(D) of this title that comply with subsections (a), (b), and (c) of this subsection. Standards that meet the requirements of this subsection and subsection 3(D) of this title are provided in Section 8 of the Metro Title 13 Model Ordinance.

   a. Avoid Habitat Conservation Areas.

      i. Development may occur within a Habitat Conservation Area only if a property owner demonstrates that no practicable alternatives to the requested development exist which will not disturb the Habitat Conservation Area;

      ii. When implementing this requirement to determine whether a practicable alternative exists, cities and counties shall include consideration of the type of Habitat Conservation Area that will be affected by the proposed development. For example, High Habitat Conservation Areas have been so designated because

[4] On file in the Metro Council office.

they are areas that have been identified as having lower urban development value and higher-valued habitat, while Low Habitat Conservation Areas have been so designated because they are areas that have been identified as having higher urban development value and lower-valued habitat; and

iii. Cities and counties shall allow flexibility in the application of local code requirements that may limit a property owner's ability to avoid development in Habitat Conservation Areas, such as setback and landscaping requirements or limits on clustering and the transfer of development rights on-site. Property owners shall also consider reduced building footprints and use of minimal excavation foundation systems (e.g., pier, post or piling foundation). The use of the techniques described in this paragraph shall be part of the alternatives analysis to determine whether any alternative to development within the Habitat Conservation Area is practicable; and

b. Minimize Impacts on Habitat Conservation Areas and Water Quality.

i. If there is no practicable alternative, limit the development to minimize, to the extent practicable, the detrimental impacts on Habitat Conservation Areas associated with the proposed development;

ii. When implementing this requirement to determine whether development has been minimized to the extent practicable, cities and counties shall include consideration of the type of Habitat Conservation Area that will be affected by the proposed development. For example, High Habitat Conservation Areas have been so designated because they are areas that have been identified as having lower urban development value and higher-valued habitat, while Low Habitat Conservation Areas have been so designated because they are areas that have been identified as having higher urban development value and lower-valued habitat; and

iii. The techniques described in subsection 4(B)(2)(a)(iii) shall be used to demonstrate that development within a Habitat Conservation Area has been minimized. In addition, the magnitude of the impact of development within Habitat Conservation Areas also shall be minimized, such as by use of the habitat-friendly development practices described in Table 3.07-13c, unless the use of such practices is prohibited by an applicable and required State or Federal permit issued to a unit of local government having jurisdiction in the area, such as a permit required under the Clean Water Act, 33 U.S.C. §§1251 et seq., or the Safe Drinking Water Act, 42 U.S.C. §§300f et seq., and including conditions or plans required by such permit; and

c. Mitigate Impacts on Habitat Conservation Areas and Water Quality.

When development occurs, require mitigation to restore the ecological functions that were lost or damaged as a result of the development, after taking into consideration the property owner's efforts to minimize the magnitude of the detrimental impacts through the use of the techniques described in Table 3.07-13c and through any additional or innovative techniques.

3. When development occurs within delineated wetlands, then the mitigation required under subsections 4(B)(1) and (2) of this title shall not require any additional mitigation than the mitigation required by state and federal law for the fill or removal of such wetlands.

C. City and county comprehensive plans and implementing ordinances shall include procedures to consider claims of hardship and to grant hardship variances for any property demonstrated to be converted to an unbuildable lot by application of any provisions implemented to comply with the requirements of this title.

D. Administering the Habitat Conservation Areas Map and Site-Level Verification of Habitat Location.

1. Each city and county shall be responsible for administering the Habitat Conservation Areas Map, or the city's or county's map that has been deemed by Metro to be in substantial compliance with the Habitat Conservation Areas Map, within its jurisdiction, as provided in this subsection 4(D) of this title.

2. The comprehensive plan and implementing ordinances amended, adopted or relied upon to comply with this subsection 4(D) of this title shall comply with subsection 3(G) of this title.

3. Verification of the Location of Habitat Conservation Areas. Each city and county shall establish a verification process consistent with subsections 4(D)(4) through 4(D)(6) of this title. The site-level verification of Habitat Conservation Areas is a three-step process. The first step is determining the boundaries of the habitat areas on the property, as provided in subsection 4(D)(4) of this title. The second step is determining the urban development value of the property, as provided in subsection 4(D)(5) of this title. The third step is cross-referencing the habitat classes with the urban development value of the property to determine whether the property contains High, Moderate, or Low Habitat Conservation Areas, or none at all, as provided in subsection 4(D)(6) of this title.

4. Habitat Boundaries.

a. Locating riparian habitat and determining its habitat class is a five-step process.

i. Step 1. Locate the water feature that is the basis for identifying riparian habitat:

(A) Locate the top of bank of all streams, rivers, and open water within 200 feet of the property;

(B) Locate all flood areas within 100 feet of the property (areas that were mapped as flood areas but were filled to a level above the base flood level prior to the local program effective date, consistent with all applicable local, state, and federal laws and regulations shall no longer be considered habitat based on their status as flood areas); and

(C) Locate all wetlands within 150 feet of the property based on the Local Wetland Inventory map (if completed) and on the Metro 2004 Wetland Inventory Map (available from the Metro Data Resource Center, 600 N.E. Grand Ave., Portland, OR 97232; 503-797-1742). Identified wetlands shall be further delineated consistent with methods currently accepted by the Oregon Division of State Lands and the U.S. Army Corps of Engineers.

ii. Step 2. Identify the vegetative cover status of all areas on the property that are within 200 feet of the top of bank of streams, rivers, and open water, are wetlands or are within 150 feet of wetlands, and are flood areas and within 100 feet of flood areas:

(A) Vegetative cover status shall be as identified on the Metro Vegetative Cover Map, attached hereto[5] and incorporated herein by reference. The vegetative cover type assigned to any particular area was based on two factors: the type of vegetation observed in aerial photographs and the size of the overall contiguous area of vegetative cover to which a particular piece of vegetation belonged. As an example of how the categories were assigned, in order to qualify as "forest canopy" the forested area had to be part of a larger patch of forest of at least one acre in size; and

(B) In terms of mapping the location of habitat, the only allowed corrections to the vegetative cover status of a property are those based on an area being developed prior to the local program effective date and those based on errors made at the time the vegetative cover status was determined based on analysis of the aerial photographs used to create the Metro Vegetative Cover Map (for the original map, the aerial photos used were Metro's summer 2002 photos) and application of the vegetative cover definitions provided in the footnotes to Table 3.07-13d.

iii. Step 3. Determine whether the degree that the land slopes upward from all streams, rivers, and open water within 200 feet

[5] On file in the Metro Council office.

of the property is greater than or less than 25% (using the methodology described in the Appendix to Exhibit A to Ordinance No. 00-839 re-adopting Title 3 of the Urban Growth Management Functional Plan).

iv. Step 4. Identify the habitat class (Class I, Class II, or none) of the areas within up to 200 feet of the identified water feature, consistent with Table 3.07-13d. Note that areas that have been identified as habitats of concern, as depicted on the Metro Habitats of Concern Map, attached hereto[6] and incorporated herein by reference, are all classified as Class I riparian habitat.

v. Step 5. Confirm that the development and vegetative cover status of areas within up to 200 feet of the identified water feature has not been altered without the required approval of the city or county since the local program effective date and, if it has, then verify the original habitat location using the best available evidence of its location on local program effective date.

b. For territory brought within the Metro UGB after the effective date of Metro Ordinance No. 05-1077, the location of upland wildlife habitat and its habitat class shall be as identified in Metro's habitat inventory of such territory performed pursuant to Section 6 of this title. The only factors that may be reviewed to verify the location of upland wildlife habitat shall be:

i. For territory that was within the Metro boundary on the effective date of Metro Ordinance No. 05-1077, whether regionally significant fish and wildlife habitat was removed, consistent with all other applicable local, state, and federal laws and regulations, prior to the date that the property was brought within the Metro UGB and, if so, then areas where habitat was removed shall not be identified as Habitat Conservation Areas;

ii. Whether errors were made at the time the vegetative cover status was determined based on (1) analysis of the aerial photographs used to determine the vegetative cover status, and (2) application of the vegetative cover definitions provided in the footnotes to Table 3.07-13d; and

iii. Whether there are discrepancies between the locations of property lot lines and the location of Habitat Conservation Areas, as shown on the Habitat Conservation Areas Map.

5. Urban Development Value of the Property. The urban development value of property designated as regionally significant habitat is depicted on the Metro Habitat Urban Development Value Map, attached hereto[7] and incorporated herein by reference. The Metro Habitat Urban Development Value Map is based

[6] On file in the Metro Council office.
[7] On file in the Metro Council office.

on an assessment of three variables, the land value of property, the employment value of property, and the Metro 2040 Design Type designation of property. Cities and counties shall make an upward adjustment of a property's urban development value designation (i.e. from low to medium or high, or from medium to high) if:

a. The Metro 2040 Design Type designation has changed from a category designated as a lower urban development value category to one designated as a higher urban development value category. Properties in areas designated as the Central City, Regional Centers, Town Centers, and Regionally Significant Industrial Areas are considered to be of high urban development value; properties in areas designated as Main Streets, Station Communities, Other Industrial Areas, and Employment Centers are of medium urban development value; and properties in areas designated as Inner and Outer Neighborhoods and Corridors are of low urban development value; or

b. The property, or adjacent lots or parcels, is owned by a regionally significant educational or medical facility and, for that reason, should be designated as of high urban development value because of the economic contributions the facility provides to the citizens of the region.

i. The following facilities are regionally significant educational or medical facilities, as further identified on the Regionally Significant Educational or Medical Facilities Map, attached hereto[8]:

(A) Clackamas Community College, 19600 S. Molalla Ave., Oregon City;

(B) Lewis & Clark College, 0615 S.W. Palatine Hill Rd, Portland;

(C) Marylhurst University, 17600 Hwy 43, in Lake Oswego;

(D) Mt. Hood Community College, 26000 S.E. Stark St., Gresham;

(E) Oregon Health Sciences University, 3181 SW Sam Jackson Park Rd., Portland;

(F) Oregon Health Sciences University, Portland South Waterfront, Portland;

(G) Oregon Health Sciences University/Oregon Graduate Institute, 20000 N.W. Walker, Hillsboro;

(H) Pacific University, 2043 College Way, Forest Grove;

[8] On file in the Metro Council office.

(I) Portland Community College, Rock Creek Campus, 17865 N.W. Springdale Rd., Portland;

(J) Portland Community College, Sylvania Campus, 12000 S.W. 49th Ave, Portland;

(K) Providence St. Vincent Medical Center, 9115 SW Barnes Rd., Portland;

(L) Reed College, 3203 S.E. Woodstock Blvd., Portland; and

(M) University of Portland, 5000 N. Willamette Blvd., Portland

(N) Veterans Hospital, 3710 SW U.S. Veterans Hospital Rd., Portland.

ii. The Metro Council may add a property to the list of facilities identified in subsection 4(D)(5)(b)(i) in the future by adopting an ordinance amending that section if the Council finds that the use of the property:

(A) Supports the 2040 Growth Concept by providing a mixed-use environment that may include employment, housing, retail, cultural and recreational activities, and a mix of transportation options such as bus, bicycling, walking, and auto;

(B) Provides, as a primary objective, a service that satisfies a public need rather than just the consumer economy (i.e., producing, distributing, selling or servicing goods);

(C) Draws service recipients (e.g., students, patients) from all reaches of the region and beyond;

(D) Relies on capital infrastructure that is so large or specialized as to render its relocation infeasible; and

(E) Has a long-term campus master plan that has been approved by the city or county in which it is located.

6. Cross-Referencing Habitat Class With Urban Development Value. City and county verification of the locations of High, Moderate, and Low Habitat Conservation Areas shall be consistent with Tables 3.07-13a and 3.07-13b.

Section 5. Claims Pursuant to Oregon Laws 2005, Chapter 1

A. The purpose of this section is to provide for Metro to accept potential liability for claims filed against cities and counties pursuant to Oregon Laws 2005, Chapter 1, adopted by the

voters in November 2004 by the approval of Ballot Measure 37, as a result of the cities' and counties' good faith implementation of this title. As a corollary of accepting financial and administrative responsibility for these claims, Metro seeks the authority and cooperation of cities and counties in the evaluation and settlement of claims.

B. Provided that cities and counties meet the requirements set out below, Metro shall indemnify a city or county for any claim made against a city or county based on its implementation of the requirements of this title. In order to receive the benefits of this provision, a city or county must:

1. Upon receipt of a written demand for compensation pursuant to Oregon Laws 2005, Chapter 1, from an owner of private real property located within its jurisdiction alleging that a comprehensive plan amendment or land use regulation adopted or relied upon to comply with the requirements of this title reduces the fair market value of the property, a city or county shall forward a copy of the demand to Metro no later than seven (7) days following receipt of the demand;

2. Reasonably cooperate with Metro throughout Metro's consideration and disposition of the claim, including promptly providing Metro with any information related to the property in question, to an assessment of its fair market value, or to the city's or county's adoption of the comprehensive plan amendment or land use regulation that is the basis of the Measure 37 demand; and

3. Substantially concur with Metro's recommendation regarding disposition of the claim, which disposition may include, but not be limited to, a cash payment or other compensation, a decision to modify, remove, or not apply the regulation, dismissal of the claim, and the imposition of appropriate conditions. Metro shall forward to the city or county Metro's recommended disposition of the claim within 120 days of Metro's receipt of notice of the claim from the city or county; provided, however, that if Metro does not provide such recommendation within the 120 day deadline then the city or county may dispose of the claim as it determines appropriate and Metro will neither indemnify the city or county for the claim nor use the city's or county's decision on the claim as a basis for finding that the city or county is not in compliance with this title. A city or county may also satisfy this requirement by entering into an intergovernmental agreement with Metro in order to grant Metro sufficient authority to implement, on the city or county's behalf, Metro's recommendation regarding the disposition of the claim.

Section 6. Program Objectives, Monitoring and Reporting

This section describes the program performance objectives, the roles and responsibilities of Metro, cities, counties, and special districts in regional data coordination and inventory maintenance, monitoring and reporting, and program evaluation.

A. The following program objectives are established:

1. Performance objectives:

a. Preserve and improve streamside, wetland, and floodplain habitat and connectivity;

b. Preserve large areas of contiguous habitat and avoid habitat fragmentation;

c. Preserve and improve connectivity for wildlife between riparian corridors and upland wildlife habitat; and

d. Preserve and improve special habitats of concern such as native oak habitats, native grasslands, wetlands, bottomland hardwood forests, and riverine islands.

2. Implementation objectives:

a. Increase the use of habitat-friendly development throughout the region; and

b. Increase restoration and mitigation actions to compensate for adverse effects of new and existing development on ecological function.

B. Program Monitoring and Evaluation.

1. Metro will monitor the region's progress toward meeting the vision of conserving, protecting, and restoring the region's fish and wildlife habitat and the intent of this title by:

a. Developing and monitoring regional indicators and targets as set forth in Table 3.07-13e to evaluate progress in achieving the four performance objectives described in subsection 5(A)(1) of this title;

b. Developing and monitoring regional indicators as set forth in Table 3.07-13e to evaluate progress in achieving the two implementation objectives described in subsection 5(A)(2) of this title;

c. Collaborating with local, state, and federal agencies and non-governmental organizations in carrying out field studies and data sharing to increase understanding of the health of the region's watersheds and to identify restoration opportunities and priorities; and

d. Preparing and presenting monitoring and program evaluation reports to Metro Council no later than December 31, 2006, and by December 31 of each even-numbered year thereafter.

2. Metro will practice adaptive management by using the results of monitoring studies and the availability of new information to assess whether the goals, objectives, and targets of this title are being achieved.

C. Reporting Requirements for Cities and Counties.

1. Cities and counties shall report to Metro no later than December 31, 2007, and by December 31 of each odd-numbered year thereafter on their progress in using voluntary and incentive-based education, acquisition, and restoration habitat protection efforts; and

2. At least 45 days prior to a city's or county's final public hearing on a proposed new or amended ordinance or regulation relating to protection of, or mitigation of damage to, habitat, trees or other vegetation, cities and counties shall mail written notice of the proposed ordinance or regulation to Metro. Cities and counties that require applications for land use approvals or a building, grading, or tree removal permits to include documentation that the development meets habitat, tree, or vegetation protection and mitigation requirements adopted by a special district, including any county service district established pursuant to ORS chapter 451, shall mail written notice to Metro of any proposed new or amended ordinance or regulation relating to protection of, or mitigation of damage to, trees or other vegetation that is proposed by such a special district at least 45 days prior to the special district's final public hearing on the proposed new or amended ordinance or regulation.

D. Regional data coordination and maintenance.

1. Metro will act as the regional coordinator for Geographic Information System (GIS) data used to create and maintain the Regionally Significant Fish and Wildlife Habitat Inventory Map and other data relevant to program implementation, monitoring, and evaluation. To carry out this role cities and counties shall provide Metro with local data in a timely fashion and in a form compatible with Metro's GIS program. To the extent that such data is collected by county service districts established pursuant to ORS chapter 451, then the county in which the county service district operates shall comply with this section. Such data shall include:

   a. Adopted and revised Local Wetland Inventories approved by the Division of State Lands and those determined to be locally significant under ORS 197.279(3)(b);

   b. Wetland mitigation sites approved by the Division of State Lands or U.S. Army Corps of Engineers;

   c. For cities and counties that have not carried out Local Wetland Inventories, wetland boundaries delineated using accepted protocols by Division of State Lands or U.S. Army Corps of Engineers;

   d. Revised or updated local surface stream inventories;

   e. Revised or updated 100-year Federal Emergency Management Act (FEMA) flood area maps or revisions to the 1996 area of inundation maps to incorporate FEMA-approved floodplain map revisions or floodplain fills approved by the U.S. Army Corps of Engineers;

   f. Completed restoration and enhancement projects; and

g. Revised or updated Metro's Habitats of Concern data layer.

2. Metro will periodically update its Regionally Significant Fish and Wildlife Habitat Inventory for use in program monitoring and evaluation. Metro will maintain a study area boundary one mile beyond the perimeter of the Metro boundary and Metro Urban Growth Boundary.

Section 7. Future Metro Urban Growth Boundary Expansion Areas

The Metro Inventory Map identifies regionally significant fish and wildlife habitat within the entire Metro boundary, including areas outside of the Metro UGB at the time this title was adopted. As described in section 2 of this title, the Metro Council has designated as Habitat Conservation Areas the regionally significant fish and wildlife habitat that has been identified as riparian Class I and II habitat within the Metro boundary. In addition, the Metro Council has also determined that the regionally significant fish and wildlife habitat identified as upland wildlife Class A and B habitat that is currently outside of the Metro UGB shall be designated as Habitat Conservation Areas at such time that those areas are brought within the Metro UGB. Territory where the Metro UGB may expand includes both areas within the current Metro boundary and areas outside of the current Metro boundary.

A. New Urban Territory That Was Previously Within the Metro Boundary.

The Metro Inventory Map already identifies the regionally significant upland wildlife Class A and B habitat in territory within the current Metro boundary but outside the current Metro UGB. At the time such territory is brought within the Metro UGB, consistent with Title 11 of this functional plan, Metro Code sections 3.07.1110 et seq., Metro shall update its inventory of regionally significant fish and wildlife habitat for such territory using the same methodology used by Metro to establish the Metro Inventory Map. Based on the updated Metro Inventory Map, Metro shall prepare a Habitat Conservation Areas Map for such new territory, as described in subsection 2(B) of this title, using the 2040 Design Types that are assigned to such territory to determine the area's urban development value.

B. New Urban Territory That Was Previously Outside of the Metro Boundary.

At the time such territory is brought within the Metro UGB, consistent with Title 11 of this functional plan, Metro Code sections 3.07.1110 et seq., Metro shall prepare an inventory of regionally significant fish and wildlife habitat for such territory using the same methodology used by Metro to establish the Metro Inventory Map. Upon adoption of such inventory, Metro shall update its Metro Inventory Map to include such information. Based on the updated Metro Inventory Map, Metro shall prepare a Habitat Conservation Areas Map for such new territory, as described in subsection 2(B) of this title, using the 2040 Design Types that are assigned to such territory to determine the area's urban development value.

C. Metro recognizes that the assigned 2040 Design Types may change as planning for territory added to the Metro UGB progresses, and that the relevant Habitat Conservation Area designations will also change as a result of the 2040 Design Type changes during such planning.

Table 3.07-13a: Method for Identifying Habitat Conservation Areas ("HCA")

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

[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 Habitat Conservation Areas, as provided in Section 4(A)(5) of this title.
[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 HCAs.

Table 3.07-13b: Method for Identifying Habitat Conservation Areas ("HCA") in Future Metro Urban Growth Boundary Expansion Areas

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

NOTE: The default urban development value of property is as depicted on the Metro Habitat Urban Development Value Map. 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 this title.

[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 Habitat Conservation Areas, as provided in Section 4(A)(5) of this title.
[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 HCAs.

Table 3.07-13c. Habitat-friendly development practices.

Part (a): Design and Construction Practices to Minimize Hydrologic Impacts

1. Amend disturbed soils to original or higher level of porosity to regain infiltration and stormwater storage capacity.
2. Use pervious paving materials for residential driveways, parking lots, walkways, and within centers of cul-de-sacs.
3. Incorporate stormwater management in road right-of-ways.
4. Landscape with rain gardens to provide on-lot detention, filtering of rainwater, and groundwater recharge.
5. Use green roofs for runoff reduction, energy savings, improved air quality, and enhanced aesthetics.
6. Disconnect downspouts from roofs and direct the flow to vegetated infiltration/filtration areas such as rain gardens.
7. Retain rooftop runoff in a rain barrel for later on-lot use in lawn and garden watering.
8. Use multi-functional open drainage systems in lieu of more conventional curb-and-gutter systems.
9. Use bioretention cells as rain gardens in landscaped parking lot islands to reduce runoff volume and filter pollutants.
10. Apply a treatment train approach to provide multiple opportunities for storm water treatment and reduce the possibility of system failure.
11. Reduce sidewalk width and grade them such that they drain to the front yard of a residential lot or retention area.
12. Reduce impervious impacts of residential driveways by narrowing widths and moving access to the rear of the site.
13. Use shared driveways.
14. Reduce width of residential streets, depending on traffic and parking needs.
15. Reduce street length, primarily in residential areas, by encouraging clustering and using curvilinear designs.
16. Reduce cul-de-sac radii and use pervious vegetated islands in center to minimize impervious effects, and allow them to be utilized for truck maneuvering/loading to reduce need for wide loading areas on site.
17. Eliminate redundant non-ADA sidewalks within a site (i.e., sidewalk to all entryways and/or to truck loading areas may be unnecessary for industrial developments).
18. Minimize car spaces and stall dimensions, reduce parking ratios, and use shared parking facilities and structured parking.
19. Minimize the number of stream crossings and place crossing perpendicular to stream channel if possible.
20. Allow narrow street right-of-ways through stream corridors whenever possible to reduce adverse impacts of transportation corridors.

Part (b): Design and Construction Practices to Minimize Impacts on Wildlife Corridors and Fish Passage

1. Carefully integrate fencing into the landscape to guide animals toward animal crossings under, over, or around transportation corridors.
2. Use bridge crossings rather than culverts wherever possible.
3. If culverts are utilized, install slab, arch or box type culverts, preferably using bottomless designs that more closely mimic stream bottom habitat.
4. Design stream crossings for fish passage with shelves and other design features to facilitate terrestrial wildlife passage.
5. Extend vegetative cover through the wildlife crossing in the migratory route, along with sheltering areas.

Part (c): Miscellaneous Other Habitat-Friendly Design and Construction Practices

1. Use native plants throughout the development (not just in HCA).
2. Locate landscaping (required by other sections of the code) adjacent to HCA.
3. Reduce light-spill off into HCAs from development.
4. Preserve and maintain existing trees and tree canopy coverage, and plant trees, where appropriate, to maximize future tree canopy coverage.

Table 3.07-13d: Locating Boundaries of Class I and II Riparian Areas

Distance from Water Feature	Development/Vegetation Status[1]			
	Developed areas not providing vegetative cover[2]	Low structure vegetation or open soils[3]	Woody vegetation (shrub and scattered forest canopy)[4]	Forest Canopy (closed to open forest canopy)[5]
Surface Streams				
0-50'	Class II [6]	Class I [7]	Class I	Class I
50'-100'		Class II [6]	Class I	Class I
100'-150'		Class II if slope>25% [6]	Class II if slope>25% [6]	Class II [6]
150'-200'		Class II if slope>25% [6]	Class II if slope>25% [6]	Class II if slope>25% [6]
Wetlands (Wetland feature itself is a Class I Riparian Area)				
0-100'		Class II [6]	Class I	Class I
100'-150'				Class II [6]
Flood Areas				
Within 300' of river or surface stream		Class I	Class I	Class I
More than 300' from river or surface stream	[8]	Class II [6]	Class II [6]	Class I
0-100' from edge of flood area			Class II [6, 9]	Class II [6]

[1] Development/vegetative cover status is identified on the Metro Vegetative Cover Map (on file in the Metro Council office). The vegetative cover type assigned to any particular area was based on two factors: the type of vegetation observed in aerial photographs and the size of the overall contiguous area of vegetative cover to which a particular piece of vegetation belonged.

[2] "Developed areas not providing vegetative cover" are areas that lack sufficient vegetative cover to meet the one-acre minimum mapping unit for any type of vegetative cover.

[3] "Low structure vegetation or open soils" means areas that are part of a contiguous area one acre or larger of grass, meadow, crop-lands, or areas of open soils located within 300 feet of a surface stream (low structure vegetation areas may include areas of shrub vegetation less than one acre in size if they are contiguous with areas of grass, meadow, crop-lands, orchards, Christmas tree farms, holly farms, or areas of open soils located within 300 feet of a surface stream and together form an area of one acre in size or larger).

[4] "Woody vegetation" means areas that are part of a contiguous area one acre or larger of shrub or open or scattered forest canopy (less than 60% crown closure) located within 300 feet of a surface stream.

[5] "Forest canopy" means areas that are part of a contiguous grove of trees of one acre or larger in area with approximately 60% or greater crown closure, irrespective of whether the entire grove is within 200 feet of the relevant water feature.

[6] Areas that have been identified as habitats of concern, as designated on the Metro Habitats of Concern Map (on file in the Metro Council office), shall be treated as Class I riparian habitat areas in all cases, subject to the provision of additional information that establishes that they do not meet the criteria used to identify habitats of concern as described in Metro's Technical Report for Fish and Wildlife. Examples of habitats of concern include: Oregon white oak woodlands, bottomland hardwood forests, wetlands, native grasslands, riverine islands or deltas, and important wildlife migration corridors.

[7] Except that areas within 50 feet of surface streams shall be Class II riparian areas if their vegetation status is "Low structure vegetation or open soils," and if they are high gradient streams. High gradient streams are identified on the Metro Vegetative Cover Map. If a property owner believes the gradient of a stream was incorrectly identified, then the property owner may demonstrate the correct classification by identifying the channel type using the methodology described in the Oregon Watershed Assessment Manual, published by the Oregon Watershed Enhancement Board, and appended to the Metro's Riparian Corridor and Wildlife Habitat Inventories Report, Attachment 1 to Exhibit F to this ordinance.

[8] If development prior to the effective date of this title within a contiguous, undeveloped flood area (to include contiguous flood areas on adjacent properties) that was not mapped as having any vegetative cover has reduced the size of that contiguous flood area to less than one half of an acre in size, then the remaining flood area shall also be considered a developed flood area and shall not be identified as habitat.

[9] Only if within 300 feet of a river or surface stream.

Table 3.07-13e: Performance and Implementation Objectives and Indicators

Performance Objectives	Targets	Targeted Condition Based on 2004 Metro Inventory	Example Indicators
Performance Objective 1: Preserve and improve streamside, wetland, and flood area habitat and connectivity.	**1a.** *10% increase in forest and other vegetated acres within 50 feet* of streams (on each side) and wetlands in each subwatershed over the next 10 years (2015).	**1a. 2004 Baseline Condition (regional data):** • 64% vegetated • 14,000 vegetated acres **10% increase:** • 70% vegetated • 1,400 acre increase in vegetation over 10 years	• Percentage of acres within 50 feet of streams (on each side) and wetlands with any vegetation • Percentage of acres within 50 feet of streams (on each side) and wetlands with forest canopy • Percentage of acres between 50 and 150 feet of streams (on each side) and wetlands with any vegetation • Percentage of acres between 50 and 150 feet of streams (on each side) and wetlands with forest canopy • Number of acres of Class I and II Riparian Habitat • Percentage of flood area acres that are developed* * "Developed" for purposes of this indicator means the methodology used in Metro's Fish and Wildlife Inventory to identify developed flood areas.
	1b. *5% increase in forest and other vegetated acres within 50 to 150 feet of streams* (on each side) and wetlands in each subwatershed over the next 10 years (2015).	**1b. 2004 Baseline Condition (regional data):** • 59% vegetated • 15,250 vegetated acres **5% increase:** • 62% vegetated • 760 acre increase in vegetation over 10 years	
	1c. No more than *10% increase in developed flood area acreage* in each subwatershed over the next 10 years (2015).	**1c. 2004 Baseline Condition (regional data):** • 10% of all flood area acres are developed • 3,450 total acres of developed flood areas **10% increase:** • 3,800 total acres of developed flood areas	

Performance Objectives	Targets	Targeted Condition Based on 2004 Metro Inventory	Example Indicators
Performance Objective 2: Preserve large areas of contiguous habitat and avoid fragmentation.	**2a.** *Preserve 75% of vacant Class A and B* upland wildlife habitat in each subwatershed over the next 10 years (2015).	**2a. 2004 Baseline Condition:** • 15,500 acres of vacant Class A and B upland wildlife habitat **75% retention:** • 11,600 acres of vacant Class A and B upland wildlife habitat remaining	• Number of acres of Class A habitat • Number of acres of Class B habitat • Number of wildlife habitat patches that contain 30 acres or more of upland wildlife habitat
	2b. Of the upland habitat preserved, *retain 80% of the number of patches 30 acres or larger* in each subwatershed over the next 10 years (2015).	**2b. 2004 Baseline Condition:** • 23,400 acres of upland habitat in 133 patches that contain 30 acres or more of upland wildlife habitat **80% retention:** 106 upland habitat patches that contain 30 acres or more of upland habitat	
Performance Objective 3: Preserve and improve connectivity for wildlife between riparian corridors and upland wildlife habitat.	**3a.** *Preserve 90% of forested wildlife habitat acres located within 300 feet of surface streams* in each subwatershed over the next 10 years (2015).	**3a. 2004 Baseline Condition:** • 28,300 acres within 1,453 patches of forested wildlife habitat located within 300 feet of surface streams **90% retention:** • 25,500 acres of forested wildlife habitat located within 300 feet of surface streams	• Number and miles of all wildlife corridors • Corridor quality: % of habitat acres within corridors with a vegetative width of 200 ft • Acres of wildlife patches with a connectivity score of 3 or greater • Acres and number of forested wildlife habitat patches (forest canopy or wetland with a total combined size greater than 2 acres) within 300 feet of surface streams compared to acres of the patches located outside of 300 feet of surface streams.

Performance Objectives	Targets	Targeted Condition Based on 2004 Metro Inventory	Example Indicators
Performance Objective 3 (continued):	**3b.** *Preserve 80% of non-forested wildlife habitat acres located within 300 feet of surface streams* in each subwatershed over the next 10 years (2015).	**3b. 2004 Baseline Condition:** 14,400 acres within 1,633 patches of non-forested wildlife habitat located within 300 feet of surface streams **80% retention:** 11,500 acres of non-forested wildlife habitat located within 300 feet of surface streams	• Acres and number of non-forested wildlife patches (shrub or low structure/open soils with a total combined size greater than 2 acres) located within 300 feet of a surface streams.
Performance Objective 4: Preserve and improve special habitats of concern.	**4a.** *Preserve 95% of habitats of concern acres* in each subwatershed over the next 10 years (2015).	**4a. 2004 Baseline Condition:** • 33% of all habitat designated as HOCs • 26,700 total acres of HOCs **95% retention:** • 25,400 total acres of HOCs	• Number of acres of wetland • Number of acres of white oak woodland • Number of acres of bottomland hardwood forest • Number of acres of vegetated riverine islands • Number of acres of key connector habitat (list out HOC connectors)

Implementation Objectives	Example Indicators
Implementation Objective A: Increase the use of habitat-friendly development throughout the region	• Number of jurisdictions that allow or require LID • Number of jurisdictions providing LID incentives • Percentage of region in forest canopy • Percentage of impervious area • B-IBI (benthic index of biological integrity) scores
Implementation Objective B: Increase restoration and mitigation actions to compensate of adverse effects of new and existing development on ecological function	• Number of restoration projects in one year • Number of mitigation projects in one year • Acres and distribution by resource class of habitat inventory • Number of culverts that need improvement • Number of watersheds in region with adopted action plans

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EXHIBIT C—ORDINANCE NO. 05-1077C

ATTACHMENT 1. HABITAT CONSERVATION AREAS MAP

Available for review in the Metro Council's files (see map labeled "Ordinance No. 05-1077B," but note that additional revisions were approved as described in Section 10 of the ordinance) or from the Metro Data Resource Center, 600 N.E. Grand Ave., Portland, OR 97232. Electronic and printed copies of maps, in any reasonable scale and size required, may be purchased from the Data Resource Center. This map may also be available via Metro's website at: **www.metro-region.org/nature**.

EXHIBIT C—ORDINANCE NO. 05-1077C

ATTACHMENT 2. TUALATIN BASIN NATURAL RESOURCES COORDINATING COMMITTEE GOAL 5 PROGRAM (WITH MAPS)

The official copies of these documents, which were submitted with Ordinance No. 05-1077 as introduced on April 14, 2005, and have not been amended since submitted, are available in the Metro Council's files.

- Program Report
- Tualatin Basin program maps
- Clean Water Services Healthy Streams Plan
- Clean Water Services Design and Construction Standards

These documents are also available for review or purchase from the Metro Planning Department, 503-797-1555, 600 N.E. Grand Ave., Portland, OR 97232, and may be available by accessing the Washington County and Clean Water Services websites:

http://www.co.washington.or.us/deptmts/lut/planning/tualatin_basin.htm

http://www.CleanWaterServices.org

EXHIBIT C—ORDINANCE NO. 05-1077C

ATTACHMENT 3. METRO 2004 WETLAND INVENTORY MAP

Available for review in the Metro Council's files (see map labeled "Ordinance No. 05-1077B") or from the Metro Data Resource Center, 600 N.E. Grand Ave., Portland, OR 97232. Electronic and printed copies of maps, in any reasonable scale and size required, may be purchased from the Data Resource Center. This map may also be available via Metro's website at: **www.metro-region.org/nature**.

EXHIBIT C—ORDINANCE NO. 05-1077C

ATTACHMENT 4. METRO HABITAT URBAN DEVELOPMENT VALUE MAP

Available for review in the Metro Council's files (see map labeled "Ordinance No. 05-1077B") or from the Metro Data Resource Center, 600 N.E. Grand Ave., Portland, OR 97232. Electronic and printed copies of maps, in any reasonable scale and size required, may be purchased from the Data Resource Center.

EXHIBIT C—ORDINANCE NO. 05-1077C

ATTACHMENT 5. METRO VEGETATIVE COVER MAP

Available for review in the Metro Council's files (see map labeled "Ordinance No. 05-1077B," as amended by Technical Amendment No. 11, approved by the Council on September 22, 2005) or from the Metro Data Resource Center, 600 N.E. Grand Ave., Portland, OR 97232. Electronic and printed copies of maps, in any reasonable scale and size required, may be purchased from the Data Resource Center. This map may also be available via Metro's website at: **www.metro-region.org/nature**.

EXHIBIT C—ORDINANCE NO. 05-1077C

ATTACHMENT 6. METRO HABITATS OF CONCERN MAP

Available for review in the Metro Council's files (see map labeled "Ordinance No. 05-1077B") or from the Metro Data Resource Center, 600 N.E. Grand Ave., Portland, OR 97232. Electronic and printed copies of maps, in any reasonable scale and size required, may be purchased from the Data Resource Center.

EXHIBIT D—ORDINANCE NO. 05-1077C

AMENDMENTS TO TITLES 3, 8, 10 AND 11 OF THE URBAN GROWTH MANAGEMENT FUNCTIONAL PLAN

Amendment 1. Title 3 of the Urban Growth Management Functional Plan shall be renamed, "Water Quality and Flood Management."

Amendment 2. Metro Code Section 3.07.310, "Intent," shall be amended as follows:

To protect the beneficial water uses and functions and values of resources within the Water Quality and Flood Management Areas by limiting or mitigating the impact on these areas from development activities, and protecting life and property from dangers associated with flooding ~~and working toward a regional coordination program of protection for Fish and Wildlife Habitat Areas~~.

Amendment 3. Metro Code Section 3.07.320, "Applicability," shall be amended as follows:

A. Title 3 applies to:

1. Development in Water Quality Resource and Flood Management Areas.

2. Development which may cause temporary or permanent erosion on any property within the Metro Boundary.

~~3. Development in Fish and Wildlife Habitat Conservation Areas when Metro's Section 3.07.350 analysis and mapping are completed.~~

B. Title 3 does not apply to work necessary to protect, repair, maintain, or replace existing structures, utility facilities, roadways, driveways, accessory uses and exterior improvements in response to emergencies provided that after the emergency has passed, adverse impacts are mitigated in accordance with the performance standards in Section 3.07.340.

Amendment 4. Metro Code Section 3.07.340, "Performance Standards," shall be amended as follows:

A. Flood Management Performance Standards.

1. The purpose of these standards is to reduce the risk of flooding, prevent or reduce risk to human life and property, and maintain functions and values of floodplains such as allowing for the storage and conveyance of stream flows through existing and natural flood conveyance systems.

2. All development, excavation and fill in the Flood Management Areas shall conform to the following performance standards:

a. Development, excavation and fill shall be performed in a manner to maintain or increase flood storage and conveyance capacity and not increase design flood elevations.

b. All fill placed at or below the design flood elevation in Flood Management Areas shall be balanced with at least an equal amount of soil material removal.

c. Excavation shall not be counted as compensating for fill if such areas will be filled with water in non-storm winter conditions.

d. Minimum finished floor elevations for new habitable structures in the Flood Management Areas shall be at least one foot above the design flood elevation.

e. Temporary fills permitted during construction shall be removed.

f. Uncontained areas of hazardous materials as defined by DEQ in the Flood Management Area shall be prohibited.

3. The following uses and activities are not subject to the requirements of subsection 2:

a. Excavation and fill necessary to plant new trees or vegetation.

b. Excavation and fill required for the construction of detention facilities or structures, and other facilities such as levees specifically designed to reduce or mitigate flood impacts. Levees shall not be used to create vacant buildable lands.

c. New culverts, stream crossings, and transportation projects may be permitted if designed as balanced cut and fill projects or designed to not significantly raise the design flood elevation. Such projects shall be designed to minimize the area of fill in Flood Management Areas and to minimize erosive velocities. Stream crossing shall be as close to perpendicular to the stream as practicable. Bridges shall be used instead of culverts wherever practicable.

B. Water Quality Performance Standards.

1. The purpose of these standards is to: (1) protect and improve water quality to support the designated beneficial water uses as defined in Title 10, and (2) protect the functions and values of the Water Quality Resource Area which include, but are not limited to:

a. Providing a vegetated corridor to separate Protected Water Features from development;

b. Maintaining or reducing stream temperatures;

c. Maintaining natural stream corridors;

d. Minimizing erosion, nutrient and pollutant loading into water;

e. Filtering, infiltration and natural water purification; and

f. Stabilizing slopes to prevent landslides contributing to sedimentation of water features.

2. Local codes shall require all development in Water Quality Resource Areas to conform to the following performance standards:

a. The Water Quality Resource Area is the vegetated corridor and the Protected Water Feature. The width of the vegetated corridor is specified in Table 3.07-3. At least three slope measurements along the water feature, at no more than 100-foot increments, shall be made for each property for which development is proposed. Depending on the width of the property, the width of the vegetated corridor will vary.

b. Water Quality Resource Areas shall be protected, maintained, enhanced or restored as specified in Section 3.07.340(B)(2).

c. Prohibit development that will have a significant negative impact on the functions and values of the Water Quality Resource Area, which cannot be mitigated in accordance with subsection 2(f).

d. ~~Vegetative cover native to the Metro Area~~Native vegetation shall be maintained, enhanced or restored, if disturbed, in the Water Quality Resource Area. Invasive non-native or noxious vegetation may be removed from the Water Quality Resource Area ~~and replaced with native cover~~. ~~Only n~~Use of native vegetation shall be ~~used~~ encouraged to enhance or restore the Water Quality Resource Area. This shall not preclude construction of energy dissipaters at outfalls consistent with watershed enhancement, and as approved by local surface water management agencies.

e. Uncontained areas of hazardous materials as defined by DEQ in the Water Quality Resource Area shall be prohibited.

f. Cities and counties may allow development in Water Quality Resource Areas provided that the governing body, or its designate, implement procedures which:

i. Demonstrate that no practicable alternatives to the requested development exist which will not disturb the Water Quality Resource Area; and

ii. If there is no practicable alternative, limit the development to reduce the impact associated with the proposed use; and

iii. Where the development occurs, require mitigation to ensure that the functions and values of the Water Quality Resource Area are restored.

g. Cities and counties may allow development for repair, replacement or improvement of utility facilities so long as the Water Quality Resource Area is restored consistent with Section 3.07.340(B)(2)(d).

h. The performance standards of Section 3.07.340(B)(2) do not apply to routine repair and maintenance of existing structures, roadways, driveways, utilities, accessory uses and other development.

3. For lots or parcels which are fully or predominantly within the Water Quality Resource Area and are demonstrated to be unbuildable by the vegetative corridor regulations, cities and counties shall reduce or remove vegetative corridor regulations to assure the lot or parcel will be buildable while still providing the maximum vegetated corridor practicable. Cities and counties shall encourage landowners to voluntarily protect these areas through various means, such as conservation easements and incentive programs.

C. Erosion and Sediment Control.

1. The purpose of this section is to require erosion prevention measures and sediment control practices during and after construction to prevent the discharge of sediments.

2. Erosion prevention techniques shall be designed to prevent visible and measurable erosion as defined in Title 10.

3. To the extent erosion cannot be completely prevented, sediment control measures shall be designed to capture, and retain on-site, soil particles that have become dislodged by erosion.

D. Implementation Tools to Protect Water Quality and Flood Management Areas.

1. Cities and counties shall either adopt land use regulations, which authorize transfer of permitted units and floor area to mitigate the effects of development restrictions in Water Quality and Flood Management Areas, or adopt other measures that mitigate the effects of development restrictions.

2. Metro encourages local governments to require that approvals of applications for partitions, subdivisions and design review actions be conditioned upon one of the following:

a. Protection of Water Quality and Flood Management Areas with a conservation easement;

b. Platting Water Quality and Flood Management Areas as common open space; or

c. Offer of sale or donation of property to public agencies or private non-profits for preservation where feasible.

3. Additions, alterations, rehabilitation or replacement of existing structures, roadways, driveways, accessory uses and development in the Water Quality and Flood Management Area may be allowed provided that:

a. The addition, alteration, rehabilitation or replacement is not inconsistent with applicable city and county regulations, and

b. The addition, alteration, rehabilitation or replacement does not encroach closer to the Protected Water Feature than the existing structures, roadways, driveways or accessory uses and development, and

c. The addition, alteration, rehabilitation or replacement satisfies Section 3.07.340(C) of this title.

d. In determining appropriate conditions of approval, the affected city or county shall require the applicant to:

i. Demonstrate that no reasonably practicable alternative design or method of development exists that would have a lesser impact on the Water Quality Resource Area than the one proposed; and

ii. If no such reasonably practicable alternative design or method of development exists, the project should be conditioned to limit its disturbance and impact on the Water Quality Resource to the minimum extent necessary to achieve the proposed addition, alteration, restoration, replacement or rehabilitation; and

iii. Provide mitigation to ensure that impacts to the functions and values of the Water Quality Resource Area will be mitigated or restored to the extent practicable.

4. Cities and counties may choose not to apply the Water Quality and Flood Management Area performance standards of Section 3.07.340 to development necessary for the placement of structures when it does not require a grading or building permit.

5. Metro encourages cities and counties to provide for restoration and enhancement of degraded Water Quality Resource Areas through conditions of approval when development is proposed, or through incentives or other means.

6. Cities and counties shall apply the performance standards of this title to Title 3 Wetlands as shown on the Metro Water Quality and Flood Management Areas Map and locally adopted Water Quality and Flood Management Areas maps. Cities and counties may also apply the performance standards of this title to other wetlands.

E. Map Administration.

Cities and counties shall amend their comprehensive plans and implementing ordinances to provide a process for each of the following:

1. Amendments to city and county adopted Water Quality and Flood Management Area maps to correct the location of Protected Water Features, Water Quality Resource Areas and Flood Management Areas. Amendments shall be initiated within 90 days of the date the city or county receives information establishing a possible map error.

2. Modification of the Water Quality Resource Area upon demonstration that the modification will offer the same or better protection of water quality, the Water Quality and Flood Management Area and Protected Water Feature.

3. Amendments to city and county adopted Water Quality and Flood Management Area maps to add Title 3 Wetlands when the city or county receives significant evidence that a wetland meets any one of the following criteria:

   a. The wetland is fed by surface flows, sheet flows or precipitation, and has evidence of flooding during the growing season, and has 60 percent or greater vegetated cover, and is over one-half acre in size;

      or the wetland qualifies as having "intact water quality function" under the 1996 Oregon Freshwater Wetland Assessment Methodology; or

   b. The wetland is in the Flood Management Area, and has evidence of flooding during the growing season, and is five acres or more in size, and has a restricted outlet or no outlet;

      or the wetland qualifies as having "intact hydrologic control function" under the 1996 Oregon Freshwater Wetland Assessment Methodology; or

   c. The wetland or a portion of the wetland is within a horizontal distance of less than one-fourth mile from a water body which meets the Department of Environmental Quality definition of "water quality limited water body" in OAR Chapter 340, Division 41.

   Examples of significant evidence that a wetland exists that may meet the criteria above are a wetland assessment conducted using the 1996 Oregon Freshwater Wetland Assessment Methodology, or correspondence from the Division of State Lands that a wetland determination or delineation has been submitted or completed for property in the city or county.

4. Cities and counties are not required to apply the criteria in Section 3.07.340(E)(3) to water quality or stormwater detention facilities.

Amendment 5. Metro Code Section 3.07.350, "Fish and Wildlife Habitat Conservation Area," shall be repealed.

Amendment 6. Metro Code Section 3.07.360, "Metro Model Ordinance Required," shall be amended as follows:

Metro shall adopt a Water Quality and Flood Management Areas Model Ordinance and map. The Model Ordinance shall represent one method of complying with this title. The Model Ordinance shall be advisory, and cities and counties are not required to adopt the Model Ordinance, or any part thereof, to substantially comply with this title. However, cities and counties which adopt the Model Ordinance in its entirety and a Water Quality and Flood Management Areas Map shall be deemed to have substantially complied with the requirements of this title.

~~Section 3.07.350 of this title shall be implemented by adoption of new functional plan provisions. The Metro Council may adopt a Fish and Wildlife Habitat Conservation Areas Model Ordinance and Map for protection of regionally significant fish and wildlife habitat.~~

Amendment 7. Metro Code Section 3.07.370, "Variances," shall be repealed.

Amendment 8. Metro Code Section 3.07.810, "Compliance With the Functional Plan," shall be amended as follows:

A. The purpose of this section is to establish a process for determining whether city or county comprehensive plans and land use regulations comply with requirements of the Urban Growth Management Functional Plan. The Council intends the process to be efficient and cost-effective and to provide an opportunity for the Metro Council to interpret the requirements of its functional plan. Where the terms "compliance" and "comply" appear in this title, the terms shall have the meaning given to "substantial compliance" in Section 3.07.1010~~(rr)~~.

B. Cities and counties shall amend their comprehensive plans and land use regulations to comply with the functional plan, or an amendment to the functional plan, within two years after its acknowledgement by the Land Conservation and Development Commission, or after such other date specified in the functional plan. The Chief Operating Officer shall notify cities and counties of the compliance date.

C. Notwithstanding subsection ~~A~~B of this section, cities and counties shall amend their comprehensive plans and land use regulations to comply with Sections 3.07.310 to 3.07.340 of Title 3 of the Urban Growth Management Functional Plan by January 31, 2000, and with the requirements in Sections 3.07.710 to 3.07.760 of Title 7 of the Urban Growth Management Functional Plan by January 18, 2003.

D. Cities and counties that amend their comprehensive plans or land use regulations after the effective date of the functional plan shall make the amendments in compliance with the functional plan. After one year following acknowledgement of a functional plan requirement adopted or amended by the Metro Council after January 1, 2005, cities and counties that amend their comprehensive plans and land use regulations shall make such amendments in compliance with the new functional plan requirement. The Chief Operating Officer shall notify cities and counties of the effective date.

E. ~~Cities and counties whose comprehensive plans and land use regulations do not yet comply with a functional plan requirement adopted or amended prior to December 12, 1997, shall make land use decisions consistent with that requirement.~~ If ~~the~~a functional plan requirement was adopted or amended by the Metro Council after December 12, 1997, cities and counties whose comprehensive plans and land use regulations do not yet comply with the requirement shall, after one year following acknowledgment of the requirement, make land use decisions consistent with that requirement. Notwithstanding the previous sentence, however, cities and counties whose comprehensive plans and land use regulations do not yet comply with the requirements of Title 13 of this chapter, Metro Code sections 3.07.1310 to 3.07.1360, shall make land use decisions consistent with those requirements after two years following their acknowledgment. The Chief Operating Officer shall notify cities and counties of the date upon which functional plan requirements become applicable to land use decisions at least 120 days before that date. The notice shall specify which functional plan requirements become applicable to land use decisions in each city and county. For the purposes of this subsection, "land use decision" shall have the meaning of that term as defined in ORS 197.015(10).

F. An amendment to a city or county comprehensive plan or land use regulation shall be deemed to comply with the functional plan if no appeal to the Land Use Board of Appeals is made within the 21-day period set forth in ORS 197.830(9), or if the amendment is acknowledged in periodic review pursuant to ORS 197.633 or 197.644. If an appeal is made and the amendment is affirmed, the amendment shall be deemed to comply with the functional plan upon the final decision on appeal. Once the amendment is deemed to comply with the functional plan, the functional plan shall no longer apply to land use decisions made in conformance with the amendment.

G. An amendment to a city or county comprehensive plan or land use regulation shall be deemed to comply with the functional plan as provided in subsection F only if the city or county provided notice to the Chief Operating Officer as required by Section 3.07.820(A).

Amendment 9. Metro Code Section 3.07.1010, "Definitions," shall be amended as follows:

For the purpose of this functional plan, the following definitions shall apply:

(a) "Accessibility" means the amount of time required to reach a given location or service by any mode of travel.

(b) "Accessway" means right-of-way or easement designed for public access by bicycles and pedestrians, and may include emergency vehicle passage.

(c) "Alternative modes" means alternative methods of travel to the automobile, including public transportation (light rail, bus and other forms of public transportation), bicycles and walking.

(d) "Balanced cut and fill" means no net increase in fill within the floodplain.

(e) "Bikeway" means separated bike paths, striped bike lanes, or wide outside lanes that accommodate bicycles and motor vehicles.

(f) "Boulevard design" means a design concept that emphasizes pedestrian travel, bicycling and the use of public transportation, and accommodates motor vehicle travel.

(g) "Calculated capacity" means the number of dwelling units and jobs that can be contained in an area based on the calculation required by this functional plan.

(h) "Capacity expansion" means constructed or operational improvements to the regional motor vehicle system that increase the capacity of the system.

(i) "Comprehensive plan" means the all inclusive, generalized, coordinated land use map and policy statement of cities and counties defined in ORS 197.015(5).

(j) "Connectivity" means the degree to which the local and regional street systems in a given area are interconnected.

(k) "DBH" means the diameter of a tree measured at breast height.

(l) "Design flood elevation" means the elevation of the 100-year storm as defined in FEMA Flood Insurance Studies or, in areas without FEMA floodplains, the elevation of the 25-year storm, or the edge of mapped flood prone soils or similar methodologies.

(m) "Design type" means the conceptual areas described in the Metro 2040 Growth Concept text and map in Metro's regional goals and objectives, including central city, regional centers, town centers, station communities, corridors, main streets, inner and outer neighborhoods, industrial areas, and employment areas.

(n) "Designated beneficial water uses" means the same as the term as defined by the Oregon Department of Water Resources, which is: an instream public use of water for the benefit of an appropriator for a purpose consistent with the laws and the economic and general welfare of the people of the state and includes, but is not limited to, domestic, fish life, industrial, irrigation, mining, municipal, pollution abatement, power development, recreation, stockwater and wildlife uses.

(o) "Development" means any man-made change defined as buildings or other structures, mining, dredging, paving, filling, or grading in amounts greater than ten (10) cubic yards on any lot or excavation. In addition, any other activity that results in the removal of more than 10 percent of the vegetation in the Water Quality Resource Area on the lot is defined as development, for the purpose of Title 3 except that ~~more~~ less than 10 percent removal of vegetation on a lot must comply with Section 3.07.340(C) - Erosion and Sediment Control. In addition, any other activity that results in the removal of more than either 10 percent or 20,000 square feet of the vegetation in the Habitat Conservation Areas on the lot is defined as development, for the purpose of Title 13. Development does not include the following: (1) Stream enhancement or restoration projects approved by cities and counties; (2) Farming practices as defined in ORS 30.930 and farm use as defined in ORS 215.203, except that buildings associated with farm practices and farm uses are subject to the requirements of Titles 3 and 13; and (3) Construction on lots in subdivisions meeting the criteria of ORS 92.040(2).

(p) "Development application" means an application for a land use decision, limited land decision including expedited land divisions, but excluding partitions as defined in ORS 92.010(7) and ministerial decisions such as a building permit.

(q) "Ecological functions" means the biological and hydrologic characteristics of healthy fish and wildlife habitat. Riparian ecological functions include microclimate and shade, streamflow moderation and water storage, bank stabilization and sediment/pollution control, sources of large woody debris and natural channel dynamics, and organic material sources. Upland wildlife ecological functions include size of habitat area, amount of habitat with interior conditions, connectivity of habitat to water resources, connectivity to other habitat areas, and presence of unique habitat types.

~~(q) "DLCD Goal 5 ESEE" means a decision process local governments carry out under OAR 660-023-0040.~~

(r) "Emergency" means any man-made or natural event or circumstance causing or threatening loss of life, injury to person or property, and includes, but is not limited to, fire, explosion, flood, severe weather, drought earthquake, volcanic activity, spills or releases of oil or hazardous material, contamination, utility or transportation disruptions, and disease.

(s) "Enhancement" means the process of improving upon the natural functions and/or values of an area or feature which has been degraded by human activity. Enhancement activities may or may not return the site to a pre-disturbance condition, but create/recreate processes and features that occur naturally.

(t) "Fill" means any material such as, but not limited to, sand, gravel, soil, rock or gravel that is placed in a wetland or floodplain for the purposes of development or redevelopment.

(u) "Flood Areas" means those areas contained within the 100-year floodplain and floodway as shown on the Federal Emergency Management Agency Flood Insurance Maps and all lands that were inundated in the February 1996 flood. ~~"Fish and Wildlife Habitat Conservation Area" means the area defined on the Metro Water Quality and Flood Management Area Map to be completed and attached hereto[1]. These include all Water Quality and Flood Management Areas that require regulation in order to protect fish and wildlife habitat. This area has been mapped to generally include the area 200 feet from top of bank of streams in undeveloped areas with less than 25% slope, and 100 feet from edge of mapped wetland on undeveloped land.~~

(v) "Flood Management Areas" means all lands contained within the 100-year floodplain, flood area and floodway as shown on the Federal Emergency Management Agency Flood Insurance Maps and the area of inundation for the February 1996 flood. In addition, all lands which have documented evidence of flooding.

(w) "Floodplain" means land subject to periodic flooding, including the 100-year floodplain as mapped by FEMA Flood Insurance Studies or other substantial evidence of actual flood events.

(x) "Full street connection" means right-of-way designed for public access by motor vehicles, pedestrians and bicycles.

~~(y) "Functions and values of stream corridors" means stream corridors have the following functions and values: water quality retention and enhancement, flood attenuation, fish and wildlife habitat, recreation, erosion control, education, aesthetic, open space and wildlife corridor.~~

(y) "Growth Concept Map" means the conceptual map demonstrating the 2040 Growth Concept design types attached to this plan[2].

(z) "Habitat Conservation Area" or "HCA" means an area identified on the Habitat Conservation Areas Map and subject to the performance standards and best management practices described in Section 4 of Title 13.

(aa) "Habitat-friendly development" means a method of developing property that has less detrimental impact on fish and wildlife habitat than does traditional development methods. Examples include clustering development to avoid habitat, using alternative materials and designs such as pier, post, or piling foundations designed to minimize tree root disturbance, managing storm water on-site to help filter rainwater and recharge groundwater sources, collecting rooftop water in rain barrels for reuse in site landscaping and gardening, and reducing the amount of effective impervious surface created by development.

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[1] On file in the Metro Council office.
[2] On file in the Metro Council office.

(bb) "Habitats of Concern" means the following unique or unusually important wildlife habitat areas as identified based on cite specific information provided by local wildlife or habitat experts: Oregon white oak woodlands, bottomland hardwood forests, wetlands, native grasslands, riverine islands or deltas, and important wildlife migration corridors.

~~(aa)~~(cc) "Hazardous materials" means materials described as hazardous by Oregon Department of Environmental Quality.

~~(bb)~~(dd) "Implementing ordinances or regulations" means any city or county land use regulation as defined by ORS 197.015(11) which includes zoning, land division or other ordinances which establish standards for implementing a comprehensive plan.

~~(cc)~~(ee) "Improved pedestrian crossing." An improved pedestrian crossing is marked and may include signage, signalization, curb extensions and a pedestrian refuge such as a landscaped median.

~~(dd)~~(ff) "Invasive non-native or noxious vegetation" means plants listed as nuisance plants or prohibited plants on the Metro Native Plant List as adopted by Metro Council resolution because they are plant species that have been introduced and, due to aggressive growth patterns and lack of natural enemies in the area where introduced, spread rapidly into native plant communities~~, or which are not listed on the Metro Native Plant List as adopted by Metro Council resolution~~.

(gg) "Land Conservation and Development Commission" or "LCDC" means the Oregon Land Conservation and Development Commission.

~~(ee)~~(hh) "Landscape strip" means the portion of public right-of-way located between the sidewalk and curb.

(ii) "Land use regulation" means any local government zoning ordinance, land division ordinance adopted under ORS 92.044 or 92.046 or similar general ordinance establishing standards for implementing a comprehensive plan, as defined in ORS 197.015.

~~(ff)~~(jj) "Level-of-service (LOS)" means the ratio of the volume of motor vehicle demand to the capacity of the motor vehicle system during a specific increment of time.

(kk) "Local program effective date" means the effective date of a city's or county's new or amended comprehensive plan and implementing ordinances adopted to comply with Title 13 of the Urban Growth Management Functional Plan, Sections 1 to 6 of Exhibit C to Ordinance No. 05-1077. If a city or county is found to be in substantial compliance with Title 13 without making any amendments to its comprehensive plan or land use regulations, then the local program effective date shall be the effective date of Ordinance No. 05-1077. If a city or county amends its comprehensive plan or land use regulations to comply with Title 13, then the local program effective date shall be the effective date of the city's or county's amendments to its comprehensive plan or land use regulations, but in no event shall the local program effective date be later than two years after Title 13 is acknowledged by LCDC. For territory brought within the Metro UGB after the effective date of Metro Ordinance No. 05-1077, the local program effective date shall be the effective date of the ordinance adopted by the Metro Council to bring such territory within the Metro UGB.

~~(gg)~~(ll) "Local trips." Local vehicle trips are trips that are five miles or shorter in length.

~~(hh)~~(mm)"Median" means the center portion of public right-of-way, located between opposing directions of motor vehicle travel lanes. A median is usually raised and may be landscaped, and usually incorporates left turn lanes for motor vehicles at intersections and major access points.

~~(ii)~~(nn) "Metro" means the regional government of the metropolitan area, the elected Metro Council as the policy setting body of the government.

~~(jj)~~(oo) "Metro boundary" means the jurisdictional boundary of Metro, the elected regional government of the metropolitan area.

~~(kk)~~(pp)"Metro Urban Growth Boundary" or "Metro UGB" means the urban growth boundary as adopted and amended by the Metro Council, consistent with state law.

~~(ll)~~(qq) "Mitigation" means the reduction of adverse effects of a proposed project by considering, in the following order: (1) avoiding the impact all together by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (3) rectifying the impact by repairing, rehabilitating or restoring the ~~e~~affected environment; (4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action by monitoring and taking appropriate measures; and (5) compensating for the impact by replacing or providing comparable substitute water quality resource areas or habitat conservation areas.

~~(mm)~~(rr)"Mixed use" means comprehensive plan or implementing regulations that permit a mixture of commercial and residential development.

~~(nn)~~(ss) "Mixed-use development" includes areas of a mix of at least two of the following land uses and includes multiple tenants or ownerships: residential, retail and office. This definition excludes large, single-use land uses such as colleges, hospitals, and business campuses. Minor incidental land uses that are accessory to the primary land use should not result in a development being designated as "mixed-use development." The size and definition of minor incidental, accessory land uses allowed within large, single-use developments should be determined by cities and counties through their comprehensive plans and implementing ordinances.

~~(oo)~~(tt) "Mobility" means the speed at which a given mode of travel operates in a specific location.

~~(pp)~~(uu)"Mode-split target" means the individual percentage of public transportation, pedestrian, bicycle and shared-ride trips expressed as a share of total person-trips.

~~(qq)~~(vv)"Motor vehicle" means automobiles, vans, public and private buses, trucks and semi-trucks, motorcycles and mopeds.

~~(rr)~~(ww)"Multi-modal" means transportation facilities or programs designed to serve many or all methods of travel, including all forms of motor vehicles, public transportation, bicycles and walking.

~~(ss)~~(xx) "Narrow street design" means streets with less than 46 feet of total right-of-way and no more than 28 feet of pavement width between curbs.

~~(tt)~~(yy) "Native vegetation" or "native plant" means any vegetation ~~native to the Portland metropolitan area or~~ listed as a native plant on the Metro Native Plant ~~l~~List as adopted by Metro Council resolution and any other vegetation native to the Portland metropolitan area provided that it is not listed as a nuisance plant or a prohibited plant on the Metro Native Plant List.

~~(uu)~~(zz)"Net acre" means an area measuring 43.560 square feet which excludes:

- Any developed road rights-of-way through or on the edge of the land; and
- Environmentally constrained areas, including any open water areas, floodplains, natural resource areas protected under statewide planning Goal 5 in the comprehensive plans of cities and counties in the region, slopes in excess of 25 percent and wetlands requiring a Federal fill and removal permit under Section 404 of the Clean Water Act. These excluded areas do not include lands for which the local zoning code provides a density bonus or other mechanism which allows the transfer of the allowable density or use to another area or to development elsewhere on the same site; and
- All publicly-owned land designated for park and open spaces uses.

~~(vv)~~(aaa)"Net developed acre" consists of 43,560 square feet of land, after excluding present and future rights-of-way, school lands and other public uses.

(bbb) "Net vacant buildable land" means all vacant land less all land that is: (1) within Water Quality Resource Areas; (2) within Habitat Conservation Areas; (3) publicly owned by a local, state or federal government; (4) burdened by major utility easements; and (5) necessary for the provision of roads, schools, parks, churches, and other public facilities.

~~(ww)~~(ccc)"Perennial streams" means all primary and secondary perennial water ways as mapped by the U.S. Geological Survey.

~~(xx)~~(ddd)"Performance measure" means a measurement derived from technical analysis aimed at determining whether a planning policy is achieving the expected outcome or intent associated with the policy.

~~(yy)~~(eee)"Person-trips" means the total number of discrete trips by individuals using any mode of travel.

~~(zz)~~(fff)"Persons per acre" means the intensity of building development by combining residents per net acre and employees per net acre.

~~(aaa)~~(ggg)"Practicable" means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose. As used in Title 13 of this functional plan, "practicable" means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose and probable impact on ecological functions.

~~(bbb)~~(hhh)"Primarily developed" means areas where less than 10% of parcels are either vacant or underdeveloped.

~~(ccc)~~(iii)"Protected Water Features"

Primary Protected Water Features shall include:

- Title 3 wetlands; and

- Rivers, streams, and drainages downstream from the point at which 100 acres or more are drained to that water feature (regardless of whether it carries year-round flow); and
- Streams carrying year-round flow; and
- Springs which feed streams and wetlands and have year-round flow; and
- Natural lakes.

Secondary Protected Water Features shall include intermittent streams and seeps downstream of the point at which 50 acres are drained and upstream of the point at which 100 acres are drained to that water feature.

~~(ddd)~~(jjj)"Redevelopable land" means land on which development has already occurred which, due to present or expected market forces, there exists the strong likelihood that existing development will be converted to more intensive uses during the planning period.

~~(eee)~~(kkk)"Regional Goals and Objectives" are the land use goals and objectives that Metro is required to adopt under ORS 268.380(1).

~~(fff)~~(lll)"Regional vehicle trips" are trips that are greater than five miles in length.

(mmm) "Regionally significant fish and wildlife habitat" means those areas identified on the Regionally Significant Fish and Wildlife Habitat Inventory Map, adopted in Section 2 of Title 13, as significant natural resource sites.

~~(ggg)~~(nnn)"Restoration" means the process of returning a disturbed or altered area or feature to a previously existing natural condition. Restoration activities reestablish the structure, function, and/or diversity to that which occurred prior to impacts caused by human activity.

~~(hhh)~~(ooo)"Retail" means activities which include the sale, lease or rent of new or used products to the general public or the provision of product repair or services for consumer and business goods. Hotels or motels, restaurants or firms involved in the provision of personal services or office space are not considered retail uses.

~~(iii)~~(ppp)"Riparian area" means the water influenced area adjacent to a river, lake or stream consisting of the area of transition from an hydric ecosystem to a terrestrial ecosystem where the presence of water directly influences the soil-vegetation complex and the soil-vegetation complex directly influences the water body. It can be identified primarily by a combination of geomorphologic and ecologic characteristics.

~~(jjj)~~(qqq)"Routine repair and maintenance" means activities directed at preserving an existing allowed use or facility, without expanding the development footprint or site use.

~~(kkk)~~(rrr)"Shared-ride" means private passenger vehicles carrying more than one occupant.

~~(lll)~~(sss)"Significant increase in Single Occupancy Vehicle (SOV) capacity for multi-modal arterials." An increase in SOV capacity created by the construction of additional general purpose lanes totaling ½ lane miles or more in length. General purpose lanes are defined as through travel lanes or multiple turn lanes. This also includes the construction of a new general purpose highway

facility on a new location. Lane tapers are not included as part of the general purpose lane. Significant increases in SOV capacity should be assessed for individual facilities rather than for the planning area.

~~(mmm)~~(ttt)"Significant increase in Single Occupancy Vehicle (SOV) capacity for regional through-route freeways." Any increase in SOV capacity created by the construction of additional general purpose lanes other than that resulting from a safety project or a project solely intended to eliminate a bottleneck. An increase in SOV capacity associated with the elimination of a bottleneck is considered significant only if such an increase provides a highway section SOV capacity greater than ten percent over that provided immediately upstream of the bottleneck. An increase in SOV capacity associated with a safety project is considered significant only if the safety deficiency is totally related to traffic congestion. Construction of a new general purpose highway facility on a new location also constitutes a significant increase in SOV capacity. Significant increase in SOV capacity should be assessed for individual facilities rather than for the planning area.

~~(nnn)~~(uuu)"Significant negative impact" means an impact that affects the natural environment, considered individually or cumulatively with other impacts on the Water Quality Resource Area, to the point where existing water quality functions and values are degraded.

~~(ooo)~~(vvv)"Single occupancy vehicle (SOV)" means private passenger vehicles carrying one occupant.

~~(ppp)~~(www)"Straight-line distance" means the shortest distance measured between two points.

~~(qqq)~~(xxx)"Stream" means a body of running water moving over the earth's surface in a channel or bed, such as a creek, rivulet or river. It flows at least part of the year, including perennial and intermittent streams. Streams are dynamic in nature and their structure is maintained through build-up and loss of sediment.

~~(rrr)~~(yyy)"Substantial compliance" means city and county comprehensive plans and implementing ordinances, on the whole, conform with the purposes of the performance standards in the functional plan and any failure to meet individual performance standard requirements is technical or minor in nature.

~~(sss)~~(zzz)"Target capacities" means the capacities in Table 3.07-1 required to be demonstrated by cities and counties for compliance with Title 1, Section 3.07.120.

~~(ttt)~~(aaaa)"Target densities" means the average combined household and employment densities established for each design type in the RUGGO 2040 Growth Concept.

~~(uuu)~~(bbbb)"Title 3 Wetlands" means wetlands of metropolitan concern as shown on the Metro Water Quality and Flood Management Area Map and other wetlands added to city or county adopted Water Quality and Flood Management Area maps consistent with the criteria in Title 3, Section 3.07.340(E)(3). Title 3 wetlands do not include artificially constructed and managed stormwater and water quality treatment facilities.

~~(vvv)~~(cccc)"Top of bank" means the same as "bankfull stage" defined in OAR 141-085-0010~~(2)~~.

~~(www)~~(dddd)"Traffic calming" means street design or operational features intended to maintain a given motor vehicle travel speed.

(eeee) "Urban development value" means the economic value of a property lot or parcel as determined by analyzing three separate variables: assessed land value, value as a property that could generate jobs ("employment value"), and the Metro 2040 design type designation of property. The urban development value of all properties containing regionally significant fish and wildlife habitat is depicted on the Metro Habitat Urban Development Value Map referenced in Section 4(E) of Title 13.

(ffff) "Urban Growth Boundary" or "UGB" means an urban growth boundary adopted pursuant to ORS chapter 197.

~~(xxx)~~(gggg)"Underdeveloped parcels" means those parcels of land with less than 10% of the net acreage developed with permanent structures.

~~(yyy)~~(hhhh)"Utility facilities" means buildings, structures or any constructed portion of a system which provides for the production, transmission, conveyance, delivery or furnishing of services including, but not limited to, heat, light, water, power, natural gas, sanitary sewer, stormwater, telephone and cable television.

~~(zzz)~~(iiii)"Vacant land" means land identified in the Metro or local government inventory as undeveloped land.

~~(aaaa)~~(jjjj)"Variance" means a discretionary decision to permit modification of the terms of an implementing ordinance based on a demonstration of unusual hardship or exceptional circumstance unique to a specific property.

~~(bbbb)~~(kkkk)"Visible or measurable erosion." Visible or measurable erosion includes, but is not limited to:

- Deposits of mud, dirt sediment or similar material exceeding one-half cubic foot in volume on public or private streets, adjacent property, or onto the storm and surface water system, either by direct deposit, dropping discharge, or as a result of the action of erosion.

- Evidence of concentrated flows of water over bare soils; turbid or sediment laden flows; or evidence of on-site erosion such as rivulets on bare soil slopes, where the flow of water is not filtered or captured on the site.

- Earth slides, mudflows, earth sloughing, or other earth movement that leaves the property.

(llll) "Water feature" means all rivers, streams (regardless of whether they carry year-round flow, i.e., including intermittent streams), springs which feed streams and wetlands and have year-round flow, Flood Management Areas, wetlands, and all other bodies of open water.

~~(cccc)~~(mmmm)"Water Quality and Flood Management Area" means an area defined on the Metro Water Quality and Flood Management Area Map, to be attached hereto[3]. These are areas that require regulation in order to mitigate flood hazards and to preserve and enhance water quality. This area has been mapped to generally include the following: stream or river channels, known and mapped wetlands, areas with flood-prone soils adjacent to the stream, floodplains, and sensitive water

[3] On file in Metro Council office.

areas. The sensitive areas are generally defined as 50 feet from top of bank of streams for areas of less than 25% slope, and 200 feet from top of bank on either side of the stream for areas greater than 25% slope, and 50 feet from the edge of a mapped wetland.

~~(dddd)~~(nnnn)"Water Quality Resource Areas" means vegetated corridors and the adjacent water feature as established in Title 3.

~~(eeee)~~(oooo)"Wetlands." Wetlands are those areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support and under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands are those areas identified and delineated by a qualified wetland specialist as set forth in the 1987 Corps of Engineers Wetland Delineation Manual.

~~(ffff)~~(pppp)"Zoned capacity" means the highest number of dwelling units or jobs that are allowed to be contained in an area by zoning and other city or county jurisdiction regulations.

Amendment 10. Metro Code Section 3.07.1120, "Urban Growth Boundary Amendment Urban Reserve Plan Requirements," shall be amended as follows:

All territory added to the Urban Growth Boundary as either a major amendment or a legislative amendment pursuant to Metro Code chapter 3.01 shall be subject to adopted comprehensive plan provisions consistent with the requirements of all applicable titles of the Metro Urban Growth Management Functional Plan and in particular this Title 11. The comprehensive plan provisions shall be fully coordinated with all other applicable plans. The comprehensive plan provisions shall contain an urban growth plan diagram and policies that demonstrate compliance with the RUGGO, including the Metro Council adopted 2040 Growth Concept design types. Comprehensive plan amendments shall include:

A. Provision for annexation to the district and to a city or any necessary service districts prior to urbanization of the territory or incorporation of a city or necessary service districts to provide all required urban services.

B. Provision for average residential densities of at least 10 dwelling units per acre of net ~~developable residential acre~~vacant buildable land in zones in which residences are allowed, or other density prescribed by the Council in the ordinance adding the territory to the UGB~~lower densities which conform to the 2040 Growth Concept Plan design type designation for the area~~.

C. Demonstrable measures that will provide a diversity of housing stock that will fulfill needed housing requirements as defined by ORS 197.303. Measures may include, but are not limited to, implementation of recommendations in Title 7 of the Urban Growth Management Functional Plan.

D. Demonstration of how residential developments will include, without public subsidy, housing affordable to households with incomes at or below area median incomes for home ownership and at or below 80 percent of area median incomes for rental as defined by U.S. Department of Housing and Urban Development for the adjacent urban jurisdiction. Public subsidies shall not be interpreted to mean the following: density bonuses, streamlined permitting processes, extensions to the time at which systems development charges (SDCs) and other fees are collected, and other exercises of the regulatory and zoning powers.

E. Provision for sufficient commercial and industrial development for the needs of the area to be developed consistent with 2040 Growth Concept design types. Commercial and industrial designations in nearby areas inside the Urban Growth Boundary shall be considered in comprehensive plans to maintain design type consistency.

F. A conceptual transportation plan consistent with the applicable provision of the Regional Transportation Plan, Title 6 of the Urban Growth Management Functional Plan, and that is also consistent with the protection of natural resources either identified in acknowledged comprehensive plan inventories or as required by Title 3 of the Urban Growth Management Functional Plan. The plan shall, consistent with OAR Chapter 660, Division 11, include preliminary cost estimates and funding strategies, including likely financing approaches.

G. Identification, and mapping ~~and a funding strategy for protecting~~of areas to be protected from development due to fish and wildlife habitat protection, water quality enhancement and mitigation, and natural hazards mitigation, including, without limitation, all Habitat Conservation Areas, Water Quality Resource Areas, and Flood Management Areas. A natural resource protection plan to protect fish and wildlife habitat, water quality enhancement areas, and natural hazard areas shall be completed as part of the comprehensive plan and zoning for lands added to the Urban Growth Boundary prior to urban development. The plan shall include zoning strategies to avoid and minimize the conflicts between planned future development and the protection of Habitat Conservation Areas, Water Quality Resource Areas, Flood Management Areas, and other natural hazard areas. The plan shall also include a preliminary cost estimate and funding strategy, including likely financing approaches, for options such as mitigation, site acquisition, restoration, enhancement, ~~or~~ and easement dedication to ensure that all significant natural resources are protected.

H. A conceptual public facilities and services plan for the provision of sanitary sewer, water, storm drainage, transportation, parks and police and fire protection. The plan shall, consistent with OAR Chapter 660, Division 11, include preliminary cost estimates and funding strategies, including likely financing approaches.

I. A conceptual school plan that provides for the amount of land and improvements needed, if any, for school facilities on new or existing sites that will serve the territory added to the UGB. The estimate of need shall be coordinated with affected local governments and special districts.

J. An urban growth diagram for the designated planning area showing, at least, the following, when applicable:

1. General locations of arterial, collector and essential local streets and connections and necessary public facilities such as sanitary sewer, storm sewer and water to demonstrate that the area can be served;

2. Location of steep slopes and unbuildable lands including but not limited to wetlands, floodplains and riparian areas;

3. Location of Habitat Conservation Areas;

~~3~~4. General locations for mixed use areas, commercial and industrial lands;

~~4~~5. General locations for single and multi-family housing;

~~5~~6. General locations for public open space, plazas and neighborhood centers; and

~~6~~7. General locations or alternative locations for any needed school, park or fire hall sites.

K. The plan amendments shall be coordinated among the city, county, school district and other service districts.

M:\attorney\confidential\07 Land Use\04 2040 Growth Concept\03 UGMFP\02 Stream Protection (Title 3)\02 Goal 5\02 Program\05 Ord 05-1077C\Ord 05-1077C Ex D UGMFP 092305.doc

EXHIBIT E—ORDINANCE NO. 05-1077C

METRO CODE CHAPTER 3.07
URBAN GROWTH MANAGEMENT FUNCTIONAL PLAN

TITLE 13 MODEL ORDINANCE

Table of Contents

Section 1. Intent
The purpose of this ordinance is to comply with Section 4 of Title 13 of Metro's Urban Growth Management Functional Plan.

A. To protect and improve the following functions and values that contribute to fish and wildlife habitat in urban streamside areas:

1. Microclimate and shade;

2. Stream-flow moderation and water storage;

3. Bank stabilization, sediment and pollution control;

4. Large wood recruitment and retention and channel dynamics; and

5. Organic material sources.

B. To protect and improve the following functions and values that contribute to upland wildlife habitat in new urban growth boundary expansion areas:

1. Large habitat patches

2. Interior habitat

3. Connectivity and proximity to water; and

4. Connectivity and proximity to other upland habitat areas

C. To establish High, Moderate, and Low Habitat Conservation Areas (HCA) to implement the performance standards of Title 13 of the Urban Growth Management Functional Plan.

D. To provide clear and objective standards and a discretionary review process, applicable to development in Habitat Conservation Areas, in accordance with Statewide Land Use Planning Goal 5.

E. To allow and encourage habitat-friendly development, while minimizing the impact on fish and wildlife habitat functions.

F. To provide mitigation standards for the replacement of ecological functions and values lost through development in Habitat Conservation Areas.

Section 2. Applicability

A. This ordinance applies to all properties containing mapped Habitat Conservation Areas (HCA).

B. All applicants must provide Construction Management Plans, in accordance with Section 5 of this ordinance.

C. Where applicants are proposing development entirely outside of the HCA, but within 100 feet of its boundary, applicants must verify this boundary through the procedures outlined in Section 9 of this ordinance.

D. Where applicants are proposing development within the HCA, they must comply with the Development Standards found in Section 6 and Section 7 of this ordinance, and the Map Verification procedures found in Section 9 of this ordinance. Conditioned Uses, and Activities that are exempt from these requirements, may be found in Section 3 of this ordinance.

E. Applicants proposing to partition or subdivide properties containing HCA must comply with the partition and subdivision standards found in Section 6(F) of this ordinance, or the Discretionary standards in Section 7 of this ordinance; as well as the Map Verification procedure in Section 9 of this ordinance.

F. The Development Standards found in Sections 6 and 7 of this ordinance do not apply to development that occurs entirely outside of any portion of the HCA.

G. The requirements of this ordinance apply in addition to other applicable local, state, regional, and federal development requirements, including those for Water Quality Resource Areas and Flood Management Areas; except that:

   1. Applicants using the discretionary review process in Section 7 of this ordinance do not need to engage in any additional review process for Water Quality Resource Areas; and

   2. This ordinance shall not impose any mitigation requirements for wetlands beyond those required by federal and state law.

H. "Development," "Partition," and "Subdivision" are defined in Section 11 of this ordinance.

Section 3. Exempt Uses and Conditioned Activities
The following uses and activities are exempt from the requirements of this chapter:

A. Change of ownership.

B. Where construction of a residence was completed before January 1, 2006, the owners or residents shall not be restricted from engaging in any development that was allowed prior to September 22, 2005; unless such development required obtaining a land use decision, or a building, erosion control, or grading permit.

C. A building permit for a phased development project for which the applicant has previously met the application requirements, so long as the site for new construction was identified on the original permit and no new portion of the HCA will be disturbed.

D. Where a property has been subdivided under subsection 6(F) of this ordinance, and the mitigation requirements of subsection 6(E) (and, if appropriate, subsections 7(B) and 7(C)) have been completed for the subdivision, development on the individual lots may proceed without further review under this ordinance. Similarly, where a property has been subdivided under subsection 7(D) of this ordinance, and the mitigation requirements of subsection 7(D) have been completed for the subdivision, development on the individual lots may proceed without further review under this ordinance.

E. Limited types of development, redevelopment, operations, and improvements, including the following:

1. Maintenance, alteration, expansion, repair and replacement of existing structures provided that the building footprint is not increased.

2. The alteration, expansion, or replacement of existing structures, provided that:

   a. The alteration, expansion, or replacement of a structure will not intrude more than 500 sq. ft. into the HCA in addition to the area defined as the building footprint as of January 1, 2006; and

   b. The new intrusion into the HCA is no closer to the protected water feature than the pre-existing structure or improvement.

3. Minor encroachments not to exceed 120 sq. ft. of impervious surface such as accessory buildings, eave overhangs, exterior building improvements for access and exiting requirements, or other similar features.

4. Temporary and minor clearing not to exceed 200 square feet for the purpose of site investigations and pits for preparing soil profiles, provided that such areas are restored to their original condition when the investigation is complete.

5. Up to 10% of vegetative cover within the original mapped HCA on a lot or parcel may be removed, provided that no more than 20,000 square feet is removed; and provided that if more than 10% has been removed at the time of a development application, the review process shall use the original mapped HCA, subject to map verification, as the basis for determining the Maximum Disturbance Area in Section 6(C) of this ordinance and Mitigation standards in Sections 6(E) and 7(B), 7(C), 7(D)(1)(b) and 7(D)(2)(d) of this ordinance.

6. Maintenance of existing gardens, pastures, lawns and landscape perimeters, including the installation of new irrigation systems within existing gardens, pastures, lawns, and landscape perimeters.

7. Removal of plants identified as nuisance or prohibited plants on the *Metro Native Plant List* and the planting or propagation of plants identified as native plants on the *Metro Native Plant List*. Handheld tools must be used to remove nuisance or prohibited plants, and after such removal all open soil areas greater than 25 square feet must be replanted.

8. Farming practices and farm uses on land within an exclusive farm use zone established under ORS 215.203, within an area designated as marginal land under ORS 197.247 (1991 Edition), or on other agricultural lands, except that this exemption does not apply to buildings associated with farm practices or farm uses. "Farming practice" as used in this subsection shall have the meaning set out in ORS 30.930. "Farm use" as used in this subsection shall have the meaning set out in ORS 215.203.

9. Forest practices on forestlands situated outside the Metro UGB, except as provided in ORS 527.722(2), (3), and (4). "Forest practices" and "forestlands" as used in this subsection shall have the meaning set out in ORS 30.930.

10. Maintenance, alteration, repair, and replacement of roads and utilities when no additional incursion into the HCA is proposed.

11. Maintenance and repair of existing streets, railroads, shipping terminals, and utilities within rights-of-way, easements, and access roads.

12. Existing water-dependent uses that can only be carried out on, in, or adjacent to water because they require access to the water for waterborne transportation or recreation.

13. Operation, maintenance, and repair of manmade water control facilities such as irrigation and drainage ditches, constructed ponds or lakes, wastewater facilities, and stormwater pretreatment facilities.

14. Projects with the sole purpose of restoring or enhancing wetlands, streams, or fish and wildlife habitat areas, provided that the project is part of an approved local, state, or federal restoration or enhancement plan.

15. Low-impact outdoor recreation facilities for public use, outside of Water Quality Resource Areas, including, but not limited to, multi-use paths, access ways, trails, picnic areas, or interpretive and educational displays and overlooks that include benches and outdoor furniture, provided that the facility meets the following requirements:

    a. It contains less than 500 sq. ft. of new impervious surface; and,

    b. Its trails shall be constructed using non-hazardous, pervious materials, with a maximum width of four feet.

F. Emergency procedures or activities undertaken which are necessary to remove or abate hazards and nuisances or for the protection of public health, safety and welfare; provided that such remedial or preventative action must take place within a timeframe too short to allow for compliance with the requirements of this ordinance. After the emergency, the person or agency undertaking the action shall fully restore any impacts to the HCA resulting from the emergency action. Hazards that may be removed or abated include those required to maintain aircraft safety.

G. Multnomah County Drainage District - Within Habitat Conservation Areas located in Multnomah County Drainage District No. 1, Peninsula Drainage District No. 1, Peninsula Drainage District No. 2, and the area managed by the Sandy Drainage Improvement Company, routine operations, repair, maintenance, reconfiguration, rehabilitation, or replacement of existing drainage and flood control facilities, and existing related facilities, including any structures, pump stations, water control structures, culverts, irrigation systems, roadways, utilities, accessory uses (such as off-load facilities that facilitate water-based maintenance), erosion control projects, levees, soil and bank stabilization projects, dredging and ditch clearing within the hydraulic cross-section in existing storm water conveyance drainageways, or other water quality and flood storage projects applicable to existing facilities and required to be undertaken pursuant to ORS chapters 547 or 554 or Titles 33 or 44 of the Code of Federal Regulations, shall be allowed, provided that:

1. The project is consistent with all other applicable local, state, and federal laws and regulations;

2. The project does not encroach closer to a surface stream or river, wetland, or other body of open water than existing operations and development;

3. Disturbed areas are replanted with vegetation and no bare soils remain after project completion; the planting of native vegetation and removal of invasive non-native or noxious vegetation is encouraged; invasive non-native or noxious vegetation shall not be planted; and,

4. Each district submits an annual report, to all local permitting agencies in which the district operates, describing the projects the district completed in the previous year and how those projects complied with all applicable federal and state laws and requirements.

H. Wildlife Hazard Management Areas - 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 comply with subsections 6(B-D), 7(D)(1)(a)(3) and (4), or 7(D)(2)(b), (c) and (e) of this ordinance. For disturbance within the HCA on property owned by the Port of Portland within 10,000 feet of an Aircraft Operating Area, as defined by the FAA, the applicant shall choose, at its sole discretion, between complying with subsection 6(E) of this ordinance or complying with subsection 7(C), or subsections 7(D)(1)(b) and 7(D)(2)(d) of this ordinance. Mitigation required pursuant to subsection 6(E) or 7(C), or 7(D)(1)(b) and 7(D)(2)(d) of this ordinance as part of any development within the HCA 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:

1. Within the same 6th Field Hydrologic Unit Code subwatershed as delineated by the United States Department of Agriculture's Natural Resources Conservation Service (NRCS) if on-site mitigation would conflict with FAA-compliant WHMP; or

2. Outside of the same 6th Field Hydrologic Unit Code subwatershed as delineated by the United States Department of Agriculture's Natural Resources Conservation Service (NRCS) only if the applicant follows the discretionary review process in section 7 of this ordinance.

Section 4. Prohibitions

A. The planting of any invasive non-native or noxious vegetation is prohibited within the HCA.

B. Outside storage of materials is prohibited within the HCA, unless such storage began before the effective date of this ordinance; or, unless such storage is approved during development review under either Section 6 or Section 7 of this ordinance.

Section 5. Construction Management Plans

In order to ensure that trees and vegetation within HCAs are not damaged during construction, all applicants, even those not developing within an HCA, shall provide a construction management plan that includes the following information:

A. Location of site access and egress that construction equipment will use;

B. Equipment and material staging and stockpile areas;

C. Erosion and sediment control measures; and

D. Measures to protect trees and other vegetation located within the HCA, but outside of the disturbance area approved under the provisions of section 6 or section 7 of this ordinance.

Section 6. Development Standards
The development standards described in this section apply to all development and redevelopment that occurs entirely, or partially, within Habitat Conservation Areas, unless such development is exempt under Section 3, or, unless the applicant chooses to follow the discretionary process in Section 7 of this ordinance. This section also applies to subdivisions and partitions of properties that contain HCAs.

Application for a land use, building, grading, land division, or other development permit through the clear and objective process may be an administrative decision. [*Insert city/county decision-type here.*]

A. **Application Requirements.** Applications for a building permit or development permit must provide a development plan and accompanying narrative explanation that includes the following information in addition to any other building permit or development permit requirements. All of the application requirements must be met prior to approval of a building or development permit.

1. Applicants must verify the HCA on their property as described in Section 9 of this ordinance.

2. For the entire subject property (HCA and non-HCA), applicants must submit a scale map of the property that includes:

   a. Location of all High, Moderate, and Low HCAs on the property;

   b. Outline of any existing disturbance area, including the location of existing adjacent streets and paved areas, utilities, culverts, stormwater management facilities, or bridges;

   c. Location of any wetlands or water bodies on the property, including a delineation of the Water Quality Resource Area;

   d. Location of 100 year floodplain and floodway boundary as defined by the Federal Emergency Management Agency (FEMA) and the area of the 1996 flood inundation; and

   e. Topography shown by contour lines of 2-ft. intervals for slopes less than 15% and by 10 ft. intervals for slopes 15% or greater. On properties that are two acres or larger, such a contour map is required only for the portion of the property to be developed.

3. Detailed site plan of proposed development outlining total disturbance area, including, proposed building footprints, site property improvements, utilities and landscaping.

4. The following additional information shall be provided about the HCA:

   a. For properties containing less than one acre of HCA, the location of all trees within the HCA that are greater than six inches diameter at breast height (DBH), shall be identified by size and species. For properties containing one acre or more of HCA, the applicant may approximate the number of trees and the diameter range, and provide a listing of the dominant species;

   b. For proposed disturbance areas containing less than one acre of HCA, all trees with a diameter of six inches or greater that will be removed shall be specifically identified as to

diameter at breast height (DBH) and species. For proposed disturbance areas containing one acre or more of HCA an approximate of the number of trees, their diameters and the dominant species; and

c. If grading will occur within the HCA, a grading plan showing the proposed alteration of the ground at 1-ft. vertical contours in areas of slopes less than 5%, and 2-ft. vertical contours in areas of slopes 6-15%, and at 5-ft. vertical contours of slopes 15% or greater.

B. **Methods for avoiding Habitat Conservation Areas.** The following habitat-friendly development practices may be used to avoid or minimize development within HCAs by allowing flexible site design. [*Cities/counties shall allow the following methods to avoid, or minimize, development within HCAs*]:

1. ***Building setback flexibility*** to avoid, or minimize, development within HCAs. The minimum building setback of the base zone may be reduced to any distance between the base zone minimum and zero, unless this reduction conflicts with applicable fire or life safety requirements.

2. ***Flexible landscaping requirements*** to avoid, or minimize, development within HCAs.

   a. Landscaping requirements, apart from those required for parking lots or street berms, may be met by preserving the HCA.

   b. Facilities that infiltrate stormwater onsite, including the associated piping, may be placed within the HCA so long as the forest canopy and the areas within the driplines of the trees are not disturbed. Such facilities may include, but are not limited to, vegetated swales, rain gardens, vegetated filter strip, and vegetated infiltration basins. Only native vegetation may be planted in these facilities.

3. ***Flexible Site Design*** (On-site Density Transfer) to avoid or minimize development within HCAs.

   a. *Residential.* For residential development proposals on lands with a HCA, a transfer of density within the property site is permitted. [*Cities/counties may establish the appropriate percentage of density that may be transferred, provided that it is not less than 50% of the maximum density that would have been permitted in the portion of property within the HCA under the applicable zoning code requirements.]*

   b. In order to accommodate the transferred density, dimensional standards and lot sizes may be adjusted by no more than 30 percent. [*Cities/counties may set the percentage of the adjustment, provided that it is no lower than 20%.*]

   c. *Commercial and Industrial Zones.* For on-site density transfers in Commercial or Industrial zones, the transfer credit is 10,000 sq. ft floor area ratio (FAR) per acre of land within the HCA.

   d. *Mixed-Use Zones.* Within mixed-use zones the density transfer credit can be factored using either 3(a) or 3(c) above, depending on the type of development proposed.

   e. All remaining HCA shall be permanently restricted from development and maintained for habitat functions, such as by making a public dedication or executing a restrictive covenant.

4. ***Site Capacity Incentives.*** The following site capacity standards provide flexibility in the design of land divisions in order to allow ways to better protect HCAs.

   a. Density bonus if HCA is protected. In multi-family residential zones, a 25 percent density bonus may be allowed for any development of four (4) or more dwelling units if 75 percent or more of the HCA on a site is permanently preserved, such as by making a public dedication or executing a restrictive covenant. The bonus density shall be in addition to the base density allowed in the applicable zoning district.

   b. All area within a HCA, or any portion of it, may be subtracted from the calculations of net size for purposes of determining the minimum number of units that must be built on the property, provided that such area is protected, such as by making a public dedication or executing a restrictive covenant. This provision may only be applied to properties that were inside the Metro UGB on January 1, 2002.

5. *[Cities/Counties may allow the following tools for avoiding or minimizing development in HCAs]:*

   Transfer of development rights (off-site) in residential zones. Transfer of development rights preserves development opportunities and reduces development pressure on environmentally-sensitive properties. The regulations described below allow development rights to be transferred from properties with HCAs to off-site areas that can accommodate the additional density without environmental conflict. Transfer of development rights between properties is allowed as follows. "Development rights" are the number of potential dwelling units that would be allowed on the property by the base zone.

   a. Sending properties. Properties where at least 50 percent of the property is within a HCA may transfer development rights.

   b. Receiving Properties.

   Option 1: All properties in 2040 Mixed-Use areas may receive development rights from sending properties except:

      i. Where any portion of the receiving property is within an HCA; or

      ii. Where any portion of the receiving property is in the undeveloped 100-year floodplain as currently defined by the Federal Emergency Management Agency (FEMA).

   Option 2: City or county may identify receiving properties upon adoption of this ordinance to be selected using the criteria in Option 1. The resulting map or criteria to identify receiving properties may include fewer properties than Option 1.

   a. Maximum density. The density of the receiving property may not exceed 200 percent of the allowable density of the receiving property.

   b. In order to accommodate the transferred density, dimensional standards and lot sizes may be adjusted by no more than 30 percent.

   c. Transfer procedure. Transfer of development rights is allowed as follows:

i. Covenant required. The owner of the sending property must execute a covenant with the authorizing authority that reflects the reduced development potential on the sending property. The covenant must be recorded before approval of the final plan. Density transfers shall be recorded on the title of the sending lot in the HCA and on the title of the transfer (receiving) property.

ii. Sending property included. The sending property must be a part of the application for development on the receiving property. A copy of the covenant for the sending property must be included with the application.

iii. City or county may purchase development rights from sending properties to place in a development rights bank for later sale to developers to use on receiving properties.

C. **Development within HCAs.** The following development standards apply to all development that occurs within the HCA except for exempt uses and conditioned activities addressed in Section 3 of this ordinance and utility facilities addressed in subsection 6(D) of this ordinance. If all development occurs outside of an HCA on a property, these standards do not apply. These standards also do not apply to development that occurs pursuant to the standards established by the alternative discretionary development standards in Section 7 of this ordinance. (Note: Applicants seeking to develop within a Water Quality Resource Area must utilize either the discretionary standards located in Section 7 of this ordinance or the review standards for Metro's Title 3 Water Quality Resource Areas).

1. ***Disturbance area limitations*** to minimize impact to HCA.

a. *Single-family residential.* The maximum disturbance area (MDA) allowed within HCAs is determined by subtracting the area of the lot or parcel outside of the HCAs from the total disturbance area (TDA) calculated as described in Table 1 below.
(TDA – Area outside the HCA = MDA)

i. Moderate and Low HCAs are subject to the same disturbance area limitations.

ii. Calculation of maximum disturbance area. If a lot or parcel includes both High and Moderate/Low HCAs then:

(A) If there is more High HCA than Moderate/Low HCA on the lot or parcel, then the MDA shall be calculated as if all of the Moderate/Low and High HCA were High, per Table 1 below; or

(B) If there is more Moderate/Low HCA than High HCA on the lot or parcel, then the MDA shall be calculated as if all of the Moderate/Low and High HCA were Moderate/Low, per Table 1 below.

iii. Location of MDA. If a lot or parcel includes different types of HCAs, then:

(A) The amount of development that may occur within the High HCA is equal to the total disturbance area minus the area of the lot or parcel outside of the High HCA (TDA – non-High HCA = MDA). If the area of the lot or parcel outside the High HCA is greater than the total disturbance area, then development shall not occur within the High HCA:

(Area outside High HCA > TDA = no development in High HCA);

(B) The amount of development that may occur within the Moderate HCA is equal to the total disturbance area minus the area of the lot or parcel outside of the High and Moderate HCA (TDA – (Low HCA + non-HCA) = MDA). If the area of the lot or parcel outside the Moderate HCA is greater than the total disturbance area, then development shall not occur within the Moderate HCA:

(Area outside Moderate HCA > TDA = no development in Moderate HCA);

and

(C) The amount of development that may occur within the Low HCA is equal to the total disturbance area minus the area of the lot or parcel outside of the High, Moderate and Low HCA (TDA – non-HCA = MDA). If the area of the lot or parcel outside the Low HCA is greater than the total disturbance area, then development shall not occur within the Low HCA:

(Area outside Low HCA > TDA = no development in Low HCA).

Table 1. HCA Total Disturbance Area Limitations for SFR.

HCA type	Total Disturbance Area
High	50 percent of the lot area, up to maximum of 5,000 sq. ft.
Moderate/Low	65 percent of the lot area, up to maximum of 6,000 sq. ft.

b. *All other zones.* The maximum disturbance area (MDA) allowed by right within Low, Moderate and High HCAs in these zones is found in Table 2 below; this MDA is subject to the mitigation requirements described in subsection 6(E) of this ordinance.

Table 2. HCA Disturbance Area Limitations for all zones other than SFR.

HCA type	Maximum Disturbance Area
High	10 percent of HCA on site
Moderate	15 percent of HCA on site
Low	50 percent of HCA on site

c. Development within an HCA in accordance with the provisions of this ordinance shall not result in a change of the HCA status of such developed areas on a property. In the case of a later development request seeking to develop within previously undisturbed HCAs on a property where a prior development request was subject to the provisions of this ordinance, the calculation of the MDA allowed on the property shall be based on the location of the HCA, notwithstanding the location of any authorized development within the HCA.

2. ***Protection of habitat during site development.*** During development of any site containing a HCA, the following standards apply:

a. Work areas shall be marked to reduce potential damage to the HCA.

b. Trees in HCAs shall not be used as anchors for stabilizing construction equipment.

c. Native soils disturbed during development shall be conserved on the property.

d. An erosion and sediment control plan is required and shall be prepared in compliance with requirements set forth in the [*locally adopted Title 3 erosion control regulations*];

e. Prior to construction, the HCA that is to remain undeveloped shall be flagged, fenced, or otherwise marked and shall remain undisturbed.

f. All work on the property shall conform to the Construction Management Plan described in Section 5 of this ordinance.

D. **Utility facility standards.** The following disturbance area limitations apply to new utilities, private connections to existing or new utility lines, and upgrade

a. The disturbance area for utility facility connections to utility facilities is no greater than 10 feet wide.

b. The disturbance area for the upgrade of existing utility facilities is no greater than 15 feet wide.

c. The disturbance area for new underground utility facilities is no greater than 25 feet wide and disturbs no more than 200 linear feet of Water Quality Resource Area, within any 1,000 linear foot stretch of Water Quality Resource Area; provided that this disturbance area shall be restored with the exception of necessary access points to the utility facility.

d. No fill or excavation is allowed within the ordinary high water mark of a stream, unless a permit is obtained from the US Army Corps of Engineers through the Standard Local Operating Procedures for Endangered Species (SLOPES) process.

e. Mitigation is required as described in subsection E below.

E. **Mitigation requirements for disturbance in HCAs.** In order to achieve the goal of reestablishing forested canopy that meets the ecological values and functions described in section 1(A) of this ordinance, tree replacement and vegetation planting are required when development intrudes into a HCA according to the following standards, except for wetlands mitigation requirements imposed by state and federal law.

1. ***Required plants and plant densities.*** All trees, shrubs and ground cover must be native plants selected from the *Metro Native Plant List*. An applicant must meet Mitigation Option 1 or 2, whichever results in more tree plantings; except that where the disturbance area is one acre or more, the applicant shall comply with Mitigation Option 2:

a. *Mitigation Option 1.* In this option, the mitigation requirement is calculated based on the number and size of trees that are removed from the site. Trees that are removed from the site must be replaced as shown in Table 3. Conifers must be replaced with conifers. Bare ground must be planted or seeded with native grasses or herbs. Non-native sterile wheat grass may also be planted or seeded, in equal or lesser proportion to the native grasses or herbs.

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Table 3. Tree Replacement

Size of tree to be removed (inches in diameter)	Number of trees and shrubs to be planted
6 to 12	2 trees and 3 shrubs
13 to 18	3 trees and 6 shrubs
19 to 24	5 trees and 12 shrubs
25 to 30	7 trees and 18 shrubs
over 30	10 trees and 30 shrubs

b. *Mitigation Option 2.* In this option, the mitigation requirement is calculated based on the size of the disturbance area within a HCA. Native trees and shrubs are required to be planted at a rate of five (5) trees and twenty-five (25) shrubs per every 500 square feet of disturbance area (calculated by dividing the number of square feet of disturbance area by 500, and then multiplying that result times five trees and 25 shrubs, and rounding all fractions to the nearest whole number of trees and shrubs; for example, if there will be 330 square feet of disturbance area, then 330 divided by 500 equals .66, and .66 times five equals 3.3, so three trees must be planted, and .66 times 25 equals 16.5, so 17 shrubs must be planted). Bare ground must be planted or seeded with native grasses or herbs. Non-native sterile wheat grass may also be planted or seeded, in equal or lesser proportion to the native grasses or herbs.

2. ***Plant size.*** Replacement trees must be at least one-half inch in caliper, measured at 6 inches above the ground level for field grown trees or above the soil line for container grown trees (the one-half inch minimum size may be an average caliper measure, recognizing that trees are not uniformly round), unless they are oak or madrone which may be one gallon size. Shrubs must be in at least a 1-gallon container or the equivalent in ball and burlap and must be at least 12 inches in height.

3. ***Plant spacing.*** Trees shall be planted between 8 and 12 feet on-center and shrubs shall be planted between 4 and 5 feet on center, or clustered in single species groups of no more than four (4) plants, with each cluster planted between 8 and 10 feet on center. When planting near existing trees, the dripline of the existing tree shall be the starting point for plant spacing measurements.

4. ***Plant diversity.*** Shrubs must consist of at least two (2) different species. If 10 trees or more are planted, then no more than 50% of the trees may be of the same genus.

5. ***Location of mitigation area.*** All vegetation must be planted on the applicant's site within the HCA or in an area contiguous to the HCA; provided, however, that if the vegetation is planted outside of the HCA then the applicant shall preserve the contiguous area by executing a deed restriction, such as a restrictive covenant. *(Note: an off-site mitigation option is provided in a streamlined discretionary review process).*

6. ***Invasive vegetation.*** Invasive non-native or noxious vegetation must be removed within the mitigation area prior to planting.

7. ***Tree and shrub survival.*** A minimum of 80% of the trees and shrubs planted shall remain alive on the fifth anniversary of the date that the mitigation planting is completed.

8. ***Monitoring and reporting.*** Monitoring of the mitigation site is the ongoing responsibility of the property owner. Plants that die must be replaced in kind. For a period of five years, the property

owner must submit an annual report to (list appropriate city or county department) documenting the survival of the trees and shrubs on the mitigation site. *[Optional: the city or county may require the property owner to post a performance bond in the amount sufficient to cover costs of plant material and labor associated with site preparation, planting, and maintenance in lieu of the monitoring and reporting requirement.]*

9. To enhance survival of the mitigation plantings, the following practices are required:

   a. Mulching. Mulch new plantings a minimum of three inches in depth and 18 inches in diameter to retain moisture and discourage weed growth.

   b. Irrigation. Water new plantings one inch per week between June 15th to October 15th, for the three years following planting.

   c. Weed control. Remove, or control, non-native or noxious vegetation throughout maintenance period.

10. To enhance survival of tree replacement and vegetation plantings, the following practices are recommended:

   a. Planting season. Plant bare root trees between December 1st and February 28th, and potted plants between October 15th and April 30th.

   b. Wildlife protection. Use plant sleeves or fencing to protect trees and shrubs against wildlife browsing and resulting damage to plants.

F. **Standards for Partitions and Subdivisions.** The purpose of this section is to allow for partitions in a manner that limits the total amount of allowable development within HCAs on the partitioned parcels; and to require that new subdivision plats delineate and show the Moderate and High HCAs as a separate unbuildable tract.

1. ***Standards for Partitions containing HCAs*:**

   a. When partitioning a property into parcels, an applicant shall verify the boundaries of the HCA on the property according to Section 9 of this ordinance.

   b. Applicants who are partitioning, but are not simultaneously developing their property, do not need to comply with Section 5 of this ordinance.

   c. When partitioning a property into parcels there shall be no more than a 30% percentage point difference in the percentage of HCA on the parcels; for example, a partition that produces two parcels, one that is 55% HCA and the other that is 35% HCA is permissible; whereas a partition that produces two parcels, one that is 75% HCA and the other that is 30% HCA is not permissible. However, an applicant may partition a property such that at least 90% of the original property's High HCA and 80% of its moderate HCA is on a separate unbuildable parcel, protected by a restrictive covenant or a public dedication.

   d. Subsequent development on any parcels containing HCAs shall comply with Section 5, and the development standards of either section 6 or section 7 of this ordinance.

2. ***Standards for Subdivisions containing HCAs*:**

   a. Applicants who are subdividing, but not developing, must verify the location of the HCA boundary according to Section 9 of this ordinance, and comply with this subsection 6(F); such applicants do not need to comply with Section 5 of this ordinance. Applicants who are subdividing, but not developing, property may:

      i. Complete the mitigation requirements of subsection 6(E) of this ordinance (and, if appropriate, subsections 7(B) and 7(C)) and thereby exempt all subsequent development on lots containing HCA from further review under this ordinance; or

      ii. Not complete the mitigation requirements of subsections 6(E), 7(B), or 7(C) of this ordinance, thus requiring that any subsequent development within an HCA be subject to this ordinance.

   b. Applicants who are subdividing and developing properties must comply with Sections 5, 6, and 9 of this ordinance.

   c. When a property containing any HCA is subdivided, this ordinance requires that new subdivision plats delineate and show the Moderate and High HCA as a separate unbuildable tract according to the following process:

      i. The applicant must place at least 90% of the High HCA and 80% of the Moderate HCA in a separate tract.

         (A) If over 50% of the HCA on a property is of a High designation, the entire calculation is for High (i.e., 90% of the HCA must be placed within a separate tract).

         (B) If over 50% of the HCA on a property is of a Moderate designation, the entire calculation is for Moderate (i.e., 80% of the HCA must be placed within a separate tract).

      ii. If the tract is adjacent to the backyard for residences, the minimum backyard requirement is reduced to 10 ft.

      iii. The standards for subdivisions in Moderate and High HCAs shall apply in addition to the requirements of the city/county land division ordinance and zoning ordinance.

      iv. Prior to preliminary plat approval, the Moderate and/or High HCA shall be shown as a separate tract, which shall not be a part of any lot used for construction of a dwelling unit.

      v. Prior to final plat approval, ownership of the HCA tract shall be identified to distinguish it from lots intended for sale. The tract may be identified as any one of the following:

         (A) Private natural area held by the owner or homeowners association by a restrictive covenant; or

         (B) For residential subdivisions, private natural area subject to an easement conveying storm and surface water management rights to the city/county and preventing the

owner of the tract from activities and uses inconsistent with the purpose of this ordinance; or

(C) At the owner's option, public natural area where the tract has been dedicated to the city/county or other governmental unit, or a private non-profit with the mission of land conservation.

Section 7. Alternative Discretionary Development Standards

Applicants may choose to use the alternative discretionary development standards provided in this section rather than the development standards provided in section 6 of this ordinance. There are four discretionary review processes provided in this section: subsection A provides discretionary review for an applicant seeking only to partition a property; subsection B provides discretionary review for an applicant who will comply with the development standards in section 6 of this ordinance, except that the applicant seeks to meet the mitigation requirements of that section on a different property from the property on which a HCA will be disturbed; subsection C provides discretionary review for an applicant who will comply with the development standards in section 6 of this ordinance, except that the applicant seeks to meet the mitigation requirements of that section by proportionally varying the number and size of plants required to be planted; and subsection D provides general discretionary review standards applicable to an applicant seeking some other type of discretionary approval of development that will disturb an HCA.

A. **Discretionary Review for Partitions.** An applicant seeking to partition land in ways that do not accord with the standards established in Section 6(F)(1) may seek review under this subsection 7(A).

1. The applicant shall verify the boundaries of the HCAs on the property according to Section 9 of this ordinance.

2. The applicant shall submit the following application materials:

   a. A scale map of the entire property that includes:

      i. Location of all High, Moderate, and Low HCA on the property;

      ii. Location of any wetlands or water bodies on the property, including a delineation of the Water Quality Resource Area;

      iii. Location of 100 year floodplain and floodway boundary as defined by the Federal Emergency Management Agency (FEMA) and the area of the 1996 flood inundation; and

      iv. A delineation of the proposed partition.

   b. A written and documented explanation of how and why the proposed partition satisfies the approval criteria in subsection 7(A)(3). Such written documentation shall include an alternatives analysis of different possible partition plans, based on the characteristics and zoning of the property.

3. Approval Criteria. A partition shall be approved under this subsection 7(A) provided that the applicant demonstrates that it is not practicable to comply with the partition standards in Section 6(F)(1) of this ordinance, and that the applicant's partition plan will result in the smallest

practicable percentage point difference in the percentage of HCA on the parcels created by the partition (this will minimize the amount of allowable disturbance areas within HCAs on the parcels, assuming that the development standards in this Section 6 were applied to future development on such parcels).

4. Subsequent development on any parcels created by the partition and containing HCAs shall comply with all provisions of this ordinance, except that the map verification completed and approved as part of the partition may be used to satisfy the requirements of section 9 of this ordinance for any such development.

B. **Discretionary Review To Approve Off-Site Mitigation.** An applicant seeking discretionary approval only for off-site mitigation within the same subwatershed (6th Field Hydrologic Unit Code), but who will comply with all other provisions of Section 6 of this ordinance, may seek review under this subsection 7(B). (An applicant who seeks to conduct the mitigation in a different subwatershed may apply for such approval under subsection 7(D) of this ordinance.)

1. The applicant shall submit:

   a. A calculation of the number of trees and shrubs the applicant is required to plant under Section 6(E) of this ordinance; and

   b. A map and accompanying narrative that details the following:

      i. The number of trees and shrubs that can be planted on-site;

      ii. The on-site location where those trees and shrubs can be planted;

      iii. An explanation of why it is not practicable for the remainder of the mitigation to occur on-site; and

      iv. The proposed location for off-site mitigation and documentation that the applicant can carry out and ensure the success of the mitigation, including documentation that the applicant possesses legal authority to conduct and maintain the mitigation, such as having a sufficient ownership interest in the mitigation site, and, if the mitigation is not within a HCA, documentation that the mitigation site will be protected after the monitoring period expires, such as through the use of a restrictive covenant.

2. Approval Criteria. Off-site mitigation shall be approved under this subsection 7(B) provided that the applicant has demonstrated that it is not practicable to complete the mitigation on-site and that the applicant has documented that it can carry out and ensure the success of the off-site mitigation on a property within the same subwatershed (6th Field Hydrologic Unit Code) as the related disturbed HCA.

3. Mitigation approved under this subsection 7(B) of this ordinance shall be subject to all of the requirements of subsection 6(E) of this ordinance, except for the requirements of subsection 6(E)(5) of this ordinance.

C. **Discretionary Review To Approve Mitigation That Varies the Number and Size of Trees and Shrubs.** An applicant seeking discretionary approval only to proportionally vary the number and size of trees and shrubs required to be planted under subsection 6(E), for example to plant fewer larger

trees and shrubs or to plant more smaller trees and shrubs, but who will comply with all other provisions of Section 6 of this ordinance, may seek review under this subsection 7(C).

1. The applicant shall submit:

   a. A calculation of the number of trees and shrubs the applicant would be required to plant under Section 6(E) of this ordinance;

   b. The numbers and sizes of trees and shrubs that the applicant proposes to plant;

   c. An explanation of why the numbers and sizes of trees and shrubs that the applicant proposes to plant will achieve, at the end of the fifth year after initial planting, comparable or better mitigation results as the results that would be achieved if the applicant complied with all of the requirements of subsection 6(E) of this ordinance. Such explanation shall be prepared and signed by a knowledgeable and qualified natural resources professional or a certified landscape architect and shall include discussion of site preparation including soil additives and removal of invasive and noxious vegetation, plant diversity, plant spacing, planting season, and immediate post-planting care including mulching, irrigation, wildlife protection, and weed control; and

   d. The applicant's mitigation site monitoring and reporting plan.

2. Approval Criteria. A request to vary the numbers and sizes of trees and shrubs to be planted shall be approved if the applicant demonstrates that the proposed planting will achieve, at the end of the fifth year after initial planting, comparable or better mitigation results as the results that would be achieved if the applicant complied with all of the requirements of subsection 6(E) of this ordinance. Such determination shall take into consideration all of the information required to be submitted under subsection 7(C)(1) of this ordinance.

3. Mitigation approved under this subsection 7(C) of this ordinance shall be subject to the requirements of subsections 6(E)(4) through 6(E)(9) of this ordinance, and it is recommended that such mitigation also follow the practices recommended in subsection 6(E)(10) of this ordinance.

D. **Discretionary Review.** An applicant seeking discretionary approval to undertake any development activity within a HCA that does not comply with subsection 6 of this ordinance and is not described in subsections 7(A), (B), or (C) of this ordinance may file an application under this section 7(D) of this ordinance.

1. **Application Requirements.** The applicant shall provide all items described in subsection 6(A) of this ordinance, except that, for utility projects undertaken by public utilities across property that is not owned by the utility, the utility shall not be required to map or provide any information about the property except for the area within 300 feet of the location of the proposed disturbance area of the utility's project, and the applicant shall also provide all of the following:

   a. ***Impact Evaluation and Alternatives Analysis.*** An impact evaluation and alternatives analysis is required to determine compliance with the approval criteria and to evaluate development alternatives for a particular property. The alternatives must be evaluated on the basis of their impact on the HCA, the ecological functions provided by the HCA on the property, and off-site impacts within the subwatershed (6^{th} Field Hydrologic Unit Code) where the property is located. The impact evaluation shall include all of the following items:

i. Identification of the ecological functions of riparian habitat found on the property as described in Table 4 of this ordinance and the habitat connectivity ecological functions described in subsection 7(D)(1)(a)(ii)(C) and (D) of this ordinance.

ii. For upland habitat in areas to be added to the Metro urban growth boundary areas after October 1, 2005, identification of the impact the proposed development would have on the following ecological functions provided by upland wildlife habitat:

(A) Habitat patch size;

(B) Interior habitat;

(C) Connectivity of the habitat to water; and

(D) Connectivity of the habitat to other habitat areas.

Table 4. Ecological functional values of riparian corridors.

Ecological function	Landscape features providing functional values
Microclimate and shade	Forest canopy or woody vegetation within **100 feet** of a stream; a wetland[1]; or a flood area[2].
Streamflow moderation and water storage	A wetland or other water body[3] with a hydrologic connection to a stream; or a flood area[2].
Bank stabilization, sediment and pollution control	All sites within **50 feet** of a surface stream; Forest canopy, woody vegetation, or low structure vegetation/open soils within **100 feet** of a stream or a wetland; or forest canopy, woody vegetation, or low structure vegetation/open soils within a flood area; and, Forest canopy, woody vegetation, or low structure vegetation/open soils within **100-200 feet** of a stream if the slope is greater than 25%.
Large wood and channel dynamics	Forest canopy within **150 feet** of a stream or wetland; or within a flood area; and The channel migration zone is defined by the floodplain, but where there is no mapped floodplain a default of **50 feet** is established to allow for the channel migration zone.
Organic material sources	Forest canopy or woody vegetation within **100 feet** of a stream or wetland; or within a flood area.

[1]Refers to "hydrologically-connected wetlands," which are located partially or wholly within ¼ mile of a surface stream or flood area.
[2]Developed floodplains are not identified as HCAs because they do not provide primary ecological functional value.
[3]"Other water body" could include lakes, ponds, reservoirs, or manmade water feature that is not a water quality facility or farm pond.

iii. Evaluation of alternative locations, design modifications, or alternative methods of development to determine which options reduce the significant detrimental impacts on the HCAs and the ecological functions provided on the property. At a minimum, the following approaches must be considered:

(A) The techniques described in subsection 6(B) of this ordinance;

(B) Multi-story construction;

(C) Minimizing building and development footprint;

(D) Maximizing the use of native landscaping materials; and

(E) Minimal excavation foundation systems (e.g., pier, post or piling foundation).

iv. Determination of the alternative that best meets the applicable approval criteria and identification of significant detrimental impacts that are unavoidable.

b. ***Mitigation Plan.*** The purpose of a mitigation plan is to compensate for unavoidable significant detrimental impacts to ecological functions that result from the chosen development alternative as identified in the impact evaluation. However, when development occurs within delineated wetlands, then the mitigation required under subsection 7(D)(2)(d) shall not require any additional mitigation than the mitigation required by state and federal law for the fill or removal of such wetlands.

i. An applicant may choose to develop a mitigation plan consistent with the requirements of subsection 6(E) of this ordinance. If an applicant so chooses, then the applicant shall submit a mitigation plan demonstrating such compliance.

ii. If an applicant chooses to develop an alternative mitigation plan that would not comply with the requirements of subsection 6(E) of this ordinance, including, for example, a proposal to create an alternative plant community type such as an oak savannah or a low-structure plant community, or where an applicant demonstrates that a portion of identified HCA on its property provides only impaired ecological functions, then the applicant shall submit a mitigation plan that includes all of the following:

(A) An explanation of how the proposed mitigation will adequately compensate for the impacts to ecological functions described in the impact evaluation required by subsection 7(D)(1)(a). The applicant may use the mitigation that would be required under subsection 6(E) of this ordinance as the baseline mitigation required to compensate for disturbance to a HCA that provides an average level of ecological functions. Such explanation shall include:

(1) If the applicant uses the mitigation that would be required under subsection 6(E) of this ordinance as the baseline mitigation required to compensate for disturbance to a HCA, then the applicant shall submit a calculation of the number of trees and shrubs the applicant would be required to plant under subsection 6(E) of this ordinance;

(2) A site plan showing where the specific mitigation activities will occur and the numbers and sizes of trees and shrubs that the applicant proposes to plant; and

(3) A discussion of site preparation including soil additives and removal of invasive and noxious vegetation, plant diversity, plant spacing, planting season, and immediate post-planting care including mulching, irrigation, wildlife protection, and weed control.

(B) Documentation of coordination with appropriate local, regional, special district, state, and federal regulatory agencies.

(C) A list of all parties responsible for implementing and monitoring the mitigation plan and, if mitigation will occur off-site, the names of the owners of property where mitigation plantings will occur.

(D) The applicant's mitigation site monitoring and reporting plan.

(E) If the proposed mitigation will not be conducted on-site, the applicant shall submit a map and accompanying narrative that details the following:

(1) The number of trees and shrubs that can be planted on-site;

(2) The on-site location where those trees and shrubs can be planted;

(3) An explanation of why it is not practicable for the remainder of the mitigation to occur on-site; and

(4) The proposed location for off-site mitigation and documentation that the applicant can carry out and ensure the success of the mitigation, including documentation that the applicant possesses legal authority to conduct and maintain the mitigation, such as having a sufficient ownership interest in the mitigation site, and, if the mitigation is not within a HCA, documentation that the mitigation site will be protected after the monitoring period expires, such as through the use of a restrictive covenant.

(F) If the mitigation area is off-site and not within the same subwatershed (6^{th} Field Hydrologic Unit Code) as the related disturbed HCA, the applicant shall submit an explanation of why it is not practicable to conduct the mitigation within the same subwatershed and of why and how, considering the purpose of the mitigation, the mitigation will provide more ecological functional value if implemented outside of the subwatershed.

(G) An implementation schedule, including timeline for construction, mitigation, mitigation maintenance, monitoring, reporting and a contingency plan. If the applicant is proposing any in-stream work in fish-bearing streams as part of the mitigation project, then the applicant shall submit documentation that such work will be done in accordance with the Oregon Department of Fish and Wildlife in-stream work timing schedule.

c. The Impact Evaluation and Alternatives Analysis required by subsection 7(D)(1)(a) and the Mitigation Plan required by subsection 7(D)(1)(b) shall be prepared and signed by either (1) a knowledgeable and qualified natural resource professional, such as a wildlife biologist, botanist, or hydrologist, or (2) a civil or environmental engineer registered in Oregon to

design public sanitary or storm systems, storm water facilities, or other similar facilities. The application shall include a description of the qualifications and experience of all persons that contributed to the Impact Evaluation and Alternatives Analysis and to the Mitigation Plan, and, for each person that contributed, a description of the elements of such reports to which the person contributed.

2. **Approval Criteria.**

a. All application requirements in subsection 7(D)(1) shall be met.

b. ***Avoid.*** An applicant shall first avoid the intrusion of development into the HCA to the extent practicable. The development that is proposed must have less detrimental impact to HCAs than other practicable alternatives, including significantly different practicable alternatives that propose less development within HCAs. If there is more than one type of HCA on a property then the applicant shall first avoid the intrusion of development into the higher-valued HCA, to the extent practicable, and the development that is proposed must have less detrimental impact to the higher-valued HCAs than other practicable alternatives. To avoid development in HCAs, and to the extent practicable, applicants shall use the approaches described in subsection 7(D)(1)(a)(iii).

c. ***Minimize.*** If the applicant demonstrates that there is no practicable alternative that will not avoid disturbance of the HCA, then the development proposed by the applicant within the HCA shall minimize detrimental impacts to the extent practicable. If there is more than one type of HCA on a property then the development within higher-valued HCAs shall be considered more detrimental than development within lower-valued HCAs.

i. Development must minimize detrimental impacts to ecological functions and loss of habitat consistent with uses allowed by right under the base zone, to the extent practicable;

ii. To the extent practicable within the HCA, the proposed development shall be designed, located, and constructed to:

(A) Minimize grading, removal of native vegetation, and disturbance and removal of native soils by using the approaches described in subsection 6(C)(2), reducing building footprints, and using minimal excavation foundation systems (e.g., pier, post or piling foundation);

(B) Minimize adverse hydrological impacts on water resources such as by using the techniques described in Part (a) of Table 5, unless their use is prohibited by an applicable and required State or Federal permit issued to a unit of local government having jurisdiction in the area, such as a permit required under the federal Clean Water Act, 33 U.S.C. §§1251 et seq., or the federal Safe Drinking Water Act, 42 U.S.C. §§300f et seq., and including conditions or plans required by such permit;

(C) Minimize impacts on wildlife corridors and fish passage such as by using the techniques described in Part (b) of Table 5; and

(D) Consider using the techniques described in Part (c) of Table 5 to further minimize the impacts of development in the HCA.

Table 5. Habitat-friendly development practices.[1]

Part (a): Design and Construction Practices to Minimize Hydrologic Impacts

1. Amend disturbed soils to original or higher level of porosity to regain infiltration and stormwater storage capacity.
2. Use pervious paving materials for residential driveways, parking lots, walkways, and within centers of cul-de-sacs.
3. Incorporate stormwater management in road right-of-ways.
4. Landscape with rain gardens to provide on-lot detention, filtering of rainwater, and groundwater recharge.
5. Use green roofs for runoff reduction, energy savings, improved air quality, and enhanced aesthetics.
6. Disconnect downspouts from roofs and direct the flow to vegetated infiltration/filtration areas such as rain gardens.
7. Retain rooftop runoff in a rain barrel for later on-lot use in lawn and garden watering.
8. Use multi-functional open drainage systems in lieu of more conventional curb-and-gutter systems.
9. Use bioretention cells as rain gardens in landscaped parking lot islands to reduce runoff volume and filter pollutants.
10. Apply a treatment train approach to provide multiple opportunities for storm water treatment and reduce the possibility of system failure.
11. Reduce sidewalk width and grade them such that they drain to the front yard of a residential lot or retention area.
12. Reduce impervious impacts of residential driveways by narrowing widths and moving access to the rear of the site.
13. Use shared driveways.
14. Reduce width of residential streets, depending on traffic and parking needs.
15. Reduce street length, primarily in residential areas, by encouraging clustering and using curvilinear designs.
16. Reduce cul-de-sac radii and use pervious vegetated islands in center to minimize impervious effects, and allow them to be utilized for truck maneuvering/loading to reduce need for wide loading areas on site.
17. Eliminate redundant non-ADA sidewalks within a site (i.e., sidewalk to all entryways and/or to truck loading areas may be unnecessary for industrial developments).
18. Minimize car spaces and stall dimensions, reduce parking ratios, and use shared parking facilities and structured parking.
19. Minimize the number of stream crossings and place crossing perpendicular to stream channel if possible.
20. Allow narrow street right-of-ways through stream corridors whenever possible to reduce adverse impacts of transportation corridors.

Part (b): Design and Construction Practices to Minimize Impacts on Wildlife Corridors and Fish Passage

1. Carefully integrate fencing into the landscape to guide animals toward animal crossings under, over, or around transportation corridors.
2. Use bridge crossings rather than culverts wherever possible.
3. If culverts are utilized, install slab, arch or box type culverts, preferably using bottomless designs that more closely mimic stream bottom habitat.
4. Design stream crossings for fish passage with shelves and other design features to facilitate terrestrial wildlife passage.
5. Extend vegetative cover through the wildlife crossing in the migratory route, along with sheltering areas.

[1] These development practices represent the state of scientific knowledge at the time of this ordinance's enactment, if more effective habitat-friendly practices become available, they should be used.

Part (c): Miscellaneous Other Habitat-Friendly Design and Construction Practices
1. Use native plants throughout the development (not just in HCA). 2. Locate landscaping (required by other sections of the code) adjacent to HCA. 3. Reduce light spill-off into HCAs from development. 4. Preserve and maintain existing trees and tree canopy coverage, and plant trees, where appropriate, to maximize future tree canopy coverage.

d. ***Mitigate.*** If the applicant demonstrates that there is no practicable alternative that will not avoid disturbance of the HCA, then development must mitigate for adverse impacts to the HCA. All proposed mitigation plans must meet the following standards.

i. The mitigation plan shall demonstrate that it compensates for detrimental impacts to ecological functions provided by HCAs, after taking into consideration the applicant's efforts to minimize such detrimental impacts through the use of the techniques described in Table 5 and through any additional or innovative techniques. A mitigation plan that requires the amount of planting that would be required under subsection 6(E) of this ordinance based on the amount of proposed disturbance area within the HCA, and that otherwise complies with all of the mitigation requirements in subsection 6(E) of this ordinance, shall be considered to have satisfied the requirements of this subsection 7(D)(2)(d) of this ordinance.

ii. Mitigation shall occur on the site of the disturbance, to the extent practicable. Off-site mitigation shall be approved if the applicant has demonstrated that it is not practicable to complete the mitigation on-site and that the applicant has documented that it can carry out and ensure the success of the off-site mitigation, as described in subsection 7(B)(1)(b)(iv) of this ordinance. In addition, if the off-site mitigation area is not within the same subwatershed (6^{th} Field Hydrologic Unit Code) as the related disturbed HCA, the applicant shall demonstrate that it is not practicable to complete the mitigation within the same subwatershed and that, considering the purpose of the mitigation, the mitigation will provide more ecological functional value if implemented outside of the subwatershed. Mitigation shall not be allowed outside of the Metro jurisdictional boundary.

iii. All re-vegetation plantings shall be with native plants listed on the *Metro Native Plant List.*

iv. All in-stream work in fish-bearing streams shall be done in accordance with the Oregon Department of Fish and Wildlife in-stream work-timing schedule.

v. A mitigation maintenance plan shall be included and shall be sufficient to ensure the success of the planting, and compliance with the plan shall be a condition of development approval.

e. ***Municipal Water Utility Facilities Standards.*** Except as provided within this subsection, in addition to all other requirements of subsection 7(D)(2) of this ordinance, municipal potable water, storm water (drainage) and wastewater utility facilities may be built, expanded, repaired, maintained, reconfigured, rehabilitated, replaced or upsized if not exempted in

Section 3 of this ordinance. These facilities may include but are not limited to water treatment plants, wastewater treatment plants, raw water intakes, pump stations, transmission mains, conduits or service lines, terminal storage reservoirs, and outfall devices provided that:

i. Such projects shall not have to comply with the requirements of subsection 7(D)(2)(b) of this ordinance, provided that, where practicable, the project does not encroach closer to a water feature than existing operations and development, or for new projects where there are no existing operations or development, that the project does not encroach closer to a water feature than practicable;

ii. Best management practices will be employed that accomplish the following:

(A) Account for watershed assessment information in project design;

(B) Minimize the trench area and tree removal within the HCA;

(C) Utilize and maintain erosion controls until other site stabilization measures are established, post-construction;

(D) Replant immediately after backfilling or as soon as effective;

(E) Preserve wetland soils and retain soil profiles;

(F) Minimize compactions and the duration of the work within the HCA;

(G) Complete in-water construction during appropriate seasons, or as approved within requisite Federal or State permits;

(H) Monitor water quality during the construction phases, if applicable; and

(I) Implement a full inspection and monitoring program during and after project completion, if applicable.

Section 8. Variances

A. The purpose of this Section is to ensure that compliance with this ordinance does not cause unreasonable hardship. To avoid such instances, the requirements of this ordinance may be varied. Variances are also allowed when strict application of this ordinance would deprive an owner of all economically viable use of land.

B. This Section applies in addition to the standards governing proposals to vary the requirements of the base zone.

C. Notice of variance applications shall be provided:

1. Upon receiving an application to vary the requirements of this ordinance, the notice shall be provided to all property owners within *[insert appropriate distance consistent with state law and other local notice provisions]* of the subject property inside the urban growth boundary, and within [*insert appropriate distance consistent with state law and other local notice provisions*] feet of the subject property outside the urban growth boundary, to Metro, to any neighborhood or

community planning organization recognized by the [*city/county*] and whose boundaries include the property, and to any watershed council recognized by the Oregon Watershed Enhancement Board and whose boundaries include the property.

2. Within seven (7) days of a decision on the variance, notice of the decision shall be provided to Metro, to any neighborhood or community planning organization recognized by the [*city/county*] and whose boundaries include the property, to any watershed council recognized by the Oregon Watershed Enhancement Board and whose boundaries include the property, and to any other person required to receive notice of such a decision under state law.

D. **Hardship Variance.** Variances to avoid unreasonable hardship caused by the strict application of this ordinance are permitted subject to the criteria set forth in this section. To vary from the requirements of this ordinance, the applicant must demonstrate the following:

1. The variance is the minimum necessary to allow the proposed use or activity;

2. Unless the proposed variance is from mitigation under Section 6(E) or mitigation under Section 7(B), (C), or (D)(1)(b) and D(2)(d), the proposed use will comply with those standards, as applicable; and

3. The proposed use complies with the standards of the base zone.

E. **Buildable Lot Variance.** A variance to avoid the loss of all economically viable use of a lot that is partially inside a HCA is permitted. Applicants must demonstrate the following:

1. Without the proposed variance, the applicant would be denied economically viable use of the subject property. To meet this criterion, the applicant must show that:

   a. The proposed use cannot meet the standards in Section 8(D) (hardship variance); and

   b. No other application could result in permission for an economically viable use of the subject property. Evidence to meet this criterion shall include a list of uses allowed on the subject property.

2. The proposed variance is the minimum necessary to allow for the requested use;

3. The proposed variance will comply with Section 6(E) or 7(B), (C), or D(1)(b) and D(2)(d) (mitigation); and

4. The proposed use complies with the standards of the base zone.

F. **Variance Conditions.** Conditions may be imposed to limit any adverse impacts that may result from granting any variance.

Section 9. Map Administration and HCA Verification

A. **Exempt development.** Development that is outside of any HCA and no closer than 100 feet to the border of an HCA (including all impervious surfaces and landscaping), based on the HCA map, may proceed without having to comply with this section or any other portion of this ordinance except for

Section 5, Construction Management Plan. *[Note: At the time a city or county adopts this model ordinance and its HCA map, such city or county may decrease the 100 feet "safe harbor" distance provided in this section to no fewer than 25 feet provided that it conducts additional analysis to correct any misalignment errors of the type described in section 9(E)(2) of this ordinance and adopts sufficient findings of fact to justify such corrections.]*

B. Verification of the location of HCAs as described in this section shall not be considered a comprehensive plan amendment. [*Note: Adjustment of the mapped HCA shall only proceed as provided in this ordinance.]*

C. Map verification is available to correct for mistakes in the location of HCAs on properties. Map verification shall not be used to dispute whether identified HCAs provide the ecological functions that they are assumed to provide based on the ecological criteria used to identify them. If an applicant believes that a properly identified HCA does not provide the ecological functions that it has been identified as providing, then the applicant may use the discretionary review process to decrease the amount of mitigation required for disturbing such an area.

D. The map verification requirements described in this section 9 of this ordinance shall be met at the time an applicant requests a building permit, grading permit, tree removal permit, land division approval, or some other land use decision. A property owner, or another person with the property owner's consent, may request to verify the location of HCAs on a real property lot or parcel pursuant to this Section 9 of this ordinance at other times, but whether the *[city/county]* processes such request shall be at the Planning Director's sole discretion, based on staff availability, funding resources, and policy priorities. If a person receives a verification separate from a simultaneous request for a building permit, grading permit, tree removal permit, land division approval, or some other land use decision, then the person may use the verification to satisfy the requirements of this section at any time up until five years after the date the verification was issued.

E. Notwithstanding any other provisions of this Section 9 of this ordinance, for utility projects undertaken by public utilities across property that is not owned by the utility, the utility shall not be required to map or provide any information about the property except for the area within 300 feet of the location of the proposed disturbance area of the utility's project.

F. **Basic Verification Approaches.** The basic verification approaches described in subsections 9(F)(1) through (3) of this ordinance are available for applicants who believe either (1) that the HCA map is accurate, (2) that there is a simple incongruity between the HCA map and the boundary lot lines of a property, or (3) that the property was developed prior to *[insert date—either the effective date of this ordinance or two years after acknowledgement of the regional program, whichever is earlier].*

1. ***Applicant Believes HCA Map is Accurate.*** An applicant who believes that the HCA map is accurate may comply with this subsection 9(F)(1) of this ordinance. The applicant shall submit the following information regarding the real property lot or parcel:

   a. A detailed property description;

   b. A copy of the applicable HCA map;

   c. A summer 2005 aerial photograph of the property, with lot lines shown, at a scale of at least 1 map inch equal to 50 feet for lots of 20,000 or fewer square feet, and a scale of 1 map inch

equal to 100 feet for larger lots (available from the Metro Data Resource Center, 600 N.E. Grand Ave., Portland, OR 97232; 503-797-1742);

d. The information required to be submitted under Section 6 or 7 of this ordinance if the applicant proposes development within any HCA under those provisions; and

e. Any other factual information that the applicant wishes to provide to support map verification.

2. ***Obvious Misalignment Between Mapped Habitat and Property Lot Lines.*** In some cases, the mapped vegetative cover layer in the GIS database might not align precisely with the tax lot layer that shows property lines, resulting in a HCA map that is also misaligned with tax lot lines. An applicant who believes that the HCA map is inaccurate based on such an obvious misalignment may comply with this subsection 9(F)(2) of this ordinance. The applicant shall submit the following information regarding the real property lot or parcel:

a. The information described in subsections 9(F)(1)(a) through (c) of this ordinance; and

b. A documented demonstration of the misalignment between the HCA map and the property's tax lot boundary lines. For example, an applicant could compare the boundary lot lines shown for roads within 500 feet of a property with the location of such roads as viewed on the aerial photograph of the area surrounding a property to provide evidence of the scale and amount of incongruity between the HCA maps and the property lot lines, and the amount of adjustment that would be appropriate to accurately depict habitat on the property.

3. ***Property Developed Between Summer 2002 and [Insert date of Approval of Regional Program].*** Where a property was developed between the summer of 2002 (when the aerial photo used to determine the regional habitat inventory was taken) and *[insert date that the regional program was approved],* the applicant shall submit the following information regarding the real property lot or parcel:

a. The information described in subsection 9(F)(1)(a) through (e) of this ordinance;

b. A summer 2002 aerial photograph of the property, with lot lines shown, at a scale of at least 1 map inch equal to 50 feet for lots of 20,000 or fewer square feet, and a scale of 1 map inch equal to 100 feet for larger lots (available from the Metro Data Resource Center, 600 N.E. Grand Ave., Portland, OR 97232; 503-797-1742);

c. Any approved building permits or other development plans and drawings related to the development of the property that took place between summer 2002 and *insert date that the regional program was approved]*; and

d. A clear explanation and documentation, such as supporting maps or drawings or an more recent aerial photograph, indicating the new development that has occurred and where previously identified habitat no longer exists because it is now part of a developed area.

4. ***Decision Process.*** The Planning Director's map verification decision made pursuant to this subsection 9(F) of this ordinance may be an administrative decision. The Planning Director's decision shall be based on consideration of the information submitted by the applicant, any information collected during a site visit to the lot or parcel, any information generated by prior

map verifications that have occurred on adjacent properties, and any other objective factual information that has been provided to the Planning Director.

G. **Detailed Verification Approach.** All applicants who believe that the HCA map is inaccurate for a reason other than as described in subsections 9(F)(2) and (3) may file a verification request consistent with this subsection 9(G) of this ordinance.

1. ***Application requirements.*** The applicant shall submit a report prepared and signed by either (1) a knowledgeable and qualified natural resource professional, such as a wildlife biologist, botanist, or hydrologist, or (2) a civil or environmental engineer registered in Oregon to design public sanitary or storm systems, storm water facilities, or other similar facilities. Such report shall include:

   a. A description of the qualifications and experience of all persons that contributed to the report, and, for each person that contributed, a description of the elements of the analysis to which the person contributed;

   b. The information described in subsections 9(F)(1)(a) through (e) of this ordinance;

   c. The information described in subsections 9(F)(2)(b) and 9(F)(3)(b) through (d) of this ordinance, if the applicant believes such information is relevant to the verification of habitat location on the subject lot or parcel;

   d. Additional aerial photographs if the applicant believes they provide better information regarding the property, including documentation of the date and process used to take the photos and an expert's interpretation of the additional information they provide;

   e. A map showing the topography of the property shown by contour lines of 2 foot intervals for slopes less than 15% and by 10 foot intervals for slopes 15% or greater; and

   f. Any additional information necessary to address each of the verification criteria in subsection 9(G)(4) of this ordinance, a description of where any HCAs are located on the property based on the application of the verification criteria in subsection 9(G)(4) of this ordinance, and factual documentation to support the analysis.

2. ***Notice requirements.*** Upon receipt of a completed application pursuant to this subsection 9(G) of this ordinance, the Planning Director shall provide notice of the map verification application to Metro, to the owners of record of property on the most recent property tax assessment roll where such property is located within 100 feet of the subject property, *[Note: A city or county may increase the 100 feet neighbor notification requirement if it so chooses]* to any neighborhood or community planning organization recognized by the governing body and whose boundaries include the property, and to any watershed council recognized by the Oregon Watershed Enhancement Board and whose boundaries include the property. The notice provided by the jurisdiction shall comply with the notice requirements of ORS 197.763. The Planning Director shall accept written public comments regarding the matter during a public comment period.

3. ***Decision process.*** The Planning Director shall apply the verification criteria in subsection 9(G)(4) of this ordinance to confirm the location of any HCAs based on the HCA map, the information submitted by the applicant, any information received during the public comment period, and any additional information readily available, including information collected during a

site visit to the lot or parcel. The applicant and all persons that submitted written comments shall be provided with a written explanation of the Planning Director's decision.

4. ***Verification Criteria.*** The verification of the location of HCAs shall be according to the four-step process described in this subsection 9(G)(4) of this ordinance. A verification application shall not be considered complete and shall not be granted unless all the information required to be submitted with the verification application has been received.

   a. ***Step 1. Verifying boundaries of inventoried riparian habitat.*** Locating habitat and determining its riparian habitat class is a four-step process:

      i. Locate the Water Feature that is the basis for identifying riparian habitat.

         (A) Locate the top of bank of all streams, rivers, and open water within 200 feet of the property.

         (B) Locate all flood areas within 100 feet of the property.

         (C) Locate all wetlands within 150 feet of the property based on the Local Wetland Inventory map (if completed) and on the Metro 2002 Wetland Inventory Map (available from the Metro Data Resource Center, 600 N.E. Grand Ave., Portland, OR 97232; 503-797-1742). Identified wetlands shall be further delineated consistent with methods currently accepted by the Oregon Division of State Lands and the U.S. Army Corps of Engineers.

      ii. Identify the vegetative cover status of all areas on the property that are within 200 feet of the top of bank of streams, rivers, and open water, are wetlands or are within 150 feet of wetlands, and are flood areas and within 100 feet of flood areas.

         (A) Vegetative cover status shall be as identified on the Metro Vegetative Cover Map (available from the Metro Data Resource Center, 600 N.E. Grand Ave., Portland, OR 97232; 503-797-1742).

         (B) The vegetative cover status of a property may be adjusted only if (1) the property was developed prior to the time the regional program was approved (see subsection 9(F)(3) of this ordinance, above), or (2) an error was made at the time the vegetative cover status was determined. To assert the latter type of error, applicants shall submit an analysis of the vegetative cover on their property using summer 2002 aerial photographs and the definitions of the different vegetative cover types provided in Section 11 of this ordinance.

      iii. Determine whether the degree that the land slopes upward from all streams, rivers, and open water within 200 feet of the property is greater than or less than 25% (using the methodology as described in *[insert a reference to the city or county code section that describes the methodology used to identify Water Quality Resource Areas pursuant to Title 3 of the Urban Growth Management Functional Plan]*); and

      iv. Identify the riparian habitat classes applicable to all areas on the property using Table 6 and the data identified in subsections 9(G)(4)(a)(i) through (iii).

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Table 6: Method for Locating Boundaries of Class I and II Riparian Areas.

Distance from Water Feature	Development/Vegetation Status[1]			
	Developed areas not providing vegetative cover	Low structure vegetation or open soils	Woody vegetation (shrub and scattered forest canopy)	Forest Canopy (closed to open forest canopy)
Surface Streams				
0-50'	Class II	Class I[2]	Class I	Class I
50'-100'		Class II[3]	Class I	Class I
100'-150'		Class II[3] if slope>25%	Class II[3] if slope>25%	Class II[3]
150'-200'		Class II[3] if slope>25%	Class II[3] if slope>25%	Class II[3] if slope>25%
Wetlands (Wetland feature itself is a Class I Riparian Area)				
0-100'		Class II[3]	Class I	Class I
100'-150'				Class II[2]
Flood Areas				
Within 300' of river or surface stream		Class I	Class I	Class I
More than 300' from river or surface stream	[4]	Class II[3]	Class II[3]	Class I
0-100' from edge of flood area			Class II[3, 5]	Class II[3]

[1] The vegetative cover type assigned to any particular area was based on two factors: the type of vegetation observed in aerial photographs and the size of the overall contiguous area of vegetative cover to which a particular piece of vegetation belonged. As an example of how the categories were assigned, in order to qualify as "forest canopy" the forested area had to be part of a larger patch of forest of at least one acre in size.

[2] Except that areas within 50 feet of surface streams shall be Class II riparian areas if their vegetation status is "Low structure vegetation or open soils," and if they are high gradient streams. High gradient streams are identified on the Metro Vegetative Cover Map. If a property owner believes the gradient of a stream was incorrectly identified, then the property owner may demonstrate the correct classification by identifying the channel type using the methodology described in the Oregon Watershed Assessment Manual, published by the Oregon Watershed Enhancement Board, and appended to the Metro's Riparian Corridor and Wildlife Habitat Inventories Report, Attachment 1 to Exhibit F to Metro Ordinance No. 05-1077C.

[3] Areas that have been identified as habitats of concern, as designated on the Metro Habitats of Concern Map (on file in the Metro Council office), shall be treated as Class I riparian habitat areas in all cases, subject to the provision of additional information that establishes that they do not meet the criteria used to identify habitats of concern as described in Metro's Technical Report for Fish and Wildlife. Examples of habitats of concern include: Oregon white oak woodlands, bottomland hardwood forests, wetlands, native grasslands, riverine islands or deltas, and important wildlife migration corridors.

[4] If development prior to the effective date of Metro Ordinance No. 05-1077C within a contiguous, undeveloped flood area (to include contiguous flood areas on adjacent properties) that was not mapped as having any vegetative cover has reduced the size of that contiguous flood area to less than one half of

an acre in size, then the remaining flood area shall also be considered a developed flood area and shall not be identified as habitat.

[5] Only if within 300 feet of a river or surface stream.

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b. ***Step 2. Verifying boundaries of inventoried upland habitat in future urban growth boundary expansion areas.*** Upland habitat was identified based on the existence of contiguous patches of forest canopy, with limited canopy openings. The "forest canopy" designation is made based on analysis of aerial photographs, as part of determining the vegetative cover status of land within the region. Upland habitat shall be as identified on the HCA map unless corrected as provided in this subsection.

i. Except as provided in subsection 9(G)(4)(b)(ii), vegetative cover status shall be as identified on the Metro Vegetative Cover Map used to inventory habitat at the time the area was brought within the urban growth boundary (available from the Metro Data Resource Center, 600 N.E. Grand Ave., Portland, OR 97232; 503-797-1742).

ii. The only allowed corrections to the vegetative cover status of a property are as follows:

(A) To correct errors made when the vegetative status of an area was determined based on analysis of the aerial photographs used to inventory the habitat at the time the area was brought within the urban growth boundary. For example, an area may have been identified as "forest canopy" when it can be shown that such area has less than 60% canopy crown closure, and therefore should not have been identified as "forest canopy." The perimeter of an area delineated as "forest canopy" on the Metro Vegetative Cover Map may be adjusted to more precisely indicate the dripline of the trees within the canopied area provided that no areas providing greater than 60% canopy crown closure are de-classified from the "forest canopy" designation. To assert such errors, applicants shall submit an analysis of the vegetative cover on their property using the aerial photographs that were used to inventory the habitat at the time the area was brought within the urban growth boundary and the definitions of the different vegetative cover types provided in Section 11 of this ordinance; and

(B) To remove tree orchards and Christmas tree farms from inventoried habitat; provided, however, that Christmas tree farms where the trees were planted prior to 1975 and have not been harvested for sale as Christmas trees shall not be removed from the habitat inventory.

iii. If the vegetative cover status of any area identified as upland habitat is corrected pursuant to subsection 9(G)(4)(b)(ii)(A) to change the status of an area originally identified as "forest canopy," then such area shall not be considered upland habitat unless it remains part of a forest canopy opening less than one acre in area completely surrounding by an area of contiguous forest canopy.

c. ***Step 3. Urban Development Value of the Property.*** The urban development value of property designated as regionally significant habitat is depicted on the Metro Habitat Urban Development Value Map (available from the Metro Data Resource Center, 600 N.E. Grand Ave., Portland, OR 97232; 503-797-1742).

i. A property's urban development value designation shall be adjusted upward if the Metro 2040 Design Type designation for the property lot or parcel has changed from a category designated as a lower urban development value category to one designated as a higher urban development value category. 2040 Design Type designations are identified on the Metro 2040 Applied Concept Map (also available from the Metro Data Resource Center, 600 N.E. Grand Ave., Portland, OR 97232; 503-797-1742).

ii. Properties in areas designated on the 2040 Applied Concept Map as the Central City, Regional Centers, Town Centers, and Regionally Significant Industrial Areas are considered to be of high urban development value; properties in areas designated as Main Streets, Station Communities, Other Industrial Areas, and Employment Centers are of medium urban development value; and properties in areas designated as Inner and Outer Neighborhoods and Corridors are of low urban development value.

iii. As designated in Title 13 of Metro's Urban Growth Management Functional Plan, properties owned by a regionally significant educational or medical facility are designated as high urban development value.

d. ***Step 4. Cross-Reference Habitat Class With Urban Development Value.*** City and county verification of the locations of High, Moderate, and Low Habitat Conservation Areas shall be consistent with Tables 7 and 8.

Table 7: Method for Identifying Habitat Conservation Areas ("HCA")

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

NOTE: The default urban development value of property is as depicted on the Metro Habitat Urban Development Value Map. 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 HCA adjustment.

[1]Primary 2040 design type: Regional Centers, Central City, Town Centers, and Regionally Significant Industrial Areas
[2]Secondary 2040 design type: Main Streets, Station Communities, Other Industrial areas, and Employment Centers
[3]Tertiary 2040 design type: 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 Habitat Conservation Areas.
[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 HCAs.

Table 8: Method for Identifying Habitat Conservation Areas ("HCA") in Future Urban Growth Boundary Expansion Areas

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

NOTE: The default urban development value of property is as depicted on the Metro Habitat Urban Development Value Map. 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 HCA adjustment.

[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 Habitat Conservation Areas.

[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 HCAs.

Section 10. Severability

The provisions of this ordinance are severable. If any section, clause, or phrase of this ordinance is adjudged to be invalid by a court of competent jurisdiction, the decision of that court shall not affect the validity of the remaining portions of this ordinance.

Section 11. Definitions

Unless specifically defined in this section, words or phrases used in this ordinance shall be interpreted to give them the same meaning as they have in common usage and to give this ordinance its most reasonable application.

Building site - The area on a lot or parcel that is designated to contain a structure, impervious surface, or non-native landscaping.

Building footprint - The area that is covered by buildings or other roofed structures. A roofed structure includes any structure more than 6 feet above grade at any point, and that provides an impervious cover over what is below. Building footprint also includes uncovered horizontal structures such as decks, stairways and entry bridges that are more than 6 feet above grade. Eaves are not included in building coverage. Underground facilities and structures are defined based on the foundation line.

Developed areas not providing vegetative cover - are areas that lack sufficient vegetative cover to meet the one-acre minimum mapping units of any other type of vegetative cover.

Developed flood area – A flood area (a) upon which a building or other structure has been located, or (b) that is an uncovered, hard-surfaced area or an area covered with a perforated hard surface (such as

"Grasscrete") that is able to withstand vehicular traffic or other heavy-impact uses; provided, however, that graveled areas shall not be considered developed flood areas.

Development - Any man-made change defined as buildings or other structures, mining, dredging, paving, filling, or grading in amounts greater than ten (10) cubic yards on any lot or excavation. In addition, any other activity that results in the removal of more than: either 10 percent or 20,000 square feet of the vegetation in the Habitat Conservation Areas on the lot is defined as development. When individual trees are removed, the area contained within the tree's drip line shall be the basis for calculating the square footage of vegetation removed.

Development does not include the following: (a) Stream enhancement or restoration projects approved by cities and counties; or (b) Farming practices as defined in ORS 30.930 and farm use as defined in ORS 215.203, except that buildings associated with farm practices and farm uses are subject to the requirements of this ordinance.

Disturb - Man-made changes to the existing physical status of the land, which are made in connection with development. The following uses are excluded from the definition:

- enhancement or restoration of the Water Quality Resource Area;
- planting native cover identified in the Metro Native Plant List.

Disturbance Area - An area that contains all temporary and permanent development, exterior improvements, and staging and storage areas on the site. For new development the disturbance area must be contiguous. The disturbance area does not include agricultural and pasture lands or naturalized areas.

Dripline - The outermost edge of a tree's canopy; when delineating the drip line on the ground, it will appear as an irregularly shaped circle defining the canopy's perimeter.

Ecological functions - The primary biological and hydrologic characteristics of healthy fish and wildlife habitat. Riparian ecological functions include microclimate and shade, streamflow moderation and water storage, bank stabilization and sediment/pollution control, sources of large woody debris and natural channel dynamics, and organic material sources. Upland wildlife ecological functions include size of habitat area, amount of habitat with interior conditions, connectivity of habitat to water resources, connectivity to other habitat areas, and presence of unique habitat types.

Effective Impervious Area - A subset of total impervious area that is hydrologically connected via sheet flow or discrete conveyance to a drainage system or receiving body of water

Emergency - Any man-made or natural event or circumstance causing or threatening loss of life, injury to person or property, and includes, but is not limited to, fire, explosion, flood, severe weather, drought earthquake, volcanic activity, spills or releases of oil or hazardous material, contamination, utility or transportation disruptions, and disease.

Engineer - A registered professional engineer licensed by the State of Oregon.

Enhancement - The process of improving upon the natural functions and/or values of an area or feature that has been degraded by human activity. Enhancement activities may or may not return the site to a pre-disturbance condition, but create/recreate beneficial processes and features that occur naturally.

Erosion - Erosion is the movement of soil particles resulting from actions of water or wind.

Fill - Any material such as, but not limited to, sand, gravel, soil, rock or gravel that is placed in a wetland or floodplain for the purposes of development or redevelopment.

Flood areas - Those areas contained within the 100-year floodplain and floodway as shown on the Federal Emergency Management Agency Flood Insurance Maps and all lands that were inundated in the February 1996 flood (note that areas that were mapped as flood areas but were filled to a level above the base flood level prior to September 30, 2005, consistent with all applicable local, state, and federal laws shall no longer be considered habitat based on their status as flood areas).

Flood Management Areas - All lands contained within the 100-year floodplain, flood area and floodway as shown on the Federal Emergency Management Agency Flood Insurance Maps and the area of inundation for the February 1996 flood. In addition, all lands which have documented evidence of flooding.

Floodplain - The land subject to periodic flooding, including the 100-year floodplain as mapped by FEMA Flood Insurance Studies or other substantial evidence of actual flood events.

Floodway - The portion of a watercourse required for the passage or conveyance of a given storm event as identified and designated by the (identify name) city/county pursuant to this Ordinance. The floodway shall include the channel of the watercourse and the adjacent floodplain that must be reserved in an unobstructed condition in order to discharge the base flood without flood levels by more than one foot.

Floor Area Ratio (FAR) - The amount of floor area in relation to the amount of site area, expressed in square feet. For example, a floor area ratio of 2 to 1 means two square feet of floor area for every one square foot of site area.

Forest canopy - Areas that are part of a contiguous grove of trees of one acre or larger in area with approximately 60% or greater crown closure, irrespective of whether the entire grove is within 200 feet of the relevant water feature.

Habitat Conservation Area or HCA - An area identified on the Habitat Conservation Areas Map and subject to the development standards.

Habitat-friendly development - A method of developing property that has less detrimental impact on fish and wildlife habitat than does traditional development methods. Examples include clustering development to avoid habitat, using alternative materials and designs such as pier, post, or piling foundations designed to minimize tree root disturbance, managing storm water on-site to help filter rainwater and recharge groundwater sources, collecting rooftop water in rain barrels for reuse in site landscaping and gardening, and reducing the amount of effective impervious surface created by development.

Invasive non-native or noxious vegetation - Plant species that are listed as nuisance plants or prohibited plants on the Metro Native Plant List as adopted by Metro Council resolution because they are plant species that have been introduced and, due to aggressive growth patterns and lack of natural enemies in the area where introduced, spread rapidly into native plant communities.

Lot - Lot means a single unit of land that is created by a subdivision of land. (ORS 92.010).

Low structure vegetation or open soils - Areas that are part of a contiguous area one acre or larger of grass, meadow, crop-lands, or areas of open soils located within 300 feet of a surface stream (low

structure vegetation areas may include areas of shrub vegetation less than one acre in size if they are contiguous with areas of grass, meadow, crop-lands, orchards, Christmas tree farms, holly farms, or areas of open soils located within 300 feet of a surface stream and together form an area of one acre in size or larger).

Mitigation - The reduction of adverse effects of a proposed project by considering, in the order: a) avoiding the impact all together by not taking a certain action or parts of an action; b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; c) rectifying the impact by repairing, rehabilitating or restoring the affected environment; d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action by monitoring and taking appropriate measures; and e) compensating for the impact by replacing or providing comparable substitute water quality resource areas or habitat conservation areas.

Native vegetation or native plant - Vegetation listed as a native plant on the Metro Native Plant List as adopted by Metro Council resolution and any other vegetation native to the Portland metropolitan area provided that it is not listed as a nuisance plant or a prohibited plant on the Metro Native Plant List.

Open space - Land that is undeveloped and that is planned to remain so indefinitely. The term encompasses parks, forests and farmland. It may also refer only to land zoned as being available to the public, including playgrounds, watershed preserves and parks.

Owner or property owner - The person who is the legal record owner of the land, or where there is a recorded land sale contract, the purchaser thereunder.

Parcel - Parcel means a single unit of land that is created by a partitioning of land. (ORS 92.010).

Partition - Partition means to divide land into two or three parcels of land within a calendar year. (ORS 92.010)

Phased development project - A phased development plan includes the following:

- A site plan showing the proposed final development of the site and phases, including the initial and interim phases.
- A written statement describing each phase, including the potential uses, and the approximate timeline for each phase of development.

Practicable - means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose and probable impact on ecological functions. The practicability of a development option shall include consideration of the type of HCA that will be affected by the proposed development. For example, High HCAs have been so designated because they are areas that have been identified as having lower urban development value and higher-valued habitat, so it should be more difficult to show that alternative development options that avoid the habitat are not practicable. On the other hand, Low HCAs have been so designated because they are areas that have been identified as having higher urban development value and lower-valued habitat, so it should be less difficult to show that alternative development options that avoid the habitat are not practicable.

Redevelopment – Development that occurs on sites that have previously been developed.

Restoration - The process of returning a disturbed or altered area or feature to a previously existing natural condition. Restoration activities reestablish the structure, function, and/or diversity to that which occurred prior to impacts caused by human activity.

Riparian - Those areas associated with streams, lakes and wetlands where vegetation communities are predominately influenced by their association with water.

Routine repair and maintenance - Activities directed at preserving an existing allowed use or facility, without expanding the development footprint or site use.

Set-back adjustment - The placement of a building a specified distance away from a road, property line or protected resource.

Significant negative impact - An impact that affects the natural environment, considered individually or cumulatively with other impacts on the HCA, to the point where existing fish and wildlife habitat functional values are degraded.

Statewide Land Use Planning Goal 5 - Oregon's statewide planning goal that addresses open space, scenic and historic areas, and natural resources. The purpose of the goal is to conserve open space and protect natural and scenic resources.

Steep slopes - Steep slopes are those slopes that are equal to or greater than 25%. Steep slopes have been removed from the "buildable lands" inventory and have not been used in calculations to determine the number of acres within the urban growth boundary that are available for development.

Stormwater pre-treatment facility - Any structure or drainage way that is designed, constructed, and maintained to collect and filter, retain, or detain surface water run-off during and after a storm event for the purpose of water quality improvement.

Stream - A body of running water moving over the earth's surface in a channel or bed, such as a creek, rivulet or river. It flows at least part of the year, including perennial and intermittent streams. Streams are dynamic in nature and their structure is maintained through build-up and loss of sediment.

Structure - A building or other major improvement that is built, constructed or installed, not including minor improvements, such as fences, utility poles, flagpoles or irrigation system components, that are not customarily regulated through zoning codes.

Subdivision - A Subdivision of land means to divide land into four or more lots within a calendar year. (ORS 92.010).

Top of Bank - The same as "bankful stage" defined in OAR 141-85-010.

Urban Development Value - The economic value of a property lot or parcel as determined by analyzing three separate variables: assessed land value, value as a property that could generate jobs ("employment value"), and the Metro 2040 design type designation of property. The urban development value of all properties containing regionally significant fish and wildlife habitat is depicted on the Metro Habitat Urban Development Value Map

Urban Growth Boundary or UGB - means an urban growth boundary adopted pursuant to ORS chapter 197.

Utility facilities - Buildings, structures or any constructed portion of a system which provides for the production, transmission, conveyance, delivery or furnishing of services including, but not limited to,

heat, light, water, power, natural gas, sanitary sewer, stormwater, telephone and cable television. Utility facilities do not include stormwater pre-treatment facilities.

Variance - means a discretionary decision to permit modification of the terms of an implementing ordinance based on a demonstration of unusual hardship or exceptional circumstances unique to a specific property.

Water-dependent - A use which can be carried out only on, in, or adjacent to water because it requires access to the water for waterborne transportation or recreation. Water-dependent also includes development, which by its nature, can be built only on, in, or over water. Bridges supported by piers or pillars, as opposed to fill, are water-dependent development.

Water feature - All rivers, streams (regardless of whether they carry year-round flow, i.e., including intermittent streams), springs which feed streams and wetlands and have year-round flow, Flood Management Areas, wetlands, and all other bodies of open water.

Water Quality Resource Area - is an area identified by a city or county as a Water Quality Resource Area in order to comply with Title 3 of Metro's Urban Growth Management Functional Plan, Metro Code sections 3.07.310- 3.07.370.

Watershed - A watershed is a geographic unit defined by the flows of rainwater or snowmelt. All land in a watershed drains to a common outlet, such as a stream, lake or wetland.

Wetlands - Wetlands are those areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support and under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands are those areas identified and delineated by a qualified wetland specialist as set forth in the 1987 Corps of Engineers Wetland Delineation Manual.

Woody vegetation - Areas that are part of a contiguous area one acre or larger of shrub or open or scattered forest canopy (less than 60% crown closure) located within 300 feet of a surface stream.

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EXHIBIT F—ORDINANCE NO. 05-1077C

FINDINGS OF FACT AND CONCLUSIONS OF LAW

By approving this ordinance, Metro adopts a new title (Title 13, "Nature in Neighborhoods") to the Urban Growth Management Functional Plan ("UGMFP"), amends the Regional Framework Plan, amends other provisions of the UGMFP, and adopts a model ordinance for use by cities and counties, at their option, to comply with the new provisions of the UGMFP. Metro adopts this ordinance to implement certain provisions of Statewide Planning Goals 5 and 6 within the Metro region. As described in these Findings of Fact and Conclusions of Law ("Findings"), Metro's adoption of this ordinance complies with Oregon land use planning statutes, statewide land use planning goals, administrative rules adopted by the Land Conservation and Development Commission to implement the statewide land use planning goals, and the Regional Framework Plan.

These Findings are intended to explain how this ordinance complies with applicable laws and goals in general. These Findings supplement the extensive decision record for this multi-year planning effort, and are supported by the facts in the decision record. That record includes all documents in the public record for Metro Resolution Nos. 00-2965, 01-3087A, 01-3141C, 02-3176, 02-3177A, 02-3195, 02-3218A, 03-3332, 03-3376B, 04-3440A, 04-3488, 04-3489A, 04-3506A, 05-3557, 05-3574A, and 05-3577A, all of which were adopted by the Council in the course of developing this ordinance. Some of the most critical documents supporting Metro's adoption of this ordinance are included as attachments to these Findings. Metro has relied on the attached documents and information in the record in developing this ordinance.

FINDINGS OF COMPLIANCE WITH STATEWIDE PLANNING GOALS

As noted above, Metro adopts this ordinance to implement certain provisions of Statewide Planning Goals 5 and 6 within the Metro region. These Findings will therefore start with Metro's compliance with those goals, and then address compliance with the other goals in numerical order.

Goal 5. Open Spaces, Scenic and Historic Areas and Natural Resources

Division 23 of Chapter 660 of the Oregon Administrative Rules (the "Goal 5 Rule") establishes procedures and criteria for complying with Goal 5. The Goal 5 Rule provides that "Metro may adopt one or more regional functional plans to address all applicable requirements of Goal 5 . . . for one or more resource categories and to provide time limits for local governments to implement the plan." OAR 660-023-0080(3). In order to adopt a Goal 5 program, local governments must follow a three-part process. The first part is to conduct an inventory of Goal 5 resources within the jurisdiction. OAR 660-023-0030. The second part is to conduct an analysis of the economic, social, environmental, and energy (ESEE) consequences of protecting or not protecting such inventoried resources (the "ESEE Analysis"), and to decide whether to allow, limit, or prohibit uses that conflict with the preservation of the inventoried resources (the "ALP Decision"). OAR 660-023-0040. The third part is to develop a program to achieve Goal 5 consistent with the government's ALP Decision. OAR 660-023-0050.

A. Metro's Inventory Process

The Goal 5 Rule describes a four-step process for conducting an inventory of Goal 5 resources. Metro's resources inventory is described in detail in Attachment 1 to these Findings which includes two documents, the *Metro's Riparian Corridor and Wildlife Habitat Inventories, August 2005* (the "Inventory Report") and the *Addendum and Update to Metro's Riparian Corridor and Wildlife Habitat Inventories, September 2005*, (the "Inventory Addendum"). The Inventory Report and the Inventory Addendum also refer to, and rely on, *Metro's Technical Report for Fish and Wildlife Habitat, April 2005* (the "Technical Report," included as Attachment 2 to these Findings). The Inventory Report, Inventory Addendum, and Technical Report, including their final recommendations, findings, and conclusions, are hereby incorporated by reference as part of these Findings. As described in detail in the Inventory Report and Inventory Addendum, Metro followed the inventory process required by the Goal 5 Rule to inventory two types of Goal 5 resources within the Metro region: riparian corridors (OAR 660-023-0090) and wildlife habitat (OAR 660-023-0110). Metro exercised its discretion under OAR 660-023-0080(3) not to inventory other Goal 5 resources.

Specifically, following the Goal 5 Rule's four-step inventory process (OAR 660-023-0030), and as fully described in the Inventory Report and Inventory Addendum, Metro collected information about riparian corridors and wildlife habitat, determined that the information it had collected was adequate, determined the significance of resource sites, and, by adoption of this ordinance, hereby adopts a list of regionally significant resource sites. Those sites are depicted on the Regionally Significant Fish and Wildlife Habitat Inventory Map (the "Inventory Map"), attached as Exhibit A to this ordinance. As fully described in the Inventory Report, Inventory Addendum, and Technical Report, the Council finds that Metro's inventory of riparian corridors and wildlife habitat complies with Goal 5.

B. Metro's ESEE Analysis and "Allow-Limit-Prohibit" Decision Process

The second step of the process required by the Goal 5 Rule is to analyze the economic, social, environmental, and energy (ESEE) consequences that could result from a decision to allow, limit, or prohibit a use that conflicts with identified Goal 5 resources. OAR 660-023-0040(1). The rule provides a four-step process for conducting the ESEE Analysis: (1) identify conflicting uses, (2) determine impact areas; (3) analyze the ESEE consequences; and (4) determine whether to allow, limit, or prohibit conflicting uses for significant resource sites.

Metro conducted its ESEE Analysis in two phases. Metro's ESEE Analysis is described in detail in Attachments 3 and 4 to these Findings, *Metro's Phase I ESEE Analysis, April 2005*, and *Metro's Phase II ESEE Analysis, April 2005* (collectively, "Metro's ESEE Reports"). Except as otherwise provided in the text of this Exhibit F to this ordinance, Metro's ESEE Reports, including their final recommendations, findings, and conclusions, are hereby incorporated by reference as part of these Findings. As described in detail in Metro's ESEE Reports, Metro followed the ESEE analysis process required by the Goal 5 Rule for all inventoried regionally significant fish and wildlife habitat.

The first step of the required ESEE analysis is to identify conflicting uses. Chapter 3 of *Metro's Phase I ESEE Analysis* describes how Metro identified conflicting uses and how Metro's approach complies with the Goal 5 Rule. Metro used its seven generalized regional zones to group similar conflicting uses. *ESEE Phase I Analysis*, page 24.

The second step of the required ESEE analysis is to determine the "impact area" surrounding the significant resources. Chapter 2 of *Metro's Phase I ESEE Analysis* describes how Metro identified impact areas and how Metro's approach complies with the Goal 5 Rule.

The third step of the required ESEE analysis is to analyze the ESEE consequences that could result from a decision to allow, limit, or prohibit conflicting uses within significant resources. Chapters 4 through 7 of *Metro's Phase I ESEE Analysis* describe, respectively, the general economic, social, environmental, and energy consequences of allowing, limiting, or prohibiting such conflicting uses within regionally significant fish and wildlife habitat, and Chapter 8 of the Phase I Report describes the likely tradeoffs that will result from a decision to allow, limit, or prohibit conflicting uses for significant resources. In order to aid in its analysis, Metro differentiated its inventory of regionally significant fish and wildlife habitat by habitat type and quality, creating six habitat categories (Riparian Class I, II and III, and Upland Wildlife Class A, B and C). In Table 8-1 of the Phase I Report, Metro summarized the ESEE consequences of allowing, limiting, or prohibiting conflicting uses on each of the different habitat categories, as well as on impact areas. In addition, Appendix D to the Phase I Report provides a matrix that further summarizes the ESEE consequences of allowing, limiting, or prohibiting conflicting uses by habitat category and by generalized regional zoning designations. This analysis allowed Metro to assess the ESEE consequences that would apply to similarly situated resource sites; that is, significant resources of the same habitat type and class are similarly situated, and Metro then analyzed such properties that are subject to the same generalized regional zoning designations.

The Phase II Report completed Metro's ESEE Analysis. Although not required by the Goal 5 Rule, the Metro Council directed staff to prepare multiple program approaches and to assess the ESEE consequences of each approach, based on criteria developed during Phase I of the ESEE analysis, in order to make as informed an ALP Decision as possible. As part of the Phase II Report, Metro also considered applicable requirements of the statewide goals and acknowledged plan requirements. In particular, Metro assessed the effect that existing non-regulatory programs have on regionally significant fish and wildlife habitat (Phase II Report, pages 9-13) and the effect that existing regulatory requirements, including locally adopted Goal 5 programs, have on significant habitat (Phase II Report, pages 25-33; and *Local Plan Analysis: A review of Goal 5 protection in the Metro region (August 2002)*, adopted by the Council with its approval of Resolution No. 02-3218A, August 8, 2002).

Based upon Metro's two-phase ESEE analysis and advice from citizens, Metro advisory committees, local governments, and other interested parties, Metro has made its ALP Decision, which is reflected below and in this ordinance. As described in the ESEE Reports, there are many factors weighing for and against allowing, limiting, or prohibiting conflicting uses within significant resources. Metro has weighed and considered those factors to make a balanced ALP Decision that seeks to conserve and preserve the highest value and most critical habitat, ensure that the Metro region's economy continues to thrive, protects and improves the region's water quality and prevents water pollution, and respects property rights. The Council finds that none of the significant resources are of such importance relative to conflicting uses to support a decision to prohibit such conflicting uses. The Council finds that conflicting uses should be limited in some significant resources and allowed in others. Reflecting Metro's balancing of competing factors in making its ALP Decision, Metro has structured its ALP Decision using a matrix that differentiates the significant resources by habitat class and type and by its urban development value. The following chart summarizes Metro's ALP Decision:

Fish & Wildlife Habitat Classification	High Urban Development Value	Medium Urban Development Value	Low Urban Development Value	Other Areas
	Primary 2040 components[1], high employment value, or high land value[4, 5]	Secondary 2040 components[2], medium employment value, or medium land value[4]	Tertiary 2040 components[3], low employment value, or low land value[4]	Parks and Open Spaces, no design types outside UGB
Class I Riparian/Wildlife	ML / A[6]	SL	SL	SL / SL+[7]
Class II Riparian/Wildlife	LL/ A[6]	LL	ML	ML / SL+[7]
Class III Riparian/Wildlife	A	A	A	A
Class A Upland Wildlife	A / LL[8]	A / ML[8]	A / ML[8]	A / SL[8, 9] / SL+[7, 8]
Class B Upland Wildlife	A / LL[8]	A / LL[8]	A / ML[8]	A / SL[8, 9] / SL+[7, 8]
Class C Upland Wildlife	A	A	A	A
Impact Areas	A	A	A	A

Key: SL = strictly limit; ML = moderately limit; LL = lightly limit; and A = allow.

[1] Primary 2040 components: Regional Centers, Central City, Town Centers, and Regionally Significant Industrial Areas

[2] Secondary 2040 components: Main Streets, Station Communities, Other Industrial areas, and Employment Centers

[3] Tertiary 2040 components: Inner and outer neighborhoods, Corridors

[4] Land value excludes residential lands.

[5] Regionally significant educational or medical facilities, as identified by Metro, are also designated as high urban development value because of the special economic and social contributions they provide and because they are frequently located in areas designated as Tertiary or Secondary 2040 components, and therefore would not necessarily receive the economic ranking they deserve; see Exhibit C, Section 4(D)(5)(b).

[6] Apply allow treatment to the International Terminal (IT) site and Port of Portland Terminals 4, 5 and 6 because Council finds the special economic importance of those sites outweighs its resource values.

[7] Apply more strict protection (SL+) to parks designated as natural areas in Class I and II riparian habitat, and to future parks designated as natural areas in Class A and B upland wildlife habitat brought within the urban growth boundary after the program's effective date.

[8] Apply these limit decisions for Class A and B upland wildlife habitat in areas brought within the urban growth boundary after the program's effective date.

[9] Apply SL designations to 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.

As described above, this ALP Decision is a balanced decision that limits conflicting uses in the most critical habitat, which is the Class I and II riparian habitat. Metro is not limiting development in wildlife habitat because the economic and social impacts of such a decision, as well as the impact on meeting the region's housing and employment needs, would be too significant compared with the value of such protections. Instead, Metro is developing aggressive non-regulatory programs to conserve and preserve such habitat, and will work closely with cities and counties in the region to do the same. In addition, Metro is adopting a "no rollbacks" requirement to ensure that existing, locally adopted and acknowledged Goal 5 programs that limit development in upland wildlife habitat are not repealed or weakened. Metro's "allow" decision for wildlife habitat applies only to areas within the current UGB. I future UGB expansion areas the economic and social impacts are not as significant because advance planning can reduce conflicts and help ensure that vibrant new communities are created. Such areas are not yet slated

for development, and there are not the same, concrete development expectations. For that reason, Metro has decided that a limit decision is appropriate within Class A and B upland wildlife habitat in future UGB expansion areas (but not within Class C habitat, which includes the smallest and most disconnected patches of habitat). Finally, Metro has made allow decisions in all Class III riparian habitat and in impact areas. Class III habitat consists primarily of developed flood areas that provide just one essential habitat function—water storage during flood events. The Council finds that the environmental benefits of limiting redevelopment of such areas is not commensurate with their economic value. Similarly, the Council finds that the environmental benefits of limiting conflicting uses in impact areas, which are not themselves habitat areas, are outweighed by the economic and social consequences that would result from such development limits.

In addition, publicly owned parks that are managed as natural areas are the backbone of the region's best functioning fish and wildlife habitat. The positive environmental consequences of limiting conflicting uses in such areas far outweighs any negative consequences of such a decision. For that reason, Metro has made a "strictly limit-plus" decision for such areas.

Metro has made two important modifications to its general ALP Decision in order to better calibrate its weighing and balancing of ESEE consequences. First, Metro has made an allow decision for four international marine terminals: the International Terminal site and Port of Portland Terminals 4, 5 and 6. Metro makes this allow decision because these terminals are currently developed for use as international marine terminals capable of mooring ocean-going tankers and cargo ships, and therefore have an especially critical role in supporting the region's economy, and in consideration that these terminals are substantially without vegetative cover, and therefore provide significantly less environmental value as habitat.

Second, Metro modifies its limit decision slightly to the extent that it affects owners of existing, developed residential properties. The modification allows such owners to undertake in the future any activity that they can currently undertake without having to obtain a land use approval or a building, grading, or tree removal permit from their city or county. The environmental consequences of imposing new limits on such activities would be to prevent certain activities that might harm the ecological functions being provided by such areas. However, the most harm done to habitat is due to significant property development, and the properties affected by this decision are already developed with residences. Thus, the environmental benefit of imposing new limits on such activities is relatively small. On the other hand, imposing any new limits on activities that homeowners can undertake today without having to seek permission could result in thousands of homeowners being confused regarding the new rules, resenting the new limits on their liberty to use their properties, and would thereby undermine Metro's efforts to encourage behavior that would benefit habitat areas in ways that regulations cannot. The Council therefore finds that imposing new limits on activities that homeowners can undertake today without having to obtain a permit would have significant detrimental social consequences that are not outweighed by the beneficial environmental consequences of imposing such new limits.

As described above and as supported by the record in this matter, the Council finds that Metro's ESEE Analysis and ALP Decision comply with Goal 5.

C. Metro's Program to Achieve Goal 5

The final step of the Goal 5 process is to develop a program to implement the ALP Decision. The Goal 5 Rule provides that Metro may adopt a functional plan to address the applicable requirements of the Goal and the Goal 5 Rule, and that, after acknowledgement by LCDC, local

governments in the region shall apply the requirements of the functional plan, rather than the requirements of the Goal 5 Rule. OAR 660-023-0080(3). Exhibit C to this ordinance is a new Title 13 to the Metro Urban Growth Management Functional Plan and is adopted to provide cities and counties with new requirements that address compliance with Goal 5 with respect to the regionally significant fish and wildlife habitat identified by Metro.

Metro is in a unique position as a regional government with authority to adopt functional plan provisions with which all 25 cities and three counties in the region must comply. Metro has designed its program in recognition of the diversity of those cities and counties. Rather than adopting a one-size-fits-all approach, Metro's program offers considerable flexibility for local governments to develop their own approaches to conserve and protect regionally significant fish and wildlife habitat. In addition, for a jurisdiction without the resources necessary to develop its own innovative approach, Metro has also developed a model ordinance, attached as Exhibit E to this ordinance, that a jurisdiction can adopt "off the shelf" to comply with the new functional plan requirements.

The Goal 5 Rule requires that, when a government has decided to protect a resource site, the measures it takes to limit conflicting uses must contain clear and objective standards. See OAR 660-023-0050(2). Metro has satisfied this requirement by including clear and objective development standards in the model ordinance (see Exhibit E, Section 6) and, for jurisdictions that choose not to adopt the model ordinance, the functional plan requires that their programs contain clear and objective standards that meet the requirements of OAR 660-023-0050(2) (see Exhibit C, Section 3(C)). The Goal 5 Rule also provides that, in addition to providing clear and objective standards, local governments may also provide alternative review standards that are not clear and objective and make them available for use at a property owner's option. See OAR 660-023-0050(3). Metro has provided such discretionary approval standards in the model ordinance (see Exhibit E, Section 7) and, for jurisdictions that choose not to adopt the model ordinance, the functional plan allows their programs to also include discretionary approval standards (see Exhibit C, Section 3(D)).

As noted above, the Goal 5 Rule provides that, upon acknowledgement of this ordinance by the Oregon Land Conservation and Development Commission, cities and counties within the Metro region shall apply the requirements of this ordinance with respect to inventoried Goal 5 resources, rather than applying the requirements of the Goal 5 Rule. See OAR 660-023-0080(3). Metro has included a provision in this ordinance, subsection 3(A) of Exhibit C, to clarify the application of that provision. First, and most critically, the Council finds that the provisions of this ordinance are to establish a floor of habitat protection for the region and shall not limit any jurisdiction from providing a greater level of habitat protection than that required by this ordinance. See subsection 1(D) of Exhibit C. Second, because Metro has made a limit decision for areas Metro has designated as Habitat Conservation Areas (HCAs), the Council finds that cities and counties in the region shall apply the requirements of this ordinance, rather than the requirements of the Goal 5 Rule, with respect to the protection of such HCAs. Third, as describe above, this ordinance allows cities and counties the option to comply with its requirements by developing their own innovative habitat protection program. To the extent that such a program includes protection of Metro-inventoried habitat resources in addition to HCAs, the Council finds that cities and counties shall only have to comply with the requirements of this ordinance (i.e., to show that their overall program provides habitat protection comparable to that which would be provided if they were to adopt a program that complied with the performance standards included in this ordinance for the protection of HCAs). The Council finds that such cities and counties shall not be required to comply with the Goal 5 Rule. Fourth, except as described above in this paragraph, the Council finds that cities and counties that wish to adopt new provisions to protect any other areas not

identified as HCAs shall do so only by complying with the Goal 5 Rule. Finally, fifth, the Council finds that existing, locally-adopted and acknowledged Goal 5 programs that limit development in Metro-inventoried upland wildlife habitat areas are critical to provide limited protections for such habitat and, for that reason, the Council finds that such programs shall not be repealed or weakened.

D. The Tualatin Basin Natural Resources Coordinating Committee

In June 2002, Metro entered into an intergovernmental agreement ("IGA") with a consortium of local governments from the Tualatin River watershed. The local governments had entered into their own IGA earlier that year to form the Tualatin Basin Natural Resources Coordinating Committee ("TBNRCC"). The municipal members of the TBNRCC included Washington County and the cities of Beaverton, Cornelius, Durham, Forest Grove, Hillsboro, King City, North Plains, Sherwood, Tigard, and Tualatin. The TBNRCC also included the Tualatin Hills Parks and Recreation District and Clean Water Services. The TBNRCC was formed to pool the resources of the member governments to conduct their own ESEE analysis using Metro's inventory of regionally significant fish and wildlife habitat, to make their own ALP Decision, and to develop their own program to achieve Goal 5, all in compliance with the Goal 5 Rule. Metro agreed to allow, and work with, the TBNRCC to do so, provided that the program eventually developed by the TBNRCC was likely to result in the conservation, protection, and restoration of a "continuous ecologically viable streamside corridor system, from the streams' headwaters to their confluence with other stream and rivers, and with their floodplains in a manner that is integrated with the surrounding urban landscape," and that it was likely to improve the condition of regionally significant habitat basin-wide, and in each subwatershed in the basin.

The TBNRCC's ESEE analysis and ALP decision are described in detail in Attachment 6 to these Findings, the *TBNRCC Goal 5 ESEE Analysis, March 2005* (the "TBNRCC ESEE Analysis"). As described in detail in the TBNRCC ESEE Analysis, and as summarized in the recitals of TBNRCC Resolution and Order No. 2005-01, adopted by the TBNRCC on April 4, 2005, the Council finds that the TBNRCC followed and complied with the ESEE analysis and ALP decision process required by the Goal 5 Rule for all inventoried regionally significant fish and wildlife habitat. For that reason, the TBNRCC ESEE Analysis and TBNRCC Resolution and Order No. 2005-01, including the TBNRCC's final recommendations, findings, and conclusions described therein, are hereby incorporated by reference as part of these Findings.

The first step of the required ESEE analysis is to identify conflicting uses. Chapter 2 and pages 2 and 3 of Chapter 6 of the TBNRCC ESEE Analysis describe how the TBNRCC identified conflicting uses and how its approach complies with the Goal 5 Rule. The second step of the required ESEE analysis is to determine the "impact area" surrounding the significant resources. Page 12 of Chapter 1 of the TBNRCC ESEE Analysis describes how the TBNRCC identified impact areas and how its approach complies with the Goal 5 Rule.

The third step of the required ESEE analysis is to analyze the ESEE consequences that could result from a decision to allow, limit, or prohibit conflicting uses within significant resources. Chapters 3 through 6 of the TBNRCC ESEE Analysis describe the economic, social, environmental, and energy consequences of allowing, limiting, or prohibiting such conflicting uses within regionally significant fish and wildlife habitat. The TBNRCC approach progressed from a general, basin-wide ESEE analysis (see Chapter 3) to a site-specific analysis (see Chapter 4). Based on information learned during the site-level analysis, the TBNRCC further revised its basin-wide analysis (Chapter 5). Finally, the TBNRCC revised all of its analysis and its ALP decision a final time during a second phase of its basin-wide analysis (Chapter 6).

The TBNRCC ESEE analysis and ALP Decision took a different approach, in many respects, than did Metro in its analysis and decision. For example, the TBNRCC defined the entire Tualatin Basin watershed as part of the impact area. In addition, though the TBNRCC describes its ALP Decision as being a "limit" decision for the entire watershed, including its impact areas, the program that has been adopted does not include the imposition of any new land use regulations. Traditionally, within the State of Oregon Land Use Program, Goal 5 program decisions have focused exclusively on the application of land use regulations to limit or prohibit conflicting uses. The TBNRCC ALP Decision and associated program decision depends upon a larger range of permissible elements for Goal 5 program decisions as provided for by the Goal 5 rule. Specifically, the Goal 5 rule definition of "program" includes examples of program elements that go beyond traditional land use regulations. See 660-023-0010 (6). For example, the definition refers to program elements for such things as "preferential assessments, or acquisition of land or development rights." The TBNRCC uses these broader revenue-based elements as integral parts of its Goal 5 limit program decision. For example, the TBNRCC limit program decision relies on revenue elements to fund an aggressive habitat restoration program with a dedicated funding source. Likewise, the TBNRCC's program will encourage the voluntary use of low impact development techniques that will limit the impact of conflicting uses and benefit habitat. Additionally, the TBNRCC's limit program decision consciously anticipates, through community education, individual choices and voluntary low impact development practices, that significant additional site-by-site limitations to conflicting uses will be achieved. Finally, although prevailing Tualatin Basin land use regulations that were put in place to comply with Title 3 of the Urban Growth Management Functional Plan, adopted pursuant to Goals 6 and 7, will not be changed as part of its program, those regulations do provide additional program elements to the overall TBNRCC limit program decision.

The TBNRCC limit decision and program is different than that applied by Metro to other parts of the region. Nonetheless, after carefully reviewing the TBNRCC program, the Council finds that, provided the TBNRCC complies with certain conditions, its program meets the standards required in the IGA between Metro and the TBNRCC. See Metro Resolution No. 05-3577A. Although the TBNRCC has taken a very different approach to conserving, protecting, and enhancing regionally significant fish and wildlife habitat, the Council also finds that the TBNRCC's approach is consistent with Metro's ESEE Analysis and ALP Decision, because its combination of existing regulatory requirements and the application of an aggressive habitat restoration program with a dedicated funding source is likely to result in the conservation, protection, and enhancement of regionally significant habitat commensurate with the habitat conservation, protection, and enhancement that Metro's program is likely to produce.

For these reasons, the Council finds that the TBNRCC ESEE Analysis, ALP Decision, and Program to Achieve Goal 5 all comply with Goal 5.

E. Other Goal 5 requirements

1. Notice and Land Owner Involvement

The Goal 5 Rule, OAR 660-023-0060, requires:

- That local governments "provide timely notice to landowners and opportunities for citizen involvement during the inventory and ESEE process;"

- That the "[n]otification and involvement of landowners, citizens, and public agencies occur at the earliest possible opportunity whenever a Goal 5 task is undertaken;" and

- That local governments "comply with their acknowledged citizen involvement program, with statewide goal requirements for citizen involvement and coordination, and with other applicable procedures in statutes, rules, or local ordinances."

The Metro Charter establishes the Metro Office of Citizen Involvement, a citizen's committee and a citizen involvement process to develop and maintain programs and procedures to aid communication between citizens and the Metro Council. See Metro Charter Section 27. Policy 1.13 of the Regional Framework Plan ("RFP") makes it the policy of the Metro Council to encourage public participation in Metro land use planning and to follow and promote the citizen participation values inherent in the RFP and the Metro Citizen Involvement Principles. The Metro Council approved Principles of Citizen Involvement by the adoption of Resolution No. 97-2433. Those principles include valuing active citizen participation, respecting and considering all citizen input, encouraging opportunities that reflect the rich diversity of the region, promoting participation of individuals and community, business, and special interest groups, providing understandable, timely, and broadly distributed communications to encourage citizen participation, organizing involvement activities to make the best use of citizens' time and effort, responding to citizens' perspectives and insights in a timely manner, and coordinating interdepartmental and interjurisdictional activities.

In compliance with the policies in the RFP and Metro's Citizen Involvement Principles, citizen involvement has been a key element in Metro's development of this ordinance to conserve, protect and restore regionally significant fish and wildlife habitat. At each stage of the process required by the Goal 5 Rule, Metro has engaged, informed, and sought input, feedback, and comments from the public, interested parties, and representatives from local governments, the State, and federal agencies. This has come in the form of extensive public outreach efforts, as well as by bringing items up for review and discussion before Metro's standing advisory committees, such as the Metropolitan Policy Advisory Committee (MPAC, consisting primarily of local elected officials from across the region), the Metropolitan Technical Advisory Committee (MTAC, consisting of planning experts from local governments, interested parties, and citizens from across the region), and the Water Resources Policy Advisory Committee (WRPAC); and before committees created specifically to assist with the development of this program, such as the Goal 5 Technical Advisory Committee, the Economic Technical Advisory Committee, the Independent Economic Advisory Board (appointed in coordination with the Northwest Power Planning Council), the Goal 5 Social Review Committee (to help Metro analyze the social consequences as part of the ESEE analysis), the Program Implementation Work Group, and the Model Ordinance Subcommittee. Metro has also engaged in extensive public outreach at each stage of the process required by the Goal 5 Rule, and, through that process, has received extensive input and comments from citizens, local governments, and other interested parties. Metro has not just heard that input and comments, but has carefully considered it, and it has played a vital role in shaping the development of this ordinance and Metro's overall Nature in Neighborhoods program.

Metro's public involvement process is summarized at pages 6 through 9 of *Metro's Riparian Corridor and Wildlife Habitat Inventories, August 2005* and on page 5 of the *Addendum and Update to Metro's Riparian Corridor and Wildlife Habitat Inventories, August 2005*. As described in those documents, and as supported by the record in this matter, which documents extensive citizen involvement throughout the five-year planning process, the Council finds that Metro has complied with the citizen involvement requirements of the Goal 5 Rule (OAR 660-

023-0060), the Metro Charter, the Metro Regional Framework Plan, and Metro's Principles of Citizen Involvement.

2. Buildable Lands Affected

The Goal 5 Rule provides that "[i]f measures to protect significant resource sites . . . affect the inventory of buildable lands in acknowledged plans required by Goals 9, 10 and 14, [Metro], prior to or at the next periodic review, shall . . ." amend the UGB to provide additional buildable lands to make up for the loss, redesignate land to replace the lost buildable land, or take a combination of both of those steps. See OAR 660-023-0070. The Council does not believe that this program will have a significant effect on the existing buildable lands inventory. The program requirements do not prohibit development on any property and provide a mechanism to allow development that would otherwise be limited if it can be shown that the program's standard limits were not "available and capable of being done after taking into consideration the cost, existing technology, and logistics in light of overall project purpose and probable impact on ecological functions." See Exhibit C, Section 4(B)(2) and Exhibit D, Amendment 9, definition of "practicable" on page 13. Metro will track the program closely, however, and, to the extent that the program's measures to protect regionally significant fish and wildlife habitat affect Metro's inventory of buildable lands in Metro's acknowledged plans required by Goals 9, 10 and 14, then at Metro's next required periodic review the Council will amend the UGB to provide additional buildable lands, redesignate lands to increase the supply of buildable lands within the UGB, or take a combination of both of those steps.

Goal 6. Air, Water and Land Resources Quality

In 1998, Metro adopted Title 3 to the Urban Growth Management Functional Plan to create Water Quality Resource Areas and Flood Management Areas. See Metro Code Sections 3.07.310 through 3.07.370 ("Title 3"). Title 3, adopted pursuant to Goals 6 and 7, created uniform Water Quality Resource Area buffers around rivers and streams in the region, and required that property owners seeking to develop such areas do everything practicable to avoid them, but if unavoidable that they then minimize development of those areas and mitigate for such development. Since the adoption of Title 3, water quality problems have persisted in the region. The Oregon Department of Environmental Quality, for example, has released a draft Total Maximum Daily Load rule addressing bacteria, temperature, mercury, and other water quality problems throughout the Willamette River Basin. That rule, which is anticipated to be issued later this year, will apply to most of the rivers and streams in the Metro region.

In addition, through Metro's science literature review undertaken in the course of developing this ordinance, Metro has learned a great deal more about how vegetated riparian areas surrounding rivers and streams can help reduce, moderate, or reverse such water quality problems. See, e.g., Technical Report, Attachment 2, at pp. 12-14, 21-23, 40-41, 49-50, 52-55, and 71-73. Through its review, Metro learned that riparian vegetation farther from rivers and streams than the standard-sized Title 3 Water Quality Resource Area buffers is essential to maintain and improve water quality. In fact, Metro specifically identified (1) microclimate and shade (i.e., preventing poor water quality caused by elevated stream temperatures) and (2) bank stabilization and pollution control as two of the five critical ecological functional values used to identify riparian habitat. Moreover, degraded water quality and altered microclimate were two of the environmental consequences described in detail in the ESEE analysis. In addition, one of the factors on which the different program options were assessed during Phase II of the ESEE analysis was how much each option would help the region comply with the Clean Water Act. See

Metro Phase I ESEE Report, Attachment 3, at pp. 127-29, 133-34, and 139-140; Metro Phase II ESEE Report, Attachment 4, at pp. 132-36.

For these reasons, the Council finds that the protection of riparian habitat areas provided in this ordinance will play a critically important role to help protect and improve the water quality of the region's rivers and streams. Metro is therefore adopting those portions of this ordinance to protect and improve water quality, pursuant to Goal 6.

Goal 6 requires that water pollutants and contaminants from future development, when combined with waste and discharges from existing development, shall not threaten to violate, or violate applicable state or federal water quality statutes, rules and standards. See OAR 660-015-000(6). The goal further provides that the discharge of such pollutants and contaminants shall not exceed the carrying capacity of water resources within watersheds, degrade such resources, or threaten their availability. One of the implementation methods and devices listed in the goal for meeting the goal's requirements is the use of land use controls and ordinances. The Council finds that this ordinance is necessary in order to comply with Goal 6 and that it complies with Goal 6.

Goal 1. Citizen Involvement

Goal 1 requires development of a citizen involvement program that insures the opportunity for all citizens to be involved in all phases of the land use planning process. For the reasons described above regarding Metro's compliance with the citizen involvement requirements of the Goal 5 Rule, the Council finds that Metro has complied with Goal 1.

Goal 2. Land Use Planning

A. Consistency With The Regional Framework Plan

The Regional Framework Plan[1] establishes eight fundamental value statements to synthesize the 2040 Growth Concept and regional policies. Fundamental 3 is to "[p]rotect and restore the natural environment including fish and wildlife habitat, streams and wetlands, surface and ground water quality and quantity, and air quality." In addition, the RFP directly calls for the development of regulations to protect critical fish and wildlife habitat areas. See, e.g., RFP, "Summary of 2040 Growth Concept," at page 5. More specifically, RFP Policy 4.6, entitled, "Fish and Wildlife Habitat Conservation," provides that "It is the policy of the Metro Council to [e]stablish standards to conserve, protect, and enhance fish and wildlife habitat by . . . identifying regionally significant fish and wildlife habitat[,] . . . determining performance standards for habitat protection[, and] . . . promoting coordination of regional watershed planning." This ordinance represents the culmination of Metro's implementation of Policy 4.6, and the Council finds that it complies with that policy.

In addition to Policy 4.6, Chapter 4 of the RFP also establishes policies related to watershed management and water quality. For example, Policy 4.2, "Overall Watershed Management,"

[1] The Metro Council adopted Ordinance No. 05-1086 on August 18, 2005, to make technical amendments to the RFP. That ordinance did not change any RFP policies, but did delete extensive prefatory discussions and reorganized the RFP to make it more easily readable, accessible, and usable for the public, local governments, Metro, and the State. Those RFP technical amendments are not effective until November 16, 2005. The Council finds that there is no substantive difference between the current RFP and the revised RFP that will become effective on November 16, 2005. For that reason, these Findings refer to the text and policy numbers in the revised RFP that will become effective on November 16, 2005.

states that it is the Metro Council's policy to "manag[e] watersheds to protect, restore and ensure to the maximum extent practicable the integrity of streams, wetlands and floodplains, and their multiple biological, physical and social values," and Policy 4.3, "Water Quality," states that it is the Metro Council's policy to both establish and maintain vegetative corridors and buffers along streams. The Council finds that this ordinance complies with, and will further, both of those policies.

Chapter 3 of the RFP, entitled "Parks, Natural Areas, Open Spaces, Trails and Recreational Facilities," also includes several policies that relate to this ordinance. For example, this ordinance supports and complies with Policies 3.1 and 3.2, calling, respectively, for inventories and the protection of parks, natural areas, open spaces, and greenways. The Council finds that this ordinance complies with Chapter 3 of the RFP.

In addition, the RFP also is replete with references to the importance of open space and access to nature in the orderly development of the region, goals that this ordinance will directly support. For example:

- Policy 1.1, "Urban Form," establishes a policy to balance growth by maintaining "a compact urban form, with easy access to nature,"

- Policy 1.10, "Urban Design," establishes a policy to "[s]upport the identity and functioning of communities in the region through . . . recognizing and protecting critical open space features in the region," and

- In the Transportation Chapter, Policies 2.8, "The Natural Environment," and 2.9, "Water Quality," establish policies, respectively, to protect the region's natural environment and water quality.

As required by the Goal 5 Rule, the development of this ordinance has involved the consideration and balancing of several competing objectives and interests—classified for purposes of analysis into economic, social, environmental, and energy-related categories. The nature of this decision as one of balance is also reflected in the consideration of the policies in the RFP. For example, as noted above, Policy 1.1 calls for "a compact urban form." As described in section E(2) of the Goal 5 compliance discussion, above, it is possible that the provisions of this ordinance could reduce the housing or employment capacity of some lands within the UGB, which could result in a future decision to expand the UGB. Although we do not believe this ordinance will have such an impact, the Council has considered that possibility and, balancing the competing objective of having a compact urban form with the objective of protecting healthy, functioning fish and wildlife habitat and keeping nature in neighborhoods, we have determined that the provisions of this ordinance represent the best approach for the region.

For these reasons, and as supported by the record in this matter, the Council finds that this ordinance complies with the RFP.

In addition, however, the Council has identified the need for certain amendments to the RFP, as provided in Exhibit B to the ordinance. Many of those amendments simply reflect that, through adoption of this ordinance, the Council has now developed functional plan provisions to protect and enhance fish and wildlife habitat. Additionally, some of the amendments reorganize the RFP to include the principles and policies reflected in this ordinance in more logical and appropriate parts of the RFP. For example, Chapter 3 is renamed, "Nature in Neighborhoods," and the

protection of fish and wildlife habitat is incorporated into its provisions. Three of the amendments to the RFP add new policies.

First, Amendment 3 of Exhibit B adds new RFP Policy 1.9.12, as part of the RFP's "Urban Growth Boundary" policies, establishing it to be the Council's policy to "[c]onduct an inventory of regionally significant fish and wildlife habitat for all lands being considered for inclusion in the UGB." The policy provides that this inventory will be used in two ways. The first is for the Council to "[c]onsider whether urbanization [of an area] can occur consistent with policies that call for protection of regionally significant fish and wildlife habitat." The second is so that, when the Council is making UGB expansion decisions, it can, to the extent possible, "[l]imit future conflicts between urbanization and the protection of regionally significant fish and wildlife habitat by examining the impacts upon the ecological quality and integrity of such habitat whenever the Council has discretion to choose between potential lands to be added to the UGB." The Council finds that this new policy will allow it to make more informed, better decisions about future UGB expansions, consistent with the Statewide Planning Goals and with the other policies of the RFP.

Second, Amendment 4 of Exhibit B adds new RFP Policy 1.10.1(c)(viii), as part of the RFP's "Urban Design" policies, adding that the RFP is intended to promote a settlement pattern that, in addition to the existing seven objectives, also "[a]voids and minimizes conflicts between urbanization and the protection of regionally significant fish and wildlife habitat." The addition of this item as another of the objectives of urban design in the region simply raises this objective to the level of several other similar objectives, such as encouraging pedestrian-friendly development (Policy 1.10.1(c)(ii)) or mixed use, neighborhood-oriented design (Policy 1.10.1(c)(iv). The Council finds that this is an appropriate objective for urban design in the region and is consistent with the Statewide Planning Goals and with the other policies in the RFP.

Third, Amendment 5 of Exhibit B includes the addition of new RFP Policy 3.2.8, as part of the RFP section that will now be entitled, "Protection of Regionally Significant Parks, Natural Areas, Open Spaces, Fish and Wildlife Habitat, Trails and Greenways." The new policy establishes the performance and implementation objectives of the fish and wildlife protection program. In addition, the reference to the development of fish and wildlife habitat protection standards that was formerly in RFP Policy 4.6 has been incorporated into Policies 3.1 (regarding inventorying parks, open spaces and habitat), 3.2 (protecting the same), and 4.3 ("Water Quality"), and Policy 4.6 has been deleted. The Council finds that it is appropriate to incorporate these provisions into the new "Nature in Neighborhoods" chapter of the RFP and that they are consistent with the Statewide Planning Goals and with the other policies in the RFP.

For the reasons described in the these Findings for why all of the elements of this ordinance are consistent with the Statewide Planning Goals, the Council finds that the RFP amendments in Exhibit B, all of which are made as a result of developing this ordinance pursuant to Goal 5 and the Goal 5 Rule, are consistent with the Statewide Planning Goals and with the other policies in the RFP.

B. Coordination With Local Governments

Metro has engaged in extensive outreach and coordination with local governments in the development of this ordinance. At each step of the Goal 5 Rule process, Metro has consulted with the Metropolitan Policy Advisory Committee, which includes elected officials representing local governments across the region, and with the Metropolitan Technical Advisory Committee, which includes planning staff and other technical representatives from local governments across

the region. In addition, as reflected in the record, Metro has received, considered, responded to, and, in many instances, amended the program and this ordinance in response to, comments and suggestions directly submitted by local governments. As the record reflects, this effort has included considerable coordination with several special districts, in addition to cities and counties, including extensive coordination with the Port of Portland, the Multnomah County Drainage District and other drainage districts, Clean Water Services in Washington County, and Water Environment Services in Clackamas County. A significant result of that coordination is reflected in several specific provisions of this ordinance that directly address how this ordinance will apply to such entities.

Of particular note, in terms of Metro's coordination with local governments, was the intergovernmental agreement entered into between Metro and the Tualatin Basin Natural Resources Coordinating Committee. As described in section D of the Goal 5 compliance discussion, above, Metro entered into this IGA in order to allow the TBNRCC to use Metro's inventory of regionally significant fish and wildlife habitat but to conduct its own ESEE analysis, make its own allow-limit-prohibit decision, and develop its own Goal 5 program. Two Metro Councilors served as ex-officio members of the TBNRCC, and Metro staff attended nearly all of the meetings of the TBNRCC's steering committee, which was made up of staff representing all of the TBNRCC members. As a result of this partnership, the Tualatin Basin was able to develop a comprehensive, watershed-based program that is likely to achieve results comparable to those expected throughout the rest of the region. The Council finds that this partnership worked exceptionally well.

Furthermore, in the last three months, Metro staff, some Metro Councilors, and the chair of MPAC (Lake Oswego City Councilor Jack Hoffman) have appeared before the Clackamas County Council and at city council meetings in nearly all of the cities in the region that are not part of the TBNRCC (including Damascus, Fairview, Gladstone, Happy Valley, Lake Oswego, Milwaukie, Portland, Troutdale, West Linn, Wilsonville, and Wood Village), in order to explain the ordinance directly to them and solicit their comments and suggestions. In fact, Chair Hoffman and Metro staff have appeared before many of those bodies twice in the last three months, once prior to the Council's approval of the initial amendments to this ordinance in May 2005, and again after the Council's May amendments, in June and July 2005. The Council's process in adopting those amendments to Exhibit E itself provides an excellent example of how Metro has coordinated with local governments. When the Council approved initial amendments to the ordinance in May 2005, representatives of several jurisdictions raised reservations about whether Exhibit E was as clear as it needed to be and whether it would be easy to implement. Those representatives indicated that they needed more time to fully consider its implications. Therefore, at the request of MTAC and MPAC, the Council appointed a special Model Ordinance work group that included many of the local government representatives that had expressed concerns, and the Council directed the work group to recommend any changes the work group thought were necessary to improve the Model Ordinance. The work group met weekly from late May until early July and recommended a complete overhaul of the Model Ordinance, and the Council adopted the work group's recommendations in July 2005.

For the reasons described above, the Council finds that Metro has complied with the Goal 2 requirement that it coordinate with local governments in the development of this ordinance.

Goals 3 and 4. Agricultural Lands and Forest Lands

This program applies to identified fish and wildlife habitat areas both inside the Metro UGB and outside the Metro UGB but inside Metro's jurisdictional boundary. Goals 3 and 4 do not apply to

lands inside the UGB. In addition, the new functional plan performance standards adopted in this ordinance are not applicable, either inside or outside the UGB, when their application would restrict or regulate farm structures or farming practices in violation of ORS 215.253 or ORS 561.191. With respect to forest practices in areas outside the UGB, the new functional plan performance standards adopted in this ordinance are not applicable when such standards and practices would violate ORS 527.722 by prohibiting, limiting, regulating, subjecting to approval, or in any other way affecting forest practices on forestlands located outside of the UGB. The Council finds that this ordinance complies with Goals 3 and 4.

Goal 7. Areas Subject to Natural Disasters and Hazards

This ordinance is not being adopted to implement Goal 7 although its adoption could help to mitigate the possibility of, or effects of, floods or landslides in the region. Although Goal 7 is arguably not applicable to this ordinance, to the extent it is applicable the Council finds that this ordinance complies with Goal 7.

Goal 8. Recreation Needs

This ordinance is not being adopted to implement Goal 8 although its adoption could help to protect certain areas that could, in the future, satisfy recreational needs of the citizens of the region. Although Goal 8 is arguably not applicable to this ordinance, to the extent it is applicable the Council finds that this ordinance complies with Goal 8.

Goal 9. Economic Development

This goal is not applicable to Metro's decision in this matter. Nevertheless, the economic impact of Metro's decision was thoroughly analyzed as part of Metro's ESEE Analysis, and was considered by the Council when it weighed and balanced the ESEE factors, made its ALP Decision, and developed its program. Moreover, as the record shows, Metro undertook extensive outreach to organizations committed to economic development in the region such as the Portland Business Alliance, the Westside Economic Alliance, and the Columbia Corridor Association, and the final program approved by the Council reflects the input that Metro received from those organizations.

Goals 10 and 14. Housing and Urbanization

As described above in subsection E(2) of the discussion of compliance with Goal 5, the Council acknowledges that this ordinance could have an effect on the region's inventory of buildable lands. The Council does not believe that its affect will be significant, however, because the provisions of this ordinance do not prohibit development on any property and provide a mechanism to allow development that would otherwise be limited if it can be shown that the program's standard limits were not "available and capable of being done after taking into consideration the cost, existing technology, and logistics in light of overall project purpose and probable impact on ecological functions." See Exhibit C, Section 4(B)(2) and Exhibit D, Amendment 9, definition of "practicable" on page 13. Of course, Metro will closely monitor the impact of this ordinance on the buildable lands supply, and will accurately account for its impact in Metro's buildable lands inventory reports. As required by Oregon law, to the extent that this ordinance results in a reduction in buildable lands, Metro will address that reduction, and the need to provide additional buildable lands, at its next periodic review of the Metro UGB.

The Council also recognizes that some of the policies it is adopting as part of this ordinance could result in the need for a larger UGB expansion in the future in order to provide the necessary and required supply of buildable lands. Such could be the result, for example, of the provisions of Exhibit C of this ordinance that require the designation of upland wildlife habitat in future UGB expansion areas as Habitat Conservation Areas, and of this ordinance's amendments to Chapter 1 of the RFP and to Title 11 of the functional plan, which establish policies that seek to avoid the creation of conflicts between HCAs and urbanization. The Council finds that these provisions are necessary and appropriate in order to ensure that the region continues to provide its residents with the high quality of life, including access to nature, open spaces, and high water quality, that they currently enjoy, and to ensure that future generations may also enjoy it. For these reasons, and as supported by the record in this matter, the Council finds that this ordinance complies with Goals 10 and 14.

Goal 11. Public Facilities and Services

This ordinance is not being adopted to implement Goal 11 although its adoption could help to protect certain areas that could, in the future, satisfy recreational needs of the citizens of the region. In addition, this ordinance includes several provisions intended to accommodate the special needs associated with the provision of utility services and of utility service providers. Thus, to the extent Goal 11 is applicable, the Council finds that this ordinance complies with Goal 11.

Goal 12. Transportation

This ordinance is not being adopted to implement Goal 12. As noted above, the Transportation chapter of the RFP makes it Metro's policy for transportation services to be provided in a manner that will protect the region's natural environment and water quality. Thus, to the extent Goal 12 is applicable, the Council finds that this ordinance complies with Goal 12.

Goal 13. Energy

Metro examined in detail the energy consequences of a decision to limit conflicting uses on significant fish and wildlife habitat resources in the ESEE analysis, and weighed and balanced those consequences when it made its ALP decision and developed this ordinance. (See, e.g., Chapter 7, pages 144-158, of the Phase I ESEE Analysis and pages 122-126 of the Phase II ESEE Analysis.) Based on that examination and on the record in this matter, the Council finds that this ordinance complies with Goal 13.

Goal 15. Willamette Greenway

Goal 15 is intended to protect, conserve, enhance, and maintain the many different, and sometimes competing, qualities and values provided by the Willamette River Greenway. Those qualities include natural, scenic, historical, agricultural, economic, and recreational qualities of lands along the river. Goal 15 specifically provides that Greenway plans adopted pursuant to the Goal shall protect significant fish and wildlife habitat. Thus, in many respects, the objectives of Goal 15 are the same as the objectives of Goal 5—to protect significant fish and wildlife habitat, but to make protection and program decisions in the context of weighing and balancing competing interests and values, including economic, social, energy, and environmental impacts of those decisions. In addition, to the extent that there is any inconsistency between the Goals, the Goal 5 Rule explicitly provides that the requirements of Goal 15 shall supersede the requirements of Goal 5. For these reasons, the Council finds that this ordinance complies with Goal 15.

Goals 16, 17, 18 and 19. Estuarine Resources, Coastal Shorelands, Beaches and Dunes, and Ocean Resources

These goals are not applicable to Metro's decision in this matter.

CONCLUSION

For the reasons described in these Findings, and as supported by the record in this matter, the Council finds that this ordinance complies with Oregon land use planning statutes, statewide land use planning goals, administrative rules adopted by the Land Conservation and Development Commission to implement the statewide land use planning goals, and the Regional Framework Plan.

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EXHIBIT F—ORDINANCE NO. 05-1077C

ATTACHMENT 1.

Part 1:
ADDENDUM AND UPDATE TO
METRO'S RIPARIAN CORRIDOR AND WILDLIFE HABITAT INVENTORIES REPORT, AUGUST 2005

Part 2:
METRO'S RIPARIAN CORRIDOR AND WILDLIFE HABITAT INVENTORIES REPORT, AUGUST 2005

These reports are available for review in the Metro Council's files (see copies referenced in Technical Amendment No. 17, approved by the Council on September 22, 2005) or on Metro's website: **http://www.metro-region.org/nature**. In addition, copies may be requested from the Metro Planning Department, 600 N.E. Grand Ave., Portland, OR 97232, or by calling 503-797-1555.

EXHIBIT F—ORDINANCE NO. 05-1077C

ATTACHMENT 2.

METRO'S TECHNICAL REPORT FOR FISH AND WILDLIFE HABITAT

This report is available for review in the Metro Council's files or on Metro's website: **http://www.metro-region.org/nature**. In addition, copies may be requested from the Metro Planning Department, 600 N.E. Grand Ave., Portland, OR 97232, or by calling 503-797-1555.

EXHIBIT F—ORDINANCE NO. 05-1077C

ATTACHMENT 3.

METRO'S PHASE I ECONOMIC, SOCIAL, ENVIRONMENTAL, AND ENERGY (ESEE) ANALYSIS

This report is available for review in the Metro Council's files or on Metro's website: **http://www.metro-region.org/nature**. In addition, copies may be requested from the Metro Planning Department, 600 N.E. Grand Ave., Portland, OR 97232, or by calling 503-797-1555.

EXHIBIT F—ORDINANCE NO. 05-1077C

ATTACHMENT 4.

METRO'S PHASE II ECONOMIC, SOCIAL, ENVIRONMENTAL, AND ENERGY (ESEE) ANALYSIS

This report is available for review in the Metro Council's files or on Metro's website: **http://www.metro-region.org/nature**. In addition, copies may be requested from the Metro Planning Department, 600 N.E. Grand Ave., Portland, OR 97232, or by calling 503-797-1555.

EXHIBIT F—ORDINANCE NO. 05-1077C

ATTACHMENT 6.

TUALATIN BASIN ESEE REPORT

This report is available for review in the Metro Council's files (see copy referenced in Technical Amendment No. 19, approved by the Council on September 22, 2005). In addition, copies may be requested from the Metro Planning Department, 600 N.E. Grand Ave., Portland, OR 97232, or by calling 503-797-1555. It is also available on the Washington County website: **http://www.co.washington.or.us/deptmts/lut/planning/tb_esee.htm** .

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Addendum and update to

Metro's Riparian Corridor and Wildlife Habitat Inventories

AUGUST 2005

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1. Why the update is needed

This document is an addendum to update Metro's riparian corridor and wildlife habitat inventories. In 2002, Metro Council adopted draft maps of regionally significant fish and wildlife habitat via Resolution #02-3176 and 02-3177A, with the intention of updating the inventories as needed prior to adopting a final Goal 5 ("Nature in Neighborhoods") ordinance. The inventories have now been updated, as outlined below.

The Goal 5 rule states that an inventory must contain information on location, quantity, and quality of fish and wildlife habitat. Metro's intention is to provide the region with the best inventory information possible, while recognizing that the inventory is fluid and will never be perfect. The information contained herein improves the inventories' information regarding quality, quantity, and location of regionally significant fish and wildlife habitat.

The underlying criteria for the fish and wildlife habitat model have not changed (presented in the primary inventory document, updated August 2005). Changes to Metro's 2001 fish and wildlife habitat inventory are categorized in three ways: updates with new information; corrections involving either initial mapping errors or changes that have occurred since the inventory was last conducted; and combining the fish and wildlife habitat inventories to produce a single program for each resource area. The following section describes these changes.

2. New or improved information incorporated into the inventories

The following new or improved information has been incorporated into Metro's fish and wildlife habitat inventories.

New watersheds (Hydrologic Unit Codes, or HUCs) developed by USGS now re-delineate each watershed boundary (Figure 1). Statistics reported here use the new HUC delineations. At the time that Metro Council passed the resolutions determining regionally significant fish and wildlife habitat, the formal Natural Resource Conservation Service's watershed delineations through the Hydrologic Unit Code (HUC) system were not yet complete for this region. The formal HUCs are now complete, and for the purpose of data consistency, Metro will use the new HUCs beginning with this inventory iteration.

Metro conducted global GIS and data updates such as re-digitized forest canopy, new aerial photographs, streamline corrections, etc. These help Metro provide the best available information on quality, quantity and location of fish and wildlife habitat. New floodplain data was incorporated from several jurisdictions (e.g., Tualatin Basin; Portland). In addition, new stream and wetland layers from several jurisdictions were incorporated (e.g., City of Portland, Clean Water Services, City of Gresham).

3. Map corrections

Metro has solicited and processed hundreds of map verifications and corrections based on specific information from landowners, agencies, and local jurisdictions. Most jurisdictions in the Tualatin Basin carefully reviewed the maps and provided corrections in 2003-2004, to facilitate the coordinated

Tualatin Basin fish and wildlife habitat work, which is on a faster time-track than Metro's current Nature in the Neighborhoods process. Non-private party entities that submitted substantial map corrections include:

- Beaverton
- Columbia Corridor
- Cornelius
- Fairview
- Forest Grove
- Gresham
- Hillsboro
- Lake Oswego
- Port of Portland
- Tigard
- Troutdale
- Tualatin
- Wilsonville
- Wood Village

Metro also processed a large number of map corrections submitted by private parties or their representatives. Corrections often included items such as vegetation that has recently been removed, new development, stream realignments, forest canopy corrections, and similar issues. Each map correction is assigned a case number and entered into a master database. An ongoing map corrections process will be an important part of Metro's inventory maintenance and staff will continue to maintain the map with the most current information possible, keeping careful records on what corrections were made, why, and on behalf of whom.

4. Combining the riparian corridors and wildlife habitat inventories

As part of Metro's Environmental, Social, Economic and Energy (ESEE) process and to avoid developing two different program approaches for the same spot on the map, Metro re-ran the inventories in September 2004 (with map corrections) and then combined the riparian corridors and wildlife habitat inventories as described in the Phase I ESEE analysis (Resolution #03-3376B, Phase I ESEE). The "first cut" was high-value riparian habitat. The qualitative and quantitative descriptions in the main Inventory document are still quite useful for characterizing fish and wildlife habitat conditions by watershed. This addendum is simply an update on the inventory so that the process can be completed. The underlying data for the two separate inventories is still retained for future assessment.

5. Update on public participation process

A great deal of public participation and consultation has occurred since the 2001 inventory report was completed, summarized in the following public information documents available online through Metro's website or though Metro's Goal 5 public affairs records documents:

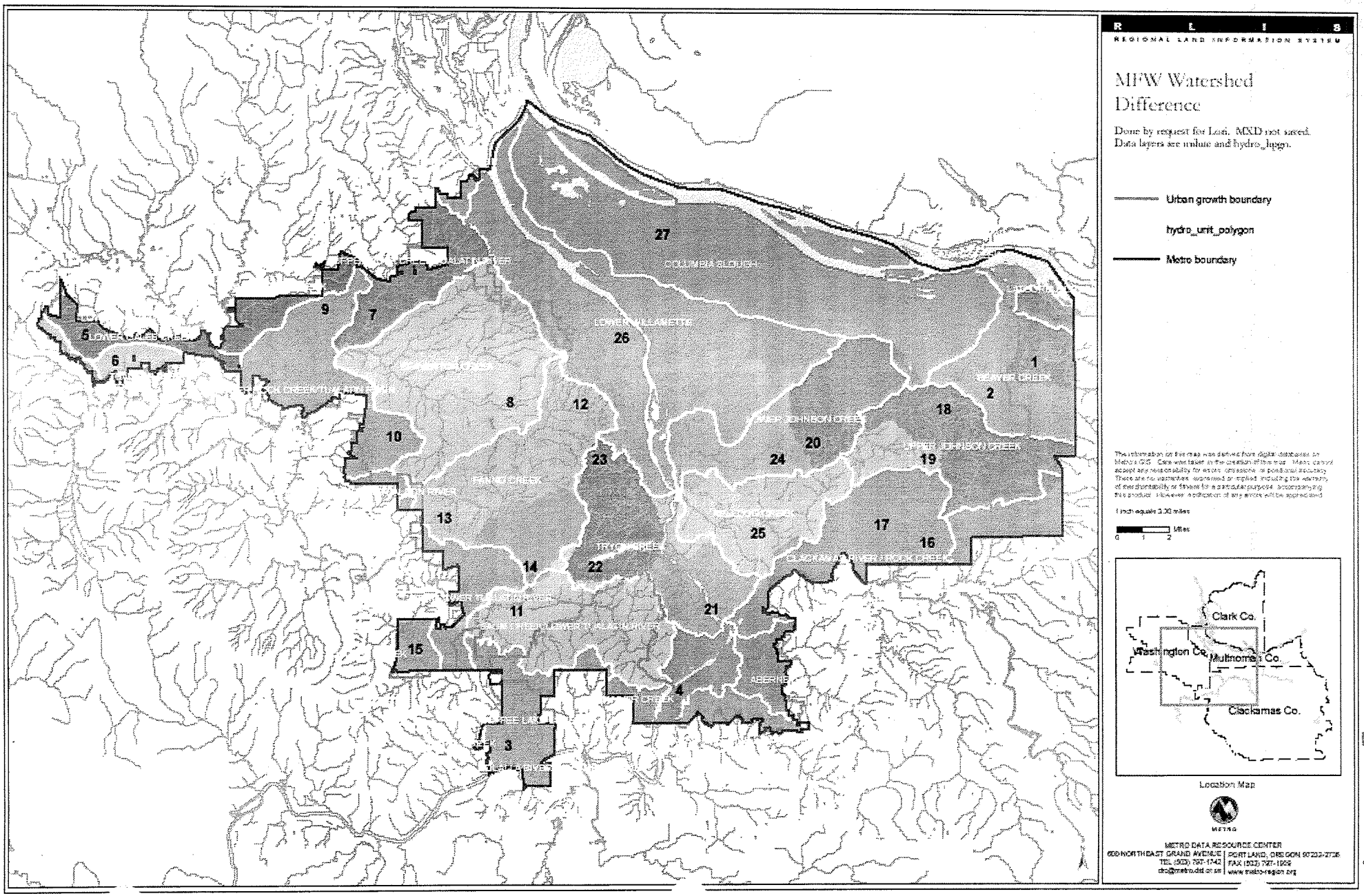
- **Public comment report, May 2004 (addendum)** – an introduction and comment summary table to describe the public comments received by Metro after the interim May 2004 comment report, from May 13 to May 20. This includes testimony received at the May 20 Metro Council hearing. The report contains copies of individual comments.
- **Public comment executive summary, May 2004** – an executive summary and comment summary table to describe the public comments received by Metro through May 2004.
- **Public comment report, May 2004** – a compilation of all public comments received by Metro through May 2004. In addition to the items in the executive summary, the report contains copies of individual comments.
- **Public comment executive summary, March 2004** – an executive summary and comment summary table to describe the public comments received by Metro through March 2004.
- **Public comment report, March 2004** – a compilation of all public comments received by Metro through March 2004. In addition to the items in the executive summary, the report contains copies of individual comments.
- **Public notice for metro area** – the version of the public notice mailed in February 2004 that shows Metro's regional fish and wildlife habitat inventory and talks about protection options for the region as a whole.
- **Public notice for Tualatin Basin** – the version of the public notice mailed in February 2004 that talks specifically about the Tualatin Basin proposal for protecting habitat.
- **Protecting the nature of the region** – an overview of Metro's fish and wildlife habitat protection efforts, including a description of the three-step planning process currently in progress. Step 1 involved an inventory of regionally significant habitat that was approved by the Metro Council in 2002. Step 2, an analysis of the economic, social, environmental and energy (ESEE) consequences of protecting - or not protecting - regionally significant fish and wildlife habitat, was completed in May 2004. Step 3 is beginning now and will result in adoption of a regional fish and wildlife habitat protection program.
- **Glossary** – terms used in describing Metro's habitat protection program.

In addition, Metro's website includes a new interactive mapping tool. The tool includes the data Metro used to develop the habitat inventory. For more information, call Natural Resources Planning at (503) 797-1839, fax (503) 797-1911 or send e-mail to habitat@metro-region.org. The hearing impaired can call TDD (503) 797-1804.

6. New watershed data

Tables 1 and 2 present the revised information on quality, quantity, and location of regionally significant fish and wildlife habitat. The total numbers are slightly different due to the complexities of GIS operations involved, which can create small variations.

Figure 1. Comparison of Metro's 2002 (black numbers) and 2005 (light-colored lines) HUC watershed units. At the time of the 2002 inventory version, NRCS hydrologic unit codes (HUCs) were unavailable, but were subsequently available for the 2005 inventory.



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*7. **Summary***

Metro has re-visited the fish and wildlife habitat inventories with improved information on quality, quantity and location of regionally significant fish and wildlife habitat, as presented in Figure 1 and Tables 1 and 2 here. The maps associated with the inventory are part of the "Nature in Neighborhoods" ordinance the Metro Council will consider for adoption in Fall 2005. This update will supplement both the primary inventory document as well as the maps depicting regionally significant habitat.

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Table 1. Quantity of fish and wildlife habitat in Metro region by watershed (includes open water).

Sub-watershed name	Acres in watershed and Metro jurisdiction	Habitat acres in watershed	Resource as % sub-watershed area	Resource as % total resource area
ABERNETHY CREEK	3,552	1,458	41%	1.5%
BEAVER CREEK	13,997	5,589	40%	5.9%
BEAVER CREEK/WILLAMETTE RIVER	2,777	535	19%	0.6%
BEAVERTON CREEK	24,212	5,762	24%	6.1%
CHICKEN CREEK	2,144	540	25%	0.6%
CHRISTENSEN CREEK/TUALATIN RIVER	735	279	38%	0.3%
CLACKAMAS RIVER / ROCK CREEK	13,710	5,334	39%	5.7%
COFFEE LAKE CREEK	7,678	2,170	28%	2.3%
COLUMBIA SLOUGH	37,060	7,898	21%	8.4%
CORRAL CREEK	130	41	32%	0.0%
DEEP CREEK / NORTH FORK OF DEEP CREEK	4,485	1,568	35%	1.7%
FANNO CREEK	20,184	4,612	23%	4.9%
GILBERT RIVER	742	677	91%	0.7%
KELLOGG CREEK	11,067	2,137	19%	2.3%
LACAMAS CREEK	43	43	100%	0.0%
LATOURELL CREEK	2,069	1,747	4%	1.9%
LOWER DAIRY CREEK	3,611	832	23%	0.9%
LOWER GALES CREEK	747	274	37%	0.3%
LOWER JOHNSON CREEK	15,859	2,967	19%	3.2%
LOWER MCKAY CREEK	3,822	629	16%	0.7%
LOWER ROCK CREEK/TUALATIN RIVER	12,744	2,362	19%	2.[illegible]
LOWER WEST FORK OF DAIRY CREEK	64	21	33%	0.0%
LOWER WILLAMMETTE	40,182	12,151	30%	12.9%
MOLALLA RIVER/WILLAMETTE RIVER	40	7	18%	0.0%
ROCK CREEK/LOWER TUALATIN RIVER	5,931	1,716	29%	1.8%
SAUM CREEK/LOWER TUALATIN RIVER	14,696	5,603	38%	6.0%
TANNER CREEK	5,839	2,281	39%	2.4%
TRYON CREEK/WILLAMETTE RIVER	16,389	5,851	36%	6.2%
TUALATIN RIVER	2,073	228	11%	0.2%
UPPER JOHNSON CREEK	15,116	6,409	42%	6.8%
UPPER ROCK CREEK/TUALATIN RIVER	8,040	2,695	34%	2.9%
COLUMBIA RIVER ISLANDS	10,095	9,732	96%	10.3%
Grand Total	**299,830**	**94,148**	**31%**	**100.0%**

Table 2. Quality of fish and wildlife habitat in Metro region by watershed (includes open water).

Sub-watershed	Riparian I	Riparian II	Riparian III	Wildlife A	Wildlife B	Wildlife C	Total
ABERNETHY CREEK	377	179	62	203	500	136	1,458
BEAVER CREEK	3,297	375	79	976	369	493	5,589
BEAVER CREEK/WILLAMETTE RIVER	82	115	19	15	178	127	535
BEAVERTON CREEK	2,168	741	450	1,146	802	455	5,762
CHICKEN CREEK	294	76	22	69	34	44	540
CHRISTENSEN CREEK/TUALATIN RIVER	42	10	5	171	0	52	279
CLACKAMAS RIVER / ROCK CREEK	1,361	810	188	1,207	1,026	741	5,334
COFFEE LAKE CREEK	837	305	53	172	460	343	2,170
COLUMBIA SLOUGH	4,477	1,313	624	291	427	765	7,898
CORRAL CREEK	11	0	0	25		5	41
DEEP CREEK / NORTH FORK OF DEEP CREEK	281	340	19	93	563	271	1,568
FANNO CREEK	1,712	634	334	357	1,152	424	4,612
GILBERT RIVER	232	5	1	438	0	1	677
KELLOGG CREEK	585	268	127	386	518	253	2,137
LACAMAS CREEK	43						43
LATOURELL CREEK	1,307	8	0	293	109	31	1,747
LOWER DAIRY CREEK	312	258	33	16	75	138	832
LOWER GALES CREEK	156	79	10	1	17	12	274
LOWER JOHNSON CREEK	919	283	492	908	284	81	2,967
LOWER MCKAY CREEK	342	99	50	5	39	93	629
LOWER ROCK CREEK/TUALATIN RIVER	1,308	426	94	69	243	221	2,362
LOWER WEST FORK OF DAIRY CREEK	1	5			1	14	21
LOWER WILLAMETTE	5,362	435	523	5,436	190	204	12,151
MOLALLA RIVER/WILLAMETTE RIVER		1				6	7
ROCK CREEK/LOWER TUALATIN RIVER	677	255	65	327	258	134	1,716
SAUM CREEK/LOWER TUALATIN RIVER	1,674	678	278	788	1,690	496	5,603
TANNER CREEK	726	250	156	567	388	193	2,281
TRYON CREEK	1,748	1,062	331	1,039	1,170	501	5,851
TUALATIN RIVER	163	34	13	2	0	16	228
UPPER JOHNSON CREEK	1,641	677	76	1,414	1,958	643	6,409
UPPER ROCK CREEK/TUALATIN RIVER	1,020	325	46	618	428	257	2,695
VANCOUVER	125	0					125
COLUMBIA RIVER ISLANDS	9,550	91	67	20		4	9,732
Grand Total	**42,832**	**10,139**	**4,218**	**17,051**	**12,878**	**7,155**	**94,273**

Metro's Riparian Corridor and Wildlife Habitat Inventories

August 2005

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Introduction

Metro has completed its Goal 5 inventory, following the Goal 5 rule, for riparian corridors and wildlife habitat within its jurisdiction. The Goal 5 rule defines an ***inventory*** as "a survey, map, or description of one or more resource sites...that includes information about the resource values and features associated with such sites." The Goal 5 rule provides specific guidance on the inventory process for local governments to follow. The rule describes a standard inventory process, which involves four steps, and specific rules for each of the fifteen Goal 5 resource categories addressed in the rule. An optional inventory approach, known as a "safe harbor," satisfies certain requirements under the standard process (OAR 660-23-020 (1)). The Goal 5 rule allows for the inventory process to be conducted for a "single site, for sites in a particular geographical area, or for the entire jurisdiction or urban growth boundary (UGB), and a single inventory process may be followed for multiple resource categories that are being considered simultaneously" (OAR 660-23-030 (1)).

The Goal 5 rule includes guidance for Metro in addressing the Goal 5 rule on a regional basis. The rule allows Metro to identify regional resources, defined as "...a site containing a significant Goal 5 resource, including but not limited to a riparian corridor, wetland, or open space area, which is identified as a regional resource on a map identified by Metro ordinance" (OAR 660-23-080 (1)(b)). Goal 5 identifies "riparian corridors" and "wildlife habitat" as two resources among many. Local governments are required to address all Goal 5 resources, but Metro may address those that the Metro Council determines to be regionally significant. The Metro Council concluded that riparian corridors and wildlife habitat are the corresponding resources that constitute regional fish and wildlife habitat consistent with Title 3. Metro has pursued identification of both riparian corridors and wildlife habitat – but separately – in order to ensure that there is independent verification of each resource type.

A regional approach to inventorying natural resources requires a consistent level of data and analysis across the entire Metro region. Metro's Goal 5 inventory is based on the best available information that can be applied consistently at a regional scale. In this document we include: a discussion of Metro's inventory methodology and how it complies with the Goal 5 rule; an analysis of existing riparian corridors and wildlife habitats by resource site; a description of the adequacy of Metro's inventories in terms of location, quantity and quality; and a discussion of Metro's significance and regional resource recommendations.

Goal 5 inventory process

Metro used the standard Goal 5 process, modified by specific requirements in the rule, to inventory riparian corridors (see *Definition of Riparian Corridor* section) and wildlife habitat (see *Definition of Wildlife Habitat* section) within its jurisdiction. The standard inventory process involves four steps:

1. *Collect information about Goal 5 resource sites.* The rule specifically notes that "existing and available information" is what drives the inventory process (OAR 660-023-030(2)). Therefore, information that could be obtainable through expensive field studies is not required (OAR 660-23-090 (4).

2. *Determine the adequacy of the information.* The inventory is deemed adequate if it provides location, quality, and quantity of the resource in question (OAR 660-023-030(3)). The inventory includes a map of resource areas, information about relative value of sites compared to others, and relative abundance or scarcity. A "site" is a particular area where resources are located. Local governments may divide the riparian corridor into a series of stream segments or reaches and regard these as individual sites (OAR 660-023-090(3)).

3. *Determine the significance of resource sites.* Once the adequacy of the information is determined, a significance determination must be made based on: (1) the location, quality, and quantity of the resource; (2) special significance criteria; and (3) additional criteria adopted by a local government (OAR 660-023-0030(4)(a), (b), & (c)). Scientific knowledge of the functions and values of riparian areas and upland wildlife habitat plays a critical role in determining resource significance. All sites that are deemed significant by local governments are included on a list of significant Goal 5 resources referred to as a "resource list" or "adopted inventory." All resources included in the adopted inventory are subject to the remaining steps of the process.

4. *Determine regional resources.* The Goal 5 rule gives Metro the authority to complete the Goal 5 process for "regional resources." A regional resource, as defined by the Goal 5 rule, is a "site containing a significant Goal 5 resource, including, but not limited to a riparian corridor, wetland, or open space area...." (OAR 660-023-080(1)(b)).

Riparian corridors and wildlife habitats identified as regional resources then proceed through the remaining Goal 5 process. These steps include an analysis of the economic, social, environmental, and energy (ESEE) consequences of protecting or not protecting a resource, and development of a Goal 5 protection program. Title 3, Section 5 of Metro's Urban Growth Management Functional Plan contains additional steps.

This chapter describes how Metro addressed the four steps in the Goal 5 inventory process for riparian and wildlife habitat resources.

Metro's advisory committees

Metro Advisory Committees play an ongoing and vital role in Metro's Goal 5 process. Citizens – that is, members of the public that are not representing a particular organization – are members of each committee; the number of citizens on each committee described below are indicated in brackets. Metro has more than a dozen committees that advise the Metro Council, Executive Officer, Auditor and staff on various matters of Metro's responsibility. Membership on these committees is varied, based on the purpose of each committee.

The Goal 5 Technical Advisory Committee (Goal 5 TAC) is composed of more than 20 representatives from local jurisdictions, natural resource agencies such as ODFW, USFWS DEQ and NMFS, consulting firms, and private citizens. The committee was formed at the inception of Metro's Goal 5 efforts in 1999 to provide technical support and review of the process. Many of the same members have been on the committee throughout the process, adding an invaluable level of detailed knowledge and consistency that would not otherwise be possible. This

committee has provided substantial input into Metro's Goal 5 inventory process and will continue to do so through subsequent phases of the Goal 5 process. [1 citizen member]

A new Goal 5 advisory committee was formed in spring 2002 to address the economic issues involved with weighing the consequences of development of sites within the riparian corridors and wildlife habitat inventories. This committee, called the Goal 5 ETAC (Economic Technical Advisory Committee), will work with Metro's staff and consultant to provide information and advice on the Environmental, Social, Economic and Energy (ESEE) consequences of allowing, limiting, or prohibiting development. The Goal 5 ETAC is composed of 22 members.

Other committees that provide feedback or recommendations relating to Metro's Goal 5 inventory process include:

- Metro Policy Advisory Committee (MPAC) – charter-mandated committee of local government representatives and citizens who consult on policy issues, especially those related to services provided by local governments, and advise Metro Council on the Regional Framework Plan and other Metro services. [three citizen members]
- Metro Technical Advisory Committee (MTAC) – committee of planners, citizens and business representatives that provide detailed technical support to MPAC for shaping land use policies. [three citizen members]
- Water Resources Policy Advisory Committee (WRPAC) - committee of water and sewer district representatives, environmental groups, federal and state natural resources agencies, business and residents advising the Metro Council on water resource matters. [four citizen members]
- Metro Committee for Citizen Involvement – 27-member citizen committee assisting in the development, implementation and evaluation of Metro's citizen involvement activities. Metro's home-rule charter mandates this committee. [27 citizen members]

Metro's public participation process

Public involvement has been a key element in Metro's efforts to conserve, protect and restore riparian corridors and wildlife habitat as resources of regional significance (i.e., Goal 5), described below.

Spring 1999 — Two series of workshops and a set of public open houses were conducted. The project team identified the following key stakeholder groups as critical to the process: citizens/neighborhood activists; watershed organizations; business/development representatives; local government officials; state/federal/tribal government officials; and environmental/non-profit organizations. These stakeholders were contacted and encouraged to distribute information to their mailing lists and participate in the public workshops. Media advisories and press releases were sent to local and regional print media, with articles and pre-event notices appearing in The Oregonian, The Beaverton Times, The Clackamas Review, The Daily Journal of Commerce, and smaller community newspapers. Metro's technical advisory committee members were also encouraged to promote the events. A more detailed description of this outreach process is available in Metro's Streamside CPR handbook (Metro 1999).

February 2000 144,000 inserts were mailed to the public via utility billings. Approximately 45,000 notices were mailed to landowners whose properties fell partially or wholly within the initial inventory.

February 2000 Meetings with the region's 27 local governments (councils and planning commissions) to explain the draft inventory program were held, as well as a series of open houses around the region.

Public comments from this outreach resulted in a revised Goal 5 inventory process, undertaken in early 2001, to identify existing ecological functions on a more site-specific basis rather than a generalized buffer width program, ultimately yielding the current inventory. The public outreach component of the current effort includes the following:

2001 Several opinion surveys were conducted in 2001, including a May 2001 Davis and Hibbits phone survey commissioned by Metro, an October 2001 Moore Information survey sponsored by KGW-TV and the Portland Tribune, and an informal "SurveyPoint" poll available by phone and on Metro's website. Results from all three studies demonstrated that Metro residents place great value on protecting natural resources and maintaining the region's quality of life. Results of these surveys are available from Metro by request.

Early 2001 A preliminary inventory map was reviewed by local governments and the public from February through April.

2001-2002 Metro's "Coffee Talks" were a series of 93 public outreach forums held in various locales throughout the urban region during non-business hours, to promote accessibility to the general public. Coffee Talks were held from September 2001 through January 2002 with discussions about the urban growth boundary, natural resource protection, and transportation; the public was notified through a variety of means similar to the earlier outreach efforts – approximately 1,000 brochures were mailed to businesses and business leaders, neighborhood associations, citizen participatory organizations, civic and community groups, chambers of commerce, local jurisdictions, and advocacy groups. In addition, approximately 90,000 citizens received an October 2001 "Let's Talk" about fish and wildlife newsletter, including some 45,000 property owners with identified Riparian areas. The Coffee Talks were also advertised via local radio, television, and newspapers. An important component of these talks involved whether the public thought it was important to protect fish and wildlife habitat in the urban region and if so, how this should be accomplished. This public feedback was distributed to Metro staff and Councilors for consideration in the planning process. The executive summary from these talks is available from Metro. One important outcome of this process was indication of strong public support for Metro's efforts to maintain and enhance natural habitat areas.

March 2002 Metro held a regional conference and series of localized workshops to garner public opinion and participation entitled "Let's Talk." The conference was held on March 14 with community workshops over the following weekend. Metro undertook a major notification process to encourage attendance to these activities, including the fall 2001 Natural Resource Protection mailing of nearly 90,000 to property owners and interested parties; press releases to major and local newspapers; partnership with KGW, a major local television station; and follow-up calls to neighborhood associations, business interests and many other parties to encourage participation (also part of the Coffee Talk outreach, above). Scholarships were offered to parties that could not afford conference registration fees, which covered part of Metro's cost for the conference. About 2,400 people attended the conference and workshops. Partial results were tabulated and immediately distributed to Metro staff and Council so that public opinion could help guide the current process. The final conference report has just been completed; once again, the results confirmed the importance of natural resource protection to the area's citizens, and interest in several strategies for natural resource protection emerged – perhaps most notably, financial incentives for protection as well as disincentives for failing to protect these resources.

June-Aug. 2002 Nearly 20,000 notices were mailed to property owners whose land fell partially or wholly within the current riparian corridor or wildlife habitat, who had not previously been notified because of the revised mapping or new wildlife habitat inventory information. The letter invited interested citizens and property owners to speak with Metro staff and make comments at several upcoming meetings of the Metro Natural Resource Committee and Council. In addition, some 800 citizens who had indicated an interest in receiving on-going Natural Resource Protection updates were sent a postcard mailer about the additional Natural Resource Committee and Council meetings. Planning electronic mail (email) notices of workshops, hearings or other activities have also been sent to interested for the past two years.

Review information about Metro's Goal 5 inventory process on Metro's website: http://www.metro-region.org/habitat/habitat_home.html.

Collection of information about riparian resource sites

Metro, following the Goal 5 rule's standard inventory process, collected information about streams, water areas, wetlands, riparian areas, and fish habitat to assist in delineating and mapping the region's riparian corridors.

The Goal 5 inventory process began in 1999 as part of the draft Streamside CPR (Conservation, Protection and Restoration) Report (Metro 1999). The Water Quality and Flood Management map, adopted as part of Metro's Urban Growth Management Functional Plan (Title 3) served as the starting point, or base map, for the Goal 5 inventory (Title 3 Functional Plan Map). The map included water features such as primary and secondary water features[1] including streams, rivers, lakes, and wetlands. Also mapped were the 100-year FEMA floodplain, areas flooded in 1996 (the 1996 area of inundation), and steep slopes (over 25 percent) adjacent to water features. This base map was compiled using Metro's extensive Geographic Information System (GIS) database layers and was edited through local jurisdiction review and public input. Appendix 1 is a data dictionary, including variable descriptions.

Metro incorporated a classification scheme for organizing streams into groups that share key characteristics, known as Channel Habitat Types (CHT) (GWEB 1999). The classification scheme used stream confinement[2] and stream gradient[3] to determine CHT. Eleven channel habitat types were originally identified within the region, as described in Table 1. Based on the comments of technical reviewers, these eleven channel habitat types were combined into three main categories: headwater streams (high), mid-section streams (middle), and floodplain and rivers (low). The benefit of incorporating such a classification system is that it can serve as the foundation for a more detailed inventory of stream and watershed conditions.[4]

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[1] Primary water features include Title 3 wetlands; rivers, streams, and drainages downstream from the point at which 100 acres or more are drained to that water feature (regardless of whether it carries year-round flow); and streams carrying year-round flow; springs which feed streams and wetlands and have year-round flow; and natural lakes. Secondary water features include intermittent streams and seeps downstream of the point at which 50 acres are drained and upstream of the point at which 100 acres are drained to that water feature.

[2] Confinement is a characterization of a channel's cross-sectional profile. It represents a stream's potential interactions with its floodplain. The Oregon Watershed Enhancement Board ("OWEB," formerly the Govern'or's Watershed Enhancement Board, or "GWEB") protocol defines confinement classes according to the ratio of floodplain width to channel (bankfull width).

[3] Gradient refers to the angle, or slope, at which the stream runs downhill.

[4] Metro applied the OWEB channel typing system as used in OWEB's Oregon Watershed Assessment Manual, July 1999, to differentiate high gradient streams from low and moderate gradient streams in Metro's scoring system for riparian ecological functions. See Table 4 on page 18.

Table 1. Channel Habitat Types within the Metro region.

Channel type code	Name	Channel type category
FP1	Low gradient large floodplain channel	Low
FP2	Low gradient medium floodplain channel	Low
LUS	Low gradient unconfined	Low
AF	Alluvial fan channel	Low
MH/MC	Moderate gradient confined headwater channel	Middle
MH/MV/BC	Moderate gradient headwater channel, moderately steep narrow valley channel, bedrock canyon channel	Middle
LC	Low gradient confined channel	Middle
LM	Low gradient moderately confined channel	Middle
MM	Moderate gradient moderately confined channel	Middle
VH	Very steep headwater	High
SV/BC/MV	Steep narrow valley channel, bedrock canyon channel, moderately steep narrow valley channel	High

Additional improvements to the Goal 5 inventory base map were made during 2000 and the early part of 2001 to improve the accuracy and consistency of regional information on streams and land cover. For example, Metro converted its stream GIS data layer to a stream routing database (streamroute), which more accurately represents stream location, supports the use of advanced GIS operations, and allows data sharing with state and federal organizations. Current wetland information obtained from local jurisdictions was used to update and augment the National Wetlands Inventory GIS coverage (Appendix 2). Another improvement to the Goal 5 inventory of resource features was the delineation of forest canopy along streams, rivers and other water features, as well as upland forest patches. A companion piece to the forest cover – the delineation of woody vegetation, low structure vegetation and undeveloped soils within 300 feet of streams – was completed in the spring of 2001.

An abbreviated sequence of events leading to the current riparian corridors inventory is summarized below:

- In February 2001, maps displaying the location of resource features such as flood areas, lakes, wetlands, streams, steep ravines, and forest canopy were made available to local governments and the general public for review and comment. Metro requested information to improve the accuracy of the features represented on the maps. The maps were made available as hard copies and as downloadable files on the internet via Metro's file transfer protocol (FTP) server.
- In June 2001, staff presented draft criteria for mapping riparian corridors and three pilot area maps. These criteria and pilot maps were reviewed by the WRPAC, Goal 5 TAC, MTAC and other Metro advisory committees. MTAC and WRPAC and the Metro Natural Resource Committee recommended that the criteria were adequate to warrant region-wide mapping for further review of the criteria.
- In the summer of 2001, Metro Council Natural Resource Committee directed staff to prepare a set of riparian corridor maps for the entire region.
- In the fall of 2001, staff presented a draft map of riparian corridors based on the criteria for WRPAC and other Metro advisory committee review.
- In November 2001, WRPAC recommended that all areas on the draft riparian corridors map (areas identified as providing both primary and secondary ecological functions) be deemed both significant and regionally significant resources.
- On November 21, 2001 Metro's Natural Resource Committee directed that changes to the criteria be made including showing developed floodplains as secondary, not primary function for streamflow moderation and water storage and not at all for large wood and channel dynamics and revising the organic material function adding undisturbed soils within 50 feet.
- On November 28, 2001, MTAC considered the draft riparian corridor maps. MTAC recommended that Metro allow a basin approach where a coordinated, intergovernmental basin-wide effort was made to address all resources identified by Metro as being significant and regional.

- In late November 2001, Metro received a critique of its draft technical report for Goal 5 from the City of Hillsboro; Metro responded to all criticisms by December 12, 2001. The critique did not result in alteration of any of the riparian functional criteria, but did result in several corrections in the technical report.
- On December 12, 2001, MPAC recommended that the Metro Council:
  (a) Revise the criteria for identifying riparian corridors as recommended by the Metro Natural Resource Committee,
  (b) Designate all areas identified through the revised criteria as regionally significant, and
  (c) Explore the basin approach.
- On December 13, 2001, the Metro Council considered all recommendations, including MPAC's recommendation, and approved Resolution No. 01-3141C (Appendix 3). This resolution accepted the riparian corridor criteria, concluded that several mapping changes (developed floodplains, organic materials) should be made, directed that a basin approach should be explored and that all riparian resources meeting the criteria should be considered as both significant and regionally significant, consistent with State Goal 5.
- On May 16, 2002, the Metro Council approved Resolution No. 02-3195 (Appendix 3), authorizing the Executive Officer to sign an intergovernmental agreement with the Tualatin Basin Natural Resource Coordinating Committee concerning a basin approach with the Tualatin River basin.
- The current riparian corridor maps have been revised as directed in Resolution No. 01-3141C (Appendix 3) for developed floodplains (Appendix 6) and organic materials. In addition:
  (a) Extensive map corrections have been made;
  (b) The map geographic extent has been increased to include areas one mile outside the Metro jurisdictional boundary and all Urban Growth Boundary Alternative Analysis sites. (This data is provided for analytical purposes, as Metro has no jurisdiction in these areas unless annexed to Metro.)
- In June 2002, MTAC, WRPAC, MPAC, the Goal 5 TAC, and Metro Natural Resources Committee considered a recommendation concerning the draft riparian corridor inventory and voted to support proposed Resolution No. 02-3176 (Appendix 3), for the purpose of adopting a draft map of regionally significant fish habitat (riparian corridors) pursuant to Resolution No. 01-3141C (Appendix 3). The Metro Council is scheduled to consider riparian corridors under proposed Resolution No. 02-3176 in late July 2002.

Metro received and reviewed numerous map corrections from local jurisdictions, property owners and other interested parties. Included in these changes was incorporation of local wetlands inventory information (see Appendix 2). Metro staff applied a consistent set of map change protocols to these requests. Some of the proposed corrections were represented on the February 2001 maps, and additional corrections were received as a result of public review of the maps in the spring of 2001. When documentation was adequate, Metro corrected its GIS data layers depicting resource features. Other proposed corrections that lacked adequate documentation will be considered in on-going updates of Metro's GIS data layers. Metro is continuing to accept map change requests and is making every attempt to see that Goal 5 maps are as accurate and complete as possible.

In fall 2001 Metro conducted U.S. Fish and Wildlife Service-funded fieldwork to assess the riparian corridor inventory's ability to identify valuable riparian resources. Processing the data for this research is time-consuming and the results are not yet complete; however, the conceptual underpinnings for this fieldwork are described in the section below entitled "Fieldwork to assess mapping criteria."

Table 2 below describes the Goal 5 inventory resource features that were used the construction of regional criteria for delineation of riparian corridors. GIS metadata (descriptions of collection methodologies for each data layer) or their locations are included in Appendix 4.

Table 2. Goal 5 riparian corridor inventory resource features.

Resource Features	Description
Flood Areas	Areas covered by the 100-year floodplain mapped for the Federal Emergency

Resource Features	Description
(FEMA/1996)*	Management Administration and/or areas mapped as inundated during the 1996 flood event by the Army Corps of Engineers, excluding ponded areas as noted by local governments.
Forest Canopy*	Land covered by forest canopy in patches generally larger than one acre in size. Delineated at a scale of 1:4800 using 2000 aerial photos and generalized criteria by the Metro Data Resource Center.
Steep Slopes*	Slopes greater than 25 percent occurring within 200 horizontal feet of the stream centerline or bank where mapped using the slope calculation method within the Arc-Info software program and using the 7½-minute USGS topographic map data.
Wetlands*	Wetlands mapped by the National Wetland Inventory and later updated as a part of the Title 3 water quality process. Additionally modified to incorporate information from local government review and local wetland inventories (see Appendix 2). Wetlands are considered hydrologically connected if the wetland boundary begins within ¼ mile of a riparian corridor.
Open Water*	Open water surface areas of lakes, ponds, and some rivers from the USGS 7½-minute quadrangle map data, from Metro stream modeling data of topography and as modified by review by cities and counties in the region.
Stream Centerlines*	Central channels or central braids of streams included on Metro's stream network. The network is composed of streams appearing on USGS digital line graph data, supplemented by stream model and edited for accuracy using air photos by Data Resource Center. The network includes minor edits to incorporate local information received through the Title 3 map review process and subsequent public reviews.
Stream Links*	Portions of streams that are non-surface, historic, or inferred and determined by examination of aerial photographs and comments from cities and counties in the region. Help to associate fragmented surface streams and drainage basins with downstream areas.
Culverts*	Stream crossings by roads and other transportation facilities but excluding stream links. Prepared by Metro Transportation Department, 2000 using road network, stream network and field inspections.
Proposed Stream Corrections*	Stream segments identified for removal, addition or relocation by local agencies.
Other Proposed Corrections*	Flood areas, wetlands, slopes, forest canopies or water bodies proposed for removal, addition or relocation by local agencies.
Woody vegetation and open space	Woody vegetation, or low structure vegetation/undeveloped soils mapped within 300 feet of streams and wetlands. Delineated at a scale of 1:4800 using 2000 aerial photos and generalized criteria by the Metro Data Resource Center.
Riparian Values Layers**	Represents resource features receiving values for one or more of the five ecological functions appearing in the riparian scoring matrix. The matrix is included in Metro's Resolution No. 01-3087A (Appendix 3). These layers were derived using the Goal 5 inventory features and the riparian scoring matrix. There is a layer for each individual function and a layer depicting cumulative score for all features.
Satellite land cover	Satellite derived land cover data. Data at 25 x 25 meter (80 x 80 feet) pixels for 17 land cover classifications.

Source: Metro 2001. See Appendix 4 for GIS metadata for each data layer.
*Goal 5 inventory features that were subject of a formal local government and general public review from February to April 2001.
**See Definition of Riparian Corridor section for more detail on the riparian values layers.

Metro has incorporated the best available information in its GIS database to accurately depict, at a regional scale, the location and quantity of Goal 5 resource features. The addition of the vegetation data layer adds information about the quality of mapped Goal 5 resource features (*see Adequacy of Information section*).

Consultations

At a minimum, the Goal 5 rule requires that local governments consult with the following sources:

(a) Oregon Department of Forestry stream classification maps;
(b) United States Geological Service (USGS) 7.5 minute quadrangle maps;
(c) National Wetlands Inventory maps;
(d) Oregon Department of Fish and Wildlife (ODFW) maps indicating fish habitat;
(e) Federal Emergency Management Agency (FEMA) flood maps; and
(f) Aerial photographs (OAR 660-23-090 (4))

Table 3 below describes these consultations and others undertaken by Metro in the inventory process.

Table 3. Agency consultations and information sources for riparian corridor inventory.

Agency	Information Type
Clean Water Services (Tualatin Basin)	• Rapid Stream Assessment point data (450 sampling sites) • Benthic Index of Biological Integrity sampling sites and data • Reports on watersheds, water quality status and trends, fish distribution and fish habitat • Stream location information
Ecotrust	• Landsat TM landcover type information
Federal Emergency Management Agency	• 100-year flood maps
Independent Multidisciplinary Science Team (IMST)	• Provided peer-review and comments on Metro's Technical Report for Goal 5 (now named "Metro's Technical Report for Fish and Wildlife Habitat").
Local governments	• Local plan Goal 5 inventories, review of Metro GIS base feature layers for accuracy and completeness • Members of several local jurisdictions on Goal 5 Technical Advisory Committee and other advisory committees
National Marine Fisheries Service	• Critical habitat for listed salmon species • Reports on salmon and trout ecology • Member on Goal 5 Technical Advisory Committee
Natural Resources Conservation Service	• Oregon Hydrology Group working to identify watersheds by USGW Hydrologic Unit Code system • U.S. Department of Agriculture and NRCS certified soil surveys
Oregon Department of Environmental Quality	• Water quality model code and handbook • 303(d) listed streams and lakes • Water quality index sampling points and data • Benthic index of biological integrity protocol and data • Total Maximum Daily Loads (TMDLs) for Tualatin Basin • Reports on environmental site cleanup information, Portland Harbor, brownfield sites, underground tanks, wastewater permits • Member on Goal 5 Technical Advisory Committee
Oregon Department of Fish and Wildlife	• Anadromous and other fish species distribution at 1:100,000 scale (statewide data) • ODFW Aquatic Inventories Project, habitat and reach data coverage • ODFW Natural Resources Information Management Program fish habitat distribution data at 1:24,000 scale • Threatened, endangered, and sensitive wildlife species habitat information

Agency	Information Type
	• Fish and wildlife species status information • Willamette Valley vegetation, 1:24,000 scale • Willamette Valley dams and barriers • Fish Passage Program data re: road culverts with fish passage problems on state and county roads • Big game winter range • Members on Goal 5 Technical Advisory Committee
Oregon Department of Forestry	• DOF stream classification maps • DOF fish presence and distribution • DOF sensitive bird site inventories
Oregon Natural Heritage Program	• record files of rare, threatened, and endangered plant and animal species within metro study area
Oregon Progress Board	• Water quality data used in the Oregon State of the Environment Report
Pacific Northwest Ecosystem Research Consortium	• procedures and data bases for evaluating Willamette Valley habitats for wildlife species • 1850 historic vegetation • land use/land cover projected at 10 year increments through 2050 • demographic, hydrologic, physiographic, base grids and land use/land cover spatial data for Willamette Valley
Port of Portland	• Wetland location on Port properties; floodplain information
Spencer B. Gross, Inc.	• Aerial photos, natural color ortho-rectified digital imagery with a pixel size of 2, 4, 10 and 20 feet. Metro area covered in 726 section tiles.
U. S. Fish and Wildlife Service	• National Wetlands Inventory maps • Threatened, endangered, and sensitive wildlife species habitat information • Fish and wildlife species status information • Oregon Endangered Species Consultation Handbook • Federally listed and proposed endangered and threatened species, candidate species, and species of concern
U.S. Environmental Protection Agency	• Terrestrial vertebrate species of the Willamette River basin, species-habitat relationships matrix • Pacific States Marine Fisheries Commission/EPA Streamnet data for anadromous fish distribution • Streamnet Pacific NW water quality sampling data for streams and lakes • Toxic Release Inventory (1985-1999) • Better Assessment Science Integrating Point and Nonpoint Sources (BASINS) for environmental information, watershed and water quality planning
United States Geological Service	• 7.5 quadrangle maps • USGS 1:24,000 10 meter digital elevation data (terrain model) • USGS Hydrologic Unit Code system • USGS reports and GIS data on water quality, toxins, habitat, hydrology, and groundwater for the Willamette Basin
Watershed Councils	• Watershed assessments and plans
Xerces Society	• Invertebrate species in the metro area • Benthic Index of Biological Integrity report for Lower Clackamas, Sandy rivers

Definition of riparian corridor

The previous section described how potential Goal 5 resources were inventoried and mapped. This section describes the methodology Metro used to identify riparian corridors. The Goal 5 rule defines a riparian corridor as a "Goal 5 resource that includes the water areas, fish habitat, adjacent riparian areas, and wetlands within the riparian area boundary." The rule does not provide guidance on how to identify the width of the riparian corridor. It only states that the

riparian corridor boundary is an "imaginary line that is a certain distance upland from the top of bank" (660-23-090(1)). The Goal 5 rule allows a jurisdiction flexibility in defining the riparian corridor, the area for which a significance determination must be made.

Methodology for mapping riparian corridors

Metro has taken an ecological functions approach to define the riparian corridor based on its extensive scientific literature review (Metro 2002). This approach, described below, combines GIS mapping technology, scientific recommendations, and fieldwork for an inventory that encompasses the entire Metro region. It is intended to inform policymakers and the public about resource features in the landscape that provide some service or function to the riparian ecosystem. The methodology assigns values to resource features that allows comparison of their cumulative importance to riparian health.

As described in Metro's Technical Report for Fish and Wildlife Habitat, April 2005, the riparian area refers to the land and vegetation adjacent to waterbodies such as streams, rivers, wetlands and lakes that are influenced by perennial or intermittent water. The spatial extent or width of the riparian area is difficult to delineate. Naiman and Decamps (1997) describe the riparian area as encompassing

> "The stream channel between the low and high water marks and that portion of the terrestrial landscape from the high water mark toward the upland where vegetation may be influenced by elevated water tables or flooding and the ability of the soils to hold water."

Gregory et al. (1991) further describes riparian areas as "three-dimensional zones of direct interaction between terrestrial and aquatic ecosystems," the boundaries of which "extend outward to the limits of flooding and upward into the canopy of streamside vegetation."

Kauffman et al (2001) encourage a functional approach to defining the "riparian zone," stating that "from an ecosystem perspective, riparian zones are defined in terms of their multiple functional roles as the interface between aquatic and terrestrial environments." According to Kauffman et al (2001), "interactions between terrestrial and aquatic ecosystems include modifications of microclimate (e.g., light, temperature, and humidity), alteration of nutrient inputs from hill slopes, contribution of organic matter to streams and floodplains, and retention of inputs."

According to the scientific literature reviewed, riparian corridors provide important ecological benefits for fish and wildlife including:

1. Microclimate and shade
2. Streamflow moderation and water storage
3. Bank stabilization, sediment and pollution control
4. Large wood and channel dynamics
5. Organic matter input
6. Riparian wildlife habitat and connectivity[5]

[5] Wildlife habitat is excluded from the riparian corridor inventory, and is addressed under the inventory for wildlife habitat under OAR 660-23-110.

The biological integrity of the riparian corridor depends, in part, on the width and condition of the riparian area, helps dictate stream functions and ultimately the type of species that can live in and around streams. Several recent literature reviews have addressed the effectiveness of various widths for maintaining specific riparian functions for both protecting water quality and preserving the biologic integrity of the riparian corridor. Metro's Technical Report for Fish and Wildlife Habitat lists a range of recommended minimum riparian area widths for fish and wildlife habitat (Table 7 in Metro's Technical Report for Fish and Wildlife Habitat, April 2005).

The ecological functions listed above provide the basis for Metro's delineation of riparian corridors. In the spring of 2001, Metro launched an effort to map the ecological functions of riparian corridors and the specific resource features that are associated with these functions. Features include stands of trees, woody vegetation, meadows, wetlands, steep slopes, and flood areas that are located along the region's stream and rivers. The recommended riparian corridor widths from Metro's Technical Report for Fish and Wildlife Habitat were used to help develop a set of mapping criteria and are summarized in Table 4. The full matrix for mapping riparian corridors is in Appendix 5

In December 12, 2001, the Metro Policy Advisory Committee (MPAC) recommended that the Metro Council revise the riparian corridor criteria for identifying riparian corridors as identified by the Metro Natural Resource Committee and designate all identified through the revised criteria as regionally significant. On December 13, 2001, the Metro Council considered all recommendations, including MPAC's recommendation, and approved Resolution 01-3141C (Appendix 3). This resolution accepted the riparian corridor criteria, concluded that several mapping changes (developed floodplains, organic materials) should be made, and that all riparian resources meeting the criteria should be considered as both significant and regionally significant, consistent with State Goal 5. Metro subsequently created and implemented a methodology for identifying developed floodplains (Appendix 6); the current riparian corridor maps have been revised as directed in resolution 01-3141C for developed floodplains and organic materials. In addition, extensive map corrections have been made and the map geographic extent has been increased to include areas one mile outside the Metro jurisdictional boundary and all UGB Alternative Analysis sites (this data is provided for analytical purposes as Metro has no jurisdiction in these areas unless annexed to Metro).

Table 4. Riparian corridors ecological functions and criteria for receiving a primary score.

Ecological function	Criteria for receiving a primary score	Criteria for receiving a secondary score
Microclimate and shade	Forest or woody vegetation within **100 feet** of a stream; a wetland[1]; or a flood area[2].	Forest or woody vegetation that is contiguous to the primary area (which is 100 feet) and extends outward to **780** feet.
Streamflow moderation and water storage	A wetland or other water body[3] with a hydrologic connection to a stream; or a flood area.	Forest, woody vegetation, or low structure vegetation/undeveloped soils within **300 feet**[4] of a stream; or forest that is contiguous to the riparian corridor (starts within **300 feet**[5] but extends beyond); or developed floodplains.
Bank stabilization, sediment and pollution control	A 50-foot band is included within the riparian corridor as a default to maintain basic functions. All sites within **50 feet** of a surface stream receive a primary score. Forest, woody vegetation, or low structure vegetation/undeveloped soils within **100 feet**[6] of a stream or a wetland; or forest, woody vegetation, or low structure vegetation/ undeveloped soils[8] within a flood area. Forest, woody vegetation, or low structure vegetation/undeveloped soils within **100-200 feet** of a stream if the slope is greater than 25%.	Forest, woody vegetation, or low structure vegetation/undeveloped soils located on a slope greater than 25%, that starts within **175** feet[7] of a stream and runs to the first effective break in slope.
Large wood and channel dynamics	Forest within **150 feet** of a stream or wetland; or within a flood area. The channel migration zone is basically defined by the floodplain, but where there is no mapped floodplain a default of **50 feet** was selected to allow for the channel migration zone[9].	Forest within **150 to 262 feet** of a stream; or developed floodplains.
Organic material sources	Forest or woody vegetation within **100 feet** of a stream or wetland; or within a flood area.	Forest or woody vegetation within **100 to 170 feet** of a stream.

Source: Metro 2001.
[1]Here we refer to "hydrologically-connected wetlands," which are located partially or wholly within ¼ mile of a surface stream or flood area.
[2]Developed floodplains are not included as a regional resource since they do not receive a primary ecological function score.
[3]"Other water body" could include lakes, ponds, reservoirs, or manmade water feature that is not a water quality facility or farm pond.
[4]All upland forests, vegetation, and undeveloped soils help to moderate streamflow and store water. Staff used 300 feet here because some data layers for landcover types do not extend past 300 feet from a stream.
[5]Forest landcover is the only type that extends beyond 300 feet in the Metro database and thus excludes other types.
[6]Metro's science paper indicates 100 feet as a suitable average distance for vegetation contributing to filtering.
[7]175 feet was chosen due to the method used for mapping riverine slopes.
[8]The woody vegetation and low structure vegetation/undeveloped soils are mapped to 300 feet, the forest is mapped to the edge of the floodplain.
[9]Application of the default to maintain basic functions will be limited to low and moderate gradient channel types.

An example of Metro's mapping technique can be illustrated by examining the ecological function of microclimate and shade. Trees and other vegetation along streams provide a microclimate that is uniquely different from upland areas because of its proximity to water. This unique microclimate influences soil moisture, temperature and relative humidity, which allows for an increase in plant diversity and a variety of food and cover opportunities for fish and wildlife. Trees and other vegetation along streams also provide shade, which moderates the amount of light reaching the stream and helps to regulate water temperature.

According to the scientific literature, the minimum riparian area width needed to provide for microclimate ranges from 75 feet to 787 feet, and from 33 feet to 250 feet for shade (on each side of the stream). Based on the scientific literature, Metro used 100 feet as the area (on each side of the stream) where trees and other woody vegetation make a significant contribution to riparian function (microclimate and shade). Using GIS mapping technology, forest and woody vegetation within 100 feet of a surface stream, a hydrologically connected wetland, or an area subject to flooding were mapped. However, forest and woody vegetation beyond 100 feet also provide riparian function, according to the scientific literature, but to a lesser degree. These areas were also mapped to the outer range of the widths recommended by the literature, in this case 780 feet.

Metro devised a scoring system to rate the landscape features according to their contribution to riparian function. Based on distances recommended in the scientific literature, landscape features were considered either primary or secondary for ecological function. For example, trees and other woody vegetation contributing to riparian function within the first 100 feet are considered primary features and given six points. Trees and other woody vegetation beyond 100 feet and up to 780 feet still provide some ecological function according to the scientific literature, and are considered secondary features and assigned one point to reflect the reduced, but still valuable, ecological functions provided. Each of the other functions listed above (streamflow moderation, organic input, etc.) went through a similar process that linked land features with the ecological function they support, based on primary and secondary functions.

The scores are additive for any given landscape feature and reflect relative ecological function at any given point on the map. For example, a point on a map could contribute significantly to all five functions listed above and receive a score of 30 (five primary functions times six points each). Another point on the map may receive primary scores for three functions (three primary functions times six points) plus secondary functions for up to two other functions (18 points for primary functions, plus two points for secondary functions). Still another point on the map may receive only a single point for one secondary function. Table 4 and Appendix 5 describe the criteria used to evaluate each ecological function, the contributing land features, and the criteria for mapping those features.

Metro's methodology for mapping ecological functions has undergone extensive public review. The methodology was first applied to three nine square mile study areas: Bronson Creek, Johnson Creek, and Wilsonville. These study area maps were presented to Metro's Natural Resources Committee in May 2001. After a period of extensive public review, Metro Council adopted the methodology as part of Resolution 01-3087A (Appendix 3) and directed staff to produce maps applying the methodology on a regional basis.[6]

The resulting regional maps were presented to Metro's Natural Resources Committee in September 2001 and show areas with primary functions in gradations of green, with the darkest green providing the most function, the lightest green providing the least. Secondary functions are shown in gradations of fuchsia. This mapping methodology provides a valuable tool for defining riparian corridors, for identifying significant resource and regional resources, and for focusing the area of analysis (for quality data) within resource sites. It will also provide valuable information for locating potential restoration sites.

[6] Review included the Goal 5 Technical Advisory Committee, Metro Technical Advisory Committee, Water Resources Policy Advisory Committee, and Metro Policy Advisory Committee.

Collection of information about wildlife habitat resource sites

In public hearings before Metro Council Natural Resources Committee and in recommendations from the Metro Policy Advisory Committee (MPAC), Metro Technical Advisory Committee (MTAC), Metro Goal 5 Technical Advisory Committee (Goal 5 TAC) and the Water Resources Policy Advisory Committee (WRPAC), Metro Council was urged to complete the analysis of potential regionally significant wildlife habitat and combine that information with the mapping of regionally significant riparian corridors

Metro, following the Goal 5 rule's standard inventory process, collected information about forested areas, low-structure vegetation, streams, water areas and wetlands to assist in delineating and mapping the region's important wildlife habitats.

The current Goal 5 wildlife habitat inventory process began in 2001. In February 2001, pilot maps were made available on Metro's ftp website for review by interested parties. In July 2001, Metro Council adopted Resolution No. 01-3087A (Appendix 3) directing staff to apply functional science-based criteria to determine Goal 5 fish and Wildlife habitat areas. The criteria and mapping methodology are described in the section below, entitled "Mapping Technology for Wildlife Habitats."

An abbreviated sequence of events leading to the current wildlife habitat inventory is summarized below:

- In early 2001, pilot maps were made available on Metro's ftp site for review by interested parties.
- In fall 2001, in public hearings before Metro Council Natural Resources Committee (NRC) and in recommendations from the Metro Policy Advisory Committee (MPAC), Metro Technical Advisory Committee (MTAC), Metro Goal 5 Technical Advisory Committee (Goal 5 TAC) and the Water Resources Policy Advisory Committee (WRPAC), Metro Council was urged to complete the analysis of potential regionally significant wildlife habitat and combine that information with the mapping of regionally significant riparian corridors.
- In fall 2001, Metro conducted U.S. Fish and Wildlife Service-funded fieldwork to assess the original model's ability to appropriately assign value to habitat patches. The results of this fieldwork, described in the section entitled "Fieldwork to assess mapping criteria" below, provided guidance for adjusting the model to more accurately reflect the region's wildlife habitat values. These changes included redefining patches based on substantially closed canopy forest plus all vegetation within 300' of waterways and omitting the species richness criterion from the model.
- In December 2001, Council adopted Resolution No. 01-3141C (Appendix 3) directing staff to complete additional work necessary to inventory and map regional wildlife habitat and present that information to Metro Council in early 2002.
- In response, staff produced the following products:
  - An analysis of existing Goal 5 data, reports and regulations from cities and counties
  - A methodology and criteria for identifying wildlife habitat and maps applying those criteria to the region
  - A map identifying Goal 5 resource sites and Goal "wildlife habitat" within those sites to serve as the basis for identifying regionally significant wildlife habitats
  - An inventory narrative (this document) including information on the location, quantity and quality of the potential resources sites identified on the map
  - A map of potentially significant wildlife habitat
  - A summary of recommended criteria for identifying and defining regionally significant wildlife habitat (see Table 7 and Appendix 5)
  - A map depicting wildlife habitat that could be adopted as "regional resources" under the Goal 5 administrative rule

- In February 2002, staff presented draft criteria to the Metro Council Natural Resource Committee for identifying Goal 5 wildlife habitat based on information contained in "Metro's Technical Report for Fish and Wildlife Habitat" (formerly entitled "Metro's Scientific Literature Review for Goal 5")
- In a subsequent step to the wildlife habitat mapping process, Metro requested information on species and habitats of concern through several advisory committees and by contacting local experts knowledgeable in the region's wildlife habitats (see Table 7; section below entitled "Species and Habitats of Concern").
- In May 2002, the inventory was revised to reflect a larger study area, habitats of concern, and several relatively minor alterations to refine the inventory. These maps were made available via Metro's FTP server.
- In summer 2002, MPAC, MTAC, and the Goal 5 TAC recommended identifying all wildlife habitats on the map as significant and recommended Option 2 (see Table 7 and Appendix 5) for regional significance. However, WRPAC recommended identifying all wildlife habitats on the map as significant but recommended Option 1 for regional significance. Also during this period a series of public hearings were held to provide information to interested parties and obtain public opinion.

The map of regionally significant riparian corridors and wildlife habitat that staff produced is a draft map which will provide the basis for conducting subsequent steps in the Goal 5 process including the economic, social, environmental and energy consequences analysis and the Program to Achieve Goal 5. Metro Council reserves the opportunity to minimally or substantially alter the draft map prior to adoption of a final map of regionally significant fish and wildlife habitat areas and Program to Achieve Goal 5, after public comment and review.

Table 5 below describes the Goal 5 inventory resource features that were used the construction of regional criteria for delineation of wildlife habitats. Appendix 5 shows the full criteria matrix used to map wildlife habitats on Metro's GIS system.

Table 5. Goal 5 wildlife habitat inventory resource features.

Resource Features	Description
Forest Canopy*	Land covered by forest canopy in patches generally larger than one acre in size. Delineated at a scale of 1:4800 using 2000 aerial photos and generalized criteria by the Metro Data Resource Center.
Wetlands*	Wetlands mapped by the National Wetland Inventory and later updated as a part of the Title 3 water quality process. Additionally modified to incorporate information from local government review and local wetland inventories (see Appendix 2).
Stream Centerlines*	Central channels or central braids of streams included on Metro's stream network. The network is composed of streams appearing on USGS digital line graph data, supplemented by stream model and edited for accuracy using air photos by Data Resource Center. The network includes minor edits to incorporate local information received through the Title 3 map review process and subsequent public reviews.
Stream Links*	Portions of streams that are non-surface, historic, or inferred and determined by examination of aerial photographs and comments from cities and counties in the region. Help to associate fragmented surface streams and drainage basins with downstream areas.
Proposed Stream Corrections*	Stream segments identified for removal, addition or relocation by local agencies.
Other Proposed Corrections*	Flood areas, wetlands, slopes, forest canopies or water bodies proposed for removal, addition or relocation by local agencies.
Woody vegetation and open space	Woody vegetation, or low structure vegetation/undeveloped soils mapped within 300 feet of streams and wetlands. Delineated at a scale of 1:4800 using 2000 aerial photos and generalized criteria by the Metro Data Resource Center.
Wildlife Habitat Values Layers	Represents resource features receiving values for one or more of the four criteria identified in the Goal 5 Technical Report. These layers were derived

	using the Goal 5 inventory features and the wildlife habitat scoring matrix. There is a layer for each individual criterion and a layer depicting cumulative score for all features.
Habitats of Concern Layer	Site-specific information collected from a variety of knowledgeable sources and digitized in a separate GIS layer (see Table 7 and section below entitled "Species and Habitats of Concern").
Species of Concern Layer	Species of concern sightings for species listed under the federal or state Endangered Species Act or identified by the Oregon Natural Heritage Program as at-risk (see Table 7 and section below entitled "Species and Habitats of Concern").

Source: Metro 2001. See Appendix 4 for GIS metadata for each data layer.
*Goal 5 inventory features that were subject of a formal local government and general public review from February to April 2001.

Metro has incorporated the best available information in its GIS database to accurately depict, at a regional scale, the location and quantity of Goal 5 resource features. The addition of the species of concern and habitats of concern data layers, combined with field studies, add information about the quality of mapped Goal 5 resource features (*see Adequacy of Information section*).

Consultations

At a minimum, the Goal 5 rule requires that local governments shall obtain current habitat inventory information from the Oregon Department of Fish and Wildlife (ODFW) and other state and federal agencies. These inventories shall include at least the following:

(a) Threatened, endangered, and sensitive wildlife species habitat information;
(b) Sensitive bird site inventories;
(c) Wildlife species of concern and/or habitats of concern identified and mapped by ODFW (e.g., big game winter range and migration corridors, golden eagle and prairie falcon next sites, and pigeon springs (OAR 660-23-110 (1))

Table 6 below describes these consultations and others undertaken by Metro in the inventory process.

Table 6. Agency consultations and information sources for wildlife habitat inventory.

Agency	Information Type
Army Corps of Engineers	• 1978 "Regional Urban Wildlife Habitat Maps" to supplement Habitats of Concern information
Audubon Society of Portland / Coalition for a Livable Future	• Mike Houck is a member of the Goal 5 Technical Advisory Committee and is Chair of the Natural Resources Working Group; comments on all aspects of program, including model criteria and scoring. • Species of Concern and Habitats of Concern information
Bob Altman, American Bird Conservancy	• Sensitive species and sensitive species habitat information (also linked with Partners in Flight, Oregon/Washington chapter)
Charlotte Corkran, local herptile expert/consultant	• Sensitive species location information • Vertebrate species list in Tualatin Basin
Clean Water Services (Tualatin Basin)	• Reports on watersheds, fish distribution and fish habitat
Defenders of Wildlife (in cooperation with ODFW)	• Information on restoration and enhancement practices for rare habitats in the Willamette Valley

Agency	Information Type
Ecotrust	• Landsat TM landcover type information
Independent Multidisciplinary Science Team (IMST)	• Provided peer-review and comments on Metro's Technical Report for Goal 5 (now named "Metro's Technical Report for Fish and Wildlife Habitat").
Local governments	• Local plan Goal 5 inventories, review of Metro GIS base feature layers for accuracy and completeness • Members of various governments on Goal 5 Technical Advisory Committee (including cities of Beaverton, Portland, Troutdale, Lake Oswego, Tualatin; and Clackamas, Washington, and Multnomah counties) and other advisory committees • Input on Habitats of Concern, Species of Concern, model formulation and refinement, scoring system
Members of GTAC (Greenspaces Technical Advisory Committee) and G5TAC (Goal 5 Technical Advisory Committee)	• Habitats of Concern request for information
Metro Parks and Greenspaces Department	• Metro Greenspaces Master Plan, including corridor information; Habitats of Concern; Species of Concern information
National Marine Fisheries Service	• Member of Goal 5 Technical Advisory Committee (Marc Liverman)
Numerous regional wildlife experts, including the fish and wildlife agencies, PSU, OSU, consultants	• Development of Vertebrate Species List
Oregon Cooperative Fish and Wildlife Unit, Oregon State University	• Sensitive species surveys (obtained via ODFW)
Oregon Department of Environmental Quality	• Member of Goal 5 Technical Advisory Committee (Don Yon)
Oregon Department of Fish and Wildlife	• Wildlife species status information; threatened, endangered, and sensitive wildlife species occurrence and habitat requirement information • Information on at-risk wildlife habitat types in the Willamette Valley • Information on restoration and enhancement of at-risk wildlife habitat types in the Willamette Valley • Wildlife Diversity Plan • Willamette Valley vegetation, 1:24,000 scale • Big game winter range • 2 Members on Goal 5 Technical Advisory Committee
Oregon Department of Forestry	• DOF stream classification maps
Oregon Natural Heritage Program	• Record files of rare, threatened, and endangered plant and animal species within metro study area • ONHP species status rankings for species list • Consultation regarding Habitats of Concern
Pacific Northwest Ecosystem Research Consortium	• Procedures and data bases for evaluating Willamette Valley habitats for wildlife species • 1850 historic vegetation • Land use/land cover projected at 10 year increments through 2050 • Demographic, hydrologic, physiographic, base grids and land use/land cover spatial data for Willamette Valley
Partners in Flight	• Status and conservation of state sensitive grassland bird species • Conservation strategy for landbirds in coniferous forests and

Agency	Information Type
	lowlands and valleys of western Oregon and Washington
Port of Portland	• Site-specific information regarding Habitats of Concern
Spencer B. Gross, Inc.	• Aerial photos, natural color ortho-rectified digital imagery with a pixel size of 2, 4, 10 and 20 feet. Metro area covered in 726 section tiles.
Tualatin Hills Parks and Recreation District	• Information on Habitats of Concern and comments on model scoring criteria
U.S. Environmental Protection Agency	• Terrestrial vertebrate species of the Willamette River basin, species-habitat relationships matrix
U.S. Fish and Wildlife Service	• National Wetlands Inventory maps • Federally listed and proposed endangered and threatened species, candidate species, and species of concern • Threatened, endangered, and sensitive wildlife species habitat and sighting location information • Oregon Endangered Species Consultation Handbook • Member on Goal 5 Technical Advisory Committee
United States Geological Service	• 7.5 quadrangle maps • USGS 1:24,000 10 meter digital elevation data (terrain model) • Breeding Bird Survey information
URS Corporation (Lynn Sharp, local wildlife habitat expert)	• Information on Habitats of Concern
Watershed Councils	• Watershed assessments and plans
Wetlands Conservancy	• Habitats of Concern request for information
Xerces Society	• Invertebrate species in the metro area

Definition of wildlife habitat

The previous section described how potential Goal 5 resources were inventoried and mapped. This section describes the methodology Metro used to identify wildlife habitats. The Goal 5 rule defines wildlife habitat as "an area upon which wildlife depend in order to meet their requirements for food, water, shelter, and reproduction. Examples include wildlife migration corridors, big game winter range, and nesting and roosting sites" (OAR 660-023-0110(1)(b)). The rule does not provide specific guidance on how to identify significant wildlife habitats other than referring to the standard inventory process (OAR 660-23-030) and minimum consultation requirements outlined in OAR 660-23-110. The Goal 5 rule allows a jurisdiction flexibility in defining the area for which a significance determination must be made.

Mapping methodology for wildlife habitats

As the agency responsible for identifying regionally significant wildlife habitat, it is not feasible to visit each potential site during the inventory process. Field surveys are encouraged but not required by the Goal 5 rule. Therefore, Metro has taken a multi-tiered approach to identify the region's important wildlife habitats based on a combination of (1) best available scientific literature; (2) GIS modeling; (3) field studies to address the Goal 5 rule to determine the location, quantity and quality of potential resource sites, as well as the adequacy of that information; and (4) local expertise to identify locations of sensitive species and habitats. This approach, described in Table 7, combines GIS mapping technology, scientific recommendations, and fieldwork for an inventory that encompasses the entire Metro region. It is intended to inform

policymakers and the public about resource features in the landscape that provide habitat to meet wildlife requirements for food, water, shelter and reproduction. The methodology assigns values to resource features that allows comparison of their cumulative importance to the regional wildlife habitat network.

According to the scientific literature reviewed, important ecological characteristics of wildlife habitat include the following:

1. Terrestrial habitat is important for many wildlife species. Important guidelines in developing a conservation plan for wildlife habitat are:
   - large patches are better than smaller patches
   - interior habitat is more important to at-risk species than edge habitat
   - connectivity to other patches is important
   - connectivity and/or proximity to water is important
   - unique or at-risk habitats deserves special consideration
2. Native vegetation plays a critical role in a watershed, particularly the longitudinal and lateral connectivity of the riparian corridor. In general, native wildlife species prefer native plants.
3. Downed wood and snags (or large woody debris), frequently found in natural ecosystems but often lacking in disturbed environments, are crucial in providing high quality habitat in both aquatic and terrestrial ecosystems.
4. Habitat fragmentation is a critical issue; buffers and surrounding land use play an important role in maintaining the functions of remaining habitat.

The ecological characteristics listed above provide the basis for Metro's delineation of wildlife habitat. In early 2001, Metro launched an effort to map wildlife habitat based on specific resource features that are associated with these characteristics. Features include stands of trees, woody vegetation, meadows, and wetlands located within the region. The recommended wildlife habitat criteria from Metro's Technical Report for Fish and Wildlife Habitat were used to help develop a set of mapping criteria and these are summarized in Table 7 (see also Appendix 5).

A GIS model developed through Metro's Parks and Greenspaces Department served as the starting point, or base map, for the Goal 5 inventory (original model). Vegetation data for the original model was derived from satellite imagery (24-m rasters). The original model was based on four criteria: habitat patch size (minimum patch size of 2 acres unless considered a Habitat of Concern, described below), proximity to water sources, proximity to other natural areas, and an Oregon Natural Heritage Program-derived species richness criterion. After reviewing the scientific literature and available local research a fifth criterion measuring forest interior, derived from Metro-region field data, was incorporated into the model. The original inventory map, which included habitat patches composed of natural land cover such as forest, shrub and grassy areas, as well as water features including streams and wetlands, was compiled using Metro's extensive Geographic Information System (GIS) database layers. Each habitat patch was ranked within the universe of habitat patches and assigned a score for each of the four model criteria, relative to other habitat patches. Sites were subsequently separated into three quality classes, of up to three possible points, for each criterion (see Table 7 footnotes for more information).

Table 7. Wildlife habitat characteristics and criteria for GIS model scoring.

Habitat characteristic	Criteria for scoring
Habitat patch size	The size value for a patch is calculated by: 1. Calculating the area in acres for all type 1 patches[7] using a GIS system. Assigning all type 1 patches a value of 1 to 3 based on their distribution within three classes derived by finding natural breaks using a GIS system[8].
Habitat interior (minimizes edge habitat)	The interior value for a patch is calculated by: 1. Defining an interior zone for all type 1 patches by using a GIS system to draw internal buffers of 200 feet for each. 2. Calculating the interior zone area (if any) in acres for all type 1 patches using a GIS system. Assigning all type 1 patches an interior value of 1 to 3 based on their distribution within three classes derived by finding natural breaks using a GIS system.
Connectivity and proximity to water resources	The connectivity to water value for a patch is calculated by: 1. Calculating the area of all type 1 and 2 patches that is less than 300 feet from of a source of water[9] using a GIS system. 2. Deriving the "connectivity to water" ratio of each type 1 patch. This is done by dividing the patch area inside 300 feet by the patch area greater than 300 feet away from a stream. (Inside 300 / outside 300 = "connectivity to water" ratio) 3. Deriving the "adjusted connectivity to water" ratio of each type 2 patch. The area inside 300 feet is divided by two to create an adjusted total. The adjusted amount is divided by the patch area greater than 300 feet away from a stream. ((Inside 300 / 2) / outside 300 = "adjusted connectivity to water" ratio) Assigning all type 1 and 2 patches a connectivity to water value of 1 to 3 based on the distribution of their ratios within three classes derived by finding natural breaks using a GIS system.
Connectivity and proximity to other patches	The Connectivity/Proximity value for a patch is calculated as follows: 1. Perform a nearest neighbor operation GIS operation that measures the average distance from each type 1 and 2 patch to other patches within ¼ mile of their perimeters.* 2. Assigning all type 1 and 2 patches a connectivity/proximity value of 1 to 3 based on their distribution within three classes derived by finding natural breaks using a GIS system. *General fragmentation also affects the overall score to a lesser degree. The more fragmented a patch the lower the score.
Habitats of concern and habitats for unique and sensitive species	A habitat of concern is a unique or unusually important wildlife habitat area. They are identified based on site-specific information provided by local wildlife or habitat experts. Habitats of concern can be smaller than 2 acres, and will be included in the inventory if falling into one or more of the following categories: Any patch specifically identified as a Priority Conservation Habitat by ODFW, USFWS, or other agencies or local wildlife experts. Priority conservation habitats are Oregon white oak savannas and woodlands, native prairie grasslands, wetlands, and bottomland hardwood forests. Any patch of natural land cover identified by ODFW, USFWS, or other agencies or local wildlife experts as a riverine island or delta important to wildlife. Specifically delineated habitat areas that provide life-history requirements of sensitive, threatened or endangered wildlife species or Great Blue Heron rookeries (for example, nesting habitat for an existing population of native turtles); habitats that support at-risk plants; or habitats that provide unusually important wildlife functions, such as major wildlife crossings/pathways or a key migratory pathway, such as an elk migratory corridor.

[7] Type 1 patches are defined as any forest landcover, forested wetland, or nonforested wetland with a total combined size greater than 2 acres. Where different cover types are contiguous they are considered to be part of a single larger patch. Type 2 patches are defined as any shrubland/scrubland or grassland/open soils landcover in a tract greater than 2 acres, within 300 feet off a surface stream.

[8] The Jenkins method for finding natural breaks was used. This method creates classes based on natural groupings of data values. Features are divided into classes whose boundaries are set where there are relatively big jumps in the data values.

[9] A source of water is defined as any surface river or stream, wetland, or other water body.

The scoring range within each criterion was determined by natural breaks in the data, as identified by the Jenk method; this method creates classes based on natural groupings of data values. Field data confirmed that the breaks were logical, justifiable, and provided a means of differentiating sites from one another based on model criteria and ecological value.

The scores are additive for any given habitat patch and reflect relative wildlife habitat value for each of the habitat patches identified on the map. A habitat patch may receive a score from 1-3 for each of the four model criteria, for a maximum of 12 possible points (four criteria times three points; see Appendix 5). However, in reality the highest score was ten and the low score was two due to the interactions of the criteria (for example, very large patches tend not to have as high a rating for water availability per unit area). Scores were adjusted downward one point to allow for an easily understandable point range of 1-9.

An example of Metro's mapping technique can be illustrated by examining the ecological function of interior habitats (see Metro's Technical Report for Fish and Wildlife Habitat, April 2005). Edge effects are the detrimental effects associated with the edge of a habitat patch, including human disturbance, non-native species invasion, reduced food resources, increased wildlife mortality and decreased bird nest success. Interior habitat is the part of a habitat patch that is sufficiently distant from the edge such that negative edge effects are reduced or eliminated.

The scientific literature indicates a wide range of edge effect distances, depending on such factors as what species or what effect is being examined and geographic location. Edge effects may be stronger in urban areas because of the high contrast between natural and human-associated environments. In the Portland metro region, research shows that non-native bird and plant species are substantially reduced beyond 200 ft from the edge of a habitat patch. Based on this data, Metro used GIS mapping technology to construct a 200-ft buffer to the interior of forest and forest/wetland habitat patches. The acreage of interior habitat was calculated for each patch; many long, linear patches contained no interior habitat and fell within the lowest point category. Interior-containing patches of the same size but different shapes may receive 2 or 3 points, depending on how much interior habitat is in the patch.

Metro's methodology for mapping wildlife habitats has undergone extensive public review. The methodology was first applied to three nine square mile study areas: Bronson Creek, Johnson Creek, and Wilsonville. These study area maps were presented to Metro's Natural Resources Committee in May 2001. After a period of extensive public review, Metro Council adopted the methodology as part of Resolution 01-3087A (Appendix 3) and directed staff to produce maps applying the methodology on a regional basis.[10]

Metro's model accounts for edge effects and habitat quality, as verified by scientific fieldwork conducted in 2001. The habitat attributes positively associated with increasing scores[11] in Metro's GIS model include:

[10] Review included the Goal 5 Technical Advisory Committee, Metro Technical Advisory Committee and Metro Policy Advisory Committee.

[11] For more detailed statistical findings, see Metro's Riparian /Corridors Inventory (Metro 2002).

- More downed wood and logs
- More food resources
- A wider variety of food resources
- Food availability over longer periods
- Fewer non-native trees
- Fewer non-native shrubs
- Fewer non-native herbs
- Increased structural diversity
- More wildlife cover available throughout the year
- More nesting and denning sites (snags, root wads, rocky crevices, etc.)
- Less human disturbance onsite or nearby
- Better wildlife diversity onsite
- More year-round availability of water
- Healthier stream channel morphology
- More vegetative cover near water sources
- More types of water resources (streams, wetlands, etc.)

Thus, the wildlife habitat model does account for habitat quality.

Species and Habitats of Concern

To identify wildlife habitat in a biologically meaningful way, habitat must be linked to wildlife use. In 2001 Metro created a species list of all vertebrates typically occurring in the region on a yearly basis (Appendix 7). The species list is based on the opinion of more than two dozen local wildlife experts, and links species to habitat types via species-habitat associations based on Johnson and O'Neil's (2001) scheme. The purpose of Metro's Species List is threefold:

1. To identify fish and wildlife species that occur in the Metro region.
2. To identify the relative importance of various types of habitat to fish and wildlife species.
3. To describe the biodiversity of the Metro region.

There are 294 known native vertebrate species in the Metro region. Ninety-three percent use riparian areas, with 45 percent dependent on those areas to meet life history requirements. Eighty-nine percent of all terrestrial species in the Metro region use upland habitats, with 28 percent depending on these habitats.

In the Metro region several species of wildlife species are listed as threatened under the federal and state Endangered Species Acts. There are also numerous species that are identified as at risk both by the state and federal agencies. However, in this region we still have substantial wildlife habitat worth protecting and restoring for the purpose of retaining existing species and preventing future ESA listings.

The Goal 5 rule states that the wildlife habitat inventory process shall contain, at a minimum, threatened, endangered, and sensitive wildlife species habitat information; sensitive bird site inventories; and wildlife species of concern and/or habitats of concern identified and mapped by ODFW. For each resource site Metro has gathered existing and new data on sensitive species

sighting locations, sensitive bird sites, and wildlife species and habitats of concern; linked sensitive wildlife species to their habitat needs; and estimated the amount of potential habitat available. These procedures are described in the following section.

Species of Concern: data sources, limitations and applications. Metro has gathered information from a variety of knowledgeable sources including ODFW, ORNHP, Metro Parks and Greenspaces, Audubon Society of Portland, local wildlife experts, and our own fieldwork that documents known sensitive species sightings, sensitive bird site inventories, and wildlife species of concern (hereafter termed "Species of Concern"). The current Species of Concern inventory includes a total of 344 sightings, including 43 sensitive plant locations included at the request of USFWS. About a quarter of these sightings are from our own data, a third each from ODFW and ORNHP, and the remainder from a variety of local experts. Note that many of these sightings fall outside of designated resource sites, reflecting the importance of the natural lands surrounding the urban region. These sightings were mapped as a GIS coverage that can be overlaid on the existing wildlife habitat inventory. When possible, species sightings were linked directly to a wildlife habitat patch in the current inventory, but in many cases this was not possible due to lack of data precision. For this and other reasons described below, there are limitations to the data and its availability. Thus in this Goal 5 inventory we present Species of Concern data in a non-specific manner by resource site, listing what is known to have been sighted within the watershed(s). We also estimate the amount of existing habitat for sensitive species. This is consistent with the Goal 5 rule, which requires sensitive wildlife species *habitat* information. Where sufficient information was available, we also mapped specific areas known to provide critical habitat to a sensitive species, and these are included as one type of "Habitats of Concern" (described below).

Sensitive species data for the metro region is sparse and has not been systematically collected for all species by any entity. There are good reasons for the lack of data; first, it would be prohibitively expensive to scientifically conduct biologically valid surveys for the region and would take more resources than any one agency has at this time. It would also be very time-consuming, probably taking years to accomplish even with adequate financial resources. In fact, although our data sources extended back as far as the 1800s, we included only species sightings since the inception of the Goal 5 rule in the early 1970's. Second, sensitive species are rare and difficult to detect by nature, making such surveys even more difficult. The most appropriate types of surveys would measure reproductive success and species-habitat associations, and these are very intensive types of studies in which researchers are typically only able to consider one or a few species at a time. Third, habitat patches not preserved as parks or open spaces typically contain multiple tax lot owners. Permission would need to be gained in advance to inventory each patch, and not all landowners would be willing to give such permission. As a result, sensitive species sightings would be biased towards public lands, but public lands are already protected to varying degrees thus are not as vulnerable to loss compared to unprotected lands. Fourth, such surveys may be limited to one or two seasons of the year, depending on the suite of species. For example, ODFW has identified the entire group of Neotropical migratory songbirds as a sensitive group in the Willamette Valley (Goggans and Boulay 1999), but these species only breed here, migrating south of the US border to overwinter. Adding further difficulty, some sensitive species information may not be generally released to the public due to potential harm to sensitive wildlife species, thus greatly complicating protection schemes.

Although these drawbacks limit the existing data's appropriateness in judging the relative value of different habitat patches, such data can provide useful information for sensitive species

management within each resource site by linking sensitive species' habitat needs to the amount of available habitat.

Metro's Vertebrate Species List (Appendix 7) includes state, federal, and Oregon Natural Heritage Program (ORNHP) sensitive species status information, as well as species-habitat relationship information for each sensitive species based on Johnson and O'Neil's (2001) information. The section below entitled "Sensitive species accounts" provides a brief species account for each sensitive species. The steps for including Species of Concern sightings in the inventory were as follow:

1. Use Metro's Vertebrate Species List to identify Species of Concern known to occur in the region, and the habitat(s) with which each species is closely associated.
2. Gather sensitive species data from knowledgeable sources, including: ODFW, USFWS, Oregon Natural Heritage Program, and other sources of field data.
3. Map Species of Concern sightings using GIS. Use a 3-tiered coding system to indicate how certain we are that the species was actually detected in a particular habitat patch. In the inventory narrative, indicate which Species of Concern have occurred in each resource site since 1972 (the 1972 cut-off was selected by consensus of the Goal 5 Technical Advisory Committee; this time frame generally matches the inception of the Goal 5 rule).
4. Crosswalk habitat patches contained in the Wildlife Habitat inventory with Johnson and O'Neil's (2001) habitat classification scheme to obtain a generalized estimate of the amount of each habitat type available within each resource site.

Of the 48 extant (still existing in the metro region; seven more are extirpated) non-fish species on the Species of Concern list, 73 percent are habitat specialists (most often riparian, oak or grassland). Specialization on a habitat type is indicated by a double XX in the Habitat Type column of Appendix 7. Of those sensitive species that are not considered habitat specialists, most depend on large wood or snags, resources that tend to decline in small habitat patches and in urban areas (Cline and Phillips 1983; Booth et al. 1997; May et al. 1997; Maser et al. 1988).

Evidence links sensitive species declines to sensitive habitat declines in our region. For example, native grasslands have virtually disappeared from the metro region, and birds depending on this habitat show substantial declines over the past several decades (Table 8). However, although long-term (since 1966) population trends for bird species are available through Breeding Bird Surveys (Sauer et al. 2001), many sensitive species in the metro region now occur in numbers too low to estimate trends through this source. Nonetheless, changes over time can be detected for species still occurring in sufficient abundance to allow estimation, and trends for the Portland-area route may be compared with statewide trends, as shown in Table 8. Note that these population trend changes are *per year* – some of these declines over the long term are quite precipitous; for example, California Quail Breeding Bird Survey detections are declining at an average rate of nearly eleven percent per year. These trends can be viewed on the following USGS website:

http://www.mbr-pwrc.usgs.gov/bbs/bbs.html

The route for the Portland metro region is ORE-002, Tualatin. It cuts a 24-mile swath through the central/south-central Portland metro region; birds are surveyed each year at the same points, every half mile.

Table 8. Long-term Breeding Bird Survey trends for grassland specialists occurring in the metro region. Trends represent percent change per year.

Species	Portland region trend (% decline per year)	Statewide trend (% change per year)
California Quail	-10.6	No significant change
Common Yellowthroat	-3.5	+ 3.6
Vesper Sparrow	Numbers too low to estimate	No significant change
Savannah Sparrow	-6.3	No significant change
Western Meadowlark	Numbers too low to estimate	No significant change
Ring-necked Pheasant*	-8.0	-2.0

* Breeding Bird Survey trends from 1966 through 2000 (statewide trends through 1999).
** Non-native species included to illustrate effects of habitat loss.

Species trends in the Portland area compared to statewide trends confirm that as a group, grassland-dependent bird species are faring poorly in the metro region, both in their own right and compared to statewide trends. Vesper Sparrows were last detected during Breeding Bird Surveys in 1988, and Western Meadowlarks, Oregon's state bird, were last detected in 1968. These birds were formerly relatively common breeders here. Agricultural lands are typically where grassland-dependent species may presently be found in our region, adding to the importance of retaining low-structure vegetation within 300' of waterways in the regional wildlife habitat system.

Sensitive Species Accounts

Below is a brief account of the habitat needs and reason(s) for sensitive status for each sensitive species on Metro's list, synthesized with permission from ODFW, USFWS, The Nature Conservancy, and NatureServe Explorer (featuring data derived from state Natural Heritage Program conservation data centers). Species' scientific names are given in Metro's Vertebrate Species List (Appendix 7). At the time of this writing a new "Birds of Oregon" book is being compiled by David Marshall, and a partial draft list of Oregon species accounts is available online at http://www.osu.orst.edu/pubs/birds/bogr/accounts.htm. Further wildlife information may be obtained via Johnson and O'Neil (2001).

Cope's Giant Salamanders need streams and seepages in moist conifer forests. Restricted distribution and habitat destruction, as well as potential demand by collectors because of rare status, are listed as reasons for sensitive status (ODFW 1996). Habitat specialist: riparian wetlands.

Cascade and Columbia Torrent ("Seep") salamanders need cold clear springs and small headwater streams (especially those associated with old-growth forests). Very sensitive to microclimate conditions, and die if they dry out. ODFW cites lack of adequate protection for headwater streams and spring habitats as a reason for sensitive status, commenting that this may result in extinctions. Effective conservation of this species should include headwater riparian buffers (ODFW 1996). Habitat specialist: riparian wetlands.

Clouded Salamanders occur in forests and forest openings, especially those created by fire. They occur under loose bark in decayed snags and logs, and ODFW cites loss of snags and large woody debris and older forest structures as a reason for their decline (ODFW 1996). This species is not a habitat specialist but relies on specific habitat elements, including large wood.

Oregon Slender Salamanders are most common in mature and old-growth forest, but also occur in second growth. These salamanders are associated with dead and decaying wood; they also occur on talus areas. Loss of snags and large woody debris and habitat fragmentation are cited as reasons for sensitive status (ODFW 1996). This species is not a habitat specialist but relies on specific habitat elements, including large wood.

Western Toads occur in humid areas with dense cover, and rely on damp woody debris or burrows during dry weather. They breed in springs, ponds, shallow areas of lakes, and slow moving streams. Possible causes for decline include increases in UV-B radiation or pathogenic funguses, according to ODFW. Given their life history requirements, it is also likely that loss of large woody debris and microclimate changes associated with loss of riparian forests negatively affect this species (ODFW 1996). Habitat specialist: water, herbaceous and riparian wetlands.

Tailed Frogs take about 12 years to reach reproductive maturity, the longest development period of any frog. These animals require cold, fast-flowing perennial streams in forested areas. Adults feed on invertebrates from rocks and downed logs near streams, and are only active during periods of very high humidity. This species has the lowest known temperature requirements and the narrowest temperature ranges of any of our region's frog species. Reasons cited for population declines are environmental changes, including sedimentation and water temperature increases; they disappear from logged or disturbed areas, presumably due to water temperature and microclimatic changes causing local extinctions. These problems are exacerbated by habitat fragmentation. Conservation efforts should include elimination of timber harvest adjacent to aquatic habitats used by these animals, and provision of buffer strips along streams (ODFW 1996). Habitat specialist: riparian wetlands.

Northern Red-legged Frogs inhabit marshes, ponds, and streams with little or no flow, and use seasonal waters if wet until late May or early June. Stems below the water line are needed for egg attachment. These frogs often use dense hardwood stands with heavy ground cover. Possible causes cited for decline include displacement by introduced bullfrogs and pesticide and herbicide runoff (ODFW 1996). Habitat specialist: water, herbaceous and riparian wetlands, westside lowlands coniferous-hardwood forests.

Oregon Spotted Frogs (extirpated) are a highly aquatic species that is now absent from the western side of the Cascade Mountains; they disappeared from the Willamette Valley in the 1950's. It was once common here, and may still occur in isolated sites in western Oregon or Washington that lack bullfrogs. These animals require marshy pond or lake edges, or algae-covered stream overflow pools; in our area they occurred along the edges of slow-moving streams. Their extirpation coincides with the introduction and spread of bullfrogs, which probably predate tadpoles and adults. They are sensitive to toxins (ODFW 1996). Habitat specialist: water, herbaceous and riparian wetlands.

Painted Turtles are one of two native Pacific Northwest turtles, and require slow-moving or still, shallow waters with soft bottoms, basking sites, and an abundance of aquatic vegetation. They may colonize seasonally flooded areas near permanent water. Nesting occurs in soft soil in open areas up to several hundred yards from water. These animals need floating logs for basking sites. Possible reasons for decline include lack of recruitment, possibly due to hatching predation by bullfrogs; habitat destruction; declines in the quality and quantity of wetlands; and human actions including shooting and collecting. Nonnative turtles such as Red-eared sliders pose a threat in terms of transmitting pathogens. Conservation measures should include keeping habitats as free of bullfrogs and carp as possible, prevention of shooting the animals, and

prevention of the release of nonnative turtles (ODFW 1996). Habitat specialist: water, herbaceous wetlands.

Western Pond Turtles in our area are the Northwestern subspecies. They require marshes, sloughs, oxbows, ponds, vernal pools, slow-moving sections of rivers and streams, and some reservoirs. They need basking sites such as floating logs, plants, and vegetation mats, as well as rocks, and mud banks. They may hibernate in soil or duff up to 1,600 feet from water; egg-laying may occur up to 1,300 feet overland, with holes dug in moist soil, typically in clayey soils with sparse grass/forb vegetation. Reasons cited for decline may include nest destruction from farm and development practices and aquatic, riparian, and upland (nesting) habitat destruction. Dams, drainage, channelization, and other hydrologic alterations are other possible reasons, generally resulting in simplified riparian ecosystems. Carp, which eat native plants, and reed canary grass invasions are other reasons cited, as well as mortality due to humans from shooting, cars, collection, and an upper respiratory disease. Conservation measures include those cited for Painted turtles (ODFW 1996). Habitat specialist: water, herbaceous and riparian wetlands.

Sharptail Snakes need conifer forest or oak-grassland edges, often near streams or damp areas of stable talus slopes. They may be found in moist rotting logs, moist talus, and under rocks, boards, or other objects. They feed on slugs. These reptiles are rare, declining, and now occur only in isolated populations, putting them at risk of large-scale extirpation. Reasons cited for decline include habitat destruction through urban development, logging, and other land use practices that reduce or destroy decaying logs and other cover (ODFW 1996). This species is not a habitat specialist but relies on specific habitat elements, including large wood.

Horned Grebes regularly occur inland during migration, but are not known to breed in our area. The need marshy areas and wet meadows. Reasons cited for decline include extremely limited population numbers and unstable breeding area conditions. Habitat specialist: water and herbaceous wetlands (ODFW 1996). BBS population trends: Portland route and statewide: insufficient data. US: no significant change.

California Condor occurred in the distant past in Oregon, as detected by the Lewis and Clark expedition. During the Pleistocene era (10,000 to 100,000 years ago) the condor ranged throughout the west; with the extinction of the large Pleistocene Era mammals, condors declined in range and numbers. Another large decline occurred when European settlers arrived on the West Coast, and accelerated during the gold rush of 1849. Current captive breeding and reintroduction programs are underway. Habitat and prey loss, power line deaths, and toxins are implicated in their extirpation. There are currently 58 birds in the wild, and first wild-laid condor chick in 18 years hatched successfully this year (USFWS 2001). No BBS data.

Dusky Canada Geese are medium-large, very dark geese and comprise one of seven subspecies of Canada Goose wintering in western Oregon. They do not breed here, but regularly overwinter in the Willamette Valley. These birds feed in pastures and certain agricultural crops, and rest on water rather closer to brush and trees than other subspecies. Reasons cited for this subspecies' decline include low population numbers, poor recruitment due to predation on the nesting area, and hunting mortality. Management issues have arisen due to conflicts between all Canada Geese and agricultural uses. Hunting restrictions are currently in place (ODFW 1996). Habitat specialist: water, herbaceous wetlands, agricultural lands. No BBS data for subspecies.

Aleutian Canada Geese are another subspecies of Canada Geese; they use the Willamette Valley and Sauvie Island as stopover habitat, and some may winter in western Oregon. In the Willamette Valley, they use pastures and croplands that are in grasses and grains. These birds were federally listed as endangered in 1967, but reclassified to threatened in 1990; a recovery plan has been in place for some time, and included establishment of the Nestucca Bay National Wildlife Refuge on the Oregon Coast. Numbers of the western population have been built up.

The primary reasons cited for their decline is predation by introduced foxes in their northern breeding grounds (ODFW 1996). Habitat specialist: water, herbaceous wetlands, agricultural lands. No BBS data for subspecies.

Harlequin Ducks migrate between turbulent mountain streams and the ocean. Pairs have been observed during the breeding season in the Clackamas River. These birds need clean, fast-flowing water with an abundance of riffles and rapids and a mixture of rocky stream bottoms. The eat macroinvertebrates. They nest beneath multi-layered forest canopies in a variety of forest ages. They seem to prefer streams with minimal human activities. This species has low population numbers and low reproduction rates. Potential reasons for decline include forest removal, road building, and other disturbances resulting in altered hydrology, because these birds nest near water and need good macroinvertebrate communities in the stream (ODFW 1996). Habitat specialist: water, riparian wetlands. No BBS data.

Bufflehead are rare breeders in Oregon and the sensitive status only applies to the breeding population; it is unlikely that they breed in our area. They winter throughout the state. During breeding season they require deep water lakes in montane forested areas; during winter they use lowland lakes and estuaries. They are a cavity-nester. Reasons for decline include low population numbers, shortage of natural cavities (loss of snags), and perhaps recreational activities. They will use artificial nest boxes (ODFW 1996). Habitat specialist: water, herbaceous wetlands. BBS population trends: Portland route insufficient data; statewide no significant change; US no significant change.

Barrow's Goldeneyes, like bufflehead, are only considered sensitive during breeding and likely do not breed here. They use montane lake habitats most of the year in Oregon. They are cavity nesters and consumer invertebrates. They are sensitive due to low population numbers combined with reliance on cavities for nesting. They will use artificial nest boxes (ODFW 1996). Habitat specialist: water. BBS population trends: Portland route and statewide, insufficient data; US no significant change.

White-tailed Kites are included here because they appear to be undergoing a range expansion to our area, and now occur in the Willamette Valley with some regularity. In the US, this species was nearly extinct by 1930 or earlier, but has now reoccupied parts of its range, with Oregon breeding records beginning in 1977. These birds prefer savanna, open woodlands, marshes, and agricultural fields, where they typically nest in trees near a marsh. They are not on the state or federal fish and wildlife agencies' at-risk species lists, but are listed as "critically imperiled" during the breeding season by the Oregon Natural Heritage Program (NatureServe Explorer 2001). Habitat specialist: agricultural lands. BBS population trends: Portland route and statewide, insufficient data; US no significant change.

Bald Eagle immatures are often mistaken for Golden Eagles, because they do not attain white heads and tails until they are four or five years old. There are numerous recent breeding records in our area. During breeding season they need large, fish-supporting water bodies with large trees nearby for nesting. These trees are typically within a mile of water and are among the tallest in a stand. They return to the same nest area year after year. Habitat loss, PCB contamination, and residues from the pesticide DDT (now banned but still present in the Willamette Valley) are some of the reasons for this species' decline. DDT residues bioaccumulate in fat, and because Bald Eagles are high up in the food web they accumulate more of this poison, which prevents calcium uptake and results in egg-crushing during incubation. This remains a problem on the lower Columbia River. Many birds are also shot (ODFW 1996). Habitat specialist: water. BBS population trends: Portland route, insufficient data; statewide insufficient data (but trend looks positive); US +10.6%/year.

Northern Goshawks are found in a variety of mature forests, and nest in areas with dense overhead foliage or high canopy cover created by tall trees (typically old-growth). They occur in

the Willamette Valley during migration and winter, where they sometimes migrate over or stop in non-forested habitats. They appear to need large habitat patches, and that combined with the need for old-growth forest are likely factors in their decline. Pesticides and human disturbance are also implicated (ODFW 1996). This species is not a specialist as defined in our habitat scheme, but depends primarily on mature and old-growth forest. BBS population trends: Portland route insufficient data; statewide –14.3%/year; US no significant change.

Merlin are a widespread species of falcon that migrate from the north to overwinter in the Willamette Valley, typically in agricultural areas. Although not listed as at-risk by the state or federal wildlife agencies, this species is identified by the Oregon Natural Heritage Program as imperiled in Oregon during the breeding season. Merlin were known to breed historically in our area, but modern-day breeding here is unconfirmed. Merlin have been negatively impacted by pollution, including organochlorine pesticides such as DDT; populations in some areas of the US are now increasing. Habitat loss is also implicated in their population declines (NatureServe Explorer 2001). This species is not considered to be a habitat specialist. BBS population trends: Portland route and statewide, insufficient data; US no significant change.

American Peregrine Falcons are, happily, recovering in our area and now regularly nest on certain Portland bridges, where they catch and eat other birds, especially pigeons. The banning of certain pesticides and carefully planned reintroduction have greatly aided their recovery here. In the Pacific Northwest, they also nest on natural shelves, ledges, and potholes. Their habitat needs are extremely variable. As with Bald Eagles, they are high in the food web and are vulnerable to toxins; these birds were nearly extirpated from the lower 48 states, and their continuing recovery is largely attributed to the ban of organochlorine pesticides such as DDT (ODFW 1996). This species is not considered to be a habitat specialist. BBS population trends: Portland route and statewide, insufficient data; US + 54%/year.

Mountain Quail are largely extirpated from the metro area, although there have been one or two undocumented reports of recent occurrences in the west hills (per Eric Scheuering, Oregon Natural Heritage Program). They prefer hilly, shrubby habitats during the breeding season and usually nest within a few hundred meters of water. These birds are the only seasonally migratory quail in the US, often moving into the lowlands for winter. Declines in northwestern Oregon are suspected, but undocumented; they are still hunted in western Oregon (NatureServe Explorer 2001). The reasons for their present scarcity are not clear. This species is not considered to be a habitat specialist. Portland route: insufficient data. Statewide and US: no significant trend detected.

Band-tailed Pigeons are a large, beautiful native woodland pigeon that tend to use montane coniferous forests and oak woodlands. These birds need mineral springs and mineral graveling sites, especially during nesting, and display strong site fidelity to both mineral and nest areas. They move around based on food availability, and although forest nesters they often forage in towns and agricultural areas, sometimes visiting backyard feeders. Pacific Coast populations have declined steeply, losing an estimated 60% of the population in the last three or four decades. Declines are likely associated with widespread changes in forest landscapes and hunting that continues today; low reproductive rates are also a factor. More studies are needed on this sensitive species (NatureServe Explorer 2001). Habitat specialist: riparian wetlands, westside lowlands coniferous-hardwood forests, oak. BBS population trends: Portland route – 3.7%/year; statewide –1.8%/year; US –2.4%/year.

Northern Pygmy Owls are charming little owls about the size of the robin – which they eat, along with other birds and a variety of small mammals, reptiles, and insects. They are unusual for an owl in that they are primarily daytime animals. They are most common along forest edges and openings, and nest in tree cavities. They may be sensitive to habitat patch size and that, combined with their dependence on woodpecker-excavated snags and mixed-age

forests, probably contribute to their decline (ODFW 1996). Habitat specialist: westside lowlands coniferous-hardwood forests. Portland route: no data; statewide: insufficient data; US: +3.6%/year.

Northern Spotted Owls are extirpated from our area due to declines in habitat quality, quantity, and increased fragmentation. They are generally associated with old-growth forests and need uneven-aged, multilayered canopies. It is unlikely that they will re-occur here unless their habitat needs change or unless we are able to provide large, old-growth forest patches in the future. (ODFW 1996) No BBS data.

Common Nighthawks were once quite common in our area, but are virtually extirpated as a breeding species now. Nighthawks undergo one of the longest migration distances of any North American bird. Preferring open (often aquatic) habitats with abundant aerial insects, these birds formerly nested on graveled rooftops in the Portland area, but this dropped off precipitously by the 1980's. Nighthawks historically nested on gravely islands of the Willamette River, and may still nest on large riverine islands today (per Birds of Oregon website cited above). Riparian habitat loss, insecticides, loss of nesting substrate (river islands and gravel rooftops), car collisions, and the spread of crows (nest predators) into urban areas are possible reasons for their decline here (NatureServe Explorer 2001). This species is not considered to be a habitat specialist in the Johnson and O'Neil scheme, but individuals are often found near water.

Lewis' Woodpeckers are considered sensitive only to breeding populations, and are now extirpated as a breeding species in our area, but in the past were summer residents in every part of the state. They are sometimes associated with post-burn areas. These birds are declining throughout their range, probably due to oak/Ponderosa pine and cottonwood habitat loss; they need open areas for foraging (they often flycatch) and large trees for nesting. Nest-site competition from European Starlings, fire and flood control are also probably factors (ODFW 1996). Habitat specialist: oak.

Acorn Woodpeckers are oak-obligates, requiring forests with at least an oak component. They need open areas under a high canopy; park-like development in oak groves with the lower vegetation layers removed actually provide desirable habitat for this species. These birds store acorns in excavated holes in thick bark or soft dead wood. They also flycatch and sap-feed. Their presence is well-known at Pacific University in Forest Grove; although the species is declining, the populations here are actually a result of a northward range expansion over the past 40 years. The large oak trees required for this species are hundreds of years old, and most of the oak habitat in our region has been lost. Urbanization is implicated (ODFW 1996). Habitat specialist: oak.

Pileated Woodpeckers, the largest of Pacific Northwest woodpeckers, are widespread but declining. They are considered an indicator species for mature and old-growth national forests in Oregon, although they also use younger forests at times. They require a very large area for nesting and foraging. In western Oregon this species can forage in forests greater than 40 years old, but need 70-year old forests for nesting or roosting, a likely reason for their decline, along with habitat loss and fragmentation. They require an abundance of logs and snags for foraging, another likely reason for their decline (ODFW 1996). This species is not a habitat specialist but relies on specific habitat elements, including large wood.

Yellow-billed Cuckoos, relatives of the familiar roadrunner, were formerly common along the Columbia River west of the cascades, but they are extirpated from our area now. Western states populations' have nearly completely collapsed. These birds need large riparian forests, especially those with cottonwood overstories and willow understories; such formerly extensive habitats are largely vanished from the metro area at present, and where cottonwood is present it tends to be invaded by nonnative blackberries rather than willow. Habitat loss is the most likely reason for their decline. These losses are attributed to conversion of riparian habitats

to urbanization, agriculture, drainage, grazing, and disconnection from or development of the floodplain (cottonwoods are typically floodplain-associated). Pesticides and insect control may also be factors (ODFW 1996). Habitat specialist: riparian wetlands.

Olive-sided Flycatchers' "quick-three-beers" song is familiar to many birdwatchers. These birds nest along the edges of lakes, rivers, and beaver meadows and in open forest sites that have been cleared or burned. In our area they are typically found in a large habitat patch with older trees on the edges, a clearing in the middle, and one or more tall snags on which to perch and flycatch. They are widespread across North America and are declining substantially throughout their range. These are one of our longest distance migrants and as such, typically only get one chance at nesting because they arrive late and leave early. Potential causes for this species' decline include fire suppression, urban development, and deforestation along migration routes and on wintering grounds (The Nature Conservancy 1998a). Habitat specialist: westside lowland coniferous-hardwood forests. BBS population trends: Portland route –10.3%/year; statewide –5.0%/year; US –3.8%/year.

Willow Flycatchers are strongly associated with brushy riparian areas of willow and similar shrubs. They breed in our area along streams and other aquatic habitats, and are known to migrate along habitats similar to their breeding sites. They are susceptible to Brown-headed Cowbird parasitism, which reduces reproductive success. Habitat destruction and fragmentation are through to be the principal causes of decline in the west (The Nature Conservancy 1999b). Habitat specialist: riparian wetlands. BBS population trends: Portland route –8.6%/year (the data graph shows a steady decline to zero by 1996); statewide –5.6%/year; US –1.3%/year.

Streaked Horned Larks are grassland obligates, and the nearly complete loss of native grasslands in our area are the most likely reason for their decline here. They were formerly very common breeders in western Oregon, but are now severely depleted in population numbers and are virtually extirpated as a breeding species in the metro region; a few do breed here in very specific areas, and a few also winter here. The sensitive status only applies to breeding populations of this subspecies. These birds need sparsely vegetated open fields, and don't mind inhabiting disturbed areas such as overgrazed pastures; they dig a nest cavity in dry ground with sparse vegetation. Urban development and changes in farming practices are cited as likely reasons for this species' decline; for example, many former pastures are now producing grass seeds, and high nest mortality may result from farm practices such as mowing (ODFW 1996). Habitat specialist: grasslands.

Purple Martins are large, colony-nesting swallows that live along rivers and other water bodies and migrate south for the winter. They require unobstructed airspace to capture high-flying insects. They are cavity nesters and readily nest in artificial nest boxes; at present, the majority in our area are here because of nest boxes. Competition from other species – for nest cavities and foraging space – are among the likely factors for their decline, along with scarcity of nesting cavities. Nonnative European Starlings and House Sparrows probably usurp many suitable cavities prior to this species' arrival on the breeding grounds (ODFW 1996). Habitat specialist: water.

Western Bluebirds are considered a sensitive species in western Oregon interior valleys during the breeding season. This formerly common species has declined dramatically over the past seven decades, and is now confined to scattered sites of suitable habitat with artificial nest boxes. Through efforts such as the Prescott Bluebird Recovery Project in our area, the number of young bluebirds fledged per year has risen steadily over the past five years, with over 1,700 young fledged in 2001 due directly to citizen efforts. Bluebirds are cavity nesters, and their initial decline coincides with the spread of the more aggressive European Starling, which takes over cavity sites. Habitat and snag loss, insect control, and urbanization are other factors implicated in this species' decline (ODFW 1996). Habitat specialist: oak.

Yellow-breasted Chats are the largest of our warblers, and are long-distance migrants. They breed in second growth, shrubby old pastures, thickets, bushy areas, and low wet areas near water sources. They are widespread in the US but are virtually gone from our urban region. Threats to this species include habitat loss due to conversion to agricultural and urban land uses, and cowbird parasitism may also pose a threat. Habitat specialist: riparian wetlands (The Nature Conservancy 1998b). BBS population trends: Portland route –13.0%/year; statewide no significant change; US no significant change.

Oregon Vesper Sparrow is the Pacific Northwest subspecies of the widespread Vesper Sparrow; these birds winter south of the US border. This formerly common species' population is greatly reduced and fragmented, perhaps associated with loss of agricultural lands in our area and changes in farming practices; they are vulnerable to nest loss due to farming equipment. Loss of native grasslands due to urbanization is almost certainly a major factor in their decline here. They still apparently breed here, but only in a very few sites (ODFW 1996). Habitat specialist: grasslands, agricultural lands. BBS population trends: Portland route numbers too low to estimate; statewide no significant change; US –1.1%/year.

Tricolored Blackbirds are rare in our area, but apparently breed in at least one location. They are a colonial nester. In Oregon, these birds are typically found in cattail marshes or in Himalayan blackberry stands bordering wetlands. Reasons cited for sensitive status are small population numbers combined with inconsistent distribution patterns, making habitat protection difficult (ODFW 1996). Habitat specialist: herbaceous wetlands.

Western Meadowlarks are our state bird and were once quite common in the metro region but sadly, breed here only in very rare cases today. Virtually complete loss of native grasslands in our area has depleted this species. Farming practices are also implicated in this insect-eating, ground-nesting species, as is predation by birds and mammals. They appear to be prone to cowbird parasitism. Habitat development for these birds should include providing a variety of grassland types and heights, sparse woody cover, and high forb and grass cover. Protection of known nesting areas should be a priority wherever this species breeds in our area (The Nature Conservancy 1999a). Habitat specialist: grasslands, agricultural lands. BBS population trends: Portland route insufficient data (last occurred during 1968 survey); statewide no significant change; US –0.5%/year.

Yuma Myotis in western Oregon consists of a subspecies, *Myotis ymanensis saturatus*. Apparently widespread in Oregon this species, like many other bat species, will use human-made structures. They occur in urban, riparian, and mature conifer habitats in northwest Oregon, but are particularly associated with water, over which they feed. Little population data is available, and this species' status as a sensitive species appears to be somewhat uncertain. However, this species is especially noisy during rearing of the young, and as a result many colonies have been extirpated or destroyed as pests or through vandalism (ODFW 1996). This species is not considered to be a habitat specialist, although individuals are often seen near water.

Long-legged Myotis in western Oregon consist of the subspecies *Myotis volans longicrus*. As with Yuma Myotis, these bats are widespread in Oregon. In our area they can be found in agricultural, riparian, oak woodlands, and mature conifer forests. Maternity roosts have been found in snags and hollow trees, and maternity and hibernation sites are limited by microclimate (temperature and humidity). This species is listed as sensitive due to absence of information combined with dependence on snags, decadent trees, old and abandoned buildings, bridges, and caves for roosting and hibernacula; most of these components are declining in terms of presence and availability. Human disturbance is also an issue, as is true for all bats that hibernate, because disturbance interferes with energy and fat storage balances during hibernation periods. Riparian protection has also been found to be inadequate (ODFW 1996). Habitat specialist: westside lowland coniferous-hardwood forests.

Fringed Myotis are known to use a variety of habitats including forests, woodlands, and grasslands; nursery colonies and roosts occur in caves, mines, buildings, etc., but more studies are needed to detail their habitat needs. They are considered sensitive due to general rarity and susceptibility to human disturbance (ODFW 1996). This species is not considered to be a habitat specialist, although little is known about life history characteristics.

Long-eared Myotis in our area are the subspecies occurring west of the Cascades, known as *Myotis evotis pacificus*. These bats probably occur statewide in forested and riparian areas, and winter in Oregon, at least in low numbers. Similar to other Myotis species, Long-eared Myotis maternity roosts and hibernation sites occur in buildings, caves and mines. Their status as a sensitive species is somewhat uncertain due to lack of information, but this forest-dwelling bat is likely at risk due to habitat loss, including maternity and hibernation roosts. General dependence on snags, decadent trees, and coarse woody debris also puts them at risk, as does human disturbance. Unlike some other bat species, these bats tend to glean insects off of bark, etc., potentially putting them more at risk due to insecticides than non-gleaners (ODFW 1996). This species is not a habitat specialist but relies on specific habitat elements, including large wood.

Silver-haired Bats are fairly large bats that occur most commonly in forests. These beautiful bats are most abundant in old-growth Douglas-fir/Western hemlock forests and apparently need high snag densities. They roost in cavities in snags, old-growth bark crevices, and similar natural types of habitat; maternity roosts are almost exclusively in cavities and crevices in snags and trees. They forage over water. Silver-haired and other forest bats are assumed to be declining based on habitat loss. In our area, declines in forest cover, snags and large wood, and aquatic habitats are potential reasons for their decline (ODFW 1996). Habitat specialist: westside lowland coniferous-hardwood forests.

Hoary bats are solitary bats except during migration and mother-young associations. This species prefers deciduous and coniferous forests and woodlands, where it needs dense foliage above and open flying room below. Roosts and hibernacula may be found in rock crevices, tree trunks or cavities, and sometimes in a squirrel's nest or moss clump. Females may show high site fidelity. Forested habitat and snag losses are potential reasons for their decline in our area (NatureServe Explorer 2001). This species is not a habitat specialist but relies on specific habitat elements, including large wood.

Pacific Western (Townsend's) Big-eared Bats really do have very large ears, and the subspecies encountered west of the Cascades is *Plecotus townsendii townsendii*. They occur in a variety of habitats across the state, but the fragmented nature of their population reflects habitat fragmentation. This species is declining seriously in Oregon, with population declines of 58 percent west of the Cascades since 1975-85. These bats need undisturbed roost, nursery, and hibernation sites, with specific microclimate conditions. Disturbance and habitat destruction are cited as potential reasons for their decline; population declines are occurring in disturbed sites, whereas protected sites contain stable or increasing populations (ODFW 1996). Habitat specialist: water.

Western Gray Squirrels are the largest native squirrel with the bushiest tail in western states. It is often confused with the nonnative Eastern Gray Squirrel, which is likely much more common here now; to distinguish the two, look for silvery frosting, reddish on the backs of the ears, and general absence of reddish elsewhere on the native squirrel. Western Gray Squirrels occur in mixed age forests dominated by pine and/or oaks, and this habitat is greatly reduced in our area. They do occur in urban areas with adjoining natural habitat, and need connectivity in the canopy layer; they typically occur within 600 feet of water, where they eat pine seeds, acorns and hazelnuts. Washington State is currently considering a threatened status for this species. Reasons cited for this species' decline include very substantial habitat loss, fire suppression

causing shifts in forest composition from oak to conifer, competition from nonnative species (particularly in urban areas), and forest fragmentation (ODFW 1996). Habitat specialist: oak.

Camas Pocket Gophers are restricted to the Willamette Valley, where habitat has been substantially altered by urbanization and intensive agriculture. These solitary, relatively short-lived (3-year lifespan) animals are important ecosystem components as prey and because they influence soils, habitat heterogeneity, plant diversity, and soil productivity. They use unforested areas with rich soils in lower elevations, where they build complex tunnel systems. Their limited geographic range, combined with habitat loss/alteration, put them at risk (NatureServe Explorer 2001). Habitat specialist: agricultural lands.

White-footed Voles are a species of mouse occur only in western Oregon (primarily west of the Willamette Valley) and northwestern California. They are probably burrowing animals, but little is known about this extremely uncommon species. They occur in a variety of forest conditions, apparently along streams with an alder component, often in heavy cover consisting of downed logs and/or brush. It is considered at-risk due to its general rarity. In our area it is likely that habitat loss, including loss of large wood, contribute to their rarity (ODFW 1996). This species is not a habitat specialist but relies on specific habitat elements, including large wood.

Red Tree Voles' range is limited to western Oregon and possibly northwestern California, where they are thought to have very limited dispersal capability. This species' optimum habitat is old-growth Douglas-fir, although other coniferous forests may be used. Red Tree Voles are also associated with high percent canopy cover, high stump density, and shorter snags and logs. Presumably their sensitive status is due to loss of formerly widespread old-growth coniferous forests, as well as habitat fragmentation (NatureServe Explorer 2001). Habitat specialist: westside lowland coniferous-hardwood forests, oak.

Habitats of Concern: data sources, limitations and applications.

Unlike Species of Concern, Habitats of Concern may add acreage to the inventory or increase an existing habitat patch's relative value in the inventory. The formal criteria for Habitats of Concern are in Appendix 5, and the list of Habitats of Concern that have been accepted into the wildlife habitat inventory is in Appendix 8. The steps for identifying Habitats of Concern are outlined below.

First, Metro consulted with Oregon Department of Fish and Wildlife, US Fish and Wildlife Service, and other conservation organizations, as well as the Goal 5 Technical Advisory Committee to develop criteria for identifying Habitats of Concern. Based on these consultations, the following three categories were acknowledged as appropriate for identifying Habitats of Concern.

The first category recognizes regionally at-risk, or priority conservation, habitats. These habitats are at risk because they formerly covered much more extensive areas, and they tend to be declining in quality where they still remain. Oregon Department of Fish and Wildlife identifies grasslands, deciduous forests (oak and riparian), aquatic habitats, and urban natural area corridors as the top four Willamette Valley habitats at risk (Goggans and Boulay 1999). The Oregon Biodiversity Project, in which ODFW and USFWS are partners, identifies native prairie grasslands, oak habitats, wetlands, and bottomland hardwood forest as conservation priorities in the Willamette Valley (Defenders of Wildlife 2000). The Oregon-Washington chapter of Partners in Flight (ODFW and USFWS are partners; Partners in Flight 2000) considers grassland-savanna, oak woodland, and riparian forests to be priority conservation habitats. From these sources we conclude that native oak habitats, native grasslands, wetlands, and bottomland

hardwood forests are priority conservation habitats. Less than one percent of historic Willamette Valley native oak and grassland habitats still exists. Over 70 percent of the bottomland hardwood forests have been lost. In the Willamette Valley, various sources document wetland losses between 40-57 percent of original, with continuing losses of more than 500 wetland acres per year.

Wetlands are a Habitat of Concern in our area and we have excellent GIS data on this important resource. However, the GIS process used to model wildlife habitat patches set forth a minimum patch size of two acres, resulting in the omission of a substantial number of wetlands smaller than two acres. These small wetlands are known to be disproportionately important to the region's wildlife. For example, small wetlands are often free of non-native bullfrogs, unlike many larger wetlands; bullfrogs routinely eat amphibians and their egg masses, ducklings, and young turtles, as well as competing with native species for food and other habitat resources. To address this modeling drawback we added wetlands less than two acres that were excluded from the Wildlife Habitat modeling process into the inventory as Habitats of Concern. The result is that all wetlands in the wetland data layer – which consists of the National Wetlands Inventory, augmented or corrected by local wetland inventory information received by Metro (Appendix 2) – are included either in the Wildlife Habitat inventory or added as an HOC.

The second category recognizes the extraordinary and unique value of riverine islands and delta areas. Riverine islands and deltas provide unique habitat for migrating and nesting shorebirds, waterfowl, nesting terns and gulls, and other wildlife through enriched food resources, sand and mudflats, and protection from predators and disturbance (Iverson et al. 1996; Elliott et al. 1998; Fleskes et al. 2002). Macroinvertebrate communities are denser and more diverse around river islands and deltas (Thorp 1992). Bald eagles winter, breed, and forage on islands in our area, as strongly indicated by sensitive species data we collected and by researchers elsewhere in the Pacific Northwest (Garrett et al. 1993; Elliott et al. 1998; Watson and Pierce 1998; Parrish et al. 2001). Channel complexity and large wood, which are linked to island formation, have been substantially reduced from historic levels; protecting these areas is vital to maintaining healthy ecosystems and the species that depend upon them (Thorp 1992).

The third category recognizes known habitat patches providing unique or critical wildlife functions. Patches providing unique or critical wildlife functions are submitted and considered on a site-by-site basis for their importance in the inventory. Such habitats include areas that provide unusually important wildlife functions, such as major wildlife crossings/pathways or a key migratory pathway, such as an elk migratory corridor. Also eligible are important migratory stopover areas such as grassy hilltops, inter-patch connectors, and biologically or geologically unique areas such as rocky outcrops or talus slopes important to many herptiles and bats. Habitat vital for the life-history requirements of a sensitive wildlife species (for example, nesting or key passage habitat for an existing population of native turtles) or Great Blue Heron rookeries, or habitats that support at-risk plants, also fall into this category. These habitat areas submitted to Metro must be specifically delineated and submitted by wildlife experts or other knowledgeable parties.

Metro requested Habitats of Concern information through the Goal 5 Technical Advisory Committee, Greenspaces Technical Advisory Committee, ODFW, USFWS, Oregon Natural Heritage Program, and various wildlife experts, parks providers, and local jurisdictions (see Consultations, Table 6). Submitted sites were clearly delineated on a map or described in such a way as to allow precise mapping, and rationale given for their inclusion in the inventory as a

Habitat of Concern. Metro evaluated proposed HOCs based on the criteria described above and in Appendix 5 (see also Appendix 8). Sites or portions of sites that did not appear to meet the criteria were excluded, based on examination of the submitted information, criteria matrix, aerial photographs, and other GIS data resources. The Habitats of Concern maps and data were subsequently provided to local jurisdictions' planning directors for review and comment.

Habitats of Concern were mapped as a separate GIS layer and overlaid on the current (GIS-modeled) wildlife habitat inventory. The assumption is that all Habitats of Concern are, by their relative value or scarcity, high value habitats. A majority of submitted sites were already included in the inventory; in fact, only 1.3% of the entire wildlife habitat inventory consisted of HOCS outside of modeled habitat patches. Most HOCs also scored relatively highly in the model, providing positive feedback to the wildlife habitat modeling process and affirming the importance of these sites. However, some sites that did not score highly in the model – for example, low-structure vegetation along important connectivity corridors – were appropriately identified as highly important wildlife resources, providing a means to test and address potential GIS model shortcomings.

Fieldwork to assess mapping criteria

The Goal 5 rule specifically notes that "existing and available information" drives the inventory process, thus no field studies to validate inventory methods are required. However, Metro has undertaken a research program designed to test the GIS model on which its Goal 5 Inventory is based. Outside funding was required to develop the program and was not obtained until August 2001 (from USFWS), thus only partial findings will be available in time for Metro Council's determination of regional significance. The purpose of this study is to evaluate the model so that Metro can proceed with appropriate conservation, protection and/or restoration measures, and/or to identify potential imperfections in the model that can be corrected or improved. The ultimate goal is adaptive management based on biology.

Briefly, the field studies include three components. The first component relates to the wildlife habitat inventory (analyses completed), and the second and third relate to the riparian corridors inventory (analyses not yet completed).

1) Wildlife Habitat Assessments (WHAs): Metro revised an existing methodology (WHA; Appendix 9) based on extensive input from Oregon Department of Fish and Wildlife, U.S. Fish and Wildlife Service, and the City of Portland (who has extensively used a previous version of the methodology). This assessment relies on a team of biologists walking through a site, discussing its characteristics and scoring it based on the quality of water resources, vegetation (wildlife cover, food, native vs. nonnative plants, and structural complexity), and human influences. The revised method was successfully field-checked against quantitative data collected at 54 study sites in 1999 (Hennings 2001). It was also performed on 102 additional randomly selected natural areas. Abbreviated results for this part of the study and are presented in the next section.

2) Rapid Stream Assessment Technique (RSAT): Metro modified an existing qualitative methodology with help from other experts (e.g., Clean Water Services and Michael Cole of ABR. This procedure also relies on a biological team to measure parameters such as stream bank erosion, sedimentation within the channel, channel substrate composition, etc. It focuses on capturing the deleterious effects associated with urbanization. RSATs were conducted at all B-IBI sites (described next); sites will be scored and the scores compared against GIS model-generated scores to test for correlations with GIS model scores, similar to the statistical analyses employed to check the Wildlife Habitat model. We will also examine relationships between instream conditions and macroinvertebrate communities (see item 3).

3) Benthic Index of Biological Integrity (B-IBI): A B-IBI looks at the composition of the macroinvertebrate communities living at the bottom of a stream, compared to what is found in relatively undisturbed conditions. Macroinvertebrates are useful indicators of instream conditions because different types of macroinvertebrates respond differently to a variety of environmental parameters (e.g. sedimentation, stream temperatures, dissolved oxygen, etc.). Thus what is in the stream, and what is missing, reveals a great deal of information about stream habitat conditions. We sampled invertebrates at 55 sites in the Metro region based on Oregon Department of Environmental Quality's current methodologies; the samples will be analyzed by Dr. Judith Li's invertebrate lab at Oregon State University, but this data will not be available

until a later date. B-IBI scores will be correlated with GIS model scores to test for relationships. Because altered hydrology is known to negatively influence macroinvertebrate communities, we do not expect to see a tremendously strong correlation between B-IBI scores and GIS model scores (research throughout the US shows a typical downward B-IBI trend line with increasing urbanization). However, we hypothesize that sites with high GIS model scores will also receive higher B-IBI scores, after accounting for the level of urbanization in the watershed.

Results of Wildlife Habitat Assessments.

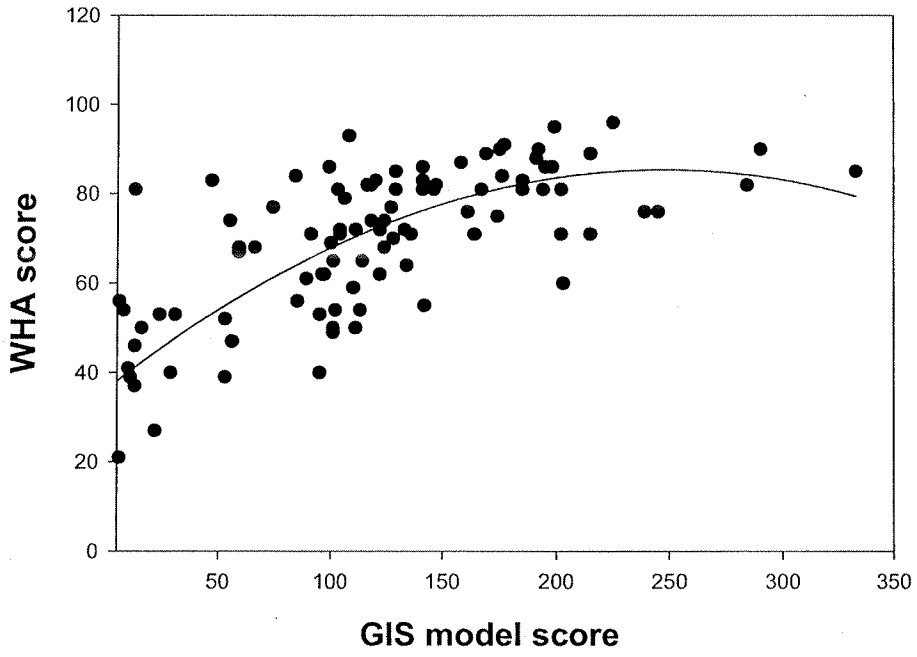
To test the substantially revised WHA protocol (Appendix 9), field crews first assessed 54 study sites for which we had quantitative plant data from 1999 (Hennings 2001). This quantitative data, including structural complexity and the relative amounts of native versus nonnative plants, was distilled into a "megavariable," or a cluster of variables that were statistically related both to one another and to bird communities. As scores for the megavariable increased, bird diversity and species richness increased, while the percentage of nonnative birds decreased. The protocol worked very well, based on linear regression of WHA scores against 1999 field scores ($p < 0.0001$, $r^2 = 0.62$). Thus, the WHA is an appropriate technique to measure the effectiveness of the GIS model in identifying habitat patches important to birds and presumably, other wildlife.

Metro subsequently conducted habitat assessments on 102 randomly selected habitat patches. A predetermined criterion for inclusion in the selection pool was that some part of each patch must include or be adjacent to public lands of some sort, so that field crews would have the ability to access the patch. Field crews also routinely asked for and received permission from landowners to enter the patch.

We statistically assessed (a) WHA scores versus each individual model criterion, and (b) WHA scores versus the model's overall performance. We examined scatterplots and conducted correlation analyses, simple linear regression (for individual variables) and multiple linear regression (for appropriate variable combinations) analyses to determine the significance of each criterion in the GIS model. Except for the species richness criterion, all model variables showed a relatively strong, statistically significant relationship ($p < 0.0001$) with field-based scores. The ONHP species richness criterion was statistically unrelated to field-based scores ($p > 0.1$), possibly due to the large spatial scale at which this data was mapped. The ONHP species richness model is currently being refined, and may well prove useful in the future. Mallow's cP statistic (a variable selection technique) suggested that the most appropriate model included four criteria: habitat patch size, interior habitat, connectivity to other patches, and water resources (Figure 1). The results of these analyses provided input into model refinement.

Field studies also revealed that some habitat patches were poorly defined due to the relatively large (24 m) raster size inherent in the satellite data used in the original model. In such cases we did not conduct WHAs but moved on to the next randomly selected habitat patch that was accurately delineated. However, this revealed the necessity to more accurately define patches based on hand-digitized forest canopy and low-structure vegetation, and the subsequent model version reflected this change.

Figure 1. Wildlife Habitat Assessment (WHA) field-based scores versus revised GIS Wildlife Habitat Model scores (based on size, interior habitat, proximity to other patches, and water resources).



To date Metro has reviewed the scientific literature pertaining to wildlife and habitats in urban ecosystems, created a corresponding model rating existing habitats in the region, and field-tested the model to assess its validity. We have adjusted the model to reflect our findings; the revised GIS wildlife habitat model is ecologically valid based on local field data. The success of the revised model scores in predicting "better" habitats – that is, the good structural complexity, higher percentage of native plants, and good food and water resources associated with enriched native bird communities – allows us to confidently proceed with inventorying the region's wildlife habitats. It provides important information concerning quantity and location of wildlife habitat patches and allows us to differentiate sites based on habitat quality.

Resource site analyses

Definition of resource sites (aggregations of subwatersheds)

The Goal 5 rule defines a "resource site" as "...a particular area where resources are located. A site may consist of a parcel or lot or portion thereof or may include an area consisting of two or more contiguous lots or parcels" OAR 660-23-010 (10). The Goal 5 rule also states that the inventory process may be followed for "a single site, for sites in a particular geographical area, or for the entire jurisdiction or urban growth boundary...." OAR 660-23-030(1). Metro has taken an ecological approach to defining resource sites by delineating subwatersheds and using these geographically specific areas as a focal point (i.e., resource site) for gathering and analyzing information on location, quality and quantity of the resource. A subwatershed is a subdivision within watersheds using the Hydrologic Unit Code (HUC) system, which is described below (see also Appendix 10).

The classic definition of a watershed is any area of land from which water, sediment, and organic and dissolved materials drain to a common point, such as a stream, river, pond, lake or ocean. Watersheds are hierarchical in nature, with small ones nesting within larger ones. In the mid-1970s, the U.S. Geological Survey (USGS) developed a standardized hydrologic unit system, referred to as the Hydrologic Unit Code (HUC) system. A hydrologic unit is a drainage area delineated to nest in a multi-level, hierarchical drainage system. The underlying concept of this system is a topographically defined set of drainage areas, based on scientific hydrologic and mapping principles, organized in a nested hierarchy by size. The advantage of this system is that it is nationally consistent, allowing for efficient sharing of information and resources and assuring the geospatial database is usable with other related Geographic Information System (GIS) databases (NRCS 2000). For these reasons, Metro chose to use the HUC system of delineating watersheds to allow future watershed planning efforts to be standardized and compatible with information generated by other agencies. Due to the standardized size of each unit, this system also allows for more accurate comparisons of watersheds across the region.

The HUC system initially divided the country into 21 regions, 222 sub-regions, 352 basins and 2,149 sub-basins. A hierarchical hydrologic unit code containing 2-digits for each of these four levels was assigned to the hydrologic units, forming the basis for the 8-digit hydrologic unit code. The geographic area (sub-basin) represented by the 8-digit standardized code is too large to adequately serve many types of water resource analysis and management needs. To address this problem, the Natural Resources Conservation Service (NRCS) mapped watersheds (5^{th} level) in the early 1980s for use in natural resource planning. In the mid-1990s, the NRCS along with State agency conservation partners, began a national initiative to delineate and digitize watershed (5^{th} level) and sub-watersheds (6^{th} level). Table 9 shows the six different levels of hydrologic units, the name, average size and an example of the hydrologic numeric coding. Appendix 10 includes information on HUCs, including definitions, HUC standards and maps of 4^{th}, 5^{th}, and 6^{th} field HUCs within the Metro boundary.

Table 9. Hydrologic Unit Code System

Hydrologic Unit Level (field)	Name of level	Size	Example	
			Name	Numeric Code
1	Region (21 units mapped)	Average: 177,560 sq. mi.	Pacific Northwest	**17**
2	Sub-region (222 units mapped)	Average: 16,800 sq. mi.	Willamette River	17**09**
3	Basin (352 units mapped)	Average: 10,596 sq. mi.	Willamette River	1709**00**
4	Sub-basin (2,149 units mapped)	Average: 450,000 acres	Lower Willamette River	17090012
5	Watershed (22,000 estimated units mapped)	40,000-250,000 acres	Johnson Creek	1709001201
6	Sub-watershed (160,000 estimated units mapped)	10,000-40,000 acres	Kelley Creek	170900120102

Source: NRCS 2000, Metro 2001

Sub-watersheds (6th level HUC) have not yet been delineated by the NRCS for the geographic area within Metro's jurisdiction. Therefore, Metro contracted with Ecotrust to delineate sub-watersheds within its jurisdiction using the HUC system mapping protocol. These delineated areas have not been reviewed by NRCS, but are sufficient for Metro's purpose of collecting and analyzing inventory information.

Table 10 shows the 11 watersheds and 41 subwatersheds that are either fully or partially within Metro's jurisdictional boundary. Some of these watersheds, such as Corral Creek and Chicken Creek, intersect the Metro boundary by only a small area. For ease of data collection and analysis, any subwatershed with less than 3,000 acres inside Metro's boundary is combined with an adjacent subwatershed that has a hydrologic relationship, if possible. In some cases, the sub-watersheds may be adjacent but without a hydrologic relationship. For example, Council Creek and Middle Tualatin River-Gales Creek (Cornelius/Forest Grove area) are combined, but are located in different watersheds (5th level HUC): Dairy Creek and Gales Creek (respectively). The cities of Cornelius and Forest Grove are split by these watersheds.

Combining the smaller subwatershed areas in Metro's boundary resulted in 27 resource sites, as shown in Table 11. The resource site analysis that follows this section provides more information on which subwatersheds were joined for data collection and analysis.

Table 10. HUC watersheds and subwatersheds in the Metro region.

WATERSHED (5th field HUC)	SUB-WATERSHED (6th field HUC)	12 digit HUC code	Total Acres	Acres in Metro
Columbia Gorge Tributaries West	Columbia River	170800010605	8,703.7	2,057.7
Gordon Creek/ Lower Sandy River	Lower Sandy River	170800012805	6,233.3	3,654.6
	Beaver Creek	170800012806	11,581.7	10,336.5
Scappoose Creek	Lower Willamette River	170900120201	32,898.7	32,899.0
	Columbia Slough	170900120202	54,396.3	53,571.9
	Multnomah Channel	170900120203	27,825.2	1,037.6
Johnson Creek	Johnson Creek-Sunshine Creek	170900120101	14,120.2	12,372.9
	Kelley Creek	170900120102	3,175.6	3,175.6
	Middle Johnson Creek	170900120103	8,949.4	8,949.5
	Lower Johnson Creek-Willamette River	170900120104	5,950.1	5,950.2
	Lake Oswego	170900120105	4,168.7	4,168.7
	Tryon Creek	170900120106	4,356.4	4,356.4
	Johnson Creek-Crystal Springs Creek	170900120107	7,844.6	7,844.6
	Mount Scott Creek	170900120108	11,809.5	11,809.6
Lower Clackamas River	North Fork Deep Creek	170900112205	8,757.7	2,644.3
	Richardson Creek	170900112206	17,969.2	3,821.2
	Rock Creek-Clackamas River	170900112208	14,103.1	11,120.6
Abernethy Creek	Corral Creek	170900070401	18,024.7	207.7
	Willamette River-Boeckman Creek	170900070402	19,678.9	7,283.4
	Beaver Creek	170900070403	20,476.0	2,867.1
	Abernethy Creek-Holcomb Creek	170900070404	21,388.4	3,180.3
	Willamette River-Lower Tualatin River	170900070405	6,589.2	5,356.3
Senecal Creek/Mill Creek	Molalla River	170900090105	5,977.6	125.632
Lower Tualatin River	Lower Tualatin River-Lake Oswego Canal	170900100501	15,230.8	15,230.9
	Upper and Middle Fanno Creek	170900100502	11,183.3	11,183.4
	Summer Creek	170900100503	3,900.6	3,769.1
	Lower Fanno Creek	170900100504	9,395.9	8,453.8
	Cedar Creek	170900100505	5,723.3	1,528.4
	Chicken Creek	170900100506	4,033.5	133.5
	Rock Creek (South Washington Co.)	170900100507	4,952.3	2,102.3
	Lower Tualatin River-Willamette River	170900100508	7,859.8	475.1
Rock Creek/Tualatin River	Middle Rock Creek-Tualatin River	170900100401	16,833.4	7,300.1
	Beaverton Creek	170900100402	24,296.7	24,296.8
	Lower Rock Creek-Tualatin River	170900100403	7,557.0	7,496.4
	Middle Tualatin River-Davis Creek	170900100404	6,801.9	1,220.7
	Middle Tualatin River-Gordon Creek	170900100405	9,043.4	3,594.8
	Lindow Creek	170900100407	10,210.0	752.5
Dairy Creek	West Fork Dairy Creek	170900100106	12,297.7	36.1
	Council Creek	170900100107	12,255.9	2,924.9
	McKay Creek	170900100108	20,443.0	3,842.7
Gales Creek	Middle Tualatin River-Gales Creek	170900100206	13,863.7	2,747.2

Source: Metro 2001

Table 11. Resource sites.

Resource site #	Sub-watershed name	Acres in Metro
1	Lower Sandy River-Columbia River	5,712.3
2	Beaver Creek-Sandy River	10,336.5
3	Willamette River-Boeckman Creek	7,616.7
4	Willamette River-Lower Tualatin River	11,403.7
5	Council Creek	5,708.2
6	McKay Creek	3,842.7
7	Middle Rock Creek-Tualatin River	7,300.1
8	Beaverton Creek	24,296.8
9	Lower Rock Creek-Tualatin River	8,717.2
10	Middle Tualatin River-Gordon Creek	4,347.3
11	Lower Tualatin River-Lake Oswego Canal	15,230.9
12	Upper and Middle Fanno Creek	11,183.4
13	Summer Creek	3,769.1
14	Lower Fanno Creek	8,453.8
15	Rock Creek (So. Washington Co.)	4,239.3
16	Richardson Creek	6,465.5
17	Rock Creek-Clackamas River	11,120.6
18	Johnson Creek-Sunshine Creek	12,372.9
19	Kelley Creek	3,175.6
20	Middle Johnson Creek	8,949.5
21	Lower Johnson Creek-Willamette River	5,950.2
22	Lake Oswego	4,168.7
23	Tryon Creek	4,356.4
24	Johnson Creek-Crystal Springs	7,844.6
25	Mount Scott Creek	11,809.6
26	Lower Willamette River	32,899.0
27	Columbia Slough	54,609.5

The sections that follow provide a summary of the information collected for each resource site. The number assigned to each resource site (1-27) corresponds to each map generated for Metro's Goal 5 inventory. The information is organized into eight sections by watershed (5th level HUC) as listed below.

- Columbia Gorge Tributaries West and Gordon Creek/Sandy River watersheds
- Abernethy Creek and Senecal Creek/Mill Creek watersheds
- Dairy Creek and Gales Creek watersheds
- Rock Creek/Tualatin River watershed
- Lower Clackamas River watershed
- Johnson Creek watershed
- Lower Tualatin River watershed
- Scappoose Creek watershed

The data gathered for Metro's inventory provides location, quality and quantity information for riparian corridors and wildlife habitat, which is required by the Goal 5 rule. All data in this document are based on Metro's jurisdictional boundary. Each section provides a summary of general watershed information. For example, Table A-1 provides information about the

subwatersheds within each watershed, the HUC code, and the acres inside Metro's jurisdictional boundary.

Other information contained in the various tables presented in each section include the following, where available:

- Miles of DEQ 303(d) listed streams
- Road density
- Miles of stream with known anadromous fish presence
- Acres of wetlands and floodplains
- Stream miles by channel type and total stream miles
- Vegetation types within 300 feet of a stream
- Number of building permits since 1996
- Characteristics of stream miles by resource site
- Riparian vegetation by resource site
- Regional zoning by resource site
- Acres within resource site by jurisdiction
- Acres providing ecological function within the riparian corridor
- Breakdown of ecological scores by acre
- Wildlife habitat by resource site
- Breakdown of wildlife model patch scores by resource site
- Breakdown of wildlife patch model scores by criteria
- Estimates of land cover type by resource site
- Estimates of wildlife habitat type availability by resource site
- Information on Habitats of Concern by resource site
- Information on Species of Concern sightings by resource site

The data tables for each 5th field HUC and resource site follow a textual description of the resource characteristics. **Note that all data relates to the area of the subwatershed that is contained within Metro's jurisdictional boundary.** Summary data tables are at the end of the Resource Site Analysis section. These tables allow easier comparison of the relative quantity and quality of riparian corridor and wildlife resources among resource sites.

Appendix 11 includes a bibliography of water quality reports. Also included are color site maps for the region (north, east, south and west sections), as well as black and white maps for each resource site depicting riparian and wildlife habitat inventory information.

A. Gordon Creek/Lower Sandy River and Columbia Gorge Tributaries West

General watershed information

Resource sites in the Gordon Creek/Lower Sandy River and Columbia Gorge Tributaries West Watersheds include:

- Lower Sandy River-Columbia River subwatersheds (combined)
- Beaver Creek-Sandy River subwatershed

Watershed assessments and plans

Bureau of Planning, City of Portland, 1989. *The Columbia Corridor Industrial/Environmental Mapping Project, April 20, 1989,* City of Portland: Portland, Oregon.

Community and Economic Development Department, City of Gresham, 1988. *Inventory of Significant Natural Resources and Open Spaces,* City of Gresham: Gresham, Oregon.

Stark, Daniel, 2001. *West of the Sandy River Rural Area, Natural Resource Inventory and ESEE Report,* Fishman Environmental Services: Portland, Oregon.

Watershed councils and related groups

Beaver Creek, Friends of, 104 SE Kibling Street, Troutdale 97060, 503-667-4960, Carolyn Taylor

Columbia Children's Arboretum Preservation Committee, 9509 NE 13th Ave., Portland 97211, Martha Johnson

Sandy Basin Watershed Council, PO Box 868, Sandy 97055, (503) 630-2382, FAX (503) 630-2341

Sandy River, Friends of, 503-663-2672, Rob Galasso

Wetlands, Friends of, 503-253-6247, Alice Blatt

Data descriptions

Table A-1 provides information about the subwatersheds within each watershed, the HUC code, and the acres inside Metro's jurisdictional boundary. Keying in on the resource site number will show how the subwatersheds are aggregated into the resource sites listed above.

The Gordon Creek/Lower Sandy River watershed contains two subwatersheds that are partially located within Metro's boundary: Lower Sandy River and Beaver Creek-Sandy River, comprising a total of 13,991 acres within Metro's jurisdictional boundary. Within the Columbia Gorge Tributaries West watershed, only a portion of one subwatershed (Columbia River) is in Metro's boundary (2,058 acres). The Columbia River subwatershed is combined with the Lower Sandy River subwatershed to comprise one resource site (now referred to the Lower Sandy River-Columbia River subwatershed, or Resource Site #1). The Beaver Creek-Sandy River subwatershed stands alone as a resource site (Resource Site #2).

Tables A-1 and A-2 provide general description about the 5th field and 6th field HUCs. Below these tables are descriptions of the riparian and wildlife habitat resources resource site.

Watershed data tables

Table A-1. Watersheds (5th level HUC), subwatersheds (6th level HUC), and acres within Metro jurisdictional boundary.

Watershed (5th level HUC)	5th field HUC code	Resource site #	Subwatershed (6th level HUC)	6th field HUC code	Acres in Metro
Gordon Creek/Lower Sandy River	1708000128	1	Lower Sandy River	170800012805	3,654.6
		2	Beaver Creek-Sandy River	170800012806	10,336.5
Columbia Gorge Tributaries West	1708000106	1	Columbia River	170800010605	2,057.7

Table A-2. Resource sites: general information.

General information	Lower Sandy-	Beaver Creek-
Miles of DEQ 303(d) listed streams	6.9	4.6
Road density (road miles/square miles in subwatershed)	3.8	9.4
Miles of stream with known anadromous fish presence+A5	6.0	11.2
Acres of hydrologically connected wetlands	304.4	202.7
Total acres of wetlands	318.3	205.8
Acres of floodplains (100 year FEMA + 1996 inundation area)	1,563.8	2,173.0
Acres of developed floodplains	40.8	59.6
Building permits since 1996 (number)	24.0	1,354.0

Table A-3. Characteristics of stream miles by resource site.

Resource site	Stream miles by channel type		Miles of stream links*	Miles of streams not categorized by channel type	Total stream miles
	Low to medium	*High*			
Lower Sandy-Columbia Rivers	11.2	4.1	0.1	8.3	23.7
Beaver Creek-Sandy River	17.0	0.0	10.7	17.7	45.4

*Stream links are links between surface streams and may be piped or culverted.

Table A-4. Riparian vegetation by resource site.

Resource site	Vegetation types within 300 feet of a stream (acres)			Forested vegetation >300 feet from a stream
	Low structure vegetation/intact topsoil	Non-forest woody vegetation	Forested vegetation	
Lower Sandy-Columbia Rivers	493.9	81.2	709.6	1,075.5
Beaver Creek-Sandy River	789.1	47.6	736.7	540.0

Table A-5. Regional zoning by resource site.

Resource site	Acres by zone within each resource site						
	Commercial	Industrial	Multi-family residential	Public/open space	Rural	Single family residential	Mixed use
Lower Sandy-Columbia Rivers	11.1	2.0	0.0	1,649.3	3,511.4	319.6	20.9
Beaver Creek-Sandy River	345.5	303.8	854.4	1,601.5	2,872.8	3,390.0	578.0

SITE #1: Lower Sandy River-Columbia River subwatershed

Named tributaries: Columbia River, Columbia Side Channel, Beaver Creek, Sandy River, Smith Creek
Communities within the subwatershed: Troutdale, unincorporated Multnomah County (see Table A-6)
Total acreage within Metro's boundary: 5,712.3 (combines Lower Sandy River and Columbia River subwatersheds)
Total acres within riparian corridor: 3,495.8

This site contains two percent of the area comprising Metro's jurisdictional boundary. About seven percent of the site is in the City of Troutdale, with the remainder in unincorporated Multnomah County (Table A-6).

This site is the least developed of all of the resource sites, with approximately 3.8 miles of road per square mile (Table A-2). Reflecting the rural nature of this resource site, the zoning is dominated by rural and public lands/open space (Table A-5); only 24 building permits have been issued here since 1996 (Table A-2).

Riparian resources. This resource site is rich with riparian resources, containing 24 total stream miles (Table A-3), or about 0.0041 miles of non-piped streams per acre (Table 12); only two resource sites contain higher stream densities. The low number of stream links suggest that few surface streams have been piped underground (Table A-3). However, seven miles, or 30 percent of total stream miles, are listed by the DEQ as 303(d) quality-limited (Tables A-2 and A-3). Anadromous fish are known to be present in six stream miles in this site (Table A-2). Low to medium gradient streams are most common here, reflected by the site's strong floodplain (27 percent of total) and wetland (six percent of total) components (Table A-2 and A-3). Less than three percent of the floodplain is developed.

The riparian corridor inventory reflects these characteristics, with this site ranking first among all sites in terms of the percentage of land (61%) within the site that is part of the riparian corridor inventory (Table 12). However, because of the relatively limited amount of this site's land falling within Metro's boundary, it contributes only about four percent of the region's total riparian resources (Table 13).

The quality of the riparian resources is high for this site, with about 40 percent of the acreage that falls within the riparian corridor inventory receiving primary scores for at least three of the five ecological functions (Table A-9). Sixty-three percent of the site's riparian corridors receive at least one primary ecological function score (Table A-9). This reflects, in part, the site's strong forest component (Tables A-4 and A-12), with the highest percentage of land receiving a primary score for *Large wood and channel dynamics* (Table A-8; see also Table 4 and Appendix 5 for description of ecological functions mapping). *Bank stabilization and pollution control* and *Streamflow moderation and water storage* are also key primary functions provided within this resource site. High amounts of streams, wetlands and forest make this site a very valuable natural resource in the region.

Wildlife habitat resources.
As is often the case, the factors that make this a valuable riparian resource site are also important to wildlife. Including Habitats of Concern, half of the lands in this site fall within the wildlife

habitat inventory, ranking it highest among all 27 resource sites (Table 16). Within model patches, a majority – about 65 percent – fall within the top third of the point range (Table A-10). Of the four criteria in the GIS model, this site is most strongly correlated with connectivity, with 86 percent receiving the top score (Table A-11). Notice that all wildlife habitats received low habitat interior scores, and this reflects the high level of stream resources and their linear nature (Table A-11). However, the relatively high percentage receiving mid-range size scores reflects the strong level of connectivity within the site.

Habitat types in this resource site are dominated by conifer/hardwood forest cover, but open water, riparian habitats, grasslands and agriculture also comprise a significant proportions (Table A-15). This site contributes 318 acres of wetlands, or four percent of the region's total, ranking seventh among the 27 resource sites. Herbaceous wetlands are the dominant type.

Species of Concern. Five Species of Concern sighting locations fall within the site. Each sighting may include one or more species; if a species occurs more than once in the resource site it is only listed once here. These include the following species:

- Northern Red-legged Frog
- Bald Eagle
- Pileated Woodpecker

There are very likely many other Species of Concern using this resource site, particularly those relying on Open Water, Herbaceous Wetlands, and forested habitats (see Table A-15). Examples of species likely to occur in this site may be found by referencing the species list in Appendix 7 and identifying the species with a double "XX" under each habitat type. General species needs and potential reasons for their decline are identified in the *Sensitive Species Accounts* section above. More detailed information on all species' needs can be obtained through Johnson and O'Neil (2001).

Habitats of Concern. A majority of the riparian corridor and wildlife areas are also identified as Habitats of Concern, attesting to their importance in the regional system of Goal 5 resources. Part of the Columbia River falls within the resource site, encompassing several important riverine islands (Gary, Flag, and part of Chatham Islands) that are HOCs. The Sandy River Delta provides invaluable wildlife habitat. The Habitats of Concern include substantial wetlands and bottomland hardwood forest. Several parks, including the Sandy River Delta parks complex, Troutdale Community Park, Lewis and Clark State Park, Dabney State Park, and some Metro-owned properties provide a significant amount of protection to these riparian areas. Sixty-six percent of all model patches are identified as Habitats of Concern (primarily bottomland hardwood forest and wetlands), and Habitats of Concern outside of model patches comprise about 14% of total inventoried wildlife habitat acreage (Table A-13).

The following Habitats of Concern are partially or wholly within this resource site. Using the Unique ID # (UID), please refer to Appendix 8 for information concerning each Habitat of Concern:

- UID numbers: 19, 90, 91, 92

Resource site data tables: Riparian Corridors

Table A-6. Acres within resource site by jurisdiction.

Jurisdiction	Acres within subwatershed
Troutdale	378.8
Unincorporated Multnomah County	5,333.6

Table A-7. Acres in Metro and riparian corridor.

Resource site	Total acres within Metro	Total acres within riparian corridor
Lower Sandy-Columbia Rivers	5,712.3	3,498.3

Table A-8. Number of acres within riparian corridor providing ecological function.

Resource site:	Ecological function	*Primary Value*		*Secondary Value*	
		Acres*	% of Total**	Acres	% of Total
Lower Sandy-Columbia Rivers	Microclimate & shade	615.8	17.6%	943.2	27.0%
	Streamflow moderation & water storage	1,610.8	46.0%	1,840.2	52.6%
	Bank stabilization & pollution control	1,637.9	46.8%	424.6	12.1%
	Large wood & channel dynamics	1,916.8	54.8%	196.4	5.6%
	Organic material sources	735.4	21.0%	137.7	3.9%

*Number of acres scored within the riparian corridor for each function
**Percent of total acres within the riparian corridor

Table A-9. Breakdown of ecological scores.

Resource site	Ecological Score	Acres	% of Total Acres
Lower Sandy-Columbia Rivers	1 to 5	1,306.7	37.4%
	6 to 11	251.6	7.2%
	12 to 17	558.3	16.0%
	18 to 23	686.3	19.6%
	24 to 29	387.3	11.1%
	30	308.1	8.8%
	Total acres	3,498.3	100.0%

Resource site data tables: Wildlife Habitat

Table A-10. Breakdown of total wildlife model patch scores.*

Resource site: Lower Sandy-Columbia Rivers	Number of acres in each wildlife score category									Total wildlife model patch acres in inventory
	1	2	3	4	5	6	7	8	9	
Model score	3.0	11.0	193.9	387.5	151.1	134.0	1,609.9	0.0	0.0	2,490.4
Percent of total	0.1%	0.4%	7.8%	15.6%	6.1%	5.4%	64.6%	0.0%	0.0%	100.0%

*Does not include Habitats of Concern outside of model patches.

Table A-11. Breakdown of total wildlife patch model scores by criteria.[1]

Resource site: Lower Sandy-Columbia Rivers	Number of acres by score for each model criterion												Total wildlife model patch acres in inventory
	Size[2]			Interior[2]			Water[3]			Connectivity			
	1	2	3	1	2	3	1	2	3	1	2	3	
Model score	620.3	1,408.1	0.0	1,874.9	0.0	0.0	150.6	1,899.4	375.4	38.6	305.1	2,146.7	2,490.4
Percent of total acres in inventory	24.9%	56.5%	0.0%	75.3%	0.0%	0.0%	6.0%	76.3%	15.1%	1.5%	12.3%	86.2%	na

[1]Does not include Habitats of Concern outside of model patches.

[2]These numbers do not add up to 100.0% because Type 2 patches (low structure vegetation within 300 feet of streams and wetlands) were not ranked for these criteria.

[3]These numbers do not add up to 100% because not all patches contained or were near water resources.

Table A-12. Breakdown of total wildlife model patch area by 2000 Metro photo interpretation landcover and known wetlands.*

Resource site: Lower Sandy-Columbia Rivers	Low structure vegetation within 300 feet of stream		Forested vegetation	Forested wetlands	Grass/shrub wetlands within 300 feet of a stream	Other wetlands	Total wildlife model patch acres in inventory
	Low structure vegetation/ Intact topsoil	Non-forest woody vegetation					
Acres	422.5	39.6	1,722.8	44.1	84.8	176.6	2,490.4
Percent of total	17.0%	1.6%	69.2%	1.8%	3.4%	7.1%	100.0%

*Does not include Habitats of Concern outside of model patches.

Table A-13. Total acres of inventoried wildlife habitat by type and total Species of Concern (SOCs).

Resource site: Lower Sandy-Columbia Rivers	Wildlife patches (acres)	HOCs inside Wildlife patches (acres)*	HOCs outside Wildlife patches (including wetlands <2 acres)	Total inventoried wildlife habitat acres	Total SOCs
Acres	2490.4	1894.2	392.6	2883.1	5
Percent of total	86.4%	65.7%	13.6%	100.0%	N/A

*Habitats of Concern.

Table A-14. Total area of model patches and Habitats of Concern by 1998 Landsat Landcover Area.

Resource Site: Lower Sandy-Columbia Rivers Landcover type:	Total area of wildlife model patches	Total area of HOCs outside of modeled patches (including wetlands <2 acres)	Percent of total inventoried habitat
Water	63.37	8.8	2.5%
Barren	38.39	35.1	2.5%
Low structure agriculture	242.78	6.8	8.7%
High structure agriculture	41.36	0.2	1.4%
Deciduous closed canopy	597.10	15.9	21.3%
Mixed closed canopy	899.28	2.7	31.3%
Conifer closed canopy	88.23	0.5	3.1%
Deciduous open canopy	33.25	5.8	1.4%
Mixed open canopy	43.01	0.8	1.5%
Conifer open canopy	2.77	0.0	0.1%
Deciduous scattered canopy	28.80	6.4	1.2%
Mixed scattered canopy	16.07	2.1	0.6%
Conifer scattered canopy	4.11	0.0	0.1%
Closed canopy shrub	38.13	14.5	1.8%
Open canopy shrub	14.38	5.3	0.7%
Scattered canopy shrub	25.05	8.7	1.2%
Meadow/grass	265.95	279.1	18.9%
Not classified	48.42	0.0	1.7%
Total	**2,490.43**	**392.6**	**100.0%**

The table below provides estimates of each type of the habitats described in Metro's Technical Report for Fish and Wildlife Habitat, based on Johnson and O'Neil's (2001) habitat scheme. These numbers are provided for subwatershed comparison purposes and represent *estimates* of available habitat type. Several data types were used to compile this table, and the data sources vary in their precision. For example, the satellite data sources are less accurate than hand-digitized forest canopy cover. There is also slight overlap between certain habitat types. For example, Riparian Wetlands (RWET) are also partially included in Westside Lowland Coniferous Hardwood/Westside Oak and Douglas-fir (WLCH/WODF) because some wetlands also contain forest, and Open Water (WATR) is not always considered part of habitat patches. Therefore, the sums of these habitat types are slightly different from the "Total wildlife habitat acres in inventory" shown in Table 16. Nonetheless, these numbers provide a generalized means of comparing the quality and quantity of habitat available to wildlife among and between subwatersheds. Note also that the estimates for Westside Grasslands (WEGR) probably represent grasslands that are not native rather than true native grasslands, which are largely extirpated from the metro region.

Table A-15. Wildlife habitat availability[1] based on Johnson & O'Neil's (2001) habitat types and species-habitat associations.

Resource site: Lower Sandy-Columbia Rivers	Habitat type						
	WATR[2]	HWET[3]	RWET[3]	TOTWET[3]	WLCH/ WODF[4]	WEGR	AGPA
Total acres	618.9	261.4	44.1	318.3	1,746.7	598.5	291.1
Percent of total	21.5%	9.1%	1.5%	11.0%	60.6%	20.8%	10.1%

[1]See Table A-14 for land cover types and crosswalk to Johnson and O'Neil's classification scheme.

[2]Note that patch type and data limitations result in an underestimation of open water habitats. For example, medium and small sized stream surfaces are excluded.

[3]Note that HWET and RWET do not represent the full suite of wetlands because some wetlands <2 acres were added in as Habitats of Concern, and some wetlands could not be associated with herbaceous or forested habitats. TOTWET represents the best estimate of all existing wetlands because it includes Habitats of Concern.

[4]Data limitations make it impossible to distinguish between these two habitat types at this time, and no comprehensive oak habitat survey has been conducted for the region. However, known oak habitats are also included in HOCs (see Appendix 10).

SITE #2: Beaver Creek- Sandy River subwatershed

Named tributaries: Beaver Creek, Columbia River, Columbia Side Channel, Kelly Creek, Sandy River
Communities within the subwatershed: Gresham, Troutdale, unincorporated Multnomah County
Total acreage within Metro's boundary: 10,336.5
Total acres within riparian corridor: 3,655.5

This site contains three percent of the area comprising Metro's jurisdictional boundary. Almost half (47 percent) of the site is in unincorporated Multnomah County, with the remainder in the cities of Gresham (37 percent) and Troutdale (16) (Table A-16).

Within the overarching watershed this resource site is more developed than the Lower Sandy-Columbia River, with 9.4 miles of road per square mile (Table A-2). The primary zoning is for single family residential, but there is also substantial rural and public/open space (Table A-5). Substantial development has occurred over the last few years; there have been 1,354 building permits issued since 1996 (Table A-2).

Riparian resources. The riparian corridor inventory comprises about 36 percent of the site's total land within the Metro boundary (Table 12). This site contributes about four percent of the region's total riparian resources (Table 13).

This resource site, similar to Site #1, is rich with riparian resources, containing more than 45 total stream miles (Table A-3). Non-piped stream density is slightly lower than Site #1, at 0.0034 miles per acre; the site ranks 15th among the 27 resource sites (Table 12). The miles of stream links, at 10.7, represents approximately 24 percent of the total number of stream miles, suggesting a significant amount of surface streams have been piped or culverted (Table A-3). However, a smaller proportion of streams are DEQ 303(d) water-quality listed in this site than in Site #1 (13 percent; Tables A-2 and A-3). Anadromous fish are known to be present in more than 11 stream miles (Table A-2). Low gradient streams are most common here, reflected by the site's strong floodplain (21 percent of total) and wetland (two percent of total) components (Tables A-2 and A-3). About three percent of the floodplain is developed, well below the average of 10.3 percent (Table 14).

The quality of the riparian resources is very high for this site, with about 58 percent of the acreage that falls within the riparian corridor inventory receiving primary scores for at least three of the five ecological functions (Table A-19). More than 75 percent of the site's riparian corridors receive at least one primary ecological function score (Table A-19). This reflects the site's strong forest component (Tables A-4 and A-22), with the highest percentage of land receiving a primary score for *Large wood and channel dynamics* (Table A-18; see also Table 4 and Appendix 5 for description of ecological functions mapping). *Bank stabilization and pollution control* and *Streamflow moderation and water storage* are also key primary functions provided within this resource site. High amounts of streams, wetlands and forest make this site a very valuable natural resource in the region.

Wildlife habitat resources.
Including Habitats of Concern, 24 percent of the lands in this site fall within the wildlife habitat inventory, ranking it 15th of the 27 resource sites (Table 16). Within model patches, 15 percent

fall within the top third of the point range, in contrast to Site #1 (Table A-20). Of the four criteria in the GIS model, this site tends to score low in size and habitat interior, moderate in water, and medium or high in connectivity (Table A-21). As with Site #1, the low habitat interior scores probably reflect the high level of stream resources and their linear nature (Table A-11). In general, this site's wildlife habitat resources are smaller and less connected than those in Site #1.

Habitat types in this resource site are co-dominated by conifer/hardwood forest cover and open water, with the most open water in this site of all 27 resource sites except Site #27, Columbia Slough. However, grasslands and agricultural lands also provide important habitat (Table A-25). This site contributes 206 acres of wetlands, or more than two percent of the region's total, ranking 12th among the 27 resource sites.

Species of Concern. Five Species of Concern sighting locations fall within the site. Each sighting may include one or more species; if a species occurs more than once in the resource site it is only listed once here. These include the following species:

- Painted turtle
- Northwestern pond turtle
- Red-legged frog
- Pileated woodpecker
- *Rorippa columbiae* (plant species)

There are very likely many other Species of Concern using this resource site, particularly those relying on Open Water, Herbaceous Wetlands, and forested habitats (see Table A-25). Examples of species likely to occur in this site may be found by referencing the species list in Appendix 7 and identifying the species with a double "XX" under the habitat. General species needs and potential reasons for their decline are identified in the *Sensitive Species Accounts* section above. More detailed information on all species' needs can be obtained through Johnson and O'Neil (2001).

Habitats of Concern.
The following Habitats of Concern are partially or wholly within this resource site. Using the Unique ID # (UID), please refer to Appendix 8 for information concerning each Habitat of Concern:

- UID numbers: 19, 89, 90, 91, 92, 143

Resource site data tables: Riparian Corridors

Table A-16. Acres within resource site by jurisdiction.

Jurisdiction	Acres within subwatershed
Gresham	3,845.0
Troutdale	1,617.8
Unincorporated Multnomah County	4,873.6

Table A-17. Acres in Metro and riparian corridor.

Resource site	Total acres within Metro	Total acres within riparian corridor
Beaver Creek-Sandy River	10,336.6	3,666.8

Table A-18. Number of acres within riparian corridor providing ecological function.

Resource site:	Ecological function	*Primary Value*		*Secondary Value*	
		Acres*	% of Total**	Acres	% of Total
Beaver Creek-Sandy River	Microclimate & shade	689.9	18.8%	527.4	14.4%
	Streamflow moderation & water storage	2,148.4	58.6%	1,455.3	39.7%
	Bank stabilization & pollution control	2,366.4	64.5%	117.3	3.2%
	Large wood & channel dynamics	2,586.8	70.5%	151.8	4.1%
	Organic material sources	927.4	25.3%	127.6	3.5%

*Number of acres scored within the riparian corridor for each function
**Percent of total acres within the riparian corridor

Table A-19. Breakdown of ecological scores.

Resource site	Ecological Score	Acres	% of Total Acres
Beaver Creek-Sandy River	1 to 5	906.4	24.7%
	6 to 11	186.1	5.1%
	12 to 17	444.9	12.1%
	18 to 23	1,260.6	34.4%
	24 to 29	483.0	13.2%
	30	385.9	10.5%
	Total acres	3,666.8	100.0%

Resource site data tables: Wildlife Habitat

Table A-20. Breakdown of total wildlife model patch scores.*

Resource site: Beaver Creek-Sandy River	Number of acres in each wildlife score category									Total wildlife model patch acres in inventory
	1	2	3	4	5	6	7	8	9	
Model score	13.0	124.1	518.7	302.5	336.0	502.3	321.7	0.0	0.0	2,118.3
Percent of total	0.6%	5.9%	24.5%	14.3%	15.9%	23.7%	15.2%	0.0%	0.0%	100.0%

*Does not include Habitats of Concern outside of model patches.

Table A-21. Breakdown of total wildlife model patch scores by criteria.*

Resource site: Beaver Creek-Sandy River	Number of acres by score for each model criterion												Total wildlife model patch acres in inventory
	Size[2]			Interior[2]			Water[3]			Connectivity			
	1	2	3	1	2	3	1	2	3	1	2	3	
Model score	1,220.6	87.7	0.0	1,115.1	0.0	0.0	26.6	1,538.1	498.5	230.9	911.2	976.3	2,118.3
Percent of total acres in inventory	57.6%	4.1%	0.0%	52.6%	0.0%	0.0%	1.3%	72.6%	23.5%	10.9%	43.0%	46.1%	na

[1]Does not include Habitats of Concern outside of model patches.

[2]These numbers do not add up to 100.0% because Type 2 patches (low structure vegetation within 300 feet of streams and wetlands) were not ranked for these criteria.

[3]These numbers do not add up to 100% because not all patches contained or were near water resources.

Table A-22. Breakdown of total wildlife model patch area by 2000 Metro photo interpretation landcover and known wetlands.*

Resource site: Beaver Creek-Sandy River	Low structure vegetation within 300 feet of stream		Forested vegetation	Forested wetlands	Grass/shrub wetlands within 300 feet of a stream	Other wetlands	Total wildlife model patch acres in inventory
	Low structure vegetation/ intact topsoil	Non-forest woody vegetation					
Acres	766.1	44.0	1,118.9	100.9	42.4	46.0	2,118.3
Percent of total	36.2%	2.1%	52.8%	4.8%	2.0%	2.2%	100.0%

*Does not include Habitats of Concern outside of model patches.

Table A-23. Total acres of inventoried wildlife habitat by type and total Species of Concern (SOCs).

Resource site: Beaver Creek-Sandy River	Wildlife patches (acres)	HOCs inside Wildlife patches (acres)*	HOCs outside Wildlife patches (including wetlands <2 acres)	Total inventoried wildlife habitat acres	Total SOCs
Acres	2118.3	943.7	317.3	2435.6	5
Percent of total	87.0%	38.7%	13.0%	100.0%	N/A

*Habitats of Concern.

Table A-24. Total area of model patches and Habitats of Concern by 1998 Landsat Landcover Area.

Resource Site: Beaver Creek-Sandy River Landcover type:	Total area of wildlife model patches	Total area of HOCs outside of modeled patches (including wetlands <2 acres)	Percent of total inventoried habitat
Water	43.02	22.6	2.7%
Barren	115.19	61.9	7.3%
Low structure agriculture	179.60	1.1	7.4%
High structure agriculture	118.11	0.8	4.9%
Deciduous closed canopy	745.09	17.6	31.3%
Mixed closed canopy	232.26	2.9	9.7%
Conifer closed canopy	46.98	0.4	1.9%
Deciduous open canopy	126.95	14.2	5.8%
Mixed open canopy	40.29	0.8	1.7%
Conifer open canopy	5.80	0.0	0.2%
Deciduous scattered canopy	59.08	8.4	2.8%
Mixed scattered canopy	30.89	1.4	1.3%
Conifer scattered canopy	5.63	0.2	0.2%
Closed canopy shrub	70.99	8.0	3.2%
Open canopy shrub	28.25	5.1	1.4%
Scattered canopy shrub	35.85	5.2	1.7%
Meadow/grass	234.01	166.6	16.4%
Not classified	0.31	0.0	0.0%
Total	**2,118.33**	**317.3**	**100.0%**

The table below provides estimates of each type of the habitats described in Metro's Technical Report for Fish and Wildlife Habitat, based on Johnson and O'Neil's (2001) habitat scheme. These numbers are provided for subwatershed comparison purposes and represent *estimates* of available habitat type. Several data types were used to compile this table, and the data sources vary in their precision. For example, the satellite data sources are less accurate than hand-digitized forest canopy cover. There is also slight overlap between certain habitat types. For example, Riparian Wetlands (RWET) are also partially included in Westside Lowland Coniferous Hardwood/Westside Oak and Douglas-fir (WLCH/WODF) because some wetlands also contain forest, and Open Water (WATR) is not always considered part of habitat patches. Therefore, the sums of these habitat types are slightly different from the "Total wildlife habitat acres in inventory" shown in Table 16. Nonetheless, these numbers provide a generalized means of comparing the quality and quantity of habitat available to wildlife among and between subwatersheds. Note also that the estimates for Westside Grasslands (WEGR) probably represent grasslands that are not native rather than true native grasslands, which are largely extirpated from the metro region.

Table A-25. Wildlife habitat availability[1] based on Johnson & O'Neil's (2001) habitat types and species-habitat associations.

Resource site: Beaver Creek-Sandy River	Habitat type						
	WATR[2]	HWET[3]	RWET[3]	TOTWET[3]	WLCH/ WODF[4]	WEGR	AGPA
Total acres	1,195.4	88.4	100.9	205.8	1,339.0	475.1	299.6
Percent of total	49.1%	3.6%	4.1%	8.4%	55.0%	19.5%	12.3%

[1]See Table A-24 for land cover types and crosswalk to Johnson and O'Neil's classification scheme.

[2]Note that patch type and data limitations result in an underestimation of open water habitats. For example, medium and small sized stream surfaces are excluded.

[3]Note that HWET and RWET do not represent the full suite of wetlands because some wetlands <2 acres were added in as Habitats of Concern, and some wetlands could not be associated with herbaceous or forested habitats. TOTWET represents the best estimate of all existing wetlands because it includes Habitats of Concern.

[4]Data limitations make it impossible to distinguish between these two habitat types at this time, and no comprehensive oak habitat survey has been conducted for the region. However, known oak habitats are also included in HOCs (see Appendix 10).

B. Abernethy Creek (and a small portion of Senecal Creek/Mill Creek)

General watershed information

Resource sites in the Abernethy Creek watershed include:

- Willamette River-Boeckman Creek (combined – Corral Creek, Molalla River & Willamette River-Boeckman Creek)
- Willamette River-Lower Tualatin River (combined – Abernethy Creek-Holcomb Creek, Beaver Creek, Willamette River-Lower Tualatin River subwatersheds)

Watershed assessments and plans

Bureau of Planning, City of Portland, 2001. *Portland's Willamette River Atlas,* City of Portland: Portland, Oregon.

Lev, Esther, 2001. *Wildlife Habitat Inventory for the Willamette River,* Environmental Consulting: Portland, Oregon.

Oregon Department of Fish and Wildlife (ODFW) and Unified Sewage Agency (USA), 1995. *Distribution of Fish and Crayfish and Measurement of Available Habitat in the Tualatin River Basin, Final Report of Research,* ODFW: Portland, Oregon and Unified Sewage Agency: Hillsboro, Oregon.

Tualatin River Watershed Council, 1999. *Tualatin River Watershed, Action Plan,* Tualatin River Watershed Council: Hillsboro, Oregon.

Tualatin Watershed Council, 2001. *Tualatin River Watershed Atlas,* Tualatin Watershed Council: Hillsboro, Oregon.

United States Geological Service (USGS), 2000. *Willamette Basin Ground-Water Study,* USGS: Portland, Oregon.

USGS, 1995. *NAWQA Willamette Basin Study,* USGS: Portland, Oregon.

Willamette Basin Task Force, Pacific Northwest River Basins Commission, 1969. *The Willamette Basin, Comprehensive Study of Water and Related Land Resources,* Pacific Northwest River Basins Commission: Portland, Oregon.

Willamette Basin Task Force, Pacific Northwest River Basins Commission, 1997. *The Willamette Basin, Recommendations to Governor John Kitzhaber,* Willamette River Basin Task Force: Portland, Oregon.

Willamette Restoration Initiative, 2001. *Restoring A River of Life, The Willamette Restoration Strategy Overview, February 2001,* Willamette Restoration Initiative: Portland, Oregon.

Willamette Restoration Initiative, 2001. *Restoring A River of Life, The Willamette Restoration Strategy – Recommendations for the Willamette Basin Supplement to the Oregon Plan for Salmon and Watersheds, February 2001,* Willamette Restoration Initiative: Portland, Oregon.

Watershed councils and related groups

Newell Creek Canyon, Friends of, PO Box 3, Oregon City 97045, 503-655-6471, James Dalton

Tualatin Watershed Council, 1080 SW Baseline, Bldg. B, Suite B-2, Hillsboro 97123, (503) 681-0953, FAX (503) 681-9772

Tualatin River National Wildlife Refuge, City of Sherwood, 90 NW Park Street, Sherwood 97140, 503-625-5522, Joan Patterson

Tualatin River Rangers, USA, 155 N First Ave., Hillsboro 97124, 503-640-3516, Linda Kelly

Tualatin Riverkeepers, 16340 SW Beef Bend Road, Sherwood 97140, 503-590-5813, Lauri Mullen

Upper Willamette River, Friends of, 541-752-3942, Sarvahara Judd
Wetlands, Friends of, 503-253-6247, Alice Blatt
Willamette River Restoration Committee, 541-484-9466, Timothy Green

Data descriptions
Table B-1 provides information about the subwatersheds within each watershed, the HUC code, and the acres inside Metro's jurisdictional boundary. Keying in on the resource site number will show how the subwatersheds are aggregated into the resource sites listed above.

The Abernethy Creek watershed contains five subwatersheds that are partially located within Metro's boundary: Corral Creek, Willamette River-Boeckman Creek, Beaver Creek, Abernethy Creek-Holcomb Creek, and Willamette River – Lower Tualatin River. Within the Senecal Creek/Mill Creek watershed, only a portion of one subwatershed (Molalla River) is in Metro's boundary. The Corral Creek, Willamette River-Boeckman Creek, and Molalla River subwatersheds are combined to comprise one resource site (now referred to the Willamette River-Boeckman Creek subwatershed, or Resource Site #3). The Beaver Creek, Abernethy Creek-Holcomb Creek, and Willamette River-Lower Tualatin River subwatersheds are combined and referred to as the Willamette-Lower Tualatin River subwatershed, or Resource Site #4.

Tables B-1 and B-2 provide general description about the 5th field and 6th field HUCs. Below these tables are descriptions of the riparian and wildlife habitat resources resource site.

Watershed data tables

Table B-1. Watersheds (5th level HUC), subwatersheds (6th level HUC), and acres within Metro jurisdictional boundary.

Watershed (5th level HUC)	5th field HUC code	Resource site #	Subwatershed (6th level HUC)	6th field HUC code	Acres in Metro
Abernathy Creek	170900704	3	Corral Creek	170900070401	207.7
			Willamette River-Boeckman Creek	170900070402	7,283.4
		4	Beaver Creek	170900070403	2,867.1
			Abernathy Creek-Holcomb Creek	170900070404	3,180.3
			Willamette River-Lower Tualatin River	170900070405	5,356.3
Senecal Creek/Mill Creek	170900901	3	Molalla River	170900090105	125.6

Table B-2. Resource sites: general information.

General information	Willamette River-	Willamette-Lower
Miles of DEQ 303(d) listed streams	1.5	6.0
Road density (road miles/square miles in subwatershed)	8.7	11.6
Miles of stream with known anadromous fish presence	2.0	8.6
Acres of hydrologically connected wetlands	362.5	85.7
Total acres of wetlands	365.0	85.7
Acres of floodplains (100 year FEMA + 1996 inundation area)	411.2	1,172.3
Acres of developed floodplains	32.8	229.4
Building permits since 1996 (number)	808.0	2,093.0

Table B-3. Characteristics of stream miles by resource site.

Resource site	Stream miles by channel type		Miles of stream links*	Miles of streams not categorized by channel type	Total stream miles
	Low to medium	*High*			
Willamette River-Boeckman Creek	4.5	0.1	9.4	17.7	31.5
Willamette-Lower Tualatin Rivers	14.6	3.1	7.5	17.8	43.0

*Stream links are links between surface streams and may be piped or culverted.

Table B-4. Riparian vegetation by resource site.

Resource site	Vegetation types within 300 feet of a stream (acres)			Forested vegetation >300 feet from a stream
	Low structure vegetation/intact topsoil	Non-forest woody vegetation	Forested vegetation	
Willamette River-Boeckman Creek	675.1	33.0	514.8	766.5
Willamette-Lower Tualatin Rivers	469.9	79.9	1,052.7	1,685.4

Table B-5. Regional zoning by resource site.

Resource site	Acres by zone within each resource site						
	Commercial	Industrial	Multi-family residential	Public/open space	Rural	Single family residential	Mixed use
Willamette River-Boeckman Creek	815.8	1,224.8	1,246.6	4.0	3,548.2	371.4	0.0
Willamette-Lower Tualatin Rivers	725.7	598.0	580.3	0.0	4,806.1	4,273.1	0.0

SITE #3: Willamette River-Boeckman Creek subwatershed

Named tributaries: Boeckman Creek, Coffee Lake Creek, Corral Creek, Mill Creek, Molalla River, Newland Creek, Seely Ditch, Willamette River
Communities within the subwatershed: Wilsonville, unincorporated Clackamas County, unincorporated Multnomah County, unincorporated Washington County
Total acreage within Metro's boundary: 7,616.7 (includes combined – Corral Creek, Molalla River & Willamette River-Boeckman Creek subwatersheds)
Total acreage within riparian corridor: 2,251.7

This site contains three percent of the area comprising Metro's jurisdictional boundary. More than half of the site falls within the City of Wilsonville (58 percent), with another four percent in Tualatin, 15 percent in unincorporated Clackamas County, and 23 percent in unincorporated Multnomah County (Table B-6).

This site contains 8.7 miles of road per square mile, falling in the second quartile (26-50 percent of maximum) of the range of development compared to other resource sites (Table B-2). It is somewhat less developed than the other resource site in the B group. The zoning is dominated by rural development types, but industrial and multi-family residential uses are also important (Table B-5). More than 800 building permits have been issued in this site since 1996 (Table B-2).

Riparian resources. Approximately 22 percent of the land in this site is part of the riparian corridor inventory (Table 12), lower than the regional average of 31 percent; it contributes 2.4 percent of the region's total riparian resources (Table 13).

This resource site contains 31.5 total stream miles, with about 0.0029 non-piped stream miles per acre, ranking it 18th among all resource sites. Thirty percent of all stream miles are stream links, suggesting that a substantial amount of original streams have been piped or culverted (Table 12). However, only seven percent of non-piped stream miles are 303(d) quality-limited (Tables B-2 and B-3). Anadromous fish are known to be present in two stream miles (Table B-2). The floodplain and wetland areas each comprise approximately five percent of the total area within Metro's jurisdiction; about eight percent of the floodplain is developed (Table B-2).

The quality of the riparian resources is moderate for this site, with about 31 percent of the acreage within the riparian corridor inventory receiving primary scores for at least three of the five ecological functions. Fifty-three percent of the site's riparian corridors receive at least one primary ecological function score (Table B-9). More acreage within 300 feet of streams is in low-structure, non-woody vegetation than in woody and forested vegetation (Table B-4). Reflecting this, the highest percentage of land receiving a primary score is *Bank stabilization and pollution control* (Table B-8; see also Table 4 and Appendix 5 for description of ecological functions mapping). *Large wood and channel dynamics, Streamflow moderation and water storage, and Organic material sources* are also important primary functions provided within this resource site.

Wildlife habitat resources.
Including Habitats of Concern, 27 percent of the lands in this site fall within the wildlife habitat inventory, ranking it 10th of the 27 resource sites (Table 16). Within model patches, 24 percent fall within the top third of the point range (Table B-10). Of the four criteria in the GIS model,

this site tends to score low in size and habitat interior, moderate to high in water, and moderate to high in connectivity (Table B-11). In general, this site's wildlife habitats are characterized by well-connected habitat patches with good water resources.

Habitat types in this resource site are dominated by conifer/hardwood forest cover, but wetlands and agricultural lands also provide substantial habitat (Table B-15). This site contributes 365 acres of wetlands, or more than four percent of the region's total, ranking fifth among the 27 resource sites.

Species of Concern. Two Species of Concern sighting locations fall within the site. Each sighting may include one or more species; if a species occurs more than once in the resource site it is only listed once here. These include the following species:

- Red-legged frog
- Band-tailed Pigeon
- Pileated Woodpecker

There are very likely many other Species of Concern using this resource site, particularly those relying on Herbaceous Wetlands, and forested habitats (see Table B-15). Examples of species likely to occur in this site may be found by referencing the species list in Appendix 7 and identifying the species with a double "XX" under the habitat. General species needs and potential reasons for their decline are identified in the *Sensitive Species Accounts* section above. More detailed information on all species' needs can be obtained through Johnson and O'Neil (2001).

Habitats of Concern.
The following Habitats of Concern are partially or wholly within this resource site. Using the Unique ID # (UID), please refer to Appendix 8 for information concerning each Habitat of Concern:

- UID numbers: 152, 153, 156

Resource site data tables: Riparian Corridors

Table B-6. Acres within resource site by jurisdiction.

Jurisdiction	Acres within subwatershed
Tualatin	281.3
Wilsonville	4,387.7
Unincorporated Clackamas County	1,165.2
Unincorporated Washington County	1,782.6

Table B-7. Acres in Metro and riparian corridor.

Resource site	Total acres within Metro	Total acres within riparian corridor
Willamette River-Boeckman Creek	7,616.8	2,248.1

Table B-8. Number of acres within riparian corridor providing ecological function.

Resource site:	Ecological function	*Primary Value*		*Secondary Value*	
		Acres*	% of Total**	Acres	% of Total
Willamette River-Boeckman Creek	Microclimate & shade	443.2	19.7%	690.3	30.7%
	Streamflow moderation & water storage	626.1	27.9%	1,468.9	65.3%
	Bank stabilization & pollution control	974.9	43.4%	31.1	1.4%
	Large wood & channel dynamics	859.0	38.2%	118.6	5.3%
	Organic material sources	579.5	25.8%	75.5	3.4%

*Number of acres scored within the riparian corridor for each function
**Percent of total acres within the riparian corridor

Table B-9. Breakdown of ecological scores.

Resource site	Ecological Score	Acres	% of Total Acres
Willamette River-Boeckman Creek	1 to 5	1,058.1	47.1%
	6 to 11	288.3	12.8%
	12 to 17	196.0	8.7%
	18 to 23	202.6	9.0%
	24 to 29	321.0	14.3%
	30	182.1	8.1%
	Total acres	2,248.1	100.0%

Table B-10. Breakdown of total wildlife model patch scores.*

Resource site: Willamette River-Boeckman Creek	Number of acres in each wildlife score category									Total wildlife model patch acres in inventory
	1	2	3	4	5	6	7	8	9	
Model score	36.7	128.1	361.1	282.0	417.2	320.8	277.6	217.5	0.0	2,041.0
Percent of total	1.8%	6.3%	17.7%	13.8%	20.4%	15.7%	13.6%	10.7%	0.0%	100.0%

*Does not include Habitats of Concern outside of model patches.

Table B-11. Breakdown of total wildlife patch model scores by criteria.*

Resource site: Willamette River-Boeckman Creek	Number of acres by score for each model criterion												Total wildlife model patch acres in inventory
	Size[2]			Interior[2]			Water[3]			Connectivity			
	1	2	3	1	2	3	1	2	3	1	2	3	
	1,258.0	252.2	0.0	1,276.5	0.0	0.0	244.0	985.1	721.0	243.3	813.4	984.3	2,041.0
Percent of total acres in inventory	61.6%	12.4%	0.0%	62.5%	0.0%	0.0%	12.0%	48.3%	35.3%	11.9%	39.9%	48.2%	na

[1]Does not include Habitats of Concern outside of model patches.

[2]These numbers do not add up to 100.0% because Type 2 patches (low structure vegetation within 300 feet of streams and wetlands) were not ranked for these criteria.

[3]These numbers do not add up to 100% because not all patches contained or were near water resources.

Table B-12. Breakdown of total wildlife model patch area by 2000 Metro photo interpretation landcover and known wetlands.*

Resource site: Willamette River-Boeckman Creek	Low structure vegetation within 300 feet of stream		Forested vegetation	Forested wetlands	Grass/shrub wetlands within 300 feet of a stream	Other wetlands	Total wildlife model patch acres in inventory
	Low structure vegetation/ intact topsoil	Non-forest woody vegetation					
Acres	496.8	34.0	1,176.4	86.0	132.4	115.4	2,041.0
Percent of total	24.3%	1.7%	57.6%	4.2%	6.5%	5.7%	100.0%

*Does not include Habitats of Concern outside of model patches.

Table B-13. Total acres of inventoried wildlife habitat by type and total Species of Concern (SOCs).

Resource site: Willamette River-Boeckman Creek	Wildlife patches (acres)	HOCs inside Wildlife patches (acres)*	HOCs outside Wildlife patches (including wetlands <2 acres)	Total inventoried wildlife habitat acres	Total SOCs
Acres	2041.0	273.7	20.0	2061.0	2
Percent of total	99.0%	13.3%	1.0%	100.0%	N/A

*Habitats of Concern.

Table B-14. Total area of model patches and Habitats of Concern by 1998 Landsat Landcover Area.

Resource Site: Willamette River-Boeckman Creek Landcover type:	Total area of wildlife model patches	Total area of HOCs outside of modeled patches (including wetlands <2 acres)	Percent of total inventoried habitat
Water	18.79	0.1	0.9%
Barren	150.60	5.7	7.6%
Low structure agriculture	359.22	2.8	17.6%
High structure agriculture	26.00	0.1	1.3%
Deciduous closed canopy	179.76	0.4	8.7%
Mixed closed canopy	258.91	0.5	12.6%
Conifer closed canopy	198.48	0.3	9.6%
Deciduous open canopy	160.40	2.5	7.9%
Mixed open canopy	214.22	0.7	10.4%
Conifer open canopy	69.07	0.3	3.4%
Deciduous scattered canopy	68.78	1.4	3.4%
Mixed scattered canopy	38.56	0.6	1.9%
Conifer scattered canopy	10.24	0.6	0.5%
Closed canopy shrub	74.50	0.2	3.6%
Open canopy shrub	44.53	1.3	2.2%
Scattered canopy shrub	59.79	1.5	3.0%
Meadow/grass	109.14	1.2	5.4%
Not classified	0.00	0.0	0.0%
Total	**2,040.99**	**20.0**	**100.0%**

The table below provides estimates of each type of the habitats described in Metro's Metro's Technical Report for Fish and Wildlife Habitat, based on Johnson and O'Neil's (2001) habitat scheme. These numbers are provided for subwatershed comparison purposes and represent estimates of available habitat type. Several data types were used to compile this table, and the data sources vary in their precision. For example, the satellite data sources are less accurate than hand-digitized forest canopy cover. There is also slight overlap between certain habitat types. For example, Riparian Wetlands (RWET) are also partially included in Westside Lowland Coniferous Hardwood/Westside Oak and Douglas-fir (WLCH/WODF) because some wetlands also contain forest, and Open Water (WATR) is not always considered part of habitat patches. Therefore, the sums of these habitat types are slightly different from the "Total wildlife habitat acres in inventory" shown in Table 16. Nonetheless, these numbers provide a generalized means of comparing the quality and quantity of habitat available to wildlife among and between subwatersheds. Note also that the estimates for Westside Grasslands (WEGR) probably represent grasslands that are not native rather than true native grasslands, which are largely extirpated from the metro region.

Table B-15. Wildlife habitat availability[1] based on Johnson & O'Neil's (2001) habitat types and species-habitat associations.

Resource site: Willamette River-Boeckman Creek	Habitat type						
	WATR[2]	HWET[3]	RWET[3]	TOTWET[3]	WLCH/ WODF[4]	WEGR	AGPA
Total acres	123.5	247.8	86.0	365.0	1,205.6	217.4	388.1
Percent of total	6.0%	12.0%	4.2%	17.7%	58.5%	10.5%	18.8%

[1]See Table B-14 for land cover types and crosswalk to Johnson and O'Neil's classification scheme.

[2]Note that patch type and data limitations result in an underestimation of open water habitats. For example, medium and small sized stream surfaces are excluded.

[3]Note that HWET and RWET do not represent the full suite of wetlands because some wetlands <2 acres were added in as Habitats of Concern, and some wetlands could not be associated with herbaceous or forested habitats. TOTWET represents the best estimate of all existing wetlands because it includes Habitats of Concern.

[4]Data limitations make it impossible to distinguish between these two habitat types at this time, and no comprehensive oak habitat survey has been conducted for the region. However, known oak habitats are also included in HOCs (see Appendix 10).

SITE #4: Willamette River-Lower Tualatin River subwatershed

Named tributaries: Abernethy Creek, Beaver Creek, Canfield Creek, Holcomb Creek, Mud Creek, Newell Creek, Tanner Creek, Tualatin River, Willamette River
Communities within the subwatershed: Oregon City, West Linn, unincorporated Clackamas County
Total acreage within Metro's boundary: 11,403.7 (combined – Abernethy Creek-Holcomb Creek, Beaver Creek, Willamette River-Lower Tualatin River subwatersheds)
Total acreage within riparian corridor: 4,159.3
Other information: One dam with no known fishway

This site contains four percent of the area comprising Metro's jurisdictional boundary. Forty-one percent of this site is in Oregon City, 17 percent in West Linn, and the remainder (42 percent) is in unincorporated Clackamas County (Table B-16).

This site contains 11.6 miles of road per square mile; although more developed than the other Group B resource site, this site also falls within the second quartile (26-50 percent of maximum) of the range of development compared to all other sites (Table B-2). Rural and single family residential zoning dominates this site almost equally, compared to primarily rural in the other Group B site (Table B-5). More than 2,000 building permits have been issued here since 1996 (Table B-2).

Riparian resources. Thirty-seven percent of this site is part of the riparian corridor inventory (Table 12), and it contributes about four and one-half percent of the region's total riparian resources (Table 13).

This resource site contains 43 total stream miles, or 0.0031 miles of non-piped streams per acre, ranking it 17th among all resource sites. About eight miles, or 17 percent, are stream links and may be piped or culverted – although non-piped stream density is similar, the proportion of stream links in this site is smaller compared to Site #3 (Tables 12 and B-3). About 17 percent of non-piped stream miles are listed by the DEQ as 303(d) quality-limited, more than double that of Site #3 (Tables B-2 and B-3). Anadromous fish are known to be present in approximately nine stream miles (Table B-2). Of streams that are categorized, low to medium gradients are most common; 28 percent of the site is floodplain, and two percent is wetland (Table B-2 and B-3). Twenty percent of the floodplain is developed, substantially higher than the proportion in Site #3; in fact, this site ranks 8th among all 27 resource sites in terms of floodplain development (Table 14).

About 31 percent of this site's acreage within the riparian corridor inventory received primary scores for at least three of the five ecological functions. Over half of the site's riparian resources are limited to secondary functions, a high proportion compared to the previous three sites (Table B-19). The highest percentage of land receiving a primary score was evenly divided between *Large wood and channel dynamics* and *Bank stabilization and pollution control* (Table B-18; see also Table 4 and Appendix 5 for description of ecological functions mapping).

Wildlife habitat resources.
Including Habitats of Concern, 28 percent of the lands in this site fall within the wildlife habitat inventory, ranking it ninth of the 27 resource sites (Table 16). Within model patches, only eight percent fall within the top third of the point range (Table B-20). Of the four criteria in the GIS

model, this site tends to score low in size and habitat interior, moderate in water resources, and high in connectivity (Table B-21). In general, this site's wildlife habitats are characterized by well-connected (but not very large) habitat patches with moderate water resources.

Habitat types in this resource site are strongly dominated by conifer/hardwood forest cover, but Open Water also provides substantial habitat (Table B-25). This site contributes 86 acres of wetlands, or more one percent of the region's total, ranking 20th among the 27 resource sites.

Species of Concern. Ten Species of Concern sighting locations fall within the site. Each sighting may include one or more species; if a species occurs more than once in the resource site it is only listed once here. These include the following species:

- Painted turtle
- Western pond turtle
- Band-tailed Pigeon
- Pileated Woodpecker
- Great Blue Heron nesting colony
- Peregrine Falcon
- *Aster curtus* (plant species)
- *Delphinium leucophaeum* (plant species)

There are very likely many other Species of Concern using this resource site, particularly those relying on Open Water and forested habitats (see Table B-15). Examples of species likely to occur in this site may be found by referencing the species list in Appendix 7 and identifying the species with a double "XX" under the habitat. General species needs and potential reasons for their decline are identified in the *Sensitive Species Accounts* section above. More detailed information on all species' needs can be obtained through Johnson and O'Neil (2001).

Habitats of Concern.
The following Habitats of Concern are partially or wholly within this resource site. Using the Unique ID # (UID), please refer to Appendix 8 for information concerning each Habitat of Concern:

- UID numbers: 119, 145, 148, 149, 150

Resource site data tables: Riparian Corridors

Table B-16. Acres within resource site by jurisdiction.

Jurisdiction	Acres within subwatershed
Oregon City	4,661.5
West Linn	1,900.7
Unincorporated Clackamas County	4,841.6

Table B-17. Acres in Metro and riparian corridor.

Resource site	Total acres within Metro	Total acres within riparian corridor
Willamette-Lower Tualatin Rivers	11,403.7	4,172.2

Table B-18. Number of acres within riparian corridor providing ecological function.

Resource site:	Ecological function	*Primary Value*		*Secondary Value*	
		Acres*	% of Total**	Acres	% of Total
Willamette-Lower Tualatin Rivers	Microclimate & shade	639.9	15.3%	1,588.8	38.1%
	Streamflow moderation & water storage	998.9	23.9%	3,016.7	72.3%
	Bank stabilization & pollution control	1,652.7	39.6%	474.3	11.4%
	Large wood & channel dynamics	1,617.6	38.8%	318.5	7.6%
	Organic material sources	699.8	16.8%	220.4	5.3%

*Number of acres scored within the riparian corridor for each function
**Percent of total acres within the riparian corridor

Table B-19. Breakdown of ecological scores.

Resource site	Ecological Score	Acres	% of Total Acres
Willamette-Lower Tualatin Rivers	1 to 5	2,281.1	54.7%
	6 to 11	292.0	7.0%
	12 to 17	318.1	7.6%
	18 to 23	658.1	15.8%
	24 to 29	408.2	9.8%
	30	214.7	5.1%
	Total acres	4,172.2	100.0%

Resource site data tables: Wildlife Habitat

Table B-20. Breakdown of total wildlife model patch scores.*

Resource site: Willamette-Lower Tualatin Rivers	Number of acres in each wildlife score category									Total wildlife model patch acres in inventory
	1	2	3	4	5	6	7	8	9	
Model score	41.6	237.2	385.7	191.2	371.6	1,736.6	28.5	240.3	0.0	3,232.5
Percent of total	1.3%	7.3%	11.9%	5.9%	11.5%	53.7%	0.9%	7.4%	0.0%	100.0%

*Does not include Habitats of Concern outside of model patches.

Table B-21. Breakdown of total wildlife model patch scores by criteria.*

Resource site: Willamette-Lower Tualatin Rivers	Number of acres by score for each model criterion												Total wildlife model patch acres in inventory
	Size[2]			Interior[2]			Water[3]			Connectivity			
	1	2	3	1	2	3	1	2	3	1	2	3	
Model score	1,859.5	897.8	0.0	2,118.9	240.3	0.0	800.1	1,979.6	291.4	384.6	747.3	2,100.6	3,232.5
Percent of total acres in inventory	57.5%	27.8%	0.0%	65.6%	7.4%	0.0%	24.8%	61.2%	9.0%	11.9%	23.1%	65.0%	na

[1]Does not include Habitats of Concern outside of model patches.

[2]These numbers do not add up to 100.0% because Type 2 patches (low structure vegetation within 300 feet of streams and wetlands) were not ranked for these criteria.

[3]These numbers do not add up to 100% because not all patches contained or were near water resources.

Table B-22. Breakdown of total wildlife model patch area by 2000 Metro photo interpretation landcover and known wetlands.*

Resource site: Willamette-Lower Tualatin Rivers	Low structure vegetation within 300 feet of stream		Forested vegetation	Forested wetlands	Grass/shrub wetlands within 300 feet of a stream	Other wetlands	Total wildlife model patch acres in inventory
	Low structure vegetation/ intact topsoil	Non-forest woody vegetation					
Acres	401.9	73.3	2,678.2	18.1	12.1	48.9	3,232.5
Percent of total	12.4%	2.3%	82.9%	0.6%	0.4%	1.5%	100.0%

*Does not include Habitats of Concern outside of model patches.

Table B-23. Total acres of inventoried wildlife habitat by type and total Species of Concern (SOCs).

Resource site: Willamette-Lower Tualatin Rivers	Wildlife patches (acres)	HOCs inside Wildlife patches (acres)*	HOCs outside Wildlife patches (including wetlands <2 acres)	Total inventoried wildlife habitat acres	Total SOCs
Acres	3232.5	767.8	7.7	3240.3	10
Percent of total	99.8%	23.7%	0.2%	100.0%	N/A

*Habitats of Concern.

Table B-24. Total area of model patches and Habitats of Concern by 1998 Landsat Landcover Area.

Resource Site: Willamette-Lower Tualatin Rivers Landcover type:	Total area of wildlife model patches	Total area of HOCs outside of modeled patches (including wetlands <2 acres)	Percent of total inventoried habitat
Water	31.60	3.7	1.1%
Barren	172.38	0.3	5.3%
Low structure agriculture	98.22	0.0	3.0%
High structure agriculture	11.73	0.0	0.4%
Deciduous closed canopy	664.16	0.4	20.5%
Mixed closed canopy	701.24	0.9	21.7%
Conifer closed canopy	283.85	0.6	8.8%
Deciduous open canopy	507.43	0.3	15.7%
Mixed open canopy	111.03	0.1	3.4%
Conifer open canopy	13.81	0.3	0.4%
Deciduous scattered canopy	132.08	0.1	4.1%
Mixed scattered canopy	68.51	0.0	2.1%
Conifer scattered canopy	13.50	0.2	0.4%
Closed canopy shrub	148.87	0.3	4.6%
Open canopy shrub	57.70	0.0	1.8%
Scattered canopy shrub	96.57	0.2	3.0%
Meadow/grass	119.24	0.5	3.7%
Not classified	0.60	0.0	0.0%
Total	**3,232.52**	**7.7**	**100.0%**

The table below provides estimates of each type of the habitats described in Metro's Metro's Technical Report for Fish and Wildlife Habitat, based on Johnson and O'Neil's (2001) habitat scheme. These numbers are provided for subwatershed comparison purposes and represent *estimates* of available habitat type. Several data types were used to compile this table, and the data sources vary in their precision. For example, the satellite data sources are less accurate than hand-digitized forest canopy cover. There is also slight overlap between certain habitat types. For example, Riparian Wetlands (RWET) are also partially included in Westside Lowland Coniferous Hardwood/Westside Oak and Douglas-fir (WLCH/WODF) because some wetlands also contain forest, and Open Water (WATR) is not always considered part of habitat patches. Therefore, the sums of these habitat types are slightly different from the "Total wildlife habitat acres in inventory" shown in Table 16. Nonetheless, these numbers provide a generalized means of comparing the quality and quantity of habitat available to wildlife among and between subwatersheds. Note also that the estimates for Westside Grasslands (WEGR) probably represent grasslands that are not native rather than true native grasslands, which are largely extirpated from the metro region.

Table B-25. Wildlife habitat availability[1] based on Johnson & O'Neil's (2001) habitat types and species-habitat associations.

Resource site: Willamette-Lower Tualatin Rivers	Habitat type						
	WATR[2]	HWET[3]	RWET[3]	TOTWET[3]	WLCH/ WODF[4]	WEGR	AGPA
Total acres	575.7	61.0	18.1	85.7	2,498.5	274.1	109.9
Percent of total	17.8%	1.9%	0.6%	2.6%	77.1%	8.5%	3.4%

[1]See Table B-24 for land cover types and crosswalk to Johnson and O'Neil's classification scheme.

[2]Note that patch type and data limitations result in an underestimation of open water habitats. For example, medium and small sized stream surfaces are excluded.

[3]Note that HWET and RWET do not represent the full suite of wetlands because some wetlands <2 acres were added in as Habitats of Concern, and some wetlands could not be associated with herbaceous or forested habitats. TOTWET represents the best estimate of all existing wetlands because it includes Habitats of Concern.

[4]Data limitations make it impossible to distinguish between these two habitat types at this time, and no comprehensive oak habitat survey has been conducted for the region. However, known oak habitats are also included in HOCs (see Appendix 10).

C. Dairy Creek and Gales Creek

General watershed information

Resource sites within the Dairy Creek Watershed include:

- Council Creek subwatershed (combines West Fork Dairy Creek, Council Creek, Middle Tualatin River-Gales Creek subwatersheds)
- McKay Creek subwatershed

Watershed assessments and plans

Breuner, Nancy, 1998. *Gales Creek Watershed Assessment Project,* Tualatin River Watershed Council: Hillsboro, Oregon.

Bureau of Land Management, U.S. Department of the Interior (BLM), 1999. *Dairy-McKay Watershed Analysis,* BLM, Salem District Office, Tillamook Resource Area: Tillamook, Oregon.

Lev, Esther, 1990. *Inventory of Wetlands, Riparian and Upland Wildlife Habitat Areas in Hillsboro, Oregon,* Environmental Consulting: Portland, Oregon.

Oregon Department of Fish and Wildlife (ODFW) and Unified Sewage Agency (USA), 1995. *Distribution of Fish and Crayfish and Measurement of Available Habitat in the Tualatin River Basin, Final Report of Research,* ODFW: Portland, Oregon and Unified Sewage Agency: Hillsboro, Oregon.

Tualatin River Watershed Council, 1999. *Tualatin River Watershed, Action Plan,* Tualatin River Watershed Council: Hillsboro, Oregon.

Tualatin Watershed Council, 2001. *Tualatin River Watershed Atlas,* Tualatin Watershed Council: Hillsboro, Oregon

Watershed councils and related groups

Banks Watershed Council, P.O. Box 428, Banks 97106

Fernhill Marsh Wetland Management Council, PO Box 373, Forest Grove 97116, 503-357-2319, Greg Johnson

Tualatin WC, 1080 SW Baseline, Bldg. B, Suite B-2, Hillsboro 97123, (503) 681-0953, FAX (503) 681-9772

Tualatin River National Wildlife Refuge, City of Sherwood, 90 NW Park Street, Sherwood 97140, 503-625-5522, Joan Patterson

Tualatin River Rangers, USA, 155 N First Ave., Hillsboro 97124, 503-640-3516, Linda Kelly

Tualatin Riverkeepers, 16340 SW Beef Bend Road, Sherwood 97140, 503-590-5813, Lauri Mullen

Wetlands, Friends of, 503-253-6247, Alice Blatt

Yamhill Basin Council, 2200 SW 2nd Street, McMinnville 97128, 503-472-6403, Melissa Leoni

Data descriptions

Table C-1 provides information about the subwatersheds within each watershed, the HUC code, and the acres inside Metro's jurisdictional boundary. Keying in on the resource site number will show how the subwatersheds are aggregated into the resource sites listed above.

The Dairy Creek watershed contains three subwatersheds that are partially located within Metro's boundary: West Fork Dairy Creek, Council Creek, and McKay Creek. Within the Gales

Creek watershed, one subwatershed (Middle Tualatin River – Gales Creek) is in Metro's boundary. The West Fork Dairy Creek, Council Creek, and Middle Tualatin River-Gales Creek subwatersheds are combined to comprise one resource site (now referred to the Council Creek subwatershed, or Resource Site #5). The McKay Creek subwatershed comprises Resource Site #6.

Tables C-1 and C-2 provide general description about the 5th field and 6th field HUCs. Below these tables are descriptions of the riparian and wildlife habitat resources resource site.

Watershed data tables

Table C-1. Watersheds (5th level HUC), subwatersheds (6th level HUC), and acres within Metro jurisdictional boundary.

Watershed (5th level HUC)	5th field HUC code	Resource site #	Subwatershed (6th level HUC)	6th field HUC code	Acres in Metro
Dairy Creek	1709001001	5	West Fork Dairy Creek	170900100106	36.1
			Council Creek	170900100107	2,924.9
		6	McKay Creek	170900100108	3,842.7
Gales Creek	1709001002	5	Middle Tualatin River-Gales Creek	170900100206	2,747.2

Table C-2. Resource sites: general information.

General information	Council	McKay
Miles of DEQ 303(d) listed streams	6.0	1.1
Road density (road miles/square miles in subwatershed)	12.7	12.8
Miles of stream with known anadromous fish presence	2.0	1.1
Acres of hydrologically connected wetlands	255.6	138.9
Total acres of wetlands	256.5	138.9
Acres of floodplains (100 year FEMA + 1996 inundation area)	626.0	344.9
Acres of developed floodplains	24.2	26.4
Building permits since 1996 (number)	1,016.0	1,055.0

Table C-3. Characteristics of stream miles by resource site.

Resource site	Stream miles by channel type		Miles of stream links*	Miles of streams not categorized by channel type	Total stream miles
	Low to medium	*High*			
Council Creek	10.4	0.0	5.4	5.4	21.3
McKay Creek	5.2	0.0	3.8	3.0	12.1

*Stream links are links between surface streams and may be piped or culverted.

Table C-4. Riparian vegetation by resource site.

Resource site	Vegetation types within 300 feet of a stream (acres)			Forested vegetation >300 feet from a stream
	Low structure vegetation/intact topsoil	Non-forest woody vegetation	Forested vegetation	
Council Creek	518.4	2.7	167.4	140.6
McKay Creek	303.5	3.8	127.3	73.9

Table C-5. Regional zoning by resource site.

Resource site	Acres by zone within each resource site						
	Commercial	Industrial	Multi-family residential	Public/open space	Rural	Single family residential	Mixed use
Council Creek	275.9	838.5	643.6	5.1	1,426.8	1,617.3	137.2
McKay Creek	557.5	1,201.5	73.8	0.0	178.7	1,680.2	125.8

SITE #5: Council Creek subwatershed

Named streams/rivers: Council Creek, Dairy Creek, Gales Creek, McKay Creek, Tualatin River
Communities within the subwatershed: Cornelius, Forest Grove, Hillsboro, unincorporated Washington County
Total acreage within Metro's boundary: 5,708.1 (combined – West Fork Dairy Creek, Council Creek, Middle Tualatin River-Gales Creek)
Total acres within riparian corridor: 1,142.3

This site contains two percent of the area comprising Metro's jurisdictional boundary. Fifty-three percent of the site is in the City of Forest Grove, 21 percent is in Cornelius, and less than one percent falls in the City of Hillsboro. The remainder (26 percent) is in unincorporated Washington County (Table C-6).

This resource site, similar to the other site in Group C, falls near the midpoint of the range of development compared to other sites, with 12.7 miles of roads per square mile (Table C-2). Single family residential is the dominant zoning pattern, followed closely by rural; industrial and residential uses are also important in this resource site (Table C-5). Agriculture is a common land use. Over a thousand building permits have been issued here since 1996 (Table C-2).

Riparian resources. Compared to the previous four resource sites, the two sites within Group C contain relatively smaller proportions of riparian resources. Lands within the riparian corridor inventory comprise about 20 percent of total lands in this subwatershed. The site contributes less than one percent of the region's riparian corridors, but that statistic is influenced by the relatively small amount of Site #5's area falling within the Metro boundary (Tables 12 and 13).

This resource site contains approximately 21 total stream miles (Table C-3), or 0.0028 miles of non-piped streams per acre, ranking it 20th among the 27 resource sites (Table 12). About 25 percent of all stream miles are stream links, suggesting a relatively high amount of piping/culverting (Table C-3); 38 percent of non-piped streams are DEQ 303(d) water-quality limited (Tables C-2 and C-3). The dominant stream gradient in this resource site is low to medium (Table C-3); 11 percent of the site is in the floodplain, with more than four percent of the land covered by wetland resources (Table C-2). Less than four percent of the floodplain is developed. Anadromous fish are known to be present in two stream miles (Table C-2).

About 38 percent of the acreage that falls within the riparian corridor inventory in this site received primary scores for at least three of the five ecological functions (Table C-9). Seventy-three percent of the site's riparian corridors receive at least one primary ecological function score, reflecting the relatively rural/agricultural nature of this resource site that tends toward more vegetation near the stream compared to urbanized areas (Table C-9). Low structure vegetation/intact topsoil is the dominant vegetation cover within 300 ft of streams (Table C-4). The percentage of land receiving a given primary score was divided relatively evenly between *Large wood and channel dynamics* and *Streamflow moderation and water storage* (Table C-8). However, *Bank stabilization and pollution control* and *Organic material sources* were also important primary functions (Table C-8; see also Table 4 and Appendix 5 for description of ecological functions mapping).

Wildlife habitat resources.
Including Habitats of Concern, 16 percent of the lands in this site fall within the wildlife habitat inventory, ranking it 25th of the 27 resource sites (Table 16). Within model patches, only seventeen percent fall within the top third of the point range (Table C-10). Of the four criteria in the GIS model, this site tends to score low in size and habitat interior, moderate to high in water resources, and moderate in connectivity (Table C-11). In general, this site's wildlife habitat patches are characterized by moderate fragmentation with fairly good water resources.

Habitat types in this resource site are co-dominated by conifer/hardwood forest cover, agricultural lands and wetlands (Table C-15). Wetlands are a very important habitat type in this resource site, comprising an estimated 28 percent of lands. Despite the relatively small amount of acreage falling within the Metro boundary, the site contributes three percent of the region's total wetlands, ranking 10th among the 27 resource sites.

Species of Concern. Two Species of Concern sighting locations fall within the site. Each sighting may include one or more species; if a species occurs more than once in the resource site it is only listed once here. These include the following species:

- Great Blue Heron nesting colony
- Western Meadowlark
- Acorn Woodpecker
- Northern Goshawk
- Merlin

There are very likely many other Species of Concern using this resource site, particularly those relying on wetlands, forested habitats and agricultural lands, which often serve as a surrogate for native grassland habitats (for example, the Meadowlark and Merlin sightings; see Table C-15). Examples of species likely to occur in this site may be found by referencing the species list in Appendix 7 and identifying the species with a double "XX" under the habitat. General species needs and potential reasons for their decline are identified in the *Sensitive Species Accounts* section above. More detailed information on all species' needs can be obtained through Johnson and O'Neil (2001).

Habitats of Concern.
The following Habitats of Concern are partially or wholly within this resource site. Using the Unique ID # (UID), please refer to Appendix 8 for information concerning each Habitat of Concern:

- UID numbers: 38, 39, 41, 43, 44, 45, 46, 165

Resource site data tables: Riparian Corridors

Table C-6. Acres within resource site by jurisdiction.

Jurisdiction	Acres within subwatershed
Cornelius	1,190.5
Forest Grove	3,040.6
Hillsboro	0.6
Unincorporated Washington County	1,471.1

Table C-7. Acres in Metro and riparian corridor.

Resource site	Total acres within Metro	Total acres within riparian corridor
Council Creek	5,708.2	1,142.4

Table C-8. Number of acres within riparian corridor providing ecological function.

Resource site:	Ecological function	*Primary Value*		*Secondary Value*	
		Acres*	% of Total**	Acres	% of Total
Council Creek	Microclimate & shade	146.4	12.8%	120.8	10.6%
	Streamflow moderation & water storage	655.4	57.4%	443.0	38.8%
	Bank stabilization & pollution control	542.6	47.5%	9.8	0.9%
	Large wood & channel dynamics	716.9	62.8%	26.5	2.3%
	Organic material sources	401.1	35.1%	14.1	1.2%

*Number of acres scored within the riparian corridor for each function

**Percent of total acres within the riparian corridor

Table C-9. Breakdown of ecological scores.

Resource site	Ecological Score	Acres	% of Total Acres
Council Creek	1 to 5	309.3	27.1%
	6 to 11	106.2	9.3%
	12 to 17	298.5	26.1%
	18 to 23	54.0	4.7%
	24 to 29	274.9	24.1%
	30	99.5	8.7%
	Total acres	1,142.4	100.0%

Resource site data tables: Wildlife Habitat

Table C-10. Breakdown of total wildlife model patch scores.*

Resource site: Council Creek	Number of acres in each wildlife score category									Total wildlife model patch acres in inventory
	1	2	3	4	5	6	7	8	9	
Model score	23.7	56.0	315.7	93.0	143.6	114.8	154.5	0.0	0.0	901.4
Percent of total	2.6%	6.2%	35.0%	10.3%	15.9%	12.7%	17.1%	0.0%	0.0%	100.0%

*Does not include Habitats of Concern outside of model patches.

Table C-11. Breakdown of total wildlife patch model scores by criteria.*

Resource site: Council Creek	Number of acres by score for each model criterion												Total wildlife model patch acres in inventory
	Size[2]			Interior[2]			Water[3]			Connectivity			
	1	2	3	1	2	3	1	2	3	1	2	3	
	484.5	0.0	0.0	315.6	0.0	0.0	7.4	502.8	363.3	108.6	545.1	247.7	901.4
Percent of total acres in inventory	53.7%	0.0%	0.0%	35.0%	0.0%	0.0%	0.8%	55.8%	40.3%	12.0%	60.5%	27.5%	na

[1]Does not include Habitats of Concern outside of model patches.

[2]These numbers do not add up to 100.0% because Type 2 patches (low structure vegetation within 300 feet of streams and wetlands) were not ranked for these criteria.

[3]These numbers do not add up to 100% because not all patches contained or were near water resources.

Table C-12. Breakdown of total wildlife model patch area by 2000 Metro photo interpretation landcover and known wetlands.*

Resource site: Council Creek	Low structure vegetation within 300 feet of stream		Forested vegetation	Forested wetlands	Grass/shrub wetlands within 300 feet of a stream	Other wetlands	Total wildlife model patch acres in inventory
	Low structure vegetation/ intact topsoil	Non-forest woody vegetation					
Acres	414.0	2.9	238.5	29.5	87.1	129.4	901.4
Percent of total	45.9%	0.3%	26.5%	3.3%	9.7%	14.4%	100.0%

*Does not include Habitats of Concern outside of model patches.

Table C-13. Total acres of inventoried wildlife habitat by type and total Species of Concern (SOCs).

Resource site: Council Creek	Wildlife patches (acres)	HOCs inside Wildlife patches (acres)*	HOCs outside Wildlife patches (including wetlands <2 acres)	Total inventoried wildlife habitat acres	Total SOCs
Acres	901.4	230.4	11.1	912.5	2
Percent of total	98.8%	25.3%	1.2%	100.0%	N/A

*Habitats of Concern.

Table C-14. Total area of model patches and Habitats of Concern by 1998 Landsat Landcover Area.

Resource Site: Council Creek Landcover type:	Total area of wildlife model patches	Total area of HOCs outside of modeled patches (including wetlands <2 acres)	Percent of total inventoried habitat
Water	49.23	0.0	5.4%
Barren	66.91	4.4	7.8%
Low structure agriculture	238.12	2.7	26.4%
High structure agriculture	40.57	0.0	4.4%
Deciduous closed canopy	51.57	0.1	5.7%
Mixed closed canopy	70.59	0.5	7.8%
Conifer closed canopy	28.77	0.2	3.2%
Deciduous open canopy	28.08	0.4	3.1%
Mixed open canopy	21.57	0.7	2.4%
Conifer open canopy	2.37	0.1	0.3%
Deciduous scattered canopy	48.26	0.6	5.4%
Mixed scattered canopy	32.61	0.4	3.6%
Conifer scattered canopy	4.47	0.0	0.5%
Closed canopy shrub	24.43	0.0	2.7%
Open canopy shrub	21.71	0.2	2.4%
Scattered canopy shrub	45.55	0.3	5.0%
Meadow/grass	126.60	0.6	13.9%
Not classified	0.02	0.0	0.0%
Total	**901.41**	**11.1**	**100.0%**

The table below provides estimates of each type of the habitats described in Metro's Technical Report for Fish and Wildlife Habitat, based on Johnson and O'Neil's (2001) habitat scheme. These numbers are provided for subwatershed comparison purposes and represent estimates of available habitat type. Several data types were used to compile this table, and the data sources vary in their precision. For example, the satellite data sources are less accurate than hand-digitized forest canopy cover. There is also slight overlap between certain habitat types. For example, Riparian Wetlands (RWET) are also partially included in Westside Lowland Coniferous Hardwood/Westside Oak and Douglas-fir (WLCH/WODF) because some wetlands also contain forest, and Open Water (WATR) is not always considered part of habitat patches. Therefore, the sums of these habitat types are slightly different from the "Total wildlife habitat acres in inventory" shown in Table 16. Nonetheless, these numbers provide a generalized means of comparing the quality and quantity of habitat available to wildlife among and between subwatersheds. Note also that the estimates for Westside Grasslands (WEGR) probably represent grasslands that are not native rather than true native grasslands, which are largely extirpated from the metro region.

Table C-15. Wildlife habitat availability[1] based on Johnson & O'Neil's (2001) habitat types and species-habitat associations.

Resource site: Council Creek	Habitat type						
	WATR[2]	HWET[3]	RWET[3]	TOTWET[3]	WLCH/ WODF[4]	WEGR	AGPA
Total acres	20.7	216.5	29.5	256.5	291.2	194.9	281.4
Percent of total	2.3%	23.7%	3.2%	28.1%	31.9%	21.4%	30.8%

[1]See Table C-14 for land cover types and crosswalk to Johnson and O'Neil's classification scheme.

[2]Note that patch type and data limitations result in an underestimation of open water habitats. For example, medium and small sized stream surfaces are excluded.

[3]Note that HWET and RWET do not represent the full suite of wetlands because some wetlands <2 acres were added in as Habitats of Concern, and some wetlands could not be associated with herbaceous or forested habitats. TOTWET represents the best estimate of all existing wetlands because it includes Habitats of Concern.

[4]Data limitations make it impossible to distinguish between these two habitat types at this time, and no comprehensive oak habitat survey has been conducted for the region. However, known oak habitats are also included in HOCs (see Appendix 10).

SITE #6: McKay Creek subwatershed

Named streams/rivers: Dairy Creek, McKay Creek, Warble Gulch
Communities within the subwatershed: Hillsboro, unincorporated Washington County
Total acreage within Metro's boundary: 3,842.7
Total acres within the riparian corridor: 677.9

This site contains one percent of the area comprising Metro's jurisdictional boundary. Most of this site (91 percent) is in the City of Hillsboro, with the remainder in unincorporated Washington County (Table C-16).

This resource site falls close to the midpoint of development compared to all other sites, with 12.8 miles of road per square mile (Table C-2). Zoning is primarily single family residential and industrial (Table C-5). More than a thousand building permits have been issued here since 1996 (Table C-2).

Riparian resources. As with the other resource site in Group C, Site #6 contains a relatively smaller proportion of riparian resources compared to the first four resource sites described. Lands within the riparian corridor inventory comprise about 17 percent of total lands in this subwatershed (Table 12). The site contributes less than one percent of the region's riparian corridors, but that statistic is influenced by the relatively small amount of Site #6's area falling within the Metro boundary (Tables 12 and 13).

This resource site has a relatively low stream density, with approximately 12 total stream miles, or 0.0022 miles of non-piped streams per acre, ranking it 23rd out of the 27 resource sites (Table 12). About 31 percent of all stream miles are stream links, suggesting a relatively high amount of piping/culverting (Table C-3); 13 percent of non-piped streams are DEQ 303(d) water-quality limited (Tables C-2 and C-3). The dominant stream gradient in this resource site is low to medium (Table C-3); nine percent of the site is in the floodplain, with approximately four percent of the land covered by wetland resources (Table C-2). Less than eight percent of the floodplain is developed. Anadromous fish are known to be present in one stream mile (Table C-2).

Forty-four percent of the acreage that falls within the riparian corridor inventory in this site received primary scores for at least three of the five ecological functions (Table C-19). Seventy-one percent of the site's riparian corridors receive at least one primary ecological function score, reflecting the relatively rural/agricultural nature of this resource site that tends toward more vegetation near the stream compared to urbanized areas (Table C-19). Low structure vegetation/intact topsoil is the dominant vegetation cover within 300 ft of streams; however, there is relatively more forest cover along streams here than in Site #5 (Table C-4). The percentage of land receiving a given primary score was divided relatively evenly between *Large wood and channel dynamics*, *Bank stabilization and pollution control,* and *Streamflow moderation and water storage* (Table C-18). However, *Organic material sources* were also important primary functions (Table C-18; see also Table 4 and Appendix 5 for description of ecological functions mapping).

Wildlife habitat resources.
Including Habitats of Concern, 13 percent of the lands in this site fall within the wildlife habitat inventory, ranking it last among the 27 resource sites. However, note that the small amount of

this site's land within the Metro boundary may not be characteristic of the entire subwatershed (Table 16). Within model patches, only ten percent fall within the top third of the point range (Table C-20). Of the four criteria in the GIS model, this site tends to score low in size and habitat interior, moderate to high in water resources, and moderate in connectivity, similar to the other resource site in Group C (Table C-21). In general, this site's wildlife habitat patches are characterized by moderate fragmentation with fairly good water resources.

Habitat types in this resource site are co-dominated by conifer/hardwood forest cover, agricultural lands and wetlands (Table C-25). Similar to Site #5, wetlands are a very important habitat type in this resource site, comprising an estimated 29 percent of lands in the resource site. Relative to the site's amount of land within the Metro boundary, it contributes a relatively large percentage of the region's total wetlands (two percent) and ranks 15th among the 27 resource sites.

Species of Concern. There are no recorded Species of Concern sighting locations within this resource site. However, it is likely that this simply indicates a lack of survey data. There are very likely Species of Concern using this resource site, particularly those relying on wetlands, forested habitats and agricultural lands, which often serve as a surrogate for native grassland habitats (see Table C-25). Examples of species likely to occur in this site may be found by referencing the species list in Appendix 7 and identifying the species with a double "XX" under the habitat. General species needs and potential reasons for their decline are identified in the *Sensitive Species Accounts* section above. More detailed information on all species' needs can be obtained through Johnson and O'Neil (2001).

Habitats of Concern.
The following Habitats of Concern are partially or wholly within this resource site. Using the Unique ID # (UID), please refer to Appendix 8 for information concerning each Habitat of Concern:

UID numbers: 40, 45, 46, 47, 59, 60

Resource site data tables: Riparian Corridors

Table C-16. Acres within resource site by jurisdiction.

Jurisdiction	Acres within subwatershed
Hillsboro	3,500.6
Unincorporated Washington County	336.7

Table C-17. Acres in Metro and riparian corridor.

Resource site	Total acres within Metro	Total acres within riparian corridor
McKay Creek	3,842.7	635.8

Table C-18. Number of acres within riparian corridor providing ecological function.

Resource site:	Ecological function	*Primary Value*		*Secondary Value*	
		Acres*	% of Total**	Acres	% of Total
McKay Creek	Microclimate & shade	137.1	21.6%	53.1	8.3%
	Streamflow moderation & water storage	361.6	56.9%	254.5	40.0%
	Bank stabilization & pollution control	334.0	52.5%	0.0	0.0%
	Large wood & channel dynamics	384.0	60.4%	10.0	1.6%
	Organic material sources	274.9	43.2%	3.3	0.5%

*Number of acres scored within the riparian corridor for each function

**Percent of total acres within the riparian corridor

Table C-19. Breakdown of ecological scores.

Resource site	Ecological Score	Acres	% of Total Acres
McKay Creek	1 to 5	182.2	28.7%
	6 to 11	56.3	8.8%
	12 to 17	120.3	18.9%
	18 to 23	19.6	3.1%
	24 to 29	151.4	23.8%
	30	106.0	16.7%
	Total acres	635.8	100.0%

Resource site data tables: Wildlife Habitat

Table C-20. Breakdown of total wildlife model patch scores.*

Resource site: McKay Creek	Number of acres in each wildlife score category									Total wildlife model patch acres in inventory
	1	2	3	4	5	6	7	8	9	
Model score	20.3	54.2	152.9	68.0	40.3	97.4	21.5	28.0	0.0	482.7
Percent of total	4.2%	11.2%	31.7%	14.1%	8.4%	20.2%	4.5%	5.8%	0.0%	100.0%

*Does not include Habitats of Concern outside of model patches.

Table C-21. Breakdown of total wildlife model patch scores by criteria.*

Resource site: McKay Creek	Number of acres by score for each model criterion												Total wildlife model patch acres in inventory
	Size[2]			Interior[2]			Water[3]			Connectivity			
	1	2	3	1	2	3	1	2	3	1	2	3	
Model score	234.1	28.0	0.0	179.0	0.0	0.0	2.4	234.2	225.8	148.1	266.2	68.4	482.7
Percent of total acres in inventory	48.5%	5.8%	0.0%	37.1%	0.0%	0.0%	0.5%	48.5%	46.8%	30.7%	55.1%	14.2%	na

[1]Does not include Habitats of Concern outside of model patches.

[2]These numbers do not add up to 100.0% because Type 2 patches (low structure vegetation within 300 feet of streams and wetlands) were not ranked for these criteria.

[3]These numbers do not add up to 100% because not all patches contained or were near water resources.

Table C-22. Breakdown of total wildlife model patch area by 2000 Metro photo interpretation landcover and known wetlands.*

Resource site: McKay Creek	Low structure vegetation within 300 feet of stream		Forested vegetation	Forested wetlands	Grass/shrub wetlands within 300 feet of a stream	Other wetlands	Total wildlife model patch acres in inventory
	Low structure vegetation/ intact topsoil	Non-forest woody vegetation					
Acres	220.6	0.0	125.2	58.9	69.9	8.2	482.7
Percent of total	45.7%	0.0%	25.9%	12.2%	14.5%	1.7%	100.0%

*Does not include Habitats of Concern outside of model patches.

Table C-23. Total acres of inventoried wildlife habitat by type and total Species of Concern (SOCs).

Resource site: McKay Creek	Wildlife patches (acres)	HOCs inside Wildlife patches (acres)*	HOCs outside Wildlife patches (including wetlands <2 acres)	Total inventoried wildlife habitat acres	Total SOCs
Acres	482.7	74.6	1.6	484.4	0
Percent of total	99.7%	15.4%	0.3%	100.0%	N/A

*Habitats of Concern.

Table C-24. Total area of model patches and Habitats of Concern by 1998 Landsat Landcover Area.

Resource Site: McKay Creek Landcover type:	Total area of wildlife model patches	Total area of HOCs outside of modeled patches (including wetlands <2 acres)	Percent of total inventoried habitat
Water	0.00	0.0	0.0%
Barren	49.76	0.0	10.3%
Low structure agriculture	162.02	0.7	33.6%
High structure agriculture	2.70	0.0	0.6%
Deciduous closed canopy	39.44	0.1	8.2%
Mixed closed canopy	37.90	0.0	7.8%
Conifer closed canopy	16.86	0.0	3.5%
Deciduous open canopy	26.87	0.0	5.6%
Mixed open canopy	24.52	0.0	5.1%
Conifer open canopy	3.50	0.0	0.7%
Deciduous scattered canopy	20.48	0.0	4.2%
Mixed scattered canopy	9.21	0.0	1.9%
Conifer scattered canopy	3.08	0.0	0.6%
Closed canopy shrub	15.51	0.1	3.2%
Open canopy shrub	11.54	0.0	2.4%
Scattered canopy shrub	19.15	0.0	4.0%
Meadow/grass	40.18	0.6	8.4%
Not classified	0.00	0.0	0.0%
Total	**482.73**	**1.6**	**100.0%**

The table below provides estimates of each type of the habitats described in Metro's Technical Report for Fish and Wildlife Habitat, based on Johnson and O'Neil's (2001) habitat scheme. These numbers are provided for subwatershed comparison purposes and represent estimates of available habitat type. Several data types were used to compile this table, and the data sources vary in their precision. For example, the satellite data sources are less accurate than hand-digitized forest canopy cover. There is also slight overlap between certain habitat types. For example, Riparian Wetlands (RWET) are also partially included in Westside Lowland Coniferous Hardwood/Westside Oak and Douglas-fir (WLCH/WODF) because some wetlands also contain forest, and Open Water (WATR) is not always considered part of habitat patches. Therefore, the sums of these habitat types are slightly different from the "Total wildlife habitat acres in inventory" shown in Table 16. Nonetheless, these numbers provide a generalized means of comparing the quality and quantity of habitat available to wildlife among and between subwatersheds. Note also that the estimates for Westside Grasslands (WEGR) probably represent grasslands that are not native rather than true native grasslands, which are largely extirpated from the metro region.

Table C-25. Wildlife habitat availability[1] based on Johnson & O'Neil's (2001) habitat types and species-habitat associations.

Resource site:	Habitat type						
McKay Creek	WATR[2]	HWET[3]	RWET[3]	TOTWET[3]	WLCH/ WODF[4]	WEGR	AGPA
Total acres	0.0	78.1	58.9	138.9	182.0	71.6	165.5
Percent of total	0.0%	16.1%	12.2%	28.7%	37.6%	14.8%	34.2%

[1]See Table C-24 for land cover types and crosswalk to Johnson and O'Neil's classification scheme.

[2]Note that patch type and data limitations result in an underestimation of open water habitats. For example, medium and small sized stream surfaces are excluded.

[3]Note that HWET and RWET do not represent the full suite of wetlands because some wetlands <2 acres were added in as Habitats of Concern, and some wetlands could not be associated with herbaceous or forested habitats. TOTWET represents the best estimate of all existing wetlands because it includes Habitats of Concern.

[4]Data limitations make it impossible to distinguish between these two habitat types at this time, and no comprehensive oak habitat survey has been conducted for the region. However, known oak habitats are also included in HOCs (see Appendix 10).

D. Rock Creek/Tualatin River

General watershed information

Resource sites in the Rock Creek/Tualatin River Watershed include:

- Middle Rock Creek-Tualatin River subwatershed
- Beaverton Creek subwatershed
- Lower Rock Creek-Tualatin River subwatershed (combined with Middle Tualatin River-Davis Creek)
- Middle Tualatin River-Gordon Creek subwatershed (combined with Lindow Creek)

Watershed assessments and plans

Bureau of Land Management, U.S. Department of the Interior (BLM), 2001. *Middle Tualatin-Rock Creek Watershed Analysis,* BLM, Salem District Office, Tillamook Resource Area: Tillamook, Oregon.

Brown and Caldwell, 1999. *Beaverton Creek Watershed Management Plan.* Unified Sewage Agency: Hillsboro, Oregon.

Lev, Esther, 1990. *Inventory of Wetlands, Riparian and Upland Wildlife Habitat Areas in Hillsboro, Oregon,* Environmental Consulting: Portland, Oregon.

Oregon Department of Fish and Wildlife (ODFW) and Unified Sewage Agency (USA), 1995. *Distribution of Fish and Crayfish and Measurement of Available Habitat in the Tualatin River Basin, Final Report of Research,* ODFW: Portland, Oregon and Unified Sewage Agency: Hillsboro, Oregon.

Tualatin River Watershed Council, 1999. *Tualatin River Watershed, Action Plan,* Tualatin River Watershed Council: Hillsboro, Oregon.

Tualatin Watershed Council, 2001. *Tualatin River Watershed Atlas,* Tualatin Watershed Council: Hillsboro, Oregon

Unified Sewage Agency, 1996. *Subbasin Strategies Plans for Upper Rock, Bronson and Willow Creeks,* Unified Sewage Agency: Hillsboro, Oregon.

Walker and Macy, Landscape Architects and Planners, 1989. *Jackson Bottom, Concept Master Plan,* City of Hillsboro, Unified Sewage Agency: Hillsboro, Oregon.

Watershed councils and related groups

Cedar Mill Creek Watershed Watch, 503-292-8713, Gretchen Vadnais

Golf Creek, Friends of, 7277 SW Barnes Road, Portland 97225, 503-292-4549, Bridget McCarthy

Jackson Bottom, Friends of, 503-647-3286, Faun Hosey

Jackson Bottom Wetlands Preserve, 123 W Main Street, Hillsboro 97123, 503-681-6206, Patrick Willis

Rock Creek Environmental Center, 503-690-5402, Bob Mann

Rock Creek Watershed Council, 16747 Timber Road, Vernonia 97064, 503-429-2401, Maggie Belmore

Tualatin Watershed Council, 1080 SW Baseline, Bldg. B, Suite B-2, Hillsboro 97123, (503) 681-0953, FAX (503) 681-9772

Tualatin River National Wildlife Refuge, City of Sherwood, 90 NW Park Street, Sherwood 97140, 503-625-5522, Joan Patterson

Tualatin River Rangers, USA, 155 N First Ave., Hillsboro 97124, 503-640-3516, Linda Kelly

Tualatin Riverkeepers, 16340 SW Beef Bend Road, Sherwood 97140, 503-590-5813, Lauri Mullen
Wetlands, Friends of, 503-253-6247, Alice Blatt
Yamhill Basin Council, 2200 SW 2nd Street, McMinnville 97128, 503-472-6403, Melissa Leoni

Data descriptions
Table D-1 provides information about the subwatersheds within each watershed, the HUC code, and the acres inside Metro's jurisdictional boundary. Keying in on the resource site number will show how the subwatersheds are aggregated into the resource sites listed above.

All six of the subwatersheds fall within the same 5th field HUC (Rock Creek/Tualatin River), but they are divided into four resource sites. The Middle Rock Creek-Tualatin River subwatershed comprises the resource site with the same name (Resource Site #7). Similarly, the Beaverton Creek subwatershed also comprises its namesake resource site (Resource Site #8). Resource Site #9 is comprised of two subwatersheds, Lower Rock Creek-Tualatin River and Middle Tualatin River-Davis Creek; this is called Lower Rock Creek-Tualatin River. Resource Site #10, Middle Tualatin River-Gordon Creek, combines its namesake with Lindow Creek.

Tables D-1 and D-2 provide general description about the 5th field and 6th field HUCs. Below these tables are descriptions of the riparian and wildlife habitat resources resource site.

Watershed data tables

Table D-1. Watersheds (5th level HUC), subwatersheds (6th level HUC), and acres within Metro jurisdictional boundary.

Watershed (5th level HUC)	5th field HUC code	Resource site #	Subwatershed (6th level HUC)	6th field HUC code	Acres in Metro
Rock Creek/Tualatin River	1709001004	7	Middle Rock Creek-Tualatin River	170900100401	7,300.1
		8	Beaverton Creek	170900100402	24,296.8
		9	Lower Rock Creek-Tualatin River	170900100403	7,496.4
			Middle Tualatin River-Davis Creek	170900100404	1,220.7
		10	Middle Tualatin River-Gordon Creek	170900100405	3,594.8
			Lindow Creek	170900100407	752.5

Table D-2. Resource sites: general information.

General information	Middle Rock Creek-Tualatin River	Beaverton Creek	Lower Rock Creek-Tualatin River	Middle Tualatin River-Gordon Creek
Miles of DEQ 303(d) listed streams	4.5	34.8	4.6	3.0
Road density (road miles/square miles in subwatershed)	10.2	15.3	12.6	12.1
Miles of stream with known anadromous fish presence	4.5	0.0	4.6	0.4
Acres of hydrologically connected wetlands	198.6	588.7	918.5	37.8
Total acres of wetlands	199.9	599.8	918.5	38.1
Acres of floodplains (100 year FEMA + 1996 inundation area)	239.2	1,246.1	854.3	83.7
Acres of developed floodplains	8.2	421.9	16.6	13.5
Building permits since 1996 (number)	2,704.0	6,183.0	1,579.0	765.0

Table D-3. Characteristics of stream miles by resource site.

Resource site	Stream miles by channel type		Miles of stream links*	Miles of streams not categorized by channel type	Total stream miles
	Low to medium	*High*			
Middle Rock Creek-Tualatin River	7.4	5.9	2.2	14.5	30.0
Beaverton Creek	31.6	6.5	20.9	42.9	101.9
Lower Rock Creek-Tualatin River	13.5	0.0	7.7	11.6	32.8
Middle Tualatin River-Gordon Creek	2.7	1.6	0.8	11.0	16.1

*Stream links are links between surface streams and may be piped or culverted.

Table D-4. Riparian vegetation by resource site.

Resource site	Vegetation types within 300 feet of a stream (acres)			Forested vegetation >300 feet from a stream
	Low structure vegetation/intact topsoil	Non-forest woody vegetation	Forested vegetation	
Middle Rock Creek-Tualatin River	682.8	71.7	744.7	923.0
Beaverton Creek	1,141.9	114.0	1,743.8	2,457.0
Lower Rock Creek-Tualatin River	726.4	9.0	451.5	278.6
Middle Tualatin River-Gordon Creek	343.8	20.3	216.2	363.5

Table D-5. Regional zoning by resource site.

Resource site	Acres by zone within each resource site						
	Commercial	Industrial	Multi-family residential	Public/open space	Rural	Single family residential	Mixed use
Middle Rock Creek-Tualatin River	748.7	801.0	751.3	5.2	2,798.8	1,608.0	177.1
Beaverton Creek	1,774.6	1,187.3	2,277.0	103.5	1,250.7	12,211.4	2,065.6
Lower Rock Creek-Tualatin River	1,777.5	1,729.8	649.9	15.7	79.0	3,944.9	413.5
Middle Tualatin River-Gordon Creek	257.5	37.7	237.5	0.0	1,323.3	2,037.0	0.0

SITE #7: Middle Rock Creek-Tualatin River subwatershed

Named tributaries: Abbey Creek, Rock Creek
Communities within the subwatershed: Beaverton, Hillsboro, Portland, unincorporated Washington County
Total acreage within Metro's boundary: 7,300.1
Total acreage within riparian corridor: 2,421.2

This site contains two percent of the area comprising Metro's jurisdictional boundary. About 23 percent of the site is in the City of Hillsboro, seven percent in the City of Portland, less than one percent in Beaverton, with the remainder in unincorporated Multnomah and Washington counties (32 and 39 percent, respectively) (Table D-6).

This resource site falls in the second quartile (26 to 50 percent of maximum) of the range of development compared to other sites, with 10.2 miles of road per square mile (Table D-2). Rural zoning strongly dominates land use, but single family residential zoning is also important; commercial, industrial and multi-family residential uses also cover substantial acreage (Table D-5). More than 2,700 building permits have been issued here since 1996 (Table D-2).

Riparian resources. The percentage of this site in riparian corridors is 33 percent, comparable to Site #4 (Willamette River – Lower Tualatin River) (Table 12). The site contributes approximately three percent of the region's riparian corridors (Table 13).

This resource site has approximately 30 total stream miles, or slightly less than 0.0038 miles of non-piped streams per acre, ranking it seventh among the 27 resource sites (Table 12). Only approximately seven percent of all stream miles are stream links, suggesting a relatively low amount of piping/culverting (Table D-3); 16 percent of non-piped streams are DEQ 303(d) water-quality limited, the lowest of any site in Group D (Tables D-2 and D-3). The site contains a mixture of stream gradients (Table D-3). Slightly over three percent of the site is in the floodplain, with approximately three percent of the land covered by wetland resources (Table D-2). Slightly more than three percent of the floodplain is developed, most similar to Site #9 in this group. Anadromous fish are known to be present in five stream miles (Table D-2).

Twenty-seven percent of the acreage that falls within the riparian corridor inventory in this site received primary scores for at least three of the five ecological functions, similar to Sites #8 and #10 in Group D (Table D-9). Forty-two percent of the site's riparian corridors receive at least one primary ecological function score, similar to all other sites in this group except Site #9, which has more primary-scoring areas (Table D-9). The vegetation types within 300 ft of streams are co-dominated by forested and low-structure vegetation, most similar to Site #8 in this group (Table D-4). The largest percentage of land receiving a given primary score is for *Bank stabilization and pollution control*, but *Large wood and channel dynamics* and *Organic material sources* are also important primary functions (Table D-8; see also Table 4 and Appendix 5 for description of ecological functions mapping).

Wildlife habitat resources.
Including Habitats of Concern, 33 percent of the lands in this site fall within the wildlife habitat inventory, ranking it eighth of the 27 resource sites (Table 16). Within model patches, a remarkably high 57 percent fall within the top third of the point range (Table D-10). Of the four criteria in the GIS model, this site tends to score low to moderate in size, moderate to high in

interior (excellent compared to many other sites), moderate in water resources, and high in connectivity (Table D-11). In general, this site's wildlife habitat patches are characterized by a low degree of fragmentation, excellent connectivity, and good water resources. There is a substantial amount of interior habitat in this resource site, making it an excellent area for Neotropical migratory birds and other species requiring interior or relatively undisturbed habitats.

Habitat types in this resource site are dominated by conifer/hardwood forest cover, reflecting the strong size and interior habitat scores discussed above (Table D-15). Wetlands comprise an estimated eight percent of lands. This site contributes over two percent of the region's total wetlands, ranking 13th among the 27 resource sites.

Species of Concern. Four Species of Concern sighting locations fall within the site. Each sighting may include one or more species; if a species occurs more than once in the resource site it is only listed once here. These include the following species:

- Acorn Woodpecker
- Willow Flycatcher
- Elk (listed as sensitive here because it is considered in the Goal 5 rule)
- Great Blue Heron nesting colony

There are very likely many other Species of Concern using this resource site, particularly those relying on forest interior habitats (see Table D-15). Examples of species likely to occur in this site may be found by referencing the species list in Appendix 7 and identifying the species with a double "XX" under the habitat. General species needs and potential reasons for their decline are identified in the *Sensitive Species Accounts* section above. More detailed information on all species' needs can be obtained through Johnson and O'Neil (2001).

Habitats of Concern.
The following Habitats of Concern are partially or wholly within this resource site. Using the Unique ID # (UID), please refer to Appendix 8 for information concerning each Habitat of Concern:

- UID numbers: 49, 55, 56, 57, 58

Resource site data tables: Riparian Corridors

Table D-6. Acres within resource site by jurisdiction.

Jurisdiction	Acres within subwatershed
Beaverton	8.8
Hillsboro	1,670.9
Portland	474.8
Unincorporated Multnomah County	2,308.2
Unincorporated Washington County	2,835.9

Table D-7. Acres in Metro and riparian corridor.

Resource site	Total acres within Metro	Total acres within riparian corridor
Middle Rock Creek-Tualatin River	7,300.2	2,390.8

Table D-8. Number of acres within riparian corridor providing ecological function.

Resource site:	Ecological function	*Primary Value*		*Secondary Value*	
		Acres*	% of Total**	Acres	% of Total
Middle Rock Creek-Tualatin River	Microclimate & shade	432.5	18.1%	978.6	40.9%
	Streamflow moderation & water storage	310.5	13.0%	2,032.4	85.0%
	Bank stabilization & pollution control	945.3	39.5%	253.5	10.6%
	Large wood & channel dynamics	751.4	31.4%	198.3	8.3%
	Organic material sources	636.8	26.6%	157.9	6.6%

*Number of acres scored within the riparian corridor for each function
**Percent of total acres within the riparian corridor

Table D-9. Breakdown of ecological scores.

Resource site	Ecological Score	Acres	% of Total Acres
Middle Rock Creek-Tualatin River	1 to 5	1,382.1	57.8%
	6 to 11	256.3	10.7%
	12 to 17	113.3	4.7%
	18 to 23	86.8	3.6%
	24 to 29	428.5	17.9%
	30	123.9	5.2%
	Total acres	2,390.8	100.0%

Resource site data tables: Wildlife Habitat

Table D-10. Breakdown of total wildlife model patch scores.*

Resource site: Middle Rock Creek-Tualatin River	Number of acres in each wildlife score category									Total wildlife model patch acres in inventory
	1	2	3	4	5	6	7	8	9	
Model score	31.1	140.5	326.1	293.3	96.8	133.6	45.3	1,282.4	0.0	2,349.0
Percent of total	1.3%	6.0%	13.9%	12.5%	4.1%	5.7%	1.9%	54.6%	0.0%	100.0%

*Does not include Habitats of Concern outside of model patches.

Table D-11. Breakdown of total wildlife patch model scores by criteria.*

Resource site: Middle Rock Creek-Tualatin River	Number of acres by score for each model criterion												Total wildlife model patch acres in inventory
	Size[2]			Interior[2]			Water[3]			Connectivity			
	1	2	3	1	2	3	1	2	3	1	2	3	
	1,086.1	638.6	0.0	257.6	638.6	643.8	67.6	1,935.4	280.3	212.5	556.7	1,579.9	2,349.0
Percent of total acres in inventory	46.2%	27.2%	0.0%	11.0%	27.2%	27.4%	2.9%	82.4%	11.9%	9.0%	23.7%	67.3%	na

[1]Does not include Habitats of Concern outside of model patches.

[2]These numbers do not add up to 100.0% because Type 2 patches (low structure vegetation within 300 feet of streams and wetlands) were not ranked for these criteria.

[3]These numbers do not add up to 100% because not all patches contained or were near water resources.

Table D-12. Breakdown of total wildlife model patch area by 2000 Metro photo interpretation landcover and known wetlands.*

Resource site: Middle Rock Creek - Tualatin River	Low structure vegetation within 300 feet of stream		Forested vegetation	Forested wetlands	Grass/shrub wetlands within 300 feet of a stream	Other wetlands	Total wildlife model patch acres in inventory
	Low structure vegetation/ intact topsoil	Non-forest woody vegetation					
Acres	555.0	69.4	1,540.8	99.6	72.1	12.2	2,349.0
Percent of total	23.6%	3.0%	65.6%	4.2%	3.1%	0.5%	100.0%

*Does not include Habitats of Concern outside of model patches.

Table D-13. Total acres of inventoried wildlife habitat by type and total Species of Concern (SOCs).

Resource site: Middle Rock Creek - Tualatin River	Wildlife patches (acres)	HOCs inside Wildlife patches (acres)*	HOCs outside Wildlife patches (including wetlands <2 acres)	Total inventoried wildlife habitat acres	Total SOCs
Acres	2349.0	234.4	19.4	2368.4	4
Percent of total	99.2%	9.9%	0.8%	100.0%	N/A

*Habitats of Concern.