FOREST GROVE CITY COUNCIL
SPECIAL WORK SESSION
Monday, September 17, 2007

4:00 PM – Work Session
(Goal 5 Amendments)

Community Auditorium
1915 Main Street
Forest Grove, OR 97116

All meetings of the City Council are open to the public and all persons are permitted to attend any meeting except as otherwise provided by ORS 192. The public may address the Council as follows:

➔ **Public Hearings – Public hearings are held on each matter required by state law or City policy. Anyone wishing to testify should sign in for any Public Hearing prior to the meeting. The presiding officer will review the complete hearing instructions prior to testimony. The presiding officer will call the individual or group by the name given on the sign in form. When addressing the Council, please use the witness table (center front of the room). Each person should speak clearly into the microphone and must state his or her name and give an address for the record. All testimony is electronically recorded. In the interest of time, Public Hearing testimony is limited to three minutes unless the presiding officer grants an extension. Written or oral testimony is heard prior to any Council action.**

➔ **Citizen Communications – Anyone wishing to address the Council on an issue not on the agenda should sign in for Citizen Communications prior to the meeting. The presiding officer will call the individual or group by the name given on the sign in form. When addressing the Council, please use the witness table (center front of the room). Each person should speak clearly into the microphone and must state his or her name and give an address for the record. All testimony is electronically recorded. In the interest of time, Citizen Communications is limited to two minutes unless the presiding officer grants an extension.**

The public may not address items on the agenda unless the item is a public hearing. Routinely, members of the public speak during Citizen Communications and Public Hearings. If you have questions about the agenda or have an issue that you would like to address to the Council, please contact the City Recorder at 503-992-3235.

City Council meetings are handicap accessible. Assistive Listening Devices (ALD) or qualified sign language interpreters are available for persons with impaired hearing or speech. For any special accommodations, please contact the City Recorder at 503-992-3235, at least 48 hours prior to the meeting.

A G E N D A

4:00 1. **WORK SESSION: GOAL 5 AMENDMENTS**
The City Council will convene in the Community Auditorium to conduct the above work session. The public is invited to attend and observe the work session; however, no public comment will be taken. The Council will take no formal action during the work session.

2. **CITIZEN COMMUNICATIONS**:

6:00 3. Adjournment

forest grove

To: **City Council**

From: **Jon Holan, Community Development Director**

Subject: **Study Session on Goal 5 Amendments**

Date: **September 17, 2007**

The City Council will be conducting a hearing at its September 24th meeting on the proposed Goal 5 amendments. These amendments are to implement Metro's Nature in Neighborhoods program and the Tualatin Basin approach to meet Metro requirements. Staff has attached the staff report that explains the proposed amendments as well as all the attachments to the staff report. The following is the list of attachments to the staff report.

Attachment 1	Proposed Text Amendments
Attachment 2	Maps showing location of Regionally Significant Fish and Wildlife Class I and II and A and B Habitat Inventory, Slopes 10 percent or greater and 100 Year Flood Plain
Attachment 3	Metro ESEE (due to its size, this item is in a separate notebook available for review)
Attachment 4	Metro Functional Plan Requirements for Nature in Neighborhoods
Attachment 5	Tualatin Basin ESEE (due to its size, this item is in a separate notebook available for review)
Attachment 6	Tualatin Basin Program
Attachment 7	Technical Issue Paper 1
Attachment 8	Technical Issue Paper 2
Attachment 9	Gap Analysis
Attachment 10	List of Native Trees from City's Street Tree list
Attachment 11	Municipal Code Provisions on Flood Plan Management
Attachment 12	Environmental Review Overlay District Text and Map
Attachment 13	Letters Received

The focus of the September 17th work session is to review Attachment 1, the proposed text amendments, so that the Council has an understanding of its content and to answer

any questions. We anticipate that this review will help facilitate the public hearing on September 24th.

Staff has included all the material to allow the Council additional review time prior to the September 24th hearing. We are not intending to reproduce all this material for the September 24th packet. **Please remember to bring the material included in this September 17th packet with you to the September 24th hearing.** What will be included in the September 24th packet is the adopting ordinance.

APPROVED

1. CALL TO ORDER:

Chairman Beck called the meeting to order at 7:00 p.m. **Planning Commission Present:** Tom Beck, Al Miller, Cindy McIntyre, Ed Nigbor. **Excused:** Lisa Nakajima, Luann Arnott, and Carolyn Hymes. Carolyn Hymes is excused for tonight's meeting as well as the next three Planning Commission meetings. **Staff Present:** Jon Holan, Community Development Director; Marcia Phillips, Permit Coordinator/Recorder.

2. PUBLIC MEETING:

2.1 PUBLIC COMMENT PERIOD FOR NON-AGENDA ITEMS: None.

2.2 PUBLIC HEARING:

Chairman Beck announced that because of the number of items on the agenda for the evening, **Agenda Item (2) 2.C** regarding Goal 5 will be continued to the May 21, 2007, meeting. One person from the audience left the meeting.

A. Planned Residential Development Number PRD-06-03: WRG Design, Inc. as applicants, are requesting a planned residential development to construct 58 single family detached dwellings on an 8.2 acre parcel. The site is located north of 26th Avenue approximately 320 feet to the east of the intersection of 26th Avenue and Sunset Drive (Washington County Tax Lot Numbers 1N3 31BD-1300, 3800, 3001, and 2900) (continued from March 19, 2007)

Chairman Beck stated that PRD-06-03 was continued from the March 19, 2007, meeting. Hearing procedures would be the same as for the first meeting. He called for the staff report.

Mr. Holan read a memo dated April 30, 2007, (Handout # 2) written by James Reitz, City Planner. In the memo Reitz commented on the applicant's response to the Planning Commission's request at the previous meeting for certain issues to be addressed by the applicant. The memo included staff's proposed Conditions of Approval.

The memo stated that according to an e-mail from Andrew Tull received on April 26, 2007, the applicant is "still in the queue at Clean Water Services . . . but is anticipating the completion of the review within the next few days." The memo stated that the applicant requests that the Planning Commission proceed with the hearing, and the Service Provider Letter will be forwarded to the City as soon as the applicant receives it. Holan stated that the Planning Commission can determine whether to allow submission of the Service Provider Letter prior to the City Council meeting.

APPLICANT:

Jon Riemann, WRG Design, 5415 SW Westgate Dr., Suite 100, Portland, OR 97221. Mr. Rienmann responded to Staff's memo by stating that he had with him a copy of the CWS Service Provider Letter and a new design for the project. The new design would eliminate half of the 4-plexes and replace them with duplexes. The product type is varied. The total number of units would be 62. A temporary pedestrian way was added to the open space located in the center of the project, and the open space was moved down. The applicant requests that the pedestrian way be removed as the area develops and streets are extended north and south. Rienmann said the applicant has made attempts to purchase the property in the middle of the project, but has been unsuccessful. The amount of open space has been increased to 1.7 acres. The remaining 4-plexes have 20-foot driveways. There is also some on-street parking. The City of Forest Grove Engineering Department has approved rolled curbs. The applicant has no issues with the location of the doors and porches. Detention will be done on site, and the City's Engineering Department agrees. The applicant concurs with the rest of Staff's recommendations for Conditions of Approval.

PROPONENTS:

Morgan Will, Project Manager Taurus Homes, PO Box 807, North Plains OR 97133. Mr. Morgan pointed out that for marketing purposes the plexes are grouped together in several locations in the project. It makes sense to retain the plexes, because the homes are more affordable.

Sue Graves, 1602 NE Orenco Station, Hillsboro, OR. Ms. Graves stated that she owns property at Sunset Drive and University Avenue. There has been much positive change to her land drainage issues. The drainage issues have been well answered. Graves referred to the letter submitted by Lee Wells (Handout # 1) in support of the subdivision. There has been a great deal of development here, and Forest Grove needs to pay attention to affordability. This project provides affordable housing with open space that would be used by people on a daily basis. Graves stated that she lives in Orenco Station and loves the 4-plexes mixed in with other types of housing.

OPPONENTS:

Blaine Nunnenkamp, 2382 Willamina Avenue, Forest Grove, OR 97116. Mr. Nunnenkamp said he owns the property northwest of the PRD. He is very concerned about increased erosion on his property from the proposed PRD. Nunnenkamp showed pictures of the deep culvert which runs along his property. He is concerned that children might fall in and drown. He stated that there is erosion around the new culvert that goes under Willamina Avenue. He is asking for erosion control.

Holan explained that the City is responsible for making sure the PRD is developed to Clean Water Services standards. There is a set of erosion control measures that must be used for development, such as silt fences and hay bales.

Tim Bertsch, 805 NE Arrington Rd., Hillsboro, OR. Mr. Birch stated that he just purchased the middle piece of property that abuts the proposed development. He has talked to Jon Rienmann several times, and told him the property is for sale. He has had several other offers on the property.

OTHER: None.

REBUTTAL:

Rienmann explained that he has talked with Nunnenkamp and Granton. It makes sense to do detention on site. The developer must obtain a 1200-C permit and provide erosion control measures. The flow will be contained on site to keep drainage to pre-development levels. Rienmann said he has gone through several designs with Staff, and is trying to meet street length and block length requirements.

Chairman Beck said that Staff suggests 41-52 units, and asked Rienmann what would happen if the Commission asked for a redesign.

Rienmann stated that it would not be economically feasible to develop with so few lots. His density calculations indicate 63 units.

Chairman Beck closed the Public Hearing at 8:05 p.m., and returned the meeting to the Planning Commission for discussion.

DISCUSSION:

Chairman Beck asked staff to discuss block length.

Holan read Ordinance Section 9.110 (1) (F) , and explained that the pedestrian way was required due to the length of the block, and gave Pacific Crossing as an example of using a pedestrian way to meet block length requirements. Holan said his impression is that the gaps between units provide some on-street parking. The parking spaces must be 23-feet in length to meet parallel parking standards in Forest Grove.

Holan explained that the density was based on Staff analysis; 41 is the minimum density, and 52 would be the target density. For an A-1 zone, density is 12 units per net acre. Eighty percent of that is 9.8 units per net acre. Historically area for streets and open space is deducted from the total acreage to determine net area. The net area is then used to determine density.

Chairman Beck made the comment that a cross street in the middle of the property would slow the speed of cars. He was pleased to see the connection between the park and the lower half of the project.

Commissioner Nigbor remarked that the Commission is being too lenient and allowing too much density. Providing affordable housing is about the only benefit he could see from this project. He questioned whether continuing to allow such high density was beneficial to the City over all. He does not like a long block of garage doors.

Holan said it was up to the Commission and the Council to weigh the benefits being provided. There is concern at the Council level about those PRDs that exceed the density requirements. Besides affordable housing, another benefit being provided is open space.

Chairman Beck said water run off is a problem, but the applicant is doing as much as is legally required and legally permitted. He wants to see an east-west street located in the middle of the subdivision, and does not like long blocks. The east-west street could be put in and stubbed at both ends. Beck said he is not willing to approve higher density. He would like another park located centrally in the southern portion of the development.

Commissioner McIntyre was not sure the applicant has done all he can to address erosion. She did not agree with Staff's recommendation that the street width on Black Pine Street be reduced to 24-feet. It should be 28-feet with parking on one side. McIntyre would also like an east-west street in the middle of the project. She stated that the 4-plexes were not the right fit for Forest Grove.

Commissioner Miller said he is not opposed to the 4-plexes. His concern is that there is no connection to collector streets. The traffic circulation is not good.

Holan stated that the Planning Commission can deny the PRD or give the applicant more time to redesign. If the PRD is denied it will not go before the City Council, but the decision can be appealed.

Chairman Beck asked the applicant whether he would prefer to redesign or start over. The applicant asked for clarification of what the Commissioners want to see. Beck summarized what the Commissioners had stated during the discussion:

- No bonus density on PRDs in this area.
- Put an east-west street in the middle of the project.
- The park would have to be moved, but not eliminated.
- The 4-plexes were aesthetically objected to by two of the Commissioners.
- One Commissioner wants the applicant to work on the storm water problem.
- Do not make Black Pine Street narrower.

- Lower the density. Get down to 52 units or close to it.
- Use a different look. The streetscape is very important. 4-plexes with four garages all in a row is not pleasing.
- The City Council is firm on 5-foot side yard setbacks.

The applicant requested four weeks to redesign, and agreed to a continuance of the hearing.

Chairman Beck continued the hearing to the June 4, 2007, meeting and called for a short recess at 8:39 p.m. The meeting was resumed at 8:45 p.m.

B. Planned Residential Number PRD-06-05: Dave Turnbull, as applicant, is requesting a planned residential development on four parcels comprising a 1.72 acre site to develop 16 lots. The site is located north of the intersection of Gales Way and 23rd Avenue and adjacent and west of "B" Street, about 275 feet north of 23rd Avenue. Addresses of the properties are 2332 "B" Street and 2307, 2311 and 2333 Gales Way. (Washington County Tax Lot Numbers 1N4 36DA-300, 800, 1000, and 1001) (continued from April 16, 2007)

Chairman Beck stated that PRD-06-05 was continued from the April 16, 2007, Meeting, and called for the staff report.

Mr. Holan read a memo from James Reitz, City Planner, dated April 30, 2007, regarding Smith's Orchard Planned Residential Development. The design submitted by the applicant for tonight's meeting (Handout # 5) and the design included in the Commissioners packets (attached to Reitz's memo) are the same design. Staff calculated 13 units at 100% density using the same method used by the applicant. With bonus density it would be 14-15 units. Holan read staff's recommended Conditions of Approval.

APPLICANT:

Matthew Newman, NW Engineers, LLC, 19075 NW Tanasbourne Dr., Suite 160. Mr. Newman said the applicant's redesign follows Staff recommendations, and addresses the concerns of both the Planning Commission and the neighbors regarding density, parking, circulation and design. The applicant is not asking for bonus density. Two existing houses will be kept and eleven new homes will be built. The property will have 36-41 parking spaces on site. Several units have 2-car garages and some have long driveways for tandem parking. The garages on Lots 6 & 7 have been pushed back to allow for a better turning radius into the driveways. The applicant does not believe it is necessary to loop the water line, is requesting approval to work with staff on this matter, and revision of Condition # 34 to reflect this. The applicant is requesting that Conditions 41 & 42 be revised to address setback issues. The applicant has been unable to locate plans with the master bedroom on the main floor that meet his requirements, but will continue to search.

Holan said Mr. Turnbull has shown some elevations with the Craftsman style similar to those mentioned in Condition 45. The decision can be left to the discretion of the Community Development Director, but in PRDs the applicant usually provides elevations to be approved.

PROPONENTS: None.

OPPONENTS:

Genevieve Bell, 2318 Gales Way, Forest Grove, OR 97116. Ms. Bell said she is grateful for the changes made by the applicant, however, the proposed street into the development is right across Gales Way from her living room window, and she is concerned about getting out of her driveway with the increased traffic from the development. Walnut trees are messy, but beautiful, and Ms. Bell would like to see them preserved. She is not happy with the high density.

John Metz, Manager of Covey Run, 1756-B Covey Run Dr., Forest Grove, OR 97116. Mr. Metz said the main sewer line is marginal, and during the rainy season toilets backup. During heavy rains two years ago, there was flooding 3-feet wide on the south side of the street into Covey Run. Mr. Metz would like a privacy fence greater than six feet tall along the property line between the proposed development and Covey Run.

Mark McDowall, 1723 23rd Avenue, Forest Grove, OR 97116. Mr. McDowall appreciates the changes the applicant has made. The number of units decreased and were made larger. McDowall said he could live with 11 units not 13.

Carol Woods, 2329 Gales Way, Forest Grove, OR 97116. Ms. Woods said that historically during the heavy rainy season, many of the neighbors have leaky basements, so she is very concerned about storm drainage.

Randy Van Wie, 2335 "B" St., Forest Grove, OR 97116. Mr. Van Wie said his property is not adjacent to the development, but is located across the street from Lot # 8. The storm drain on "B" Street typically backs up during heavy rains. His concerns include the density, character change of the neighborhood, and the foot traffic to and from the nearby grade school and high school which will be impacted by this development.

Sue & Joe Rowley, 2339 Gales Way, Forest Grove, OR 97116. Ms. Rowley is concerned that the development is too small for a HOA to maintain Tract E. Eleven houses should be the maximum density.

Melissa Moore, 2326 "B" Street, Forest Grove, OR 97116. Ms. Moore said that typically the existing homes in the area have similar architectural features on all four sides of the homes. She is concerned that the proposed houses will have a "Disneyland" façade with architectural features mainly on the front. Lots 6, 7 & 9

will be along her property. Lots 6 & 7 face her back yard, but she would prefer that the back of these houses face her backyard. The current design removes the large Maple tree, and Ms. Moore hopes it will be saved. She would like the existing house to remain, even if it must be shifted.

Roy Adams, 2326 "B" Street, Forest Grove, OR 97116. Mr. Adams showed a site plan with ten units that he designed as a possible alternative to the applicant's design. Mr. Adams wants the trees to be saved, and grass Crete to the WQF.

OTHER: None.

Chairman Beck called a recess at 9:45 pm. The meeting was resumed at 9:50 pm.

REBUTTAL:

Mr. Newman said cost is an issue. This is medium density not high density. To the north Covey Run has twelve units in a smaller area. Regarding storm drainage, the applicant has proposed detention to predevelopment levels. It may be possible to save the Maple tree. The applicant is willing to work with staff concerning facades on all four sides of the homes. The applicant has not heard of any sanitary problems. A fence greater than six feet in height would require engineering, which would add to the cost of the project.

Mr. Turnbull said if the project was reduced to less than 13 units, it would not be cost feasible. He also wants to save the Maple tree, and any trees that are removed will be replaced with other trees. Normally ninety percent of the décor is on the front of the home with some on the sides. He is agreeable to a privacy fence along Covey Run.

Chairman Beck closed the public hearing at 9:52, and returned the meeting to the Planning Commission for discussion.

DISCUSSION:

Commissioner McIntyre: Appreciates what the applicant has done with the redesign. It still looks busy and cluttered. The design showing ten units that was presented by one of the neighbors looked good. She suggested that perhaps the applicant could do fewer larger homes that would sell for a greater price. McIntyre expressed concern about fire access to the 14-foot road (Tract C driveway).

Commissioner Miller: This project does not have to change the neighborhood. The new homes just need to look like they have been there awhile. The problem with the sewer has not been brought up before. Someone needs to find out what the problem is and address it.

Commissioner Nigbor: The redesign has some good changes. The new houses need to tie in with the existing homes as much as possible. Lots 4, 5 & 6 should not be duplexes and should be angled to provide privacy. There is a substantial improvement in the open space. The applicant needs to look carefully at the architecture.

Chairman Beck: The changes were necessary and good. Eliminate the walkways. Lots 10 and 11 face Gales Way, so it is important how they look. Lot 8 faces "B" Street, and it is also important how it looks. The internal neighborhood is different. The redesign is a big improvement, but there are still changes that need to be made. The houses do not seem to address the real senior housing issues. The homes need to be wheelchair accessible for example. Beck said he would be willing to grant a continuance. He is not ready to approve this version. Density is an issue. The Planning Commission needs to see some definite designs for the houses. Make Smith Court narrower with no parking.

The applicant agreed to a continuance, and agreed to waive the 120-day rule. Chairman Beck continued the hearing to the June 4, 2007 meeting.

BUSINESS MEETING:

3.1 **APPROVAL OF MINUTES:** Miller moved to approve the minutes from the April 2nd and April 9th meetings. Nigbor seconded. Motion passed 4-0 by voice vote.

3.2 **REPORTS FROM COMMISSIONERS/SUBCOMMITTEES:** None.

3.3 **DIRECTOR'S REPORT:**

The next meeting will deal with Goal 5 and the Ortman appeal. Holan invited the Planning Commissioners to come in to his office and go over the Goal 5 information, because there is a lot to absorb. He said he is willing to talk with anyone to help with comprehension.

3.4 **ANNOUNCEMENT OF NEXT MEETING:** Next meeting May 21, 2007. Miller, Beck and Hymes will not be here in June. McIntyre will not be available for the June 18th meeting.

3.5 **ADJOURNMENT:** Meeting was adjourned at 10:20 pm.

Respectfully submitted by:
Marcia Phillips

APPROVED

PLANNING COMMISSION MEETING MINUTES
FOREST GROVE COMMUNITY AUDITORIUM CONFERENCE ROOM

1. CALL TO ORDER:

Chairman Beck called the meeting to order at 7:00 p.m. **Planning Commission Present:** Tom Beck, Al Miller, Cindy McIntyre, Ed Nigbor. **Staff Present:** Jon Holan, Community Development Director; Marcia Phillips, Permit Coordinator/Recorder.

2. PUBLIC MEETING:

2.1 PUBLIC COMMENT PERIOD FOR NON-AGENDA ITEMS: None.

2.2 PUBLIC HEARING:

Chairman Beck announced that due to the length of time needed for Agenda Item (2) 2.A dealing with Goal 5, the Commission would hear Agenda Item (2) 2.B the Ortman appeal first.

The public hearing for the Ortman appeal was opened at 7:02 p.m.

B. Appeal of Community Development Director's Determination: Appeal of Community Development Director's Determination on Building Permit Number BLD 06-00220 and Attendant Site Plan Review. Location is 2937 Watercrest Road, Forest Grove. (Washington County tax lot number 1N4 35AC-4100.)

Chairman Beck read the hearing procedures and asked for disclosure of any conflicts of interest, ex-parte contacts, bias or abstentions. There were none, and no challenges from the audience. Beck called for the staff report.

Mr. Holan stated that on October 27, 2006, Rick Vanderkin applied for a building permit to build a 720 square foot accessory structure. The application went through the review process, including site plan review by the Planning Division, and was approved. The permit was issued, work has begun and inspections have been done by City Building Inspectors. During construction a large tree on the Ortman's property blew down during a strong windstorm. Mr. and Mrs. Ortman sent letters to the Community Development Director about the accessory building. On March 14, 2007, the Director sent a response to the Ortmans. On April 4, 2007, an appeal was filed with the Community Development Director by the Ortmans. The appellant had four arguments:

1. The City did not give notice of the permit application
2. The project violates the Code's minimum setback requirements.
3. The second driveway violates code requirements.
4. The project encroaches on the Ortman's property.

Holan stated that staff concludes there was no error in the lack of notice as to the

original approval of the site plan because the site plan review was not a limited land use decision. Staff based its evaluation of required setbacks on past practices. The second driveway does not violate City requirements. There does not appear to be any evidence of any encroachment caused by the construction of the accessory structure, and it appears speculative that the excavation of the structure resulted in the tree being blown down. If the Commission concurs with the Appellant's argument regarding setbacks, the solution is to require the applicant to move the structure the appropriate distance to maintain the 5 foot setback

Pam Beery, City's Land Use Attorney, stated that the Planning Commission and both legal councils had been given a copy of her memo regarding the appeal (Handout #1). In the memo Beery states that there are two legal questions presented.

1. Was the City required to give notice of the initial decision to approve the building permit, and if so, is this appeal to the Planning Commission timely filed insofar as it purports to challenge the issuance of the building permit itself?
2. Does the Planning Commission have the legal authority to require that the accessory building be moved to provide a setback of at least 5 feet?

In her summary, Ms. Beery stated that although it can be argued that the Zoning Ordinance sets out clear and objective standards for the setbacks applicable to accessory structures, the decision concerning which of two potentially applicable standards should be applied is an exercise of discretion. Therefore, the City should have provided notice of the decision granting the building permit. The question of whether this appeal of the building permit is timely is a question for the Commission to determine following the hearing. Even if the appeal is deemed timely, the Commission does not have the authority to require that the setback be changed at this time.

Ms. Beery stated that once the applicant received the building permit, he is allowed to build according to that permit. No changes in code can be made. The City does not have the authority to change the standard. The Planning Commission needs to make a ruling on all parts of the appeal and appeal criteria. It is not within the Commission's authority to require the shed to be moved.

Ms. Beery explained that notice does not necessarily mean receiving a piece of paper in the mail. Notice can mean seeing excavation or going to City Hall to inquire about what is being built.

PROPONENTS:

Andrew Stamp, Attorney for the Vanderkins, Kruse-Mercantile Professional Offices, Suite 15, 4248 Galewood St., Lake Oswego, OR 97035. Mr. Stamp

stated that on November 2, 2006 the City issued a building permit to Mr. Vanderkin. The site plan submitted by the applicant shows a three-foot side-yard setback, which is consistent with the flyer the City gives prospective permittees seeking information on zoning restrictions. The planning division signed off on the building permit, indicating its determination that the application was in compliance with the Zoning Code, including setbacks. The City did not give notice with opportunity for comment to neighbors.

Mr. Stamp said the building permit became final on November 23, 2007, twenty-one days after its issuance. No timely local appeal was filed, which was predictable due to the City's failure to provide for notice and comment period. Mr. Vanderkin began construction consistent with a three foot side yard setback, and has since completed construction of the structure.

After construction had begun, a neighbor, Brad Ortman, sent two letters to the City's Planning Director alleging that the City erred in approving the building permit application with a three foot side yard setback, because the code actually requires a five foot side yard setback for accessory structures. The Planning Director issued a letter in response to Mr. Ortman on March 14, 2007, in which he acknowledges an internal inconsistency in the Code. The Director determined that the three foot setback was correctly applied, but that the matter could be appealed to the Planning Commission. On April 4, 2007, the Ortmans filed a timely local appeal of the Director's letter to the Commission.

Mr. Stamp stated that the Ortman's appeal seeks to have the building permit revoked. The appeal seeks to have the Planning Commission reverse various code interpretations of the Director for future unrelated cases, but is not a valid means of appealing the Vanderkin building permit. The City's failure to give notice or hold a hearing before issuing the building permit resulted in the Ortman's having a right to a direct LUBA appeal. The deadline for a LUBA appeal expired 21 days after the Ortmans received actual notice of the building permit. The Ortmans failed to file a timely appeal to LUBA, and cannot now file a local appeal of the director's letter.

Mr. Stamp said he agrees with Staff's analysis on the third driveway. If in fact excavation encroached onto the Ortman's property, the Vanderkins should pay for damages.

OPPONENTS:

Krista Hardwick, Attorney for the Ortmans, 300 Pioneer Tower, 888 SW Fifth Avenue, Portland, OR 97204-2089. Ms. Hardwick handed out a copy of the second page of the February 5, 2007, letter which was left out of the handout given to the Planning Commission. Hardwick stated that the Vanderkins had removed the encroachment to the Ortman's satisfaction.

Hardwick requested that the record be left open to give her the opportunity to review Ms. Beery's memo in depth.

Ms. Hardwick stated that Section 9.855 and Section 9.915 of the Zoning Ordinance are contrary to one another. The former section states that all one story accessory structures are allowed to have a three foot setback. The latter section states that all accessory structures taller than 36 inches must have a five foot setback. Regardless of whether it is one or two stories, the accessory structure built by the Vanderkins is taller than 36 inches. The building permit should not have been issued with a three foot setback. Hardwick said that Mr. Stamp stated that the Ortmans are appealing Mr. Holan's letter, but the original letters appealed the building permit.

Ms. Hardwick sited the Warf case in which a local appeal was filed and accepted and did not void an appeal to LUBA. As soon as the Ortmans noticed excavation, they wrote letters to the Director. The Ortmans' appeal letters were accepted. Ms. Hardwick agreed that Ms. Beery gave a good explanation of "notice". Hardwick said the Planning Commission can hold to the five foot setback. The accessory structure has not received its final inspection. Hardwick pointed out that LUBA can repeal a decision if the City misconstrues the law.

Brad Ortman, 2941 Watercrest Rd., Forest Grove, OR 97116. Mr. Ortman said he was initially told by the Vanderkins that they were building a dog run and sport court.

Wendy Ortman, 2941 Watercrest Rd., Forest Grove, OR 97116. Ms. Ortman said they were aware in late January that a building was being built.

OTHER: None.

REBUTTAL:

Mr. Stamp stated that the opponents' attorney claims that the letters sent to the Director in February constitute an appeal. The appeal period for the building permit is 21 days after it was issued. That would be November 23, 2006. After that the only recourse would be to file an appeal directly to LUBA. It was not correct to file a late local appeal. Mr. Stamp referred to page 9 of his letter to the City's land use attorney where his explanation of the Warf case is mentioned.

Mr. Stamp concluded by saying that the Planning Commission tonight could make a ruling as to whether the three or the five foot setback will apply to future applications. But since the Vanderkins were issued a building permit with an approved three foot setback, and the 21 day appeal period has passed, they must be allowed to finish the construction as approved. Judges do not usually require a

building to be torn down or moved. It is considered a waste of resources.

Chairman Beck closed the public hearing at 8:10 p.m.

Ms. Beery stated that for the record the appellant has request that the record be left open for seven days for the appellants' attorney to respond. Then the record should be left open for an additional seven days to allow the applicants' attorney to respond. Ms. Beery will give her response after receiving the responses from the two attorneys.

Chairman Beck continued the deliberation to the July 2, 2007 meeting. The Commission would appreciate it if the appellants' attorney would have her analysis completed and turned into the City by May 29, 2007, and if the applicants' attorney would have his analysis completed and turned into the City by June 5, 2007.

Chairman Beck said the Commission would now hear Agenda Item (2) 2.A.

A. Comprehensive Plan Amendment Number CPA-06-03, Zoning Text Amendment Number ZA-06-03, Land Division Ordinance Number LDO-06-02 and Municipal Code Amendment: The City, as applicant, is proposing amendments to the Comprehensive Plan, Zoning and Land Division ordinances and the Municipal Code to implement the requirements of Metro's Title 13 Functional Plan requirements pertaining to Nature in the Neighborhood (otherwise referred to as Goal 5). The amendments are city wide. (continued from May 7, 2007)

Chairman Beck stated that this is a legislative hearing. Due to the length of the staff report, the Commission would first hear from the only person in the audience, so he could leave the meeting if he chose to do so.

OPPONENTS:

George Burlingham, 45157 David Hill Road, Forest Grove, OR 97116. Mr. Burlingham owns property to the north and south of David Hill Road and was annexed into the City two months ago. Burlingham requested that the Upland Wildlife Habitat Class A Green applied to the property north of David Hill Road be deleted. He concurred with staff that the overlay was appropriate south of David Hill Road. Burlingham gave the Commissioners an arial photograph on which he indicated the changes (Handout #2). Burlingham stated that he planted the stand of trees north of the road about fifty years ago, there is a tax liability with the county, and he plans to cut them down within ten years, so this is not a natural forest.

Mr. Holan stated that in Mr. Burlingham's situation, because it is within the current UGB. However, the proposed amendments do not apply to the northern portion of

his property it does raise the issue that if the City brings additional lands into the UGB which have forest practice permits or other activities going on, how should the ordinance requirements be handled.

Mr. Burlingham's property northeast of David Hill Road shows upland habitat. In the code as it is proposed, which is consistent with Metro, there are no standards and no provisions that apply to uplands. The code only applies to properties being brought into the UGB after the adoption of Goal 5 by Metro. In this case, Mr. Burlingham's property has been inside the UGB since the original inception of the UGB. So as far as the area with which he is concerned, there are no restrictions and no limitations as far as clearing the trees.

Burlingham said he wants the map changed.

Holan explained that it is a Metro map and would require an application to Metro to make that change. This is not necessary, because it is not an issue.

Burlingham requested a copy of the minutes of tonight's meeting for his records.

Chairman Beck asked for the staff report.

Commissioner Miller asked what the ramifications would be if the Commission does not understand Goal 5.

Chairman Beck explained that it was not necessary to understand every item, but it was important to understand the theory. The Commission has had work sessions on Goal 5 with Mr. Holan to help with comprehension.

Commissioner Nigbor asked Holan for a brief statement of Metro's Goal 5. Holan said Metro needed to comply with Goal 5 which addresses the preserving of resources, both natural and man made. Metro approached this in two ways. The first way was through water quality. No development is allowed in the 50-foot buffer on either side of creeks, which has been implemented through CWS requirements.

The second way is to protect riparian and upland habitat. Forest Grove has the option to adopt the Tualatin Basin proposal, whose goal is to improve the health of eco-systems, or to comply with Metro's functional plan requirements for communities outside the Tualatin Basin. Metro's model code could be adopted by the cities. To comply with the Tualatin Basin program, the City must offer incentives to use low impact development techniques. Holan stated that there is little the City can offer as incentives. One significant way is to reduce SDC's on water quality and quantity facilities. CWS sets the SDC charges, so the City cannot offer reduction in fees as an incentive.

During a previous work session the City Council and Planning Commission indicated that they wanted a set of standards. As a result of this, staff moved forward on the version being presented, which blends the Metro model code with the City Ordinance.

Holan went through the proposed amendments which are referred to as Items 1-25 and began on page 8 of the staff report.

Item # 1 – Commissioner McIntyre asked whether she needed to understand Class 1 and Class 2. Holan explained that they just refer to the maps. Class 1 is a higher rated habitat area.

Item # 2 – This is a text amendment which has nothing to do with Goal 5. It adds a new section regarding updated flood studies and allows the use of other studies to make a decision.

Item # 3 – Provides a policy basis for what is being done.

Item # 4 – Adds a new definition of natural resource areas. Tries to provide clarity so there is no jurisdictional conflict between CWS and the City.

Item # 5 – Informational. Makes sure there is proper map verification of where a natural resource is located.

Item # 6 – Eliminates barriers for low impact, such as the use of pervious concrete.

Item # 7 – Allows for the use of open drainage as long as the City's Engineering Department has no problem with it.

Page 7 – Allows narrow streets through sensitive areas. This is intended to minimize impervious surface through resource areas.

Item # 8 –Sidewalks can be less than City standards where ADA is not an issue. Removes a barrier and allows for consideration of narrower sidewalks in subdivisions.

Item # 9 – Replicates what is written in the Environmental Review Zone.

Item # 10 – This is a policy amendment to add conservation of natural resource areas the purpose statement of the Zoning Ordinance.

Item # 11 – Very important – changes density. Currently when determining density, streets and open space are deducted. With this amendment if there is a natural resource area, it will not be deducted to determine density. This will avoid

Measure 37 claims regarding reduction of development potential.

Commissioner Beck stated that he disagrees with this whole section, and does not want it included. It uses Measure 37 as an excuse, and Forest Grove may have to pay in the future. It allows dense housing up next to areas we want to protect. It contradicts what we are trying to do here.

Holan explained that the whole purpose is to encourage developers not to go into natural resource areas. It allows some intrusion with mitigation elsewhere, and does not change development standards for property owners. This is actually more than Metro requires, Holan said he is not sure the City has the authority to do this due to the ESEE analysis that has been done by Metro and the Tualatin Basin. Holan recommends going through Periodic Review and do an ESEE analysis.

Beery did not have an immediate answer. This is a significant policy change. She suggested that the Planning Commission could recommend the policy change to City Council and the legal discussion could occur there.

Item # 13 – To make it explicit that Planned Developments can be used for the conservation of natural resource aresas..

Item # 14 – Adds new subsection (3) to Section 9.813.

Item # 15 – Add criteria for planed developments to take into consideration natural resource areas.

Item # 16- Encourages use of native vegetation.

Item # 17 – Bio retention facilities. Landscape areas may include bio swales, etc.

Item # 18 – Allows use of pervious paving for walkways.

Item # 19 – Needed more reference to geo tech reports. This amendment provides a standard.

Item # 20 – Allows open swales as approved by the City Engineer.

Item # 21 – Native vegetation to be used in buffer areas.

Holan explained that Items # 22-24 are the meat of how the program applies to lands.

Item # 22 – This is a restatement of tree protection in natural resource areas.

Item # 23 – Definitions that appear in the Metro's model code.

Item # 24 – Trees in natural resource areas. Holan read the amendment. Due to the vesting issue, Holan said he is apprehensive about applying this retroactively. After there is a determination of completeness on a project, those are the requirements under which they develop.

Beery stated that this would not be allowed to be retroactive.

Chairman Beck stated that he is still opposed to increased density next to areas that are being protected. Incentives make sense only if something is gained.

Holan stated that if a developer avoids building in natural resource areas he gets incentives, and the City gets less intrusion. That is what is gained. Chairman Beck said that made sense.

Holan said there is a good chance the Planning Commission may not meet until July, due to lack of a quorum. A special meeting could be held in June, if enough Commissioners were available to make a quorum. Because Goal 5 is legislative and not quasi judicial, Commissioners that were not present tonight can participate without listening to the recorded tapes of the meeting.

Chairman Beck said he will be here May 31st and the first of June, and then will be gone until the end of June.

Chairman Beck continued the meeting to July 2, 2007. Commissioner Miller said he may not be here on July 2nd.

3.0 BUSINESS MEETING:

3.1 APPROVAL OF MINUTES: None.

3.2 REPORTS FROM COMMISSIONERS/SUBCOMMITTEES: None.

3.3 DIRECTOR'S REPORT: None.

3.4 ANNOUNCEMENT OF NEXT MEETING: Next meeting will be held on July 2, 2007.

3.5 ADJOURNMENT: The meeting was adjourned at 10:15 p.m.

Respectfully submitted by:
Marcia Phillips

APPROVED

PLANNING COMMISSION MEETING MINUTES
FOREST GROVE COMMUNITY AUDITORIUM CONFERENCE ROOM
July 16, 2007 –7:00 P.M. **PAGE 1 of 7**

1. CALL TO ORDER:

Chairman Beck called the meeting to order at 7:05 p.m. **Planning Commission Present:** Tom Beck, Al Miller, Carolyn Hymes, Ed Nigbor, Luann Arnott. Absent: Lisa Nakajima and Cindy McIntyre. **Staff Present:** Jon Holan, Community Development Director; Kerstin Cathcart, Senior Planner; Marcia Phillips, Permit Coordinator/Recorder.

2.1 PUBLIC COMMENT PERIOD FOR NON-AGENDA ITEMS: None.

2.2 PUBLIC HEARING:

Chairman Beck opened the meeting and stated that the Commission would hear Agenda Item (2)2.B first, because it would not require as much time as Agenda Item (2)2.A.

B. Comprehensive Plan Amendment Number CPA-07-03: Pacific University, as applicant, requests an amendment to the Comprehensive Plan to redesignate 8.13 acre portion of a 12.27 acre site from "Semi-Public/Institutional – College" designation to "High Density Residential". The subject site located between Cedar and Elm Streets and about 175 feet north of 23rd Avenue. The site is known as Cannery Field. (Washington County Tax Lot number 1N331CA3500.)

Chairman Beck read the hearing procedures and asked for disclosure of any conflicts of interest, ex-parte contacts, bias or abstentions. Commissioner Miller said he has been on site. Chairman Beck said he has a former interest. He was a former employee of Pacific University, and in the past he had the area rezoned. There were no objections and no challenges from the audience.

Chairman Beck opened the Public Hearing at 7:10 p.m. and called for the staff report.

Ms. Cathcart said that Pacific University owns a 12.27 acre site which is commonly referred to as "Cannery Field." The current tax lot 1N331CA 3500 was originally two different lots. In 1948, the University was presented with 8.13 acres, originally tax lot 3600, from the Taylor family. This lot was designated Semi-Public/Institutional on the City's Comprehensive Plan map which was adopted in 1980. This is the portion of the project subject to the proposed amendment.

The University then acquired the adjacent lot, originally tax lot 3500, which is approximately 4.14 acres, in 1986. This property was never designated Semi Public/Institutional. Its existing zoning was General Industrial. Both lots together were referred to as "Cannery Field."

In 2002, the applicant requested a zone change on a 4.25-acre portion of the original 8.13 acre site (tax lot 3600). This portion was changed from General Industrial (GI) to A-2

Multi-Family Residential in order to facilitate the intended development of an athletic facility. This change gave the same zoning, high density residential, to both tax lots.

The two tax lots were combined in 2004 under the tax lot number 3500. The Comprehensive Plan has a split designation on the property – High Density Residential and Semi-Public/Institutional.

Pacific University and the City of Forest Grove have entered into a joint agreement to develop Lincoln Park as the new athletic facility for Pacific University and the community. The University expects to sell the Cannery Field property shortly and, therefore, the current comprehensive plan map designation would be inappropriate for private development.

Ms. Cathcart stated that the applicant is requesting removal of the Comprehensive Plan map designation of Semi-Public/Institutional on part of tax lot 3500, to be replaced with High Density Residential. The Zoning Map already assigns the entire lot the A-2 Multi-Family Residential district, so only a comprehensive plan map amendment is required. Removing the designation unifies the property.

This redesignation leaves two small parcels as an island with General Industrial zoning surrounded by A-2 High Density zoning. Tonight's focus is on the Comprehensive Plan Amendment. The rezoning of these two small parcels would require another hearing.

PROPONENTS:

Jerry Brown, 43578 Purdin Road, Forest Grove, OR 97116. Mr. Brown owns the flag lot at 2323 Cedar Street, and is in favor of changing the University's property to A-2 Multi-family.

OPPONENTS:

Robert Cox, 2409 Cedar Street, Forest Grove, OR 97116. Mr. Cox missed the opportunity to testify against the last zone change. He objects to a playing field being there due to lights and noise, and is not certain that High Density is appropriate due to drainage problems. Mr. Cox said the area floods even with the new storm drains. Water runs down driveways. He is very concerned about the drainage problem.

Chairman Beck explained that the intent of Pacific University is to sell the property to a developer. When the property develops, the drainage issue would be addressed. Beck suggested that Mr. Cox talk to the City Engineer now about the drainage problem.

Josh Reynolds, Executive Vice President of Gray & Co., 2331 23rd Avenue, Forest Grove, OR 97116. Home address 8024 SE 32nd Avenue, Portland, OR. Mr. Reynolds stated that Gray & Co. intends to do maraschino cherries long term in Forest Grove. The company has always been supportive of Pacific University developing a playing field.

Mr. Reynolds wants the A-2 zone designation to remain – not single family. The company sometimes produces stinky odors and is messy. Home owners may think it would affect property values. He is agreeable to high density housing. The company wants to know about the University's property so long term decisions can be made.

Chairman Beck suggested that Mr. Reynolds appear before the City Council and say what he said tonight.

Mr. Reynolds said he will write a letter and give it to staff.

Mr. Holan recommended that Mr. Reynolds be involved in the Periodic Review update process.

Dr. Forrest Bump, no address given. Dr. Bump said he has a personal interest in Forest Grove and its development. He is concerned about Pacific University selling property and moving away.

Chairman Beck explained that Pacific University moved to Hillsboro to get more patients for various classes. The University is putting five million dollars into development of Lincoln Park in partnership with the City, and the sale of this property will help pay for that.

Chairman Beck closed the Public Hearing at 7:35 p.m. and returned the meeting to the Commission for discussion.

Commissioner Hymes: Why wasn't this brought to us together as a rezone of the two extra properties (zoned General Industrial) and the Comprehensive Plan Amendment?

Holan: Measure 56 notices will need to be sent to property owners involved with the rezone of those two properties. The Commission can direct staff to initiate a Zone Change Amendment and Comprehensive Plan Amendment for the two properties.

Commissioner Arnott made a motion to recommend approval of CPA-07-03. Commissioner Hymes seconded. Motion passed 5-0.

Commissioner Arnott made a motion directing staff to initiate a Zone Change Amendment and a Comprehensive Plan Amendment for the two properties east of Cedar Street now zoned General Industrial to be changed to A-2 Multi-family. Commissioner Hymes seconded. Motion pass 5-0 with a voice vote.

A. Comprehensive Plan Amendment Number CPA-06-03, Zoning Text Amendment Number ZA-06-03, Land Division Ordinance Number LDO-06-02 and Municipal Code Amendment: The City, as applicant, is proposing amendments to the Comprehensive Plan, Zoning and Land Division ordinances and the Municipal Code to implement the requirements of Metro's Title 13 Functional Plan

requirements pertaining to Nature in the Neighborhood (otherwise referred to as Goal 5). The amendments are city wide. (continued from May 7 and May 21, 2007)

Chairman Beck explained that agenda item (2)2.A Goal 5 was continued from the May 7th and May 21st meetings, and asked staff to continue with the staff report.

Mr. Holan said, since two property owners were in the audience, the Commission could hear from them at this time, or continue with the staff report. The Commission chose to hear from the property owners.

Ray Hoodenpyle, 44471 NW David Hill Road, Forest Grove, OR 97116. Mr. Hoodenpyle owns 2.41 acres on David Hill Road. He asked why on the Metro map so much Class I is on the west side of Thatcher and not on the east side. The east side is wetter.

Holan explained that the areas are determined by Metro, and the City is obligated to use Metro's inventory. He could surmise that the designation is due to modifications on the east side of Thatcher Road due to farming. It appears the drainage continues along David Hill road to the north, and is a possible tributary to Council Creek. The area in brown on the map is due to slope, not wetlands. Most of the Hoodenpyle property is blue – Class I riparian area. The Planning Commission will make a recommendation to City Council. When it goes to the Council there can be a discussion of how this affects your particular property. Mr. Hoodenpyle agreed to meet with Mr. Holan next Friday to discuss the matter.

Chairman Beck asked whether existing houses in the areas affected by Goal 5 would be "grandfathered in", so if they burned the houses could be rebuilt.

Holan said they can rebuild, because they are exempt from this provision. No one else in the audience wanted to speak at this time, so Mr. Holan resumed the staff report.

Holan said he ended on page 29 of the staff report at the last meeting. Metro Functional Plan Requirements Section 3 requires that the implementing ordinances must establish clear and objective standards, and may include an alternative, discretionary approval process. This is accomplished by proposed Subsections 9.944 (F) and (G) which are taken from the Metro Model Ordinance. These are the two basic sections. In Section F, if the developer meets all standards, he can build, and Section G is if standards are not met.

The idea is to avoid impacting Natural Resource Areas. These are areas beyond the fifty foot buffer required by Clean Water Services. If these areas cannot be avoided, then the developer must mitigate on site or off site in the same basin. Site design is flexible. The overall density does not change, but the housing can be clustered to keep away from the Natural Resource Area.

Beck: The Commission still has the same basic conundrum – trading High Density to preserve the resource area.

Holan: Density for the overall property would not change. Density on a particular part of the property would change (clustered homes). The developer would not have to do a Planned Residential Development, because provision is already in the Goal 5 plan. The main thrust of Goal 5 is to avoid, minimize, mitigate. Holan discussed the formula used to determine the amount of area that can be built upon.

Commissioner Miller: Who will do the calculations?

Holan: Staff will do the calculations. The applicant must do the mapping verification process. A Wetlands Biologist would prepare the report. There is a basic procedure for this, and a more complex procedure if the situation is complicated or the applicant desires more precision.

No commercial areas are affected by Goal 5, except one small area identified as an upland riparian area. Per the chart on page 31 Table 2, Class I CC (Community Commercial) – 10% of the Natural Resource Area can be disturbed. In Class II GI (General Industrial) - 50% of the Natural Resource Area can be disturbed.

Beck: It seems like it should be the opposite. It allows 50% intrusion by the most intrusive development.

Holan: The intent of Metro is to allow greater flexibility for industrial uses. The City can do a separate Goal 5 program, if it wishes more restrictive requirements.

Hymes: If we accept the Metro plan now, could we make our own plan on down the line?

Holan: Yes. As part of the Periodic Review update, the City can pursue its own Goal 5 program. Moving on to page 32 - Parks and Open Space, Tom Gamble, Aquatic/Parks and Recreation Director, has no problem with this section as written. I do not believe the City has much park property that would be affected by this. Holan read Section (3) on page 33 – Utility Facility Standards. Holan stated that Rob Foster, Engineering/Public Works Director, has no concerns with this section. This section applies if you are in a Natural Resource Area and states how to mitigate the disturbance. It gives specifications of plant size and spacing, etc. All of this is a significant improvement over what the City has now.

On page 37 Standards for Subdivisions, Section (ii) could be changed to read, "Applicants who are sub-dividing and developing properties must comply with Subsections (E), (F) or (G) and (H).

On page 37 Section (vii), "Prior to final plat approval, ownership of the NRA tract shall be identified to distinguish it from lots intended for sale." It then lists three ways the

NRA tract can be identified. The intent is to make sure it is managed by someone.

Page 48 Section (v), Municipal Water Utility Facilities Standards - Rob Foster, Engineering/Public Works Director, has no concern with this section.

Page 52 Section (c) – Property Developed Between Summer 2002 and January 5, 2006. I do not believe the City could have a property owner who developed during this period of time retroactively go through this process.

Page 52 Section (7)(b) – Detailed Verification Approach – Notice Requirements. The Commission agreed notification should be sent to property owners within 300 feet rather than only 100 feet.

On Page 58 is a new section which will apply citywide. This section deals with Habitat-Friendly Development Techniques and Natural Resource Area Requirements. Section 9.971 (3) encourages property owners and developers to integrate habitat friendly development procedures, and actually lists habitat friendly development procedures and practices. There are no incentives to do so, just encouragement.

Chairman Beck closed the Public Hearing at 9:08 p.m.

Holan said there were a few minor tying errors that will need to be corrected, and the two changes requested by the Commission.

> **On page 37 Standards for Subdivisions, Section (ii) could be changed to read, "Applicants who are sub-dividing and developing properties must comply with Subsections (E), (F) or (G) and (H).**
>
> **and**
>
> **Page 52 Section (7)(b) – Detailed Verification Approach – Notice Requirements. The Commission wants notification sent to property owners within 300 feet rather than only 100 feet.**

Commissioner Arnott made a motion to recommend approval of CPA-06-03, ZA-06-03, Land Division Ordinance Number LDO-06-02 and Municipal Code Amendment with changes as noted to staff. Commissioner Miller seconded. Motion passed 5-0.

3.0 BUSINESS MEETING:

3.1 APPROVAL OF MINUTES: None.

3.2 REPORTS FROM COMMISSIONERS/SUBCOMMITTEES: None.

3.3 DIRECTOR'S REPORT:

Holan said he had gone on the Metro tour to Vancouver BC. He visited Port Moody which is similar to location in the Vancouver metro area as Forest Grove is to the Portland area.. There is a significant difference there in development, pricing and average income between the two communities.

The attorney for the Rau's will not be available on August 6, 2007, so there will probably need to be a second meeting in August.

Chairman Beck asked when the curbs and sidewalks will be installed on University Avenue.

Holan replied that it is part of the development agreement for Burlingham Hall. The City's Public Works Director has not pushed forward with that yet. Darlene Morgan would be happy to come to a Planning Commission meeting to discuss it.

The new Pacific University Student Housing Phase II will begin soon. The building site is where the tennis courts are located now, and includes property further up Main Street. Parking has been expanded by sixty spaces.

Commissioner Miller: Where are we now on the Pacific University Master Plan?

Holan: The student housing was the first application under the Master Plan.

Chairman Beck: Pacific University had designated parking on Cannery Field, which they will no longer own.

Holan: The University has sufficient parking for the new student housing. If there is further development, they will have to put in parking in other areas.

3.4 ANNOUNCEMENT OF NEXT MEETING: The next meeting will be held on July 30, 2007.

3.5 ADJOURNMENT: The meeting was adjourned at 9:20 p.m.

Respectfully submitted by:
Marcia Phillips

Comprehensive Plan, Zoning Text, Land Division Ordinances and Municipal Code Amendments Staff Report and Recommendation

Community Development Department, Planning Division

Report Date: April 30, 2007

Hearing Date: May 7, 2007

Land Use Request: The proposed amendments to Forest Grove's Comprehensive Plan, Zoning Ordinance and Land Division Ordinance to come into compliance with Metro's Goal 5 program as approved for the Tualatin Basin. These amendments are to address the deficiencies the City has to allow for low impact development (LID) techniques. Further, the proposed amendments incorporates Metro's model ordinance to address other Metro requirements and to establish specific standards.

The Municipal Code amendment and certain Zoning Ordinance amendments do not pertain to Goal 5. They address flood management and slope issues to update the City's codes and revise the City's approach to performance standards rather than overlay zone districts. (see Attachment 1 for text of the amendment.)

File Numbers: Comprehensive Plan Amendment CPA-06-03, Zone Map Amendment ZC-06-03, Land Division Ordinance Amendment LDO-06-02 and Municipal Code Amendment

Property Locations: The amendments to allow LID techniques are citywide. The portion of the amendments that incorporates Metro's model ordinance would apply to areas identified as Class I and II Riparian habitat and Class A and B uplands by Metro's Regionally Significant Fish and Wildlife Habitat Inventory map. Floodplain changes would apply to those areas within the 100 year floodplain while steep slope provisions apply to those areas with slopes 20 percent or greater. (see Attachment 2 for maps showing the location of the habitat areas, slopes of greater than 10 % and 100 year floodplain locations).

Applicant: *Applicant*: City of Forest Grove

Applicable Standards and Criteria:	▪ City of Forest Grove Comprehensive Plan *Amendment Applications* ▪ City of Forest Grove Zoning Ordinance: o Section 9.905 *Criteria for Zone Changes* ▪ City of Forest Grove Land Division Ordinance o Section 9.118
Reviewing Staff:	Jon Holan, Community Development Director
Recommendation:	Staff recommends approval.

I. HISTORY AND BACKGROUND

Metro adopted Title 3 to its Functional Plan to study and develop a protection program for the protection and conservation of fish and wildlife habitat. This is borne out of the provisions of State Planning Goal 5, which "is intended to protect natural resources and conserve scenic and historic areas and open spaces," and Metro's Regional Framework Plan which provides that Metro will adopt programs to maintain and improve water quality and to protect fish and wildlife habitat in the region.

The first step to meet these goals was to address water quality issues. For Washington County and its communities, this was done in 2000 with Clean Water Services (CWS) Agency adoption of sensitive area and vegetative corridor requirements as part of its Design and Construction Standards.

The second step was the development of the program to protect fish and wildlife habitat in the region. This consisted of three different general tasks to be compliant with Goal 5 requirements:

- Creating an **Inventory** of Significant Regional Resources,
- Analyzing the Economic, Social, Environmental and Energy (**ESEE**) consequences of allowing, limiting or prohibiting conflicting uses in resource and impact areas, and
- Developing a **Program** to implement the allow/limit/prohibit (ALP) decision.

The Metro Goal 5 efforts included completing the inventory analysis of significant regional resources, preparation and acceptance of an ESEE analysis for the regional effort (see Attachment 3) and the development of a regional program called Nature in Neighborhoods.

The Metro effort also lead to two local efforts. One was the formation of the Tualatin Basin Natural Resources Coordinating Committee. The committee was formed in 2002 and entered into an intergovernmental agreement with Metro to develop its own ESEE analysis and program. Public meeting was held on the acceptance of the ESEE analysis in April, 2004. The Committee held a public hearing on the draft program on August 2, 2004 and adopted Resolution and Order No. 2005-01 on April 4, 2005 to adopt the program and forward it to Metro. During the time of developing the program, Metro and the Tualatin Basin sponsored several open houses including an open house in Forest Grove.

The other local effort was the City of Forest Grove. Staff has held several work sessions with the Planning Commission and Council on the matter. Work sessions and updates were held with the Commission on June 18, 2001, September 30, 2002, March 17, 2003, November 17, 2003, May 17, 2004, March 7, 2005, October 2, 2006, November 20, 2006 and January 29, 2007. It should be noted that City Councilors were invited to the last two Commission meetings and several Councilors were in attendance. Meetings with Council included June 11, 2001, November 13, 2001, April 22, 2002, July 8, 2002, May 27, 2003, May 27, 2004, and July 26, 2005. In addition, three joint work sessions were held with both the Planning Commission and Council on July 12, 2004, October 17, 2006 and September 5, 2006.

Metro Program: Metro inventoried 80,000 acres of regionally significant fish and wildlife habitat. It was classified for its ecological value. For Forest Grove, the one portion of the proposed amendments would apply to the two highest valued habitat areas for riparian and upland habitat areas inventoried by Metro.

After the inventory, the process resulted in two approaches. Metro pursued Tasks 2 and 3 for most of the region. Washington county communities formed there own approach to meet Metro's program requirements. This effort will be discussed below.

On September 29, 2005 the Metro Council voted to approve Ordinance Number 05-1077 A to establish a regional Nature in Neighborhoods (Goal 5) program. Part of this approval was the adoption of a new Title 13, Nature in Neighborhoods, into Metro's Functional Plan (see Attachment 4). Section 3.B. establishes the implementation alternatives for cities and counties. Communities must either:

- Adopt the Metro Model Ordinance and Metro Habitat Conservation Areas;
- An alternative ordinance that substantially meets specified performance standards and best management practices identified in Section 4 of the Functional Plan;
- Implement a program based on alternative approaches that will achieve protection and enhancement of Class I and II riparian habitat and Class A and B upland wildlife habitat areas in territory added after the effective date of Metro's adopting ordinance (Ordinance No. 05-1077 which was January 5, 2006);
- Develop a district plan with other jurisdictions; or
- Amend ordinances and plans to be compliant with the Tualatin Basin program and other provisions of Section 3 (see below). The following conditions are required to be met by the Basin program to be compliant:
    - Comply with the six steps identified in Section B of Chapter 7 of the Tualatin Basin program;
    - CWS approves and implements its Healthy Streams Plan;

- Tualatin Basin members renew and extend their partnership to implement Healthy Streams project list and cooperate with Metro to develop regional public information;
- Cities adopt provisions to facilitate and encourage use of habitat-friendly development practices, where feasible, in Class I and II riparian habitat;
- Cities adopt provisions to allow for density reduction consistent with other portions of Section 3 (see below)
- Cities adopt either the Model Ordinance or alternative ordinances to apply to upland wildlife habitat in territory added to the UGB after the effective January, 2006 date.

In addition to the above, Section 3 of the Functional Plan also requires:

- The implementing ordinances:
  - Must establish clear and objective standards; and
  - May include an alternative, discretionary approval process;
- Allow the use of habitat-friendly development practices in regionally significant fish and wildlife habitat areas by:
  - Identifying provisions in Comprehensive Plans and implementing ordinances that prevent or limit the use of habitat-friendly practices; and
  - Adopt amendments to remove the barriers so that habitat-friendly practices may be used where practical, in regionally significant fish and wildlife habitat.
- Local jurisdictions must provide a reasonable, timely and verifiable process to locate habitat areas on a specific piece of land.
- Densities may be reduced on subdivisions if the property was within the UGB on January 1, 2002, the area of the property to be developed has been identified as a regionally significant fish and wildlife habitat and such a decision will directly result in protection of the remaining habitat either through dedication or restrictive covenant.

Tualatin Basin Program: The Metro Council action in adopting the Nature in Neighborhoods incorporated the Tualatin Basin Fish & Wildlife Habitat Program, as developed and recommended by the Tualatin Basin Partners for Natural Places. The Tualatin Basin's coordinated Goal 5 effort is known as *Partners for Natural Places* (Partners). The Partners represent an alliance of eight cities (Beaverton, Cornelius, Durham, Forest Grove, Hillsboro, Sherwood, Tigard and Tualatin) and Washington County working together with Metro, Tualatin Hills Parks and Recreation District and Clean Water Services to meet federal, state and regional requirements for protecting riparian corridors and wildlife habitat in the Tualatin Basin. Washington County

communities, including Forest Grove, proposed a separate approach (called the Tualatin Basin approach) based on the Metro inventory.

As part of adopting the new Functional Plan requirements, the following are those plan requirements pertaining to the Tualatin Basin program:

- Comply with the six steps identified in Section B of Chapter 7 of the program. These steps are:
  - Development and adoption of the Basin Program as incorporated in the Metro Functional Plan;
  - Develop a model Low-Impact Development (LID) ordinance for the basin providing tools designed to reduce environmental impacts of new development and remove barriers to their utilization. This step includes local adoption of LID guidelines.
  - Coordination with CWS to implement the Healthy Streams Action Plan as well as local actions needed to support updated Stormwater Management Plan.
  - Coordinate with Metro on development of a regional bond measure supporting protection of regionally significant fish and wildlife habitat (this step has been completed).
  - Coordinate with CWS, Metro and others as necessary to develop and support the voluntary and educational components of the Basin program.
  - Coordinate with CWS, Metro and others as necessary to develop and support the monitoring and adaptive management components of the Basin Program.
- CWS approves and begins implementing its Healthy Streams Plan;
- Tualatin Basin members renew and extend their partnership to implement Healthy Stream Project List and target projects that protect and restore Class I and II Riparian Habitat, including habitat extending beyond CWS vegetative corridors and continue to coordinate activities with Metro and cooperate with Metro on a regional public information program;
- Cities (and the county) adopt provisions to facilitate and encourage the use of habitat-friendly development practices, where technically feasible and appropriate, (see Table 1 of Section 9.970 on pages 56 and 57 of the proposed amendments) for Class I and II habitat areas;
- The city has adopted provisions to allow for the reduction of density and capacity requirements of Title 1 of the Functional Plan that would apply:
  - Only to properties within the UGB on January 1, 2002;
  - Require the protection of regionally significant habitat either by public dedication or restrictive covenant; and
  - Allow only for the reduction of density based on the area protected and report by April 15 any approvals based on the density reduction.

The Tualatin Basin communities prepared its own ESEE analysis (see Attachment 5) for State Planning Goal 5 requirements and a program (see Attachment 6) to meet Metro's Functional Plan requirements. The program (see Chapter 6 of Attachment 6) is composed of four components: revenue, regulatory, non-regulatory and ongoing monitoring. In an outline form, the following summarizes the program elements:

Revenue Component:

- $95 Million in Healthy Streams Plan (HSP) recommended capital improvements (ranging from $3.5-$6.5 million per year over the next twenty years) will be focused in areas of highest resource quality. Typical projects will include:
  - community tree planting
  - riparian corridor restoration and enhancements
  - culvert replacements
  - stormwater outfall retrofits
  - flow restoration;
- Regional Bond Measure providing funding for site acquisition and preservation; and
- Other potential funding alternatives (including grants, local bond measures, opportunities for park SDCs, etc.) – may be utilized for education, restoration and enhancement or acquisition.

Regulatory Component:

- Existing Clean Water Services Design & Construction Standards:
  - development related activity restrictions in Water Quality Sensitive Areas (wetlands, springs, streams, and the Tualatin River) and their associated Vegetated Corridor areas. (Vegetated Corridors average approximately 50 feet and range up to 200 feet depending on resource type and size, drainage area, slope, and site conditions.)
  - required enhancement of degraded or marginal condition vegetated corridors;
- Existing local Goal 5 program requirements;
- Existing local tree protection standards; and
- Other existing standards which result in local habitat protection (including but not limited to: local, state and federal wetland regulations, floodplain regulations, ESA, Clean Water Act, etc.).

Non-Regulatory (Voluntary and Incentives) Component:

- Educational programs;
- Guidelines for low-impact-development & green design;
- Flexible development standards;
- Technical assistance programs;
- Local, state, federal and non-profit grant programs; and
- Potential implementation of tax incentive programs.

Ongoing Monitoring and Administration Component;

- Adaptive management process;
- Regional data coordination;
- Continued TBNRCC functions:

  - Project coordination
  - Funding coordination;
- CWS monitoring activities for NPDES permit compliance and stream health; and
- HSP commitments to re-sample Watersheds 2000 Rapid Stream Assessment Technique (RSAT) inventory

An important feature of the Basin program is encouraging of land developers and property owners to incorporate habitat friendly practices in their site design. *Habitat friendly development practices* include a broad range of development techniques and activities that reduce the detrimental impact on fish and wildlife habitat relative to traditional development practices. The **Program Implementation Report to Develop and Encourage Habitat Friendly Development Practices** outlines a draft program to implement the ALP decision within significant riparian corridor and wildlife habitat resources and their impact areas within the Tualatin Basin Study Area.

One notable aspect of the Tualatin Basin approach is that the only regulatory aspect of the program, aside from allowing the use of low-impact development techniques, is the current Clean Water Services standards.

City Proposed Program: As part of the development of the Tualatin Basin Program, two technical issue papers were issued (See Attachments 7 and 8) that established a matrix to evaluate the adequacy of local programs. Attachment 9 is a summary of how various communities in the Tualatin Basin, including Forest Grove, meets those requirements and where gaps exist.

The Planning Commission held a work session with invitations to the City Council on November 20, 2006. At that meeting, the direction was to develop code amendments that were performance based rather than the use of the Environmental Review Overlay district. Further, there was discussion that specific, identified areas and specific standards be provided in the code amendments.

Based on that direction and the gap analysis, staff prepared a set of code amendments pertaining to requirements in habitat areas that were reviewed by the Commission on January 2, 2007. The proposal essentially incorporates the Metro Model Ordinance into the Zoning Ordinance and proposes changes to remove identified barriers to address the gap analysis. The Commission gave direction to proceed with that approach with minor clarification changes.

II. SUMMARY OF THE AMENDMENTS

Attachment 1 contains the specific text amendments. Staff has broken the amendments down into 25 separate items to facilitate review and discussion. The following is a summary of the proposed amendments by item:

COMPREHENSIVE PLAN AMENDMENT

1. Add new Natural Resource Policy to adopt Metro's Class I and II Riparian and Class A and B Upland areas and to set forth the basis of an implementation program through ordinance amendments and an informational and educational program.

MUNICIPAL CODE TEXT AMENDMENT

2. Amend Section 5.815 to redefine the basis to determine the areas of Special Flood Hazard. Currently, the code only recognizes the floodplain as defined by the 1981 FEMA study. Based on the city's experience with the Rau project, that study may not be accurate and regional and federal laws allow for the consideration of more recent data in determining floodplain location. This amendment is intended to address that gap by adopting the wording from Clean Water Services Design and Construction Standards. This is a non-Goal 5 amendment.

LAND DIVISION ORDINANCE TEXT AMENDMENTS:

3. Amend Section 9.101, Purpose Statement, of the Land Division Ordinance to incorporate natural resource conservation.

4. Amend Section 9.102 to add new definition 27 to define natural resource areas as Class I and II riparian areas and Class A and B upland habitat areas excluding those portions within Clean Water Service vegetative corridors. The definition excludes those areas within Clean Water Services vegetative corridors. This exclusion is intended to avoid having two sets of standards within the corridor and direct developers to follow the CWS requirements. This amendment coincides with and intended to help implement Amendment Item 24.

5. Amend Section 9.108, Supplemental Materials with Tentative Plan, to require submittal of information required for Natural Resource Area review where within 100 feet of such areas. This is an informational requirement to help implement the proposed provisions in Amendment Item 24.

6. Amend Section 9.109, Required Improvements, to require compliance with the proposed provisions of Amendment Item 24 where improvements are within natural resource areas. In addition, it provides the option to use habitat friendly techniques including pervious paving for certain streets and sidewalks, and drainage swales. Staff did not include specifying the use of native trees for street trees since trees to be used in street tree plans must be suited to Western Oregon. The Commission could consider revised wording to specify native trees. Attachment 10 is a list of native trees on the City's accepted tree list prepared by the City Arborist.

7. Amend Section 9.110 (1) to allow minimal (24 feet wide without parking) street widths through Natural Resource Areas. This is intended to minimize impervious surface through these resource areas. Clean Water Services already specified such a street width for one project in Forest Grove (Casey Meadows PRD).

8. Amend Subsection 9.110(2)b.iv. to allow sidewalks narrower than city standards where ADA requirements do not apply. This item is to remove a barrier and allow for the consideration of narrower sidewalks in subdivisions.

9. Amend Section 9.113 to remove reference to Environmental Review (ER) Overlay District and replace with natural resource, flood management and steep slope areas with requirements to allow appropriate review for each area type. Requirements for natural resource areas would implement Goal 5 requirements. Requirements for flood management make reference back to the requirements of the Municipal Code (see Attachment 11). These requirements are more detailed than that required by the ER zone but they currently exist. Thus, no new regulations are proposed. The steep slope area requirements makes reference to the proposed Zoning Ordinance amendment under Item 19113(3)d..

ZONING ORDINANCE TEXT AMENDMENTS:

10. Amend Section 9.601, Purpose Statement, of the Zoning Ordinance to include conservation of natural resource areas. This is a policy amendment.

11. Amend definition of "Density, net" (Section 9.603 42.) to include natural resource areas in determining net density and thereby unit yield. Currently, Forest Grove excludes all open space area from the density and unit yield determination. This amendment is intended to assure that these proposed standards do not reduced the entitled development levels as allowed by current zoning and land division ordinance provisions. This reduces the basis for possible Measure 37 claims.

12. Add new definitions for Natural Resource Areas and Bio-swales to Section 9.603 and renumber existing definitions accordingly. The bioswale definition is provided as a result of the worksession comments of January 2, 2007. The definition of natural resource areas is similar to the Land Division Ordinance definition and is intended to implement the proposed amendments in Item 24.

13. Amend Section 9.810, Intent, for establishment of a Planned Development to make it explicit that PD's can be used for the conservation of natural resource areas. Staff envisions that the planned development approach (residential, commercial or industrial) may be the best way to encourage good design that can reinforce the preservation and, if needed, enhancement of habitat areas. Where intrusions into habitat areas do occur, alternative design solutions may be available through a planned development to help minimize impacts to the remaining habitat.

14. Add new subsection (3) to Section 9.813, Preliminary Development Plan to require information for natural resource areas where applicable as part of Planned Development applications. This provision is included to help assure the proposed provisions under Item 24 are addressed.

15. Add criteria for planned developments to take into consideration natural resource areas. This is added to better assure that where planned developments are used in natural

resource areas, that the project comply achieves the resource objectives as proposed in Items 24 and 25.

16. Amend Subsection 9.826(2)(a), Parking Area Landscaping Requirements, to encourage use of native vegetation. This amendment is to remove a barrier and would apply citywide.

17. Amend Subsection 9.826(3)(a) and (b) to allow bio-retention facilities on the perimeter of parking lots. This amendment is to remove a barrier and would apply citywide.

18. Amend Subsection 9.830(7) to allow walkways be constructed with pervious paving. This amendment is to remove a barrier and would apply citywide.

19. Amend Subsection 9.855 (1) to acknowledge the need for other approvals for flooding and natural resource areas either concurrent with or prior to site plan review. This is to define the appropriate time in the land development review process when such analysis is required. The additional wording related to slope areas are similar in intent to the Environmental Review Overlay zone requirements but are more definitive. The proposed wording is taken from the City of Salem's Landslide Hazards ordinance.

20. Amend Subsection 9.855(4)(e) to eliminate the restriction of piped storm water lines to allow for open swales. This amendment is to remove a barrier and would apply citywide.

21. Amend Subsection 9.858(3)(b) to specify native vegetation to be used in buffer areas. As proposed, this is more than removing a barrier, but to require the use of native vegetation. It could be amended to consider using native vegetation except in natural resource area where it would be required.

The next three items are intended to establish specific standards and processes for natural habitat protection and enhancement. This is proposed to be achieved through the integration of Metro's Model Ordinance into the City's Tree Protection Ordinance. Text in italics indicates where Metro has identified options on standards for local jurisdictions to consider. The current ordinance has a provision for trees in natural resource areas (Section 9.944). In the current ordinance (Section 9.944 (B)), no vegetation can be removed unless:

- The permanent impact is negligible;
- To prevent the spread of disease or insects or to eliminate a natural hazard;
- The loss is temporary or there is a mitigation plan of adequate replacement of resource area of equal value either on or off-site;
- Timetables for work would have a minimum impact on wildlife.

There are no standards associated with these requirements such as defining a resource area of equal value or minimum impact on wildlife. Further, there is no definition of what a natural resource area is. Under Section 9.940, there is a definition of Natural Resource Vegetation which includes trees and vegetation within wetland or wetland buffer areas, floodplains, within 30 feet of the center line of mapped drainage ways, and open space areas as designated on the Comprehensive Plan. The Comprehensive Plan shows open

space for one city park, along a small portion of Gales Creek, along Council Creek from the Cornelius city limits to the end of the UGB north of the Sunset Drive/Highway 47 intersection, an open space preserve in Knox Ridge, a parcel in the southern portion of the historic old town area and an area in the General Industrial area. Wetlands are under the authority of U.S. Army Corps of Engineers and State Division of Lands. Wetland buffer areas are not defined. Generally, the drainage way definition has been usurped by Clean Water Services Vegetative Corridor requirements, although the ordinance does not define drainage ways and could be more inclusive. The issue of drainage ways versus ditches was not addressed by the current code. Thus, the provision has not been applied.

The amendments revise the Natural Resource Area by defining it as Class I and II riparian habitat areas and Class A and B wildlife habitat areas as inventoried by Metro. Many of these areas would be similar to the areas defined for Natural Area Vegetation. The notable exception would be 30 feet from the centerline of a drainage way. Metro's inventory extended to 100 to 150 feet of certain drainages. As noted above, it excludes those portions under the authority of CWS Vegetative Corridor requirements to avoid contradictory standards. The proposed amendments are less restrictive than if the current standards were applied. It would allow intrusion into habitat areas while the current requirements would not.

22. Amend Section 9.940, Intent Statement of the Tree Protection Ordinance to redefine natural resource vegetation to coincide with Natural Resource Areas.

23. Amend Section 9.941 to add definitions taken from Metro's Model Ordinance. This is added to assure consistent implementation with Metro's intent and to define terms that currently are not defined. The provision could have been included in the definition portion of the ordinance. It was included here because it pertained to Natural Resource Areas addressed under the next Item and other terms pertaining to the Tree Ordinance are placed in this section rather than under the general definitions.

24. Amend Section 9.944, Trees in Natural Resource Areas, to incorporate Metro's Model Code provisions. This Item is the most complex of all the proposed amendments. The following is a section-by-section discussion of the proposed changes to Section 9.944, Trees in Natural Resource Areas. Most of the changes are taken from the Metro Model Code.

    a. Section A is the information requirements. Subsections (1) to (6) identify the particular information to be submitted. Consistent with Metro Functional Plan requirements, verification of the natural resource area is required under this section. The information must be submitted either prior to or concurrent with any land use application. If no permit is required, then prior to any land disturbance.

    b. Section B identifies those uses and activities that are exempt from the requirements. Generally, these are minor activities or activities that enhance the habitat. The most notable exception is dwellings in a subdivision that has met the Natural Resource requirements.

c. Section C identifies prohibitions in natural resource areas.

d. Section D is essentially a holdover from the current requirements. The criteria offer some factors not addressed by the Metro code such as the spread of disease or insects and impact on wildlife. References to the new requirements are included to avoid any potential contradiction (i.e. permanent impact negligible versus allowed disturbance) between the current criteria and the proposed amendments.

e. Section E requires construction management plans. Staff views this section as a significant provision to help assure the disturbance is minimized. Currently, the City does not have this type of requirement.

f. Section F establishes the clear and objective standards as called for by Metro's Functional plan. As expressed in the first paragraph of the section, it establishes the priority of avoidance, minimize intrusion or as the lowest priority, mitigate the impacts where no alternatives exist.

Subsection (1) identifies methods to avoid or minimize disturbance. It proposes flexibility similar to a planned development but with limitations. Under density transfer, dimensional standards and lot sizes can be adjusted by no more than 20 percent than that allowed by the underlying zone district. The Commission could consider a 30 percent adjustment. It also proposes site incentives to adjust site capacity both by either allowing a density bonus or reduction of density. While the definition of net density includes habitat area for the purpose of computing development yield, this subsection allows the applicant to not include the area for that purpose.

Subsection (2) establishes standards for development within Natural Resource Areas. It establishes the amount of disturbance (known as Maximum Disturbance Area (MDA)) allowed for single family residential and other zone districts (Subsection (2)(a)). The Metro Model Ordinance uses Habitat Conservation Areas (HCA) to determine the disturbance area. HCAs are the result of the ESEE analysis for allow, limit and prohibit determinations. (That is, to determine if certain types of development will be allowed, limited or prohibited in the resource area.) The relationship of the HCA's to Metro land use design types are as follows:

Class I Riparian: Town Centers – Moderate HCA
Industrial and Employment (i.e. commercial) areas, and Inner and Outer Neighborhoods – High HCA
Class II Riparian: Town Centers – Low HCA
Industrial and Employment areas – Moderate HCA
Inner and Outer Neighborhoods – High HCA
Class A Upland: Existing UGB – No HCA
Future UGB - Town Centers – Low HCA
Industrial and Employment areas – Moderate HCA

Inner and Outer Neighborhoods – Moderate HCA
Class B Upland: Existing UGB – No HCA
Future UGB - Town Centers – Low HCA
Industrial and Employment areas – Low HCA
Inner and Outer Neighborhoods – Moderate HCA
(Note: "High" represents the greatest level of limitations and "Low" represents the least level of limitations)

Translating this to Forest Grove's land uses is as follows. Although there is no riparian habitat area in the Town Center area, the Central Business District (CBD) is included in the table. All multi-family residential zone districts would have a high HCA since they are all within either inner or outer area design types. All industrial and commercial districts (with the exception of the CBD) would have a high HCA in Class I riparian areas and low HCA in Class II riparian areas.

There are no disturbance limitations for any property currently within the UGB for upland habitat. It would apply to lands brought into the UGB as of January 5, 2006. (It should be noted that as of the date of this report, there has not been any lands brought into the UGB in the Forest Grove area since that date that has upland habitat.)

Table 1 is for the single family zone districts (i.e. all the "R" zone districts). The table identifies the *total* disturbance area (TDA). It relates the requirements to the City's zone districts and includes the HCA designation for purposes of implementing the subsections pertaining to multiple HCAs. Tables 2 and 3 are for non-single family zone districts but do not include the HCA classification. Including the zoning designations makes it easier to interpret and implement. All the tables do comply with the HCA approach.

For Table 1, the MDA is determined by subtracting the TDA from Table 1 from the area of the parcel outside the natural resource area. For example, if a lot was 5,000 square feet in size and 30% (i.e. 1,500 square feet) of it was outside the resource area, the amount of disturbance allowed would be determined as follows:

> 2500 (50% of lot area) – 1500 = 1000 square feet of the resource area on the lot can be disturbed.

The formula is such that the greater the area within a habitat area, the greater the allowed disturbance area.

Tables 2 and 3 are for the non-single family districts. The main difference is that the table provides the maximum disturbance area directly. Thus, the table has been modified from the Metro Model Code in that it does not include the HCA classification.

This subsection (Subsection (2)(b)) also includes standards for protecting habitat during constructions.

Subsection (3) establishes utility facility standards. The Public Works Department has reviewed these standards and had no concerns.

Subsection (4) establishes mitigation requirements for any disturbance. Reference is made to the intent section that is contained in Section 9.970. There are two options to determine replacement. Option One is based on the size of trees removed and Option Two is based on the size of the disturbance area. Also included in this subsection are standards pertaining to plant size, spacing and diversity, location of the mitigation area, prohibition of invasive vegetation and ongoing requirements.

Subsection (5) establishes standards for land divisions (partitions and subdivisions). For partitions, the most significant requirement is that any natural resource area needs to be somewhat evenly divided between the lots being created (within 30% of each other.) As a note, partitions in Forest Grove generally occur in the older, developed portion of the community where NRA does not exist.

For subdivisions, the requirements are different whether there is subsequent construction by the applicant. Mitigation and construction management plans are not required by the applicant if they are not developing. In all cases, map verification is required. Significant requirements for subdivisions are that 80 percent of the NRA be within a separate, unbuildable tract, and that backyard setbacks are reduced to 10 feet where the lot backs up to an open space tract.

g. Section G provides an alternative, discretionary development standards in lieu of Subsection F. There are four basis to seek a discretionary review:

- For a partition;
- For an applicant who meets all the requirements of Subsection (F) except that mitigation is proposed to be offsite;
- For an applicant who meets all the requirements of subsection (F) except that they seek to proportionally vary the number and size of plants; and
- For an applicant seeking another type of discretionary approval of development that will disturb an NRA.

Some of the more significant aspects of these provisions are as follows:

- For partitions, must demonstrate there are no practicable alternatives to comply with the 30% provision;
- For offsite mitigation, it must be in the same subwatershed (6th Field Hydrologic Unit Code – the same subwatersheds used by Metro in their inventory) as the parcel to the disturbed;

- For alternative planting schemes, an explanation that by the 5th year, the planting scheme will achieve comparable or better results than the required planning under Section F;
- For a general discretionary approval, an alternative analysis and impact evaluation must be performed and mitigation plan provided. The approval criteria addresses avoidance, minimize and mitigation options.

The section also provides an alternative process for municipal water utility facility standards. It would not apply to the City's watershed since it is outside the area but would affect any water related utilities (municipal water, sewer and storm drain conveyance system).

h. Section H contains the Functional Plan required map verification requirement. Any project within 100 feet of a mapped NRA would have to go through the verification process. Metro offers a reduction to 25 feet if the City conducts additional analysis to correct any misalignment between various GIS layers. Due to person-power limitations and the likely need to resurvey streets, it is unlikely that the City could provide the findings to reduce the area. It is possible that the applicant could provide this analysis, but that could be accomplished through the provisions of subsection (H)(6)(b).

There are two verification approaches: basic and detailed. Both processes involve an administrative determination. The basic process is to allow for a simplified method to determine NRA boundaries. There are three different situations the simplified process applies to:

- Applicant believes the NRA map is accurate;
- A misalignment between mapped habitat area and property lines due to GIS differences between property lines and the NRA map; and
- Property developed between Summer, 2002 and January, 2006.

Regarding this latter provision, there is little development activity that would come under this provision. There is a small portion of the Parks project, David Hill project (including Ridge Point and Summit Point), Cook Village and Council Meadows that would fall under this provision. There are several projects that could be subject to this provision except construction has yet to begin (Karen's Glenn, Casey Meadows and Hawthorne Meadows.

This is the most problematic provision of the model ordinance. While the purpose of this provision is to simply update Metro's maps due to construction, it is difficult to get developers to go through such a verification process. Some have completed their development while others may likely object having to meet this requirement due to vesting or simply the hassle and cost factor.

There is not a requirement to adopt this provision. The Function Plan only requires a verification process but does not require verification on property constructed between the two dates. However, the Functional Plan (Section 4 D.) does require each community responsible to administer the maps.

The last portion of the verification process is the detailed approach. It follows the requirement established by the Functional Plan. The most significant difference is that the process in the proposed amendment is based on habitat type rather than HCAs. This should not be an issue in that the HCA is based on the habitat map.

25. Add New Chapter 9.970 et. seq. to establish Habitat-Friendly Development Techniques and Natural Resource Area requirements that some can apply citywide while others are limited to land adjacent to natural resource areas. Section 9.970 adopts the intent statement taken from the Model Ordinance. It is placed here rather than Section 9.944 for two reasons. First, there already is an intent statement in the Tree Ordinance and adding this statement in that section would be inappropriate because of tree requirements other than trees in Natural Resource Areas. Second, this section also includes standards (permissive and required) that relate to habitat-friendly techniques.

    Section 9.971 adopts Metro's regionally significant fish and wildlife habitat inventory map by reference. Subsection (2) requires that if can't avoid the Natural Resource Areas through standard development requirements, then the provisions of Section 9.940 applies. The table identifying habitat friendly techniques from the Model Ordinance is incorporated in this section. Subsection (3) encourages people to use these techniques but there is no requirement citywide. Subsection (4) recognizes density reductions or increases that are allowed through Section 9.944. This provision applies only in these areas and not citywide. Subsection (5) provides habitat friendly requirements. They are placed here rather than Section 9.944 because it would likely to apply to property that may not have habitat but is adjacent to habitat areas. **Subsection (5) (b) may be a concern. It requires the use of native vegetation in landscaping unless waived by the Community Development Director. This was included in response to the matrix in the draft issue papers produced for the Tualatin Basin. The only requirement from Metro is that native vegetation be used in habitat areas. This is achieved elsewhere and the current zoning ordinance encourages the use of native vegetation as part of the general landscaping standards (Section 9.858 (3) (c) (x)).**

III. PROCEDURAL REQUIREMENTS

Comprehensive Plan Amendment Process: "Any citizen may prepare an application for plan amendment and submit it for the Council's consideration...Proposed amendments shall be subject to a public review process including, at a minimum, public hearings before the Planning Commission and City Council...The Planning Commission shall prepare a recommendation for the Council on all amendment applications...."
(Comprehensive Plan, Ordinance 83-15, Section II, *Amendments to the Comprehensive Plan*).

Zoning Amendment Process: Zoning Ordinance Section 9.902 *Planning Commission Public Hearing on an Amendment Required* authorizes the Planning Commission to act on a request for a zone change after holding a public hearing pursuant to Sections 9.915

Notice of Public Hearings and Limited Land Use Decisions and 9.916 *Procedure for Planning Commission Action at a Public Hearing.*

"At the hearing, the Planning Commission shall review the application and shall receive pertinent evidence and testimony as to why or how:

1. The proposed change is consistent with and promotes the goals and policies of the Comprehensive Plan and the Zoning Ordinance of the City; and
2. There is a public need for a change of the kind in question."

Comprehensive Plan Amendment and Zoning Map Amendment approval criteria follow on Section VI below.

DLCD and Metro Notification and Review: Notice of the proposed comprehensive plan and zoning amendments was provided to the Department of Land Conservation and Development (DLCD) and Metro on February 8, 2007 pursuant to ORS 197.610, OAR Chapter 660 – Division 18, and Metro Code Section 3.07.820 (Functional Plan Title 8). Both DLCD and Metro have reviewed the amendments and have registered no comments.

Public Notice: A Measure 56 notice was mailed to affected property owners (with habitat, FEMA flood plain and slopes of 10 percent or greater) on March 13, 2007; and published in the *News Times* on March 23, 2007, as required by Zoning Ordinance Section 9.915, and republished on May 1, 2007. Property owners include those within the city limits including those properties brought into the city from the recent city sponsored annexation effort. Ten percent slope was used because staff did not have GIS information for 20 percent slopes. Thus, more property owners than required were notified.

As of the writing of this report, staff has received two letters from the public that are included with the staff report. Mr. Jim Labbe from the Audubon Society of Portland submitted a letter in support of the proposed amendments and made suggestions concerning the intent statement. Mr. George Burlingham submitted a letter to delete the Upland Wildlife Habitat Class A from his property in that he is intending to harvest the trees on this property.

IV. ANALYSIS

Requirements:

The proposed amendments are intended to implement State Planning Goal 5 through a regional program. Goal 5, in part, is as follows:

> **"To protect natural resources and conserve scenic and historic areas and open spaces.**
>
> Local governments shall adopt programs that will protect natural resources and conserve scenic, historic, and open space resources for present and future

generations. These resources promote a healthy environment and natural landscape that contributes to Oregon's livability."

It is intending accomplish this through enhancing and preserving riparian areas currently in the City of Forest Grove and as the city expands. It is also intended to achieve the same objectives to upland wildlife habitat being brought into the Urban Growth *Boundary in the future. This is being accomplished through promoting avoidance,* minimize and mitigate strategy to limit intrusion into NRA where feasible. Standards are established for removing vegetation and mitigation for replacement as well as flexible standards to promote minimizing such intrusion.

The proposed amendments meet or exceed the Metro Functional Plan requirements. As noted above, Forest Grove has two options for compliance, the standard Functional Plan requirements for communities within the region, or the plan requirements for the Tualatin Basin program. The following is an analysis for each.

Tualatin Basin Program Requirements:

The following conditions are required to be met by the Basin program to be compliant and staff analysis concerning compliance. Generally, the proposal does exceed the Tualatin Basin program by extending regulations beyond CWS Sensitive Lands and Vegetative Corridor requirements and is consistent with the Metro approach. It is staff's understanding that the intent of the Tualatin Basin approach was to establish a common baseline approach for all communities in the Basin. There is nothing in the Tualatin Basin approach or Metro's requirements to prevent a community to go beyond the Basin approach. Based on this approach, the City of Sherwood has also adopted requirements that exceed the Basin requirements.

- Comply with the six steps identified in Section B of Chapter 7 of the Tualatin Basin program;

  Comment: Of the six steps, the only one that pertains to this action is the adoption of Low Impact Development Guidelines. This is accomplished in proposed new Section 9.971.

- CWS approves and implements its Healthy Streams Plan;

  Comment: Not applicable as this the requirement for Clean Water Services.

- Tualatin Basin members renew and extend their partnership to implement Healthy Streams project list and cooperate with Metro to develop regional public information;

  Comment: Not applicable as this item is outside the scope of the ordinance amendment. However, Forest Grove remains part of the Tualatin Basin effort and will assist in supporting the project list and cooperation with public information program to the extent that the city can.

- Cities adopt provisions to facilitate and encourage use of habitat-friendly development practices, where feasible, in Class I and II riparian habitat;

  Comment: Based on the review of other cities programs submitted to Metro, it is staff's understanding that "encourage" means some type of incentive to developers to use habitat-friendly development practices. Generally, those incentives could be in the form of increased densities or other type of regulatory flexibilities, or financial incentives by reducing water quantity and water quality SDCs.

  Financial incentives are not feasible since water quality and water quantity SDCs are collected for an outside agency (CWS). Thus, the use of Metro's Model Ordinance is proposed to be used to address this requirement. The amendment proposes flexible densities and development standards for development within or avoiding NRA's. Further, it requires the use of habitat-friendly practices to the extent that Metro has deemed appropriate through its Model Ordinance. It should be noted that the proposed amendments exceeds the Metro requirements in that it establishes requirements near habitat areas (Section 9.971 (5)) and offers the developer the flexibility to use habitat-friendly approaches though-out the city.

- Cities adopt provisions to allow for density reduction consistent with other portions of Section 3 (see below)

  Comment: This is achieved in Sections 9.944 (F) (1) (d) (iii) and 9.971 (4).

- Cities adopt either the Model Ordinance or alternative ordinances to apply to upland wildlife habitat in territory added to the UGB after the effective January, 2006 date.

  Comment: This is accomplished by integrating the Model Ordinance into Sections 9.944.

In addition to the above, Section 3 of the Functional Plan also requires:

- The implementing ordinances must establish clear and objective standards, and may include an alternative, discretionary approval process.

  Comment: This is accomplished by proposed Subsections 9.944 (F) and (G) which are taken from the Metro Model Ordinance.

- Allow the use of habitat-friendly development practices in regionally significant fish and wildlife habitat areas by:

  - Identifying provisions in Comprehensive Plans and implementing ordinances that prevent or limit the use of habitat-friendly practices; and

    Comment: This is accomplished by the barrier analysis provided in Attachment 9.

- Adopt amendments to remove the barriers so that habitat-friendly practices may be used where practical, in regionally significant fish and wildlife habitat.

  Comment: This is being accomplished by several proposed amendments including Items 6, 16, 17, 18, 20 and 25.

- Local jurisdictions must provide a reasonable, timely and verifiable process to locate habitat areas on a specific piece of land.

  Comment: This is accomplished through Subsection 9.944 (H) which is taken from the Metro Model Ordinance.

- Densities may be reduced on subdivisions if the property was within the UGB on January 1, 2002, the area of the property to be developed has been identified as a regionally significant fish and wildlife habitat and such a decision will directly result in protection of the remaining habitat either through dedication or restrictive covenant.

  Comment: As noted above, densities can be reduced per Subsection 9.944 (F) and requirements through dedication or restrictive covenant in Subsections (F) and (G).

  Metro Function Plan Requirements:

  While the City can exceed the Tualatin Basin requirements, it cannot exceed the Metro requirements due to the background and ESEE analysis that was performed for the Metro program. As will be seen below, there are two aspects of the proposed that do exceed the program requirements. Barriers and allowance to use low impact development techniques extend beyond habitat area. However, this is a permissive "regulation" that developers are encouraged to use rather than be required to use outside the habitat areas.

  There are two requirements under Subsection 9.971 (5) that also exceed the Metro requirements. These requirements relate to landscape placement and outdoor lighting. These requirements are proposed to comply with the Issue Papers 1 and 2 produced for the Tualatin Basin agencies to assess their local requirements. Further, the lighting requirement was also supported to be included in the most recent Planning Commission work session.

  The Functional Plan requirements for non-Tualatin Basin communities and staff comment are as follows:

  - Adopt the Metro Model Ordinance and Metro Habitat Conservation Areas;

  - An alternative ordinance that substantially meets specified performance standards and best management practices identified in Section 4 of the Functional Plan;

  - Implement a program based on alternative approaches that will achieve protection and enhancement of Class I and II riparian habitat and Class A and B

upland wildlife habitat areas in territory added after the effective date of Metro's adopting ordinance (Ordinance No. 05-1077 which was January 5, 2006); or

- Develop a district plan with other jurisdictions.

Staff Comment: The proposed amendments are adopting the Metro Model Ordinance. As discussed above, the Metro Habitat Conservation Areas are not being adopted. In its place, the Regionally Significant Fish and Wildlife Habitat Inventory Map is being adopted and linking standards to city zone districts and parks are being proposed.

In addition to the above, Section 3 of the Functional Plan also requires:

- The implementing ordinances must establish clear and objective standards, and may include an alternative, discretionary approval process;

- Allow the use of habitat-friendly development practices in regionally significant fish and wildlife habitat areas by identifying provisions in Comprehensive Plans and implementing ordinances that prevent or limit the use of habitat-friendly practices; and adopt amendments to remove the barriers so that habitat-friendly practices may be used where practical, in regionally significant fish and wildlife habitat.

- Local jurisdictions must provide a reasonable, timely and verifiable process to locate habitat areas on a specific piece of land.

- Densities may be reduced on subdivisions if the property was within the UGB on January 1, 2002, the area of the property to be developed has been identified as a regionally significant fish and wildlife habitat and such a decision will directly result in protection of the remaining habitat either through dedication or restrictive covenant.

Staff Comment: These were addressed under the Tualatin Basin analysis.

Revision Assessment:

The maps in Attachment 2 indicate the location of habitat and slopes of 10 percent or more for the four quadrants of the community and a separate map indicating the flood plain location. Also included is a map showing the locations of the Environmental Overlay Districts and the text of the district (see Attachment 12). Comparing the maps indicates that there is little relationship between the location of resources and hazards and the ER districts. The change from basing requirements on the ER District to development requirements will assure a more consistent application of requirements.

Flood plain: In the vicinity of Forest Grove, the FEMA 100 year flood plain is determined on Council Creek and small segments of its tributaries, Gales Creek and

Tualatin River. Many of these areas are currently not in the Environmental Review Overlay district.

The flood plain requirements as they apply to properties are not establishing new requirements but providing an update consistent with current provisions. In addition, the amendments assure that current requirements in the Municipal Code are being properly implemented. The requirements are not applied unless there is proposed development within the 100 year flood plain or there is a question as to the definition of the flood plain in determining its location. To staff's knowledge, there have only been two developments where the definition of the flood plain has been an issue: Knox Ridge and Gales Creek Terrace. To staff's knowledge, there is no development within the City of Forest Grove that is within the 100 year flood plain. Thus, staff views the flood plain provisions to be used on rare occasions and the amendment is to help avoid a situation that the City initially faced with Gales Creek Terrace.

Part of the proposed amendments pertaining to the flood plain involves defining the flood plain on the FEMA study or more recent data (Amendment Item 3). This is consistent with federal, state and subregional requirements and brings the City's code up-to-date.

Item 9 includes references to CWS standards for fill requirements within the 100 year flood plain. This requirement would already be imposed if proposed in the community but the amendment reaffirms that relationship.

Item 9 also makes reference to flood plain code requirements contained in the Municipal Code. Thus, there is no new requirement and it clarifies when the information is required for the review of land divisions. There is a similar provision in Item 19. The standards and requirements in the Municipal Code are more definitive than the ER requirements under Section 9.807 and have recently been accepted by the State as being in compliance with state flood hazard requirements.

Slopes: The 20 percent slope threshold is that used in the ER District. The city in the future may want to reconsider that threshold as being too steep. The map showing slopes is for slopes of 10 percent or greater. This is because we do not have current information on 20 percent slopes. This is for purposes of determining the extent of slopes in the city and whom to send Measure 56 notices to. It is not intended to be used to determine when the standards apply. That will be assessed when a project is submitted.

The significant amendment related to slopes is in Item 19. It defines the appropriate professional certification required to prepare reports and assessments. Although Section 9.804 (2) requires a geological analysis, the proposed amendment is more specific. It should help avoid the minimal analysis such as that submitted with the David Hill Tentative Map application. It also clarifies the submittal requirements that the City currently receives for grading permits in high slope areas.

Natural Resource Areas: The focus of this section is how these requirements would apply to land uses. Since uplands within the current UGB is not affected by the proposal, the main areas would be the Class I and II riparian areas. For future development, the primary areas would be located on David Hill Road and the industrial areas along the south boundary of the city. It might also affect 38 developed lots in the Forest Gale Heights area. It should be noted that for much of the area within the Class I and II areas may also be subject the limitations from existing CWS Sensitive Lands and Vegetative Corridor requirements.

Regarding future residential development areas, the property owner does not lose their development potential. If a parcel has the ability to develop 100 units with the underlying zoning, that does not change. However, if the applicant wishes, densities can be lowered or increased to the extent NRA covers the site. What changes is how the site gets developed. It is intended to encourage development away from any NRA site on the property. If it can't, certain amount of disturbance is allowed under the objective standards. If that does not work, a process to seek an alternative method to comply including off-site mitigation is provided.

For existing homes, there are specific exceptions from the regulations for rebuilding of destroyed homes, expansions or alterations not exceeding 500 square feet *into* the natural resource areas, minor encroachments into the NRA not to exceed 120 square feet of impervious surface for accessory buildings, and maintenance of existing gardens, pastures, lawns and landscape perimeters. In addition, if there is a need to remove vegetation for wild land fire purposes, Subsection 9.944 (D) (2) establishes criteria for vegetation removal for natural hazards.

For industrial, the amendments allow for 10 percent of the NRA Class I area and 50 percent of the Class II area under the objective standards. In reviewing CWS Sensitive Area Pre-screen map, there appears to be a high degree of similarity between wetland areas and the location of Class I areas. Although state and federal requirements can allow for fill of wetland areas, the amendments may limit the extent of that fill under the objective requirements. However, the alternatives option may allow a method to permit a greater amount of fill with proper mitigation.

There are no commercial areas affected by the proposed NRA amendments.

The letter from Mr. Burlingham brings up another issue. That is, whether the requirements would conflict with forest practices. For Mr. Burlingham and any others currently within the UGB, this is not an issue because the NRA upland designations do not apply. However, this may become an issue for any UGB changes in the future and should be investigated as part of any annexations of land involving forest practices.

V. CONFORMANCE TO LAND USE POLICY

1. Physical Environment Goal 1:

   ALL DEVELOPMENT SHALL CONSIDER, TAKE INTO ACCOUNT AND DEMONSTRATE SUITABILITY RELATIVE TO THE NATURAL HAZARD LIMITATIONS OF THE AREA.

   Staff Analysis and Finding: Complies. The proposed amendment Item 2 is intended to update the City's Flood plain standards to use the most up-to-date information in making determinations as to the location of the 100 year flood elevations. Further, other proposed amendments will make current requirements related to flood plain management more effective by including references into the City's Zoning and Land Division ordinances. In addition, requirements for steep sloping areas and flood management areas are addressed in a more consistent basis by establishing performance requirements rather than relying on the provisions of the ER District. Also, the requirements under the proposed amendments for both steep areas and flood plain areas will be more specific than under the ER District requirements.

2. Residential Land Use Goal 1:

   RESIDENTIAL AREAS SHALL BE DEVELOPED IN A SAFE, AESTHETICALLY PLEASING, AND EFFICIENT MANNER.

   Staff Analysis and Finding: The amendments would contribute to this goal by retaining habitat area to the extent feasible and mitigating where removed. Preservation and enhancement of habitat adjacent to residential areas increases the aesthetic value of the area. In addition, allowances for clustered housing increases the efficiency of housing by using less land for a given number of units. It is also more efficient by reducing road and other paving requirements, and reducing the amount of utility extensions since the housing would be closer proximity with each other.

3. Commercial Land Use Goals 1 and 2:

   STRENGTHEN FOREST GROVE'S POSITION AS A COMMERCE CENTER OF WESTERN WASHINGTON COUNTY, AND ENCOURAGE SHOPPING BY RESIDENTS OF THAT AREA.

   ENCOURAGE THE OPPORTUNITY FOR REVITALIZATION OF THE CENTRAL BUSINESS DISTRICT

   Staff Analysis and Finding: None of the commercial areas are near steep slopes, flood management areas or natural resource areas. Thus, the propose would not have any impact on the City to achieve these commercial goals.

4. Industrial Land Use Goal 3:

   THE CITY SHALL COOPERATE IN PROVIDING THE PUBLIC SERVICES AND FACILITIES NEEDED BY EXISTING AND FUTURE BUSINESSES AND INDUSTRIES.

   Staff Analysis and Finding: The proposed Natural Resource Area provisions would allow the installation of utilities through these areas. Thus, the proposed amendments would not have an impact on meeting this Goal.

5. Natural Resource Land Use Goal 1 and Open Space Goal 2:

   PRESERVE AND MAINTAIN THE QUALITY OF EXISTING AGRICULTURAL, FORESTRY, WILDLIFE AND OTHER NATURAL RESOURCE AREAS.

   Staff Analysis and Finding: The proposed amendments would help achieve this goal for wildlife and other natural resource areas by adding a new policy to the Comprehensive Plan to implement the regional Nature in Neighborhoods program and establishing standards and requirements for preserving, minimize intrusions or mitigate intrusions into these areas.

6. Natural Resource Land Use Goal 2:

   OPEN SPACE VALUABLE TO FISH AND WILDLIFE RESOURCES SHALL BE PROTECTED.

   Staff Analysis and Finding: The amendment is intended to preserve open space valuable to fish and wildlife resources in riparian areas and in upland areas brought into the UGB in the future. This is accomplished through adding a new policy to the Comprehensive Plan to implement the regional Nature in Neighborhoods program and establishing standards and requirements for preserving, minimize intrusions or mitigate intrusions into these areas. Further, areas preserved as open space must be placed into tracts which cannot be developed.

7. Natural Resource Land Use Goal 3:

   THE PRESERVATION OF EXISTING TREES SHALL BE ENCOURAGED.

   Staff Analysis and Finding: Through the adoption of a new natural resource policy and implementing the Nature in Neighborhood program, this goal will be achieved by encouraging limiting removal of trees in riparian areas though proposed objective standards.

8. Agricultural and Forest Land Use Goals 2 and 3:

   FORESTRY LANDS SHALL BE PRESERVED FOR FOREST USES.

   PRESERVE AND MAINTAIN THE QUALITY OF EXISTING AGRICULTURAL, FORESTRY WILDLIFE AND OTHER NATURAL RESOURCE AREAS.

Staff Analysis and Finding: Natural resource preservation was addressed above. Regarding forestry, the amendments would not affect properties in forest production within the current UGB since the Natural Resource Area designation does not apply to upland resource areas identified by Metro. However, it may affect properties in forest practices that are brought into the UGB in the future.

9. Open Space Goal 3:

   PRESERVE AND IMPROVE SPECIFIC OPEN SPACE AREAS TO PROVIDE RECREATION, EDUCATION, CONTACT WITH NATURE AND SCENIC AMENITIES.

   Staff Analysis and Finding: Open space intended for active recreational use will not be limited by the proposed natural resource amendments since the natural resource designation will not be applied to these areas. Open space intended for natural preservation will be limited to vegetation removal only for trail development.

10. *Open Space Goal 4:*

    MAINTAIN DESIRABLE EXISTING OPEN SPACE AND ENHANCE THE ENVIRONMENT WITHIN THE CITY THROUGH PRESERVATION AND LANDSCAPING.

    Staff Analysis and Finding: This goal will be promoted through the natural resource provisions included in the proposed amendments. The amendments encourage the preservation of existing open space in natural resource areas where possible. Where not possible, it provides measures to minimize intrusion into these areas and to mitigate any intrusion.

11. Zoning Ordinance Purpose Statement:

    This ordinance has been designed in accordance with the adopted goals, and policies of the Forest Grove Comprehensive Plan. It is the general purpose of this ordinance, therefore, to provide one of the principal means for the implementation of the Forest Grove Comprehensive Plan as well as: encourage the most appropriate use of the land; conserve and stabilize the value of property; promote a variety of housing opportunities; aid in the rendering of fire and police protection; provide adequate open space for light and air; lessen the congestion on streets; promote orderly growth in the city; prevent undue concentrations of population; facilitate adequate provisions for community utilities and facilities such as water, sewerage, electrical distribution systems, transportation, schools, parks and other public facilities; and in general promote public health, safety, convenience and general welfare.

    Staff Analysis and Finding: The proposed amendments to the Zoning Ordinance, as discussed above, forwards the applicable goals of the Forest Grove Comprehensive Plan. Thus, the proposed amendments meet the purpose of the Zoning Ordinance. Further, this section of the ordinance is proposed to be changed to include conservation of natural resource areas to better reflect the Comprehensive Plan Goals and policies as amended.

12. Land Division Purpose Statement:

This ordinance has been formulated in accordance with the adopted goals and policies of the Forest Grove Comprehensive Plan. It is the general purpose of this ordinance, therefore, to provide one of the principal means for the implementation of the Comprehensive Plan. It is also the intent of this ordinance to accomplish the orderly development of land within the City through rules, regulations and standards governing the approval of subdivisions and partitions, taking into consideration all of the applicable goals and policies and the locations of proposed subdivisions and partitions, as well as their impact on the surrounding area and the entire City. These rules, regulations and standards are intended to provide for lessening congestion in the streets, for securing safety from fire, flood, slides, pollution or other dangers, for providing adequate light and air, including solar energy access, for preventing overcrowding of land, for facilitating drainage, education, recreation and other needs, and in general to promote the public health, safety, convenience and general welfare.

Staff Analysis and Finding: The proposed amendments to the Land Division Ordinance, as discussed above, forwards the applicable goals of the Forest Grove Comprehensive Plan. Thus, the proposed amendments meet the purpose of the Zoning Ordinance. Further, this section of the ordinance is proposed to be changed to include conservation of natural resource areas to better reflect the Comprehensive Plan Goals and policies as amended.

12. Oregon State Land Use Goal 5, Natural Resources, Scenic and Historic Areas, and Open Spaces

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

Staff Analysis and Finding: The proposed amendment is consistent with this Goal. It includes new policies, standards and requirements for the protection of natural resources consistent with the Metro Nature in Neighborhoods program that has been acknowledged by Land Conservation and Development Commission.

13. Oregon State Land Use Goal 7, Areas Subject To Natural Hazards

To protect people and property from natural hazards.

Staff Analysis and Finding: The proposed amendments would assure more consistent protection from natural hazards since the current Environmental Review Overlay District, intended to address natural hazard conditions, only applies to portion of areas subject to steep slopes and flood management hazards. Further, the protection is being brought up-to-date by allowing more recent information than current FEMA studies completed in 1981 to determine the location of the 100 year flood plain. In addition, more specific requirements than that specified by the ER district would be implemented by the amendment.

14. Metro Functional Plan Requirements:

The proposal is in conformance with Metro Functional Plan Requirements for the Tualatin Basin program as well as the Regional program as described in the following:

Tualatin Basin Program Requirements:

The following conditions are required to be met by the Basin program to be compliant and staff analysis concerning compliance. Generally, the proposal does exceed the Tualatin Basin program by extending regulations beyond CWS Sensitive Lands and Vegetative Corridor requirements and is consistent with the Metro approach. It is staff's understanding that the intent of the Tualatin Basin approach was to establish a common baseline approach for all communities in the Basin. There is nothing in the Tualatin Basin approach or Metro's requirements to prevent a community to go beyond the Basin approach. Based on this approach, the City of Sherwood has also adopted requirements that exceed the Basin requirements.

- *Comply with the six steps identified in Section B of Chapter 7 of the Tualatin Basin program*;

  Comment: Of the six steps, the only one that pertains to this action is the adoption of Low Impact Development Guidelines. This is accomplished in proposed new Section 9.971.

- CWS approves and implements its Healthy Streams Plan;

  Comment: Not applicable as this the requirement for Clean Water Services.

- *Tualatin Basin members renew and extend their partnership to implement* Healthy Streams project list and cooperate with Metro to develop regional public information;

  Comment: Not applicable as this item is outside the scope of the ordinance amendment. However, Forest Grove remains part of the Tualatin Basin effort and will assist in supporting the project list and cooperation with public information program to the extent that the city can.

- Cities adopt provisions to facilitate and encourage use of habitat-friendly development practices, where feasible, in Class I and II riparian habitat;

  Comment: Based on the review of other cities programs submitted to Metro, it is staff's understanding that "encourage" means some type of incentive to developers to use habitat-friendly development practices. Generally, those incentives could be in the form of increased densities or other type of regulatory flexibilities, or financial incentives by reducing water quantity and water quality SDCs.

Financial incentives are not feasible since water quality and water quantity SDCs are collected for an outside agency (CWS). Thus, the use of Metro's Model Ordinance is proposed to be used to address this requirement. The amendment proposes flexible densities and development standards for development within or avoiding NRA's. Further, it requires the use of habitat-friendly practices to the extent that Metro has deemed appropriate through its Model Ordinance. It should be noted that the proposed amendments exceeds the Metro requirements in that it establishes requirements near habitat areas (Section 9.971 (5)) and offers the developer the flexibility to use habitat-friendly approaches though-out the city.

- Cities adopt provisions to allow for density reduction consistent with other portions of Section 3 (see below)

  Comment: This is achieved in Sections 9.944 (F) (1) (d) (iii) and 9.971 (4).

- Cities adopt either the Model Ordinance or alternative ordinances to apply to upland wildlife habitat in territory added to the UGB after the effective January, 2006 date.

  Comment: This is accomplished by integrating the Model Ordinance into Sections 9.944.

In addition to the above, Section 3 of the Functional Plan also requires:

- The implementing ordinances must establish clear and objective standards, and may include an alternative, discretionary approval process.

  Comment: This is accomplished by proposed Subsections 9.944 (F) and (G) which are taken from the Metro Model Ordinance.

- Allow the use of habitat-friendly development practices in regionally significant fish and wildlife habitat areas by:

  - Identifying provisions in Comprehensive Plans and implementing ordinances that prevent or limit the use of habitat-friendly practices; and

    Comment: This is accomplished by the barrier analysis.

  - Adopt amendments to remove the barriers so that habitat-friendly practices may be used where practical, in regionally significant fish and wildlife habitat.

    Comment: This is being accomplished by several proposed amendments including Items 6, 16, 17, 18, 20 and 25.

- Local jurisdictions must provide a reasonable, timely and verifiable process to locate habitat areas on a specific piece of land.

Comment: This is accomplished through Subsection 9.944 (H) which is taken from the Metro Model Ordinance.

- Densities may be reduced on subdivisions if the property was within the UGB on January 1, 2002, the area of the property to be developed has been identified as a regionally significant fish and wildlife habitat and such a decision will directly result in protection of the remaining habitat either through dedication or restrictive covenant.

  Comment: As noted above, densities can be reduced per Subsection 9.944 (F) and requirements through dedication or restrictive covenant in Subsections (F) and (G).

  Metro Function Plan Requirements:

  While the City can exceed the Tualatin Basin requirements, it cannot exceed the Metro requirements due to the background and ESEE analysis that was performed for the Metro program. As will be seen below, there are two aspects of the proposed that do exceed the program requirements. Barriers and allowance to use low impact development techniques extend beyond habitat area. However, this is a permissive "regulation" that developers are encouraged to use rather than be required to use outside the habitat areas.

  There are two requirements under Subsection 9.971 (5) that also exceed the Metro requirements. These requirements relate to landscape placement and outdoor lighting. These requirements are proposed to comply with the Issue Papers 1 and 2 produced for the Tualatin Basin agencies to assess their local requirements. Further, the lighting requirement was also supported to be included in the most recent Planning Commission work session.

  The Functional Plan requirements for non-Tualatin Basin communities and staff comment are as follows:

  - Adopt the Metro Model Ordinance and Metro Habitat Conservation Areas;

  - An alternative ordinance that substantially meets specified performance standards and best management practices identified in Section 4 of the Functional Plan;

  - Implement a program based on alternative approaches that will achieve protection and enhancement of Class I and II riparian habitat and Class A and B upland wildlife habitat areas in territory added after the effective date of Metro's adopting ordinance (Ordinance No. 05-1077 which was January 5, 2006); or

  - Develop a district plan with other jurisdictions.

Staff Comment: The proposed amendments are adopting the Metro Model Ordinance. As discussed above, the Metro Habitat Conservation Areas are not being adopted. In its place, the Regionally Significant Fish and Wildlife Habitat Inventory Map is being adopted and linking standards to city zone districts and parks are being proposed.

In addition to the above, Section 3 of the Functional Plan also requires:

- The implementing ordinances must establish clear and objective standards, and may include an alternative, discretionary approval process;

- Allow the use of habitat-friendly development practices in regionally significant fish and wildlife habitat areas by identifying provisions in Comprehensive Plans and implementing ordinances that prevent or limit the use of habitat-friendly practices; and adopt amendments to remove the barriers so that habitat-friendly practices may be used where practical, in regionally significant fish and wildlife habitat.

- Local jurisdictions must provide a reasonable, timely and verifiable process to locate habitat areas on a specific piece of land.

- Densities may be reduced on subdivisions if the property was within the UGB on January 1, 2002, the area of the property to be developed has been identified as a regionally significant fish and wildlife habitat and such a decision will directly result in protection of the remaining habitat either through dedication or restrictive covenant.

Staff Comment: These were addressed under the Tualatin Basin analysis.

VI. APPROVAL CRITERIA AND FINDINGS

A. Comprehensive Plan Map Amendment Criteria (Comprehensive Plan, Ordinance 83-15, Section II, Amendments to the Comprehensive Plan):

1. Justification of the proposed amendment and an explanation of how it fulfills applicable comprehensive plan goals and policies and LCDC statewide planning goals.

   Staff Analysis and Findings: Based on the analysis and findings contained in the staff report, the proposed amendment fulfills applicable comprehensive plan goals and LCDC statewide planning goals.

2. Identification of alternative locations within the City or Urban Planning Area which could be used without amending the plan, and a explanation as to why they are considered unsuitable.

   Staff Analysis and Findings: The amendments are intended to apply to those areas containing natural resources and in areas subject to either flood plain or

steep slope hazards. Thus, there are no alternative locations that would be appropriate since other areas would not contain these resources or hazards.

3. Identification of the short and long-term environmental, social, economic and energy consequences of the proposed change on the city, region, and state, with particular attention to the impacts on public facilities and services such as streets, traffic control, mass transit, sewer, water, drainage, parks, schools, public safety, and public utilities.

   Staff Analysis and Findings: ESEE analysis has been performed by Metro and the Tualatin Basin. The Tualatin Basin ESEE contains analysis from the City of Forest Grove. Those ESEE analysis are adopted here by reference.

4. Demonstration that the proposed new land uses will be compatible with existing adjacent land uses and with future adjacent land uses as proposed in the comprehensive plan.

   Staff Analysis and Findings: Not applicable. The amendment proposes no new land uses.

B. Zoning Ordinance Amendment Criteria (Zoning Ordinance Section 9.902):

1. The proposed change is consistent with and promotes the goals and policies of the Comprehensive Plan and Zoning Ordinance of the City; and

   Staff Analysis and Findings: As discussed in the findings, the proposal promotes the goals of the Comprehensive Plan and the purpose of the Zoning Ordinance.

2. There is a public need for a change of the kind in question.

   Staff Analysis and Findings: The public need is based on Metro Functional Plan requirements to for local jurisdictions to amend their ordinances to implement the Nature in Neighborhoods program either by the regional program requirements or the requirements adopted for the Tualatin Basin program.

C. Land Division Ordinance Amendment Criteria (Land Division Ordinance 9.118 (7):

In that the Comprehensive Plan for Forest Grove may be amended from time to time to keep it consistent with the changing needs and desires of the community, it may be necessary to amend these regulations to implement the goals and policies of the Comprehensive Plan.

Staff Analysis and Findings: As discussed in the findings, the proposal promotes the goals of the Comprehensive Plan as proposed to be amended and the purpose of the Land Division Ordinance as proposed to be amended.

VII. ALTERNATIVES

The Planning Commission may recommend approval as proposed, approval with modifications, deny, or continue deliberations to a date certain.

VIII. RECOMMENDATION

Based on the analysis and findings above, staff recommends that the Commission approve the proposed comprehensive plan, zoning, land division and Municipal Code amendments to establish provisions to conserve natural resource areas, and adopt performance requirements to implement flood plain management and steep slope provisions that are more current than not have to rely on the Environmental Review Overlay District.

IX. LIST OF EXHIBITS

The following attachments are part of the staff report and entered into the record as evidence for this application at the time this staff report was written. Exhibits received after the date of this report will be marked beginning with the next consecutive letter and will be entered into the record at the time the public hearing is opened, prior to oral testimony.

Attachment 1	Proposed Text Amendments
Attachment 2	Maps showing location of Regionally Significant Fish and Wildlife Class I and II and A and B Habitat Inventory, Slopes 10 percent or greater and 100 Year Flood Plain
Attachment 3	Metro ESEE (due to its size, this item is in a separate notebook available for review)
Attachment 4	Metro Functional Plan Requirements for Nature in Neighborhoods
Attachment 5	Tualatin Basin ESEE (due to its size, this item is in a separate notebook available for review)
Attachment 6	Tualatin Basin Program
Attachment 7	Technical Issue Paper 1
Attachment 8	Technical Issue Paper 2
Attachment 9	Gap Analysis
Attachment 10	List of Native Trees from City's Street Tree list
Attachment 11	Municipal Code Provisions on Flood Plan Management
Attachment 12	Environmental Review Overlay District Text and Map
Attachment 13	Letters Received

Attachment 1

Proposed Text Amendments

ATTACHMENT 1

Proposed Text Amendments

COMPREHENSIVE PLAN AMENDMENT

1. ***New Natural Resource Policy 3:*** The City shall implement and exceed the Tualatin Basin Goal 5 program consistent with Metro Title 13 requirements through a strategy of preserve, minimize and mitigate intrusions into Class I and Class II Riparian Wildlife Habitat and Class A and B Upland Habitat as identified by Metro and adopted by reference in this Comprehensive Plan. Implementation shall be achieved through amendments in the Zoning and Land Division ordinances, and through education and other public information efforts.

MUNICIPAL CODE TEXT AMENDMENT

2. ***Amend Section 5.815 to redefine the basis to determine the areas of Special Flood Hazard:***

5.815 Basis for Establishing the Areas of Special Flood Hazard. The areas of special flood hazard are determined by:

(1) ~~identified by t~~The Federal Insurance Administration in a scientific and engineering report entitled "The Flood Insurance Study for the City of Forest Grove," dated September 15, 1981, with accompanying Flood Insurance Rate Maps, is hereby adopted by reference and declared to be a part of this code. The Flood Insurance Study is on file at the Administrative offices of the city~~.~~; or

(2) Updated flood studies or any other authoritative data documenting flood elevations as approved by the City Engineer or as a result of complying with the requirements of Clean Water Services' Design and Construction Standards.

LAND DIVISION ORDINANCE TEXT AMENDMENTS:

3. ***Amend Section 9.101 of the Land Division Ordinance as follows:***

9.101 PURPOSE. This ordinance has been formulated in accordance with the adopted goals and policies of the Forest Grove Comprehensive Plan. It is the general purpose of this ordinance, therefore, to provide one of the principal means for the implementation of the Comprehensive Plan. It is also the intent of this ordinance to accomplish the orderly development of land within the City through rules, regulations and standards governing the approval of subdivisions and partitions, taking into consideration all of the applicable goals and policies and the locations of proposed subdivisions and partitions, as well as their impact on the surrounding area and the entire City. These rules, regulations and standards are intended to provide for lessening congestion in the streets, for securing safety from fire, flood, slides, pollution or other dangers, for providing adequate light and air, including solar energy access, for preventing overcrowding of land, for facilitating drainage,

education, recreation and other needs, for conserving natural resource lands and in general to promote the public health, safety, convenience and general welfare.

4. Amend Section 9.102 to add new definition 27 and renumber accordingly:

(27) Natural Resource Area. The area defined by Metro as Riparian Wildlife Habitat Class I and II and Upland Wildlife Habitat Area A and B as shown on the Regionally Significant Fish and Wildlife Habitat Inventory Map dated at the time of adoption of this section or as amended in the future excluding those portions within Sensitive Areas and Vegetated Corridors as determined by the ~~Chapter 3 of~~ Clean Water Services Design and Construction Standards.

5. Amend Section 9.108 to add reference to Natural Resource Area review:

9.108 SUPPLEMENTAL MATERIALS WITH TENTATIVE PLAN

(1) In addition to those submittal materials to be provided in connection with an application for a proposed land division, as contained in Section 9.107, the Community Development Director may require that any of the following be submitted to supplement a tentative plan application:

a. Approximate centerline profiles with extensions for a reasonable distance beyond the limits of the proposed land division, showing the finished grade of streets and sidewalks and the nature and extent of street construction.
b. Proposal for other utilities and improvements such as electric facilities.

(2) Where the subject site is within 100 feet of a Natural Resource Area, the applicable informational requirements of Section 9.944 of the Zoning Ordinance shall be met.

6. Amend Section 9.109 to provide habitat-friendly provisions and reference Natural Resource Area requirements:

9.109 REQUIRED IMPROVEMENTS

(1) For any subdivision approved in the City, the subdivider or partitioner shall have the responsibility of providing the following improvements pursuant to plans and specifications as approved by the City Engineer and in conformance with the design standards as contained in this ordinance. In instances where improvements are within or cross natural resource areas, the requirements of Section 9.944 of the Zoning Ordinance shall apply:

a. Streets: All streets and alleys within the development and those adjacent streets which directly serve the development shall be fully improved, including grading, base grade, paving, and installation of curbs, all constructed to design specifications as approved by the City Engineer. All streets to be constructed and/or improved shall comply with the minimum street improvement standards contained in this ordinance. Where traffic is anticipated to be less than 500 average daily trips, pervious paving may be used for roadway and/or parking areas as

approved by the City Engineer. In cases where physical conditions warrant it, special soils analyses or engineering designs may be required by the City Engineer. In addition, where a proposed subdivision or partition abuts a substandard arterial or collector street, the developer shall provide to the Community Development Department prior to final plat or map approval, adequate guarantees that within one year from the issuance of a building permit for construction within the development, such abutting arterial or collector street or streets shall be improved adjacent to the land division site in a manner which is compatible with the standards for streets as contained in this ordinance. Adequate guarantee shall consist of formation of a local improvement district, or provision of a bond or cash deposit in an amount sufficient to cover the estimated actual improvement cost, plus 15%. (Ord. 92-04; 1/27/92)

b. Storm Sewers and Erosion Control Facilities: Public storm sewer lines and facilities shall be constructed in compliance with the City's Master Storm Sewer Plan, and shall connect with existing storm sewer facilities which conform with the Master Storm Sewer Plan, or to lines which can be shown to be adequate for the development proposed. Drainage swales and other open drainage facilities may be used with the approval of the City Engineer. On-site storm water retention and disposal systems shall be provided in accordance with the provisions of Section 9.111 and as approved by the City Engineer.

c. Sanitary Sewer Facilities: Public sanitary sewer facilities shall be constructed in compliance with the City's Master Sewer Plan, and shall connect with existing sanitary sewers which conform with the Master Sewer Plan, or to lines which can be shown to be adequate for the development proposed. All sanitary sewers shall be constructed according to plans and specifications as approved by the City Engineer.

d. Water Facilities: Public water lines shall be constructed in compliance with the City's Master Water Plan, and shall connect with existing public water lines which conform with the Master Water Plan, or which can be shown to be adequate for the development proposed. All water systems shall be designed to provide domestic water to each lot or parcel and to provide adequate fire protection facilities, and shall be constructed according to plans and specifications as approved by the City Engineer.

e. Sidewalks: Public sidewalks shall be constructed in all street right-of-ways, on both sides of the street roadway, according to plans and specifications as approved by the City Engineer. Where other designated walkways or pedestrian accesses are shown on the plat, such walkways shall be constructed of hard-surface material in conformance with the approved tentative plan. Where approved by the City Engineer, pervious materials may be used for sidewalk construction.

Sidewalks shall be property-line sidewalks. These may be modified by the City Engineer for:

a) Cul-de-sac bulbs; or
b) Slopes of over 20% at right angles to the sidewalk; or
c) To curve around existing or future trees.

f. If existing storm sewer, sanitary sewer, and/or water facilities which will serve the subdivision are not brought into immediate conformance with the appropriate public facilities

master plan elements of the Comprehensive Plan prior to development of the subdivision, but where such elements of the Comprehensive Plan indicate a future need for additional public facilities capacities which would directly serve or benefit such proposed subdivision, the subdivider shall be required to participate in the future construction of the facilities indicated, through the provision of a waiver of the right to remonstrate against future formation of a local improvement district.

g. Public and Private Utilities: Public electric, data communication and telecommunication conduits as well as conduits for franchise utilities including, but not limited to, telephone, natural gas and cable television shall be installed to serve all newly created lots and developments. Where necessary to provide for orderly development of adjacent properties, public and franchise utilities shall be extended through the site to the edge of adjacent property(ies).

Installation of utilities shall be provided in public utility easements and shall be sized, constructed, located and installed consistent with the following:

a) Public telecommunication and data communication conduits, electrical conduits and appurtenances shall be installed per the City of Forest Grove Light and Power Department design standards.
b) Franchise utility conduits shall be installed per the utility design and specification standards of the utility agency (Ord. 2006-18; 09/25/2006)

h. Street Trees:

i. At the time of submittal of a tentative plat application for a subdivision, a Street Tree Plan may be submitted to accompany such application. If submitted, the Street Tree Plan shall be provided on a copy of the tentative plat map, and shall include the following items:

- Quantities and species of all proposed street trees.
- The proposed locations of street trees and common area trees with dimensions given for spacing between trees.
- Locations, species, and sizes of all existing trees which will remain within street rights-of-way following construction of the street roadway, curbs, and sidewalks. Where existing trees larger than 6 inches d.b.h. are located within the anticipated parkway of a proposed street right-of-way, such trees shall be identified and preserved wherever possible, and, if of an appropriate species, shall be considered as meeting the requirements for street trees, as contained in this subsection. (Ord. 97-05; 3/24/97. Ord. 97-17; 11/3/97)

ii. No Street Tree Plan shall be approved unless it complies with the following standards:

- The total number of street trees and open space trees provided shall be based on the total lineal curb frontage in feet divided by 30 plus the total

area of any common area(s) in square feet divided by 2,000, except the total number of trees can be adjusted based on optimum tree spacing and/or the design of the open space for the particular tree species. Spacing between street trees may be variable. (Ord. 97-17; 11/3/97)

- Species of street trees selected shall be those which are suited to the environment of Western Oregon.
- Species of street trees bearing fruit, nuts or berries which fall on an annual basis shall be prohibited. In addition, those tree species prohibited by City Code Section 9.415 shall not be allowed as street trees.
- Street trees shall have a minimum caliper size of one and one-half (1 ½) inches as measured one (1) foot above ground level, and a minimum branch height of six (6) feet.
- The species of trees selected shall be the largest possible after considering above-ground constraints (such as overhead wires or adjacent buildings), and the available planting area. (Ord. 97-17; 11/3/97)
- After determining the largest size appropriate for the site, the particular species is determined after considering at a minimum any Master Street Plan, other street trees on streets entering the subdivision, the need for street tree diversity in Forest Grove, and the importance of replacing the Oregon White Oak. (Ord. 97-17; 11/3/97)

iii. Street trees shall be planted in substantial conformance with the approved Street Tree Plan. If no Street Tree Plan is approved, the City shall be responsible for determining trees species and locations, using (ii) above as guidelines. (Ord. 97 17; 11/3/97)

iv. Street trees shall be funded and installed based on the following steps:

- Funding and installation (as set forth below) goes into effect for all areas which have not received Engineering Department approval and acceptance of required public improvements, even when the tentative plat was submitted prior to adoption of this ordinance.
- Payment shall be made at the time of dwelling unit building permit request equal to the parcel's total lineal street frontage divided by 30 feet, and that number multiplied times a "Street Tree Cost", except 50 feet shall be used if the street frontage is 50 feet or less (for example, a flag lot).
- Street Tree Cost shall include the cost of the tree, installation, and one year maintenance. The fee shall be updated by the City Council as part of the City Fee Schedule.
- Money collected and interest earned shall be deposited into a Street Tree account, and used to plant trees on the specified lots. Any extra revenues received through interest earnings, volume discounts, etc. shall be used for other trees in public rights-of-way. The City, interested citizens, and other parties may also contribute to this program for the planting and

maintenance of public trees, with private parties eligible for a tax deductible contribution.

- The City shall prepare a Request for Proposal (RFP) on an annual (or semi-annual) basis and contract for the purchase, planting, and one year maintenance of the street trees, including appropriate watering throughout the summer. The same contractor shall be responsible for the full length of the planting maintenance period of street trees in specific developments, and replacement and subsequent maintenance of any dead or dying trees. The City, using standard accounting practices as referenced in ORS 279, has the option of bidding on this contract.
- Trees shall be planted during late winter/early spring after occupancy permits are issued, or as otherwise determined by the contractor.
- The City shall inspect the trees prior to installation to ensure compliance with the American Standard for Nursery Stock, and after installation for correct species and number. At the end of the maintenance period the City shall inspect the trees for health and determine what trees (if any) need to be replaced.
- When the trees pass approval at the end of the maintenance period, homeowners shall become responsible for maintaining the trees. Such transfer of responsibility to homeowners shall include City notice to the homeowners and pamphlets on their street tree responsibility, and the care, maintenance, pruning, and the process for removal and replacement of street trees. (Ord. 97-17; 11/3/97)

~~h~~ i. Joint Mailboxes: Joint mailbox facilities shall be provided in all residential subdivisions, with each joint mailbox serving at least two, but no more than eight, dwelling units. Joint mailbox structures shall be placed in the street right-of-way adjacent to roadway curbs. Proposed locations of joint mailboxes shall be designated on a copy of the tentative plan of the subdivision, and shall be approved by the City Engineer prior to tentative plan approval. In addition, sketch plans for the joint mailbox structures to be used shall be submitted and approved by the City Engineer prior to final plat approval.

(2) The City shall not issue any building permit and shall withhold all public services of any nature, including the maintenance of streets and the furnishing of sewer, water and electrical facilities in all subdivisions and partitions until the above improvements have been fully constructed and/or installed as approved by the City Engineer, and in full conformance with the design standards of this ordinance, provided that public sidewalks adjacent to any lot or parcel need not be constructed prior to issuance of a building permit, but shall be provided prior to occupancy of any structure built on such lot or parcel. (Ord. 92-04; 1/27/92. Ord. 97-17; 11/3/97)

7. ***Amend Section 9.110 (1) to allow minimal street widths through Natural Resource Areas.***

(1) Streets: Adequate street right-of-way shall be dedicated to provide for the safe and efficient movement of vehicular traffic within and adjacent to the subdivision, in accordance with the standards of this Section and with construction specifications as approved by the City

Engineer. In general, the design of local streets shall be such that through traffic is discouraged. Where a proposed arterial or collector street is projected within the land division as shown on the Functional Classification Map of the Comprehensive Plan, street rights-of-way shall be provided in those locations and to those standards for arterial and collector streets as contained in this ordinance. (Ord. 99-16; 11/22/99)

a. Minimum Right-of-Way and Roadway Width: Widths of street right-of-way and paving design shall be not less than those set forth in the following table. Where an existing street is located adjacent to any boundary of the subdivision or partition, the applicant shall dedicate additional right-of-way to allow for street construction in accordance with the following table for any such adjacent street where the existing width of right-of-way for such street is less than the minimum in said table. Bike paths on arterial and collector streets shall be at least 5 feet wide. (Ord. 92-04; 1/27/92; Ord. 98-04; 3/23/98; Ord. 99-16, 11/22/99)

Street Type	**Minimum R.O.W. Width**	**Minimum Roadway Width**
Major Arterial	90-96 feet	52-64 feet
Minor Arterial	66 feet	40 feet
Residential Collector	66 feet	40 feet
Neighborhood Route	54 feet	28 feet (7)
Local Industrial	66 feet	40 feet
Local	58 feet	32 feet
Local	54 feet	28 feet (1)
Local	50 feet	24 feet (2)
Local	50 feet (3)	15 feet (4)
Cul-de-sac (street)	58 feet	32 feet
Circular End of Cul-de-sac	55 feet (radius)	42 feet (radius)
Cul-de-sac	50 feet	24 feet (5)
Circular End of Cul-de-sac	40 feet (radius)	34 feet (radius) (6)
Alley	15 feet	12 feet

(1) These streets shall serve not more than 16 single-family or duplex dwelling units, nor more than 20 multi-family dwelling units. For streets with two accesses, (a loop or grid system), these standards shall double. (Ord. 97-05; 3/24/97)

(2) These streets shall serve not more than 12 single-family or duplex dwelling units, nor more than 16 multi-family dwelling units. For streets with two accesses, (a loop or grid system), these standards shall double. On-street parking permitted on one side only. <u>This street width shall be used where local streets are going though a Natural Resource Area and no parking allowed on either side.</u> (Ord. 97-05; 3/24/97)

(3) Street right-of-way may be reduced if approved by the City Engineer, to preserve natural features or where construction of a full-width street would result in excessive cut-and-fill due to existing topography. (Ord. 97-05; 3/24/97)

(4) One-way traffic only; no on-street parking permitted. One-way streets may be permitted only to preserve natural features or where the construction of a full-width street would result in excessive cut-and-fill due to existing topography, as determined by the City Engineer. (Ord. 97-05; 3/24/97)

(5) No on-street parking permitted.

(6) Sidewalks permitted adjacent to curb. The City Engineer may require slope easements due to topography, the size and shape of the tract, or other conditions.

(7) On-street parking permitted on one side only. (Ord. 99-16; 11/22/99)

8. Amend Subsection 9.110(2)b.iv. to allow sidewalks narrower than city standards where ADA requirements do not apply.

i. Sidewalks and/or walkway connections shall be designed according to City standards or specifications on file at the City. Where not required to meet ADA requirements, sidewalks may be less than the city standard where approved by the City Engineer. (Ord. 98-04; 3/23/98)

9. Amend Section 9.113 to remove reference to Environmental Review Zones and replace with natural resource, flood management and steep slope areas with requirements to allow appropriate review for each area type:

9.113 LAND DIVISIONS IN ~~ENVIRONMENTAL REVIEW ZONES~~ NATURAL RESOURCE, FLOOD MANAGEMENT AND STEEP SLOPEAREAS

(1) The provisions of this section shall apply to proposed land divisions located entirely or in part within ~~an ER zone as designated in~~ a natural resource area as defined by the Zoning Ordinance, flood management area as defined by the Municipal Code, or locations with slopes of 20 percent or greater. The requirements of this section shall be applied in addition to all other general requirements of the Land Division Ordinance. The purposes of this section are to:

a. Encourage the planning, design, and development of safe and enjoyable building sites, while maintaining the integrity of the natural terrain and local ecosystem.
b. Use good building design, landscape design, and engineering to preserve and enhance the appearance and resources of hillsides and floodplains;
c. Prevent additional water runoff, soil erosion, sedimentation, and flooding which may otherwise occur through development of environmentally sensitive lands;
d. Achieve land use densities that are consistent with the Comprehensive Plan; and

e. Encourage alternative approaches to conventional development where necessary to reduce the impact of urban development on environmentally sensitive areas.

(2) ~~Environmental~~ Report Required: The applicant for approval of a land division proposal in ~~the ER zone~~ natural resource, flood management or steep slope areas shall file with the Community Development Department ~~an environmental~~ a report ~~as specified in the Zoning Ordinance~~. For natural resource areas, the report shall address the requirements of Section 9.944 of the Zoning Ordinance. For flood management areas, the information necessary to meet the applicable requirements of Section 5.800 et. seq. of the Municipal Code. For steep slopes, the information and assessment required by Section 9.855 (1) of the Zoning Ordinance.

(3) Development Standards. These standards shall apply to all developments where improvements or grading are made in ~~the ER zone~~ any of the areas subject to this section and shall be incorporated into the ~~environmental~~ report and the design of the proposed land division:

a. General Standards:

i. No grading, filling, clearing or excavating of any kind shall be initiated on the land division site until the final plat or map for the land division has been approved as required by this ordinance.

ii. Fill areas shall be prepared by removing organic material, such as vegetation and rubbish, and other material which is determined by the soils analysis to be detrimental to proper compaction or otherwise not conducive to stability; no rock or similar irreducible material with a maximum diameter greater than eight inches shall be used as fill material in fills that are intended to provide structural strength.

iii. All retaining walls or facings with a total vertical projection in excess of three feet and associated with cut or fill surfaces shall be designed as structural members keyed into stable foundations and capable of sustaining the design loads.

iv. If the developer can demonstrate conclusively to the City Engineer that any of the requirements contained in items (v) through (ix) below are not necessary in the proposed land division and that the omission of such requirements would not result in hazard to life or limb, hazard to property, adverse effects on the safety, use, or stability of a public way or drainage channel, or adverse impact on the natural environment, those particular requirements may be waived.

v. Fills shall be compacted to at least 95% of maximum density, as determined by AASHTO T99 and/or ASTM D698.

vi. Cut slopes shall be no steeper than two horizontal to one vertical; subsurface drainage shall be provided as necessary for stability.

vii. Fill slopes shall be no steeper than two horizontal to one vertical; fill slopes shall not be located on natural slopes 2:1 or steeper or, where fill slope toes out, within 12 feet horizontally of the top of an existing or planned cut slope.

viii. Top and toes of cut and fill slopes shall be set back from property boundaries a distance of three feet plus one-fifth of the height of the cut or fill, but need not exceed a horizontal distance of 10 feet; tops and toes of cut and fill slopes shall be

setback from structures a distance of six feet plus one-fifth the height of the cut or fill, but not exceeding 10 feet.

ix. Borrowing for fill shall be prohibited unless the material is obtained from a cut permitted under an approved grading plan obtained for some purpose other than to produce fill material, or imported from outside ~~the ER zone~~ natural resource, flood management or steep slope area.

b. Roadway Standards:

i. No grading, filling, clearing or excavation of any kind shall be initiated for the land division site until the final plat or map of the land division has been approved as required by this ordinance.

ii. Fill areas shall be prepared by removing organic material, such as vegetation and rubbish, and any other material which is determined by the soils engineer to be detrimental to proper compaction or otherwise not conducive to stability.

iii. All retaining walls or facings with a total vertical projection in excess of three feet and associated with cut or fill surfaces shall be designed as structural members keyed into stable foundations and capable of sustaining the design loads.

iv. Borrowing for fill shall be prohibited unless the material is obtained from a cut permitted under an approved grading plan, or imported from outside the land division site.

v. Streets shall be designed to create the minimum feasible amount of land coverage and the minimum feasible disturbance to the soil.

vi. Existing vegetation of the deep-rooted perennial variety shall be preserved to the greatest extent possible in the location of streets. Street alignment should follow natural terrain and no unnecessary cuts or fills shall be allowed in order to create additional lots or building sites.

vii. Where sufficient justification is provided in the required environmental reports, the City Engineer may allow limited variations from the street design standards of the ordinance in order to keep grading and cut-fill slopes to a minimum.

viii. The width of a graded section shall extend at least three feet beyond the outside edge of the sidewalk.

ix. Standard vertical curb (six inches) and gutter shall be installed along both sides of all street roadways.

x. If the developer can demonstrate conclusively to the City Engineer that any of the requirements contained in items (xi) through (xvi) below are not necessary in the proposed land division and that the omission of such requirements would not result in hazard to life or limb, hazard to property, adverse affects on the safety, use, or stability of a public way or drainage channel, or adverse impact on the natural environment, those particular requirements may be waived.

xi. Cut slopes shall be no steeper than 1-1/2 horizontal to one vertical; subsurface drainage shall be provided according to the approved storm drainage, erosion and sedimentation control plan required in Section 9.108(4), and as necessary for stability.

xii. The maximum horizontal distance of disturbed soil surface shall not exceed 75 feet.

xiii. Fill slopes shall be no steeper than 1-1/2 horizontal to one vertical; fill slopes shall not be located on natural slopes steeper than 2:1 or, where fill slope toes out, within 12 feet horizontally of the top of an existing or planned cut slope.

xiv. Tops and toes of cut and fill slopes shall be set back from buildings a horizontal distance of six feet plus one-fifth the height of the cut or fill, but need not exceed ten feet.

xv. Fills shall be compacted to at least 95% of maximum density, as determined to AASHTO T99 or ASTM D698.

xvi. All slopes which are stabilized by mechanical or chemical restraints shall be adapted to conform to the surrounding terrain and shall be given proper aesthetic treatment.

c. Slope Stabilization and Re-vegetation: The developer shall submit a slope stabilization and re-vegetation plan which shall include a complete description of existing vegetation, the vegetation to be removed and the method of disposal, the vegetation to be planted, and slope stabilization measures to be installed. The plan shall include an analysis of the effects of such operations on slope stability, soil erosion and water quality. The re-vegetation and slope stabilization plan shall be submitted with the other environmental reports required by this section. The following standards shall be applied in preparation of the slope stabilization and re-vegetation plan:

i. Vegetation shall be removed only when absolutely necessary, e.g. for buildings, filled areas, roads.

ii. Every effort shall be made to conserve topsoil which is removed during construction for later use on areas requiring vegetation or landscaping, e.g. cut and fill slopes.

iii. New plantings shall be protected with organic cover.

iv. All disturbed soil surfaces shall be stabilized or covered within 15 days of disturbance. If the planned impervious surfaces (i.e. streets) cannot be provided within 15 days, a temporary treatment adequate to prevent erosion shall be installed on those surfaces.

v. Between the first day of November and the fifteenth day of April, construction shall be scheduled to minimize soil disturbance.

vi. The developer shall be fully responsible for any destruction of native vegetation designated to be retained. He shall carry the responsibility both for his own employees and for all subcontractors from the first day of construction until the completion of all required improvements. The developer shall be responsible for replacing such destroyed vegetation.

vii. The use of qualified personnel experienced and knowledgeable in the practice of re-vegetation shall be required in all areas where re-vegetation is designated on the plan.

d. Floodplain Fill Standards: Proposed excavation and filling within the 100-year floodplain is subject to the standards established in the ~~Zoning Ordinance~~ Municipal Code and Clean Water Services Design and Construction Standards. (Ord. 82-15, 9/27/82)

ZONING ORDINANCE TEXT AMENDMENTS:

10. ***Amend Section 9.601 of the Zoning Ordinance:***

9.601 PURPOSE. This ordinance has been designed in accordance with the adopted goals, and policies of the Forest Grove Comprehensive Plan. It is the general purpose of this ordinance, therefore, to provide one of the principal means for the implementation of the Forest Grove Comprehensive Plan as well as: encourage the most appropriate use of the land; conserve natural resource areas, conserve and stabilize the value of property; promote a variety of housing opportunities; aid in the rendering of fire and police protection; provide adequate open space for light and air; lessen the congestion on streets; promote orderly growth in the city; prevent undue concentrations of population; facilitate adequate provisions for community utilities and facilities such as water, sewerage, electrical distribution systems, transportation, schools, parks and other public facilities; and in general promote public health, safety, convenience and general welfare.

11. ***Amend definition of "Density, net" (Section 9.603 42.) as follows:***

"42. Density, net. The actual number of dwelling units per unit of land including the area for dwelling unit development and natural resource areas ~~which~~ but does not include land in streets, and other public/private institutional and other uses. Density is expressed as the number of dwelling units per acre.

12. ***Add new definitions Numbers 27 and 96 to Section 9.603 and renumber existing definitions accordingly.***

"27. Bio-swale. One type of a stormwater management technique that uses chemical, biological and physical properties of plants, microbes and soils to remove, or retain, pollutants from stormwater runoff. It is distinguished from other types of bioretention techniques in that it is designed as part of a stormwater conveyance system that has relatively gentle side slopes and flow depths that are generally less than 12 inches."

"96. Natural Resource Area. The area defined by Metro as Riparian Wildlife Habitat Class I and II and Upland Wildlife Habitat Area A and B as shown on the Regionally Significant Fish and Wildlife Habitat Inventory Map dated at the time of adoption of this section or as amended in the future excluding those portions within Sensitive Areas and Vegetated Corridors as determined by ~~Chapter 3 of~~ Clean Water Services Design and Construction Standards."

13. ***Amend Section 9.810, Intent, for establishment of a Planned Development as follows:***

9.810 INTENT. The intent of the Planned Development designation is to provide greater flexibility in the development of land for residential, commercial, or industrial development, or a mixture thereof. The Planned Development provides flexibility in the administration of certain Code standards to encourage:

(1) Creative site development design.
(2) Efficient use of land with more economical arrangement of building, circulation system, and utilities than conventional development regulated in other sections of this code.
(3) Mitigation of unfavorable visual and other environmental impacts of development on adjacent land.
(4) Provision of variety in the location of improvements, lot size, lot coverage, density, building bulk, structure type, etc.
(5) Conservation of natural land features including but not necessarily limited to natural resource areas.
(6) Creation of open space and the best use of open space.

However, a PD shall comply with the provisions of Section 9.810 through 9.819.5 for review of the proposal, and with the appropriate provisions dealing with Planned Residential Developments, Commercial Planned Development, and Planned Industrial Developments.

14. Add new subsection (3) to Section 9.813, Preliminary Development Plan, as follows:

(3) Where there is a natural resource area on the site, information as required by Section 9.944.

15. Add criteria for planned developments to take into consideration natural resource areas:

9.814 CRITERIA FOR PRELIMINARY PLAN APPROVAL. A Preliminary Plan for a PD shall be approved if findings are made that each of the following criteria is satisfied:

(1) Public facilities serving the proposed development, including but not limited to, sanitary sewers, water, streets, storm sewers, electrical power facilities, parks, public safety and schools shall be adequate and meet current City standards; or it is guaranteed that inadequate or nonexistent public facilities will be upgraded or constructed by the applicant prior to occupancy of the project.

(2) The impact of the proposed development on public facilities shall not exceed the impact anticipated for the site in the formulation of the public facilities master plans contained in the Comprehensive Plan.

(3) Any uses proposed for the development which are not listed as uses permitted outright in the zone in which the proposed PD is located shall be designed to achieve compatibility with both the remainder of the PD and properties adjacent to the PD site.

(4) The proposal shall provide adequate open space, landscaping, and design features to minimize significant adverse effects on natural resource areas consistent with the requirements of Section 9.944, adjacent properties and uses.

(5) The location, shape, size and character of common open space areas shall be suitable and appropriate to the scale and character of the project, considering its size, density, expected population, topography, and the number, type and location of buildings to be provided.

(6) The proposed development shall not result in creation of any nuisance, including but not limited to air, land, or water degradation, noise, glare, heat, vibration or other conditions which may be injurious to public health, safety, and welfare.

(7) The proposal shall meet the intent and objectives for a PD as expressed in Sections 9.680 (PRD), or 9.730 (CPD), or 9.760 (PID), or 9.770 Manufactured Home Subdivisions or 9.780 Manufactured Home Parks (MHP), as appropriate.

16. Amend Subsection 9.826(2)(a) to encourage use of native vegetation.

(a) Installation—Native vegetation is encouraged to be used for all parking area landscaping except within 100 feet of a natural resource area. In such situations, native vegetation is required. All landscaping shall be installed in a sound workmanship like manner and according to ~~accepted good~~ best practice planting procedures with the quality of plant materials as hereinafter described. All elements of landscaping exclusive of plant material except hedges shall be installed so as to meet all other applicable ordinances and code requirements. Landscaped areas shall require protection from vehicular encroachment as herein provided in Section 9.825. A qualified representative of the agency charged with the issuance of building permits shall inspect all landscaping and no Certificates of Occupancy or similar authorization will be issued unless the landscaping meets the requirements herein provided.

17. Amend Subsection 9.826(3)(a) and (b) to allow bio-retention facilities on the perimeter of parking lots.

(a) Required Landscaping Adjacent to Public Rights-Of-Way--A strip of land at least 5 feet in width located between the abutting right-of-way and the off-street parking area or vehicle use area which is exposed to an abutting right-of-way, except in required vision clearance areas as provided in Section 9.826(3)(d). Landscaped areas may include water quality features such as bio-swales or wetlands, trees, grass, shrubs, and other plant material so as to cover the landscape area.

(b) Perimeter Landscaping Relating to Abutting Properties--On the site of a building or structure or open lot use providing an off-street parking area or other vehicular use area, where such areas will not be entirely screened visually by an intervening building or structure from abutting property, a 5-foot landscaped strip shall be between the common lot line and the off-street parking area or other vehicular use area exposed to abutting property. Landscaped areas may include water quality

features such as bio-swales or wetlands, trees, grass, shrubs, and other plant material so as to cover the landscape area.

18. Amend Subsection 9.830(7) to allow walkways be constructed with pervious paving:

(7) Walkways shall be paved with hard-surfaced materials such as pervious or standard concrete or asphalt, stone, brick, etc. Walkways may be required to be lighted and/or signed as needed for safety purposes. (Ord. 98-05; 3/23/98)

19. Amend Subsection 9.855 (1) to acknowledge the need for other approvals with or prior to site plan review:

(1) To ensure compliance with the provisions of this ordinance, prior to the issuance of a building permit for the construction of any new building within the city, and prior to any grading, excavation or filling or other site modification within ~~an ER zone~~ flood management or within 100 feet of a natural resource area or areas having a slope of 20 percent or greater, there shall be submitted to the Community Development Department for review and approval, or approval with modifications, a site plan (showing any grading, excavating or filling) drawn to scale of the entire property developed and of the proposed construction. For flood management areas, information required by Section 5.800 et. seq. of the Municipal Code. For natural resource areas, compliance with applicable requirements of Section 9.944 and 9.971. For areas with slopes of 20 percent or greater, the submission of a geological assessment and geotechnical report prepared and stamped by a Certified Engineering Geologist who is a registered geologist certified in the specialty of Engineering Geology under provisions of ORS 672.505 to 672.705. The assessment and report shall address the entire site and meet the following requirements:

(a) The geological assessment shall include information and data regarding the nature, distribution of underlying geology, and the physical and chemical properties of existing soils; an opinion as to stability of the site, and conclusions regarding the effect of geologic conditions on the proposed development.

(b) The geotechnical report shall include a comprehensive description of the site topography and geology; an opinion as to the adequacy of the proposed development from an engineering standpoint; and opinion as to the extent that instability on adjacent properties may adversely affect the project; a description of the field investigation and findings; conclusions regarding the effect of geologic conditions on the proposed development; and specific requirements for plan modification, corrective grading and special techniques and systems to facilitate a safe and stable development. The report shall provide other recommendations as necessary, commensurate with the project grading and development.

Where applicable, applications for other approvals shall be submitted prior to or concurrent with the site plan application. Said site plan may be submitted simultaneously or prior to application for a building permit. The site plan submittal shall include the items listed in Section 9.855(2) of this ordinance, except that the Community Development Director or his designee, may waive certain of these submittal items in the case of applications for single and two-family dwellings. Notice of application shall be provided pursuant to Section 9.915 of this ordinance. Upon review and approval by the Community Development Director or his designee, the site plan shall act as the official plan of development for that parcel, and any grading, excavating, filling, construction of the building(s), or use(s) to occur on that site shall be in strict compliance with the approved site plan. Should, at a later date, it be deemed necessary by the property owner to vary from the approved site plan, an application shall be filed with the Community Development Department requesting an amendment to the approved site plan. Any amendment to the site plan shall follow the same procedure as set forth in this Section. (Ord. 92-01, 1/13/92)

20. Amend Subsection 9.855(4)(e) to eliminate the restriction of piped storm water lines to allow for open swales:

(e) Storm Sewer Lines and Facilities--Private storm drain lines shall be required to connect with public storm sewer lines that comply with the City's Master Storm Sewer Plan or to existing lines that can be shown to be adequate for the development proposed. ~~In no case shall storm drainage be permitted in open ditches.~~ An alternate storm water retention and disposal system may be approved by the City Engineer including the use of open swales. The provision of public storm drain lines that comply with the Master Storm Sewer Plan or an alternate system meeting the City Engineer's approval shall be guaranteed prior to the issuance of a building permit, as provided in Section 9.855(3).

21. Amend Subsection 9.858(3)(b) to specify native vegetation to be used in buffer areas.

(b) At least 75% of the required landscaped area shall be planted with any suitable combination of native trees, shrubs, or ~~evergreen~~ ground cover. The required 75% coverage shall be accomplished and shall be based on the size of the plant material within a specified time as follows:

(i) Trees--Within 5 years from the date of final inspection by the Building Official.
(ii) Shrubs--Within 2 years from the date of final inspection by the Building Official.
(iii) Ground Covers--At the time of final inspection by the Building Official.

22. ***Amend Section 9.940, Intent Statement of the Tree Protection Ordinance, as follows:***

9.940 **INTENT.** The trees of Forest Grove, a reminder of the City's namesake, offer historic, aesthetic, spiritual, social, environmental, and monetary values to the community. To ensure the success of the urban forestry program, the tree management ordinance establishes governing guidelines, a legal framework, and authority for the community forestry program. This ordinance seeks to enhance the quality of life in Forest Grove by promoting good stewardship that will ensure the continued health and well-being of the community forest. This ordinance creates a protected status for trees as listed below:

(1) Street Trees: Any woody perennial plant permitted by the City to be planted in the public right-of-way. Typically a 1 3/4-inch caliper or larger nursery stock tree.

(2) Natural Resource Vegetation: Trees and vegetation within ~~wetlands or wetland buffer areas, flood plains, within 30 feet of center line of mapped drainage ways, and open space areas~~ Natural Resource Areas ~~the Comprehensive Plan~~.

(3) Trees on Developable Land: Trees which have a diameter of 6 inches or larger, measured at 4.5 feet above natural grade, and are on land subject to or undergoing development review. Development review includes site review, subdivision review, partition review, building permit review and design review.

(4) Trees on Approved Site Plan: These trees were existing and/or shown on site plans, and are part of an approved development.

(5) Register Trees: Trees placed on a register list (includes tree groves) as defined in this ordinance. Register Trees may include trees from any of the above categories as well as on private property.

Where any tree falls into more than one category, the most restrictive criteria apply.

23. ***Amend Section 9.941 to add the following definitions:***

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 floodplain - Any man-made change to improved or unimproved lands within a FEMA defined floodplain, including but not limited to buildings or other structures, dredging, filling, grading, paving, excavation, or storage of equipment and materials.

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; 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 Titles 3 and 13.

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 Title 3 wetland or floodplain for the purposes of development or redevelopment.

Floodplain - The land area identified and designated by the United States Army Corps of Engineers, the Oregon Division of State Lands, FEMA, or (identify name) county/city that has been or may be covered temporarily by water as a result of a storm event of identified frequency. It is usually the flat area of land adjacent to a stream or river formed by floods.

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.

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-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.

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.

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 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.

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.

24. Amend Section 9.944, Trees in Natural Resource Areas, as follows:

9.944 TREES IN NATURAL RESOURCE AREAS.

(A) Additional Information Requirements. An applicant who wishes to remove vegetation or do work within a Natural Resource Area (NRA) shall submit for a tree permit. It shall include the information required by this subsection. The information shall be submitted either prior to or concurrent with a site development or conditional use permit or planned development application required by the Zoning Ordinance or a preliminary subdivision or partition application required by Land Division Ordinance. Where no land use permit is required, the tree permit shall be submitted and approved prior to any physical modification of the subject site. ÷

(1) Applicants must verify the natural resource area on their property as described in Section 9.944 (H).

(2) ~~Information indicating the area being affected; and~~ For the entire subject property (natural resource area and non-natural resource area), applicants must submit a scale map of the property that includes:

(a) Location of all natural resource areas 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 sensitive lands and vegetative corridors consistent with Clean Water Services Design and Construction Standards;

(d) Location of 100 year floodplain and floodway boundary as defined by Section 5.805 and determined by Section 5.815 of the Municipal Code; 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) The nature of the work proposed, and/or the reasons for removal of vegetation. If applicable, this shall include 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 natural resource area:

(a) For properties containing less than one acre of natural resource area, the location of all trees within the natural resource area 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 natural resource area, 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 natural resource area, 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 natural resource area an approximate of the number of trees, their diameters and the dominant species; and

(c) If grading will occur within the natural resource area, 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.

(5) A plan for mitigation or re-vegetation consistent with the applicable mitigation requirements of Section 9.944 (F) or (G); and

(6) Evidence of submittal of appropriate applications to local, state and/or federal agencies as required.

(B) Exempt Uses and Conditioned Activities. The following uses and activities are exempt from the requirements of this Section:

(1) Change of ownership.

(2) 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.

(3) 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 natural resource areas will be disturbed.

(4) Where a property has been subdivided under section (F)(5) of this ordinance, and the mitigation requirements of (F)(4) have been completed for the subdivision, development on the individual lots may proceed without further review under this ordinance.

(5) Limited types of development, redevelopment, operations, and improvements, including the following:

(a) Maintenance, alteration, expansion, repair and replacement of existing structures, provided that:

(i) The rebuilding of existing residential and non-residential structures damaged by fire or other natural hazards occurs within the same foundation lines ("building footprint"); and

(ii) The alteration, expansion, or replacement of a structure will not intrude more than 500 sq. ft. into the natural resource areas, and so long as the new intrusion is no closer to the protected water feature than the pre-existing structure or improvement.

(b) 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.

(c) 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.

(d) Up to 10% of vegetative cover within the original mapped natural resource areas 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 natural resource areas, subject to map verification, as the basis for determining the Maximum Disturbance Area in Subsection (F)(2) and Mitigation standards in Sections (F)(4) and (G)(2), (G)(3), (G)(4)(a)(ii) and (G)(4)(b)(iv).

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

(f) 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.

(g) Maintenance, alteration, repair, and replacement of roads and utilities when no additional incursion into the natural resource areas is proposed.

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

(i) 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.

(j) 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.

(k) 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.

(l) 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:

(i) *It contains less than 500 sq. ft. of new impervious surface; and,*

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

(6) 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 natural resource areas resulting from the emergency action. Hazards that may be removed or abated include those required to maintain aircraft safety.

(C) Prohibitions

(1) The planting of any invasive non-native or noxious vegetation is prohibited within the NRA.

(2) Outside storage of materials is prohibited within the NRA, unless such storage began before the effective date of this ordinance; or, unless such storage is approved during development review under either Subsection (F) or (G).

(D) Criteria. The request for vegetation removal shall be approved based on the criteria below:

(1) The permanent impact will be negligible or minor and mitigation meets the requirements of this subsection, subsection (F)(4) or that allowed by Subsection (G).

(2) The removal is necessary to prevent the spread of disease or insects declared to be a nuisance by a government agency or qualified arborist, or to correct or eliminate a natural hazard (as identified by the City or qualified arborist) to the property owner, surrounding properties, or community at large.

(3) The loss of value will be of temporary duration of two years or less until new vegetation can be established, or the mitigation plan provides satisfactory replacement of the lost vegetation and establishment of a new resource area of equal value to be completed within two planting seasons. Mitigation for lost vegetation is preferred on-site, or within the immediate vicinity of the subject site.

Off-site mitigation may be approved if there is no reasonable alternative and a method of guaranteeing permanent use of the area off-site is found, such as dedication of the area to a public entity, easement or deed restriction.

(4) Timetables for the work shall be established which minimize the impact on wildlife.

(5) Notwithstanding the above criteria, intrusion into the natural resource area is allowed provided the requirements in Subsection (F) or (G) are met.

(E) Construction Management Plans: In order to ensure that trees and vegetation within NRAs are not damaged during construction, all applicants, even those not developing within an NRA, shall provide a construction management plan that includes the following information:

(1) Location of site access and egress that construction equipment will use;
(2) Equipment and material staging and stockpile areas;
(3) Erosion and sediment control measures; and
(4) Measures to protect trees and other vegetation located within the NRA, but outside of the disturbance area approved under the provisions of Subsection (F) or (G).

(F) Standards. The following standards are to be met when the subject site contains natural resource areas. In order of preference, these natural resource areas are to be avoided when development as allowed by the underlying zone district can be achieved outside the area or through alternative site design allowed by a planned development; minimize intrusion into the area to the extent feasible; or mitigate impacts from intrusions where no feasible alternatives exists. The following standards shall apply to achieve these avoid, minimize or mitigate objectives. As an alternative, the applicant may submit for discretionary approval pursuant to Section 9.944 (G):

(1) Methods for avoiding or minimizing disturbance in Natural Resource Areas. The following habitat-friendly development practices may be used to avoid or minimize development within NRAs by allowing flexible site design:

(a) Building setback flexibility to avoid, or minimize, development within NRAs. 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.

(b) Flexible landscaping requirements to avoid, or minimize, development within NRAs.

(i) Landscaping requirements, apart from those required for parking lots or street berms, may be met by preserving the NRA.

(ii) Facilities that infiltrate stormwater onsite, including the associated piping, may be placed within the NRA 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.

(c) Flexible Site Design (On-site Density Transfer) to avoid or minimize development within NRAs.

(i) Residential. For residential development, up to 100 percent of the development that could be allowed on lands within a natural resource area can be transferred other portions of the property outside the resources area.

(ii) In order to accommodate the transferred density, dimensional standards and lot sizes may be adjusted by no more than 20 percent. *(30% reduction can be used)*

(iii) Commercial and Industrial developments shall avoid natural resource areas unless no other practicable alternative is available.

(iv) Mixed-Use Zones. Within mixed-use zones the density transfer credit can be factored using either (i) or (ii) above, depending on the type of development proposed.

(d) Site Capacity Incentives. The following site capacity standards provide flexibility in the design of land divisions in order to allow ways to better protect NRAs.

(i) Density bonus if NRA is protected. In the Multi-Family (A-2) Residential Zone District, a 25 percent density bonus over the based density may be allowed for any development of four (4) or more dwelling units if 75 percent or more of the NRA on a site is permanently preserved.

(ii) All area within a NRA, or any portion of it, may be subtracted from the calculations of net size for purposes of determining minimum density provided that such area is protected. This provision may only be applied to properties that were inside the Metro UGB on January 1, 2002.

(iii) Projects can be developed below minimum density allowed by the zone district if the natural resource area is protected. This

provision may only be applied to properties that were inside the Metro UGB on January 1, 2002.

(e) All natural resource areas that are preserved shall be permanently restricted from development and maintained for habitat functions, such as by making a public dedication or executing a restrictive covenant.

(2) Development within NRA. The following development standards apply to all development that occurs within the NRA except for exempt uses and conditioned activities addressed in Subsection (B) and utility facilities addressed in subsection (F)(3). If all development occurs outside of an NRA 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 Subsection (G).

(a) Disturbance area limitations to minimize impact to NRA.

(i) *Single-family residential.* The maximum disturbance area (MDA) allowed within NRAs ~~HCAs~~ is determined by subtracting the area of the lot or parcel outside of .Habitat Conservation Area (HCA) 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. Total Disturbance Area Limitations for Single Family Residential Zone Districts.

HCA Type	Habitat type	Total Disturbance Area (TDA)
High	Class I	50 percent of the lot area, up to maximum of 5,000 sq. ft.
Moderate/Low	Class II	65 percent of the lot area, up to maximum of 6,000 sq. ft.
Moderate/Low	Uplands Class A and B for properties brought into the UGB after January 5, 2006	65 percent of the lot area, up to maximum of 6,000 sq. ft.
No HCA or NRA	Uplands Class A and B within the UGB as of January 5, 2006	N/A

(ii) All other zones. The maximum disturbance area (MDA) allowed by right within Natural Resource Areas in these zones is found in Tables 2 and 3 below; this MDA is subject to the mitigation requirements described in subsection (F)(4).

Table 2. NRA Disturbance Area Limitations for Riparian Areas for all zones other than SFR.

Riparian Class and Zone District	Maximum Disturbance Area (MDA)
Class I – A-1, A-2, CC, CN, CH, LI, GI	10 percent of NRA on site
Class I – CBD, A-2 Class II – A-1, A-2	15 percent of NRA on site
Class II - CC, CN, CH, LI, GI	50 percent of NRA on site

Table 3. NRA Disturbance Area Limitations for Upland Areas for all zones other than SFR

Upland Class and Zone District for property brought into UGB after January 5, 2006[1]	Maximum Disturbance Area
Class A: CC, CN, CH, LI, GI; Class B: A-1, A-2	15 percent of NRA on site
Class A: CBD; Class B: CC, CN, CH, LI, GI	50 percent of NRA on site

[1]There is no uplands classification for lands within the UGB as of January 5, 2006.

(iii) Parks and Open Space

I. Publicly owned property designated for open space or for habitat on the City's Park, Recreation and Open Space Master Plan shall be limited to vegetation removal for trail development. Any other vegetation removal shall be mitigated by replanting consistent with this Section.

II. Parks intended for active recreational purposes as designated on the City's Park, Recreation and Open Space Master Plan shall not be considered in an NRA.

(iv) Development within an NRA in accordance with the provisions of this ordinance shall not result in a change of the NRA status of such developed areas on a property. In the case of a later development request seeking to develop within previously undisturbed NRAs 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 NRA, notwithstanding the location of any authorized development within the NRA.

(b) Protection of habitat during site development. During development of any site containing a NRA, the following standards apply:

(i) Work areas shall be marked to reduce potential damage to the NRA.

(ii) Trees in NRAs shall not be used as anchors for stabilizing construction equipment.

(iii) Native soils disturbed during development shall be conserved on the property.

(iv) An erosion and sediment control plan is required and shall be prepared in compliance with requirements set forth by Chapter 3 of Clean Water Services Design and Construction Standards;

(v) Prior to construction, the NRA that is to remain undeveloped shall be flagged, fenced, or otherwise marked and shall remain undisturbed.

(vi) All work on the property shall conform to the Construction Management Plan described in Subsection (E).

(3) 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 (4) below.

(4) Mitigation requirements for disturbance in NRAs. In order to achieve the goal of reestablishing forested canopy that meets the ecological values and functions described in this Chapter and Section 9.970(A), tree replacement and vegetation planting are required when development intrudes into a NRA according to the following standards, except for wetlands mitigation requirements imposed by state and federal law.

(a) 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:

(i) *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 2. 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.

Table 2. 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

(ii) *Mitigation Option 2.* In this option, the mitigation requirement is calculated based on the size of the disturbance area within a NRA. 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. 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.

(b) 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.

(c) 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.

(d) 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.

(e) Location of mitigation area. All vegetation must be planted on the applicant's site within the NRA or in an area contiguous to the NRA; provided, however, that if the vegetation is planted outside of the NRA then the applicant shall preserve the contiguous area by executing a deed restriction, such as a restrictive covenant.

(f) Invasive vegetation. Invasive non-native or noxious vegetation must be removed within the mitigation area prior to planting.

(g) 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 is completed.

(h) 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.]*

(i) To enhance survival of the mitigation plantings, the following practices are required:

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

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

(iii) Weed control. Remove, or control, non-native or noxious vegetation throughout maintenance period.

(j) To enhance survival of tree replacement and vegetation plantings, the following practices are recommended:

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

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

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

(a) Standards for Partitions containing NRAs:

(i) When partitioning a property into parcels, an applicant shall verify the boundaries of the NRA on the property according to Subsection (H).

(ii) Applicants who are partitioning, but are not simultaneously developing their property, do not need to comply with Subsection (E).

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

(iv) Subsequent development on any parcels containing NRAs shall comply with Subsection (E), and the development standards of either Subsection (F) or (G).

(b) Standards for Subdivisions:

(i) Applicants who are sub-dividing, but not developing, must verify the location of the NRA boundary according to Subsection (H) of this ordinance, and comply with this subsection (F)(5); such applicants do not need to comply with Subsection (E). Applicants who are sub-dividing, but not developing, property may:

I Complete the mitigation requirements of section (F)(4) and thereby exempt all subsequent development on lots

containing NRA from further review under this ordinance; or

II Not complete the mitigation requirements of section (F)(4), thus requiring that any subsequent development within an NRA be subject to this ordinance.

(ii) Applicants who are sub-dividing and developing properties must comply with Subsections (E), (F), or (G) and (H).

(iii) When a property containing any NRA is subdivided, this ordinance requires that new subdivision plats delineate and show 80 percent of the NRA as a separate unbuildable tract according to the following process:

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

(v) The standards for land divisions in Moderate and High NRAs shall apply in addition to the requirements of the city/county land division ordinance and zoning ordinance.

(vi) Prior to preliminary plat approval, the NRA shall be shown as a separate tract, which shall not be a part of any lot used for construction of a dwelling unit.

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

I Private natural area held by the owner or homeowners association by a restrictive covenant; or

II For residential land divisions, private natural area subject to an easement conveying storm and surface water management rights to the city and preventing the owner of the tract from activities and uses inconsistent with the purpose of this ordinance; or

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

(G) 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 Subsection (F). There are four discretionary review processes provided in this section: subsection (1) provides discretionary review for an applicant seeking only to partition a property; subsection (2) provides discretionary review for an applicant who will comply with the development standards in Subsection (F) 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 NRA will be disturbed; subsection (3) provides discretionary review for an applicant who will comply with the development standards in Subsection (F), 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 (4) provides general discretionary review standards applicable to an applicant seeking some other type of discretionary approval of development that will disturb an NRA.

(1) Discretionary Review for Partitions. An applicant seeking to partition land in ways that do not accord with the standards established in Subsection (F)(5)(a) may seek review under this subsection (G)(1)).

(a) The applicant shall verify the boundaries of the NRAs on the property according to Subsection (H).

(b) The applicant shall submit the following application materials:

(i) A scale map of the entire property that includes:

I Location of all NRA 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.

(ii) A written and documented explanation of how and why the proposed partition satisfies the approval criteria in subsection (G)(1)(c). Such written documentation shall include an alternatives analysis of different possible partition plans, based on the characteristics and zoning of the property.

(c) Approval Criteria. A partition shall be approved under this subsection (G)(1) provided that the applicant demonstrates that it is not practicable to comply with the partition standards in Section (F)(5)(a), and that the applicant's partition plan will result in the smallest practicable percentage

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

(d) Subsequent development on any parcels created by the partition and containing NRAs 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 Subsection (H) for any such development.

(2) 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 (G)(2). (An applicant who seeks to conduct the mitigation in a different subwatershed may apply for such approval under subsection (G)(4).)

(a) The applicant shall submit:

(i) A calculation of the number of trees and shrubs the applicant is required to plant under Section (F)(4) of this ordinance; and

(ii) 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 NRA, documentation that the mitigation site will be protected after the monitoring period expires, such as through the use of a restrictive covenant.

(b) Approval Criteria. Off-site mitigation shall be approved under this subsection (G)(2) 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 NRA.

(c) Mitigation approved under this subsection (G)(2) shall be subject to all of the requirements of subsection (F)(4), except for the requirements of subsection (F)(4)(e).

(3) 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 (F)(4), 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 Subsection (F), may seek review under this subsection (G)(3).

(a) The applicant shall submit:

(i) A calculation of the number of trees and shrubs the applicant would be required to plant under Subsection (F)(4);

(ii) The numbers and sizes of trees and shrubs that the applicant proposes to plant;

(iii) 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 (F)(4). 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 plant diversity, plant spacing, site preparation including removal of invasive and noxious vegetation and soil additives, planting season, and immediate post-planting care including mulching, irrigation, wildlife protection, and weed control; and

(iv) The applicant's mitigation site monitoring and reporting plan.

(b) 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 its 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 (F)(4) of this ordinance. Such determination shall take into consideration all of the information required to be submitted under subsection (G)(3)(a).

(c) Mitigation approved under this subsection (G)(3) shall be subject to the requirements of subsections (F)(4)(d) through (F)(4)(i), and it is recommended that such mitigation also follow the practices recommended in subsection (F)(4)(j).

(4) Discretionary Review. An applicant seeking discretionary approval to undertake any development activity within a NRA that does not comply with subsection (F) and is not described in subsections (G)(1), (2), or (3) may file an application under this Subsection (G)(4).

(a) Application Requirements. The applicant shall provide all items described in subsection (A) and the following, 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:

(i) 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 NRA, the ecological functions provided by the NRA on the property, and off-site impacts within the subwatershed (6th 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 3 of this section and the habitat connectivity ecological functions described in subsection (G)(4)(a)(i)II(C) and (D).

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.

III Evaluation of alternative locations, design modifications, or alternative methods of development to determine which options reduce the significant detrimental impacts on the NRAs and the ecological functions provided on the property. At a minimum, the following approaches must be considered:

(A) The techniques described in subsection (F)(1);

(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.

Table 3. 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 NRAs 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.

(ii) 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 (G)(4)(b)(iv) 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 (F)(4). 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 (F)(4), 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 NRA 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 (G)(4)(a)(i). The applicant may use the mitigation that would be required under subsection (F)(4) as the baseline mitigation required to compensate for disturbance to a NRA 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 (F)(4) as the baseline mitigation required to compensate for disturbance to a NRA, then the applicant shall submit a calculation of the number of trees and shrubs the applicant would be required to plant under subsection (F)(4);

(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 plant diversity, plant spacing, site preparation including removal of invasive and noxious vegetation and soil additives, 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 responsible parties.

(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 NRA, 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 NRA, 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.

(iii) The Impact Evaluation and Alternatives Analysis required by subsection (G)(4)(a)(i) and the Mitigation Plan required by subsection (G)(4)(a)(ii) 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.

(b) Approval Criteria.

(i) All application requirements in subsection (G)(4)(a) shall be met.

(ii) Avoid. An applicant shall first avoid the intrusion of development into the NRA to the extent practicable. The development that is proposed must have less detrimental impact to NRAs than other practicable alternatives, including significantly different practicable alternatives that propose less development within NRAs. If there is more than one type of NRA on a property then the applicant shall first avoid the intrusion of development into the higher-valued NRA, to the extent practicable, and the development that is proposed must have less detrimental impact to the higher-valued NRAs than other practicable alternatives. To avoid development in NRAs, and to the extent practicable, applicants shall use the approaches described in subsection (G)(4)(a)(i)III.

(iii) Minimize. If the applicant demonstrates that there is no practicable alternative that will not avoid disturbance of the NRA, then the development proposed by the applicant within the NRA shall minimize detrimental impacts to the extent practicable. If there is more than one type of NRA on a property then the

development within higher-valued NRAs shall be considered more detrimental than development within lower-valued NRAs.

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 NRA, 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 (F)(2)(b), 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 1 in Section 9.971, 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 8 of Section 9.971; and

(D) Consider using the techniques described in Part (c) of Table 1 of Section 9.971 to further minimize the impacts of development in the NRA.

(iv) Mitigate. If the applicant demonstrates that there is no practicable alternative that will not avoid disturbance of the NRA, then development must mitigate for adverse impacts to the NRA. 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 NRAs, after taking into consideration the applicant's efforts to minimize such detrimental impacts through the use of the techniques described in Table 1 in Section 9.971 and through any additional or innovative techniques. A

mitigation plan that requires the amount of planting that would be required under subsection (F)(4) of this ordinance based on the amount of proposed disturbance area within the NRA, and that otherwise complies with all of the mitigation requirements in subsection (F)(4) of this ordinance, shall be considered to have satisfied the requirements of this subsection (G)(4)(b)(iv).

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 (G)(2)(a)(ii)IV. In addition, if the off-site mitigation area is not within the same subwatershed (6th Field Hydrologic Unit Code) as the related disturbed NRA, 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 Plan 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.

(v) Municipal Water Utility Facilities Standards. Except as provided within this subsection, in addition to all other requirements of subsection (G)(4)(b), 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 Subsection (B). 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 (G)(4)(b)(ii), 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 NRA;

(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 NRA;

(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.

(H) Map Administration and NRA Verification

(1) Exempt development. Development that is outside of any NRA and no closer than 100 feet to the border of an NRA (including all impervious surfaces and landscaping), based on the NRA map, may proceed without having to comply with this section or any other portion of this ordinance except for Subsection (E), Construction Management Plan. *[Note: At the time a city or county adopts this model ordinance and its NRA 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 (H)(6)(b) of this ordinance and adopts sufficient findings of fact to justify such corrections.]*

(2) Verification of the location of NRAs as described in this section shall not be considered a comprehensive plan or zoning amendment. *[Note: Adjustment of the mapped HCA shall only proceed as provided in this ordinance.]*

(3) Map verification is available to correct for mistakes in the location of NRAs on properties. Map verification shall not be used to dispute whether identified NRAs 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 NRA does not provide the ecological functions that it has been identified as providing, then the applicant may use the discretionary review process to decrease its mitigation responsibilities for disturbing such an area.

(4) Except for applicants seeking approval to undertake any exempt activities or conditioned uses described in Subsection (B), the map verification requirements described in this Subsection (H) 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 NRAs on a real property lot or parcel pursuant to this Subsection (H) at other times, but whether the City processes such request shall be at the Community Development 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.

(5) Notwithstanding any other provisions of this Subsection (H), 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.

(6) Basic Verification Approaches. The basic verification approaches described in subsections (H)(6)(a) through (c) are available for applicants who believe either (1) that the NRA map is accurate, (2) that there is a simple incongruity between the NRA 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].*

(a) Applicant Believes NRA Map is Accurate. An applicant who believes that the NRA map is accurate may comply with this subsection (H)(6)(a). The applicant shall submit the following information regarding the real property lot or parcel:

(i) A detailed property description;

(ii) A copy of the applicable NRA map;

(iii) 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);

(iv) The information required to be submitted under Subsection (A) or (G) if the applicant proposes development within any NRA under those provisions; and

(v) Any other information that the applicant wishes to provide to support the assertion that the NRA map is accurate.

(b) 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 NRA map that is also misaligned with tax lot lines. An applicant who believes that the NRA map is inaccurate based on such an obvious misalignment may comply with this subsection (H)(6)(b). The applicant shall submit the following information regarding the real property lot or parcel:

(i) The information described in subsections (H)(6)(a)(i) through (iv); and

(ii) A documented demonstration of the misalignment between the NRA 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 NRA maps and the property lot lines, and the amount of adjustment that would be appropriate to accurately depict habitat on the property.

(c) Property Developed Between Summer 2002 and January 5, 2006. Where a property was developed between the summer of 2002 (when the aerial photo used to determine the regional habitat inventory was taken) and January 5, 2006, the applicant shall submit the following information regarding the real property lot or parcel:

(i) The information described in subsections (H)(6)(a)(i) through (iv);

(ii) 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);

(iii) Any approved building permits or other development plans and drawings related to the development of the property that took place between summer 2002 and January 5, 2006; and

(iv) 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.

(d) Decision Process. The Planning Director's map verification decision made pursuant to this subsection (H)(6) 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.

(7) Detailed Verification Approach. All applicants who believe that the NRA map is inaccurate for a reason other than as described in subsections (H)(6)(b) and (c) may file a verification request consistent with this subsection (H)(7) of this ordinance.

(a) 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:

(i) 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;

(ii) The information described in subsections (H)(6)(a)(i) through (v);

(iii) The information described in subsections (H)(6)(b)(ii) and (H)(6)(c)(ii) through (iv), if the applicant believes such information is relevant to the verification of habitat location on the subject lot or parcel;

(iv) 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;

(v) 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

(vi) Any additional information necessary to address each of the verification criteria in subsection (H)(7)(d), a description of where any NRAs are located on the property based on the application of the verification criteria in subsection (H)(7)(d), and factual documentation to support the analysis.

(b) Notice requirements. Upon receipt of a completed application pursuant to this subsection (H)(7), 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 300 feet of the subject property, 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.

(c) Decision process. The Planning Director shall apply the verification criteria in subsection (H)(7)(d) to confirm the location of any NRAs based on the NRA 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.

(d) Verification Criteria. The verification of the location of NRAs shall be according to the four-step process described in this subsection (H)(7)(d). 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.

(i) 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 (H)(6)(c) 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 9.941.

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 Chapter 3 of Clean Water Services Design and Construction Standards; and

IV Identify the riparian habitat classes applicable to all areas on the property using Table 4 and the data identified in subsections (H)(7)(d)(i)I through III.

(ii) 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 NRA map unless corrected as provided in this subsection.

I Except as provided in subsection (H)(7)(d)(i)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 9.941; 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 (H)(7)(d)(ii)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.

Table 4: Method for Locating Boundaries of Class I and II Riparian Areas

Distance in feet 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	Class I	Class I
50-100		Class II[2]	Class I	Class I
100-150		Class II[2] if slope>25%	Class II[2] if slope>25%	Class II[2]
150-200		Class II[2] if slope>25%	Class II[2] if slope>25%	Class II[2] if slope>25%
Wetlands (Wetland feature itself is a Class I Riparian Area)				
0-100		Class II[2]	Class I	Class I
100-150				Class II[2]
Flood Areas (Undeveloped portion of flood area is a Class I Riparian Area)				
0-100			Class II[2]	Class II[2]

[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]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.

25. Add New Chapter 9.970 et. seq. regarding Habitat-Friendly Development Techniques and Natural Resource Area Requirements:

HABITAT-FRIENDLY DEVELOPMENT TECHNIQUES AND NATURAL RESOURCE AREA REQUIREMENTS

9.970 INTENT:

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

(1) To protect and improve the following functions and values that contribute to fish and wildlife habitat in urban streamside areas:
- (a) Microclimate and shade;
- (b) Stream-flow moderation and water storage;
- (c) Bank stabilization, sediment and pollution control;
- (d) Large wood recruitment and retention and channel dynamics; and
- (e) Organic material sources.

(2) To protect and improve the following functions and values that contribute to upland wildlife habitat in new urban growth boundary expansion areas:
- (a) Large habitat patches
- (b) Interior habitat
- (c) Connectivity and proximity to water; and
- (d) Connectivity and proximity to other upland habitat areas

(3) To adopt habitat areas determined by Metro to implement the performance standards of Title 13 of the Urban Growth Management Functional Plan.

(4) To implement performance standards through Natural Resource Areas (NRA) as provided in Section 9.944

(5) To provide clear and objective standards and a discretionary review process, applicable to development in Natural Resource Areas, in accordance with Statewide Land Use Planning Goal 5.

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

(7) To provide mitigation standards for the replacement of ecological functions and values lost through development in Natural Resource Areas.

9.971 COMPLIANCE WITH NATURAL RESOURCE AREA PROVISIONS

(1) The City of Forest Grove adopts Metro's Regionally Significant Fish and Wildlife Habitat Inventory Map dated at the time of adoption of this section or as amended in the future.

(2) All development with Natural Resource Areas shall attempt to design development through avoidance of the resource area. If that cannot be achieved through standard development requirements, then the requirements of Section 9.944 shall apply and shall override any conflicting development requirements established by other portions of the Zoning Ordinance in order to minimize intrusion into the NRA.

(3) All property owners, developers, or other persons proposing to modify land in the city limits of Forest Grove are encouraged to integrate the habitat-friendly development practices listed in Table 1 as part of any modification of the site. Those practices within road rights-of-way or other public property shall be approved by the City Engineer. Other practices shall be approved by the Community Development Department. Said approvals shall be obtained:

(a) Where no land use permit is required, prior to any physical modification of the site;

(b) Where any land use permit is required by the Zoning or Land Division ordinances, concurrent with an approval of the permit; or

(c) Where there is a Natural Resource Area and alternative discretionary development standards are used pursuant to the requirements of Subsection 9.944 (F0(4)(b).

Table 1. 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.

[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 (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 NRA). 2. Locate landscaping (required by other sections of the code) adjacent to NRA. 3. Reduce light-spill off into NRAs from development.

(4) Section 9.944 allows for the applicant to either increase or decrease densities to provide options to address NRA impacts on their site. Where reduction of densities or employees is chosen, the reduction shall be taken into consideration when determining Metro's Functional Plan Title 1 density and capacity requirements.

(5) Habitat-friendly design requirements are as follows:

(a) Landscaping and setback areas for parking lots and buildings shall be located adjacent to protected natural resource areas.

(b) All landscaping required by this ordinance shall be of native vegetation unless waived by the Community Development Director.

(c) All street, pedestrian and other outdoor lighting within 100 feet of a natural resource area shall be shielded in a manner to minimize light intrusion into the resource area. Street lights shall be metal halide within 100 feet of a natural resource area.

(d) Where bio-swales, rain gardens and other open conveyances are to be installed, soil amendments, drainage holes and other techniques shall be used as approved by the City Engineer to allow stormwater to infiltrate into the ground.

(e) Outside of natural resource areas, all solid walls and fences shall be designed to the satisfaction of the City Engineer to allow stormwater conveyance provided that all state and Clean Water Service requirements pertaining to off-site drainage are met.

(f) Where approved by the City Engineer, bio-swales shall be allowed as part of an on-site drainage system.

(g) Roads and driveways shall be designed to be perpendicular across streams and through natural resource area with minimal crossings taking into account adequate circulation and opportunities to reserve open space areas.

Attachment 2

Maps showing location of Regionally Significant Fish and Wildlife Class I and II and A and B Habitat Inventory, Slopes 10 percent or greater and 100 Year Flood Plain

city of forest grove
1924 Council Street
P.O. Box 326
Forest Grove, OR 97116

N

0 0.5
Miles

METRO Regionally Significant Fish and Wildlife Habitat Inventory Map

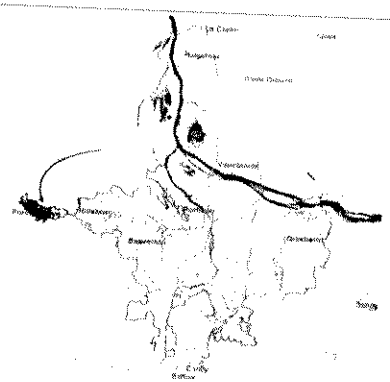
Legend

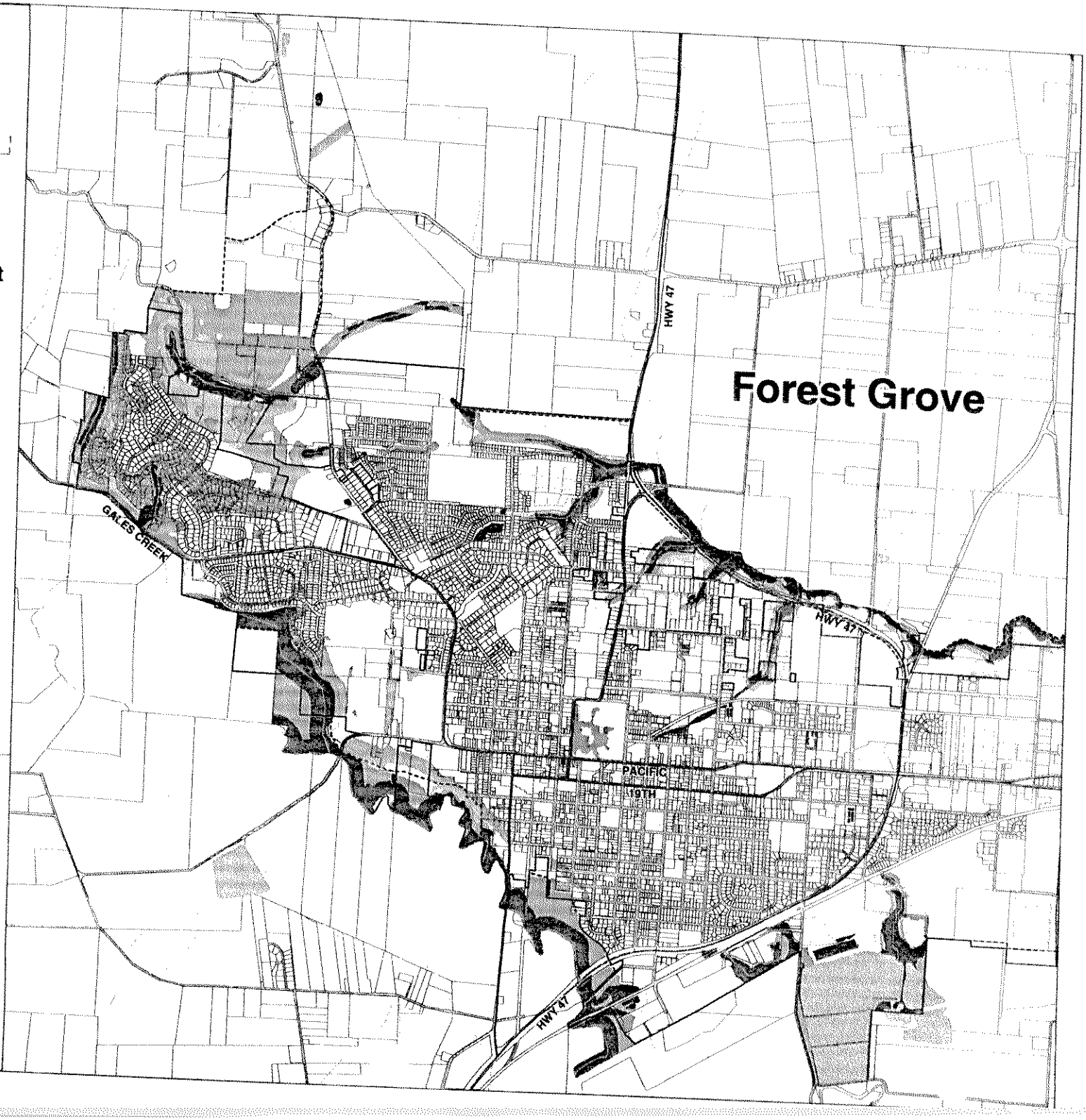
- Metro Boundary
- Urban Growth Boundary
- City Boundary
- River & Lake Areas
- Slope of 10% or More

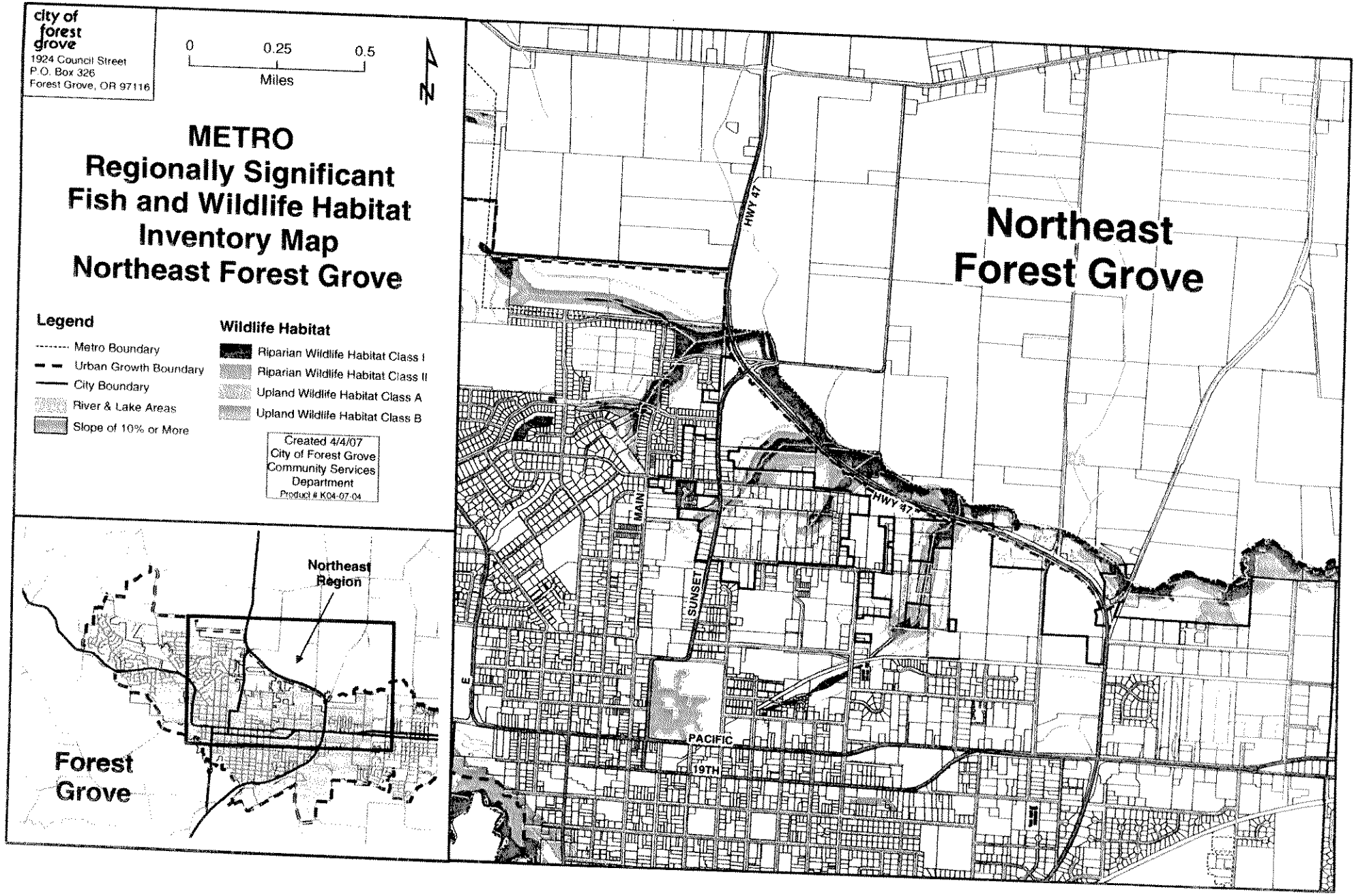
Wildlife Habitat

- Riparian Wildlife Habitat Class I
- Riparian Wildlife Habitat Class II
- Upland Wildlife Habitat Class A
- Upland Wildlife Habitat Class B

Created 4/4/2007
City of Forest Grove
Community Services
Department
Product # K04-07-07



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Northeast Forest Grove
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Urban Growth Boundary
City Boundary
River & Lake Areas
Slope of 10% or More
Wildlife Habitat
Riparian Wildlife Habitat Class I
Riparian Wildlife Habitat Class II
Upland Wildlife Habitat Class A
Upland Wildlife Habitat Class B
Created 4/4/07
City of Forest Grove
Community Services
Department
Product # K04-07-04
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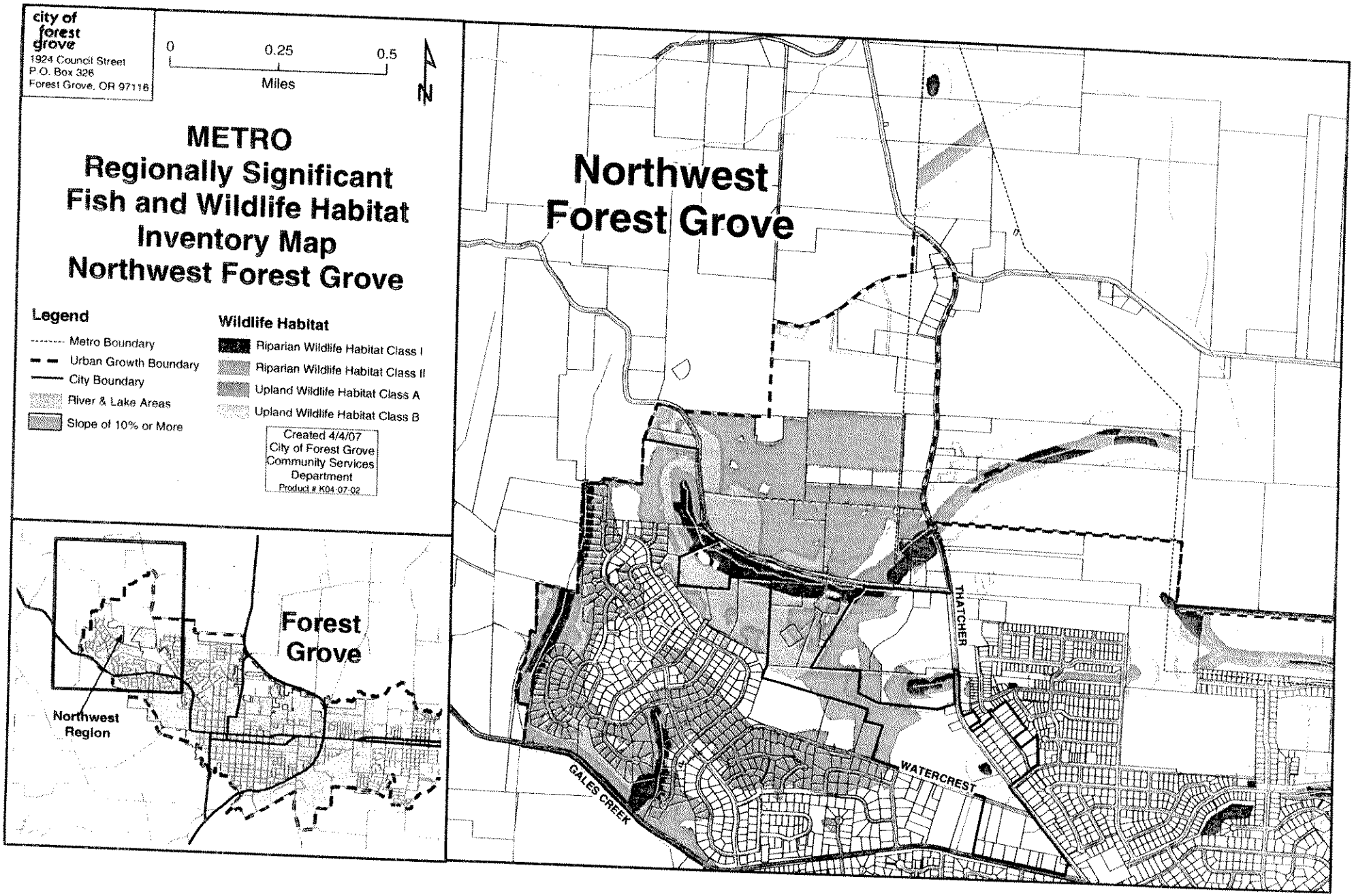
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Fish and Wildlife Habitat
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Urban Growth Boundary
City Boundary
River & Lake Areas
Slope of 10% or More
Wildlife Habitat
Riparian Wildlife Habitat Class I
Riparian Wildlife Habitat Class II
Upland Wildlife Habitat Class A
Upland Wildlife Habitat Class B
Created 4/4/07
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Northwest Forest Grove
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WATERCREST
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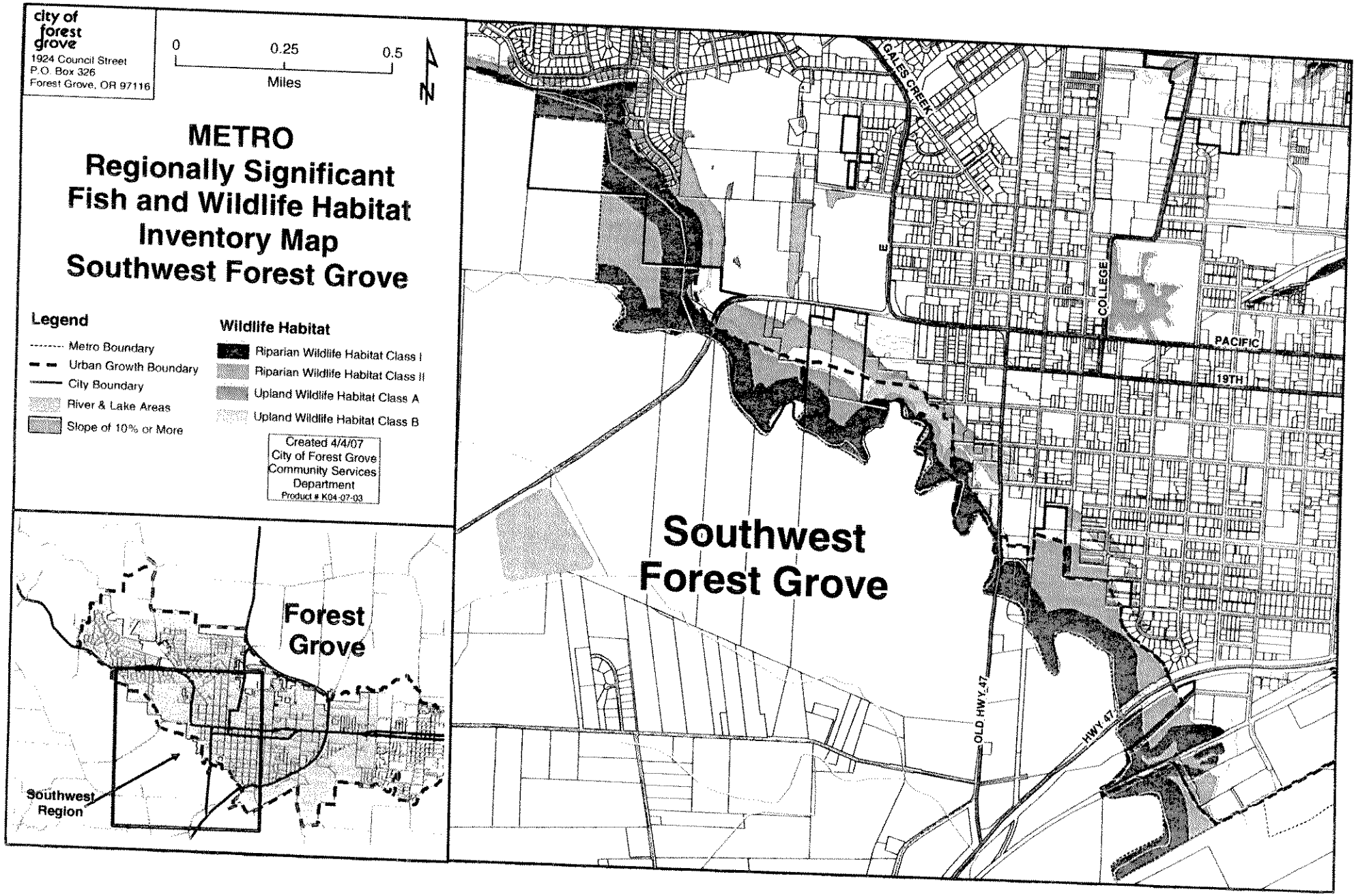
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Slope of 10% or More
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City of Forest Grove
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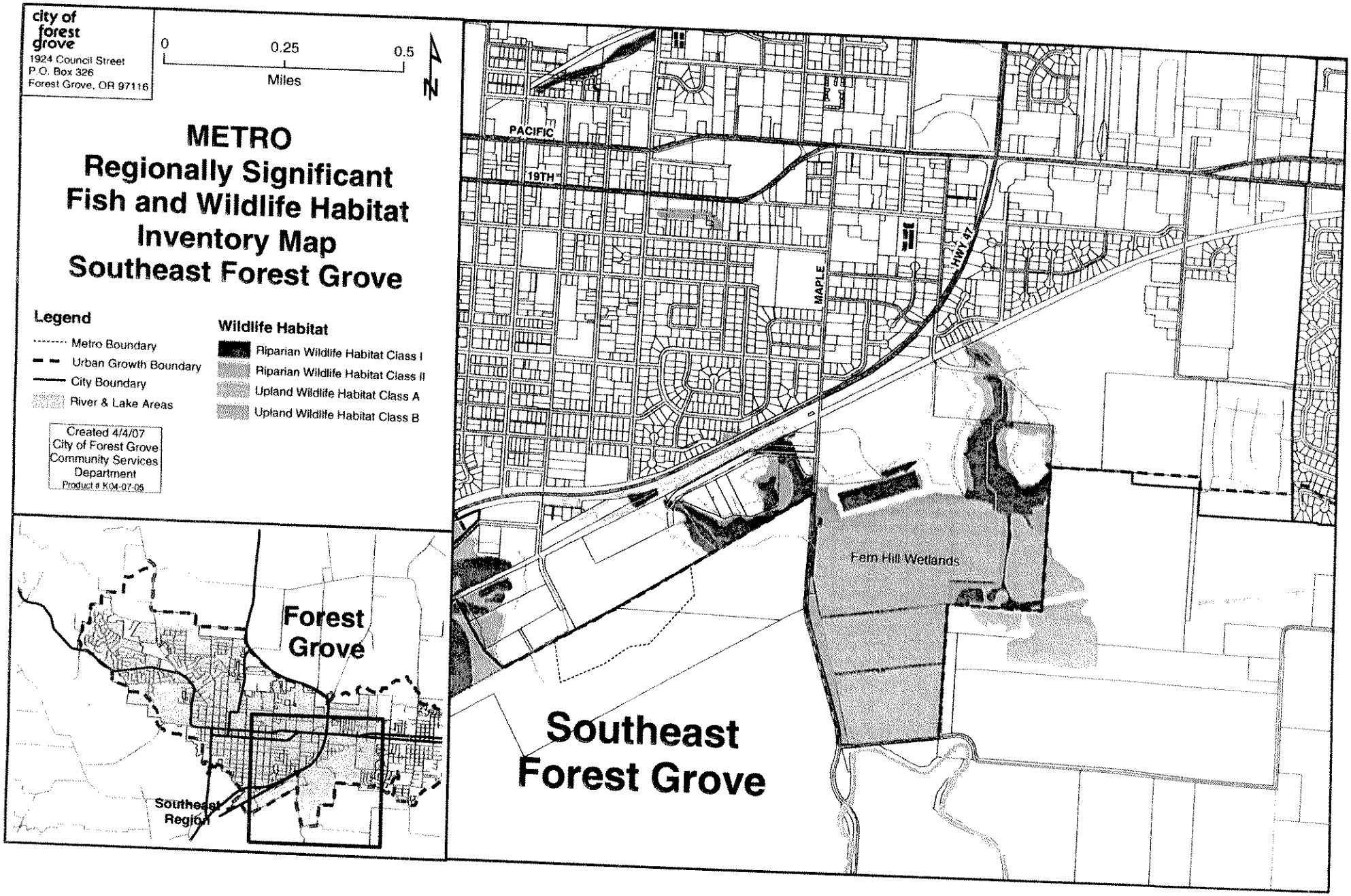
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Urban Growth Boundary
City Boundary
River & Lake Areas
Wildlife Habitat
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City of Forest Grove
Community Services
Department
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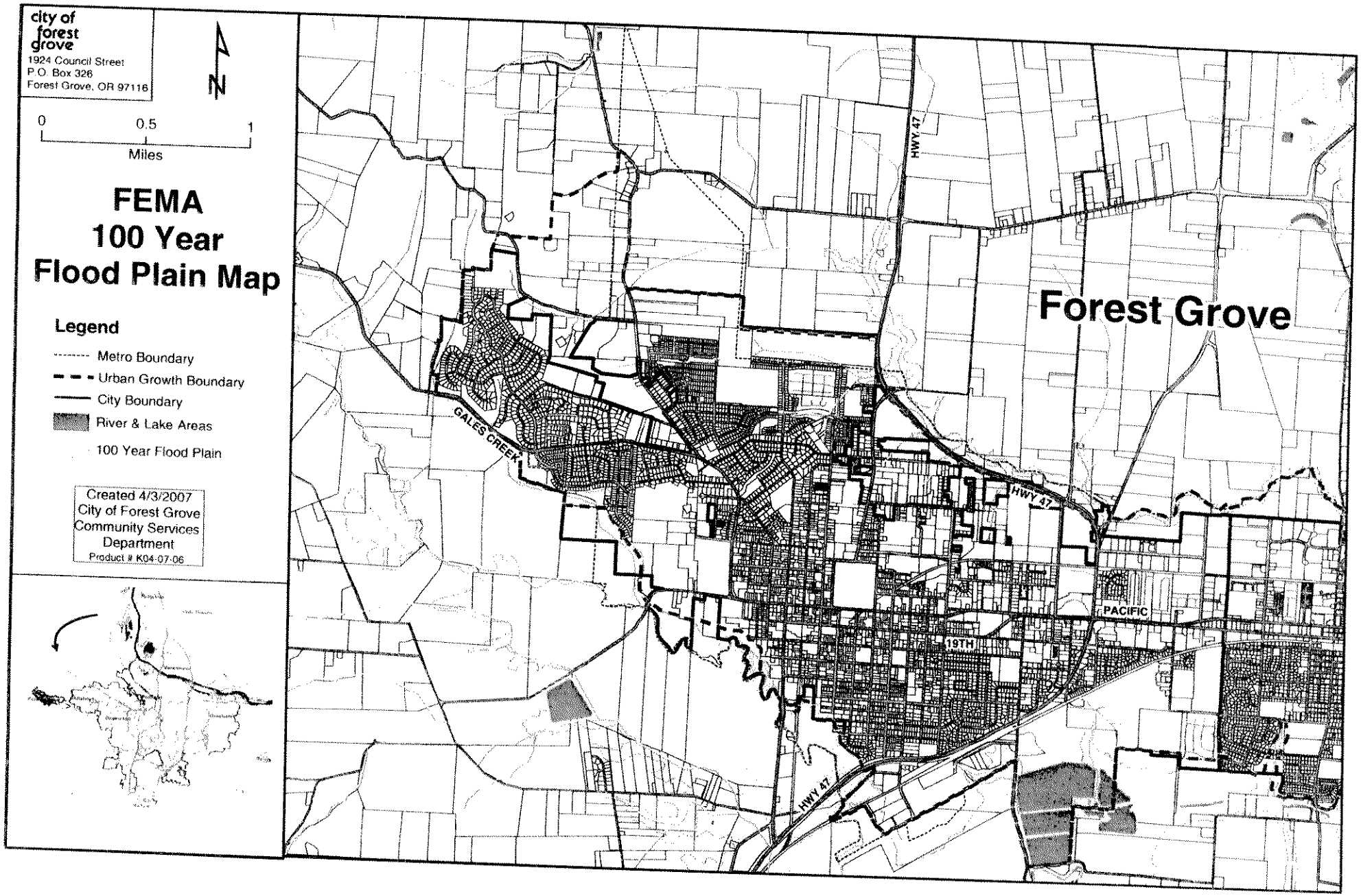
Forest Grove
Southeast Region
PACIFIC
19TH
MAPLE
HWY 47
Fern Hill Wetlands
Southeast
Forest Grove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City Boundary
River & Lake Areas
100 Year Flood Plain
Created 4/3/2007
City of Forest Grove
Community Services
Department
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Forest Grove
HWY 47
GALES CREEK
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Attachment 3

Metro ESEE (due to its size, this item is in a separate notebook available for review)

Attachment 4

Metro Functional Plan Requirements for Nature in Neighborhoods

EXHIBIT C—ORDINANCE NO. 05-1077A

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 maps that form the basis of Metro's fish and wildlife habitat protection and restoration program. These 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.

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

[1] On file in the Metro Council office.

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;

   c. Port of Portland Marine Terminal 5; and

   d. Port of Portland Marine Terminal 6.

[2] On file in the Metro Council office.

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 regionally significant fish and wildlife habitat, 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. However, if a city or county adopted any comprehensive plan amendments or land use regulations in compliance with the provisions of division 23 of OAR chapter 660 prior to the effective date of this title, and if such amendments or regulations are applicable to any regionally significant fish and wildlife habitat, then such city or county shall not repeal such amendments or regulations, nor shall it amend such regulations in a manner that would decrease the level of protection provided to regionally significant fish and wildlife habitat. 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 amend a riparian area protection program or a fish and wildlife habitat protection program to increase the level of protection provided to regionally significant fish and wildlife habitat beyond 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 amendments from LCDC or treat such amendments 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; 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

[3] On file in the Metro Council office.

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 in Exhibit C to Ordinance No. 05-1077 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, consistent with Section 3(H) of Exhibit C to Ordinance No. 05-1077. 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 density calculation based on the 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 Exhibit C to Ordinance No. 05-1077;

f. The city or county complies with the provisions of Exhibit C to Ordinance No. 05-1077 as those provisions apply to upland wildlife habitat in territory added to the Metro urban growth boundary after the effective date of that ordinance. Such compliance shall include compliance with one of subsections 3(B)(1) to 3(B)(3) of Exhibit C to Ordinance No. 05-1077. 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 Exhibit C to Ordinance No. 05-1077 as it applies to upland wildlife habitat in new urban areas, or (3) demonstrate that they have 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 Exhibit C to Ordinance No. 05-1077.

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.

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;

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.

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 to maintain and enhance the quality of fish and wildlife habitat that they provide, 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)(7) 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)(6) 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. 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 subsection 4(B) 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, flood control, and 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 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. Where practicable, the project does not encroach closer to a surface stream or river, wetland, or other body of open water than existing operations and development; and

c. Where practicable, vegetation native to the Metro Area is maintained, enhanced and restored, if disturbed; other vegetation is replaced, if disturbed, with any 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.

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. 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 they are areas that have been identified as having lower urban

[4] On file in the Metro Council office.

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; 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. Flood areas are those areas contained within the 100-year floodplain, flood area and floodway as shown on the Federal Emergency Management Agency Flood

Insurance Maps and all lands that were inundated in the February 1996 flood (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 vegetated 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) Vegetated cover status shall be as identified on the Metro Vegetated 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 vegetated 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 of the property is greater than or less than 25% (using the

[5] On file in the Metro Council office.

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 vegetated 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 vegetated 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 on an assessment of three variables, the land value of property, the employment

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

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. Measure 37 Claims

A. The purpose of this section is to provide for Metro to accept potential liability and to process and settle claims made by property owners against cities and counties pursuant to

Statewide Ballot Measure 37, adopted by the voters in November 2004, 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 administer any claim made against a city or county based on its implementation of the requirements of this title and Metro shall indemnify a city or county from any financial responsibility or other required remedy for such claim. If Metro rejects any such claim, then Metro shall be solely responsible to defend such decision, at Metro's own cost and expense. If a property owner prevails in the courts on any claim that Metro rejects, then Metro shall be solely responsible to pay any compensation, attorneys' fees, expenses, and costs awarded to such property owner. In order to receive the benefits of this provision, a local government must:

1. Upon receipt of a written Measure 37 demand for compensation 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. Amend any land use regulation or other ordinance, or enter into an intergovernmental agreement with Metro, in order to grant Metro sufficient authority to implement Metro's decision regarding the disposition of the claim, which disposition may include, but not be limited to, a cash payment or other compensation, waiver or modification of the regulation, dismissal, and the imposition of appropriate conditions.

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)(4) 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)(4) 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.

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

Distance in feet 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	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 (Undeveloped portion of flood area is a Class I Riparian Area)				
0-100			Class II [6]	Class II [6]

[1] Development/vegetated cover status is identified on the Metro Vegetated 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 units of any other 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.

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 floodplain 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 floodplain acres that are developed* * "Developed" for purposes of this indicator means the methodology used in Metro's Fish and Wildlife Inventory to identify developed floodplains.
	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 *20% increase in developed floodplain acreage* in each subwatershed over the next 10 years (2015).	**1c. 2004 Baseline Condition (regional data):** • 10% of all floodplain acres are developed • 3,450 total acres of developed floodplains **20% increase:** • 4,200 total acres of developed floodplains	

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	• 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
		75% retention: • 11,600 acres of vacant Class A and B upland wildlife habitat remaining	
	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	• 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.
		90% retention: • 25,500 acres of forested wildlife habitat located within 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

EXHIBIT C—ORDINANCE NO. 05-1077

ATTACHMENT 1. HABITAT CONSERVATION AREAS MAP

This map is available at the Metro Planning Department, 503.797.1555 or online at http://www.metro-region.org/.

Attachment 5

Tualatin Basin ESEE (due to its size, this item is in a separate notebook available for review)

Attachment 6

Tualatin Basin Program

Partners for Natural Places

REVISED RECOMMENDATION

Tualatin Basin Goal 5 Program Report

Submitted to: Metro

Submitted by: Tualatin Basin Natural Resources Coordinating Committee

Prepared by: Tualatin Basin Steering Committee

March 28, 2005

Acknowledgements

Tualatin Basin Natural Resources Coordinating Committee

Beaverton	Rob Drake, Mayor – TBNRCC Vice Chair
Cornelius	Steve Heinrich, Mayor
Durham	Dean Gibbs, Councilor
Forest Grove	Richard Kidd, Mayor
Hillsboro	Tom Hughes, Mayor
King City	Ron Shay, Councilor
Metro	Carl Hosticka, Councilor
	Susan McLain, Councilor
North Plains	Cheryl Olson, Mayor
Sherwood	Mark Cottle, Mayor
Tigard	Nick Wilson, Councilor
	Sally Harding, Councilor (alternate)
Tualatin	Ed Truax, Councilor
THPRD	Deanna Meuller-Crispin, Director
	Joel Blowers, Director (alternate)
Clean Water Services	Andy Duyck, Commissioner
	Dick Schouten, Commissioner (alternate)
Washington County	Tom Brian, Commissioner – TBNRCC Chair
	John Leeper, Commissioner (alternate)

Tualatin Basin Goal 5 Steering Committee

Beaverton	Hal Bergsma, Principal Planner
	Barbara Fryer, Senior Planner
	Leigh Crabtree, Associate Planner
Cornelius	Richard Meyer, Community Development Director
Durham	Roel Lundquist, City Manager
Forest Grove	Jon Holan, Community Development Director
	Jeff Beiswenger, Senior Planner
Hillsboro	Patrick Ribellia, Senior Project Manager
	Valerie Counts, Planning Supervisor
	Jennifer Wells, Senior Planner
	Doug Miller, Urban Planner 1 – GIS Specialist
Metro	Chris Deffebach, Planning Manager
	Lori Hennings, Associate Regional Planner - Ecologist
North Plains	Don Otterman, City Manager
Sherwood	Dave Wechner, Planning Director
	Kevin Cronin, Planning Manager
Tigard	Duane Roberts, Associate Planner
	Julia Hajduk, Associate Planner
Tualatin	Jim Jacks, Special Projects Manager
	Stacy Hopkins, Associate Planner
THPRD	Julie Reilly, Natural Resources Planner
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B. David Noren, Legal Memo on Fees and System Development Charges, June 2004
C. Metro Inventory Documents
D. Clean Water Services Design & Construction Manual
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F. Tualatin Basin EEHR June 2004
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EXECUTIVE SUMMARY

Background

The April 2005 program recommendation from the Tualatin Basin Steering Committee represents a revised approach toward fulfilling obligations set forth in the Metro-Basin inter-governmental agreement. Under the IGA, the primary goal for the Tualatin Basin Partners for Natural Places (Partners) is to recommend a program proposal for Metro Council consideration that will result in improvement of the environmental health of the Tualatin River Basin and its component urban watersheds. Demonstrating an improvement of this nature requires a commitment over time to resource protection, impact mitigation and restoration as well as continuing monitoring of program effectiveness resulting in program adjustments as necessary. Toward this end, the Basin Approach incorporates a plan for implementation and continued cooperation and coordination among the Partners to execute the underlying commitment.

Revised Approach

The Basin Approach is designed to address Metro's inventory of regionally significant fish & wildlife habitat, demonstrate compliance with Goal 5 administrative rule requirements for LCDC acknowledgement, and support efforts to protect habitat of threatened and endangered species under the ESA, as well as the Basin's obligation to meet overall water quality standards under a combined NPDES permit. If adopted by Metro, the Basin Approach will be regarded as a means for achieving substantial compliance with pending Urban Growth Management Functional Plan (UGMFP) requirements under Title 3.

In its initial configuration, the regulatory component of the Basin proposal relied—as it continues to—upon existing Vegetated Corridor provisions for protection and enhancement of core riparian areas as adopted by Clean Water Services and implemented by cities and Washington County. As well, the program proposal for August 2004 included a regulatory framework for areas outside of Vegetated Corridors that would have advanced a consistent Goal 5 regulatory approach throughout the urban portion of the basin.

In response to a shifting focus at state and regional levels away from the use of land use regulations as a means of achieving planning objectives, the Partners developed a revised approach for March 2005 that defaults to existing resource protection programs and regulatory requirements, including local Goal 5 programs, in lieu of proposing a new regulatory scheme. While specifics of existing programs vary among jurisdictions, their composite provides a solid regulatory basis for protecting resource areas beyond the limits of Vegetated Corridors standards. The components fundamental to achieving the Partners' goal of improved health, namely the riparian enhancement investment strategy and a commitment to continued partnership for implementation and ongoing program management, remain unchanged by the recent program revision.

Program Components

At the front of the report document is a matrix entitled "Proposed Tualatin Basin Goal 5 Program Overview." This matrix summarizes the program framework in terms of its four major components, namely revenue, regulatory, voluntary and administration/monitoring; each of these is described more fully in the program report.

The program significantly augments existing regulatory programs through the following means:

- a funded, major capital investment strategy for system-wide improvements;
- efforts to facilitate various voluntary actions aimed at diminishing conflicting use impacts; and
- a commitment to continued coordination among Partners regarding implementation, project oversight, and a monitoring and adaptive management approach designed to assure the effectiveness of program efforts.

The foundation of the Basin Approach is its investment strategy, which involves the Partners coordinating with Clean Water Services in the implementation if their draft Healthy Streams Plan (HSP), which calls for $95 million in improvements and other implementation efforts over the next twenty years, including education and partnerships. Additional sources of existing and future revenue may be applied toward acquisition of key resources, including upland areas.

Report Overview

The first chapter of the program report provides an overview of the Tualatin Basin Approach, including steps involved in the Goal 5 process, extensive public outreach efforts, interim decisions and an outline of the program approach. The Basin Approach uses Metro's inventory of riparian and upland wildlife habitat to conduct an ESEE analysis, make an allow-limit-prohibit decision, and develop an implementing program. Public outreach and involvement efforts were executed at each major step in the process in conjunction with interim decisions. The Basin Approach emphasizes preservation of core riparian resource areas, overall stream system enhancement, and diminishment of future stream impacts via incentives for property owners and developers to temper conflicting use activities through a variety of habitat sensitive practices.

The second chapter provides a relevant regulatory context, including those related to Goal 2 coordination requirements, as well as regional and local policy issues regarding Goal 5 resource areas. This chapter additionally describes baseline references for future basin environmental health assessments.

Chapter 3 describes urban program elements, including: descriptions of ALP designations, overlap with existing local programs, low impact development guidelines, best management practices, administration and procedures, and inventory maintenance. The proposed program incorporates existing regulatory provisions applicable to riparian resource areas as defined by Clean Water Services' Design & Construction standards for Water Quality Sensitive Areas (WQSAs) and Vegetated Corridors. These standards exceed the minimum necessary to substantially comply with existing Title 3 requirements for water quality under Metro's UGMFP inasmuch as development along similar stream corridors is regulated and restoration of degraded corridors is required in association with new adjacent development. Pursuant to Goal 5 administrative rule provisions, the vegetated corridor standards are considered clear and objective and are not modified as part of this proposal. While the areas regulated as WQSAs and Vegetated Corridors are not mapped, GIS analyses conservatively estimate that over 65% of

these areas correlate with Class I and II Riparian inventory areas[1]. In addition, the proposed Basin Approach relies upon (but does not incorporate) a variety of existing resource-related programs throughout the region. Some of these include local tree protection ordinances, best management practices for ESA compatibility regarding roadway operations and right-of-way vegetation maintenance, and local wetland and floodplain protections. These programs have direct and indirect benefits for Goal 5 resources and in many instances go beyond the boundaries of the Metro resource inventory area.

Program elements applicable outside the UGB are addressed in Chapter 4. While local authority does not cover regulation of farm and forestry practices, there are upland and riparian habitat conservation programs in place for development activities, as well as floodplain protections. In addition to these regulatory-based programs, best management practices mentioned above are implemented, and there are efforts in practice to improve and preserve urban fringe headwater areas through CWS enhancement of a federal conservation incentive program. These elements of the rural program component represent features of the proposed Basin Approach that exceed Metro's draft program.

Chapter 5 provides a preliminary description of the non-regulatory and voluntary program elements the Partners are committed to exploring and implementing if feasible. These elements are designed to augment the regulations and capital improvements in environmentally sensitive areas. The non-regulatory options include:

- targeting of revenue to extend restoration and enhancement activities outside of vegetated corridor areas;
- education and outreach programs for property owners, builders and developers;
- review and implementation of appropriate tax incentives;
- stewardship recognition;
- development of a model low impact development (LID) ordinance with commitments to removal of barriers to implementation of LID techniques;
- provision of technical assistance for property owners and developers;
- provision of support for volunteer activities; and
- review of, participation in and support for state, federal and private grant programs.

Collectively (and independent of the other program elements), these proposed actions and activities can provide significant improvement to regionally significant habitat and work toward improving environmental conditions throughout the basin.

Chapter 6 outlines the program's response to meeting the Partners' goal of improving the environmental health of the basin, and reviews the fundamental program components from the standpoint of achieving this goal. In general, the existing regulatory structure—including various local Goal 5 and related programs—provides a basis for preserving and enhancing the habitat function of core stream resource areas, as well as protecting broader ecological functions. Proposed capital investments will augment regulatory programs, and will be focused on Class I and II Riparian resource areas. The program proposes further enhancement of these activities through efforts to promote non-regulatory program elements described above, particularly

[1] During the summer of 2004, Metro updated their inventory to incorporate existing CWS stream data for the Tualatin Basin that resulted in a significant increase in the amount of area covered by the Metro inventory.

through voluntary and incentive efforts such as educational programs and technical assistance for property owners and developers. In addition, local jurisdictions will be required to amend local codes to incorporate guidelines for low impact development and green design, and facilitate their implementation.

The Healthy Streams Plan includes a strategy for directing a cost-effective capital improvements instrumental to enhancement of stream health. The capital investments outlined in this plan will cover community tree planting, necessary culvert replacements, stormwater outfall retrofits, flow restoration and a variety of riparian corridor restoration and enhancement projects. The latter will potentially include streamside preservation and re-vegetation, channel and wetland enhancement, large wood placement, in-stream pond adjustments, and streamside property owner education. The intent of the HSP is to guide the adaptive management of the surface water system. The Basin Approach endorsement of the HSP reflects a progressive step in inter-governmental coordination of habitat-related issues in the Basin that is modeled after the successful WCCC coordination of transportation projects. Local funding to begin these projects has already been committed.

Basin plans for program implementation, administration and monitoring are addressed in Chapters 6 and 7. A strength of the Basin's program lies in the Partners' commitment to continue to coordinate resource protection and enhancement efforts at both the regional and local levels by establishing the Tualatin Basin Natural Resources Coordinating Committee as a permanent standing committee. Chapter 7 further outlines steps anticipated for future implementation and coordination with Metro.

ESEE Update

In spite of the fact that the Basin's revised approach no longer includes additional development restrictions, the conclusions drawn from the original ESEE work continue to be applicable. The analysis therefore has been supplemented with an update to address changes related to Economic and Social factors. It is expected that the investment strategy will be more than adequate to achieve the Partners' goal without the need for new land use restrictions.

CHAPTER 1 INTRODUCTION

A. Purpose

This chapter documents the Basin Partners recommendations for a proposed program to implement the *Tualatin Basin Goal 5 / Natural Resources Draft Economic, Social, Environmental and Energy (ESEE)-ALP decision.* This proposed program addresses significant **Riparian Corridor** and **Wildlife Habitat** resources and their impact areas within the Tualatin Basin Program Area in compliance with State Goal 5 and in cooperation with Metro's Goal 5 planning efforts.

Goal 5 Process

Oregon's nineteen statewide planning goals are the framework for local planning programs in the State. The purpose of Goal 5, Oregon Administrative Rule (OAR) 660-023-0000, is to protect natural resources and conserve scenic and historic areas and open spaces. Local governments, both counties and cities, must address Goal 5. In addition, the Goal 5 rule provides for a "Regional" Goal 5 process to be conducted by the Metropolitan Service District (Metro).

The steps necessary for compliance with Goal 5 are described in OAR 660, Division 23 Procedures and Requirements for Complying with Goal 5. However, in general, the basic steps include:

Step 1. Map Significant Regional Resources. The Metro Council has adopted Resolution 01-3141C establishing criteria to define and identify regionally significant riparian corridors and wildlife habitat relating to the inventory phase of the Goal 5 aspects of its Fish and Wildlife Habitat Protection Program. The Tualatin Basin ESEE analysis is based on Metro's inventory of Riparian Corridors and Wildlife Habitat that have been determined to be regionally significant consistent with State Goal 5. Clean Water Act requirements and Endangered Species Act listings are also addressed in a basin watershed approach.

Step 2. ESEE Analysis. A general analysis of the Economic, Social, Environmental and Energy (ESEE) consequences of allowing, limiting or prohibiting conflicting uses in resource and impact areas throughout the inventoried portion of the Basin was completed in April 2004. After significant resource sites were identified, land uses that *conflict* with Goal 5 resource sites (known as "conflicting uses") were identified. The economic, social, environmental, and energy consequences of allowing or not allowing conflicting uses were then considered. The ESEE analysis is the basis of the Basin's determination of whether to:

- **Allow** conflicting uses,
- **Limit** (Lightly [LL], Moderately [ML], Strictly [SL]) conflicting uses, and/or
- **Prohibit** conflicting uses.

The Allow, Limit, Prohibit analysis is referred to as the "ALP decision." For the Basin Approach, the mapped ALP determinations were refined through a second

phase ESEE analysis, which resulted in several site-specific modifications to the ALP decision. This work was completed in July 2004.

In March 2005, new program direction called for a modification of the social and economic analysis factors of the general Basin ESEE analysis. The results of the cumulative analysis are summarized in Table 1-1, below.

Table 1-1: Tualatin Basin ALP Decision

Land Area Category	Conflicting Use Category			
	High Intensity Urban	Other Urban	Future Urban (2002 and 2004 additions)	Non-Urban (outside UGB)
Class I and II Riparian resource (**Inside** Vegetated Corridor)	ML*	SL	SL	N/A
Class I and II Riparian resource (**Outside** Vegetated Corridor)	ML	ML	ML	ML
All Other Resource Areas	LL	LL	LL	LL
Inner Impact Area	LL	LL	LL	LL
Outer Impact Area	LL	LL	LL	LL

* Vegetated Corridor standards are applied consistently throughout the District; in HIU areas they supercede the ALP designation.

The ESEE analysis and ALP decision provide the findings and the basis for Step 3: the program.

Step 3. Develop a Program to implement the ESEE decision. The primary focus of this chapter is todocument the process and procedures utilized to develop the recommended program to implement the ALP decision within significant Riparian Corridor and Wildlife Habitat resources and their impact areas within the Tualatin Basin Study Area.

Resources Considered in the Tualatin Basin

The Tualatin Basin Goal 5 program addresses:

- Riparian Corridors (OAR 660-023-0090), and
- Wildlife Habitat (OAR 660-023-0110).

Riparian Areas. A riparian area is defined in the Goal 5 rule as "the area adjacent to a river, lake, or stream, consisting of the area of transition from an aquatic ecosystem to a terrestrial ecosystem." A *Riparian corridor* is defined as "a Goal 5 resource that includes the water areas, fish habitat, adjacent riparian areas, and wetlands within the riparian area boundary". A *Riparian corridor boundary* is "an imaginary line that is a certain distance upland from the top of bank..."

The Goal 5 riparian corridors provide essential habitat for many fish and wildlife species during critical life stages for some and general development for others. These corridors also provide basic food and shelter and serve as travel corridors for the movement of fish and wildlife across

the landscape. A well-vegetated corridor can moderate stream temperatures and protect water quality as stormwater runoff is filtered before it flows into streams..

Wildlife Habitat. Through the use of Geographic Information Systems (GIS), Metro created a model of upland wildlife habitat. The wildlife habitat assumptions included:

- 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 that deserve special consideration

Each of the wildlife criteria or characteristics was modeled in the study area and the aggregate score was mapped. Additionally, Habitats of Concern (HOC) were mapped for known sensitive and at-risk habitat areas in the region. This information was collected from a variety of agencies, citizens, groups, and other sources of habitat information. In addition, all significant wetlands were included as HOC's. The Goal 5 "Wildlife Habitat" resource provides for the food and shelter requirements of wildlife in the area including small mammals, birds, and others found in the study area. Riparian corridors and wildlife habitat share many functions and values. Although fish are considered wildlife too, for this analysis, fish habitat is considered as part of the riparian corridor discussion.

Impact Areas. The Goal 5 rule directs that an impact area be delineated for significant natural resources in order to identify the area for the ESEE consequences analysis. The only guidance given in the Goal 5 rule for determining impact areas is that the impact area shall be drawn to include only the area in which allowed uses could "adversely affect" the identified resource. The impact area defines the geographic limits within which to conduct the ESEE analysis for the identified significant resource site. In addition, any regulatory program that may result from the Goal 5 process must be limited to those areas mapped as significant Goal 5 resource sites and impact areas.

For the purposes of the Tualatin Basin ESEE analysis, two types of Impact Areas have been identified:

- Inner Impact Areas. The inner impact areas are comparable to the impact areas established by Metro for the purposes of the Regional ESEE analysis. It includes:
  - The area within 150 feet of a stream, wetland or lake that is not within a significant resource site; and
  - The area within 25 feet of Wildlife Habitat and HOC significant resource sites and within 25 feet of the edge of remaining Riparian Corridor significant resource sites (not already covered in first part).

- Outer Impact Areas. The outer impact areas include all land within the Tualatin Basin ESEE Study Area, which is not within a resource or an inner impact area. Establishing outer impact areas supports a watershed approach and is consistent with Effective Impervious Area data. Literature cited throughout Metro's work establishes a nexus between the levels of general development throughout watersheds to the viability of significant resources. For example, one source established that altered hydrology and increased impervious surfaces increase flooding and damage streams. Recognizing that

riparian corridor and wildlife habitat health is the responsibility of the entire watershed will enable the impacts of any eventual program to be more equitably shared among beneficiaries and property owners.

B. Tualatin Basin Partners for Natural Places

"Partners for Natural Places" is the name of the collective community efforts underway to improve the natural environment. The Partners' work will lead to programs to conserve, protect, and restore streams and waterways, to support healthy fish and wildlife habitat. Tualatin Basin Partners for Natural Places is an alliance of local governments in Washington County working together with Metro to meet federal and state requirements for protecting natural resources in the Tualatin Basin. The draft Tualatin Basin ESEE Analysis and Program Report has been prepared by the Tualatin Basin Partners, through their participation by elected officials in the Tualatin Basin Natural Resource Coordinating Committee (TBNRCC) and by technical staff in the Tualatin Basin Steering Committee (TBSC):

Tualatin Basin Partners

- Clean Water Services
- Metro*
- Tualatin Hills Parks and Recreation District
- Washington County, and
- The cities of:
  - Beaverton
  - Cornelius
  - Durham
  - Forest Grove
  - Hillsboro
  - King City
  - North Plains
  - Sherwood
  - Tigard
  - Tualatin

*While Metro coordinated with and provided input throughout the Partners' process, they did not assist in preparing this report; Metro Councilors participate as non-voting members on the TBNRCC.

The Tualatin Basin Partners developed the "Basin Approach" (Appendix A) wherein local governments in the Tualatin Basin have worked together to develop a more detailed ESEE analysis and ultimately suggest a program approach to address the impacts of conflicting uses that might occur within resource areas.

The Basin Approach

The Basin Approach provides an opportunity for the Partners to coordinate concurrent, joint efforts by the Tualatin Basin governments, Clean Water Services (District) and others that are working to address Federal Clean Water Act requirements and Endangered Species Act listings that likely will affect the same areas as Metro's fish and wildlife habitat protection plan. In addition to reducing the number of times that the same areas are analyzed and public outreach provided and applying more detailed information than is readily available region-wide, the Basin Approach allowed for coordination among similar but distinct, Federal, State and Regional requirements. The Basin Approach also provided local governments with an opportunity to shape a basin-wide program that is tailored to local conditions within the Tualatin River basin while addressing regional Goal 5 objectives.

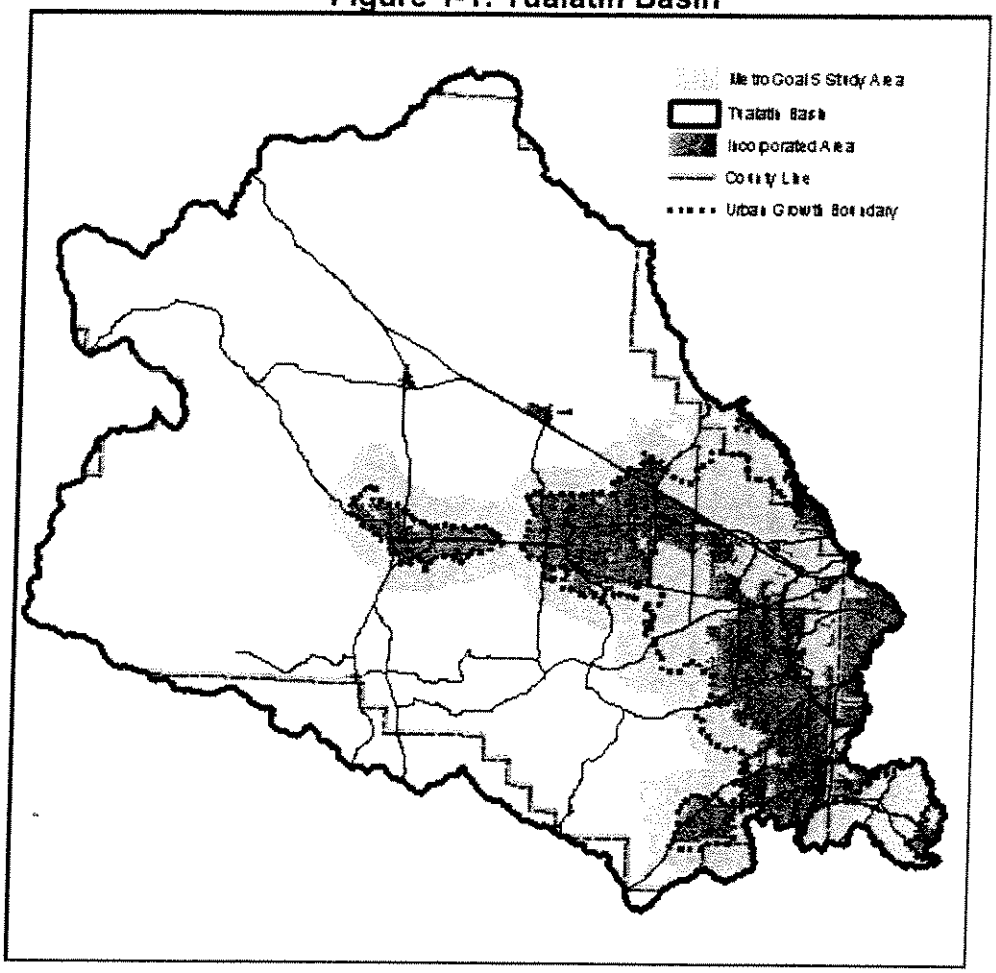
The following is the goal statement from the Basin Approach document:

> *Metro's fish and wildlife vision articulates the overriding goal of the Basin Approach:*
>
> *The overall goal is 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. This system will be achieved through conservation, protection and appropriate restoration of streamside corridors through time.*
>
> *Improvement of habitat health within each of the Region's 27 hydrologic units including the eleven hydrologic units inside the Tualatin Basin shall be a primary objective of the Basin Approach. The following objectives within Metro's Fish and Wildlife Habitat Vision Statement shall be pursued by the Basin Approach: to sustain and enhance native fish and wildlife species and their habitats; to mitigate high storm flows and maintain adequate summer flows; to provide clean water; and to create communities that fully integrate the built and natural environment. The region wide system of linked significant fish and wildlife habitats will be achieved through preservation of existing resources and restoration to recreate critical linkages, as appropriate and consistent with ESEE conclusions about whether to prohibit, limit or allow conflicting uses within a regionally significant resource site. Avoiding any future ESA listings is another primary Basin Approach objective.*

Tualatin Basin Program Area

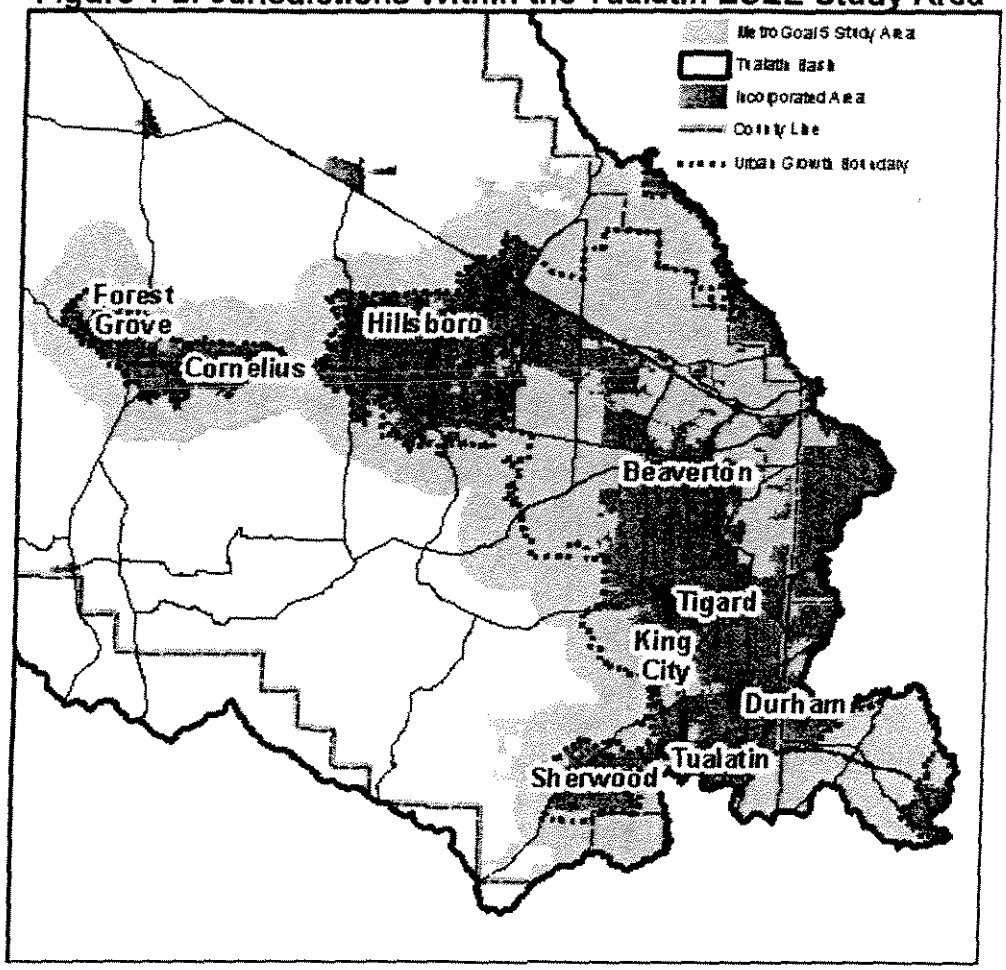
The general geographic extent of the Basin Program Area is that area draining the Tualatin River within the corporate limits of Washington County. The majority of the basin falls within Washington County. However, as shown in Figure 1-1, portions of the Tualatin Basin also fall within unincorporated Tillamook, Yamhill, Columbia, Multnomah and Clackamas counties including the cities of Lake Oswego, Portland, River Grove and West Linn as well.

Figure 1-1: Tualatin Basin



For the purposes of this Goal 5 program, the Tualatin Basin Urban Program Area includes those areas of the Tualatin River basin within the Portland Metropolitan Area Urban Growth Boundary and lands within one mile of the Metro jurisdictional boundary as shown in Figure 1-2. Rural, farm and forest lands that are more than one mile from the UGB were not included in the ESEE Study Area due to limitations of the Goal 5 inventory area. Natural resource protection for all rural areas are addressed in Chapter 4 pursuant to local, regional, state and federal regulations.

Figure 1-2: Jurisdictions Within the Tualatin ESEE Study Area



C. Public Outreach Efforts

In 2002, the intergovernmental agreement forming the Tualatin Basin Natural Resources Coordinating Committee was signed. It's designated *Steering Committee* formed subcommittees to aid in its work, one of which was the *Public Outreach* subcommittee. This subcommittee has met and coordinated Basin Goal 5 public outreach since June of 2002. Members include public involvement or planning staff from the thirteen public partner agencies, and importantly, also include representatives from an assortment of interested private agencies: Community Planning Organizations (CPO), Audubon Society of Portland, Tualatin Riverkeepers, Home Builders Association, Associated General Contractors, Westside Economic Alliance, and SOLV. They named themselves, and the Basin's coordinated Goal 5 effort, *Partners for Natural Places*. Members include:

- Anne Madden, Washington County, Chair
- Sheri Wantland, Clean Water Services
- Gina Whitehill-Baziuk, Metro
- Karen Withrow, Metro
- David Endres, Tualatin Hills Park and Recreation District
- Megan Callahan, Beaverton

- Barbara Fryer, Beaverton
- Jennifer Wells, Hillsboro
- Julia Hajduk, Tigard
- Stacy Hopkins, Tualatin
- Steve Kelley, Washington County, liaison with Steering Committee

Private agency partners:

- Linda Gray/Patt Opdyke, CPOs
- Jim Labbe, Audubon Society of Portland
- Brian Wegener, Tualatin Riverkeepers
- Kelly Ross, Home Builders Association of Metropolitan Portland
- Cindy Catto, Associated General Contractors
- Betty Atteberry, Westside Economic Alliance (WEA)

The Partners undertook a lengthy series of outreach efforts, which are summarized in tables in Appendix B. This report summarizes their public outreach efforts to-date and what they have heard from the public about the Tualatin Basin Goal 5 fish and wildlife habitat protection program.

Phase One: Inventory Outreach

In **September 2003,** the Partners organized three open houses to share Goal 5 progress to-date with the general public. These were held in Forest Grove, Beaverton and at the Tualatin Valley Fire & Rescue Training Facility between Tualatin and Sherwood. In all, approximately 240 people attended the open houses. Additional outreach activities included publication of a Newssheet, two televised presentations at the Washington County Public Affairs Forum in October 2003, talks at CPO's 1 and 5, the creation of a Partners' website, and numerous articles in jurisdictions' newsletters. Media releases and posters combined with creative outreach by all the Partners helped with public awareness. The Partners produced a panel television show under the auspices of Tualatin Valley Television (TVTV), which was broadcast throughout the late winter and early spring of 2004. Outreach from other entities included multiple Metro presentations to interested parties, a well-attended Goal 5 Business Summit organized by Commercial Real Estate Economic Council (CREEC) in October 2003, a Raindrops to Refuge open house, and other outreach by organizations, such as the Audubon Society of Portland and the Tualatin Riverkeepers.

Comment Forms

Jurisdictional staff and elected officials were available at the Fall 2003 open houses to answer questions and listen to individuals' views on the habitat program. Maps of regionally significant habitat and informational newssheets were available at these events, along with public comment forms. The Basin Partners made use of the Comment Sheet created by Metro, which set forth six questions.

1. The first asked whether habitat protection should be equal or varied based on ecological value. The numbers were almost equally split between protecting the most ecologically valuable areas first and protecting all equally; a small minority said no new regulations were needed.

2. The second asked about varying protection by land use (zoning) and considering habitat while planning for roads and utilities. Respondents called for balance and flexibility in regulations to preserve economic viability, and were pleased with the idea of local knowledge being applied in decision making. However, they affirm that natural resource protection does improve property values. Regarding infrastructure, respondents overwhelmingly favored considering the impacts of roads and utilities on habitat areas.

3. The third asked if habitat areas that provide connections to other areas should be given priority. Most respondents supported greater protection efforts for these areas, though a few of these suggest that all habitat areas should be equally protected. A few respondents raised concerns about the impacts of this decision on private property. Others mentioned acquisition of these areas as a potential policy approach.

4. The fourth addressed protecting established versus new development, allowing exceptions from development restriction, and requiring mitigation. Most respondents support protection standards on newly developed and re-developed land, while some people favor exempting already developed land from protections. Still others favor protections on all land. Respondents mostly favor mitigation, though a few expressed concerns about whether mitigation was equal to protection. In general, people favored a balanced approach of avoiding impacts when possible and mitigating losses when they occur.

5. The fifth asked the public for input on the types of incentives that should be used to protect habitat. The most commonly reported suggestions include: tax incentives (e.g., reduced property taxes), grants and technical assistance for habitat protection and restoration, education efforts including school programs, community recognition and awards for habitat protection and restoration, free or reduced cost native plants and other restoration materials, and conservation easements or transfer of development rights.

6. The sixth addressed how the habitat protection program should be funded and personal willingness to support public financing mechanisms. The majority of respondents were supportive of public financing mechanisms, including bonding. Other funding mechanisms mentioned include fees on development, stormwater fees, grants, and voluntary contributions.

Letters

One letter was received from the Audubon Society of Portland and one from an interested citizen, both calling for strong protection standards. The Audubon Society is particularly concerned about riparian corridor continuity and upland wildlife habitat, which has fewer protections in place than riparian areas do.

Postcards

The Friends and Advocates of Urban Natural Areas (FAUNA) distributed pre-addressed postcards to be sent to Metro and the Tualatin Basin partners in support of the Goal 5 protection program. Metro received 1,320 postcards and Tualatin Partners received another 168. Only two expressed concerns about property rights and were less supportive of a habitat protection program. The following are major themes expressed in the postcards that support a regional habitat protection program:

- Desire and need for additional regulations to protect watershed and habitat resources
- Need to pursue responsible development and stop reckless development
- Importance of habitat areas for environmental health and neighborhood livability
- Positive influence protected natural areas have on property rights
- Long time frame involved in recovering resource health relative to the short timeframe of degrading resources
- Desire and need to protect habitat resources to maintain the character of our region and for the benefit of future generations

Summary

Based on that early feedback, the public appeared generally supportive of protecting fish and wildlife habitat and including regulatory and non-regulatory measures. Metro reports that the majority of the critical feedback received was through phone calls from concerned citizens who worry about the impacts of Metro's habitat protection program on the use of their property or who oppose all habitat protection based on private property rights or anti-tax sentiments. Other critical feedback suggested that Metro was not currently doing *enough* for the protection of fish and wildlife habitat.

Phase Two: ESEE Analysis and Allow/Limit/Prohibit Decision

Over the fall and winter of 2003-2004, as the ESEE analysis and development of Allow-Limit-Prohibit maps was proceeding, Tualatin Basin staff spoke before the Washington County Medical Society, WEA, CPOs 10 and 5, and the Tualatin River Watershed Council. They also made a presentation at the second CREEC Goal 5 Business Summit March 2, 2004. Media releases, posters, and continued creative outreach by all the Partners continued to help build public awareness.

In **March 2004** the Partners held three open houses, one in Hillsboro, one in Tualatin, and one in Beaverton, to share the results of the ESEE analysis and the proposed Allow-Limit-Prohibit maps; 255 people attended. The public notice for these events was created and mailed jointly by the Partners and Metro to 43,011 citizens. Planners and laptop computers loaded with property information were available for one-on-one interaction. A second edition of the Newssheet was produced for wide distribution. A slide show presentation on the status of the process was shown five times each evening (except in Beaverton). The Clean Water Services' video *Wild by Design* was shown. Citizens were encouraged to write their comments for the public record.

The March 29, 2004 Open House in Beaverton was followed by the Partners' first Goal 5 **Public Hearing**. Taped by TVTV, it was rebroadcast around the Basin through June of 2004 approximately a dozen times. About 100 persons attended, with 40 providing formal testimony.

Summary

All told, counting oral testimony, comment cards, letters, and e-mail, approximately 160 pieces of testimony were received. Although the lines of demarcation were not always clear and many spoke to the need to balance environmental and economic concerns, in general the ratio of comments received was two-to-one in favor of higher levels of protection. Of the 56 who expressed support for development rights, these were their major themes:

- Regulations are already in place; stop moving the goal posts.
- Landowners must be compensated for loss of economic value.

- If the public wants more greenspace, they should buy it.
- Metro's inventory maps contain errors, especially in counting as habitat suburban gardens, orchards, etc.
- Site specific analysis is necessary.
- Honor the UGB and agricultural land by keeping development constrained, even if it means loss of habitat within the UGB.
- Institutional campuses (schools, universities, hospitals) are pressed for space.
- The region suffers from a shortage of industrial land.
- Too-strict regulations prohibit responsible stewardship, force people to harvest timber, etc.

Of the 104 who called for strengthening habitat protection, their major issues were as follows:

- We support science-based efforts to preserve and enhance eco-system health.
- It is foolish to develop flood-prone land or steep slopes.
- Please identify the habitat land already in public ownership (parks, etc.); this will help alleviate concerns.
- Please develop proactive conservation education programs.
- Environmental health improves economic value.
- Fragmenting habitat lessens its value.
- Environmental degradation is a major "takings" from us all and from our own future.
- Please protect the best interests of the greatest number of the citizenry.
- This is a unique opportunity to do the right thing – make the most of it.

One person summed it up this way: "No one these days objects to sanitary sewer requirements, as it is generally accepted that as population densities increase, our aquifers would suffer without the waste water management sewer systems provide. Our densities now require further community actions to protect broader aspects of our natural environment. Flood control, wildlife protection, water quality, etc. are all required for a reasonable quality of life. If these benefits are sacrificed, property values throughout the basin will be reduced. Property values and natural values converge. I urge you to protect our region's natural assets for our children."

Phase Three: The Program

Public outreach efforts continued throughout the spring and summer of 2004. Media releases and editorial briefings resulted in stories in the major newspapers, as well as in the newsletters of all the Partners, including the CPOs. Mayor Tom Hughes of Hillsboro and Senior Planner Hal Bergsma of Beaverton made a guest appearance on TVTV's Talk of the Town (rerun on cable TV four times). Information was also available at many community events, including Tualatin's Songbird Festival and a Public Works Fair at Washington Square on May 15; Beaverton's Neighborhood Clean Up on June 5; Tigard's Balloon Festival June 17-20; Tualatin River Discovery Day on June 26; Beaverton's Summerfest July 16-18; and the Washington County Fair July 28 through August 1. Information was also available on the County's Planning web site.

Open houses in July and a public hearing in August were set to share possible program options with the public. In mid-July, Public Notices were mailed to approximately 35,000 property owners and interested parties inviting them to these events. Open Houses on the proposed Tualatin Basin Goal 5 program were scheduled for the following dates and locations:

- Monday July 26, 4 to 7:30 pm, Beaverton Library, 12375 SW 5th Street, Beaverton

- Wednesday July 28, 4 to 8 pm, Forest Grove Community Auditorium, 1915 Main Street, Forest Grove
- Thursday July 29, 4 to 8 pm, Tualatin High School, 22300 SW Boones Ferry Road, Tualatin

The Public Hearing was held on:

- Monday August 2, 6 to 8 pm, Public Services Building Auditorium, 155 N First Avenue, Hillsboro – this hearing was continued until August 9th.

Continuations of the initial Hearing on the proposed Basin Program:

- Monday August 9, 1 pm, at the Beaverton City Library, 12375 SW Fifth Avenue, Beaverton; public comment period held open until 5:00 pm - hearing was continued until Monday, August 16th
- Monday August 16, 1 pm, at the Beaverton City Library, 12375 SW Fifth Avenue, Beaverton; hearing was continued until Monday, August 30th for continued deliberations on proposed Program
- Monday August 30, 1 pm, at the Beaverton City Library, 12375 SW Fifth Avenue, Beaverton; hearing was continued until Monday, September 13, 2004 for continued deliberations on proposed Program
- Monday September 13, 1 pm, at the Beaverton City Library, 12375 SW Fifth Avenue, Beaverton; hearing was continued until Monday, September 27, 2004 for continued deliberations on proposed Program
- Monday September 27, 1 pm, at the Beaverton City Library, 12375 SW Fifth Avenue, Beaverton; at this hearing, decisions on the draft Program were deferred for further consideration of outstanding issues

Further TBNRCC Public Meetings considering proposed Basin Program:

- On Monday November 15, 1:00 pm, at Beaverton City Hall, 4755 SW Griffith Drive, Beaverton; meeting to consider issues and potential revisions to Metro's Regional Goal 5 Program (Metro Draft Resolution 04-3506A) – discussed Measure 37 implications and determined that potential changes to Regional Program and/or effects of Measure 37 may require new direction for Basin program. Directed Steering Committee to work with Metro on affects of Measure 37.
- Through August 9th at 5:00 pm the public was also invited to submit comments in writing to:

  The Tualatin Basin Natural Resources Coordinating Committee
  Washington County Department of Land Use and Transportation
  Planning Division, 155 N First Avenue, Suite 350-14
  Hillsboro, OR 97124

After holding final public hearings, the Coordinating Committee will make final recommendations to the Metro Council on a Goal 5 program for the Tualatin River Basin. Metro will consider the Tualatin Basin program and, in turn, hold its own public hearings. The Basin Partners anticipate that Metro will accommodate the Tualatin Basin program into their regional Goal 5 program. Following Metro's approval, local governments will have 180 days to adopt implementing ordinances. A subsequent update to the Basin-Metro IGA extends the implementation period to one year.

Phase Four: Program Revision

Public involvement activities during recent Program Revisions have focused on invitations for public comments at Steering Committee meetings being held three to four times per month since early February as well as invitations for public comment at TBNRCC meetings in January and February. An extended public comment period is being scheduled during the upcoming TBNRCC public hearing on March 28th.

Following TBNRCC adoption of final Program recommendations for the Basin, those recommendations, together with relevant findings will be forwarded to Metro for Council consideration for incorporation in the draft Regional Program. Additional opportunities for public involvement and comments on the Basin Program will be in afforded as Metro holds Open Houses and Public Hearings on the Regional Program in April and May of this year. Metro is also expected to provide public notice in compliance with the requirements of ORS 197.047 (also known as Measure 56 notice) prior to holding public hearings for final adoption of a Regional Program. This notice is expected to cover all potentially affected properties in the Tualatin Basin and will provide opportunities for public comment at Metros adoption hearings. Finally, prior to any new Basin Goal 5 Program elements becoming effective, local governments throughout the Basin will be required to provide yet another public notice pursuant to Measure 56 standards and hold public hearings before their local Commissions, Boards and/or Councils.

D. Organization and Approach to Goal 5 Program

The Tualatin Basin Goal 5 Program approach emphasizes three key elements:

- **Preserve** existing system through regulation of new development and landscape alteration activities in core resource areas, and requiring mitigation of disturbances;
- **Enhance** overall health of regional sites through capital improvements designed to restore natural function of riparian corridors; and
- **Mitigate** new development impacts to significant resources throughout Basin through encouraging the use of Low-Impact-Development (LID) practices, along with the removal of existing barriers to implementing those guidelines for LID approaches. Provide incentives to utilization of LID such as flexible development standards.

In addition to the above, the non-regulatory program component addresses non-development related activities, and includes the following elements:

- Education
- Stewardship Recognition
- Restoration Funds
- Tax Incentives
- Technical Assistance
- Promote Volunteer Activities
- Acquisition.

CHAPTER 2 RELATIONSHIPS TO OTHER ENVIRONMENTAL REGULATIONS AND PROGRAMS

The policy framework under which this Program Report is submitted is part of a state and regional land use and natural resource policy framework that is complex. This chapter describes various other activities and explains how the Tualatin Basin Goal 5 Program fits into this framework.

A. Statewide Planning Goal 2 Coordination

Land Conservation and Development Commission's (LCDC) Statewide Planning Goal 2 requires coordination with affected local governments. Prior to completion of the original Tualatin Basin Approach and the formation of the Tualatin Basin Natural Resources Coordinating Committee, all governments within the Tualatin Basin were invited to be members and/or participants. Multnomah County, Columbia County, Clackamas County, Yamhill County, the city of Portland, the city of Lake Oswego and the city of West Linn all declined the invitation. However, all requested they receive notices and be allowed to comment on all technical and policy work products. That coordination has been happening since the beginning of this work. Additionally, the Tualatin Basin Partners participated and periodically briefed a variety of the Regional Goal 5 committees hosted by the Metropolitan Service District (Metro) as well as the Metro Council and its policy advisory committee (MPAC).

B. Regional and Local Policy Framework

Metro's Regional Goal 5 ESEE and Program

The Goal 5 rule provides for a "Regional" Goal 5 process to be conducted by Metro. Specifically, OAR 660-023-0080 defines "regional resources" and authorizes Metro to adopt one or more regional functional plans to address all applicable requirements of Goal 5 and the OAR for one or more resource categories. Ultimately, the program requirements for Metro's Goal 5 work will become part of the Urban Growth Management Functional Plan (Functional Plan), specifically, Title 3, Section 5. Once adopted by the Metro Council and acknowledged by LCDC, the Functional Plan text will become part of the Metro Code and local governments will be required to take actions and/or show "compliance" with its provisions.

Metro began conducting a Goal 5 process for the area within its service boundaries in 1999. In 2002, Metro adopted an inventory for Regionally Significant Riparian Corridors and Wildlife Habitat and began work on a regional ESEE analysis. The Basin Approach is being completed concurrently with Metro's regional tasks. The Tualatin Basin is most likely to be implemented sooner than other portions of the region if the non-basin jurisdictions wait for the Metro regional safe harbor to be completed and acknowledged by the state before they begin local implementation tasks.

Clean Water Services (District)

Water quality problems have long been recognized in the Tualatin Basin. To address these issues, the Unified Sewerage Agency (USA, now Clean Water Services) was formed as a special district under Oregon Revised Statutes (ORS) 451 by a vote of the people in the 1969 election season in order to combine the 26 operating wastewater treatment plants operating in the

Tualatin Watershed at the time. This action was motivated by the Environmental Quality Commission (EQC) establishing a building moratorium in the watershed until the poor water quality was corrected (an order, not a lawsuit). The ORS requires that its Board of Directors be the County Commission. This is the only connection to County government.

Over the years, Clean Water Services built two new "regional" plants (Durham and Rock Creek), upgraded two more to modern operating standards for the watershed (Hillsboro, formerly West Hillsboro, and Forest Grove), and took the remainder out of wastewater treatment and replaced them with pump stations, hooked them into "interceptor lines" and moved the waste to the regional plants for treatment.

The Department of Environmental Quality (DEQ), in compliance with section 303 of the Clean Water Act (CWA), is required to establish Total Maximum Daily Loads (TMDLs) in twelve watersheds, the first being the Tualatin. When the TMDLs were established in 1988, twelve cities within Washington County asked the District to form a stormwater utility. To do so, the District had to ask the Legislature to amend ORS 451 to allow stormwater management along with the existing wastewater collection. Following that amendment, the cities established interagency agreements with the District to allow the agency to do wastewater collection and stormwater management in the respective cities.

Basin Approach to Title 3 – Vegetated Corridors

The local governments in the Tualatin Basin developed a unified program, implemented through the Clean Water Services District's Design & Construction Standards, to successfully comply with Title 3 of Metro's Urban Growth Management Functional Plan, which outlines water quality and flood management requirements for the region. The District's Design and Construction Standards exceed the minimum requirements of Title 3 for water quality protection of the Tualatin and its 700 miles of tributaries, providing for vegetated stream corridor buffers up to 200 feet wide and mandating restoration of corridors in marginal or degraded condition. District compliance with existing Title 3 requirements also addresses protection of flood management areas in order to protect life and property from dangers associated with flooding; and provides for flood storage, reduction of flood velocities, reduction of flood peak flows and reduction of wind and wave impacts. The multi-jurisdictional approach resulted in a method for implementation of Title 3 based on water quality standards, good science, and best management practices that meet Metro's substantial compliance requirements.

Clean Water Services Healthy Streams Plan

The Healthy Streams Plan (HSP) is an updated watershed plan designed to address the Clean Water Act and Endangered Species Act (ESA), with a focus on the urban and urban fringe portions of the Tualatin Basin. The District, local cities, Washington County, Metro, and Tualatin Hills Park and Recreation District, are all partners in the Healthy Streams Plan development and implementation. The Healthy Streams Plan contains the following key elements: an inventory of the stream location and condition (Watersheds 2000), an analysis of public habits and values, an economic analysis, policy and programmatic focus areas (effective impervious area reduction, vegetated corridors, hydrology / hydraulics, and operations and maintenance). The HSP was recommended for approval by its project advisory committee, and is anticipated to be before the District Board for consideration in June 2005.

Watersheds 2000 is the ecological stream inventory and water resource modeling component of the Healthy Streams Plan. The study area for Watersheds 2000 included the urban and urban fringe areas draining into waters primarily managed by Clean Water Services. Consultants were used to gather field information and generate the hydrology and hydraulic models. Project Committee's of citizens, regulators, cities, and other stakeholders were formed for three separate regions of the study area to assist with identifying desired conditions for specific stream reach types based on the scientific data delivered and social values of the participants.

The Water Resource Engineering element of the Watersheds 2000 Inventory developed detailed topographic surveys of the floodplain and stream cross sections. Hydrology models using HEC-HMS and Hydraulic models using HEC-RAS were developed. The engineers and ecologists also evaluated culverts and bridges for conveyance and fish passage.

The ecological inventory element of Watersheds 2000 was conducted from July to early November 2000. Follow-up gap analysis, replicate sampling, and detailed macroinvertebrate sampling also occurred from September through early November 2001. Ecologists sampled streams using the Tualatin Basin Rapid Stream Assessment Technique (RSAT). Numerous sites were sampled and applied to a proportionate stream reach in miles to determine the physical condition and habitat character of our stream system. Streams and other water quality sensitive features in the study area that were not sampled were still field verified for location and condition (piped, open, etc.). In addition, Clean Water Services and the Watershed Council worked with Oregon Department of Fish and Wildlife to collect fish and crawfish at 67 sites between 1999 and 2001. Clean Water Services contracted the monitoring of 63 macroinvertebrate sites in 2002.

Existing Environmental Health Report (March 2004)

The Existing Environmental Health Report (EEHR) was prepared by the Tualatin Basin Partners for Natural Places to provide an assessment of the environmental health of the eleven Regional Sites found within the urban portion of the Tualatin River Basin, which are the subject of Metro's Goal 5 natural resource planning process. The EEHR serves as a preliminary indication for reviewing strategies for improving the health of Tualatin Basin Watersheds in future programs, as well as a reference for determining whether program strategies achieve the goal of promoting improved overall health.

The EEHR is based on a comparative model of existing data sources: Metro Regionally Significant Inventories for Riparian Corridor and Wildlife Habitat, Clean Water Services Rapid Stream Assessment Technique (RSAT) data, and Clean Water Services Effective Impervious Area (EIA) data. Each set of information represents a different method for assessing the environmental health. The EEHR uses the Metro inventory to provide the boundaries of the natural resource Regional Sites and associated scoring attributes. The Metro Regional Sites are then analyzed on a local level utilizing available Clean Water Services data.

The EEHR is principally organized around the following environmental key environmental criteria:

1. Effective Impervious Area (EIA)
2. Stream Flow
3. Geomorphology
4. Riparian Vegetation
5. Water Quality
6. Aquatic Habitat
7. Upland Wildlife Habitat

The comparative assessment of the District's and Metro inventory data provided one approach to evaluating the existing environmental health of the urban portion of the Tualatin Basin and eleven major sub basins. In addition, this methodology provides the basis that will allow for measurement of improvement in environmental health over time. This process provides both a static snapshot of current health as well as a tool for dynamic measurement of future health over time. The table below provides a summary of the assessments for each of the eleven Regional Sites and an overall summary of the environmental health for the entire Basin Study Area. While there is considerable variability, when considered as a whole, the riparian and wildlife habitat conditions within the urban portion of the Tualatin River Basin merit an overall environmental health rating of "Fair."

Table 2-1: Summary of Basin Study Areas from the EEHR

Study Area Sub Basins	Metro Regional Site	Overall Rating
Council Creek, Gales Creek, and Upper Dairy Creek	Site 5	Fair to Good
Dairy Creek, McKay Creek, and Waibel Creek	Site 6	Fair
Middle and Upper Rock Creek, Abbey Creek, Holcomb Creek	Site 7	Poor to Good
Lower and Upper Beaverton Creek, Bronson Creek, Cedar Mill Creek, and Basin	Site 8	Poor to Fair
Rock Creek, Reedville Creek, Dawson Creek, and Turner Creek	Site 9	Fair
Butternut Creek, Gordon Creek, and Tualatin River Tributary	Site 10	Fair
Hedges, Nyberg, and Saum Creeks	Site 11	Fair
Ash Creek, Upper Fanno Creek, Sylvan Creek, Vermont Creek, and Woods Creek	Site 12	Poor to Fair
Summer Creek	Site 13	Poor to Fair
Ball Creek, Lower Fanno Creek and Red Rock Creek	Site 14	Fair
Chicken Creek, Cedar Creek, and South Rock Creek	Site 15	Fair
Entire Basin Study Area		**Fair**

C. Clean Water Act Wetland Fill and Removal Permits (Section 404)

Army Corps of Engineers and Oregon Division of State Lands

These two agencies implement sections of the Clean Water Act that require case by case review and permitting for fill and/or removal of over 50 cubic feet of material from a wetland or waters of the United States (creeks and streams). These permits are coordinated by both of these state and federal agencies, who in turn seek and receive comments from other state and federal agencies as well as local land use permitting agencies. Currently, the District's Design & Construction standards for Water Quality Sensitive Areas and their associated Vegetated Corridors do not regulate areas that are part of a 404 permit application and mitigation plan. The final Tualatin Basin Goal 5 program will address the hierarchy of mitigation and permit activities so that resource protection is coordinated and reviews are not duplicative.

CHAPTER 3 URBAN PROGRAM ELEMENTS

A. Introduction

This chapter of the Tualatin Basin Program Report identifies proposed Fish & Wildlife Habitat Protection program elements that will be applied to the study area located within the Urban Growth Boundary (UGB) area of Washington County. These elements of the proposed program are intended to meet the requirements of the Goal 5 Administrative Rule, and satisfy Metro's criteria for meeting regional Goal 5 requirements, pursuant to the Metro-Tualatin Basin Natural Resources Coordinating Committee (TBNRCC) intergovernmental agreement.

The proposed program consists of four major components, including a revenue component, a non-regulatory (voluntary and incentive) component, a regulatory component and a monitoring component. The program proposal serves as a basis for implementing the recommendations of the draft Tualatin Basin Goal 5 Economic, Social, Environmental, and Energy (ESEE) analysis and Allow-Limit-Prohibit (ALP) decision. The focus of this chapter is to describe the proposed program elements that will apply to the urban portion of the Tualatin River Basin, including those use categories defined in the ESEE report as High Intensity Urban (HIU), Other Urban (OU) and Future Urban (FU). The program approach that is proposed for the Non-Urban (NU) use category is described in Chapter 4 of this report, which is entitled "Rural Program Elements."

The existing regulatory element of the proposed urban program approach applies to proposed development and redevelopment activities within and adjacent to areas designated as Water Quality Sensitive Areas and Vegetated Corridors and subject to Clean Water Services' (CWS) Design & Construction Standards. As proposed, incentive and voluntary elements of the program apply to all areas of the Basin, and special development flexibility is available for development of Class I and II Riparian inventory areas and their vicinities, where they occur outside of Vegetated Corridors. The proposed program is structured to achieve the following three goals:

- *Improvement of the environmental health of the basin* through restoration, mitigation and enhancement efforts in riparian areas, funded by the investment of fee-generated revenue, in conjunction with the Healthy Streams Plan (HSP);
- *Preservation of the existing core system* through resource conservation, impact reduction and enhancement of degraded and disturbed resource areas among lands classified as Water Quality Sensitive Areas and Vegetated Corridors; and
- *Mitigation of future resource impacts* by encouraging and providing incentives for the use of Low Impact Development practices in resource areas, in part to meet water quantity management targets pursuant to Clean Water Services' Design & Construction standards.

This chapter elaborates on the regulatory aspects of the second and third bulleted goals. The description of the program approach toward meeting the first bulleted goal is provided in the Healthy Streams Plan. This draft watershed plan has been recommended for adoption and is anticipated for CWS Board consideration in June 2005.

B. Applicability and Resource Location

As will be explained throughout this chapter, the proposed program applies differently in different areas of the Basin. Generally speaking, the program regulatory component intended to preserve and enhance the core riparian system is reliant upon existing Design & Construction standards currently administered by CWS and Basin cities. These standards, specifically applicable to Water Quality Sensitive Areas (WQSAs) and their associated Vegetated Corridors, are particularly relevant for the protection of riparian fish and wildlife habitat, and thus provide a Goal 5 function. All Goal 5 resource areas with a Basin ALP designation of Strictly Limit (SL) fall within the parameters of the Vegetated Corridor boundaries. Vegetated Corridor areas are not regulated beyond the CWS District boundary, which generally corresponds with the UGB. As such, there are no SL areas identified outside the UGB.

The Basin resource areas identified with a Moderately Limit (ML) ALP designation are generally consistent with the areas where Class I and Class II Riparian inventory lands occur beyond the limits of the Vegetated Corridors. This is the case throughout the entire inventoried area, which extends approximately one-mile beyond the year 2000 UGB, however the application of the ML designation can be characterized differently in urban versus rural situations. Outside the UGB (where Vegetated Corridor standards do not apply), all inventoried Class I and II Riparian resource areas feature a ML designation. The rural ML areas very generally represent significant stream corridors with approximate widths typically ranging from 300 to 350 feet, and much broader in floodplain areas. Within the UGB, Class I and II Riparian areas typically occur within 100 feet of the Vegetated Corridor boundary, although these also are much broader in floodplain areas. For cases where the Class I and II resources correspond with HIU conflicting use areas, the ALP designation reflects a ML designation. In addition, there are limited cases throughout the Basin where a Site-level ESEE decision adjusts for a Lightly Limit designation in Class I and II Riparian resource areas. These adjustments are based on unique circumstances and are reflected on the ALP map.

All other portions of the study area, including Inner and Outer Impact Areas, are provided with a Lightly Limit ALP designation. While the impact areas are not considered to feature significant fish and wildlife habitat resources per se, activities that occur in all areas of the watershed could have a potentially adverse impact on stream resources. Accordingly, the Basin Outer Impact Areas meet the definition for impact area provided by the Goal 5 OAR (660-023-0010(3)).

Implementation of ALP Designations

Pursuant to the Design & Construction standards, the limits of WQSAs and Vegetated Corridors are to be identified using parameters defined in the standards. The basis for this is the site-specific and fluctuating nature of the resource; factors such as soil type, water table level and slope each represent significant determining factors. Accordingly, the identification and delineation of these features occurs on a case-by-case basis. In order to properly administer the applicable regulations, any proposed development activity for areas nearby potential wetland or stream vicinities is required to undergo a site review to make a more accurate determination of sensitive area locations. This procedural practice will continue to apply, and therefore there is no need for implementing jurisdictions to adopt maps of SL areas for Goal 5 purposes. As explained in Part Two of the ESEE analysis, even in cases where the underlying ALP decision is less than SL for Goal 5 purposes, the Vegetated Corridor standards will apply consistently within

CWS-defined areas regardless of the Goal 5 decision. However, the clear and objective Design & Construction Standards related to Vegetated Corridors include an option for an alternative review process which may be used in cases with corresponding ML and LL designations in order to achieve additional flexibility to accommodate development while achieving necessary objectives for stream corridor protection.

As explained above, land areas with ML designations are part of significant riparian corridors. Outside the UGB, these generally correspond with vegetated stream corridors and are thus relatively easy to locate at the site level or with aerial photography. Inside the UGB, ML areas typically are located in-between SL and LL areas. While there is a process for identifying the outer margins of SL areas as they correspond with the regulatory measures for Vegetated Corridors, delineating the boundary between ML and LL areas is a different matter. As further explained elsewhere in this chapter, the precise site-level distinctions between ML and LL areas are not critical for programmatic purposes. To begin with, the boundaries between ALP designations do not follow "site" boundaries from a development (i.e., conflicting use) standpoint. For development purposes, site boundaries are generally consistent with tax lot lines, which form the basis for articulating the limits of proposed development activity in nearly all cases. Individual development activities are expected to overlap ML and LL areas on a regular basis.

The general programmatic distinction between ML and LL areas is the availability of bonus flexibility in development regulations pertaining to site design, in exchange for resource benefits. For example, on-site density transfer, reduced setbacks, and below-minimum residential densities may be utilized by a property developer where special provisions are made to permanently preserve significant resource areas on a site. Provisions such as these are more likely to be useful if they are applied to the entire site, rather than a limited portion of a site, particularly in the urban area where most affected tax lots are of a relatively small scale. These provisions are intended to provide resource benefits, and it is appropriate for them to extend beyond the limits of streamside ML areas if opportunities exist to protect significant resource areas in this manner. It is therefore not important for local jurisdictions to adopt maps showing the precise extent of ML areas. The Basin ALP map recommended for adoption by Metro is sufficient to generally locate properties where the special provisions for design flexibility can be applied, as well as the adjacent LL inventory areas into which they may be extended.

C. Program Elements

The following provides more detail in describing salient Basin program elements. A comparative overview of the urban program is provided below in **Table 3-1**, Program Approach – Summary Table. This Table summarizes the program approach for each of the three program resource areas, in order to illustrate the relative distinctions among them. In general, the proposed program approach is most liberal in the Lightly Limit areas and most rigorous in Strictly Limit areas.

Traditionally, the practice of Goal 5 programming has involved land use planning and regulatory approaches to achieving administrative rule requirements. The Partners' approach is less traditional in that it provides a revenue basis for limiting impacts to significant resources. In addition, the proposed program incorporates existing regulatory procedures to address habitat

protection in core riparian areas. The program elements described in this chapter elaborate on the Partners' objective to provide development-related incentives for reducing resource impacts.

Table 3-1: Program Approach – Summary Table

	PROGRAM LIMIT DECISION		
	Lightly Limit	**Moderately Limit**	**Strictly Limit**
Goals:	▪ encourage minimizing impact through sensitive development and maintenance practices ▪ encourage and support preservation and enhancement of resource areas ▪ optional resource retention, where resources are present	▪ target and fund environmental projects for riparian system enhancement ▪ design flexibility for minimizing disturbance ▪ encourage minimizing impact through sensitive development and maintenance practices ▪ encourage and support preservation and enhancement of resource areas ▪ optional resource retention	▪ target and fund environmental projects for riparian system enhancement ▪ development generally not allowed ▪ development that is permitted must avoid or minimize disturbance of resource area ▪ require use of sensitive development and maintenance practices ▪ require enhancement of degraded resource areas
Approach:	▪ incentives to preserve and enhance vegetation ▪ technical assistance available to facilitate and encourage use of tools and incentives ▪ guidelines for LID and habitat sensitive green design approaches	▪ special development tools available to minimize potential resource disturbance area ▪ incentives to preserve and enhance vegetation via credit toward on-site storm water management requirements ▪ technical assistance available to facilitate and encourage use of tools and incentives ▪ guidelines for LID and habitat sensitive green design approaches	▪ development allowed in limited cases or under certain circumstances ▪ any permitted disturbance must be mitigated ▪ required enhancement of degraded resource areas within vegetated corridors ▪ technical assistance available to facilitate and encourage use of tools and incentives ▪ guidelines for LID and habitat sensitive green design approaches

ALP Designations

Strictly Limit (SL) Areas: In Strictly Limit areas, protection, conservation, enhancement and mitigation are required. Projects must be designed to avoid impacting Strictly Limit areas and may not encroach into these areas except under limited circumstances as provided for under CWS' Design & Construction Standards. (Examples of exceptions include one house on a lot that is entirely within a Vegetated Corridor area, and utility crossings). The use of land use tools, such as height and setback flexibility, would be supported in order to avoid or minimize the total disturbance area.

Moderately Limit (ML) Areas: Conservation and restoration will be encouraged in ML areas. Density reduction would be allowed provided conserved resource lands are permanently protected. Resources in ML areas would be targeted for restoration or enhancement projects.

Lightly Limit (LL) Areas: A Lightly Limit Program decision is applied to all remaining Goal 5 resource areas as well as to Impact Areas. The focus in Lightly Limit areas will be on education and incentives for the implementation of LID and green design approaches.

Impact Areas: The Goal 5 Administrative Rule requires that the ESEE address conflicting uses in impact areas. The March 2004 Tualatin Basin ESEE describes the approach to impact areas in detail, modified by the March 2005 addition to address Part Two of the Basin-Wide ESEE. The basin ESEE Report describes the Partners' approach to impact areas, which reflects a conviction that impacts to fish and wildlife habitat resources are not limited to areas immediately adjacent to the resource. Factors such as non-point source pollutants and hydrology have significant impacts on stream condition and water quality, and incremental impacts of development and increased impervious surfaces exacerbate these problems which, in turn, have a rippling effect on habitat quality throughout the basin's identified resource areas. The basin's urban program approach identifies the entire watershed as an impact area, and does not distinguish between Inner Impact Areas (which are based on Metro's definition for Impact Area) and Outer Impact Areas, which cover the remainder of the urban portion of the basin, from the standpoint of available program elements.

Overlap with Existing Floodplain and Local Goal 5 Programs

Goal 5 resource areas often correspond with areas already subject to regulation by cities and the District through floodplain, wetlands, tree protection ordinances and other existing Goal 5 programs. These existing regulations meet regional requirements under Metro's Title 3 provisions, as well as state and federal requirements to comply with the Clean Water Act. For these areas, existing regulatory programs such as local floodplain ordinances and wetland inventories, the District's Design & Construction Standards, and state/federal Removal and Fill permits would remain in place and the proposed Basin Goal 5 program would apply as well. For most cases, both sets of provisions would take effect; however, existing regulations would dominate where they are more restrictive. For example, an applicant may not be permitted to develop in a ML area if it also is within a floodplain and under a jurisdiction that restricts floodplain development.

Local floodplain and wetland ordinances vary to some degree by jurisdiction. For example, some cities actively manage development in the floodplain while others permit development in floodplain areas provided there is no decrease in flood water storage capacity as a result of the project (i.e., balanced cut and fill). This represents a circumstance where the proposed Goal 5 program provisions would add value to existing regulations because any development allowed in floodplain areas where a ML designations also applies would be allowed to incorporate a LID and/or density-reducing approach to the site design. This could effectively result in a more environmentally sensitive treatment of floodplain areas throughout the urban portion of the basin.

The District's requirements include the following:

- Preparation of a surveyed delineation and Natural Resource Assessment for evaluation of Vegetated Corridors adjacent to Sensitive Areas (defined as intermittent or perennial streams, the Tualatin River, wetlands and springs). A Natural Resource

Assessment (Site Analysis) may be required for site developments located within 200 feet of a Sensitive Area in order to obtain a Service Provider Letter from the agency.

- Revegetation of degraded and marginal condition Vegetated Corridor areas with native vegetation.
- Placement of areas adjacent to streams and wetlands in separate public easements or tracts.
- Other enhancement of Vegetated Corridors such as removal of invasive plants, in accordance with Design & Construction standards.
- Some buffer averaging is permitted.
- Very limited uses are allowed.
- Rules for erosion control and prevention.

Low Impact Development (LID) Guidelines

The proposed program encourages the use of environmentally sensitive site design practices throughout the watershed in order to reduce the impact of new development on fish and wildlife habitat in the basin and to aid in improving environmental quality. These design practices include a variety of techniques known collectively as Low Impact Development (LID).

Habitat Benefits: Low-impact stormwater management is a tool that can be used to limit development impacts on fish and wildlife habitat. These development impacts typically arise from altered hydrology and non-point source pollution to sensitive water bodies resulting from high levels of impervious surfaces.[1] The LID approach would encourage the retention of existing habitat resources on a given site because undeveloped resource areas would be factored into a site's EIA calculation and would be counted as unconnected impervious surface area (i.e., would help off-set the impact of the new development).

Stormwater Management Benefits: Urban imperviousness causes significant negative hydrologic impacts to habitat areas by way of increased stormwater flow rate and volume, resulting from decreased soil infiltration and plant uptake.[2] Low Impact Development techniques are a means by which proposed development projects can meet Clean Water Service's storm and surface water management requirements. The water quantity management component of the Healthy Streams Plan proposes revising water quantity design standards so that LID techniques may be utilized to meet these requirements in lieu of the traditional use of a detention facility.

Low Impact Development (LID) is a stormwater management strategy concerned with maintaining or restoring the natural hydrologic functions of a site designed to achieve natural resource protection objectives and fulfill environmental requirements. LID employs a variety of natural and built features that reduce the rate of runoff, filter out its pollutants, and facilitate the infiltration of water into the ground. By reducing water pollution and increasing groundwater recharge, LID helps to improve the quality of receiving surface waters and stabilize the flow rates of nearby streams. LID incorporates a set of overall site design strategies as well as highly localized, small-scale, decentralized source control techniques known as Integrated Management Practices (IMPs). IMPs may be integrated into buildings, infrastructure, or landscape design.

[1] Sherman, 2004.
[2] Sherman, 2004.

Rather than collecting runoff in piped or channelized networks and controlling the flow downstream in large stormwater management facilities, LID takes a decentralized approach that disperses flows and manages runoff closer to where it originates. Because LID embraces a variety of useful techniques for controlling runoff, designs can be customized according to resource protection goals, as well as site constraints. New projects, redevelopment projects, and capital improvement projects can all be viewed as candidates for implementation of LID techniques.

Typically, on-site runoff retention measures to meet hydrology impact requirements entail the construction of a detention basin. The proposed LID requirements would implement similar hydrologic performance standards on a given site through a design approach that incorporates conservation, storage, conveyance, landscaping and/or infiltration techniques to retain runoff on site. Features such as stormwater planters and bioswales in parking lots or adjacent to roads would be designed to balance out or reduce the effect of impervious area for a given development, thereby reducing the indirect, cumulative impact of urbanization on water quality and habitat resources in the basin. While hydrology requirements will continue to apply throughout the District service area, the use of LID techniques should be established as the preferred method of meeting those requirements.

It is intended that program implementation include the development of a model ordinance to address a menu of several applicable low impact development (LID) approaches and the inclusion of LID guidelines in local development codes. The program will also address removal of current impediments to the implementation of LID development techniques. As well, the permit process will be streamlined to allow beneficial activities, such as tree planting, resource enhancement, and removal of noxious plant species either "by-right" or through a relatively simple and low-cost administrative review process. Procedures relating to enhancement activities for improvement of resource conditions (including invasive species removal, revegetation, grading to create habitat or stabilize stream banks, large wood placement, and fish habitat improvements) that are consistent with the Healthy Streams Plan (and coordinated with the District) will be streamlined and subject to an administrative review only.

Note that for many if not most jurisdictions in the basin, removal of obstacles in existing regulations will be required in order to allow for an LID approach to meeting stormwater management requirements. Program development will include a review of the Audubon Society's Stormwater/Pavement Impacts Reduction (SPIR) report for identification of specific conflicts.

Reducing Effective Impervious Area (EIA): According to the July 2002 Draft of CWS' Tualatin Basin Effective Impervious Area Reduction Task Force Report:

> *In a simplified undisturbed hydrological cycle, precipitation falls from the sky, gets intercepted by vegetation, infiltrates into the rich duff layers of forests and prairies, recharges groundwater, and emerges in local streams and wetlands as base flow.*

In the typical urbanized landscape in Washington County, the amount of effective impervious area increases dramatically over pre-development conditions, and most storm water from this

urbanization is typically handled in a piped system. Impervious surfaces or "hardscapes" circumvent the natural hydrologic cycle and concentrate water into a piped stormwater system, which is composed of above ground retention ponds, detention basins, underground catch basins, pipes, curbs and gutters. Most stormwater controls currently in place are designed to quickly direct water away from the built environment (roads and buildings) and to prevent flooding, erosion and impacts to adjacent property. Impervious area that collects and drains the water directly to a stream or wetland system via pipes or sheet flow is considered "effective impervious area" (EIA) because it effectively drains the landscape. Impervious area that drains to landscaping, swales, parks, and other pervious areas is **not** considered EIA because the water infiltrates through the soil and into ground water, without a direct connection to the stream or wetland. The term EIA better describes urban hydrology and provides an objective measurement for management of stormwater from impervious areas.

Low Impact Development Applicability: As a key element of the proposed Basin Program, guidelines for the implementation of LID techniques will be developed and LID approaches will be encouraged in order to reduce the impacts of future development on environmental health. Program implementation will include the development of a model Low Impact Development ordinance for the Basin. This ordinance would be developed in cooperation with Clean Water Services ongoing efforts to update their stormwater management program.

Low Impact Development Techniques: It is anticipated that a model LID ordinance will provide incentives for the use of a variety of optional tools designed to reduce the total EIA of typical land development activities. A broad array of LID techniques (tools) are currently in use throughout the world. Many of these techniques can be applied to typical development here in the Pacific Northwest. Examples include:

1. **Landscaping**: Techniques can be employed that maximize effectiveness of runoff filtration and detention. This includes practices such as the use of compost at least twelve inches in depth and a multi-layered canopy in forested areas. Landscaping standards could be coordinated with the District's requirements for use of native species, as outlined in the Design & Construction standards. The program would also promote limited pesticide and herbicide use through property owner education and as a result of incorporating native species, which are more suitable as low-maintenance plantings. A requirement to incorporate predominantly native plants will augment the habitat benefits of this approach, and may decrease maintenance costs.

2. **Tree Canopy Preservation**: Tree canopy preservation and maintenance of native understory vegetation is recognized as an effective method of reducing EIA.

3. **Bioswales**: The creation of bioswales can improve water quality, help reduce EIA, and provide new habitat. Bioswales can be flexibly integrated into site design with a variety of alternative shapes and sizes. Rooftops, parking lots, decks, walkways and other impervious features can be designed to drain into bioswales. "Weepholes" in curbs can allow stormwater to drain into bioswales or other pervious landscape areas.

4. **Green Streets**: The term "Green Street" describes an alternative roadway design incorporating LID type stormwater treatments. Typical designs drain stormwater runoff from paved road surfaces through a bioswale within the right-of-way. The design of these bioswales includes vegetation that cleans the stormwater before it is allowed to infiltrate into the ground. For the proposed program, the "green streets" option could apply to either public or private streets or parking lots, where feasible.

   Note that there may be maintenance concerns related to green street design which will require further review and analysis prior to final implementation. Recently, a technical group from jurisdictions in the Tualatin Basin met as an advisory committee to discuss what types of changes or design parameters should be included if green street design options were to be included in local road design standards. There were a variety of concerns expressed by the group, including new and untested/unknown maintenance methods, concerns about areas that may not be appropriate for green streets such as steep slopes and aquifer protection areas, and that specific clay soil types that may not readily allow for infiltration of stormwater. The latter concern, however, can be overcome by sub-grade application of gravel and other soil amendments.

5. **Pervious Pavement**: Pervious pavements which soak up and infiltrate storm water may be applied in a variety of situations without conflicts with other standards (ADA). Some examples include pavers, porous asphalt or concrete, and grass paver systems.

6. **Eco-roofs and Disconnected Downspouts**: Eco-roofs are also known as green roofs, and include those planted with vegetation that absorbs rainfall, and are built to be pervious instead of impervious. Large roof areas drain acres of stormwater though downspouts, many of which are typically required to drain directly into the piped system in accord with local codes. There are several examples of eco-roofs in the Portland metropolitan area, including the Clean Water Services Field Operations Center on Merlo Road and the Multnomah County Building in southeast Portland. Rain gardens are areas designed to manage disconnected downspouts and allow slow filtration of stormwater runoff. For example, stormwater scuppers (which are openings at the side of a building for the drainage of water from the roof) can effectively drain a rooftop into stormwater gardens or planter boxes. Note that the use of the eco-roof option may be more appropriate for larger scale development, such as commercial, industrial and multi-family residential structures. Single family dwellings however, can also disconnect roof drains in order to reduce the effect of their impervious roof surfaces.

Administration: While there are clearly habitat benefits to the proposed program's LID component (particularly with regard to the use of native plantings and incentives to preserve tree canopy), the ELA reduction aspect helps implement the stormwater management element of Clean Water Services' Healthy Streams Plan and NPDES MS4 permit. The dispersion and detention of runoff on-site effectively mitigates concentrated flows and non-point source

pollution loads, which result in cleaner, more stable stream conditions. In addition, EIA reduction approaches result in increased volume and duration of summertime flows. In other words, reducing the volume and rate at which stormwater enters the surface management system more closely simulates the runoff performance of a less urbanized area, which in turn reduces impacts on basin fish and wildlife habitat areas.

As proposed in the HSP, the District's surface water management program will update the Design & Construction standards to include specifics on impervious area management and the LID approaches as described above, which can be used to achieve required EIA targets throughout the urban area. Local jurisdictions would adopt these standards by reference. In addition, the District is developing a template to facilitate and standardize data input for applicants to utilize in calculating increases in EIA. EIA targets would be determined by the District, and engineers with local jurisdictions would review for compliance.

Best Management Practices

Washington County's Best Management Practices for Roadway Operations (BMPRO) 2003 is the result of an analysis of roadway management activities and the integration of public works engineering with environmental sciences, and has been designed to for submittal to provide guidance to county employees in the effective operation of the roadway system. These practices are designed to maintain the functional integrity of the roadway system, to provide for public safety, to preserve critical habitat and to meet the specific requirements outlined by NOAA Fisheries for coverage under the Endangered Species Act (ESA) Section 4(d) rules for threatened salmon and steelhead species. BMPRO 2003 includes a description of roadway management activities along with a description of techniques to minimize or avoid actions that may cause harm to endangered fish species, resource waters or wildlife habitats.

The BMPRO 2003 program includes several goals that relate to the management of vegetation along county roadways. An important part of this Best Management Practices program is the research, development and implementation of an Integrated Vegetation Management Program (IVMP) that will provide for an appropriate balance between conflicting uses such as maintenance practices and the basin's diverse natural environments. The IVMP incorporates multiple methods of vegetation management to achieve goals for public safety, cooperation with neighbors, environmental protection, and operational effectiveness.

Administration and Procedures

Because of the overlapping nature of Goal 5 resource areas with those managed by Clean Water Services, the program concepts outlined in this report will require District-jurisdictional coordination of proposed development activities. It is logical to accomplish this through the expansion of existing procedures. Although the details of program administration cannot be well articulated until after the program is more fully developed, below are some preliminary thoughts about how they might operate.

The aim of this expanded review process would be to provide technical assistance to property owners and developers regarding the implementation of special development provisions and site design techniques for minimizing impacts to habitat resources. The intention would be to explore site design alternatives and regulatory flexibility to achieve balanced results. Local

government and development interests would be best addressed through a process that involves District participation and technical assistance at an early stage in the development review process, such as through the service provider letter process, when site designs are typically in a preliminary phase. Current review practices require applicants for development proposals on property near WQSAs to obtain a service provider letter from the District.

For development sites that also include ML Goal 5 overlays, the proposed program provides for technical assistance to explore potential site design solutions that would conserve and/or protect sensitive habitat areas. However, this represents an expansion of District responsibilities and would likely require funding for the District to support additional staffing, or a fee assessment for the service provided that could cover added staffing costs. Alternatively, the cities and the county may wish to collectively subsidize a shared staff person who has land use planning and ecological expertise. Ideally, Goal 5 technical review staff would be housed within the District and would be familiar with the Design & Construction standards, but funded by the local jurisdictions. This would allow for the most efficient, simultaneous provision of resource area design assistance and vegetated corridor review.

Inventory Maintenance

Development activities in the basin will result in adjustments to inventoried resource areas. For instance, some areas that are set aside in tracts or easements via the development review process may be re-assigned with a SL program determination, while resource areas that are encroached upon through the development review process may garner a reduced inventory score or removal from the inventory. In addition, newly mitigated or enhanced areas will create fish and wildlife habitat where it may not have existed previously. To adjust for these modifications over time, the program will include the development of an inventory maintenance process, to be coordinated with Metro. Metro staff have noted the logic in having a centralized venue for processing these adjustments, particularly because of the regional nature of the inventory. Further, having Metro oversee the adjustments is appropriate because they developed the inventory scoring methodology and, therefore, can continue to apply it consistently to areas that require re-evaluation. As the details of the basin's program are developed, consideration will be given to a notice procedure that would keep Metro informed of inventory adjustments as they occur as a result of development, mitigation and enhancement activities. The TBNRCC may also be periodically apprised of basin-wide inventory adjustments resulting from development and enhancement activities.

Proposed Tualatin Basin Goal 5 Program Overview

DRAFT

MAJOR PROGRAM COMPONENTS

REVENUE — SOURCES

SWM fee portion	- coordinate with CWS HSP - $95M over 20 years - implementation of targeted tasks - adaptive management plan
CAPITAL IMPROVEMENTS	- focus on SL and ML areas - culvert replacements - outfall retrofits - riparian enhancement - tree planting challenge (partnerships)
	some SWM funding also applicable to VOLUNTARY efforts
Metro bond measure	- anticipated for November 2006 vote - potential funding for regionally significant acquisitions
Future Considerations	- other local revenue options - grants

REGULATORY — APPLICABILITY

BASIN-WIDE	Road Projects	Best Management Practices for ESA compliance: - Washington County BMPRO 2003, adopted September 2004 - opportunities for additional local programs (cities)
	CWS stormwater management program	- program to be updated for spring 2006 - incentive to implement green development approaches
RURAL	Within inventoried areas (one-mile UGB buffer)	- will coordinate with Metro to re-evaluate these areas as future UGB expansions occur - comply with Title 11 of Metro UGMFP - concept planning for new urban land
	Beyond inventoried area	- existing county Goal 5 program continues to apply
URBAN	ALP LIMIT LEVEL DETERMINATION: STRICTLY LIMIT: protection, conservation, enhancement and mitigation required	Consistent with CWS existing Design & Construction Standards for WQSAs and Vegetated Corridors (clear and objective standards) STANDARDS: - includes measures that extend beyond Metro's existing Title 3 UGMFP requirements - no development of WQSAs, including wetlands and stream corridors (with exceptions) - riparian buffers required (i.e., Vegetated Corridors) - nearby development triggers enhancement of degraded vegetated buffer areas (average 50' widths) - limited development of floodplain areas - 125-ft. buffers for Tualatin River EXCEPTIONS: - DSL-approved projects are permitted - local programs may be more restrictive about development of wetland and floodplain areas - downtown Tualatin and central Beaverton Title 3 exempt areas

VOLUNTARY — CATEGORIES

DEVELOPMENT RELATED

ALP LIMIT LEVEL DETERMINATION: MODERATELY LIMIT: conservation and restoration encouraged	RIPARIAN	- target areas for restoration and enhancement projects - allow flexibility in development approaches - includes remainder of Metro Class I/II inventory areas - CWS standards still apply within Vegetated Corridor areas - existing local Goal 5 programs will continue to apply DEVELOPMENT OPTIONS to MINIMIZE IMPACTS: - decreased density, provided conserved resource area is permanently protected - clustering/reduced setbacks - on-site density transfers - guidelines for LID/green design approaches - technical assistance
LIGHTLY LIMIT: focus on education and incentives	UPLANDS	- possible future ML designation of significant resources, to be determined - possible future acquisition of significant sites, to be determined
	REMAINDER OF URBAN AREA	- includes balance of Metro resource inventory area
		DEVELOPMENT OPTIONS to MINIMIZE IMPACTS: - technical assistance - guidelines for LID/green design approaches - local tree ordinance may apply - some areas already protected as parks and open space - CWS standards still apply within Vegetated Corridor areas - existing local Goal 5 programs will continue to apply

NON-DEVELOPMENT RELATED

PRIVATELY-OWNED PROPERTY and BASIN-WIDE EFFORTS	- education and outreach - stewardship recognition - explore local implementation of available tax incentive programs - partnering with environmental community - promote and support volunteer activities - CWS property owner partnerships to support riparian corridor conservation

ADMINISTRATION and MONITORING — LEVEL

REGIONAL — METRO	- coordination to provide data for regional monitoring activities and updates to regional resource inventory
LOCAL — TBNRCC	- extend Formation Agreement (which includes ex-officio Metro membership) - coordinate with CWS on implementing HSP program objectives - continued involvement in decision-making and project coordination
CWS	- continuous monitoring activities in place for DEQ permit purposes - planned re-sampling of Watersheds 2000 stream data (every 5 years)

acronyms:

BMPRO: Best Management Practices for Roadway Operations
CWS: Clean Water Services
DEQ: Department of Environmental Quality
DSL: Division of State Lands
HSP: Healthy Streams Plan
LID: low impact development
ML: Moderately Limit
SL: Strictly Limit
SWM: surface water management
TBNRCC: Tualatin Basin Natural Resources Coordinating Committee
UGB: Urban Growth Boundary
UGMFP: Urban Growth Management Functional Plan
WQSA: Water Quality Sensitive Area

3/23/05

CHAPTER 4 RURAL PROGRAM ELEMENTS

A. Applicability

The program elements described in this chapter apply to that portion of the Tualatin Basin in rural Washington County, outside of existing UGB. This includes the Non-Urban (NU) conflicting use category addressed in the Basin ESEE Analysis (basically consisting of the Metro study area extending approximately one mile beyond their jurisdictional boundary) and the remainder of the county that extends beyond the study area. The Basin study area includes new Goal 5 resource inventory data provided by Metro. While there is no new inventory data for the outlying rural portion of the county, the county will continue to implement its existing, acknowledged Goal 5 program in that area. In addition, the Basin program proposes to augment the existing program as described below.

B. Rural Elements of the Proposed Basin Goal 5 Program

The rural element of the proposed Basin program is addressed in two parts based upon the geographic area covered. Each of these is described in general terms below.

Within Metro Study Area

As mentioned above, the NU conflicting use category lands fall within the study area for the Metro resource inventory and generally extend approximately one mile beyond the Metro jurisdictional boundary. The program recommendations for this area focus on targeting high-value, regionally significant resources for restoration, enhancement and/or acquisition. The following program directions will apply to rural lands within the Metro inventory area:

For all areas within the one-mile buffer, including those with Moderately Limit and Lightly Limit ALP designations, the urban program applications proposed for resource areas will be applied as appropriate for rural development. These include the following:

- continued application of regulatory requirements of the Rural/Natural Resources element of the Washington County Comprehensive Plan, including Significant Natural Resources overlays and related standards;
- potential re-evaluation of resources in areas subject to future UGB expansions (coordination with Metro through Title 11 concept planning provisions);
- support of CWS Enhanced CREP (Conservation Reserve Enhancement Program) efforts;
- continued state oversight of standards applicable under the Oregon Forest Practices Act;
- continued state oversight of standards applicable under regulations administered by the Oregon Department of Agriculture;
- continued state oversight of water quality standards administered by the Oregon Department of Environmental Quality; and
- the implementation of the county's Best Management Practices for Roadway Operations and associated Integrated Vegetation Management Program for ESA compliance (described in chapter 3 of this report).

In the working landscapes of rural Washington County, agricultural and forestry practices near streams may have a much greater impact on water resources than rural residential development activities. However, the county does not have land use authority over farm and forest practices,

which fall under the auspices of the state departments of Agriculture and Forestry, respectively. Thus, the existing land use regulatory program (and any proposed program) will continue to be limited in applicability to non-farm and non-forest activities only.

For those areas within the one-mile buffer portion of the study area that are identified as regionally significant Class I & II Riparian resources (and thus feature a Moderately Limit ALP designation), the following additional program activities are proposed:

- identification of target areas for restoration and enhancement projects; and
- identification of target areas for future acquisition opportunities (willing seller).

The combined effect of these efforts will contribute to the improvement of basin environmental health by targeting concerns in key urban fringe areas.

Beyond Metro Study Area

The proposed Basin program also includes measures to enhance the county's existing rural Goal 5 program beyond the basin study area. In this area, the County has identified significant Goal 5 resource areas on the Rural/Natural Resources Map Element of its Comprehensive Plan. The following program directions will apply to rural lands in this area:

- continued application of regulatory requirements of the Rural/Natural Resources element of the Washington County Comprehensive Plan, including Significant Natural Resources overlays and related standards;
- support of CWS Enhanced CREP (Conservation Reserve Enhancement Program) efforts;
- continued state oversight of standards applicable under the Oregon Forest Practices Act;
- continued state oversight of standards applicable under regulations administered by the Oregon Department of Agriculture; and
- the implementation of the county's Best Management Practices for Roadway operations and associated Integrated Vegetation Management Program for ESA compliance (described in chapter 3 of this report).

C. Enhancement of Existing Rural Goal 5 Program

Washington County regulates development activity in all rural areas within its jurisdiction and has had a Goal 5 program in place for areas outside the Urban Growth Boundary since 1986. Currently, for lands outside the UGB pursuant to Community Development Code (CDC) Section 421 (Floodplain and Drainage Hazard Areas) and CDC Section 422 (Significant Natural Resources), Washington County regulates the area within 125 feet of a stream. In order to develop within this area, applicants must submit the following:

- Peak volume/velocity hydrology report for designated drainage hazard areas; and
- Habitat report for significant natural resource areas.

The standards of Section 422 allow for resource encroachment with a finding that the development "will not seriously interfere with preservation" of habitat. These standards, while not as rigorous as the Clean Water Services' Vegetated Corridor standards, do provide water resource and habitat benefits to rural stream corridors. Section 421 outlines standards that generally regulate development within 125 feet of a stream where they are applicable. However, these standards only regulate from a flood or drainage hazard perspective, and thus do not apply to all rural stream corridors.

Other Program Opportunities

In the working landscapes of rural Washington County, agricultural and forestry practices near streams can, and often do, have a much greater impact on water resources than rural residential development activities. Proper management of streamside vegetation and channel morphology can lead to significant improvements in both water and biological quality of streams (Johnson and Ryba, 1992). Working with the Department of Forestry on a process for review and input into forestry practices could help reduce problems caused by streamside logging activities. Working in partnership with the agricultural community to fund and implement streamside management agreements that support improvements such as livestock fencing and revegetation could also help improve stream health. Cooperative agreements and funding for improvement of stream health in farm and forestry areas would likely have a very positive impact on resource quality and quantity.

Clean Water Services is currently engaged in program efforts to work cooperatively with willing rural land owners on critical water quality issues such as livestock in streams and the clear-cutting of headwaters. There are additional positive, incentive-based efforts being made by the Soil and Water Conservation Districts and non-profit organizations to encourage more water and wildlife friendly land management practices.

Recognizing the limitations imposed by state-assumed regulation of farm and forest practices and in lieu of adopting new regulatory standards, it is recommended that the county, consider a process to identify the following:

- opportunities to work with the state departments of Agriculture and Forestry to reduce impacts to potentially sensitive habitat areas located on agricultural and forest lands; and
- other program elements that will serve to protect riparian and wildlife resources indirectly.

Minimum Stream Buffer Areas

It is well documented that vegetated stream buffers offer a variety of ecosystem benefits including: stream bank stability, erosion management, pollutant filtering, microclimate moderation, fish and wildlife habitat, and storm water attenuation (Johnson and Ryba, 1992). The ecosystem benefits of stream buffers occur both inside and outside the urban growth boundary; data from Watersheds 2000 study of Tualatin Basin streams generally suggests overall stream health rankings improve with increasing streamside buffer width and decreasing presence of non-native vegetation (Figures 5-1 a-b). Ecological investigations of riparian corridors have demonstrated they are a key landscape feature with substantial influence on environmental vitality (Naiman et al., 1993). The issue of how best to protect riparian corridors in the rural area should therefore be addressed as recommended above during Program implementation.

Additional program efforts that may be considered include:

- Opting back into the Wildlife Habitat Conservation and Management Program (supported by the Department of Agriculture and Department of Forestry). In addition to the political concerns, there are economic considerations associated with increasing regulatory buffers for rural residential owners. If the property owner chooses to dedicate a conservation easement over certain portions of its property for water and wildlife habitat, any existing regulation will diminish the value of the conservation easement. This

will negatively impact the property owner in terms of income and property tax benefits of a conservation easement donation; the buffer regulation thus becomes a disincentive to a long-term protection strategy.

Washington County has chosen to opt out of the Wildlife Habitat Conservation and Management program that allows conservation easement areas on farm and forestry parcels to still be taxed as farm and forestry use. This implementing legislation has since been revised. The County may reconsider its position regarding the revised tax program in order to remove the disincentive surrounding farm and forestry use land tax conversion that results when a conservation easement is put in place. For rural residential owners, the implementation and expansion of the Riparian Tax Credit program could provide the incentive needed for enhanced near stream resource management, without regulation.

- Coordination with Clean Water Services and the Department of Forestry to develop and implement a memorandum of understanding designed to minimize pre-emptive clear cutting of near stream areas on the urban fringe and in headwater areas.

- Continued implementation and enforcement of current floodplain balance cut and fill and drainage hazard area regulations.

- Coordination with local partners to provide necessary funding to acquire and maintain conservation easements on critical habitat lands.

- Support for the implementation of the Riparian Tax Credit program throughout the County.

CHAPTER 5 NON-REGULATORY PROGRAM OPTIONS

A. Overview

The Tualatin Basin Goal 5 Program is built upon three pillars: **revenue** for capital improvements, **regulations** to protect the health of riparian corridors (Clean Water Services' Vegetated Corridors) and **voluntary efforts;** together these components will improve the environmental health of the Basin. This chapter explains the voluntary aspects of the Basin Program, which will be further developed during the program implementation phase. It notes the potential effectiveness of these efforts, their costs, and the partners who will help implement them. These efforts will educate Tualatin Basin commercial interests and residents to a higher level of awareness of the environmental effects of their actions. The efforts will be coordinated Basin-wide in order to make the most of each partners' resources.

Partners will be chosen that have already established trusted local reputations in the field of environmental enhancement and protection. Costs will be rated high if they include granting funds; medium if they include dedicated staff; and low if they include materials only with some staff time. (A summary is provided at the end of this chapter in Table 5-2.) Funding for public awareness and educational purposes will come from a variety of sources including, but not limited to, Metro's forthcoming Nature in the Neighborhoods bond measure, Clean Water Services educational programs and resources from local jurisdictions.

In order to understand these voluntary efforts, it is first important to understand the term "**limit**" as it is used in various ways throughout the Basin program. The programmatic requirement in **Strictly Limit (SL)** areas is for protection and conservation of resources. These areas are predominantly consistent with the limits of Clean Water Services Water Quality Sensitive Areas and associated Vegetated Corridors (generally 50' buffers along streams and 125' buffers along the Tualatin River). With few exceptions, development is not allowed in SL areas. For the most part, the non-regulatory program measures described in this chapter are not targeted at SL areas, which are the focus of the proposed program's regulatory component.

The **Moderately Limit (ML)** designation generally applies to Class I and II Riparian Resource areas beyond the Vegetated Corridor boundaries. In areas identified as ML, conservation and restoration is encouraged, and the revenue tools the Basin has at its disposal will be directed to help make such conservation and restoration happen. The **Lightly Limit (LL)** designation applies to the remainder of the Tualatin Basin. The term does NOT mean that new regulations are in place in these areas. It does mean that the Basin Partners recognize that the health of our environment should not rest solely on streamside property owners. Thus education and incentives will be offered to everyone.

With these definitions in mind, voluntary efforts are divided into two categories: development-related and non-development related. These are described below.

B. Development-Related Options

Development-related efforts for riparian areas with ML designations include targeting revenue to extend **restoration and enhancement** projects into these areas. The agents will be governmental or private, and the properties could be public or private. Such restoration grants will come with provisos that mandate future protection. They will go to developers in return for habitat restoration in concert with habitat-friendly development. Such grants will encourage innovative practices and increase the effectiveness of regulations. Tree planting and preservation will be especially encouraged. Grants will also go to public works agencies to help build and maintain better wildlife crossings and culverts.

Effective restoration work will require a trained and experienced staff with monitoring capability. Maintenance and monitoring of restoration sites over time will be needed for effective long-term restoration. Possible partners will be Clean Water Services, the Tualatin River Watershed Council, Wetlands Conservancy and Cities.

Cost of restoration varies based on type and quality of habitat. Current Metro projects range from $1,800-3,500 per acre; removal of one small dam, for example, would cost approximately $80,000. The cost of restoration grants/activities will be medium to high. For example, $100,000 will fund:

- ten small restoration grants for residential or business owners, OR
- two habitat friendly development/redevelopment grants, OR
- one grant for a wildlife crossing/culvert replacement project

Clean Water Services reports that costs for tree planting are highly variable depending on the condition of the site, the availability of plant stock and water to irrigate, whether contract laborers, staff or volunteers do the work, etc. However, a rule of thumb might be drawn from their recently adopted rates for mitigation of vegetated corridors. An excerpt from the R&O is provided below:

Table 5-1: Vegetated Corridor Payment

Square Footage to be Mitigated	Cost Per Square Foot
1 – 5,000 sq. ft.	$8.66
5,001 – 10,000 sq. ft	$4.33
10,001 – 20,000 sq. ft.	$2.22
20,001 – 40,000 sq. ft.	$1.11
Over 40,000 sq. ft.	$0.55

The Basin partners will also work to allow much more **flexibility in development approaches** on these lands, including options for decreased density, for clustering development and/or reducing setbacks, and for making on-site density transfers. Most importantly, Washington County will work to create a **model Low-Impact Development (LID) ordinance** which local governments can adopt to streamline regulations to encourage environmentally friendly "green" building practices. The county and the Basin Partners will also work together to remove barriers in existing codes that represent barriers to the

implementation of LID practices. An example will be removing the obligation to construct a storm water piping system where a developer alternatively opts to build a storm water management system that utilizes vegetated swales and other biofiltration techniques to slow the flow of runoff and increase site permeability. Educational efforts will not be sufficient to implement Low-Impact Development to its greatest practical extent; removing regulatory barriers to LID is key. Clean Water Services has agreed to support this effort and, in fact, CWS is currently funding a study to improve hydrologic modeling that could encourage the more effective use of LID techniques.

What about **upland habitat** (significant stands of trees)? Such natural resources treasures are not covered by the SL/Vegetated Corridor regulations. However, they are mapped as areas for possible future acquisition. This approach stresses that in ML areas, revenue sources (including possible use of park district SDC's) are most important. Some of the inventoried upland habitat areas are already protected as parks and open space. In addition, local tree ordinances (where applicable) and local Goal 5 programs that exceed the Basin's proposed program will continue to apply.

Beyond the ML resource lands, in areas with a LL designation, the proposed Basin Approach provides that a program of education and incentives will guide **all** development throughout our urban areas. Besides offering guidelines for LID and green design approaches, this will include a **technical assistance** program. Technical Assistance entails dedicating staff to give direct help to property owners, businesses and developers, one-on-one or in groups with workshops, seminars, etc. Such staff will be particularly useful during preliminary development stages by helping applicants understand the range of flexible site design measures and how they can be implemented to effectively conserve the most valuable resource areas on site. In many cases an applicant will be able to receive "credit" toward stormwater management requirements through the appropriate use of vegetation on site. Technical assistance staff will also develop and distribute habitat restoration/protection/ enhancement literature, including habitat-friendly development and green business practice manuals, web sites, etc. They will help make native plants more widely valued and available.

An example of a program effort that will reduce costs and that will benefit private property owners is supplying free or low-cost native plants and trees for planting during habitat restoration/reforestation, protection and enhancement. The nature of much of this technical assistance work is a natural extension of Clean Water Services' development review process for Water Quality Sensitive Areas. Accordingly, it seems logical that technical assistance will be provided through the addition of personnel at CWS (as described in Chapter 3 of this report). This technical assistance staff would be available to help city and county staffs assist property owners, including help in compliance with the Vegetated Corridor regulations. They could help private landowners develop a Habitat Protection Plan for their individual properties. The success of this option will depend on the level of partner commitment and the longevity of the program. It will be helpful in supporting many of the other options, such as the stewardship and grants programs. It will increase the effectiveness of the regulatory program. Partners might be a consortium of local governments and agencies, including the Wetlands Conservancy. This option will be staff intensive; the staff will have to be technically proficient, and a high staff-to-client ratio will be desirable. Thus the cost will be medium.

C. Non-Development-Related Options

With regard to non-development related voluntary efforts, some will apply on a case-by-case basis to **private property owners**. These will include **education and outreach, stewardship recognition** and exploring local implementation of available **tax incentive** programs.

Education and outreach for property owners to help them properly manage the habitat land they own could include brochures, newsletters, web sites, even a telephone hot line to help owners maintain and enhance natural resource lands on their property. Developers will be further enlightened as to the economic benefits of sustainable site design and low-impact development (LID). Education will also include helping schools develop and implement curricula. This will have to be a long-term effort, as a long-term commitment is required to change behaviors and practices. Over time, a well-crafted education program can reach a large number of people and have a significant social effect (examples: campaigns against litter and for recycling).

Possible partners include organizations that provide habitat-oriented classes, such as naturescaping and natural gardening. Clean Water Services, the Tualatin River Watershed Council, the Tualatin Basin Public Awareness Committee (TB PAC), the Audubon Society of Portland and the Tualatin Riverkeepers (TRK) are prime examples. Working together with many natural resource partners will provide a consistent message and economy of scale throughout the Basin. Costs will be low to medium.

TB PAC is presently drawing up a proposal for Naturescaping classes that will be a paradigm for this option. CWS reports that its most recent venture at bringing naturescaping to the Tualatin Basin priced out at $900 per class, which assumes free meeting rooms, reproduction of materials, and snacks to be provided by a host jurisdiction. A good target attendance is thirty-five persons per class. Metro's existing environmental education program in the Parks & Greenspaces Department costs $245,000 per year.

Stewardship recognition will involve voluntary agreements set up with property owners or even entire neighborhoods that agree to restore, protect, and maintain their habitat according to best management practices. Stewards will be private landowners, or developers or businesses acting in a habitat-friendly manner. They will be recognized publicly for their achievements, culminating in annual awards and special ceremonies.

This option relies on willing participants. It will be more effective with long-term monitoring, and when coupled with grants and technical assistance to encourage more successful projects. Possible partners might be Clean Water Services, the Tualatin River Watershed Council, the Tualatin Basin PAC, the Audubon Society of Portland and the Tualatin Riverkeepers. Cost will be low to medium.

Tax incentive programs already exist under Oregon state law: the Riparian Lands Tax Incentive Program and the Wildlife Habitat Conservation Management Program. These

programs reduce property taxes or provide a credit to streamside property owners who sign management agreements or easements that result in preservation of enhancement of healthy riparian areas. Thus far there is a limited landowner enrollment in these programs, which may be due to the lack of enabling local ordinances. This issue needs more study. We will make options available for property owners to sign up for programs that reduce their property taxes or provide credit to streamside property owners. These do require ongoing management with the Oregon Department of Fish and Wildlife, and landowners can opt out of the program simply by paying the withheld taxes.

As counties are the agents of these state programs, a possible partner will be Washington County. The cost will be low to medium. Costs include lost property taxes, administrative costs, potential restoration costs, approval of habitat management plans. A related option might be for fee reductions on the part of Clean Water Services and the other jurisdictions in Washington County in return for a property owner providing certain benefits to the stream system. Note that Clean Water services already is engaging in effective property owner partnerships (i.e. the Enhanced CREP program) to support riparian corridor conservation in agricultural areas outside the UGB.

Other non-development related voluntary efforts will be applied **Basin-wide**. These will include similar education and outreach as described above. Public works agencies are already gearing up to educate staff in environmental **best management practices**. Washington County has recently appointed a Senior Environmental Resource Specialist, heading up their recently formed Environmental Services section, whose job is making sure road maintenance activities protect the environment. Her first goal is to make sure all road workers are trained in the county's Best Management Practices (BMPs) for Routine Road Maintenance that were adopted by the Board of County Commissioners in September 2004. She is developing a training program and field manual to increase workers' awareness of the impact of their activities. She also plans to implement a monitoring program to ensure the BMPs are effective. A fish passage barrier assessment is one of her longer-term goals. She intends to identify opportunities to partner with other agencies and find funding to remove fish barriers associated with the county's roadway system. Being a more proactive voice for the transportation industry in setting state environmental policy is also on her list of things to do. The county's BMPs are available online: www.co.washington.or.us/limit10.

Basin-wide voluntary efforts will also mean extensive partnering with the environmental community, promoting and supporting their **volunteer activities**, focused on restoration of significant habitat areas. Substantial restoration work is already being conducted in the Basin with volunteer efforts; the program will augment them with new financial resources, volunteer training, etc. For example, more "Watershed Wagons" will be purchased and outfitted with naturescaping tools.

This option will be more successful on public than private land. Partners will include SOLV, various Friends groups, the Tualatin River Watershed Council, the Audubon Society of Portland, Tualatin Riverkeepers and the Tualatin Basin PAC. More "Friends" groups will be encouraged and supported to form. The cost will be low to medium. One example is SOLV's

"Team Up for Watershed Health" program. Metro's existing volunteer coordination program (Greenspaces) costs $136,000 per year.

For more than 15 years, Clean Water Services has made a priority of public education and has developed and shared numerous and diverse, award-winning public information, awareness and outreach programs, including:

- Facility Tours open to the public at the Durham Facility and available on request throughout the year to students, visiting dignitaries, etc. Tours are advertised in local newspapers and invitations are mailed to facility neighbors, community groups and elected officials.
- Facility Brochures describe the Durham and Rock Creek Facilities, the wastewater treatment process, and technical details.
- Tualatin River Rangers Classroom Presentations teach children the wastewater treatment process and how they can protect water resources; employees present classes to up to 5,000 fourth graders annually and the program is marketed to other facilities throughout the U. S.
- Videos/DVDs have been produced by the District on several topics, with the most recent being the award-winning Tualatin: *A Watershed Restored and Wild by Design: Restoring Urban Steams & Wetlands.*
- Exhibitor at Community Events including Washington County Fair, Tualatin Crawfish Festival, Earth Day at the Nature Park, Public Works Fair, Tigard Balloon Festival, Tualatin Riverkeepers Discovery Day, Hillsboro Fourth of July Parade, Beaverton Summerfest and more creates an opportunity for staff to share information with thousands of residents, informing them of about the facilities and how to protecting water resources.
- Regional Coalition for Clean Rivers and Streams is one of many partnerships by which Clean Water Services has leveraged public education resources to develop and distribute information more effectively. A charter member of the Coalition (Portland, Gresham, Clackamas County, Clean Water Services, Metro, City of Vancouver, Clark County, and other metropolitan governments), Clean Water Services' contribution to a $60,000 transit and print advertising campaign in 2004 was $17,000. The 2004 Campaign was *"Is Your Lawn Chemical Free?"*
- *Go Native* Campaign provides a link to the District's web site and native plant line to request a free Gardening with Native Plants poster. In one year, there were nearly 7500 requests for the posters.
- Stream and River Clean Up and Restoration Events on the Tualatin River and its tributaries regularly benefit from District financial support and technical expertise. In 2004, 2,180 volunteers planted 8,290 native trees and shrubs at District stream and wetland sites; 90,000 pounds of invasive plants were removed, and volunteers clocked 6,540 hours on planting restoration.
- Community Based Restoration Projects receive funding, technical assistance, plants and other support. Last year, the Division coordinated six Home Owners Association volunteer projects, two school enhancement projects, two church/Eagle Scout projects, and eight stream enhancements at over 20 sites.

- Tualatin Basin Public Awareness Committee (TB PAC) is comprised of partner cities and stakeholder groups to do public education and outreach as a combined effort. In the past ten years, they have installed more than 800 signs on stream crossings, developed brochures and informational materials, sponsored a movie theater ad campaign, festivals, and a bilingual project to promote water quality awareness. In the past year they gave monetary support for Tualatin River Discovery Day, watershed education performances and *Naturescaping for Clean Rivers* classes.
- *Watershed Wagon* is a 14-foot enclosed trailer equipped with tools and equipment for stream restorations that has helped staff and volunteers focus on projects rather than gathering equipment and supplies. Since March 2001 it has aided community groups in over 88 stream restoration projects.
- Community Best Management Practices Cooperative Funding program established in 1996 by the District's Public Affairs and Watershed Management programs provides technical and organizational support for community water quality projects. In 2004, key support included $1,500 for the Children's Clean Water Festival; $1,000 for the Tualatin Riverkeepers annual Discovery Day, $2,500 for Jackson Bottom Wetlands Preserve *Tweet of Dreams* fund-raiser; $100 to the River Network; $1,100 for the Audubon Society annual dinner; funding to sustain a native plant nursery at Fernhill Wetlands, and support for stream enhancement projects by providing drop boxes for debris and invasive nonnative plants removed by volunteers.
- *Fats, Oils and Grease Campaign: Gravy, cooking oil, shortening, and sauces, oh my!* The battle of the bulge isn't just at our waistline; it's in our sewers causing clogs and messy overflows. To combat the fatty enemies, the *Freeze the Grease, Save the Drain!* campaign was jointly developed in November 2004 by the City of Portland Bureau of Environmental Services, Clackamas County Water Environment Services, City of Gresham and Clean Water Services. Radio and newspaper ads ran over a three-week period that encouraged residents to call and request a free kit which included a pan scraper, can lid, and a step-by-step informational bookmark in Spanish and English. More than 1,500 callers have responded to date, ready to take part in the fat-free sewer regime.

Other District ongoing public education activities include:

- Information Brochures and Booklets
- "Clean Water Starts at Home" Website
- Billing Inserts, Bookmarks, Door hangers
- Leaf Pick Up Program
- Household Hazardous Waste Disposal Events
- Eco-Logical Business Certification
- Clean Water Action Day
- "Dump No Waste, Drains to Stream" storm drain stenciling
- Customer Awareness and Satisfaction Survey
- Stream Friends Support
- Tualatin Watershed Enhancement Coalition
- Streamside Owner Direct Mail
- Mercury Awareness Campaign

Under the Basin's proposed Goal 5 program and with the on-going guidance of the Tualatin Basin Natural Resources Coordinating Committee, such efforts will gather force and continue. All these voluntary paths, taken together, will help achieve the goal of improving the environmental health of the Tualatin Basin.

Table 5-2: Summary of Non-Regulatory Measures

Option	Cost	Partners
1) Acquisition	High	Governments at the local, regional, state or federal level; nonprofit agencies such as the Wetlands Conservancy
2) Education	Low to medium	District, TRWC, TB PAC, Audubon Portland, TRK
3) Recognition	Low to medium	District, TRWC, TB PAC, Audubon Portland, TRK
4) Restoration grants	Medium to high	District, TRWC, TRK, Wetlands Conservancy
5) Reduction in property taxes	Low to medium	Washington County
6) Technical assistance	Medium	Consortium of local governments and agencies such as the Wetlands Conservancy
7) Volunteer support	Low to medium	SOLV, Friends groups, TRWC, Audubon Portland, TRK, TB PAC.

CHAPTER 6 PROGRAM RESPONSE TO ENVIRONMENTAL HEALTH

A. Introduction

The Intergovernmental Agreement (IGA) between the Tualatin Basin Natural Resources Coordinating Committee (TBNRCC) and Metro describes the goals the Basin must strive to achieve. The overriding goal of the Basin Approach is taken from Metro's Streamside CPR Program Outline "Vision Statement," which states:

> *The overall goal is to conserve, protect and restore a continuous ecologically viable stream-side corridor system, from the stream's headwaters to their confluence with other streams and rivers, and with their floodplains in a manner that is integrated with the surrounding urban landscape. This system will be achieved through conservation, protection and appropriate restoration of stream-side corridors through time.*

In order to achieve this goal (and to provide further definition), the IGA also identifies improvement of the environmental health of each of the eleven regional sites and the entire Tualatin Basin as a primary objective. This chapter describes how the following program components function to achieve this goal relative to the current condition of the Basin.

B. Summary of Key Elements of Proposed Program Components

As described in Chapter 3, the overarching structure of the proposed program consists of four major components: revenue, regulations, voluntary or non-regulatory, and monitoring. The following key elements of program components are described in more detail elsewhere in this report.

Revenue Component:

1. $95 Million in Healthy Streams Plan recommended capital improvements (ranging from $3.5-$6.5 million per year over the next twenty years) will be focused in areas of highest resource quality. Typical projects will include:
   - community tree planting
   - riparian corridor restoration and enhancements
   - culvert replacements
   - stormwater outfall retrofits
   - flow restoration;
2. Regional Bond Measure providing funding for site acquisition and preservation; and
3. Other potential funding alternatives (including grants, local bond measures, opportunities for park SDCs, etc.) – may be utilized for education, restoration and enhancement or acquisition.

Regulatory Component:

1. Existing Clean Water Services Design & Construction Standards:
   - development related activity restrictions in Water Quality Sensitive Areas (wetlands, springs, streams, and the Tualatin River) and their associated Vegetated Corridor areas. (Vegetated Corridors average approximately 50 feet and range up to 200 feet depending on resource type and size, drainage area, slope, and site conditions.)
   - required enhancement of degraded or marginal condition vegetated corridors;

2. Existing local Goal 5 program requirements;
3. Existing local tree protection standards; and
4. Other existing standards which result in local habitat protection (including but not limited to: local, state and federal wetland regulations, floodplain regulations, ESA, Clean Water Act, etc.).

Non-Regulatory (Voluntary and Incentives) Component:

1. Educational programs;
2. Guidelines for low-impact-development & green design;
3. Flexible development standards;
4. Technical assistance programs;
5. Local, state, federal and non-profit grant programs; and
6. Potential implementation of tax incentive programs

Ongoing Monitoring and Administration Component:

1. Adaptive management process;
2. Regional data coordination;
3. Continued TBNRCC functions:
   - Project coordination
   - Funding coordination;
4. CWS monitoring activities for NPDES permit compliance and stream health; and
5. HSP commitments to re-sample Watersheds 2000 RSAT inventory

The following sections elaborate on the above program components to explain their contribution to improvement of the environmental health of the Tualatin River Basin.

C. Revenue Program Component

CWS Capital Improvement Program (outlined in the Healthy Streams Plan)

The estimated overall cost of implementing all the elements of the Healthy Streams Plan is $95 million over the next twenty years. It is important to note that the community tree planting and the riparian corridor restoration and enhancement activities alone (representing less than 42% of the $95 million total program costs), are estimated to produce a total net environmental benefit valued at over twice the entire cost of the program. The implementation of the Healthy Streams Plan will be funded predominately by Surface Water Management (SWM) fees. Culvert upgrades and repairs may qualify for system development charge (SDC) and/or transportation funds use. Capital improvements will directly benefit in-stream, riparian corridor or upland habitat throughout the urban portion of the basin.

The SWM fees currently collected together with funds on hand are expected to cover program costs for several years. However, it is anticipated that a future SWM fee increase may be necessary to complete the twenty-year Plan. The surface water management program is currently funded at a very modest level relative to similar jurisdictions throughout the region and the state. Clean Water Services conducted a public values survey in which over ninety percent of respondents were willing to support a modest fee increase of $1 to $2 per month. Based upon recent estimates, implementation of a $1 per month per ESU (equivalent service unit) increase could generate more than $63 Million over twenty years.

All of the capital improvements identified in the HSP are projects designed to enhance riparian corridor conditions and/or improve stream health. These projects generate ongoing, appreciating benefits to water quality and aquatic habitat. The community tree planting projects will provide multiple benefits including water quality, in-stream and near stream habitat improvements, and community education and awareness.

To identify projects, policies and programs that will achieve the goals and objectives identified in this Goal 5 Program, the Partners relied upon the Healthy Streams watershed planning process. The GIS-based modeling tool RESTORE (OSU, 2004)—a spatially explicit decision support tool designed to assist watershed planners in restoration decision-making—was adapted to the Tualatin Basin by Clean Water Services and Oregon State University to identify multi-objective stream enhancement opportunities. The RESTORE model generated the locations of various project elements (preservation, flow restoration, etc.) based on a set of rules that governed which practices would be most effective under various site conditions. The model identified project elements totaling approximately 675[1] miles over the 338 miles studied (see **Table 8-1a**). (Note that many stream reaches have multiple project elements along the same mileage). From that initial opportunity list, the District used the guiding principles established by the Healthy Streams Project Advisory Committee to identify 45 miles of priority enhancement activities and six flow restoration projects over ten years. Additional enhancement activities will be identified as part of the five-year capital improvements programming process, as RESTORE is regularly updated. In addition, yearly performance targets were established for community based tree planting in each jurisdiction, with a goal of planting a total of a million trees over twenty years. At that rate, approximately 20 percent of the 338 miles of stream will be improved within the first ten years.

Table 8-1a: Potential Health Improvement Opportunities

Project Element	Approximate Number
Preservation (200' width / side of stream)	50 Miles
Flow Restoration	170 Miles
Re-vegetation (50' width / side of stream)	140 Miles
Large Wood Placement	230 Miles
Channel and Wetland Enhancements	40 Miles
In-Stream Pond Adjustments	5 Miles
Streamside Property Owner Education & Tree Planting	40 Miles
Total Project Element Miles	**675 Miles**

For the single objective projects of culvert upgrades/repair and stormwater outfall retrofit, Clean Water Services completed prioritization based on location, stream conditions, contributing land use, and other factors. There were 106 pre-1990 outfalls identified as part of the initial NPDES Stormwater permitting process; the 68 draining commercial, industrial, multifamily residential, and transportation areas were identified as a priority to retrofit. Yearly performance targets for the jurisdictions will generate a total of three to nine retrofits per year, with all 68 being treated by 2015. There were a total of 581 culverts identified as deficient for either conveyance, fish

[1] Represents total linear miles of stream corridor improvements.

passage, or both; a total of 383 were identified as priorities to address. Yearly performance targets for the jurisdictions will generate improvements of 20-24 culverts per year by 2015, with the remaining being completed by 2025. **Table 8-1b** identifies the structural improvement opportunities.

Table 8-1b: Potential Structural Improvement Opportunities

Project Element	Number of Facilities
Stormwater Pretreatment Retrofit	106 Facilities
Culvert Repair	581 Facilities
Total Project Facilities	**687 Facilities**

The scope of the projects identified for this program is very broad and covers all of the Regional Sites in the basin (refer to **Figure 8-1**, below). The projects generally target some form of stream corridor work for the majority of the riparian resource areas within the urban portion of the basin. The RESTORE model will be adjusted and updated over time to respond to new information on watershed conditions. This adaptive management approach allows the Partners to meet the needs of the basin by adjusting the project priorities to address changes in environmental conditions, while retaining the underlying goals and objectives of the planning process.

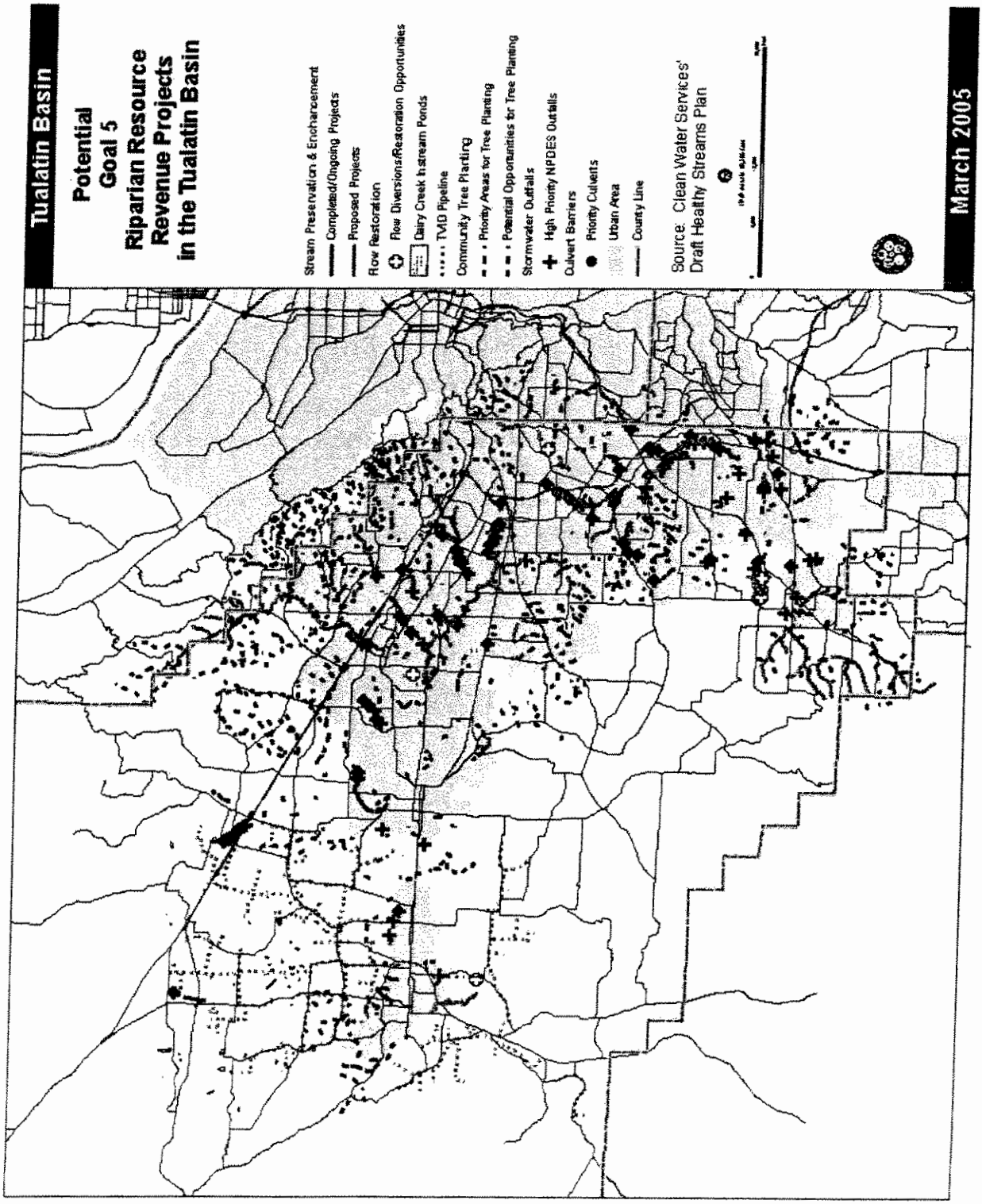


Figure 8-1: Stream Corridor Projects (identified by RESTORE model)

1

Healthy Streams Plan – Program Refinements

A strong impetus for creating the Tualatin Basin Approach was to coordinate the Goal 5 effort with Clean Water Services' (CWS) Healthy Streams Plan (HSP). The HSP is an updated watershed plan for the urban and urban fringe portions of the Tualatin Basin designed to meet the goals and requirements of the federal Clean Water Act and the Endangered Species Act. A major component of the HSP went into effect early in 2004, incorporating updated vegetated corridor requirements into the CWS Design and Construction Standards. Further refinements to Clean Water Services standards and practices related to stormwater management are currently being reviewed as an element of an update of the District's Stormwater Management Plan due to DEQ in May 2006. A broad array of policy and program refinements have also been incorporated in the draft HSP plan. These refinements are broken down into ten unique categories as shown below in **Table 8-2**. There are an average of 6 unique refinements in each of the categories and many of these have either direct or indirect benefits to environmental health in the basin, while others will benefit the administration and monitoring efforts.

Table 8-2: CWS Policy and Program Refinements

	Category / Description:
1	Stormwater Regulations
2	Local Land Use and Building Codes
3	Sensitive Areas and Vegetated Corridors Regulations
4	Operations and Maintenance of the Storm System
5	Inspection and Code Enforcement
6	Incentives
7	Public Education and Awareness
8	Monitoring Effectiveness and Implementation Progress
9	SWM Funding
10	Capital Project Implementation

Metro – Regional Bond Measure

The Partners support Metro's commitment to a regional bond measure designed to fund acquisition or protection of key habitat areas throughout the region. The Partners have locations for potential preservation identified as part of RESTORE and will refine the recommendations as part of the bond measure preparation process. Following successful passage of this measure, the Partners are prepared to assist in the acquisition process for important sites in the Tualatin River Basin. In combination with established park and open space sites, wetland and wildlife preserves, conservation easements, and other public and even privately held open space in the Basin, important habitat will be preserved and many species will be protected.

Other Funding Alternatives

A variety of grant and funding assistance opportunities are available to support habitat and water quality related improvements. In Oregon, these include (but are not limited to) the following:

- Federal Timber Safety Net Program – Title II
- DEQ – Non-point Source Pollution 319 grants
- The Nature Conservancy / PGE / Pacific Power – Salmon Habitat Fund
- Oregon Fish & Wildlife Office (U.S. FWS) – Greenspaces Program (w/ Metro)

- Oregon Fish & Wildlife Office (U.S. FWS) – Habitat Restoration and Conservation
- Oregon Watershed Enhancement Board (OWEB) – General Grant Program
- Oregon Watershed Enhancement Board (OWEB) – Small Grant Program
- Oregon Watershed Enhancement Board (OWEB) – Flexible Incentives Program (see ORS 541.381)
- Bureau of Land Management (BLM) – Local Watershed Projects
- USDA Conservation Reserve Enhancement Program (CREP)
- US EPA – Targeted Watershed Grant Awards

In addition to grant opportunities, the Basin Partners may choose to seek local bond funding for acquisition and/or protection of local sites that may not qualify for other funds.

D. Regulatory Program Components

CWS Design & Construction Standards

In order to meet stringent requirements of the Clean Water Act, as implemented by the state Department of Environmental Quality, Clean Water Services currently manages activities within and near all water resources (streams, wetlands, etc.) located in their service area. Generally, new development is "strictly limited" within Water Quality Sensitive Areas and Vegetated Corridors. The corridors along all sensitive areas average approximately 50 feet and may extend up to 200 feet depending on the resource type, drainage area, slope, and site conditions. Over 60 percent of identified Class I and Class II Riparian Habitat in the Tualatin River Basin are located within the vegetated corridor areas. Implementation of CWS' Design & Construction Standards provides for protection and/or enhancement of a high percentage of all riparian corridors in urban Washington County.

Existing Goal 5 Programs

Most jurisdictions in the basin have acknowledged Goal 5 Programs currently in place that provide resource protection. Many jurisdictions require protection of resources beyond those identified by Metro as regionally significant.

Existing Tree Protection Standards

Many jurisdictions in the basin include tree protection standards in their local development codes. Jurisdictions in the Basin that currently have some form of tree protection regulations include the cities of Beaverton, Durham, Forest Grove, Hillsboro, Lake Oswego, North Plains, Portland, Sherwood, Tigard, Tualatin and Washington County. Although the protection standards vary greatly among these jurisdictions, the cumulative effect of the regulations will play a positive role in maintaining overall environmental health in the Basin.

Other Relevant Standards and Regulations

Other federal, state and/or local programs that provide protection to Metro designated resources and/or function to meet the Basin goal of improving environmental health include: local wetland inventories and related protection standards, floodplain regulations that restrict development within the 100-year floodplain, Forest Practices Act – stream buffer requirements, USDA's Conservation Reserve Enhancement Program (CREP), and CWS Water Quality easements. As with the tree protection standards, the cumulative effects of these programs have a significant positive impact on environmental health in the Basin.

E. NON-REGULATORY (VOLUNTARY and INCENTIVE) COMPONENT

Educational Programs

The Partners have begun to identify a variety of educational tools that could be utilized to assist property owners and developers in understanding habitat values, protecting ecological functions and enhancing habitat. These tools may include publishing of newsletters or brochures, development of web sites or establishing partnerships with non-profit organizations (such as the National Arbor Day Foundation and Wetlands Conservancy), state and federal programs (such as those administered by ODFW and NMFS) education service districts, schools, park districts, libraries and community centers to provide classes on any of a number of key topics important to improving environmental health in the basin. These topics could include:

- design and construction of Low Impact Development projects
- the importance and value of trees and native vegetation
- drainage-reducing effective impervious area
- watershed ecology / environmentally friendly landscaping practices
- enhancing degraded stream corridors
- homeowners guide to the environment

Education is a fundamental element of all aspects of life, but only to the degree that learned skills are put into practice. Oregonians have a strong history of showing concern for the environment and it would be reasonable to expect that many (if not most) residents in the Tualatin Basin would be receptive to the education tools and programs if offered. In turn, it would be reasonable to expect that they would put the resulting knowledge to effective use with actions designed to improve environmental health.

Development of Low Impact Development & Green Design Guidelines

Land use planning in Oregon requires urban areas to maximize densities in order to preserve resource land and to provide for efficient use of infrastructure. Analyses conducted by Clean Water Services indicate that (unless mitigated), at current planned densities, the percentages of effective impervious area (EIA) within the UGB will be high enough to significantly alter basin hydrology and degrade in-stream habitat. While an overall decrease in EIA cannot practically be achieved, it can be mitigated, particularly through the application of environmentally sensitive development approaches categorized as LID. With the proposed basin program, LID techniques would be developed and encouraged in order to reduce the impacts of future development on stream health. The threshold for achieving this would be based on a performance standard set for each sub-watershed based on current and proposed future watershed conditions. New development may be required to manage storm water quantity as well as quality on site; this requirement would be established in Clean Water Services stormwater management program. Ongoing coordination activities with CWS will assure local implementation of the techniques incorporated in this program. The low-impact development standards discussed in Chapter 3 will assist in managing EIA throughout the basin. Use of LID/habitat sensitive approaches to development will be encouraged and supported throughout the basin, which in turn will support improvements to environmental health.

Best Management Practices

In addition to the Washington County BMPRO 2003 program described in Chapter 3, Clean Water Services and the cities implement an extensive program of stormwater management BMPs that include street sweeping, catch-basin and line cleaning, leaf pickup, stormwater facility maintenance, public education and awareness, erosion control, and source control. These program elements are part of the requirements of the NPDES Stormwater Permit under the Clean Water Act. By minimizing impacts to Goal 5 resources, these practices contribute to improving the environmental health of the Basin.

Technical Assistance

For property owners wanting to improve local wildlife habitat or just reduce total environmental impacts from buildings or other improvements on their land, partnerships with local non-profit organizations could be established to provide an array of free or low-cost services. Examples of potential services could include:

- landscaping and site design services;
- native plant sales (e.g. Tualatin Hills Park & Recreation District sales);
- team leadership for volunteer programs; and
- CWS Stream Makeover program – working with streamside property owners to plant trees and improve their creeks.

Every property owner taking advantage of these services would be directly contributing to improving both the environmental health for the sub-watershed in which they are located as well as the overall basin.

Tax Incentives

Existing state tax law supports two programs that could help to encourage landowners to protect important riparian areas and wildlife habitat. These include the Riparian Lands Tax Incentive Program and the Wildlife Habitat Conservation Management Program. These programs could be accommodated and promoted by Washington County. Education activities supported by the Healthy Streams Plan could be utilized to inform property owners of these programs and to encourage them to take advantage of the tax incentives.

In order to qualify for the tax reduction, a property owner must demonstrate that they meet the qualifications prescribed under the state program. Meeting those qualifications serves to demonstrate that steps have been taken which will lead to improvement of environmental conditions in the basin.

F. ADMINISTRATION, MONITORING AND ADAPTIVE MANAGEMENT

Administration

Continuation of the Goal 5 Steering Committee: As a key program element, the Steering Committee is proposing to continue to be involved in ongoing program management activities. These activities include continued coordination among the basin partners for all basin level environmental issues that may benefit from such involvement. The Steering Committee will continue to effectively frame and seek guidance on these issues from the TBNRCC.

Continuation of the TBNRCC: The Program includes a recommendation for continuing Tualatin Basin Natural Resources Coordinating Committee functions. A primary responsibility of the TBNRCC would be to review and recommend priorities for the capital improvements needed to improve environmental health in the basin. The TBNRCC would also be involved in coordination of funding for multi-jurisdictional projects in the basin as well as making policy decisions related to those projects.

Monitoring: In order to reasonably adapt to changing environmental conditions in the basin and to ultimately demonstrate that conditions are improving, it is important to document changes to site specific as well as overall basin-wide indicators over time.

Regional Data Coordination: As the coordinator for primary regional GIS data, Metro would be expected to continue historic practices of acquiring, developing and distributing data for lands that fall under the purview of the Regional Functional Plan. For Goal 5 resources and related Functional Plan Compliance standards, it is reasonable to expect that Metro will monitor vegetated land cover data as an important indicator in determining local environmental health. The Basin Partners will be coordinating acquisition of this data with Metro as part of their ongoing monitoring activities. As well, basin jurisdictions will continue to share local GIS data with Metro and others throughout the region.

CWS Monitoring Activities: Monitoring of watershed conditions within urban areas of the basin for water quality and stream health is an important element of the District's Integrated Water Resources Management Program (IWRM). The District monitors various combinations of water quality, flow, fish and macroinvertibrates, and physical stream channel conditions at numerous sites throughout the basin. This data is utilized today to monitor effectiveness of the District's programs and projects. It is expected that these monitoring activities will continue and that resulting data will be shared with all of the Basin Partners to assist with tracking environmental conditions both regionally and locally.

Future Stream Data Sampling: The District has indicated in the Healthy Streams Plan that re-sampling of the Watersheds 2000 inventory data should occur at reasonably regular intervals beginning in 2010. This data will be very valuable in determining the overall effectiveness of the Basin Goal 5 Program.

Adaptive Management: As discussed in Chapter 7 of this report, adaptive management will be incorporated into the program implementation process to determine where project funds can be most effectively spent in order to attain the goals to improve environmental health. Monitoring of environmental conditions will be utilized in an iterative process to test and adjust actions over time. Decisions to adjust program actions will be based upon inputs from the monitoring process which reveal changes in local or basin-wide conditions that may warrant adjustments. It is this ongoing monitoring and adjustment process that will assure that program funds and efforts are targeted to areas where they will be most effectively utilized. As well, the adaptive management process will help to assure that resources are targeted in a manner which yields the highest possible gains in environmental improvement.

G. Conclusion

The difference between the Tualatin Basin's Goal 5 Program and current regulations and plans is definable and clearly shows that this program will provide a significant improvement for the environment over the status quo. Committing to over $95 million in capital projects, policy and program refinements tied directly to environmental improvements, preserving up to 7,000 acres inside Vegetated Corridors, strictly limiting activities within water resource areas, developing low impact development guidelines and removing barriers to their utilization as well as educating property owners and developers in the utilization of these (and other) tools will greatly increase the level of natural resource protection and conservation over the standards in place when this process began. This program will result in measurable improvements to the environmental health of the eleven regional sites in the basin as well as the basin as a whole.

CHAPTER 7 PROGRAM IMPLEMENTATION, ADMINISTRATION & MONITORING

A. Introduction

As discussed in Chapter 1 and addressed in other parts of this report, the Basin Partners' Intergovernmental Agreement (IGA) with Metro both enables and commits them to the development of a Goal 5 Program designed to address the Metro inventory of regionally significant fish & wildlife habitat and to demonstrate that this Program will achieve a primary objective. This objective is to improve the environmental health in the eleven regional sites and the entire basin. Additionally, Metro Code requires that performance measures be used to evaluate the success and effectiveness of its functional plan to realize regional policies. As well, the National Marine Fisheries Service 4(d) rule calls for monitoring and evaluation. Chapters 1 through 6 of this report describe the structure and function of the proposed program. This chapter will describe how the Basin Partners propose to carry out this program in a manner designed to achieve it's primary objective and to fulfill future requirements related to monitoring and related activities designed to determine the effectiveness of the program's implementation.

The proposed program consists of four major components: revenue, regulation, a voluntary or non-regulatory component, and monitoring. The sections below describe the overall program implementation process, provide a general overview of the program administration process, and describe the development of a continuous monitoring process and adaptive management approach designed to assure program success.

B. Program Implementation

Following final TBNRCC adoption of the proposed program, the following four subsequent steps are anticipated. First, Metro is expected to incorporate the Basin Program into the regional fish & wildlife program. Second, Metro will send public notice of the intent to adopt this regional program and carry-out a public review process. Third, the final regional program will be adopted by the Metro Council, submitted to the state Department of Land Conservation and Development (DLCD) for state Goal 5 compliance review, and presented to the Land Conservation and Development Commission for Acknowledgement. Finally, for the fourth step, once Metro has adopted the Basin Program as an element of its Regional Functional Plan, the Basin Partners have agreed to begin amending local comprehensive plans and land use regulations and to complete implementation of the Basin Program within one year of Metro's action (or as otherwise described in the Basin-Metro IGA). [In the event that the Regional Program is remanded to Metro (LCDC Continuance Order) for amendment, the Basin Partners will work with Metro to resolve any issues related to the Basin element of the Regional Program.]

The general steps anticipated for implementation of the Basin Program include:

1. Development and adoption of local ordinances implementing the provisions of the Basin Program as incorporated in the Metro Urban Growth Management Functional Plan. This step includes provision of public notice(s) and holding public hearings and other public involvement activities as appropriate.

2. Development of a model Low Impact-Development (LID) ordinance for the basin providing tools designed to reduce environmental impacts of new development and removing barriers to their utilization. This step includes local adoption of LID guidelines.
3. Coordination with Clean Water Services for activities necessary for implementation of the Healthy Streams Action Plan (including all related capital projects as needed), as well as for local actions needed to support the updated Stormwater Management Plan.
4. Coordination with Metro on development of a regional bond measure supporting protection of regionally significant fish & wildlife habitat.
5. Coordination with CWS, Metro and others as necessary to develop and support the voluntary and educational components of the Basin Program.
6. Coordination with CWS, Metro and others as necessary to develop and support the monitoring and adaptive management components of the Basin Program.

C. Program Administration

Administration of the proposed basin program will involve continued coordination and cooperation among Partners to ensure the program objectives are achieved. This includes the following:

a) Cooperation in implementing the Healthy Streams and Stormwater Management Plan update

The primary elements of future activities to implement the Healthy Streams Action Plan and Stormwater Management Plan will be carried out among the Basin Partners under the guidance of Clean Water Services. It is anticipated that CWS staff (in cooperation with the other Basin Partners), will carry out the activities and projects incorporated in these plans and will assist in assuring that the goals of improving environmental health in the basin can be met.

b) Continuation of the Tualatin Basin Steering Committee

As a key program element, the Tualatin Basin Steering Committee is proposing to continue to be involved in ongoing program management activities. Project activities will be tracked and managed by SWM Teams developed as part of the HSP adaptive management process. These activities of the committee include continued coordination among the basin partners for all basin level environmental issues that may benefit from such involvement. The steering committee will continue to effectively frame and seek guidance on these issues from the TBNRCC.

c) Continuation of the TBNRCC

The Program includes a recommendation for continuing Tualatin Basin Natural Resources Coordinating Committee functions. A primary responsibility of the TBNRCC would be to review and recommend priorities for the capital improvements needed to improve environmental health in the basin. The TBNRCC would also be involved in coordination of funding for multi-jurisdictional projects in the basin as well as making policy decisions related to those projects.

D. Program Monitoring and Adaptive Management

Program monitoring and adaptive management are key activities necessary to assure that the commitments incorporated in the Basin Approach can be attained. Activities anticipated under this program element include:

The monitoring process: In order to monitor the effectiveness of the Basin Approach, the Partners are relying upon baseline conditions established and documented in 2000-2001 as part of the Watersheds 2000 planning activities. In addition to ongoing long-term monitoring activities for water quality and flow, it is anticipated that periodic monitoring of biological communities and physical habitat conditions will also be needed in order to provide adequate comparisons with baseline data and to determine the effectiveness of program activities. Clean Water Services commitments to continued monitoring of environmental conditions are incorporated in their Healthy Streams and Stormwater Management plans.

Adaptive Management: Adaptive management is generally described as the integration of design, management, and monitoring to systematically test assumptions in order learn and to adjust actions based on that learning until a set goal is attained. For purposes of the Basin Program, adaptive management will be incorporated into the program implementation process to determine where project funds can be most effectively spent in order to attain the goals to improve environmental health. The monitoring process described above will be utilized in an iterative process to test and adjust actions over time. Decisions to adjust program actions will be based upon inputs from the monitoring process which reveal changes in local or basin-wide conditions that warrant program adjustments.

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Attachment 7

Technical Issue Paper 1

Tualatin Basin Goal 5

Program Implementation Report

Draft 2 Issue Paper #1:

Approaches and Methods to Develop and Encourage Habitat Friendly Development Practices

Preliminary Draft prepared for:

Tualatin Basin Steering Committee

Prepared by:

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February 24, 2006

Approaches and Methods to
Develop and Encourage Habitat Friendly Development Practices

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A. INTRODUCTION

Background and Purpose

On September 29, 2005 the Metro Council voted to approve a regional Nature in Neighborhoods (Goal 5) program. This council action incorporated the *Tualatin Basin Fish & Wildlife Habitat Program*, as developed and recommended by the Tualatin Basin Partners for Natural Places (Partners). Under an intergovernmental agreement between the Partners and Metro, applicable elements of the adopted Basin program are required to be implemented within one year following the Metro Council's final decision (or within 60 days of LCDC's acknowledgement of Metro's Functional Plan provisions, whichever is later).

Applicable elements included compliance with the six steps identified in Section B of Chapter 7 of the *Tualatin Basin Fish & Wildlife Habitat Program*. One of these steps is the development of a model Low Impact-Development (LID) ordinance for the basin, which would provide tools designed to reduce environmental impacts of new development and removing barriers to their utilization. This step includes local adoption of LID guidelines. In addition, Basin jurisdictions must adopt provisions that 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.

An important feature of the Basin program is the encouragement of land developers and property owners to incorporate habitat friendly practices in their site design. *Habitat friendly development practices* include a broad range of development techniques and activities that reduce the detrimental impact on fish and wildlife habitat relative to traditional development practices. As shown in Table 1 below, Metro has identified a wide range of habitat-friendly development practices that represent best management practices. While the phrases are sometimes used interchangeably, for the purposes of this paper *low impact development (LID)*, which is more specifically focused on minimizing hydrologic impacts, e.g., reducing *effective impervious area (ELA)* and improving water quality, is considered a subset of habitat friendly practices.

The primary objective of this Issue Paper is to begin to identify those approaches and methods which could be successfully used within the Tualatin Basin to develop and encourage habitat friendly development practices. The potential benefits and challenges associated with each approach (including any technical issues and/or regulatory barriers) are noted. Some approaches may conflict with current locally adopted regulations, which may necessitate modification of the approach or a modification of local ordinances before they can be implemented. The importance of removing barriers from existing regulations in order to enable the use of these types of approaches was

highlighted in the Audubon Society of Portland's 2004 *Stormwater/ Pavement Impacts Reduction (SPIR) Project Report.*

The Basin jurisdictions currently implement many practices which reduce the detrimental impact of development on fish and wildlife and these will be discussed and detailed for each jurisdiction in an appendix to this document. As demonstrated under each approach explored, not all approaches are appropriate for all areas of the Tualatin Basin. Also, some methods may not be appropriate to implement together, as their combined effect may actually be detrimental. All approaches, both currently used and possible future practices, must consider specific topographic and soil constraints, and be evaluated for safety, effectiveness, longevity, and maintenance costs. The list of approaches and methods is not exhaustive, but is intended to highlight practices that have been used successfully in the Portland metropolitan region and could have limited or broad applicability in the Tualatin Basin.

Within the Tualatin Basin, the following concerns have been noted relative to the practices listed in Table 1:

- Infiltration and groundwater recharge practices will need to address DEQ / UIC standards;
- The potential implementation of infiltration / groundwater recharge practices in the Tualatin Basin will be subject to local soils and groundwater conditions;
- Stormwater 'pollutants' are identified and regulated under existing MS4 permits in the Tualatin Basin.

Table 1

Habitat-friendly development practices (Urban Growth Management Functional Plan Table 3.07-13c.)
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.

Format of Issue Paper #1

The following sections describe various approaches that could be used to encourage habitat friendly development. The ten approaches presented in this paper are divided into three general categories:

- Planning and development. These approaches include methods that are typically associated with land use planning and development reviews.
- Engineering and design. These approaches include methods that typically require a more innovative approach to engineering and may require the adoption of new design specifications and public works standards. These approaches may require detailed geotechnical analysis and design for on-site soil suitability and slope stability. Within public rights-of-way, how these approaches affect emergency response access, utility access, roadway structure, and road maintenance costs will require careful evaluation.
- Building design. This approach includes methods that affect the building itself and may necessitate modifications to the building and/or plumbing code.

For each of the approaches described in this paper, information is provided in the following format:

- A brief description of the various methods typical of the approach,
- The potential benefits and challenges associated with implementing the approach,
- A preliminary recommendation for the Tualatin Basin, and
- Examples and references of how the approach has, or might be, used.

In addition, at the beginning of each section, the answers to the following key questions are summarized:

? Does the approach "Help avoid and/or minimize impacts?" *Tools that help to avoid the intrusion of development into habitat areas to the extent practicable are the preferred. When impacts cannot be avoided, the use of tools that help lessen or minimize detrimental impacts to the extent practicable should be encouraged.*

? Is the approach "Applicable basin-wide or adjacent to resource area?" *Some practices could be effective anywhere within the basin; others are only effective within or adjacent to habitat areas.*

? Are "New or amended regulations required" to implement the approach? *In some cases implementing a practice would require new regulation to be effective; in others existing regulations may be sufficient or a non-regulatory approach is sufficient.*

? Does this approach provide "Tools to reduce effective impervious area (EIA)?" *Reducing EIA provides direct benefits to water quality and in-stream and streamside habitat through stream flow moderation, reduced frequency of flooding. Some, but not all, habitat-friendly practices will help reduce EIA.*

? Is the approach "Recommended for basin?" *Some practices may be particularly recommended for use in the Tualatin Basin; others may be less useful due to regulatory or locational constraints.*

B. PLANNING AND DEVELOPMENT APPROACHES

Planning and development approaches include those methods that can be implemented most easily at the time of land use approval, e.g., as part of a subdivision or development review. With the possible exception of the use of pervious materials within parking areas, these methods do not require any engineering innovations or new specifications. Many jurisdictions in the Tualatin Basin employ some, or even most, of these tools. For example, since 1974, Washington County has preserved flood-prone areas within easements and non-buildable tracts, which has resulted in much of THPRD's parkland. However, in some cases, it may be necessary for jurisdictions to modify their development ordinances in order to enable the use of specific approaches.

The planning and development approaches considered in this section include the following:

1) Land Division Design
   - Methods include clustering/lot size averaging and on-site density transfers

2) Site Design
   - Methods include increased flexibility for setbacks, lot coverage, building heights

3) Parking Design
   - Methods include reduced parking ratios, shared driveways and parking areas, increased parking lot landscaping, smaller car spaces and stall dimensions, increased use of pervious materials

4) Landscaping/Hardscape Design
   - Methods include locating landscaping adjacent to habitat areas, increased use of native plant, improved soil amendment, reduction of non-ADA sidewalks within a site, increased use of habitat-friendly fencing, preservation of existing trees, maximize forest canopy

5) Lighting Design
   - Methods include re-directing outdoor lighting and reducing light spill-off

6) Density Reduction for Regionally Significant Habitat
   - Methods include modifying definition of net buildable areas, establishing reduced minimum buildable lot sizes

1. Land Division Design

Key Questions	
Help avoid or minimize impacts?	*Both, but primarily these methods allow developments to avoid habitat areas.*
Applicable basin-wide or adjacent to resource area?	*Effective on sites adjacent to resource area; however, may have "smart development" benefits basin-wide.*
New or amended regulations required?	*Some codes may have to be amended to allow increased flexibility in lot size averaging and density transfers. Could be provided option rather than requirement for developer.*
Tools to reduce effective impervious area (EIA)?	*No, unless combined with other "green" design and development approaches.*
Recommended for basin?	*Yes, only for properties which include resources.*

Description of Methods (Lot Size Averaging and Transfer of Density)

Zoning and land division ordinances can require, allow, or encourage lot size averaging at the land division stage to avoid or minimize impacts to significant riparian and habitat areas. Lot size averaging is typically most relevant for residential land divisions, but the method could also be applicable in commercial and industrial zones that establish minimum lot sizes. These techniques are generally implemented through local Planned Development (PD) or Planned Unit Development (PUD) review options.

Rather than specify a minimum lot size for every lot in a land division (such as 8,000 square feet), lot size averaging could allow a combination of smaller and larger lots, with an overall average lot size of 8,000 square feet. Another approach could be zoning that establishes the overall maximum number of units per gross acre, and allows a mix of lot sizes to achieve that overall density. Significant riparian and habitat areas could also be set aside and protected in an open space tract (dedicated to a public agency or owned by a homeowners association), with an allowance for the remaining lots to be smaller than the specified minimum lot size to achieve the overall average density. However, it should be noted that creating open space tracts may have implications for enforcement and the related costs for long-term maintenance.

Ordinances could also allow or encourage transfer of development potential from constrained portions of a site to non-constrained portions. This method is commonly used to permit transfer of development potential from floodplain and wetland areas to upland areas. The tool is less

commonly used to transfer density from upland habitat areas. On-site density transfers can be implemented through a land division or site plan review process (for example, multifamily projects that do not involve a land division). For residential projects, on-site density transfers typically require lot size averaging or clustering of units on a smaller portion of the site. Ordinances can provide incentives for density transfers, such as "bonus" density or permitted flexibility on lot sizes, setbacks, street widths, and landscaping standards. The density transfer provides a tool to protect significant riparian and habitat areas through dedication, an open space easement or tract or deed restriction.

Benefits and Challenges

A. The lot size averaging and density transfers can provide benefits, including the opportunity to avoid impacts on significant resource areas, and create neighborhoods that are responsive to natural features. In addition, there may be non-habitat related benefits such as the potential for a broad mix of lot sizes and associated housing types and sizes and varied development patterns.

B. Developers could be reluctant to pursue lot size averaging or density transfers if they make the land division review process more complex, time-consuming, or vulnerable to appeal. For example, in jurisdictions where lot size flexibility is accomplished through the planned unit development process, requirements such as minimum development size, larger open space dedications, increased submittal requirements and, subsequently, longer processing times, will limit the use of this method.

C. Smaller lots with shared open space may be seen by some developers as less marketable than traditional subdivisions.

D. Most of the development in the urbanized portion of the Basin is now limited to relatively small-scale redevelopment and infill projects, which may reduce potential opportunities for (and benefits of) transferring density.

E. In infill settings, surrounding property owners could be resistant to smaller lot sizes or clustered homes, even if the overall average density is maintained. Buffers may be required to mitigate impacts. Ordinances may also limit certain housing types (such as attached or multifamily units) in particular zones.

F. Allowing lot size averaging and density transfer by right (subject to clear and objective standards) may help encourage preservation of the resource, but may be seen as conflicting with a jurisdiction's objectives for community involvement and citizen participation.

G. Minimum density requirements can conflict with objectives to protect significant riparian and habitat areas. Unless a development site is quite large, there may not be enough area to effectively accommodate the on-site density transfer in a manner that is compatible with surrounding developments and marketable for the developer *(see discussion of Density Reduction for Regionally Significant Habitat – Section B6).*

H. Average lot size and density transfer approaches may also necessitate greater flexibility in development standards such as maximum building coverage, lot dimensions, and setbacks. If use of lot size averaging or density transfer options require approval of a planned development, variance, or adjustment, developers will be less likely to use the methods.

I. The resource area associated with the density transfer shall be provided with long-term protection through dedication, an open space easement, deed restriction or other appropriate tool. This is already common in the Tualatin Basin for dedicated floodplain areas. Issues of access, maintenance, and management of the resource area must be considered as part of the density transfer.

J. If combined with other "green" design and development approaches, lot size averaging and density transfers could help to reduce effective impervious area in new development.

Recommendation for the Basin

1. Lot size averaging and density transfers are appropriate tools for the Tualatin Basin and are specifically recommended for sites that include or are adjacent to significant riparian and/or habitat areas. Local jurisdictions in the Basin should review their ordinances and document existing standards (e.g., amount of flexibility permitted), criteria (e.g., minimum development size), and procedures (e.g., Type III planned unit development) that apply to lot size averaging and density transfers.
2. Ordinance amendments may be needed to remove barriers (such as minimum site requirements to be eligible for lot size averaging) or to provide some consistency Basin-wide in how these methods will be used to protect Goal 5 resources.
3. Ordinances should allow lot size averaging and density transfer by right (subject to clear and objective standards) and should not require complex, discretionary review procedures such as planned unit development or variance approvals. A land division that involves lot size averaging or a density transfer should not be any more burdensome from a procedural standpoint than a standard land division.
4. In order to maximize flexibility, ordinances should specify the smallest buildable lot size that can be permitted within the zone as the minimum lot size that is permitted with lot size averaging or density transfer.
5. If the larger lot(s) in a land division based on lot size averaging are at least twice the minimum lot size, the local government may want to consider a deed restriction to preclude future division of the large lot(s).
6. The Basin jurisdictions may want to consider the provision of technical design assistance and outreach to property owners and potential developers of vacant or underdeveloped sites near significant riparian and/or habitat areas (similar to the Transportation & Growth Management "Quick Response" Program).

Examples and References

Most jurisdictions in the Basin have existing ordinance provisions that address lot size averaging and density transfers. These will need to be evaluated in order to ensure they provide adequate flexibility. For example:

The Washington County Code (Section 404-4) provides broad flexibility in lot sizes and development standards through the Type II planned development process to provide incentives for protection and dedication of open space. However, it appears only industrial and commercial planned development proposals are able to use floodplain, drainage hazard, or riparian open space on the subject property to offset up to 50% of the open space requirement. The Washington County Code (Section 300-3) also provides options for transfer of density from unbuildable lands within a single lot or parcel with the same land use designation or to an adjoining lot or parcel that is included in the development application and is within the same land use designation. For density transfer purposes, the definition of "unbuildable" lands includes designated significant natural resource areas, water quality sensitive areas or vegetated corridors. The transferred density shall not more than double the density allowed on the buildable portion of the site.

The Tigard Code (18.430.020D) permits "lot averaging," but no lot may be less than 80% of the minimum lot size permitted in the underlying zone. The Tigard Code (18.715.030) allows residential density transfer from sensitive lands, which includes the 100-year floodplain, natural drainage ways, wetland areas, and steep slopes. However, the number of units that can be transferred is limited to the number of units that would have been allowed on 25% of the unbuildable area. The total number of units per site shall not exceed 125% of the maximum number of units per gross acre permitted by the applicable plan designation.

2. Site Design

Key Questions	
Helps avoid or minimize impacts?	*Primarily minimize, potential to use flexibility to avoid impact to a habitat area.*
Applicable basin-wide or adjacent to resource area?	*Primarily adjacent to resource areas, but may also be used to protect other attributes (e.g. mature trees or habitat connectivity).*
New or amended regulations required?	*Some codes may have to be amended to provide additional flexibility.*
Tools to reduce effective impervious area (EIA)?	*No, unless combined with other "green" design and development approaches.*
Recommended for basin?	*Yes, only for properties which include resources.*

Description of Methods

Zoning ordinance development standards typically establish specific minimum lot size, lot dimensions, setbacks, building heights, and maximum lot coverage, particularly within residential zoning districts. The standards are applied at the land division, site plan, or building permit phases of development. When applied too rigidly, these types of standards can result in increased impacts on resource areas. Allowing flexibility can enable and encourage sensitive site designs and may be necessary to facilitate lot size averaging and/or on-site density transfer *(see discussion in Section B1)*. In addition to avoiding development immediately within or adjacent to resource areas, sensitive site designs could take into account the preservation of mature trees and connectivity between habitat areas. If a site is adjacent to or near habitat areas, wildlife and migratory birds may use the site as a pathway. Whenever possible, these pathways should be preserved or enhanced to provide continued access and protection for wildlife.

Examples include:

- Building setback flexibility to maximize the separation of the proposed development from the resource area (with the option to reduce setbacks to the minimum required by fire and building codes).
- Automatic flexibility in lot dimensional standards (such as 30% adjustment) to facilitate on-site density transfers and protection of the resource area.
- Building height flexibility (such as one-story bonus over base building heights) to facilitate avoidance and protection of the resource area.

- Bonus lot coverage if the proposed development is concentrated on smaller lots or in a smaller area of the overall site than permitted under base development standards.

Benefits and Challenges

A. Greater flexibility in development standards (particularly if it doesn't trigger a more complex review procedure) could encourage avoidance and protection of significant resource areas and enable the use of other tools such as on-site density transfer and lot size averaging.
B. Surrounding property owners or the larger community may be resistant to smaller lots, taller buildings, or reduced setbacks, particularly if they do not view the protection of the resource area as a corresponding benefit.
C. Most of the development in the urbanized portion of the Basin is now limited to relatively small-scale redevelopment and infill projects. In infill settings in particular, surrounding property owners may feel that the new projects are out of character with neighborhood design, and that reductions in setback standards and increased building height reduce privacy on adjoining parcels.
D. A developer will not pursue the more flexible development approach to protect the resource area if the alternative site plan is perceived as more difficult to permit, more difficult to finance, or less marketable.
E. Providing site design flexibility by right (subject to clear and objective standards) may help encourage preservation of the resource, but may be seen as conflicting with a jurisdiction's objectives for community involvement and citizen participation.

Recommendation for the Basin

1. Broader flexibility in development standards is recommended and should be targeted to sites that include or are adjacent to significant riparian and/or habitat areas. In addition, Basin jurisdictions should specify other attributes that may qualify for special flexibility (e.g. mature trees or habitat connections).
2. Local jurisdictions in the Basin should review their ordinances and document existing standards. Ordinances should specify the degree to which base development standards can be adjusted outright, with the option of a discretionary review if more flexibility is requested. It may be appropriate to consider a percentage modification in the development standards that is linked to the overall percentage of the site that is protected. For example, if the riparian/habitat area encompasses 20% of the overall site and is protected from development, all development standards applicable to the remainder of the site may be adjusted outright by up to 20%.
3. Similar to the recommendation for other topics, Basin jurisdictions may want to target technical design assistance and outreach to property owners and potential developers of vacant or undeveloped sites near significant riparian and/or habitat areas to encourage habitat friendly site plans.

Examples and References

The examples below illustrate how some of the Basin jurisdictions currently provide some flexibility from site design standards to facilitate natural resource protection.

The Washington County Code (404-2) allows only a limited modification of front, side, and rear yard setbacks (up to 10%) based on evidence that the modification is necessary to retain natural or topographic features such as mature trees, drainage swales, slopes, ridge lines, or rock outcropping. More extensive modification of standards (including lot sizes) requires approval of a Type II planned development.

The Tualatin Development Code (Chapter 72) includes options for shift of density for residential development adjacent to greenways and natural areas; landscaping credit for commercial and industrial planning districts adjacent to greenways and natural areas; and reduction in setback requirements adjacent to greenways and natural areas. Implementation of these options typically requires Architectural Review approval (Type II or III).

Beaverton's Code includes options for flexible setbacks (Chapter 40.30). However, flexible setback(s) for a proposed residential land division require a Type III approval.

3. *Parking Design*

Key Questions	
Helps avoid or minimize impacts?	*Use reductions in parking to avoid impact to a habitat area. Minimization also possible through ELA reduction.*
Applicable basin-wide or adjacent to resource area?	*Primarily adjacent to resource area, but could be used Basin-wide.*
New or amended regulations required?	*Yes – for some of the methods described.*
Tools to reduce effective impervious area (EIA)?	*Yes, these methods can provide ELA reduction.*
Recommended for basin?	*Yes, primarily for properties which include resources. Use of pervious pavement could have an ELA benefit, but use limited by soil constraints.*

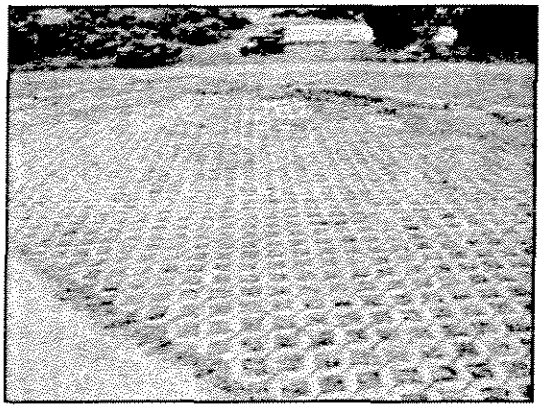
Description of Methods

There are several methods related to parking lot design that could reduce the overall amount of impervious surface and cut down on stormwater runoff. The number of parking spaces created could be reduced through revisions to the parking requirements. Metro currently requires that all jurisdictions use parking maximums in their code to limit excessive parking. In addition, jurisdictions may allow alternative parking spaces to count towards the minimum parking standard. For example, adjacent on-street parking, nearby public parking and shared parking could all be included in the parking count. Metro recommends this, but does not require it.

Another technique is to minimize the size of the parking spaces created. Some jurisdictions have standards that allow a certain percentage of parking to be designed for compact vehicles. For example, the city of Tualatin allows no more than 35% of total parking stalls to be compact. Increasing this allowable percentage would be one way to reduce the overall size of a parking lot. Jurisdictions could also allow a higher percentage of compact parking (which would be a cost savings for the developer) in exchange for more beneficial landscaping. Parking stall design standards may also be revised in cases where the standard provides for a space that may be larger than necessary.

Large parking lots with catch basins generally require active stormwater control techniques, such as utilizing detention ponds and water quality treatment prior to discharge to a public system. As an alternative, the same amount of parking may be broken into several smaller parking lots that are

separated by natural vegetation (outside of required vegetated corridors) and bioretention areas *(see discussion of bioretention areas - Section C3)*. This could reduce or eliminate the need for detention and/or piping and provide more opportunities for natural infiltration.[1]



Example of pervious parking material

There are a number of alternatives to conventional paving materials that can be used to reduce impervious surface area. Pervious concrete and asphalt both allow for more infiltration than traditional impervious pavement, and therefore have the effect of reducing the amount of runoff created by a parking lot. Pervious pavement may be most effective for driveways, sidewalks, and other pedestrian and bikeways that are not associated with public rights-of-way, which are subject to typical safety and maintenance practices in this area (sanding in winter conditions, street sweeping). Brick, pavers, and natural stone or gravel provide similar benefits, although the amount of infiltration is not as high. These materials are not always appropriate for high use parking lots, but they can be used in combination with conventional paving materials to provide at least some benefit.

Benefits and Challenges

A. In addition to possible water quality benefits, reducing the overall amount of required parking and/or the size of parking spaces reduces development costs, allows more space for landscaping, and provides greater efficiency of land use. However, in order to result in a reduction in EIA, the area that was no longer needed for parking should not be used for other impervious uses (e.g., larger buildings).

B. Allowing for smaller parking spaces or proportionately more compact spaces may result in a smaller overall parking area, but may not reflect the actual mix of vehicles that will be using the facility; and thus, could create some frustration on the part of users. In addition, adequate parking for trucks, large SUV's and RV's still needs to be provided.

C. Breaking up large parking lots and the use of natural vegetation creates a more attractive development while providing stormwater benefits.

[1] *Depending on local regulations, these methods related to parking lot design may not eliminate the need for required detention despite their effect on reducing stormwater runoff.*

D. Permeable paving materials may reduce development costs by reducing the need for stormwater infrastructure and treatment.[2] Bricks and pavers can also add visual appeal and character that may be desirable in commercial or residential areas.

E. There may be resistance to the idea of reducing parking requirements on the part of the community, particularly neighboring property owners. There may also be property owner concerns regarding shared parking arrangements.

F. Alternative paving materials may have higher installation costs to construct correctly and require more maintenance than regular asphalt and concrete. However, these costs could be offset to some degree by the savings associated with less stormwater treatment. This approach needs evaluation and monitoring to develop true costs. Overall development costs should always be considered when making a comparison between paving materials. Additionally, soil permeability issues in the Basin will also pose a challenge on some sites, as will slope stability and impacts to adjacent properties. Long term benefits are not well documented and required evaluation for long term effectiveness and maintenance costs.

Recommendation for the Basin

1. Basin jurisdictions should review and document their current parking standards in terms of minimum spaces, shared parking, parking space and parking aisle size, and percent of compact spaces permitted. Jurisdictions may want to revise their parking codes to require fewer and/or smaller parking spaces wherever possible and appropriate. For example, the City of Portland amended its zoning/development code to include these key elements:
    - Promote management of parking lot runoff within parking lot landscaping.
    - Reduce parking space dimensions to 16 feet x 18½ feet for 90-degree parking.
    - Reduce aisle width to 20 feet.
    - Specific requirements for parking lot runoff management are included in the city's *Storm Water Management Manual.*
2. Shared parking should be recommended and encouraged for all new developments where the uses may be able to utilize this type of arrangement. Basin jurisdictions should also consider allowing alternative parking arrangements (on-street, etc.) to count towards the overall parking standard and explore ways to mitigate potential conflicts this could generate within neighborhoods.
3. Encourage construction of structured parking and shared structured parking.
4. The long term effectiveness and maintenance costs of alternative paving methods need to be fully assessed. Alternative paving methods (pavers and/or permeable pavement) should be

[2] *According to Washington County Engineering Standards, the piping requirements for larger and longer duration storm events may still be required.*

permitted where appropriate on an individual basis. For private development, basin jurisdictions may want to provide information about these alternatives to permit applicants. This should be coordinated with CWS specifications.

5. Basin jurisdictions could offer potential developers some examples of parking lot design alternatives that incorporate some or all of these techniques. They might consider creating a "toolkit" that could be handed out to developers to provide information about LID methods and their benefits, case studies, and additional resources available to them.

Examples and References

CWS Merlo Road Field Operations Facility

The Field Operations Facility's employee parking lot is paved with porous concrete. Porous concrete allows rainfall to be absorbed directly into the soils below, recharging groundwater and reducing or eliminating any surface runoff. The porous parking lot acts as a retention facility, slowing the flow and replicating natural hydrology. The cost of porous concrete is offset in part by the elimination of catch basins and pipe conveyance systems.

Concrete paver blocks provide seven additional parking places (945 square feet) for visitors to the Field Operations Facility. Spaces between the interlocking pavers allow stormwater to be absorbed into the sub-base and soils below. Porous pavers are commonly used and readily available, and can be more attractive than asphalt or conventional pavement.

Structural gravels supported by an 8-inch deep synthetic grid provide 3,000 square feet of storage area in the Field Operations Facility maintenance yard. The three-dimensional network of interconnected, perforated cells was filled with 11/2-inch to 3/4-inch open graded river gravel.

[Source: Clean Water Services, "Slow the Flow! Designing the Built Environment to Protect Urban Environments" brochure
http://www.cleanwaterservices.org/content/documents/Permit/Slow%20the%20Flow%20brochure.pdf]

4. Landscape/Hardscape Design

Key Questions	
Helps avoid or minimize impacts?	*Both avoid and minimize.*
Applicable basin-wide or adjacent to resource area?	*Primarily adjacent to resource area, but could be used Basin-wide.*
New or amended regulations required?	*Yes – for some of the methods described.*
Tools to reduce effective impervious area (EIA)?	*Yes, subject to local soil conditions.*
Recommended for basin?	*Yes, primarily for properties which include resources. Tree preservation, additional landscaping and soil amendments would have an EIA benefit.*

Description of Methods

Methods can include enabling and encouraging the use of rain gardens, native landscaping, and tree canopy preservation. More information about rain gardens is provided in Section C3 of this paper. Native landscaping, also called "lawn conservation," focuses on planting or replanting lawns or sections of lawns to a more natural state. This includes planting hardy native plant species of grasses, shrubs, wildflowers and/or trees, which require less maintenance than the conventional lawn. One benefit of native landscaping to the local watershed is that it requires little or no fertilizer or pesticides. Lawn conversion also provides stormwater management that promotes groundwater infiltration, water quality treatment, and flood control. Some general conservation landscaping techniques are listed here.

- Minimize the use of supplemental watering by using appropriate plants, mulching, drip irrigation, and captured rainwater.
- Minimize the amount of lawn in order to reduce fertilizer and pesticide use, cut down on watering, and create habitat for wildlife.
- Plant to create windscreens and buffers and reduce erosion.
- Reduce the use of pesticides and fertilizers through the use of native plants, lawn conversion, natural soil enhancers, and soil aeration.
- Minimize bare soil and stabilize slopes with planted ground cover.
- Capture and detain water for use in landscaping.
- For hardscaped surfaces, use permeable paving like bricks or pavers instead of concrete and asphalt.
- Preserve existing trees and plant additional trees where appropriate.

Trees and the canopy they provide are an important component of landscaping for water quality. An intact tree canopy can reduce the amount of precipitation that results in runoff, thus reducing the amount of stormwater that needs to be treated. There are also habitat benefits to preserving resource areas with tree canopy and vegetative cover. Tree roots stabilize soil and reduce erosion, and the shade that trees provide acts as a shelter and cooling agent. Trees also purify the air, provide habitat for birds and wildlife, and add character and aesthetics to an area. Some development ordinances require preservation of trees during construction to the extent possible, and mitigation if a tree must be removed. Others impose a penalty if a tree is cut down on a property without a permit – the fine can vary depending on the type, size, and age of the tree.

Benefits and Challenges

A. Conservation landscaping is a low-cost way to minimize stormwater runoff. Savings are created through reduced maintenance, water use, and treatment.
B. Many people prefer the more natural look and feel of native landscaping. However, it may also be perceived as "weedy" and "unattractive." Informative signage near these areas may help to educate the public and prevent negative impressions.
C. If jurisdictions do not allow vegetated stormwater management facilities to count towards the overall landscaping requirement, it can act as a disincentive to developers. While it may provide some incentive for their creation, allowing these facilities to count toward landscaping requirements will not result in an increase in pervious surface.
D. Many of these methods also provide air quality benefits, help to reduce temperatures during summer months, and create suitable habitat for wildlife, especially birds and butterflies.
E. There is the potential to use development activities on a site as an opportunity to encourage improvement of existing resource areas.
F. Some jurisdictions currently allow hardscape areas to be counted toward the required landscaping percentage. While this may improve opportunities for pedestrian connectivity within a development site, it may reduce the overall perviousness.

Recommendations for the Basin

1. Basin jurisdictions should review and document[3] their current landscape standards. Basin jurisdictions should consider revising their existing landscaping requirements to incorporate some of the methods mentioned above. Potential revisions may include:

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[3] *Local jurisdictions should document their current standards to determine to what extent they are already employing the explored methods/approaches, achieving the same results as expected through the use of alternative methods/approaches, and/or could modify existing standards to employ the explored methods/approaches. It is also a way to documents the "good work" jurisdictions are already doing.*

- Allow vegetated stormwater facilities *(also see discussion of rain gardens[4] and bioretention in Section C3)* to count towards the minimum landscaping requirement. This will act as an incentive to developers.
- Provide incentives or credit for the preservation of existing native vegetation (trees, shrubs, and ground cover, for example).
- Revise the code so that the purpose section of the landscaping requirement includes language about reducing stormwater runoff and providing for infiltration.
- Allow only pervious hardscape to be counted towards the required landscaping.

2. Additional education and incentive programs for developers are recommended. Demonstration projects are a useful educational tool and show government support for the methods. Long term evaluation of current commercial landscape maintenance practices should be included in review.
3. The Basin should evaluate opportunities to use fees (SWM, local surcharges or independent environmental impact fees) and fee waivers as incentives/disincentives that will encourage developers to seek alternatives.
4. Encourage the preservation and enhancement of on-site resource areas. Maintaining resource area connectivity for wildlife habitat should be stressed.
5. Visit, evaluate, and document the success of public investment in regional watershed stewardship grants (see example below). Explore elements that can be borrowed or changed to be applicable for Basin jurisdictions.

Examples and References

Community Watershed Stewardship Program

Watershed stewardship grants provide up to $5,000 to citizens and organizations to encourage watershed protection and enhancement at the local level. Grant money can be used for supplies, materials, equipment, room rentals, feasibility studies or technical assistance. The Grant Program is a partnership between the City of Portland Environmental Services, Portland State University, and the Northwest Service Academy. The program provides financial and technical support to foster partnerships that improve the health of local watersheds. From 1995 through 2004, the program dispersed $360,000 to 92 projects across the city. These funds were matched by over $1 million in community support through donations of services, materials and volunteer time. As of Fall 2002, of the 62 projects that included physical improvements to the landscape, 54 (87%) are still active and supported by the community. Over 17,000 people have donated 93,219 volunteer hours, which includes planting over 56,215 native trees and shrubs.
[Source: City of Portland Bureau of Environmental Services]

[4] *Note that 'rain gardens' do not qualify as "stormwater facilities" in the Tualatin Basin.*

References:

[NOTE: While these references provide good examples of ways to employ conservation landscaping, implementation in the Tualatin Basin may require modifications due to the specific climate and soil types in the region.]

- "Healthy Landscapes," University of Rhode Island
  http://www.uri.edu/ce/healthylandscapes/tips/5.html
- Landscaping for a Healthy Planet" Pennsylvania Audubon and Alliance for the Chesapeake Bay
- http://www.envirolandscaping.org/conservation.htm
- "Skills for Protecting Your Stream: Retrofitting Your Own Backyard," Center for Watershed Protection, April 2002
  http://www.cwp.org/Community_Watersheds/educating_constituents.htm

5. Lighting Design

Key Questions	
Helps avoid or minimize impacts?	*Minimize*
Applicable basin-wide or adjacent to resource area?	*Applicable to areas adjacent to resource areas.*
New or amended regulations required?	*Adoption of ordinance language required for jurisdictions that currently do not have a lighting ordinance; possible amendments to existing lighting ordinances to include measures associated with mitigation for habitat areas.*
Tools to reduce effective impervious area (EIA)?	*No*
Recommended for basin?	*Yes, although information on lighting impacts on Basin specific species may not be available.*

Description of Methods

When outdoor lighting is not designed, installed, or managed properly, deleterious effects to natural systems can occur. Some of the biological and behavioral activities of plants, animals (including birds and amphibians), insects, and microorganisms are either adversely affected by light or can only function effectively in darkness. Such activities include foraging, breeding, and social behavior in higher animals, amphibians and insects, which are all affected in various ways when artificial light is introduced into their environment.

Artificial light at night can disrupt hunting, migrating, and reproductive patterns of invertebrates, mammals and birds. Lighting used along river corridors, near woodland edges and near hedgerows can be particularly harmful to animals that hunt and live in these habitats. There is also evidence that trees and plants can be impacted by lighting because of their sensitivity to day length and seasonality. Prolonged artificial light can alter their flowering and dormancy cycles.

Different light sources have different emission spectra; different types of lamps give off more or less light of certain wavelengths (color).

Benefits and Challenges

A. Many of the jurisdictions in the Basin already have current lighting regulations that mitigate the affects of artificial lighting in their development codes. Typically these regulations include allowed or prohibited lamp types, screening requirements, and required elements of a lighting

plan that mitigate the affects of artificial lighting on neighboring developments and existing housing. Measures that shield humans from unwanted light can also benefit habitat areas.

B. Proposed lighting plans associated with new development can be reviewed and regulated with the development plan approval process. Measures that are related to habitat, and not typically required in local jurisdictions' ordinances, such as ensuring that the species of tree proposed is suitable with the lighting plan, shielding artificial lighting from habitat areas as well as existing development, or consultation with a habitat biologist regarding the presence and needs of animal species in the area, could be included in development regulations.

C. There may be less opportunity for retrofitting lighting plans and fixtures in existing development where lighting may be detrimentally impacting riparian and habitat areas. Existing lighting designs with the most impact will likely be associated with large developments, such as commercial centers and industrial campuses, and the best opportunity to require changes to the lighting type or plan is when the property expands or redevelops.

D. There is not a lot of available research that quantifies the long-term effects of artificial light on habitat areas. While species-specific information regarding the disruption of natural patterns due to artificial light is more abundant, not all of these species are prevalent in the Tualatin Basin. The lack of quantifiable evidence of the effects of artificial light or night lighting on habitat areas, and the existence of arguably more pressing issues, such as reduction of habitat areas due to development, may downplay the importance of this issue. The benefits of mitigating artificial light are also difficult to measure.

Recommendation for the Basin

1. Basin jurisdictions should review and document their current lighting standards.
2. Basin jurisdictions could consider revising their existing lighting requirements to incorporate some of the following concepts:
   - When artificial lighting is installed, mercury vapor, metal halide, or fluorescent lamps should be used in this order of preference. High-pressure sodium lamps should be avoided; low-intensity incandescent lighting is also not recommended. Evaluate power and maintenance costs and coordinate with power provider/ lighting utility and local road jurisdiction.
   - Shielding fixtures so that all light is directed toward the ground onto pedestrians and vehicular traffic and away from plants is one way to reduce light pollution for trees. Up-lighting and shining light over great horizontal distances should be avoided.
   - Lights should be turned off or dimmed during off-peak hours to avoid continuous lighting of trees, which has the greatest potential for upsetting normal growth patterns.
   - When planting trees where supplemental night lighting already exists, choosing those with low sensitivity to light is recommended. There is a good deal of variation in the

susceptibility of woody plants to artificial lighting. Highly sensitive trees should be avoided in areas where high intensity lighting rich in red and infrared wavelengths is used.

- The type of lighting used in and near habitat areas is also a consideration. Low pressure sodium lamps have less impact on fauna than high pressure sodium or mercury lamps. Keeping the brightness of lights as low as legally possible and planning lighting schedules that allow some dark periods can also mitigate the affects of lighting on animals. Where possible, lighting should be directed to where it is needed to avoid light spillage; limiting the height of lighting columns and directing light at a low level reduces the ecological impact of the light. Also, knowledge of sensitive species in the area and their biological needs can be used to design lighting and installation plans that minimize their impact.

Examples and References:

[NOTE to TBSC: This section is still in work – It would be ideal to have descriptions and pictures of local examples, please suggest any local examples you might have available.]

- LightLinx List Index, Light Pollution Awareness Links. http://members.aol.com/ctcadman/LiteLynx.htm
- Alessi, Ryan. "Protecting Animals from 24-7 Light", Scripps Howard News Service, January 09, 2002 http://www.knoxstudio.com/shns/story.cfm?pk=DARKSKY-SPECIES-01-09-02&cat=AN
- Fatal Flight Awareness Program (FLAP). http://www.flap.org/new/nocturnfr.htm
- "Impact of Lighting on Bats", based on a document produced by Dr. Jenny Jones (May 2000) http://www.0ad.co.uk/bats/downloads/Helpline/lighting.pdf
- Chaney, William R. "Does Night Lighting Harm Trees?", Purdue University Department of Forestry and Natural Resources, Purdue University, West Lafayette, IN 47907
- http://www.ces.purdue.edu/extmedia/FNR/FNR-FAQ-17.pdf
- "Ecological Consequences of Artificial Night Lighting" Conference Abstracts, The Urban Wildlands Group, http://www.urbanwildlands.org/abstracts.html
- "Ecology of the Night", Muskoka Heritage Foundation (Canada) http://www.muskokaheritage.org/ecology-night/scotobiology.asp
- Bidwell, Tony. 'Scotobiology of Plants", Conference material for the Dark Sky Symposium held in Muskoka, Canada, September 22 -24, 2003 http://www.muskokaheritage.org/ecology-night/media/tony-bidwell.pdf

6. Density Reduction

Key Questions	
Helps avoid or minimize impacts?	*Avoid and minimize*
Applicable basin-wide or adjacent to resource area?	*Adjacent to resource areas*
New or amended regulations required?	*Codes may need to be amended to allow waivers from minimum density requirements.*
Tools to reduce effective impervious area (EIA)?	*Yes*
Recommended for basin?	*Yes, only for properties which include resources.*

Description of Methods

Objectives to preserve regionally significant riparian and habitat areas within the urban area may conflict with objectives to achieve minimum densities and avoid expansion of the Urban Growth Boundary (UGB). Minimum density requirements, along with other factors such as escalating land prices and development costs, have had an impact on shrinking residential lot sizes. Minimum density requirements may have also resulted in pressures and impacts on significant riparian and habitat areas inside the UGB. The impact of this issue may increase as many of the remaining developable areas within the UGB have constraints, and it can be a challenge to fit the required number of dwellings on these sites in a manner that is habitat friendly.

Metro's Functional Plan (Section 3.07.140) states that "a city or county shall not approve a subdivision or development application that will result in a density below the minimum density for the zoning district." The potential impact of this requirement is off-set by the fact that the Functional Plan (Section 3.07.1010) definition of a "net acre" excludes "... environmentally constrained areas, including any ... natural resource areas protected under statewide planning Goal 5 in the comprehensive plans of cities and counties in the region.... 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..." Similarly, most local ordinances already allow developers to subtract sensitive areas such as floodplains, Title 3 buffers, and steep slopes from gross acres before calculating required minimum densities.

While many local ordinances offer density bonuses to encourage protection of significant resource areas and to avoid regulatory takings, a waiver from minimum density requirements may be just as

attractive to the development community and could facilitate greater protection of resource areas. Minimum density requirements are most commonly an issue for residential development. However, minimum floor area requirements also apply to non-residential development in regional centers, town centers, and station areas. Expectations for minimum floor area ratios and more intensive mixed use development in these areas may be difficult to balance with resource protection and reductions in effective impervious area.

Local ordinances could be further amended to reduce or eliminate minimum residential density and floor area requirements for specific areas or types of resources (such as regionally significant habitat, and Goal 5 resources designated on local comprehensive plans). Potential *maximum* densities or floor area ratios would not be affected.

Benefits and Challenges

A. Developers (and neighbors) may view waivers to minimum density requirements as a positive tool to avoid and protect significant resource areas.
B. Combined with protection of the resource area, fewer residential lots or less commercial floor area could also result in reductions in effective impervious area.
C. Minimum density requirements are an important regional tool to manage the UGB. Metro may be reluctant to allow waivers, or may want to tie them very tightly to protection of regionally significant habitat.
D. Many individuals, neighborhood groups, or local governments in the region have concerns with or are opposed to minimum density requirements for other reasons (traffic and school congestion, urban design, etc.). If waivers to minimum density requirements are granted for protection of resource areas, there may be pressure to expand the waivers for other situations.
E. Local governments may be hesitant to encourage the implementation of this approach because of the economic impacts resulting from a decrease in overall development capacity. This issue could be addressed by reallocating the "lost" density back to the jurisdiction or subregion.

Recommendation for the Basin

1. Granting waivers to minimum density requirements is an appropriate tool to consider, if tied to long-term protection of the resource area, such as dedication, or an open space easement.
2. Tualatin Basin Partners, in coordination with Metro, will need to evaluate the number and location of resource areas that may be eligible for density waivers and identify a means of ensuring that lost density is reallocated back to the jurisdiction or Basin.
3. Local governments should coordinate with the development community to test the idea of waivers to minimum density requirements in concert with protection of the resource area. Politically, the concept may not be worth pursuing if the applicability is minimal or the developer interest is low.

Examples and References

All of the jurisdictions in the Basin have adopted ordinance requirements for minimum densities to comply with Title 1 of the Metro Functional Plan. Most jurisdictions have also adopted provisions that allow (1) subtracting Title 3 and Goal 5 natural resource areas from gross acreage before calculating minimum density requirements; and (2) transfering density from constrained or unbuildable areas to buildable portions of the site.

See the *Tigard Code (18.715.020)*, and the *Washington County Code (300-2)* for examples of approaches to calculate net density and minimum density requirements.

C. ENGINEERING AND DESIGN APPROACHES

The engineering and design approaches described in this section typically require a more innovative approach to engineering and may require the adoption of new design specifications and public works standards. Amendments to transportation system plans may also be needed. These measures, in particular, will require close cooperation with Clean Water Services stormwater management program and updates of their Design & Construction Standards. Engineering and Design approaches described in this section consider innovative practices that are commonly used, as well as those that may not be as widely known to the public, as possible approaches.

Many jurisdictions throughout the Tualatin Basin currently employ practices that minimize the impacts of street construction and address water quality standards while minimizing maintenance costs. It is common for major road improvement projects to employ a variety of public involvement techniques, including citizen project advisory committees, open houses with the public, and mailers to homeowners in the area to solicit comments on the project design. This input can have a direct impact on landscape and sidewalk design, road alignments, and lighting details. Also, it is common practice for jurisdictions to coordinate road design closely with emergency responders to ensure safety is not compromised.

The clay soils of the Basin have limited the use of some methods. Implementing the engineering and design methods described in this section may require specific monitoring and evaluation on a prototype basis, as well as coordination with Clean Water Services and other local jurisdictions, to determine the short and long-term benefits of using specific approaches within the Basin. The engineering and design approaches considered in this section include the following:

1. Street design
    - Methods include minimizing paving (reducing street width, length, cul-de-sac radii, using vegetated islands in center), using pervious paving materials, maximizing street tree coverage, using multi-functional open drainage systems in lieu of more conventional curb-and-gutter systems, modifying drainage practices (e.g., allowing sidewalks to drain into yards or adjoining landscape areas rather than to the street system)

2. Stream crossing and street connectivity standards
    - Methods include minimizing the number of stream crossings and placing crossings perpendicular to the stream channel, allowing narrow street right-of-ways through stream corridors, using habitat sensitive bridge and culvert designs

3. Stormwater management facility design
    - Methods include using vegetated stormwater management facilities, such as bioretention cells or rain gardens[5]; detention ponds, underground detention and detention criteria specific to the local stream needs; water quality swales

[5] NOTE: these do not qualify as stormwater treatment facilities under CWS' standards.

1. Street Design

Key Questions	
Helps avoid or minimize impacts?	*These methods can be used to minimize and avoid impacts.*
Applicable basin-wide or adjacent to resource area?	*Effective Basin-wide.*
New or amended regulations required?	*May require transportation system plan and code amendments and amendment to public works/ engineering standards. Could be an option for developers, and encouraged for prototype public improvement projects.*
Tool to reduce effective impervious area (EIA)?	*Yes*
Recommended for basin?	*Yes; however, use of some methods will be limited by site suitability.*

Description of Methods:

The Practice of Low Impact Development (published by the Partnership for Advancing Technology in Housing in July 2003) notes that besides rooftops and driveways, residential streets account for an enormous share of a community's impervious surfaces. Street designs that minimize the amount of paved area by reducing street width, cul-de-sac radii or length, can result in an overall reduction of effective impervious area provided the area saved is not made impervious by development. Narrower roads encourage travel at posted speeds as well as reduce overall impervious area. In addition, the *Regional Transportation Plan (RTP)* Section 6.4.5 already requires that street design code language and guidelines allow for consideration of narrow street design alternatives (for local streets, no more than 46 feet of total right-of-way, including pavement widths of no more than 28 feet, curb-face to curb-face, sidewalk widths of at least 5 feet and landscaped pedestrian buffer strips that include street trees).[6] However, because reduced street widths can create issues for emergency

[6] *The city of Beaverton currently allows a minimum 22 foot local street design and has noted a variety of issues and problems resulting from streets built to this standard. One key example cited by the city is that garbage haulers cannot use automated pick-up equipment in the narrow right-of-way. Washington County has a 24 foot minimum local street design standard and has also experienced a variety of problems. The Fire Marshall has recommended that these minimums be increased. [Source: Washington County Transportation Engineering]*

vehicle access, especially where on-street parking is allowed, implementation of narrow street standards will require additional review and concurrence by the Fire Marshall.[7]

Limiting street length is more difficult to address than street width as streets lengths are typically a matter of connectivity. However, for residential subdivisions, jurisdictions may be causing streets to be unnecessarily long by establishing large minimum frontage requirements. Further, the size of intersections could be reduced by allowing tighter turning radii. Reductions in the size of cul-de-sac radii are often precluded by the need to maneuver emergency and maintenance vehicles; however, jurisdictions could encourage the use vegetated islands in the center of cul-de-sacs or intersections.

According to an *APA PAS Memo* on low impact development, the Puget Sound Action Team, a government partnership charged with developing conservation programs to protect Washington State's Puget Sound, recommends several ways to reduce the length and amount of roadways:

- Lengthen street blocks to reduce the number of cross streets for grid or modified grid layouts.
- Provide pedestrian paths to connect the end of a cul-de-sac with other pathways, roads, or open spaces.
- Create pedestrian routes to neighborhood destinations that are direct, safe, and aesthetically pleasing.
- Narrow lot frontages and cluster homes to reduce the need for more roads.

These concepts are already being used in Washington County and other local Tualatin Basin jurisdictions to reduce the length and amount of roadways.

Pervious pavement allows stormwater to pass through it. While not recommended for high traffic areas, pervious paving materials could be used in low traffic areas within the public right-of-way, such as parking strips, shoulders, and sidewalks. However, local soil conditions and federal underground injection control (UIC) regulations may limit where pervious pavement may be successfully used in the Tualatin Basin. The stormwater impact of the street system could potentially be further mitigated by maximizing the use of street trees. Street trees may be able to help with runoff reduction and detention, conveyance attenuation, and water quality improvement. The use of multi-functional open drainage systems (e.g., swales or linear basins), as well as the modification of drainage standards for the movement of surface water (e.g., allow sidewalks to drain

[7] *Washington County Transportation Engineering notes that the existing standards have been closely coordinated with the State and local Fire Marshall and represent the minimum widths currently allowed. These standards are reviewed periodically with the Fire Marshall and may be revised in light of experience and practice.*

into yards or adjoining landscape areas rather than to the street system), can be used in lieu of, or in addition to, more conventional curb-and-gutter systems.

Benefits and Challenges:

A. Narrower street widths will only result in a decrease in EIA if the extra width is used to provide landscaping or other pervious area. The *Stormwater/Pavement Impacts Reduction (SPIR) Project Report* recommends that street cross-sections be amended to conform to Metro's *Green Streets* and *Creating Livable Streets* design guidelines. To the extent that these cross-sections may be narrower than those within adopted transportation system plans, amending the cross-sections (especially where on-street parking is allowed) will require further discussions with public service providers to resolve accessibility issues for larger vehicles (fire trucks, street sweepers, garbage & recycling trucks, etc.).

B. Longer blocks may result in an increase in out-of-direction travel and congestion (see discussion of street connectivity in the next section).

C. Locating linear swales within the planting area between the sidewalk and the travel may have significant maintenance costs and affect pollutant load (e.g., increased pollutant loading from pet waste). CWS, as the stormwater management authority in the Basin, sets maintenance roles and responsibilities. However, adjacent property owners are traditionally responsible for maintaining the planting areas between the sidewalk and travel lane. Managing stormwater in the planting area creates a utility function within the planting area and may lead to conflicts with regard to maintenance responsibility and the increased costs. Ensuring long term stormwater function and maintenance has been a major challenge on private properties and it may not be feasible to transfer public runoff responsibility to private frontage owners.

D. Structural design solutions such as infiltration trenches and basins and vegetated swales require regular inspection and maintenance. Because most public works departments are set up to maintain existing traditional systems, they may not currently have the staff or equipment required for this maintenance.[8] While these methods may result in a net cost-savings within the Basin, public works departments may experience a cost increase, at least in the short-term. For example, Metro's 2001 cost comparison for a regional boulevard estimated landscape/maintenance as follows: $6,950 for a standard street (based on Washington County standards) vs. $264,583 for a Metro Green Street Boulevard.

E. The use of methods that rely on the infiltration of stormwater will be limited to those areas of the Tualatin Basin with suitable soils and ground water levels.[9]

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[8] *Washington County Transportation Engineering staff notes that open drainage systems have been monitored and found to greatly increase stormwater maintenance costs for trash patrol. There are also issues regarding potential increases in fecal coliform pollution due to pet waste.*

[9] *A review of the SCS (NRCS) Soil Survey of Washington County - Table 8 - show all soils except three to be listed with "restrictive soil features" which preclude infiltration including one or more of the following:*

F. Potentially underground injection control (UIC) rules may restrict the infiltration of road runoff in areas which utilize underground storage of drinking water.

Recommendation for the Basin:

1. Where jurisdictions have already adopted standards to allow for narrow street widths in compliance with the RTP, this information should be documented in the final report. In order to decrease EIA, cross-sections for narrower streets should reflect a corresponding increase in pervious area.
2. Jurisdictions within the Basin could consider adding consistent policy language to their comprehensive plans, transportation system plans, and public works standards allowing the use of alternative street design cross sections. Approval for use of alternative street designs should be based on non-discretionary criteria.
3. In order to encourage the implementation of these specifications, jurisdictions should identify clear and objective (non-discretionary) performance criteria for use of alternative designs and establish an approval process for alternative designs that will not require a variance.
4. Additional information from the Green Streets Technical Advisory Committee final report should be considered when available.
5. Identify mechanisms to ensure increase maintenance costs are adequately funded.
6. Utilize existing detention and water quality methods and optimize release criteria for the local conditions. Maximize storage criteria in the upper basins as feasible.
7. Consider removing street stubs that cannot be extended and utilizing right-of-way for open space and native vegetation.

Examples/References:

CWS Merlo Road Field Operations Facility

The access road to the Field Operations Facility is a "green" street with no curb and gutter on the south side of the street. Vegetated swales planted with native trees and shrubs replace traditional catch basins and conveyance pipes. Stormwater is absorbed into the soil and plant roots instead of being concentrated and directed to a storm drain, stream or wetland. Green streets treat stormwater within the right of way, while providing maximum tree canopy to intercept rainfall and to cool road surfaces. There were no extra costs for this access road, compared to a standard street development. Swales replaced traditional catch basins and underground pipes, which reduced costs and minimized potential sediment impacts during construction. However, one study of construction costs found a "green" boulevard was 22

"wetness, too clayey, or severe slopes." One soil that is not so restricted is the "Briedwell" series soil located in T.2S., R.1W., section 13 - in Tualatin/ Durham area. The other two, Hillsboro and Willamette soils, are listed as low strength and would require site specific testing and long term evaluation. [Source: Washington County Transportation Engineering]

percent more costly than a conventional boulevard. The 2002 study was conducted by Metro regional government, comparing costs in Washington County, Oregon. Still, stormwater credits may be available to offset extra costs.

[Source: Clean Water Services, "Slow the Flow! Designing the Built Environment to Protect Urban Environments" brochure]

Street Edge Alternatives (SEA) projects

Seattle's public utilities and transportation departments are experimenting with LID design elements in their Street Edge Alternatives (SEA) projects. By modifying circulation design, SEA Streets significantly improved stormwater management: the initial project to retrofit a 660-foot long residential street has resulted in a 98 percent reduction in stormwater runoff over the past three years. The project was initiated to control heavily polluted stormwater that ran off impervious road surfaces, adversely affecting the area's creeks and wildlife. To minimize these impacts, more than 100 evergreen trees and 1,100 shrubs were planted, the road width was reduced from more than 20 feet (plus space for angled parking) to 14 feet, and grassed swales and two feet of grass shoulder were added next to the curb-free roads. The amount of parking was determined by each owner, and parallel and angle parking was grouped between swales and driveways. Sidewalks were installed on only one side of the road, which was considered adequate for residential communities.

[Source: APA PAS MEMO, Low Impact Development: An Alternative Approach to Site Design]

References:

- Clean Water Services, "Slow the Flow! Designing the Built Environment to Protect Urban Environments" brochure http://www.cleanwaterservices.org/content/documents/Permit/Slow%20the%20Flow%20brochure.pdf
- Creating Livable Streets: Street Design Guidelines for 2040, 2nd edition. Metro, June 2002.
- Green Streets: Innovative Solutions for Stormwater and Stream Crossings, 1st edition. Metro, June 2002.
- Low Impact Development: An Alternative Approach to Site Design. APA PAS MEMO, Asa Foss, May/June 2005
- The Practice of Low Impact Development. US Department of Housing and Urban Development, Office of Policy Development and Research, Contract No. H-21314CA, July 2003.
- Review of Low Impact Development Techniques. CH2MHILL on behalf of the Puget Sound Action Team., January 2004.
- Stormwater/Pavement Impacts Reduction (SPIR) Project Report, Audubon Society of Portland, 2004.

2. Stream Crossing and Street Connectivity Standards

Key Questions	
Helps avoid or minimize impacts?	*Primarily used to avoid impacts.*
Applicable basin-wide or adjacent to resource area?	*Primarily adjacent to resources.*
New or amended regulations required?	*Amendments may be required, but will not increase requirements for private development.*
Tool to reduce effective impervious area (EIA)?	*No*
Recommended for basin?	*Yes*

Description of Method:

Stream crossings can have a significant impact on in-stream water flow as well impacts on the adjacent riparian area They can also impede the travel patterns of fish and wildlife. Typically, bridges have fewer in-stream impacts than culverts. CWS's *Healthy Stream Plan* found that "in the urban portion of the Tualatin Basin most bridges "... are adequately sized to convey significant flood flows, and allow for fish passage. Conversely, culverts ... are often undersized for significant flood flows, frequently alter the geomorphic condition of the stream, and limit fish passage." Stream crossing can also affect other wildlife by interrupting a pathway. When the crossing interrupts a terrestrial pathway, properly located fencing and natural landscaping can help guide animals around or through these areas.

Improving stream crossing within the Basin has been an on-going effort. Basin jurisdictions have constructed stream crossings to fish- and wildlife-friendly standards for more than 20 years. With State and Federal resource agencies as participants, each project is reviewed, designed and constructed with fish and wildlife benefits as a project feature. While many older culverts do impede fish and wildlife, these are being identified and corrected in a coordinated and systematic manner by the jurisdictions under the Healthy Streams Plan. In addition, culvert construction within the upper portions of the watershed allows for detention facilities that can offset the impacts of existing and proposed development and that help to restore stream geomorphology to a pre-development condition.

Street connectivity standards can also impact riparian and habitat areas. According to an *APA PAS Memo* on low impact development, depending on the density, location, and type of development, a hybrid street network that combines a conventional grid with a curvilinear system can reduce the amount of total roadways while still allowing for smooth traffic circulation. Most jurisdictions in the

Basin have adopted street connectivity standards that emphasize transportation functionality, but which also recognize barriers to connectivity, such as natural resource areas.

The *Regional Transportation Plan (RTP)* establishes the following standards for street connectivity within the region. As highlighted in bold below (emphasis added), the RTP design standards include some exceptions for stream crossings; however, exceptions for other habitat impacts are not provided (e.g., avoidance of upland habitat areas).

Section 6.4.5 Design Standards for Street Connectivity

2. In addition to preparing the above conceptual street plan map, cities and counties shall require new residential or mixed-use development involving construction of new street(s) to provide a site plan that reflects the following:

a. Street connections:

- *Responds to and expands on the conceptual street plan map as described in Section 6.4.5(1) for areas where a map has been completed.*
- *Provides full street connections with spacing of no more than 530 feet between connections except where prevented by barriers such as topography, railroads, freeways, pre-existing development, or where lease provisions, easements, covenants or other restrictions existing prior to May 1, 1995, which preclude street connections.*
- *Where streets must* **cross water features** *identified in Title 3 of the Urban Growth Management Functional Plan (UGMFP), provide crossings at an average spacing of 800 to 1,200 feet,* **unless habitat quality** *or length of crossing prevents a full street connection.*

b. Accessways:

- *When full street connections are not possible provides bike and pedestrian accessways on public easements or rights-of-way in lieu of streets. Spacing of accessways between full street connections shall be no more than 330 feet except where prevented by barriers such as topography, railroads, freeways, pre-existing development, or where lease provisions, easements, covenants or other restrictions existing prior to May 1, 1995 which preclude accessway connections.*
- *Bike and pedestrian accessways that* **cross water features** *identified in Title 3 of the UGMFP should have an average spacing no more than 530 feet,* **unless habitat quality** *or length of crossing prevents a connection.*

c. Centers, main streets and station communities: Where full street connections **over water features** *identified in Title 3 of the UGMFP cannot be constructed in centers, main streets and station communities (including direct connections from adjacent neighborhoods), or spacing of full street crossings exceeds 1,200 feet, provide bicycle and pedestrian crossings at an average spacing of 530 feet,* **unless exceptional habitat quality** *or length of crossing prevents a connection.*

d. Other considerations:

- *Limits the use of cul-de-sac designs and other closed-end street systems to situations where barriers prevent full street extensions.*
- *Includes no closed-end street longer than 200 feet or with more than 25 dwelling units.*
- *Includes street cross-sections demonstrating dimensions of right-of-way improvements, with streets designed for posted or expected speed limits.*

- *For replacement or new construction of local street crossings on streams identified in Title 3 of the Urban Growth Management Functional Plan, Cities and Counties, TriMet, ODOT and the Port of Portland shall amend design codes, standards and plans to* ***allow consideration of the stream crossing design guidelines contained in the Green Streets handbook.***

As noted above, the RTP includes a cross reference to the stream crossing design guidelines in the *Green Streets* handbook. Fewer street connections could reduce the overall amount of EIA within the Basin; however, by shifting traffic to fewer through streets, more travel lanes could be needed on the through-streets and therefore could be a potential increase in out-of-direction travel.

Benefits and Challenges:

A. Additional analysis of existing stream crossing may be needed. The analysis conducted for the Healthy Stream Plan, which was limited in terms of time, budget and jurisdiction, represents only a portion of the total number of structures.
B. Improvements to existing culverts are expensive. Based on a study of 1,200 culverts and bridges, the Healthy Stream Plan has identified 383 culverts in the Basin as priorities for improvement.[10]
C. Providing a high level of street connectivity has a number of transportation benefits, but these benefits must be balanced with the environmental impacts of providing a connection.
D. Amendments to transportation system plans to modify or reduce proposed stream crossings may impact regional transportation systems.
E. Local FEMA floodplain jurisdictions must continue to require engineering hydraulic analysis of all culvert work.

Recommendation for the Basin:

1. Encourage Metro to amend the RTP to refer to all Goal 5 resources, as well as Title 3 water features, and to include a reference to the other stream crossing standards (e.g., CWS).
2. Develop educational materials to inform the public on the work jurisdictions have accomplished, or intend to accomplish, in their efforts to remove barriers to fish passage.
3. Basin jurisdictions, together with CWS, should continue to coordinate culvert work and efforts to verify the critical basins where safe fish passage is a design issue.

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[10] *This preliminary study was the beginning of detailed culvert-by-culvert evaluation by the County, Clean Water Services (CWS), and the Tualatin Basin cities. Jurisdictions have included culvert projects in their adopted capital improvement project lists and have corrected many culverts. CWS maintains a detailed database and meets regularly with the jurisdictions to coordinate corrective projects. Many culverts in the preliminary study were subsequently removed from the barrier list. As of January 2006, progress on improvements to culverts continues throughout the Basin. [Source: Washington County Transportation Engineering]*

4. To the extent that this has not already occurred locally, CWS has suggested that local jurisdictions will need to assess the culvert list relative to their own capital programming to determine the order of implementation.
5. In order to facilitate culvert replacement (and keep costs down), Basin jurisdictions could permit culvert replacement and associated enhancement work outright (or in groups of projects) and not require additional land use or vegetative corridor mitigation review for those culvert projects and enhancement projects listed in the Healthy Streams Plan. The Healthy Streams Plan suggests that a regional stream enhancement permit be secured for the District to streamline the permitting process of in-stream and wetland activities. Similarly, CWS should consider amending the vegetative corridor standards to allow for the permitting of groups of projects by public agencies. Basin jurisdictions, together with CWS, should adopt unified stream crossing guidelines, if needed to facilitate these efforts.
6. In fish-bearing streams, investigate automatic gate operators to minimize fish impact while optimizing detention to restore healthy streams and providing improved flood control.

Examples/References:

The County and local jurisdictions have constructed control structures on culverts to provide flow control. State and Federal permitting agencies agree that the "stream-forming" flows are approximately the two-year flow. Detaining storm flows behind these culverts for the developed basin to be released at the undeveloped 2-year flow mitigates stream impacts from existing and proposed development. Opportunities also exist to restrict large event flows with these same structures to provide flood control in the basin. CWS is now studying several sub-basins to optimize this program. The culvert control structures do not restrict local resident fish and wildlife during normal flows. Costs are little more than a standard culvert installation. Maintenance is not increased over the standard installation because these are located in public right-of-way or public easements: long-term operation and effective function is assured. Future modifications to the control structures can be easily completed when needed to address changes in technology, development impacts, or downstream goals. *[Source: Washington County Transportation Engineering]*

References

* Green Streets: Innovative Solutions for Stormwater and Stream Crossings, 1st edition. Metro, June 2002.
* Healthy Streams Plan, Clean Water Services, June 2005.
* Regional Transportation Plan, Metro.

3. *Stormwater Management Facility Design*

Key Questions	
Helps avoid or minimize impacts?	*Minimize*
Applicable basin-wide or adjacent to resource area?	*Applicable basin-wide.*
New or amended regulations required?	*Yes*
Tool to reduce effective impervious area (EIA)?	*Yes. Subject to UBC, Plumbing Code and local drainage conditions.*
Recommended for basin?	*Yes; however, use of some methods will be limited by site suitability.*

Description of Method:

The *Healthy Streams Plan* found that stormwater was a key factor in stream health and that the management of stormwater quality and quantity influences the ability of a stream to absorb changes in water quality and hydrology. The Plan includes stormwater policy and program refinements for the Basin. It recommends the development and evaluation of a policy that requires "cleaner" runoff from sidewalks, patios, and certain rooftops be retained and infiltrated into the ground where practical. The evaluation would consider soils, long-term effectiveness, maintenance responsibility and cost, as well as other factors. Based on the evaluation of the methods standards and stormwater quantity mitigation credits for effective impervious area, reduction techniques would be developed. These methods could offer several habitat benefits, including preserving existing resource areas and improving water quality (i.e., fish habitat). In addition, local jurisdictions in the Basin can continue to further augment the habitat benefits of the CWS's *Design & Construction (D&C)* standards by, for example, requiring the incorporation of minimum percentages of native plant species within vegetated stormwater facilities.

According to *The Practice of Low Impact Development*, in addition to protecting the environment, when correctly planned for and accommodated, stormwater management systems can satisfy regulatory requirements, act as desirable site design elements, and reduce infrastructure costs. Stormwater treatment can be designed to mimic pre-development hydrologic conditions (particularly

Examples of bioretention in parking lot

for smaller, more frequent storms[11]) through the use of a variety of structural and nonstructural practices that detain, retain, percolate, and evaporate storm water. Alternatives to conventional stormwater systems include infiltration systems such as rain gardens or bioretention areas. These are shallow, topographic depressions filled with engineered soils and vegetation that retain, treat, and infiltrate water. They are commonly located in parking lot islands or within small pockets in residential land uses. Bioretention systems are designed for the temporary storage of rainwater. They provide an opportunity for the water to have increased contact time with soils and plant materials, allowing for the natural systems to filter pollutants and permitting the processes of infiltration, evaporation, and transpiration to occur. They can be used as a buffer to shoreline areas to capture runoff from the home landscape before it enters a lake, pond, or river. Jurisdictions in the Tualatin Basin, in cooperation with CWS, have approved construction of many of these facilities. However, performance is not well documented for this area and these soils and long term evaluations of effectiveness and costs are needed.

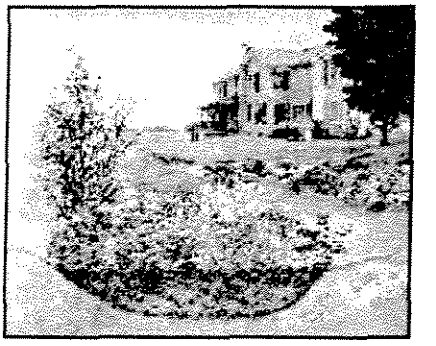

Illustration of a rain garden

Filtering systems, such as "Filter Strips," use soils and vegetation to remove pollutants from stormwater for pre-treatment. Filter strips are low-grade vegetated areas that permit sediment to be deposited. Alternative conveyance systems, such as vegetated channels or swales, slow the speed of stormwater and filter pollutants before treatment.[12]

Benefits and Challenges:

A. Low impact development storm water management systems can reduce development costs through the reduction or elimination of conventional storm water conveyance and collection system. However, larger storms may exceed those systems' capacity due to the Tualatin Basin's climate and soils.

B. LID systems can reduce the need for paving, curb and gutter, piping, inlet structures, and storm water ponds by treating water at its source. However, installation and maintenance costs may be

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[11] *Bioretention systems may be better suited to accommodate small storm events. Larger storm events may still require some degree of conventional piping and detention systems in addition to low-impact development methods. [Source: Washington County Transportation Engineering]*

[12] *Filtering systems, such as cartridge filter systems, use filter media cartridges in vaults or above ground systems to filter pollutants out of stormwater. While these systems require yearly maintenance, they require little or no added right-of-way. Construction costs can be slightly more than swales. Maintenance costs are predictable and manageable to budget. Testing and monitoring are easily provided. Within road rights-of-way, road projects have, in the past, constructed underground detention vault systems. These have been designed as necessary to release runoff from impervious surfaces as a designed controlled rate. These are easily maintained and not affected by future utility construction, which would destroy porous*

greater than the costs associated with other methods such as piping. Further evaluation of LID systems is needed to verify long-term effectiveness.

C. LID practices remove pollutants from storm water naturally and may help restore a site's pre-development hydrology. Certain practices can help recharge local groundwater tables, reduce domestic water use for lawns and vegetation, and provide habitat for a variety of species.

D. UBC and Plumbing code requirements, as well as local soil conditions, groundwater, adjacent development, future utility construction, and slope stability may limit or prohibit the application of alternative drainage features and designs.

E. Inadequate or poorly maintained systems may fail to perform and may negatively impact adjacent properties. Standards for the construction and maintenance of stormwater management facilities are needed to ensure their effectiveness. An evaluation of existing LID systems within the basin and their effectiveness is the logical first step prior to development of new standards.

Recommendation for the Basin:

1. Adoption of Basin-wide standards for the construction and maintenance of stormwater management facilities would help encourage the use of alternative systems and would ensure fair application of stormwater mitigation credits.
2. Work with building officials to identify UBC and Plumbing code issues.
3. Local jurisdictions in the Basin should consider further augmenting the habitat benefits of the updated D&C standards by requiring the incorporation of minimum percentages of native plant species within vegetated stormwater facilities.

Examples/References:

Clean Water Services Merlo Road Field Operations Facility

Vegetated swales, biofiltration, and "softscaping" at the site was designed to mimic a natural landscape and manage stormwater runoff on site. Instead of underground pipes, catch basins and large detention ponds, there is an integrated system of vegetated swales. Planted with trees, shrubs and herbaceous perennials, the swales provide the stormwater conveyance system. This biofiltration system disperses stormwater on site, controls the rate and volume of runoff, and improves water quality.

All landscaped areas were designed to retain as much rainfall as possible and drain their runoff to swales. Even the runoff from the traditional parking lots flows to swales. The adjacent Nature Park is protected by a 50-foot wide by 600-foot long water quality swale that runs the

pavements or infiltration systems. These continue to be an excellent and cost-effective option where needed. [Source: Washington County Transportation Engineering]

downstream length of the site. Dispersing stormwater runoff at its source is especially suited for the rainfall patterns here in the Pacific Northwest, where nearly 90 percent of all 24-hour rainfall events are less than 1/2 inch. These small events are easily managed with "softscaping" or biofiltration landscaping that absorbs rain, recharges groundwater, reduces winter runoff and virtually eliminates summer runoff.

In contrast, typical pipe conveyance systems concentrate and accelerate flows creating artificially high peaks and volumes that negatively impact stream hydrology and aquatic habitat. Warm weather rains can increase water temperature, especially when runoff courses over hot pavement and roofs. Warm water temperatures lower the available oxygen for aquatic organisms, critical for healthy streams and wetlands. Piped systems rush rain downstream, disrupting the natural process of replenishing groundwater.

The facility's vegetated conveyance swales were designed as major or minor, with 2:1 or 3:1 slopes respectively. The depth and width of the swales vary by location. All swales were lined with 6-inches of topsoil, jute mat and a 3-inch layer of 2-inch to 3/4-inch river run rock.

[Source: CWS Slow the Flow ! Designing the Built Environment to Protect Urban Environments brochure]

References

- The Practice of Low Impact Development. US Department of Housing and Urban Development, Office of Policy Development and Research, Contract No. H-21314CA, July 2003.
- Low Impact Development: An Alternative Approach to Site Design. APA PAS MEMO, Asa Foss, May/June 2005.
- Lower Phalen Creek Project, St. Paul, Minnesota http://www.mepartnership.org/sites/LOWERPHALENCREEK/sub_page7.asp

D. Building Design Solutions

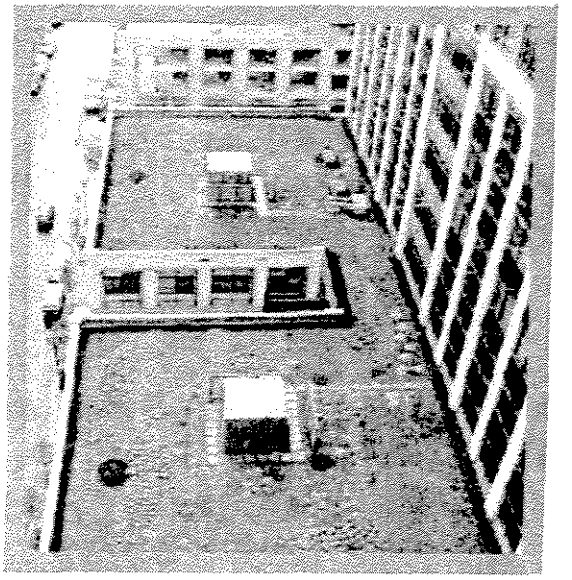
Key Questions

Helps avoid or minimize impacts?	*Minimize*
Applicable basin-wide or adjacent to resource area?	*Applicable basin-wide*
New or amended regulations required?	*Some codes may have to be amended, or new guidelines drafted, to ensure proper placement of disconnected downspouts. Codes may have to be amended to allow green roofs as an element of new development or redevelopment and to account for the structural requirements necessary to support green roofs.*
Tools to reduce effective impervious area (EIA)?	*Yes. May be subject to UBC, Plumbing Code and local drainage conditions.*
Recommended for basin?	*Yes; however, seismic design and the health concerns of moisture within the building (mold) require careful evaluation.*

Description of Method

Incorporating certain elements into the design of new buildings and retrofitting existing buildings can minimize the amount of stormwater runoff leaving a property or site. Elements that can be incorporated into building and landscaping designs that reduce or detain runoff include green roofs, disconnecting downspouts, and rain barrel detention. There are several examples of this approach constructed and operating in Basin.

Brewery Blocks - Block 4 – from BES slide show "Portland Ecoroof Tours"



Photograph-GBD Architects

Green roofs, also known as *vegetated roof covers* or *eco-roofs*, are thin layers of living vegetation installed on top of conventional flat or sloping roofs. Potential benefits associated with green roofs include controlling storm water runoff, improving water quality, mitigating urban heat-island effects, and creating wildlife habitat. Green roofs may be

appropriate as an addition to many types of buildings, including commercial, industrial, institutional, and residential settings. They are particularly effective at controlling runoff on the large roofs typical of commercial and institutional buildings.

Green roofs reduce the amount of stormwater runoff and also delay the time at which runoff occurs, resulting in decreased stress on sewer systems at peak flow periods. Water is stored by the substrate of the green roof and then taken up by the plants, where the water is returned to the atmosphere through transpiration and evaporation. In summer, depending on the plants and depth of growing medium, green roofs retain 70-90% of the precipitation that falls on them; in winter they retain between 25-40%. Because flows from larger storms or longer duration storms will not be fully retained, other systems will likely also be needed.

Green roofs can be designed to achieve specified levels of storm water runoff control, including reductions in both total annual runoff volume (reductions of 50-60% are common) and peak runoff rates for storms. By reducing both the volume and the rate of storm water runoff, green roofs benefit cities with combined sewer overflow (CSO) impacts. Green roofs not only retain the rainwater, but also moderate the temperature of the water and act as natural filters for any of the water that happens to run off. In addition, in urban areas, up to 30% of total nitrogen and total phosphorus released into receiving streams is derived from dust that accumulates on rooftops. Acting as natural bio-filtration devices, green roofs reduce this water contamination. However, to survive the long, dry summers, existing green roofs in Washington County are maintained through irrigation.

The 8,000 square foot green roof system at Clean Water Services Merlo Road Field Operations Facility has drought-resistant plants that absorb rainfall and help insulate the building. Nearly all rain is expected to be retained in warm, dry months. Nearly 80 percent of water is expected to be returned to the atmosphere through evapotranspiration, which will cool the roof and the surrounding air.

Clean Water Services Merlo Road Field Operations Facility from the *Slow the Flow !* brochure

Disconnecting downspouts from the stormwater system is another way to

manage stormwater runoff. Reducing the volume of runoff being diverted directly into municipal storm systems is of primary importance to those jurisdictions with a combined sewer/stormwater system. Disconnecting downspouts from this system reduces pressure on combination sewer system and helps prevent overflows into streams and rivers. This is the case with the city of Portland, who provides grants and materials to neighborhood associations and other volunteer groups that donate time disconnecting downspouts for interested property owners.[13]

While the Tualatin Basin does not have this type of combined system, allowing stormwater to be absorbed or detained on site instead of being conveyed to a piped system could still play a role in reducing storm water volumes where local conditions support these applications. According to Washington County Transportation Engineering, disconnecting downspouts in some locations in the County has led to flooded crawlspaces. This is a health and safety concern due to mold infestation. The plumbing code requires positive crawlspace drainage, but older homes may not have the required safety system in place.

Another way of dealing with localized stormwater runoff is through a rain barrel or cistern system. This type of rainwater collection system stores rooftop runoff to be used later for activities such as lawn and garden watering, car washing, and window cleaning. A cistern functions similarly to a rain barrel, but has a much greater storage capacity and, in addition to rainwater collection, can be used to filter the water for a wider range of domestic uses. Over the rainy season, even a small roof has the potential to capture enormous amounts of water that otherwise flows down the drain. For example, a typical residence in Portland (36 inches of rain per year) with a 2,000 square foot roof collection area will result in around 35,000 gallons of water captured per year, an average of almost 100 gallons per day.

Rainwater collection and reuse is beneficial to the environment because the stored water would otherwise run off into the storm sewers, bringing pollutants such as oil and grease, bacteria, and nutrients with it. The more rainwater that is reused, the less need there is to chlorinate or chemically treat it before reusing or releasing it back into the watershed. Rainwater harvesting, or capturing rain and storing it for later use, also results in less water use and lower water bills.

Other sustainable or "green" building practices have an indirect benefit on watersheds and habitat areas. Providing efficient landscape irrigation and systems that utilize "low-flow" fixtures to minimize water usage can reduce the impact new development has on the ecosystem.

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[13] *NOTE: Depending on specific locations, soils in the Tualatin Basin may not be as suitable for this approach as those in the City of Portland. Also, the City of Portland has building and plumbing codes that*

Many of these sustainable practices have been incorporated into building practices associated with the US Green Building Council's national LEED™ (Leadership in Energy and Environmental Design) certification. Portland has developed the country's first supplemental guide to the LEED™ standards. Portland's green building incentive program includes a series of pre-approved innovation credits that reflect the City's goals for mixed use development, construction waste management, alternative transportation, and stormwater management. This program has also centralized local building and zoning code regulations and relevant green building resources into a resource guide for Portland-area development professionals.

Benefits and Challenges

A. Detaining stormwater runoff on site through the use of disconnected downspouts or rain barrels can be accomplished relatively easily and at a low cost. In some cases, these solutions can be easily integrated into site design for new developments, as well as installed by property owners of existing homes/buildings. Careful design and construction is important in order to avoid flooding crawlspaces or impacting adjacent properties.

B. Not all areas are suitable candidates for retaining stormwater on site. It is not advisable to encourage disconnecting from the stormwater system in areas that have poor soil percolation or a high water table.

C. Rain water collection systems (e.g., rain barrels) can freeze and degrade with age, they may require pumps and filter which will need maintenance and care needs to be taken to restrict access from children.

D. Development guidelines or revisions to building codes may be necessary to regulate onsite stormwater conveyance in a manner that does not damage property or pose a threat to neighboring sites.

E. Development guidelines or revisions to building codes may be necessary to ensure structures are strong enough to support proposed green roofs.[14] To construct a green roof on an existing building may require minor or possibly extensive structural upgrades to meet local seismic requirements. Evaluate existing green roofs to verify loading assumptions currently employed and draft or update development guidelines as appropriate.

F. Green roofs are expensive. The initial cost of a green roof can be 30% greater than a conventional roof, despite the fact that long term maintenance (green rooftops prolong the life of a conventional roof) and energy cost savings can offset this cost increase to some degree.

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allow a degree of flexibility in implementing LID techniquest.

[14] From "Extensive Green Roofs" (see "Examples/References"): In the United States, green roof designs are generally regulated using existing standards for ballasted roofs. The International Code Council (ICC) code, formerly the BOCA code, used for guidance by many municipal authorities, recognizes roof gardens. It requires that the 'wet weight' of the green roof be treated as an additional dead load. It also supplies live load requirements for maintenance-related foot traffic and for regulated pedestrian access. One limitation of the ICC standards is that it does not specify the testing methods to be used in satisfying the code.

Market fluctuations in the cost of building materials can also be a disincentive to building structures that can support green roofs.

G. The challenge is to explain the costs and benefits, both in financial terms and relating to the environment, of these typically non-traditional building design elements. Education is the key to garnering public acceptance, excitement, and action. Education must include the long-term maintenance requirements.

Recommendation for the Basin

1. The disconnecting of downspouts for existing homes and buildings in the Tualatin Basin should be evaluated and only allowed and encouraged in those areas that have adequate soil percolation and where the risk of private property damage from water-saturated soil is low.
2. Work with CWS to evaluate the need for Basin-wide standards for the construction and maintenance of green roofs and similar facilities, and explore ways to promote green roof building (see examples below). Ensure that building officials are involved to identify UBC and Plumbing code issues.
3. Work with CWS to evaluate, develop, and promote educational and outreach programs to property owners and potential developers regarding methods available to reduce impervious surfaces through design solutions.
4. Utilize the Four-County Building Officials meetings as a forum to review issues or concerns related to the applicability and consistent application of current Building and Plumbing Codes to LID/Habitat Friendly design.

Examples and References

Some examples of ways to promote green roof building include:

- Provide financial incentives. The city of Chicago's Department of Environment and Department of Planning and Development is making a limited number of grants ($5,000 each) to help residential and/or small commercial (less than 10,000 square feet) building owners with a green roof project.
- Make research and resources available. The city of Toronto has created a website that lists specific benefits to the community and a timeline for creating policies to promote "green development standards."
- Lead by example. Multnomah County installed a 15,000 square foot green roof on the Multnomah County Building; Metro installed a 25,000 square foot green roof on the Metro Regional Center building; Clean Water Services installed an 8,000 square foot green roof at the Merlo Road Field Operations Facility.

Resources

- Miller, P.E., Charlie. "Extensive Green Roofs", Roofscapes, Inc., Whole Building Design http://www.wbdg.org/design/greenroofs.php
- Green Roofs for Healthy Cities http://www.greenroofs.net/index.php
- http://www.greenroofs.com
- "Healthy Landscapes", University of Rhode Island http://www.uri.edu/ce/healthylandscapes/tips/5.html
- "Skills for Protecting Your Stream: Retrofitting Your Own Backyard", Center for Watershed Protection, April 2002 http://www.cwp.org/Community_Watersheds/educating_constituents.htm
- City of Chicago Department of Environment www.cityofchicago.org/environment
- City of Toronto http://www.toronto.ca/greenroofs/index.htm
- City of Portland Green Building Resource http://www.green-rated.org/default.asp
- City of Portland, Bureau of Environmental Services, Portland Ecoroof Tours, http://www.portlandonline.com/shared/cfm/image.cfm?id=53988
- King, Jason, ASLA,LEED AP, "Working With Water: Innovative Design Approaches for Stormwater Management", January 3, 2006, , Macdonald Environmental Planning, p.c. http://www.edcmag.com/CDA/Articles/Feature_Article/e79855c9ff298010VgnVCM100000f932a8c0
- Portland Office of Neighborhood Involvement http://www.portlandonline.com/oni/index.cfm?c=28992
- Clean Water Services, "Slow the Flow! Designing the Built Environment to Protect Urban Environments" brochure http://www.cleanwaterservices.org/content/documents/Permit/Slow%20the%20Flow%20brochure.pdf

Attachment 8

Technical Issue Paper 2

Tualatin Basin Goal 5

Program Implementation Report

Steering Committee Recommended Draft Issue Paper #2:

Implementation Recommendations to Encourage Habitat Friendly Development Practices

Prepared for:

Tualatin Basin Steering Committee

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May 2, 2006

Implementation Recommendations to Develop and Encourage Habitat Friendly Development Practices

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A. INTRODUCTION

1. Background

On September 29, 2005 the Metro Council voted to approve a regional Nature in Neighborhoods (Goal 5) program. This council action incorporated the *Tualatin Basin Fish & Wildlife Habitat Program*, as developed and recommended by the Tualatin Basin Partners for Natural Places (Partners). Under an intergovernmental agreement between the Partners and Metro, applicable elements of the adopted Basin program must be implemented within one year following the Metro Council's final decision (or within 60 days of LCDC's acknowledgement of Metro's Functional Plan provisions, whichever is later).

Applicable elements included compliance with the six steps identified in Section B of Chapter 7 of the *Tualatin Basin Fish & Wildlife Habitat Program.* One of these steps is the development of a model Low Impact-Development (LID) ordinance for the basin, which would provide tools designed to reduce environmental impacts of new development and removing barriers to their utilization. This step includes local adoption of LID guidelines. In addition, Basin jurisdictions must adopt provisions that 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.

An important feature of the Basin program is the encouragement of land developers and property owners to incorporate habitat friendly practices in their site design. *Habitat friendly development practices* include a broad range of development techniques and activities that reduce the detrimental impact on fish and wildlife habitat relative to traditional development practices. While the phrases are sometimes used interchangeably, for the purposes of this paper *low impact development*, which is more specifically focused on minimizing hydrologic impacts, e.g., reducing *effective impervious area (ELA)* and improving water quality, is considered a subset of habitat friendly practices.

2. Purpose

This paper has been prepared by Angelo Eaton & Associates on behalf of the Tualatin Basin Steering Committee (TBSC) as part of the *Tualatin Basin Fish & Wildlife Habitat Program.* As part of Basin Program, a compliance report is being prepared to document the process, methods, and results of the program implementation work. As a first step, Issue Paper #1 (draft dated February 24, 2006) identified those approaches and methods which could be successfully used within the Tualatin Basin to develop and encourage habitat friendly development practices.

Issue Paper #2 suggests code concepts that could be included in local comprehensive plans and development codes in order to implement and encourage those habitat friendly practices recommended for the Basin in Issue Paper #1. These concepts include addressing typical barriers

to habitat friendly development, as well as those that may preclude the implementation of low impact development techniques being considered by Clean Water Services (CWS) as acceptable methods of on-site stormwater management. Issue Paper #2 is intended to assist in the development of local program implementation ordinances. Each Basin jurisdiction is responsible for drafting and adopting local comprehensive plan and/or development code amendments necessary for implementation of habitat friendly practices. Because most of the Basin jurisdictions already implement some practices which reduce the detrimental impact of development on fish and wildlife, all of the suggested changes may not be necessary in all cases. In these cases, Basin jurisdictions will document current practices.

Fully implementing the recommended approaches and methods outlined in Issue Paper #1 will raise significant policy issues. For example, allowing density transfer by right may facilitate resource protection, but may upset neighboring property owners and lessen public involvement (in a sense, creating a conflict between Statewide Planning Goal 1 and Goal 5). Resolving these issues will require policy "trade-offs." The implementation discussion in Issue Paper #2 is meant to identify those provisions that facilitate and encourage the use of habitat-friendly development practices for the benefit of Goal 5 resources. In considering these implementation concepts, each of the Basin jurisdictions will have to determine which trade-offs it finds appropriate.

3. *Summary of Approaches and Methods*

As previously described in Issue Paper #1, some of the approaches and methods that can be used to encourage habitat friendly development could be effective anywhere within the basin *(including within or adjacent to habitat areas)*; others are only recommended for areas within or adjacent to habitat areas. This distinction becomes particularly important in terms of implementation. In some cases, a method may be effective in both situations. For example, reducing parking space requirements basin-wide may help reduce Effective Impervious Area (EIA), if the "saved" area is used for landscaping or to retain existing vegetation. Alternatively, if the concept were only applied on a more limited basis to those sites which contain Goal 5 resources, it could help create the flexibility needed to protect the resource while allowing development of the site.

In addition, some of the approaches and methods recommended in Issue Paper #1 will have limited applicability in the Basin due to soil conditions. As noted in Issue Paper #1, a review of the SCS (NRCS) *Soil Survey of Washington County - Table 8* shows all but three soils types in the Basin to be listed with "restrictive soil features". These soils are not necessarily impervious, but may be very slow draining. Those approaches and methods which are listed as "soil limited" will require soil amendments or other engineering solutions to offset the permeability issue when located on these soils. Finally, full implementation of some methods is dependent on adoption of technical design specifications. CWS has developed, or will be developing, technical specifications for some

approaches. In other cases, the input of the Basin jurisdictions' building officials or engineers will be required. Metro may also be able to assist in the development of technical design specifications.

The table below summarizes the approaches and methods recommended in Issue Paper #1 and notes whether they are applicable basin-wide or only on sites that include habitat. In addition, the table notes whether they are limited or constrained in applicability by soil conditions. It also identifies those methods that will require technical specifications to be developed in order to be fully implemented.

Table 1: Applicability of Approaches and Methods from Issue Paper #1

Approaches and Methods from Issue Paper #1	Sites w/ Habitat	Basin-Wide	Soil Limited	Design Specs
Planning and development approaches				
1) Land Division Design				
○ Clustering/lot size averaging, on-site density transfers	X			
2) Site Design				
○ Increased flexibility for setbacks	X			
○ Increased flexibility for lot coverage	X			
○ Increased flexibility for building heights	X	x*		
3) Parking Design				
○ Reduced parking ratios	X	x*		
○ Shared driveways and parking areas		X		
○ Flexibility in parking lot landscaping / Additional parking lot landscaping	X			
○ Smaller car spaces and stall dimensions	X	x*		
○ Increased use of pervious materials		X	X	X
4) Landscaping/Hardscape Design				
○ Locating landscaping adjacent to habitat areas	X			
○ Increased use of native plant	X	X		
○ Improved soil amendment		X		X
○ Reduction of non-ADA sidewalks within a site	X	x*		
○ Increased use of habitat-friendly fencing	X			
○ Preservation of existing trees and maximize forest canopy	X	X		
5) Lighting Design				
○ Re-directed outdoor lighting, reducing light spill-off	X			
6) Density Reduction for Regionally Significant Habitat				
○ Modified definition of net buildable areas	X			
○ Reduced minimum buildable lot sizes	X			
Engineering and Design Approaches				
1) Street design				
○ Minimize paving	X	x*		

Approaches and Methods from Issue Paper #1	Sites w/ Habitat	Basin-Wide	Soil Limited	Design Specs
○ Use pervious paving materials		X	X	X
○ Maximize street tree usage		X		
○ Use multi-functional open drainage systems / modify drainage practices		X	X	X
2) Stream crossing and street connectivity standards				
○ Minimize the number of stream crossings/place crossings perpendicular	X	x		X
○ Allow narrow paved widths through stream corridors	X	x		
○ Use habitat sensitive bridge and culvert designs	X	x		X
3) *Stormwater management facility design*				
○ Use vegetated stormwater management facilities		X	X	X
○ Use detention ponds		X		X
○ Use of underground detention and/or treatment		X		X
Building Design Solutions				
○ Encourage Green roofs (eco-roofs)		X		X
○ Disconnect downspouts		X	X	X
○ Use rain barrel or cistern system		X		X

** The encouragement of these methods basin-wide, above and beyond current practices, may not be practicable or may have conflicts with other policy considerations. The primary recommendation is for consideration within or adjacent to habitat areas at this time.*

B. IMPLEMENTATION RECOMMENDATIONS FOR DEVELOPMENT SITES WITH HABITAT

1. *Encouragement through Flexibility*

Pursuant to the intergovernmental agreement with Metro, Basin jurisdictions must adopt provisions that 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. Jurisdictions may also choose to encourage habitat-friendly development practices in other habitat areas including Class III riparian areas and Class A uplands. For development sites that include Class I and II riparian habitat areas (and other habitat types), providing increased flexibility in the development standards for projects that use habitat-friendly development techniques is one way of facilitating and encouraging habitat protection.

As proposed, the approach is intended to convey a benefit to the developer in exchange for the use of habitat-friendly development practices. It is not intended to increase development restrictions. Use of the standards would be at the option of the developer/property owner.

2. *Defining Habitat Areas*

The general location of Habitat Benefit Areas is indicated on Metro's Regionally Significant Fish and Wildlife Habitat Inventory Map (or Habitat Conservation Areas Map), and Basin jurisdictions may wish to include a reference to the map as a source document. However, the standards should be applied based on the definition of habitat and delineation methodologies (see example in Appendix A). Because use of these standards is optional and conveys a benefit to the property owner, delineation of the habitat area and its buffer is not likely to be a major issue.

3. *Establishing a Habitat Benefit*

Given the policy trade-offs that are necessary for implementation of these standards, the public should be assured of a reciprocal habitat benefit. The advantages should only be available to projects that provide habitat benefits above and beyond what is otherwise required by current regulations (e.g., CWS D&C standards, Division of State Lands). Only qualified "Habitat Benefit Areas" would be allowed to take advantage of the flexibility offered by the standards. Table 2, below, outlines some suggested minimum criteria for qualifying Habitat Benefit Areas.

Table 2:

Suggested minimum criteria for qualifying Habitat Benefit Areas

Resource Type	Requirements for Habitat Benefit Areas
Class I riparian habitat area Class II riparian habitat area Class III riparian habitat area Class A Upland habitat area Habitat buffer area	▪ Habitat and buffer areas must be placed in a non-buildable tract or protected with a restrictive easement. ▪ Restoration and enhancement of habitat and buffer areas required, including monitoring for a minimum of five years. Restoration and enhancement include, but are not limited to: o Revegetation of non-vegetated areas o Removal of non-native vegetation o Improved soil amendments o Preservation of existing trees and forest canopy o Planting native vegetation o Use of habitat-friendly fencing, if needed o Use of habitat friendly outdoor lighting design adjacent to buffer ▪ Buffer area must be adjacent to a protected habitat area ▪ As defined, the Habitat Benefit Area would be in addition to any areas required for natural resource protection by existing regulations.

4. *Guidelines for Local Jurisdictions*

Local jurisdictions should consider providing flexibility in their land development ordinances to encourage the protection of qualified Habitat Benefit Areas. Below are some suggested concepts to do so. Not all of the suggested concepts will be appropriate in every jurisdiction. Basin jurisdictions should review their codes using the concepts below as general guidelines. Individual jurisdictions may already meet or exceed some of these suggestions; in those cases, the jurisdiction should simply document current practices.

Process

- Discretionary processes represent increased time, money, and risk for the developer. Optimally, the standards to encourage the protection of habitat would be clear and objective, with no additional land use processes required to take advantage of them. Jurisdictions should evaluate their codes to determine if their review processes are appropriate to encourage the use of the standards. Some jurisdictions may wish to allow this flexibility only through their existing planned development processes. In that case, fees, approval criteria, open space dedications, and review processes for planned developments should be reviewed and minimized for sites with Habitat Benefit Areas.

Land Divisions

- On-site density transfers/lot size averaging – At a minimum, all jurisdictions should consider allowing all development potential to be transferred from a qualified Habitat Benefit Area to the remainder of the development site; provided that the transferred density shall not more than

double the density allowed on the buildable portion of the site. For development sites with split zoning, transfers should be permitted across zoning districts. NOTE: Most jurisdictions already allow some level of on-site transfer to protect resources. These should remain in place as this transfer would only apply to Habitat Benefit Areas and not those areas already protected by existing natural resource regulations (e.g., DSL/COE, CWS).

- Lot dimensional standards – Jurisdictions should consider allowing lot dimensional standards (width, depth, and frontage) to be reduced by up to 40%.
- Minimum density – Local jurisdictions should adopt procedures to allow a waiver of the minimum density requirements. These procedures would be used at the option of the subdivider and should only allow for a reduction in the minimum number of units required to be built based on the amount of area protected. This reduction would not be limited to only Habitat Benefit Areas, but could include all regionally significant habitat on the property that has been protected through a public dedication or restrictive covenant. Procedures should include a standard protocol for notifying Metro by Report to Metro by April 15 of every year of the impact of this provision. Jurisdictions should work with Metro to ensure that "lost" units are allocated back to the Basin.
- Net Acre –Alternatively, jurisdictions could amend their definitions of "net acre" or "buildable area" to exclude Habitat Benefit Areas (at the option of the developer). However, this may require an amendment to the Functional Plan (Section 3.07.1010) definition of "net acre" as the definition does not "net out" 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.

Site Design

- Setbacks – Encouraging protection of Habitat Benefit Areas may require flexibility in terms of setbacks. Except for lot lines adjacent to property zoned single-family residential, jurisdictions should consider allowing the minimum building setback established by the base zone to be reduced to any distance between the base zone minimum and zero, unless this reduction conflicts with applicable fire or life safety requirements. Codes should also allow this level of flexibility for setbacks that are internal to new single family residential developments.
- Lot coverage - Smaller single family lots (and townhouse lots) created through density transfer may need increased lot coverage in order to be buildable. Jurisdictions should consider allowing lot coverage to be increased up to 80%, provided the square footage of the additional coverage doesn't exceed the total square footage of the Habitat Benefit Area. NOTE: This will need to be established at the time of the land division.
- Building heights - Except for areas within 40 feet of property zoned single-family residential, jurisdictions should consider allowing an increase in the maximum building height established by

the base zone of up to 12 feet, unless this increase conflicts with applicable fire or life safety requirements.

Parking

- Shared parking and On-Street Parking Credit - Jurisdictions should review their codes to confirm that they encourage the use of shared parking and on-street parking credits as a means of reducing the amount of required on-site parking.
- Reduced parking ratios – For sites with Habitat Benefit Areas, jurisdictions should consider reducing parking ratios for non-residential development by up to 10%.
- Smaller car spaces and stall dimensions – For sites with Habitat Benefit Areas, jurisdictions should consider allowing up to 40% of the required parking spaces to be compact. Parking space dimensions may vary by jurisdiction; however, as a general guideline, DLCD's *Model Development Code & User's Guide for Small Cities* (Model Code) includes the following dimensions for 90° compact stall: width = 7' 6" and length = 15'. The suggested standard vehicle parking space is 8' 6" wide by 18' long (or 16' feet long, with not more than a 2' overhang).

Landscaping/Hardscape Design

- Flexibility in parking lot landscaping/Locating landscaping adjacent to habitat areas – For sites with Habitat Benefit Areas, jurisdictions should consider allowing a reduction of up to 15% of the required landscaping and/or parking lot landscaping square footage; provided that the square footage of landscaping reduction does not exceed the size of the Habitat Benefit Area. Jurisdictions should also consider allowing a commensurate reduction in their parking lot landscaping dimensional and spacing standards.
- Reduction of non-ADA sidewalks within a site – For sites with Habitat Benefit Areas, jurisdictions should consider creating an exception in their pedestrian connectivity standards that allows a reduction in the width of required sidewalks and pedestrian accessway to the minimum necessary to comply with the Americans with Disabilities Act.

Street design

- Minimize or allow alternative (pervious) paving – Jurisdictions should consider allowing reductions in required pavement (and sidewalk) width (and right-of-way dedications) for sites with Habitat Benefit Areas.

Stream crossing and street connectivity standards

[NOTE: Most stream crossings occur within Class I, II, or III riparian areas. Therefore, these guidelines are recommended for sites with habitat; however, they are also applicable in cases where stream crossings occur in areas not designated as riparian habitat.]

- The approaches include minimizing the number of stream crossings/placing crossings perpendicular; allowing narrow paved widths through stream corridors; using habitat sensitive bridge and culvert designs. Implementation is on-going. CWS has existing standards and technical specifications for these methods.
- Jurisdictions, together with CWS, continue to coordinate culvert work and efforts to verify the critical basins where safe fish passage is a design issue.
- Jurisdictions should confirm that their culvert list has been evaluated relative to their capital programming to determine the order of implementation.
- Jurisdictions should consider amending their codes to permit culvert replacement and associated enhancement work outright and not require additional land use or vegetative corridor mitigation review for those culvert projects and enhancement projects listed in the Healthy Streams Plan.
- Jurisdictions should review their Transportation System Plans and Comprehensive Plan Transportation Elements to ensure that block length and connectivity standards include necessary flexibility to minimize stream crossings.
- Basin should encourage Metro to amend the RTP (Section 6.4.5 Design Standards for Street Connectivity) to refer to all Goal 5 resources, as well as Title 3 water features, and to include a reference to the other stream crossing standards (e.g., CWS).

C. IMPLEMENTATION RECOMMENDATIONS FOR BASIN-WIDE APPROACHES

One element of the adopted Basin program is the development of a model Low Impact-Development (LID) ordinance for the basin, which would provide tools designed to reduce environmental impacts of new development and removing barriers to their utilization. This step includes local adoption of LID guidelines. This effort is closely tied to Clean Water Services goal of reducing Effective Impervious Area (EIA) within the Basin and a number of the suggested methods will be addressed in the update of CWS Design and Construction Standards. It is also closely related to the issues raised in the Audubon Society of Portland's 2004 *Stormwater/Pavement Impacts Reduction (SPIR) Project Report*, which made recommendations for stormwater management for new development, redevelopment and public projects.

1. Guidelines for Local Jurisdictions

Shared driveways and parking areas

- Jurisdictions should evaluate their codes for opportunities to reduce the need for paved areas by permitting shared driveways and parking areas where practicable. The Model Code suggests that when a shared driveway is provided or required as a condition of approval, the land uses adjacent to the shared driveway may have their minimum parking standards reduced in accordance with the shared parking provisions of Section 3.3.300C. However, the extent to which this area is then retained as pervious will likely be affected by the availability of incentives to reduce effective impervious area.

Increased use of pervious materials/ Use pervious paving materials

- Jurisdictions should consider amendments to remove barriers to, and encourage the use of, pervious paving materials in parking areas and low traffic private streets. For example, many existing codes require parking and street areas to be hard-paved surfaces with asphalt or concrete.
- Technical design specifications will need to be adopted Basin-wide to facilitate the use of this method. Specifications should address site suitability criteria and additional steps needed for sites that are not highly suitable in terms of soil permeability. Concerns about slope stability and impacts to adjacent properties should also be addressed. Specifications should include project monitoring to help ensure that these facilities are functioning as designed. The work completed at CWS Merlo Road Field Operations Facility could be used as the basis to establish Technical Specifications for the use of porous concrete, concrete paver blocks, and structural gravels.

Increased use of native plant/ Preservation of existing trees and maximize forest canopy

- Jurisdictions should document their existing tree cutting and mitigation standards. Avoiding the cost of mitigation can be a significant incentive for preserving existing trees. However, most tree preservation standards don't make a distinction between native species and non-native species and trees are typically not required to be replaced with native species. Jurisdictions could consider encouraging or requiring that a certain percent of mitigation trees be native species. Alternatively, as an incentive, jurisdictions could allow somewhat smaller specimens to be planted if native species are used (e.g., 2" caliper instead of 2.5").
- Jurisdictions should consider adding language to encourage the use of native plants and the preservation of existing trees throughout the Basin. The Model Code suggests the following language: "Existing non-invasive vegetation may be used in meeting landscape requirements. When existing mature trees are protected on the site (e.g., within or adjacent to parking areas) the decision making body may reduce the number of new trees required by a ratio of one (1) inch caliper of new tree(s) for every one (1) inch caliper of existing tree(s) protected." Most jurisdictions require the irrigation of landscaped areas. Installing irrigation in existing vegetated areas may not be possible without destroy the existing vegetation. Jurisdictions could consider waiving the irrigation requirement for landscaped areas that are retaining existing, native vegetation. [NOTE: CWS further augments the habitat benefits provided by vegetated stormwater facilities by requiring the incorporation of native plant species.]
- Jurisdictions may also wish to consider allowing some flexibility in their parking lot landscaping standards (the number, dimension, spacing of landscape islands and required trees) to retain individual mature trees in, or adjacent to, the parking area. For example, requiring one tree per X parking spaces *on average* be planted *or retained* to create a partial tree canopy over and around the parking area. Using an average would allow some rows of parking to have more spaces between trees and some to have fewer and this flexibility could allow for the retention of more existing trees.

Improved soil amendment

- Jurisdictions should encourage the use of soil amendments to improve the permeability of soils within landscaped areas. While stormwater management is typically not a stated benefit of landscaped areas, it could be noted as an ancillary benefit in the purpose statement. For the purposes of calculating effective impervious area, performance standards and technical specification for soil permeability should be adopted basin-wide.

Maximize street tree usage

- Jurisdictions should document their existing standards to ensure that they are requiring street trees be planted appropriately. For example, Metro's *Green Street* recommends spacing large and

very large trees 35 feet to 50 feet, respectively. Jurisdictions may also wish to document any street tree planting efforts they have engaged in.

Use multi-functional open drainage systems / vegetated stormwater management facilities / modify drainage practices

- Technical design specifications will need to be adopted Basin-wide to facilitate the use of these methods. Specifications should address site suitability criteria and additional steps needed for sites that are not highly suitable in terms of soil permeability. CWS and the Basin jurisdictions should consider developing and adopting Basin-wide standards for the construction and maintenance of stormwater management facilities, including working with building officials to identify UBC and Plumbing code issues. This may help to encourage the use of alternative systems and would ensure fair application of any stormwater mitigation credits. Specifications should include project monitoring to help ensure that these facilities are functioning as designed. The work completed at CWS Merlo Road Field Operations Facility could be used as the basis to establish Technical Specifications for vegetated conveyance swales and biofiltration.

Underground detention and/or treatment

- While underground detention and treatments facilities do not provide any habitat benefits on-site, by helping to improve water quality they do serve to benefit in-stream habitat within the watershed. Jurisdictions should address when it is appropriate to allow these facilities (e.g., in conjunction with street/road projects).

Encourage Green roofs (eco-roofs)

- Technical design specifications will need to be adopted Basin-wide to facilitate the use of this method. CWS and the Basin jurisdictions should consider developing and adopting Basin-wide standards for the construction and maintenance of green roofs, including working with building officials to identify UBC and Plumbing code issues. This may help to encourage the use of these systems and would ensure fair application of any stormwater mitigation credits. Specifications should include project monitoring to help ensure that these facilities are functioning as designed. The green roof completed at CWS Merlo Road Field Operations Facility could be used as the basis to establish Technical Specifications.

Disconnect downspouts / Use rain barrel or cistern system

- Technical design specifications will need to be adopted Basin-wide to facilitate the use of this method. Specifications should address site suitability criteria and additional steps needed for sites that are not highly suitable in terms of soil permeability. Concerns about slope stability and impacts to adjacent properties should also be addressed. If overflow from the cistern is connected to the stormwater system, then site suitability may not be an issue.

Methods Not Recommended for Basin-wide Implementation at this time

As noted in Table 1, some of methods (shown in the table with "x*") are only recommended for consideration within or adjacent to habitat areas at this time. However, these could have potential benefits basin-wide and may be considered in the future. These are noted briefly below:

- Increased flexibility for building heights – Allowing increased building height may allow for reduction in effective impervious area if the "reserved" area is used for landscaping or other pervious uses. However, building height is often seen as a major public issue, especially with infill development.
- Reduced parking ratios - Reducing parking ratios basin-wide may allow for reduction in effective impervious area if the "reserved" area is used for landscaping or other pervious uses. However, the current parking ratios are seen as quite low and there are concerns about the impact on adjacent uses of not requiring sufficient parking on-site.
- Smaller car spaces and stall dimensions - Reducing stall dimensions or allowing more compact spaces basin-wide may allow for reduction in effective impervious area if the "reserved" area is used for landscaping or other pervious uses. However, the existing parking stall sizes are seen as quite small given the current mix of automobiles and there are concerns about the impact on adjacent uses of not requiring sufficient parking on-site.
- Reduction of non-ADA sidewalks within a site – Public policy has been emphasizing pedestrian connectivity for a number of years. Code requirements help implement that policy by requiring wide (e.g. 6' to 8') sidewalks and multiple connections, especially in commercial areas. Reducing these requirements basin-wide may allow for reduction in effective impervious area if the "reserved" area is used for landscaping or other pervious uses. However, there would be a significant public policy trade off.
- Minimize paving - Public policy has been emphasizing "skinny" streets for a number of years. Jurisdictions in the Basin have been successful in implementing that policy to a considerable extent. Reducing street widths further basin-wide may allow for reduction in effective impervious area if the "reserved" area is used for landscaping or other pervious uses. However, concerns have been raised by the State and local Fire Marshals.

Appendix A – Sample Delineation Methodology (based on Metro's Model Ordinance)

Verifying boundaries of inventoried riparian habitat. Locating habitat and determining its riparian habitat class is a four-step process:

(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.
  (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.

(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
  (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, 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.

(3) 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

(4) Identify the riparian habitat classes applicable to all areas on the property using Table 6.

Table 6: Method for Locating Boundaries of Class I and II Riparian Areas.

Distance in feet 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	Class I	Class I
50-100		Class II[2]	Class I	Class I
100-150		Class II[2] if slope>25%	Class II[2] if slope>25%	Class II[2]
150-200		Class II[2] if slope>25%	Class II[2] if slope>25%	Class II[2] if slope>25%
Wetlands (Wetland feature itself is a Class I Riparian Area)				
0-100		Class II[2]	Class I	Class I
100-150				Class II[2]
Flood Areas (Undeveloped portion of flood area is a Class I Riparian Area)				
0-100			Class II[2]	Class II[2]

[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] *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.*

Verifying boundaries of inventoried upland habitat. 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.

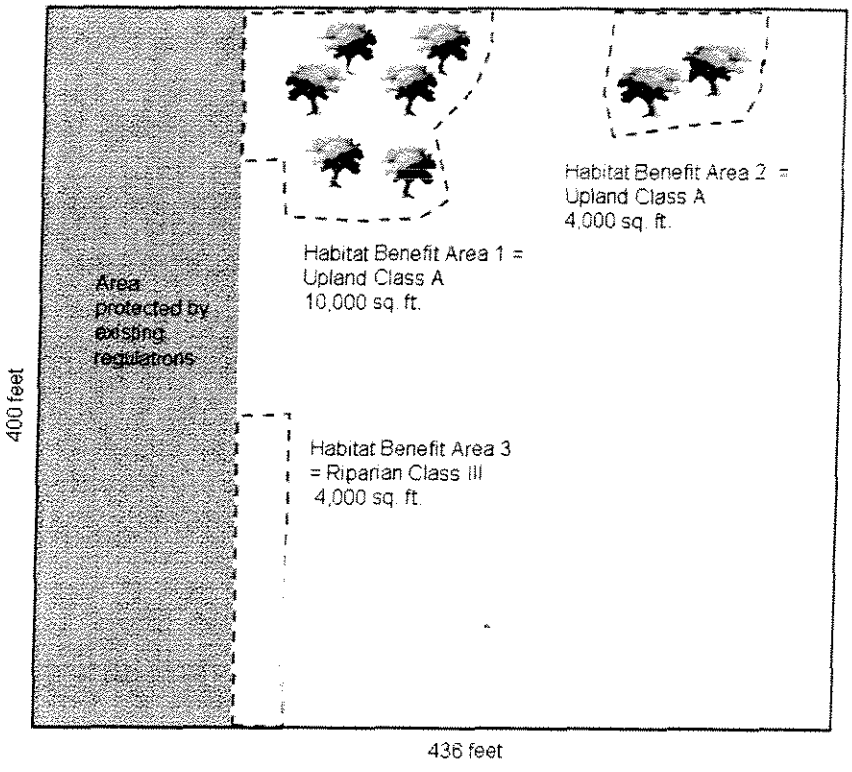
1. Except as provided below, vegetative cover status shall be as identified on the Metro Vegetative Cover Map used to inventory habitat at the time the area was brought within

the urban growth boundary (available from the Metro Data Resource Center, 600 N.E. Grand Ave., Portland, OR 97232; 503-797-1742).

2. 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.
3. 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.

Appendix B: Example of Criteria for Habitat Benefit Area

[NOTE: As defined, the Habitat Benefit Area would be in addition to any areas required for natural resource protection by existing regulations.]



EXAMPLE 1:

Site = 174,240 sq. ft. (4 ac.)

Area protected by existing regulations (CWS, DSL/COE) = 40,000 sq. ft.

Minimum Habitat Benefit Area to qualify = 17,424 sq. ft.

Habitat Benefit Area proposed = 18,000 sq. ft.

Attachment 9

Gap Analysis

ENCOURAGING HABITAT FRIENDLY DEVELOPMENT PRACTICES IN THE TUALATIN BASIN

- SUMMARY OF CURRENT CODE STANDARDS AND RELATED RECOMMENDATIONS -

Approaches & Methods from Issue Paper #1	JURISDICTION	RECOMMENDATION(S)
Planning and development approaches		
1. Land Division Design		
Clustering/lot size averaging, on-site density transfers	**Beaverton**	May consider allowing review of PUDs at an administrative level of review rather than a public hearing level when associated with habitat protection and habitat friendly development practices.
	Cornelius	Status: Natural Resource Overlay Zone allows density transfers or clustering through a CUP-PUD approval.
	Durham	Code allows on-site density transfer but not lot size averaging.
	Forest Grove	Allowed by Zoning Ordinance
	Hillsboro	Lot size averaging and on-site density transfers permitted for properties with a Significant Natural Resource. May consider language adding HBA conservation as an exception criteria.
	Sherwood	Lot sizes could be reduced by up to 10% if the equal amount of land reduced was dedicated as public open space.
	Tigard	Existing Tigard regulations allow 25% of the density to be transferred onsite...up to 125% of the entire sites maximum density.
	Tualatin	The TDC has allowed on-site density transfers for multi-family, commercial, & industrial since the 1970's provided minimum setbacks are met. The city could consider adopting a PUD process for singly family subdivisions.
	Washington County	Clustering and lot size averaging already allowed in R-5 through R-9; no potential gain in higher density districts.
Reduction of lot dimensional standards;	**Beaverton**	The City of Beaverton allows for adjustments from numerical Site Development Requirements (Chapter 20, Land Uses), which includes reductions to lot dimensional standards. A policy change affecting the level of review may be an option toward encouraging this practice when associated with preserving habitat areas.
	Cornelius	Current Code provides a formula for lot size reduction based on protection buffer sizes.
	Durham	Current Code does not specify width and depth and does require frontage; no reduction provision other than the variance procedure
	Forest Grove	Current Code allows duplex/townhouses on 8 or 20% of lots in the single family zone districts. Lot sizes can also be varied through planned development.
	Hillsboro	Currently allow adjustments from the structural setbacks and lot coverage standards (minimum and maximum) of the underlying zone, provided consideration is given to potential impacts to neighboring properties. May consider language adding HBA conservation as an exception criterion.
	Sherwood	Propose a reduction of setbacks up to 30%, provided the setback for garages remains 20 feet from the property line and the setbacks otherwise comply with TVF&R separation requirements.
	Tigard	Inventoried habitat areas could be added to the lot dimensional standard adjustment criteria applied to areas within or adjacent to the vegetated corridor.

Approaches & Methods from Issue Paper #1	JURISDICTION	RECOMMENDATION(S)
	Tualatin	The city could consider reducing lot dimensional standards. For single family lots, changes may not be appropriate because the standards were reduced in 1995, 1998 and 2000, including lots near habitat.
	Washington County	Amend lot frontage requirements
Allow for waiver of minimum density requirements (Metro);	**Beaverton**	Work with Metro and other jurisdictions to address this practice.
	Cornelius	Current Code requires development to maintain minimum densities
	Durham	Current Code does not provide procedure to allow a waiver of the minimum density requirements
	Forest Grove	Must meet 80% of target density.
	Hillsboro	An adjustment to the min. required density is allowed through the SNRP process. The city may consider language supporting density reductions in HBAs and for using habitat friendly development practices.
	Sherwood	Environmentally significant areas (not constrained areas) may be removed from the density calculation for net buildable area in exchange for habitat protection.
	Tigard	The city would need to incorporate language into its comprehensive plan and development code supporting density reductions for habitat areas.
	Tualatin	The city could consider waivers of minimum density requirements. The Minor and Major Variance processes are available to use. Density is based on Net Acres, not gross acres, thus residential developers are not negatively affected when habitat is placed in Tracts.
	Washington County	Allow for waiver of minimum density req's in exchange for habitat protection.
2. Site Design		
Increased flexibility for setbacks	**Beaverton**	The City of Beaverton provides for flexibility for setbacks through six different Flexible and Zero Yard Setback applications. The city may reduce the processing for a Flexible Setback for Proposed Residential Land Division to a Type 2 if protection of a HBA.
	Cornelius	Commercial, Industrial, and Mixed-Use districts permit zero side & rear yard setbacks. Code currently allows a 10% setback reduction through a Type 1 Admin. Review
	Durham	Current Code allows reductions in front, side, and rear setbacks for a planned residential development.
	Forest Grove	Current Code does not allow for flexible setbacks on site with habitat or riparian zones (without a variance) or to minimize construction impacts
	Hillsboro	Code standards currently allow adjustments from the structural setbacks and lot coverage standards (minimum and maximum) of the underlying zone, provided consideration is given to potential impacts to neighboring properties. The city may consider language adding HBA conservation as an exception criterion to support increased flexibility for setbacks when preserving HBAs and/or using habitat friendly development practices.
	Sherwood	Current commercial and industrial setbacks already allow zero setbacks except when adjacent to residential zone.
	Tigard	Inventoried habitat areas could be added to the setback adjustment criteria applied to areas within or adjacent to the vegetated corridor. The current reduction sets a maximum of 50%. This would need to be changed to meet the zero foot recommendation.

Approaches & Methods from Issue Paper #1	JURISDICTION	RECOMMENDATION(S)
	Tualatin	The City could consider adopting more flexible setbacks for single family and multi-family dwellings in subdivisions and partitions. For single-family changes may not be appropriate because the setbacks were reduced in 1995 and 2001, including dwellings near habitat. For single- and multi-family, it is not clear that allowing even narrower yards is appropriate given other factors such as fire, safety, space, air and light access to single family dwellings.
	Washington County	Some flexibility currently exists – recommend development of "Habitat Protection Planned Development" process which would allow for more significant level of flexibility in exchange for protected habitat.
Increased flexibility for lot coverage	**Beaverton**	Beaverton regulates a lot coverage maximum for industrially zoned properties (60%). All other development is site specific based on setbacks and landscaping. City may allow for an increase in lot coverage for industrially zoned properties in association with preserved HBA.
	Cornelius	
	Durham	Current Code does not specify a provision for lot coverage for residential development. Office Park, Industrial Park, and Business Park developments are limited to a maximum 35% floor area ratio.
	Forest Grove	Code does not have lot coverage standards. Setbacks for residential can be varied through planned development. Code has snout house provisions for single family detached. No setback requirements in most commercial and all industrial zones.
	Hillsboro	Code standards currently allow adjustments from the minimum and maximum structural setbacks and minimum and maximum lot coverage standards of the underlying zone, provided consideration is given to potential impacts to neighboring properties. The city may consider language supporting increased flexibility for lot coverage when preserving HBAs and/or using habitat friendly development practices.
	Sherwood	Status: No required minimum or maximum lot coverage.
	Tigard	Current code meets the Basin recommendation
	Tualatin	The City could consider adopting more flexible standards for lot coverage. The current limit is 45% for single family dwellings.
	Washington County	Recommend development of "Habitat Protection Planned Development" process
Increased flexibility for building heights	**Beaverton**	Allows for adjustments from numerical Site Development Requirements (Chapter 20, Land Uses), which includes increases in building heights, through either a Minor Adjustment (Type 2), Major Adjustment (Type 3), or Variance (Type 3). A policy change affecting the level of review may be an option toward encouraging this practice
	Cornelius	Status: Building heights may be exceeded through approval by the Planning Commission
	Durham	Status: An increase in maximum building height only available through the variance procedure
	Forest Grove	No barriers in existing code except in single family residential zones where the maximum height is 35 feet.
	Hillsboro	Planning Commission may grant an exception through the PUD process. The city may consider incorporating Building Height flexibility (such as one-story bonus over base building heights) to facilitate avoidance and protection of the HBA.
	Sherwood	

Approaches & Methods from Issue Paper #1	JURISDICTION	RECOMMENDATION(S)
	Tigard	Inventoried habitat areas could be added to the building height adjustment criteria applied to areas within or adjacent to the vegetated corridor
	Tualatin	The city could consider adopting more flexible standards for height.
	Washington County	Recommend development of "Habitat Protection Planned Development" process
3. Parking Design		
Reduced parking ratios	**Beaverton**	Code allows for reduction in the minimum parking ratio when related to transit; may be possible for the city to create options for reductions to the minimum parking ratio when related to a habitat benefit.
	Cornelius	Code currently allows a 10% reduction in measurable standards (i.e., parking) through a Type 1 Administrative Review process
	Durham	No code provision
	Forest Grove	Status: Allowed in transit corridor and TOD, or with traffic study.
	Hillsboro	Allowed through the PUD process. The city may consider language adding HBA conservation as an exception criterion
	Sherwood	Allow a 10% reduction in the required parking spaces for sites with more than 50 required parking spaces provided dedication of habitat lands or enhancement of vegetated area with native plants
	Tigard	The City allows for up to 20% reduction in required parking for commercial, industrial or civic uses.
	Tualatin	TDC already provides this flexibility.
	Washington County	CDC currently provides options for reduction in parking requirements.
Shared driveways and parking areas; On-street parking credit	**Beaverton**	Allows shared parking (Type 2 review) and shared driveways, assuming certain criteria are met. The City may want to re-visit the requirement for abutting property and may want to consider a change in the review type to a Type 1 for shared parking when arrangement benefits HBAs.
	Cornelius	The Off-Street Parking section of the current Code provides for shared parking. Local and Collector streets allow on-street parking in the Main Street District. Arterial streets permit some on-street parking.
	Durham	Code presently allows shared access and could be amended to allow shared parking. No code provision for on-street parking.
	Forest Grove	Shared driveways required by current code. Code allows for shared parking areas and on-street parking credit for non-residential uses.
	Hillsboro	The city does not preclude shared parking areas; requires commission or committee approval in some cases.
	Sherwood	Sherwood code allows shared parking and credit for on-street parking
	Tigard	Existing regulations address the issue of joint access, egress, parking and loading areas.
	Tualatin	TDC already provides this flexibility, except for on-street parking. The city could consider on-street parking credit.
	Washington County	CDC supports shared driveways and parking areas – propose amending design standards to address typical subdivision designs; Modify code to allow on-street parking; exempt "partitions" from on-street parking requirements in urban areas.

Approaches & Methods from Issue Paper #1	JURISDICTION	RECOMMENDATION(S)
Flexibility in parking lot landscaping / Additional parking lot landscaping	**Beaverton**	Parking lot landscaping requires a Type 2 Design Review approval and Type 3 if the applicant proposes a design that does not meet the prescribed standards. The city may investigate options for flexibility when a developer is working to preserve a HBA.
	Cornelius	Current code allows for a 10% reduction in measurable parking standards through a Type 1, Administrative Review process.
	Durham	Would be subject to review and approval by the Design Review Board, which may consider making allowance for parking lot landscaping on sites adjacent to HBAs.
	Forest Grove	Current code requires 8% minimum landscaping.
	Hillsboro	When preserving HBAs and/or using habitat friendly development practices, the city may consider allowing a 15% reduction of the required parking lot landscaping square footage; provided that the square footage does not exceed the size of the HBA.
	Sherwood	Code doesn't have specific percentage for parking lot landscaping (need to fix); Has specific widths for parameter landscaping; Requires one landscaping island (min. 64 sq. ft.)/15 spaces.
	Tigard	Current code allow for a 1% reduction in the required amount of landscaping, for every 2% of canopy cover preserved, totaling a reduction of up to 20%.
	Tualatin	The city could consider changes to clearly encourage flexible provisions.
	Washington County	Pursue allowing protected Habitat Benefit Areas to count toward minimum landscaping requirements. No change to internal landscaping requirements.
Smaller car spaces and stall dimensions	**Beaverton**	Code allows compact vehicle spaces dependent on zoning. Facilities Review Committee may recommend allowing compact spaces for short-term parking with justification. The city may review the section to allow for additional compact spaces in relation to protection of HBAs.
	Cornelius	Current code allows for a 10% reduction in measurable standards through a Type 1 Admin Review process
	Durham	
	Forest Grove	Current code allows compact car spaces.
	Hillsboro	Current Zoning Ordinance allows up to thirty (30) percent of the minimum number of off-street automobile parking spaces required may be constructed as compact spaces.
	Sherwood	Further reduction in stall dimension is not supported by the Planning Commission or Council.
	Tigard	Code allows stalls to be distributed 50% compact and 50% standard spaces The standard stall width matches the Basin recommendation (at 8' 6") and the stall length is only slightly longer (at 18' 6").
	Tualatin	The city could consider changing the TDC language to clearly state pervious parking areas are allowed. Because the city already allows a significant percentage of spaces to be compact spaces and because many cars are large, a percentage greater than 35% may not be appropriate at this time.
	Washington County	Existing Code standard minimums may be too small for the current average vehicle size – further reductions not recommended.

Approaches & Methods from Issue Paper #1	JURISDICTION	RECOMMENDATION(S)
Increased use of pervious materials	**Beaverton**	The city has approved pervious pavement for areas that do not require access for large vehicles (80,000 pounds). The city may look toward encouraging, through education, use of pervious materials in those areas that do not require access for large vehicles, including parking spaces and bicycle and pedestrian ways. The detention goal of each site will need to be taken into account when engineering and reviewing plans for each site.
	Cornelius	
	Durham	Good idea if there is a low maintenance pervious paving material available for use.
	Forest Grove	No adopted standards.
	Hillsboro	The city allows alternative pavement materials and other approved materials.
	Sherwood	
	Tigard	The existing Tigard regulations serve as a barrier to the use of pervious materials on access drives and off-street parking.
	Tualatin	The city could consider such changes because the TDC does not clearly allow, encourage or require pervious materials, except in the Central Design District.
	Washington County	Recommend changes to CDC Sections 408 & 409 to permit alternative structural designs to incorporate pervious paving on lands outside the Public R.O.W.
4. Landscaping/Hardscape Design		
Locating landscaping adjacent to habitat areas	**Beaverton**	The city does allow stormwater quality and quantity facilities to be placed within required landscaping. It may be reasonable that the city could allow a reduction in the amount of required landscaping in exchange for equivalent preserved HBA.
	Cornelius	Status: Natural Resource Overlay zone permits through a CUP-PUD approval of a 1:1 ratio exchange for square footage of native landscaped protection setback area in-lieu of required private on-site landscaping.
	Durham	
	Forest Grove	Required in Environmental Review districts. Landscape plans are not currently required to show existing habitat/conditions.
	Hillsboro	The city allows stormwater quality and stormwater quantity facilities to be placed within required landscaping. When preserving HBAs and/or using habitat friendly development practices the city may consider allowing a reduction of the required landscaping square footage provided that the square footage of landscaping reduction does not exceed the size of the HBA.
	Sherwood	
	Tigard	Existing code allows for up to 20% reduction (greater than the 15% recommended) of required landscaping in exchange for preservation of existing tree canopy (1% reduction for each 2% of canopy).
	Tualatin	The TDC requires landscaping, but does not specifically allow the flexibility to move required landscaping from one property line to another to, in effect enlarge the habitat.
	Washington County	Existing standards allow for flexibility in locating required landscaping except for those portions required within parking areas – no change recommended.

Approaches & Methods from Issue Paper #1	JURISDICTION	RECOMMENDATION(S)
Increased use of native plant	**Beaverton**	City currently requires review for removal of existing trees, places emphasis on retaining native trees and understory, and requires preservation areas to be set aside in conservation easements or set aside in tracts. The city may look for opportunities to further encourage the use of native vegetation. One option may be adding HBAs as a classification under the definition of "Protected Tree"
	Cornelius	
	Durham	Tree ordinance seeks to accomplish this.
	Forest Grove	Adopted by current ordinance: "The use of native plant materials is encouraged to reduce irrigation and maintenance demands."
	Hillsboro	The city may consider encouraging the use of native plants through the landscaping requirements in areas outside SNRs.
	Sherwood	
	Tigard	Code includes language promoting the use of native plant materials to reduce irrigation and maintenance demands.
	Tualatin	The city could consider changes to the TDC to allow, encourage or require native plants in the required landscape areas.
	Washington County	Coordinate with CWS
Improved soil amendment	**Beaverton**	None proposed to City Code; Proposing that CWS add a best management practice provision to the CWS Design and Construction Standards addressing improved soil amendments where native soil or post-development disturbed soil conditions in landscape areas do not provide identified benefits.
	Cornelius	
	Durham	Code does not have such a provision and city would need to be provided with suitable performance standards and technical spec's. This may not be a workable requirement to administer.
	Forest Grove	Code may not allow for hydrophytic vegetation (wetland plants) and or hydric soil
	Hillsboro	The city may include this in a menu of LID/Habitat Friendly Development guidelines to be added to the Comp Plan or Zoning Ord.
	Sherwood	
	Tigard	Existing regulations do not encourage the practice.
	Tualatin	The city could consider changes to clearly allow, encourage or require amendment.
	Washington County	Coordinate with CWS for technical guidance

Approaches & Methods from Issue Paper #1	JURISDICTION	RECOMMENDATION(S)
Reduction of non-ADA sidewalk widths within a site	**Beaverton**	The EDM allows for pre-approved modifications of sidewalk design by the City Engineer. The city may revise Design Review Standards and Guidelines or develop incentives that will deter construction of internal walkways that are not required by ADA or will allow for reductions of walkway widths. Evaluate reductions to determine the minimum impact necessary to balance function in relation to HBA.
	Cornelius	
	Durham	No code provision allowing reduction in width of required sidewalks and ped walkways
	Forest Grove	Sidewalk widths can only be reduced through planned developments.
	Hillsboro	For the preservation of HBAs or to encourage the use of habitat friendly development practices the city may consider creating an exception in pedestrian connectivity standards that allows a reduction in the width of the required sidewalks and pedestrian accessways to the minimum necessary to comply with the Americans with Disabilities Act.
	Sherwood	Decrease pedestrian path widths for any areas not providing primary connections to the public right of way. The "primary" connectivity system shall continue to be 6 feet wide, but the "secondary" or "internal" connectivity system may be reduced to ___ feet, provided ADA requirements are fully satisfied.
	Tigard	Sidewalk width reduction is not addressed by current regulations, which require 5' to 10' widths depending on street classification.
	Tualatin	Because the TDC complies with the ADA and the Oregon Transportation Planning Rule, the city need not consider adopting TDC amendments that would require more sidewalks than are required by the ADA and TPR.
	Washington County	Propose to amend Section 408 to allow reductions where appropriate.
Increased use of habitat-friendly fencing	**Beaverton**	The city regulates fencing for protection of preservation areas during construction & with regard to vision clearance for permanent fencing. Provisions may need to be added to specifically allow for or encourage its use.
	Cornelius	
	Durham	
	Forest Grove	Current Code allows masonry walls, which could obstruct flow of water during rainfall events and compact soil around habitat conservation areas.
	Hillsboro	The city regulates fencing for the protection of preservation areas during construction. The city may consider encouraging the use of habitat friendly fencing in all HBAs and significant natural resource areas.
	Sherwood	
	Tigard	Code does not mention this practice.
	Tualatin	The city could consider changes to clearly allow, encourage, or require habitat friendly fencing.
	Washington County	Propose to amend screening and buffering and other code sections requiring fencing to require habitat friendly designs for fencing located adjacent to habitat areas.

Approaches & Methods from Issue Paper #1	JURISDICTION	RECOMMENDATION(S)
Preservation of existing trees and maximize forest canopy	**Beaverton**	The city may look for opportunities to further encourage the use of native vegetation in conjunction with current Tree Plan application required for tree removals and protections.
	Cornelius	Site Design Review criteria currently requires developers to design where possible to incorporate & preserve existing trees or vegetation of significant size and species. Consideration shall be given to whether habitat, survival of tree species, and aesthetics can be achieved by preserving groves or areas of trees opposed to only individual trees.
	Durham	Current Tree Ordinance includes a policy that emphasizes a preference for native mitigation trees and does specify standards (ratios) for replacement of preserved trees depending on diameter of removed tree.
	Forest Grove	Code currently has a protected tree list and language to protect trees in development sites.
	Hillsboro	Current code requires tree protection if impacting a significant natural resource or within SCPA zone. No change needed.
	Sherwood	City currently requires one street tree per 25 feet of frontage (as opposed to on center)
	Tigard	Current code contains provisions and incentives for tree preservation and mitigation of removed trees
	Tualatin	The TDC allows and encourages tree retention. The city could consider changes because the TDC does not clearly require tree retention.
	Washington County	Preservation of existing trees and vegetation is addressed in Sections 422, 407 and 410. Consider clarifying standards to encourage tree preservation.
5. Lighting Design		
Re-directed outdoor lighting, reducing light spill-off	**Beaverton**	The city limits illumination at the property line to 0.5 foot-candles or less. May add language to Chapter 60 of the city's development code and the EDM that specifies the need to reduce light spill-off into HBAs. Also, may encourage the use of mercury vapor, metal halide, or fluorescent lamps, in that order, and discourage the use of high-pressure sodium and low-intensity incandescent near HBAs.
	Cornelius	Current Site Design Review approval criteria states adequate exterior lighting shall be provided to promote public safety, and there shall be designed to avoid unnecessary glare upon other properties.
	Durham	
	Forest Grove	Addressed
	Hillsboro	For development near SNR, a permit is required that limits types, sizes and intensities of lights.
	Sherwood	
	Tigard	There is no mention in code for this practice.
	Tualatin	The TDC allows outdoor lighting and requires it not shine onto abutting properties or R.O.W.s, but it does not address fish & wildlife habitat. The city could consider such changes to clearly require outdoor lighting to not shine onto fish and wildlife habitat.
	Washington County	Recommend requiring lighting adjacent to Regionally Significant Fish & Wildlife Habitat areas to be directed away from or appropriately screened to protect the habitat areas.

Approaches & Methods from Issue Paper #1	JURISDICTION	RECOMMENDATION(S)
6. Density Reduction for Regionally Significant Habitat		
Modified definition of net buildable areas	**Beaverton**	May consider adding HBAs to current definition of Net Acreage, which allows for removal of areas deemed undevelopable provided they are set aside in separate tracts or dedicated to a public entity.
	Cornelius	Status: Natural Resource Overlay Zone allows density transfers or cluster development through a CUP-PUD approval.
	Durham	
	Forest Grove	Status: Net area excludes open space areas. An approved environmental report may suggest modified definitions of net buildable acres for a particular site.
	Hillsboro	The City may consider amending their definition of "net acre" to exclude HBAs (at the option of the developer). The city may add a definition to the zoning ordinance for HBA and habitat friendly development practices.
	Sherwood	Environmentally significant areas (not constrained areas) may be removed from the density calculation for net buildable area in exchange for habitat protection.
	Tigard	The current definition of net developable area excludes sensitive lands. The recommendation would be met if Tualatin Basin program maps were adopted and this provision was applied to HBAs.
	Tualatin	Because the TDC uses net acres, which does not negatively affect developers, the City need not consider changes.
	Washington County	Existing standards allow non-buildable lands to be removed from calculation of net buildable areas - minimum densities may be applied to resulting net buildable area.
Reduced minimum buildable lot sizes	**Beaverton**	The city does not have minimum buildable lot sizes. No changes proposed. There is a minimum lot area, but this can be averaged over an entire development through the PUD process.
	Cornelius	Code requires development to maintain minimum densities, but provides a formula for lot size reduction based on protection buffer sizes.
	Durham	
	Forest Grove	Status: Code does not have minimum buildable lot sizes. Does allow for duplex and townhouses in single family districts. Lot sizes can be varied in planned developments. The Environmental Review overlay district allows for reduced minimum buildable lot sizes and flexible setbacks.
	Hillsboro	The City does not have minimum buildable lot sizes. The City's Zoning Ordinance has minimum lot area. However, it is not equivalent to minimum buildable lot sizes as the minimum lot size can be averaged over an entire development through the PUD process.
	Sherwood	
	Tigard	The development code allows for a reduction of lot size (as the result of lot size averaging) below the minimum allowed by the underlying zone as an incentive for tree retention in commercial, industrial or civic zones.
	Tualatin	Because the TDC allows reduced minimum lots sizes, averaging and the calculations are based on net acres, the City need not consider changes.
	Washington County	Reductions below currently allowed minimums may be permitted through the existing Planned Development or proposed Habitat Protection Planned Development process.

Comment: Replace previously text revision

Approaches & Methods from Issue Paper #1	JURISDICTION	RECOMMENDATION(S)
Engineering and Design Approaches		
1. Street design		
Minimize paving	**Beaverton**	The city may choose to specifically state that a street modification for reduced width be approved if, given all engineering requirements for safe motor-vehicle movement are met, the modification results in preservation of a HBA. The current approach for tree removal and preservation in R.O.W.s may be applied to encourage preservation of HBAs and minimize the amount of pavement internal to the development of a site.
	Cornelius	Natural Resource Overlay Zone requires approval of a CUP for new streets, roads, recreational trails and paths in riparian areas.
	Durham	
	Forest Grove	Do allow for skinny streets (15 to 28 feet) for particular circumstances but not for resource protection. Otherwise, ordinance does not address.
	Hillsboro	No change needed.
	Sherwood	The City recently adopted an updated TSP and is reluctant to re-open discussion for reduction of pavement width. The City allows a reduction in the ROW cross-section elements when clearly necessary to preserve existing natural resource areas and there are no function or safety issues. Modification will be outright but subject to criteria, i.e., requirement for inventoried habitat area.
	Tigard	The city may consider the applicability of "skinny" roadway widths for neighborhood streets adjacent to regionally significant fish and wildlife habitat and through stream corridors.
	Tualatin	Because the TDC and Public Works Construction Code do not clearly allow, encourage or require the minimization of paving, the City could consider such changes. It should be noted, however, that such standards with less paving will be adopted.
	Washington County	
Use pervious paving materials	**Beaverton**	City allows use of pervious pavement on case by case basis. The city may look toward encouraging use of pervious materials in areas not required for large vehicle maneuvering (i.e., parking, bicycle, and pedestrian ways). May require changes to the City Code, Comp. Plan, Dev. Code and EDM. Referencing new ODOT design standards for pervious pavement may be appropriate.
	Cornelius	The City Public Works Public Utilities Design Standards allows for 'alternative surfaces' to be used, if they demonstrate an equivalent design life as Portland cement concrete
	Durham	Considered allowing alternative (pervious) paving for streets. Maintenance cost associated with a pervious pavement surface imposes an excessive cost burden on small city with limited funds.
	Forest Grove	Current zoning ordinance requires hard-surface asphalt or concrete materials for streets, sidewalks and driveways; approved by the City Engineer
	Hillsboro	The City may want to consider adding development guidelines that will encourage the use of, pervious paving materials in parking areas and low traffic private streets.
	Sherwood	
	Tigard	Existing regulations serve as a barrier to the use of pervious materials on access drives and off-street parking
	Tualatin	The city has allowed pervious paving materials in parking lots, but because the TDC and PWCC do not clearly allow, encourage or require pervious paving materials, the City could consider adding a statement allowing such paving.

Approaches & Methods from Issue Paper #1	JURISDICTION	RECOMMENDATION(S)
	Washington County	Amend CDC Sections 408 & 409 to permit alternative structural designs to incorporate pervious paving on lands outside the Public R.O.W.
Maximize street tree usage	**Beaverton**	Status: Requires spacing every 30 ft on center. Ongoing urban forestry program. Recognized as a Tree City USA. No changes proposed.
	Cornelius	All City street designs require planter strips with street trees spaced every 30 feet.
	Durham	
	Forest Grove	Adopted
	Hillsboro	Street tree standards for PUDs; currently conducting inventory to become recognized as a Tree City USA and to provide the foundation for an Urban Forestry Management Program
	Sherwood	City of Sherwood requires one street tree to be planted for every 25 feet of frontage (as opposed to every 25 feet on center) which is greater than most neighboring jurisdictions.
	Tigard	Current code meets Basin recommendation. Tigard has a Street Tree Planting Program, which provides free street trees for public right-of-way areas. A Street Tree List was developed to assist Tigard homeowners, businesses, and developers in choosing appropriate street trees.
	Tualatin	The TDC requires street trees, but does not specifically require maximizing the number of street trees. The city could consider such changes.
	Washington County	General standard is 35 feet on center – increased planting density will require further review and analysis.
Use multi-functional open drainage systems / modify drainage practices	**Beaverton**	Will require changes to the City Code, Comprehensive Plan, Development Code and EDM. The city may want to develop a "typical" street section for inclusion in the EDM. However, staff recognize that designs will typically be site specific and dependent on the components of the proposed Green Street.
	Cornelius	Natural Resource Overlay zone requires approval of a CUP for new drainage facilities.
	Durham	
	Forest Grove	Pending: Forest Grove is expecting a new Stormwater Master Plan that will account for CWS and Goal 5 standards 08/06.
	Hillsboro	Status: allowed as long as it doesn't create safety risks; depth may be increased if fenced.
	Sherwood	CWS and Engineers need to develop design standards Code should not preclude options
	Tigard	There are no barriers to the use of these facilities. Current code meets Basin recommendation.
	Tualatin	Because the city is participating in CWS's stormwater regulations review, the city could consider changes. However, it is not likely that the city will allow open ditches in the City Limits when development occurs.
	Washington County	Will require further review prior to recommending changes to established practices. Will need to be coordinated through Clean Water Services for lands outside of the public right-of-way.

Approaches & Methods from Issue Paper #1	JURISDICTION	RECOMMENDATION(S)
2. Stream crossing and street connectivity standards		
Minimize the number of stream crossings/place crossings perpendicular	**Beaverton**	The city may evaluate the Transportation Plan in relation to stream and creek locations when it is updated. City staff may work to find ways to encourage minimization of stream crossings and the perpendicular placement in association with neighborhood routes, local streets, and infill residential streets.
	Cornelius	Natural Resource Overlay zone requires approval of a CUP for new streets, roads, recreational trails and paths in riparian areas.
	Durham	Already addressed in code & CWS D&C Standards
	Forest Grove	Allowed & preferred by current design approaches; used when possible, subject to utility needs & stream conditions.
	Hillsboro	Status: For SNR Permit approval process, city uses standards for bridge types. The number of crossing shall be minimized through the use of shared access for abutting lots and access through easements for adjacent lots.
	Sherwood	See Street Design – Minimize Pavement
	Tigard	Already addressed in CWS D&C Standards
	Tualatin	The city allows perpendicular crossings and could consider changes to allow, encourage, or require minimizing stream crossings and perpendicular crossings. However, it is not likely that the city will amend the Transportation System Plan resulting in fewer crossings.
	Washington County	Already addressed in code & CWS D&C Standards
Allow narrow paved widths through stream corridors	**Beaverton**	The city may explore design options. However, staff understand that designs for stream crossings typically vary dependent on the specific portion of a stream that is to be crossed.
	Cornelius	Natural Resource Overlay zone requires approval of a CUP for new streets, roads, recreational trails and paths in riparian areas.
	Durham	Already addressed in code & CWS D&C Standards
	Forest Grove	Allowed design approach, subject to street classification standards and approval of the City Engineer. Min. width is 24 feet for two way and 15 feet for one-way under special circumstances. Narrow roads can be approved through planned developments.
	Hillsboro	Status: For SNR Permit approval process, design rights-of-way, roadways, driveways and pathways to be the minimum width necessary within the SNR Site while also allowing for safe passage of vehicles, bicycles and/or pedestrians.
	Sherwood	See *Minimize Paving* under Item 1, Street Design
	Tigard	The City may consider the applicability of "skinny" roadway widths for neighborhood streets adjacent to habitat areas and through stream corridors.
	Tualatin	The city allows narrow paved widths and meets CWS's standards and regulations for Metro's Title 3. The city could consider changes to clearly allow, encourage or require narrow paved widths through stream corridors.
	Washington County	Already addressed in code

Approaches & Methods from Issue Paper #1	JURISDICTION	RECOMMENDATION(S)
Use habitat sensitive bridge and culvert designs	**Beaverton**	No changes proposed, as city complies with CWS Healthy Streams Plan.
	Cornelius	Natural Resource Overlay zone requires approval of a CUP for new streets, roads, recreational trails and paths in riparian areas. Natural Resource Overlay zone requires approval of a CUP for new drainage facilities
	Durham	Already addressed in code & CWS D&C Standards
	Forest Grove	Allowed design approach; cost incentive for narrow bridges.
	Hillsboro	Status: Through SNRP, use bridges and culverts with a natural bottom.
	Sherwood	Sherwood Code does not have a permit process for culvert replacement or in-stream enhancements.
	Tigard	City does not currently permit culvert replacement and associated enhancement work outright. However, certain work is exempt when performed under the direction of the City.
	Tualatin	The city has adopted by reference CWS's regulations for Metro's Title 3 and all bridge and culvert designs meet CWS's standards. Because the TDC and PWCC do not clearly allow, encourage or require habitat sensitive bridge and culvert designs, the city could consider such changes.
	Washington County	Already addressed in code & CWS D&C Standards
3. *Stormwater management facility design*		
Use vegetated stormwater management facilities	**Beaverton**	Language changes specifically allowing for use of these systems may be required. Some basic standards may need to be developed with specific performance measures included
	Cornelius	Comply with CWA standards for water quality and quantity
	Durham	
	Forest Grove	Adopted and required as per CWS standards.
	Hillsboro	As part of removing barriers to LID practices several sections of the comprehensive plan will be amended to incorporate language that includes a comprehensive development and drainage system that includes vegetated stormwater management facilities as part of the stormwater system.
	Sherwood	
	Tigard	No barriers identified in the audit. Numerous water quality facilities have been constructed in the City of Tigard.
	Tualatin	Because the TDC and PWCC do not clearly allow, encourage, or require vegetated stormwater management facilities, the city could consider such changes.
	Washington County	Currently allowed – must be approved by CWS.
Use detention ponds	**Beaverton**	
	Cornelius	Comply with CWA standards for water quality and quantity
	Durham	
	Forest Grove	Allowed.
	Hillsboro	Requires detention facilities for all projects. Uses CWS standards
	Sherwood	
	Tigard	No proposed change. No apparent barriers exist, but also no technical design specifications at this point.
	Tualatin	The PWCC allows the use of detention pond.
	Washington County	Currently allowed – must be approved by CWS.

Approaches & Methods from Issue Paper #1	JURISDICTION	RECOMMENDATION(S)
Use of underground detention and/or treatment	**Beaverton**	The City Code and EDM mandate storm water detention and storm flow attenuation to a higher standard than CWS. No changes proposed
	Cornelius	Comply with CWA standards for water quality and quantity
	Durham	
	Forest Grove	Allowed.
	Hillsboro	The city requires installation for all projects using CWS Design & Construction Standards.
	Sherwood	
	Tigard	Must comply with CWS design and construction standards.
	Tualatin	Because the PWCC does not clearly allow, encourage, or require underground detention and/or treatment, the city could consider such changes.
	Washington County	Currently allowed – standard practice in appropriate areas on county road system.
Building Design Solutions		
Encourage Green roofs (eco-roofs)	**Beaverton**	City may encourage use through education. Consider implementing a stormwater credit after further discussion. Changes to the City Code, Comprehensive Plan, Development Code and EDM may be required.
	Cornelius	City implements State building and plumbing codes for the collection and conveyance of surface water into approved systems.
	Durham	
	Forest Grove	Allowed according to International Building Code
	Hillsboro	Education
	Sherwood	Development Code does not preclude options
	Tigard	No apparent barriers exist within the Development Code precluding options. The City administers those specialty codes and building requirements adopted by the state.
	Tualatin	Because the TDC does not clearly allow, encourage, or require green roofs, except in the Central Design District where they are encouraged, the city could consider such change for more widespread application.
	Washington County	Currently allowed.
Disconnect downspouts	**Beaverton**	Opportunity where adequate landscape area exists, proper distance from structure, and high flows are directed toward a catch basin that connects to the public storm sewer system. Changes to the City Code, Comprehensive Plan, Development Code and EDM may be required.
	Cornelius	City implements State building and plumbing codes for the collection and conveyance of surface water into approved systems.
	Durham	A voluntary effort on the part of the property owner could be implemented and would need to be monitored
	Forest Grove	Not allowed due to soil conditions
	Hillsboro	Technical design specifications may need to be adopted Basin-wide to facilitate the use of this method. Specifications should address site suitability criteria and additional steps needed for sites that are not highly suitable in terms of soil permeability
	Sherwood	Technical design specifications still need to be developed. Code should not preclude options
	Tigard	No apparent barriers exist within the Development Code precluding options. The City administers those specialty codes and building requirements adopted by the state.

Approaches & Methods from Issue Paper #1	JURISDICTION	RECOMMENDATION(S)
	Tualatin	The city could consider changes to clearly allow, encourage or require downspout disconnections.
	Washington County	Potential Plumbing Code, drainage and health issue – coordinate with CWS for potential future code amendments.
Use rain barrel or cistern system	**Beaverton**	Staff concerns re use in rainy months. Open to continuing discussion. Changes to the City Code, Comprehensive Plan, Development Code and EDM may be required.
	Cornelius	City implements State building and plumbing codes for the collection and conveyance of surface water into approved systems.
	Durham	A voluntary effort on the part of the property owner could be implemented and would need to be monitored
	Forest Grove	Allowed with conditions.
	Hillsboro	Technical design specifications may need to be adopted Basin-wide to facilitate the use of this method. Specifications should address site suitability criteria and additional steps needed for sites that are not highly suitable in terms of soil permeability.
	Sherwood	Technical design specifications still need to be developed. Code should not preclude options
	Tigard	No apparent barriers exist within the Development Code precluding options.
	Tualatin	Because the building code does not allow, encourage or require rain barrel or cistern systems, the city could consider such changes.
	Washington County	Potential Plumbing Code issue – coordinate with CWS for potential future code amendments.

Attachment 10

List of Native Trees from City's Street Tree list

Native Trees for Street Trees

Oregon Ash	Fraxinus latifolia	80X40
Red Bud	Cercis occidentalis	18X10
Pacific Dogwood	Cornus nuttallii	50X20
Vine Maple	Acer circinatum	35X10
Big leaf Maple	Acer macrophyllum	90X50
Box Elder	Acer negundo	40X20
Oregon White Oak	Quercus garryana	90X60
Madrone	Arbutus menziesii	90X40 hard to grow
Cascara	Rhamnus purschiana	40X20 small black fruit
Alder	Alnus oregona or rhombifolia	90X40
Willow	several smaller native species OK would have to do research to confirm species.	
Crab Apples	several northwest varieties available Adams,Beverly,Liset. 20X10	

Attachment 11

Municipal Code Provisions on Flood Plan Management

5.705 - 5.750 Automatic Fire Sprinkler Systems (ORD. 1990-08, 10/08/1990; Repealed in its entirety per ORD. 2004-06 09/27/2004)

AREAS OF SPECIAL FLOOD HAZARD

5.800 Statement of Purpose. It is the purpose of sections 5.800 to 5.860 of this code to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

(1) To protect human life and health;

(2) To minimize expenditure of public money and costly flood control projects;

(3) To minimize the need for rescue and relief efforts associated with flooding, and generally undertaken at the expense of the general public;

(4) To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;

(5) To ensure that those who propose development in the areas of special flood hazard assume responsibility for their actions.

5.805 Definitions. (ORD. 2005-17. 09/26/2005)

Area of special flood hazard. The land in the flood plain within the city of Forest Grove subject to a one percent or greater chance of flooding in any given year. This is commonly referred to as the "100 year floodplain."

Basement. Any area of the building having its floor subgrade, below ground level, on all sides.

Base flood. The flood having a one percent chance of being equalled or exceeded in any given year.

Development. Any man-made change to improved or unimproved real estate, including but not limited to structures, mining, dredging, filling, grading, paving, excavation or drilling operations located within the area of special flood hazard.

Elevated Building. For insurance purposes, a nonbasement building which has its lowest elevated floor raised above ground level by foundation walls, shear walls, post, piers, pilings, or columns.

Flood or Flooding. A general and temporary condition of partial or complete inundation of normally dry land areas from:

(1) The overflow of inland or tidal waters and/or

(2) The unusual and rapid accumulation of runoff of surface waters from any source.

Flood Insurance Rate Map(FIRM). The official map on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.

Flood Insurance Study(FIS). The official report provided by the Federal Insurance Administration that includes flood profiles, the Flood Boundary-Floodway Map, and the water surface elevation of the base flood.

Floodway. The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation by more than one foot.

Lowest Floor. The lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage, in an area other than a basement area, is not considered a building's lowest floor.

Manufactured Home. A structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured home" does not include a "recreational vehicle."

Recreational Vehicle. A vehicle which is:

(a) Built on a single chassis;

(b) 400 square feet or less when measured at the largest horizontal projection;

(c) Designed to be self-propelled or permanently towable by a light duty truck; and

(d) Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

Substantial Damage. Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

Substantial Improvement. Any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure either:

(1) Before the improvement or repair is started; or

(2) If the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition, "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure.

The term does not, however, include either:

(1) Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions; or

(2) Any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

5.810 Lands to Which This Code Applies. This code applies to all areas of special flood hazard within the jurisdiction of the city.

5.815 Basis for Establishing the Areas of Special Flood Hazard. The areas of special flood hazard identified by the Federal Insurance Administration in a scientific and engineering report entitled "The Flood Insurance Study for the City of Forest Grove," dated September 15, 1981, with accompanying Flood Insurance Rate Maps, is hereby adopted by reference and declared to be a part of this code. The Flood Insurance Study is on file at the Administrative offices of the city.

5.820 Compliance. No structure or land shall be under development, constructed, located, extended, converted, or altered without full compliance with the terms of this code and other applicable regulations. (ORD. 2005-17. 09/26/2005)

5.825 Abrogation and Greater Restrictions. This code is not intended to repeal, abrogate, or impair any existing easement, covenants, or deed restrictions. However, where this code and an easement, covenant or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

5.830 Designation Of The City Engineer, Or His/Her Designee. The City Engineer, or his/her designee, is hereby appointed to administer and implement this ordinance by granting or denying development permit applications in accordance with its provisions. (ORD. 2005-17, 09/26/2005)

5.835 Review of Applications for Permits and Approvals. (ORD. 2005-17, 09/26/2005)

In reviewing applications for permits or approvals required by the city for development in any area of special flood hazard, including, but not limited to site plan approvals and subdivision approvals, the city engineer shall:

(1) Review all development permits to determine that the requirements of this code have been satisfied.

(2) Review all development permits to determine that all necessary permits have been obtained from those federal, state, or local government agencies from which prior approval is required.

(3) Review all development permits to determine if the proposed development is located in the floodway. If located in the floodway, assure that the provisions of Section 5.850 are met.

(4) Obtain and record the actual (i.e., as-built) elevation in relation to mean sea level of the lowest floor, including basement, of all new or substantially improved structures, and whether or not the structures contain a basement.

(5) For all new or substantially improved non-residential structures that are floodproofed instead of elevated, obtain and record the actual elevation in relation to mean sea level to which the structures were floodproofed. Maintain for public inspection all records pertaining to the provisions of this code.

(6) Maintain for public inspection all records pertaining to the provisions of this code, including elevation and floodproofing certifications.

(7) Notify adjacent communities and the Oregon Department of Land Conservation and Development prior to any alteration or relocation of a watercourse and submit evidence of notification to the Federal Insurance Administration.

(8) Require that maintenance be provided within the altered or relocated portion of the watercourse and submit evidence of such notification to the Federal Insurance Administration.

(9) Require that maintenance is provided within the altered or relocated portion of said watercourse so that the flood carrying capacity is not diminished.

(10) Make interpretations, where needed, as to exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation, such appeals shall be granted consistent with the standards of Section 60.6 of the Rules and Regulations of the National Flood Insurance Program (44 CFR 59-76).

(11) Obtain, review, and reasonably utilize any base flood elevation and floodway data available from a federal, state, or other source, as criteria for requiring that new construction, substantial improvements, or other development meet the standards of sections 5.840 and 5.845.

5.840 General Standards. (ORD. 2005-17, 09/26/2005)

In all areas of special flood hazard, the following standards apply:

(1) All new construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure.

(2) All manufactured homes must likewise be anchored to prevent flotation, collapse, or lateral movement, and shall be installed using methods and practices that minimize flood damage. Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors (Reference FEMA's "Manufactured Home Installation in Flood Hazard Areas" guidebook for additional techniques).

(3) All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.

(4) All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.

(5) All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system.

(6) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharge from the systems into flood waters.

(7) No on-site waste disposal systems shall be allowed.

(8) All subdivision proposals shall be consistent with the need to minimize flood damage.

(9) All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize flood damage.

(10) All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage.

(11) Electrical, heating, ventilation, plumbing, and air-conditioning equipment and other service facilities shall be elevated or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

5.845 Specific Standards. (ORD. 2005-17, 09/26/2005)
In all areas of special flood hazards where base flood elevation data has been provided the requirements of Section 5.846 to 5.849 shall be met.

5.846 Residential Construction. (ORD. 2005-17, 09/26/2005)

(1) New construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated one foot above the base flood elevation.

(2) Fully enclosed areas below the lowest floor that are subject to flooding are prohibited, or shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must be either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:

(i) A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided.

(ii) The bottom of all openings shall be no higher than one foot above grade.

(iii) Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

5.847 Nonresidential Construction. (ORD. 2005-17, 09/26/2005)
New construction and substantial improvement of any commercial, industrial or other nonresidential structure shall either have the lowest floor, including basement, elevated at or above the base flood elevation; or, together with attendant utility and sanitary facilities, shall:

(1) Be floodproofed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water;

(2) Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy;
(3) Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this subsection based on their development and/or review of the structural design, specifications and plans. Such certifications shall be provided to the City's Engineer.
(4) Nonresidential structures that are elevated, not floodproofed, must meet the same standards for space below the lowest floor as described in 5.841(1);
(5) Applicants floodproofing nonresidential buildings shall be notified that flood insurance premiums will be based on rates that are one foot below the floodproofed level (e.g. a building floodproofed to the base flood level will be rated as one foot below.

5.848 Manufactured Homes. (ORD. 2005-17, 09/26/2005)
(1) All manufactured homes to be placed or substantially improved on sites:
(i) Outside of a manufactured home park or subdivision,
(ii) In a new manufactured home park or subdivision,
(iii) In an expansion to an existing manufactured home park or subdivision, or
(iv) In an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood;
shall be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated one foot above the base flood elevation and be securely anchored to an adequately designed foundation system to resist flotation, collapse and lateral movement.

(2) Manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision within the City's FIRM that are not subject to the above manufactured home provisions be elevated so that either:

(i) The lowest floor of the manufactured home is elevated one foot above the base flood elevation, or

(ii) The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above grade and be securely anchored to an adequately designed foundation system to resist flotation, collapse, and lateral movement.

5.849 Recreational Vehicles. (ORD. 2005-17, 09/26/2005) Recreational vehicles placed in special flood hazard areas are required to either:

(i) Be on the site for fewer than 180 consecutive days,

(ii) Be fully licensed and ready for highway use, on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions; or

(iii) Meet the requirements of 5.848 above and the elevation and anchoring requirements for manufactured homes.

5.850 Floodways. (ORD. 2005-17, 09/26/2005) Located within areas of special flood hazard established in section 5 .815 are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of flood waters which carry debris, potential projectiles, and erosion potential, the following provision shall apply:

Prohibit encroachments, new construction, substantial improvements, and other development unless certification by a registered professional engineer is provided demonstrating that

encroachment will not result in any increase in flood levels during the occurrence of the base flood discharge; provided, however, that under no condition shall any fill be permitted within a floodway.

5.860 Violations and Penalties. No structure or land shall be constructed, located, extended, converted, or altered without full compliance with the terms of sections 5.800 to 5.855 of this code and other applicable regulations. Violations of the provisions of this code by failure to comply with any of its requirements shall constitute a misdemeanor. Any person who violates this code or fails to comply with any of its requirements shall, upon conviction, be fined not more than $1,000 for each violation, and in addition shall pay all costs and expenses involved in the case. Nothing contained in this code shall prevent the city from taking other lawful action as necessary to prevent or remedy any violation. (ORD. 2005-17, 09/26/2005)

Attachment 12

Environmental Review Overlay District Text and Map

ENVIRONMENTAL REVIEW (ER)

9.800 INTENT. The ER Overlay Zone is established to protect environmentally sensitive areas. Characteristics which can render an area environmentally sensitive include slopes of 20% or greater, location within Flood Management Areas, wetlands, presence of geological hazards, or moderate/severe to severe soil limitations for urban development. The purposes of the ER zone are to: (Ord. 88-1, 1/25/88; 90-12, 11/13/90; 00-04, 6/12/00)

(1) Encourage the planning, design, and development of safe and enjoyable building sites, while maintaining the integrity of the natural terrain and local ecosystem;

(2) Use good building design, landscape design, and engineering to preserve and enhance the appearance and resources of hillsides, floodplains, and wetlands; (Ord. 90-12, 11/13/90)

(3) Prevent additional water runoff, soil erosion, sedimentation, and flooding which may otherwise occur through development of environmentally sensitive lands;

(4) Achieve land use densities that are consistent with the Comprehensive Plan; and

(5) Encourage alternative approaches to conventional development where necessary to reduce the impact of urban development on environmentally sensitive areas. (Ord. 82-14, 9/27/82)

9.801 PERMITTED USES. The requirements of the ER zone supplement the requirements of the underlying residential, commercial, or industrial zone. Except where otherwise provided below, uses permitted in the underlying zone shall be permitted in the ER zone.

(1) Uses Permitted in Open Space Areas: Development allowed in open space areas shall be limited to the following uses where they are permitted in the underlying zone:

(a) Agricultural uses including general farming, pasturing, grazing, outdoor plant nurseries, horticulture, viticulture, truck farming, forestry, sod farming, and wild crop harvesting;
(b) Recreational uses including golf courses, tennis courts, driving ranges, archery ranges, picnic grounds, boat launching ramps, swimming areas, parks, wildlife and nature preserves, game farms, fish hatcheries, hunting and fishing areas, hiking and horseback riding trails;
(c) Lawns, gardens, and play areas incidental to residential, commercial, industrial, and institutional developments;
(d) Necessary public utilities;
(e) All other uses not involving installation of a building.

(2) Uses Permitted in Wildlife Conservation Areas: Development allowed in Wildlife Conservation areas shall be limited to:

(a) Hunting and fishing areas;
(b) Hiking and horseback riding trails;
(c) Wildlife and nature preserves;
(d) Necessary public utilities. (Ord. 82-14, 9/27/82)

9.802 AREA, DENSITY LOT AND HEIGHT REQUIREMENTS.

(1) Maximum Density: The maximum development density shall be as recommended in the approved environmental report, provided it does not exceed the density prescribed by the

underlying zone. If, for portions of the development, the approved environmental report supports higher densities than allowed in the underlying zone, and if the developer follows planned development (PD) procedures, the City may allow these higher densities, if the average density for the entire development, excluding density bonuses, does not exceed that prescribed by the underlying zone.

(2) Setback and Frontage Requirements: The yard setbacks and frontage requirements of the underlying zone shall be waived in the ER zone, provided that the intent of Section 9.800 is complied with in the total development plan. Building separation shall be maintained in accordance with the requirements of the Fire Code and other safety codes of the City.

(3) Height Regulations: No building or structure shall exceed the height allowed in the underlying zone. (Ord. 82-14, 9/27/82)

9.803 OPEN SPACE. All land below the elevation of the base flood shall be reserved as open space. For all other areas within the ER zone, open space shall be reserved as recommended in the approved environmental report. The reservation and maintenance of required open space areas shall be guaranteed through an appropriate legal instrument approved by the City Attorney. (Ord. 82-14, 9/27/82) (Ord. 88-1, 1/25/88)

9.804 ENVIRONMENTAL REPORT. The applicant for a major or minor partition, subdivision, planned development, or commercial or industrial development in the ER zone shall prepare and file with the Community Development Department an environmental report which shall include, at a minimum, the following analyses:

(1) Soils Analysis:

(a) This analysis shall include, at a minimum, a description of the type, nature, distribution, and development limitations of the soils, plus development recommendations including grading procedures, design criteria for soil erosion control measures, the maximum density of development, minimum lot size, and landscaping and preservation of existing vegetation. The recommendations shall set forth specific conditions for safe development of the site while achieving the performance standards of Section 9.805.

(b) This analysis shall be conducted by a professional engineer registered in the State of Oregon, and experienced and knowledgeable in the practice of soil mechanics.

(2) Geological Analysis:

(a) This analysis shall include, at a minimum, a detailed description of the geology of the site, an assessment of effect of geological conditions on the proposed development, and recommendations for the safe development of the site while achieving the performance standards of Section 9.805.

(b) The analysis shall be conducted by a professional engineer registered in the State of Oregon and experienced and knowledgeable in the practice of engineering geology.

(3) Hydrological Analysis:

(a) This analysis shall include, at a minimum, a description of the surface and subsurface hydrology of the site, an assessment of the effect of the hydrological conditions on the proposed development, and recommendations for the safe development of the site while achieving the performance standards of Section 9.805.

(b) This analysis shall be conducted by a professional engineer, registered in the State of Oregon, and experienced and knowledgeable in the practice of hydrological engineering.

(4) Ecological Analysis:

(a) For developments within a wetland or a Flood Management Area, an ecological analysis also shall be prepared. This analysis shall include, at a minimum, an inventory of plant and animal species occurring within the wetland or floodplain portion of the site, a description of the relationship of the plants and animals with the environment, and recommended measures for minimizing the adverse impacts of the proposed development on the wetland or floodplain ecosystem and for meeting the performance standards of Section 9.805. (Ord. 90-12, 11/13/90; 00-04, 6/12/00)

(b) This analysis shall be prepared by a biologist experienced and knowledgeable in the practice of environmental impact analysis.

(5) The recommendations of the environmental report, as approved by the City, shall be incorporated into the design plan and site improvement specifications for the proposed development. (Ord. 82-14, 9/27/82)

9.805 PERFORMANCE STANDARDS. The applicant shall design, construct, and maintain developments within the ER zone so as to achieve the following performance standards:

(1) Stormwater Runoff: The release rate of stormwater from the site, both during and after construction, shall not exceed or, in wetlands or Flood Management Areas, be less than the runoff rate from the area in its natural, undeveloped state. Equations, assumptions, and coefficients used to estimate runoff shall conform with the Master Storm Sewer Plan. All calculations shall be submitted with the environmental report. (Ord. 90-12, 11/13/90; 00-04, 6/12/00)

(2) Soil Erosion: The rate of soil erosion from the site, both during and after construction, shall not exceed the soil erosion rate from the area in its natural, undeveloped state. The Universal Soil Loss Equation, or such other equation approved by the City Engineer, shall be used to estimate soil erosion. All calculations shall be submitted with the environmental report. (Ord. 82-14, 9/27/82)

(3) Hazardous materials not properly managed or contained, as defined by the Department of Environmental Quality, are prohibited within Flood Management Areas. (Ord. 00-04, 6/12/00)

9.806 GRADING & EROSION AND SEDIMENT CONTROL PLAN. Before development of the site shall begin, the developer shall submit to the Community Development Department for approval a detailed grading and erosion and sediment control plan for the development which includes, at a minimum, the following (Ord. 00-04, 6/12/00):

(1) Cross-sections showing the original and proposed ground surfaces, noting grades, slopes, and elevations.

(2) Detailed plans showing the direction of surface water runoff and all drainage devices, walls, cribbing, dams, or other protective devices to be constructed in connection with the proposed development.

(3) A map showing the drainage area and estimated runoff of the area served by any

drains and proposed methods of runoff disposal.

(4) A soil stabilization report including final groundcover, landscaping, and erosion control measures.

(5) Erosion control measures that meet the requirements of the Unified Sewerage Agency's Design & Construction Standards for Sanitary Sewer and Surface Water Management. (Ord. 82-14, 9/27/82; 00-04, 6/12/00)

9.807 LIMITED FILLING WITHIN WETLANDS OR FLOOD MANAGEMENT AREAS ALLOWED. The Community Development Director or his designee may permit limited filling, with compensatory excavation, within wetlands or Flood Management Areas in accord with the provisions of the ER zone and provided that the applicant's environmental report shall demonstrate that, in addition to the performance standards of Section 9.805, the following conditions will be met: (Ord. 90-12, 11/13/90; 00-04, 6/12/00)

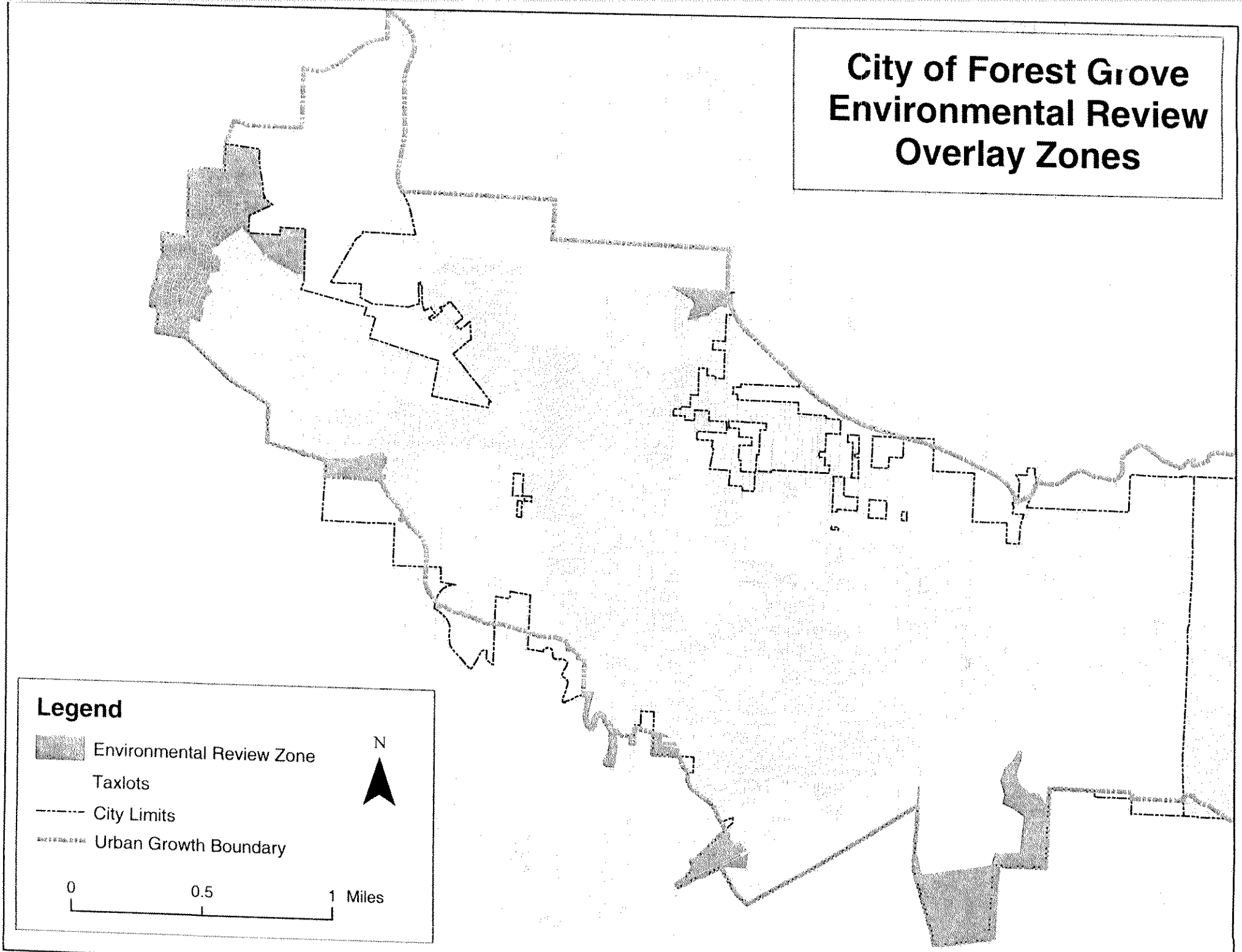
(1) The proposed fill will not have a serious tendency to change the direction, velocity, or elevation of future flood waters so as to compound flood hazards; and

(2) The proposed fill will not seriously harm the natural ecosystems of the immediate and downstream areas.

(3) Evidence is submitted that permits have been obtained from the appropriate State and Federal agencies. (Ord. 90-12, 11/13/90)

Under no condition shall the Community Development Director or his designee allow any fill within a flood way. (Ord. 82-14, 9/27/82)

City of Forest Grove Environmental Review Overlay Zones



Location of Environmental Review Overlay District

Attachment 13

Letters Received

27March 2007

To: Jon R. Holan
Community Development Director
City of Forest Grove

From: George Burlingham
45157 NW David Hill Rd.
Forest Grove, OR97116

Subject: Change in Comprehensive Plan CPA-06-03 Zone MPP
Amendment ZC-06-03 Land Division Ordinance
Amendment LDO-06-02 For Flood Plain

The purpose of this letter is to ask for a change from the proposal—specifically to delete all "Upland wildlife habitat Class A" as it affects my property.

This area consists of Douglas Fir trees which I planted over 40 years ago with the specific purpose of harvesting these trees when they were marketable. This takes about 50 years. I filed this plan with Washington County a long time ago. I am only asking for a change on the north and east side of David Hill Road.

I own a small acreage on the south side of David Hill Road. This consists mostly of wetland and native trees. On this area I totally agree with the Plan. I would like to meet with the proper city official to determine a possible city wetlands ownership of this area.

I will be available until April 8th and then after May 2nd to have a complete discussion of my requests.

Sincerely,

George Burlingham

April 2, 2007

Chair Tom Beck and Planning Commission
City of Forest Grove (Attn: Jon Holans)
1924 Council Street
P.O. Box 326
Forest Grove, Oregon 97116-0326

Dear Chair Beck and Planning Commission,

I am writing on behalf of Audubon Society of Portland and our 10,000 members residing in the Portland-Metro region to support the adoption of proposed comprehensive plan amendments (Natural Resource Policy 3) and associated code revisions (especially sections 9.101, 9.940, 9.941, 9.944, 9.970, and 9.971) relating to natural resource protection in Forest Grove.

We are pleased to see Forest Grove demonstrating leadership in the Tualatin Basin by developing policies and programs to protect and restore regionally significant fish and wildlife habitat. This supports more consistent policies across the Portland-Metro region to protect regionally interdependent natural resource values including clean water, fish and wildlife habitat, and public health and safety.

Having reviewed the draft code language that closely mirrors the Metro Title 13 model ordnance, we offer one comment and suggestion. The Planning Commission should consider closely the language specifying purpose and intent of proposed policies to ensure that they proposed regulations fall within Measure 37exemptions, namely those preclude claims against regulations intended to control pollution, protect the public health and safety, and comply with federal law.

Again, we urge the Planning Commission to recommend that the City Council adopt these proposed comprehensive plan and zoning code amendments to protect regionally significant natural resources in Forest Grove.

Respectfully,

Jim Labbe
Urban Conservationist,
Audubon Society of Portland

Handout #2

AERIAL PHOTOGRAPH