City of Corvallis

Natural Features Inventory
Draft Final Report

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I. Executive Summary

Purpose

The purpose of the Natural Features Project is to provide comprehensive information about the location and condition of natural resources and hazards within the Corvallis urban growth boundary (UGB). This information is needed by the City of Corvallis, Benton County, property owners, and the general public to make decisions about land use planning. The Natural Features Project and the associated inventories respond to the requirements of the Oregon statewide planning goals, primarily Goals 5, 6, and 7, and associated administrative rules. The Natural Features Project information will be used, in conjunction with other information and with substantial public input, to implement the Corvallis 2020 Vision Statement and the Corvallis Comprehensive Plan (1998). Both the Statewide Planning Goals and the Corvallis Comprehensive Plan direct the City to achieve a balance between providing a sufficient supply of buildable lands to meet the City's needs for housing and economic development while protecting significant natural features and reducing risks from natural hazards. The Oregon Department of Land Conservation and Development (DLCD) has directed the City of Corvallis to complete this work within the next several years.

Natural Features Project Planning Process

The Natural Features Project is a multi-year community project to inventory (systematically map and describe) and prioritize (determine the relative "significance" of) the natural features within the Corvallis UGB. The inventories are used to balance the community's need for buildable land for housing and economic development with natural resource protection and reducing risks from natural hazards. The steps necessary to achieve this work are discussed in more detail in the Introduction of the Inventory report. Briefly, the Natural Features Project has four major phases, consistent with State requirements:

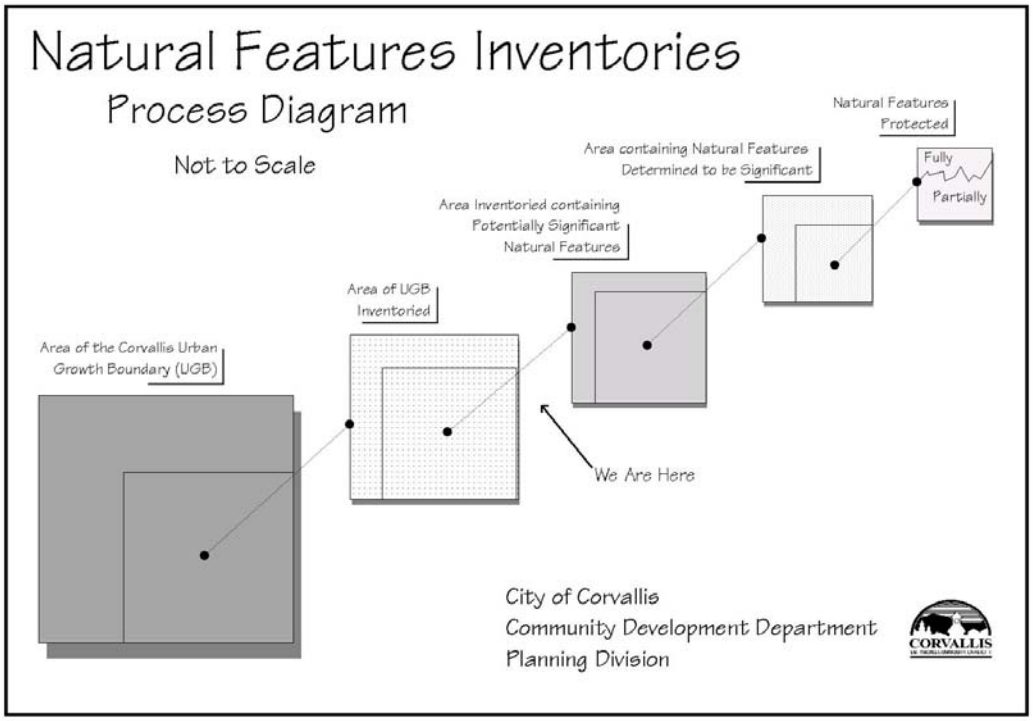
- **Phase 1 - Scoping (completed):**
  The *Natural Features Scoping Project* was completed in January 2002. It determined what natural features to inventory and provided a methodological framework for conducting natural feature inventories, and established preliminary criteria for ranking each of the natural features.

- **Phase 2 - Inventory (February 2002 – June 2003):**
  The resources identified by the *Scoping Project* were inventoried. The Natural Resources Inventory Report is the inventory for the wetlands, riparian areas, wildlife habitats and tree groves. A separate Natural Hazards Report will include the inventories for natural hazards including floodplains, steep slopes/hillsides, earthquake associated hazards, landslides, alluvial fans, and wildfires.

- **Phase 3 - Establish Priorities and Balance Needs (June 2003 – April 2004):**
  Not all natural features identified in the inventories will be significant and warrant protection. During this stage, the community will review the inventory information and will make decisions regarding the significance of each resource site. The community will also consider the consequences of various protection programs to ensure that a balance is achieved between resource and hazard protection, and providing sufficient buildable land to meet the community's needs.

- **Phase 4 - Developing Implementation Program (January - July 2004):**
  The final stage of the project will be to develop a combination of incentives, education materials, and regulations to protect the significant natural features and reduce the risks associated with natural hazards. Resource protection programs will include clear and objective standards in the Land Development Code and provide more certainty to property owners and the broader community regarding where development can occur, and where it will be limited.

It is important to understand that the inventory does not, by itself, establish which lands will be available for development or which natural features will be protected. Not all of the natural features included in the inventory will be considered "significant", not all of the significant natural features will be protected, and limited development may be allowed on protected resources. Each phase of the Natural Features Project will include decisions to balance conflicting or competing goals, which will reduce the number of natural feature areas under consideration (see figure below). These decisions will be made in future phases through a collaborative process with significant input from property owners and the general public.



The Natural Resources Inventory Report

This report is part of the inventory step in the Natural Features Project and includes the following resources:

- Wetlands
- Streams and Riparian Areas
- Wildlife Habitat (including Significant Vegetation)
- Tree Groves

In addition, the City of Corvallis is preparing separate inventories for the following natural hazards:

- Floodplains
- Steep Slopes/Hillsides
- Earthquake Associated Hazards
- Landslides
- Alluvial Fans
- Wildfire Potential

How To Use This Inventory

The Natural Features Inventory is divided into four resource types: wetlands, riparian areas, wildlife habitat and tree groves. Each resource has a **technical report** that describes the detailed methodology with summary tables and analysis. Detailed **data sheets** can be found for each resource site. The maps are divided into two categories: water-related resources (wetlands and riparian areas) and upland resources (wildlife habitat and tree groves). Each resource category has three types of maps with increasing detail. A **summary map** identifies the resource location within the Corvallis UGB. The **locator maps** are divided by study area (north, west-central, south) and provide a map index to the detailed **map sheets**, using 2002 aerial photos as their base.

Inventory Methodology

Specific methods are used for each of the natural features in this inventory. The inventory and assessment methods described in this report are based on the *Natural Features Scoping Project Report* (2002) prepared by the Corvallis Natural Features Technical Advisory Committee (NFTAC). The scoping report provides clear direction regarding what natural features to inventory further and provides the methodological foundation for determining how to inventory the natural features. The functional values of each natural resource area are evaluated using ranking/point systems to allow comparisons among all areas with the same type of resources. Detailed descriptions of the methods are found in each of the technical reports. Briefly:

- **Local Wetlands Inventory (LWI)** – the LWI includes all wetlands at least 0.5 acres is size, either isolated or within riparian assessment areas or wildlife habitat assessment areas. The methods are determined by Oregon Division of State Lands (DSL) administrative rules.[1] The LWI is unique in that it is the only resource in which "significance" of a local wetland is determined by state administrative rules. The *Oregon Freshwater Assessment Methodology* (OFWAM) is used to assess whether or not a wetland meets the criteria for a Local Significant Wetland.

- **Riparian Assessment** – the riparian assessment is conducted within riparian assessment areas (RAA), which vary in width depending on stream type (perennial or intermittent) and the presence of locally significant wetlands and/or continuous riparian vegetation. The width of the RAA extends beyond the width of the riparian vegetation to identify potential offsite impacts. Each RAA is mapped with subareas or **"**subpolygons**"** that indicate different vegetative cover types (i.e. trees, shrubs, grasses, developed). The methodology is based on the *Urban Riparian Inventory and Assessment Guide* (URIAG) and a supplemental Riparian Corridor Survey to provide additional information on vegetation cover and stream conditions consistent with the *NFTAC Scoping Report*.

- **Wildlife Habitat Assessment (WHA)** – the wildlife habitat assessment includes all areas of at least five acres with natural vegetation, except for areas within riparian assessment areas. The WHA inventories and assess six general categories of habitat features or conditions: water, food, cover, human disturbance, patch size and connectivity, and unique features. Vegetation subpolygons are defined within each WHA area based on vegetative cover types. Each vegetation subpolygon includes a description and characterization of the vegetation and identification of any rare, threatened or endangered species associations.

- **Tree Grove Assessment (TGA)** – tree grove assessments are conducted for all areas with trees that are predominantly 25 feet or more in height with a continuous canopy cover of 0.5 acres or more. The TGA distinguishes between isolated tree groves (less than five acres in size) and vegetative subpolygons within WHA areas (greater than five acres), but does not include tree cover within developed areas or riparian assessment areas. The TGA evaluates tree groves for scenic, aesthetic, and other functional values.

Aerial photo interpretation is used to identify potential resource sites, which are then confirmed by field surveys. The fieldwork is conducted on-site where access permission is granted. Where access is not obtained, off-site assessments are conducted using aerial photographs, existing data sources, and observation from public lands and adjacent rights-of-way.

In many cases, resource boundaries overlap. For example, tree groves may be isolated or part of a wildlife habitat assessment area; or, a riparian corridor may be located within a wildlife habitat assessment area. Similarly, wetlands may be part of either a wildlife habitat assessment area or a riparian assessment area. The methodology ensures comprehensive coverage and consideration

1 OAR 141-86-110 through 141-86-240

of multiple functional values for each type of resource (i.e. riparian areas serve as wildlife habitat), while avoiding "double counting" resources.

Natural Resources Inventory Results

The inventory area is the Corvallis UGB, which includes 17,963 acres or approximately 28 square miles. Just under half of this land is within the Corvallis city limits (approximately 8,940 acres)**,** and the remainder is within unincorporated, but urbanizable, Benton County. Both Corvallis and Benton County have responsibility to plan for unincorporated land within the Corvallis UGB. The inventory area is divided into three study areas based on watershed basin boundaries (see Figures 1 and 2):

- North Corvallis Study Area (4,966 acres);
- West-Central Corvallis Study Area (8,466 acres); and
- South Corvallis Study Area (4,531acres).

The total acres included in the inventories for all four resource categories cover approximately 44% of the Corvallis UGB. Approximately 2,156 acres or 27% of the resource areas are inside the Corvallis city limits. Approximately 5,757 acres or 73% % of the resource areas are outside the city limits in unincorporated Benton County. This imbalance is not unexpected given most of the vacant, undeveloped land is outside the city limits. Table 1 provides a breakdown of the total acreage in the inventory study area.

Table 1. Total Acres Inventoried by Area

	Total Area (Acres)	**Resource Inventory** (Acres)	**% Area Inventoried**
Corvallis UGB	17,963	7,913	44%
North Study Area	4,966	2,280	46%
West-Central Study Area	8,466	3,720	44%
South Study Area	4,531	1,913	42%
City of Corvallis	8,940	2,156	24%
Unincorporated Benton County	9,023	5,757	64%

Figure 1. Study Areas within Corvallis Urban Growth Boundary

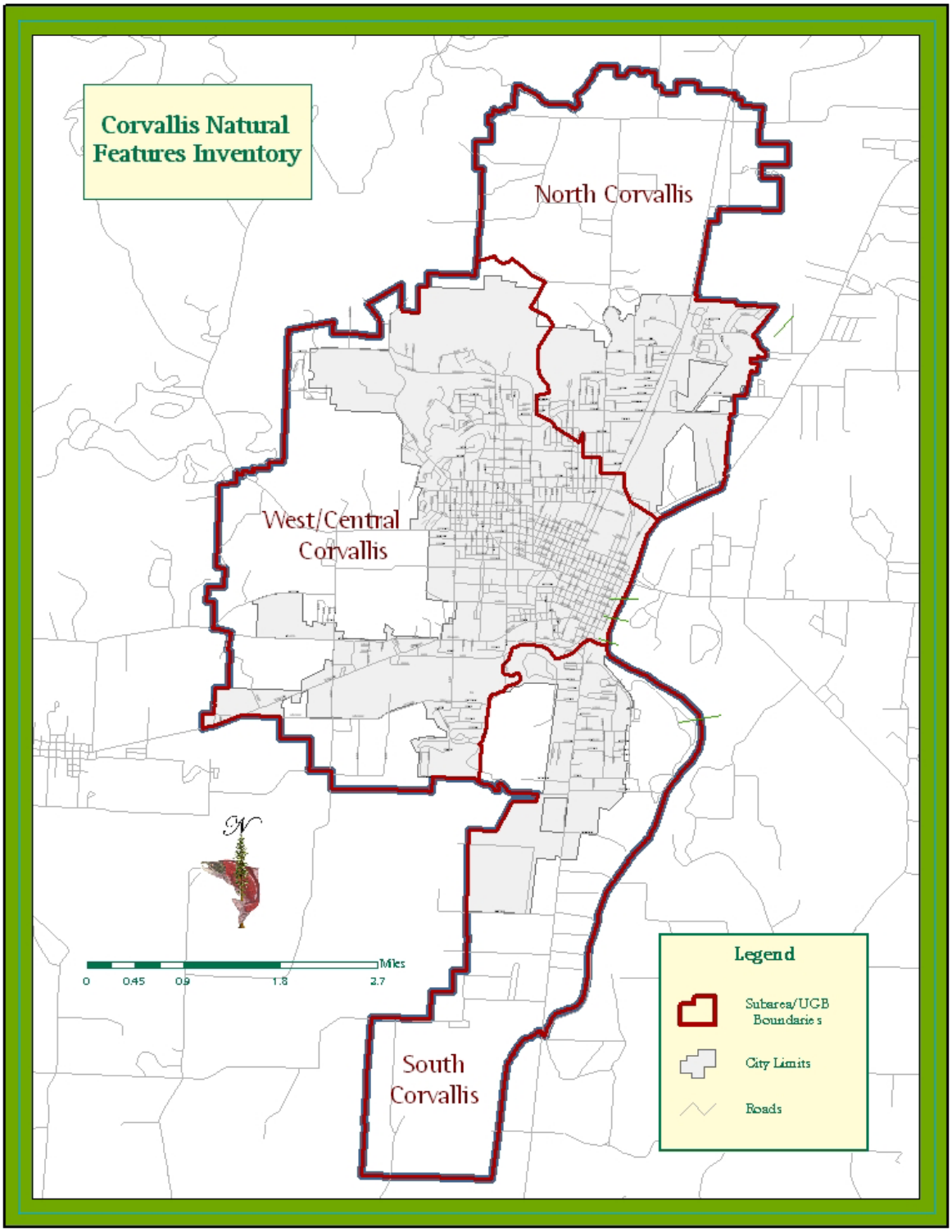
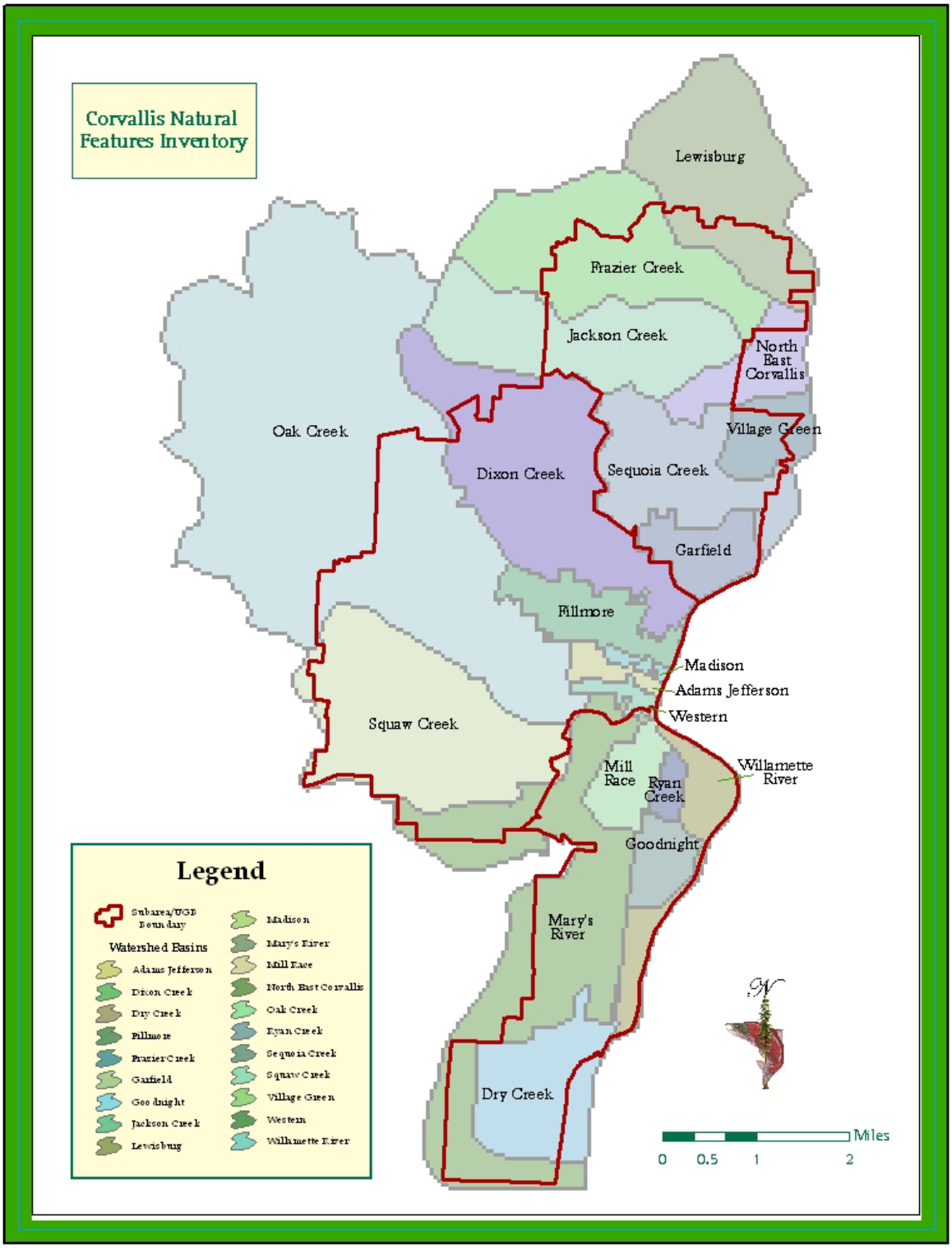


Figure 2. Watershed Basins within Corvallis Urban Growth Boundary



Local Wetland Inventory (LWI)

The LWI includes 121 wetland units. These wetlands cover approximately 2,607 acres, or 15 percent of the 17,963-acre Corvallis LWI study area. The average wetland size is approximately 21.6 acres.

All 121 wetland units were assessed using OFWAM. The result of OFWAM identified 58 wetlands as locally significant. These locally significant wetlands (LSWs) total 1,247 acres, or 48 percent of the total wetland area. The average size of a LSW is 21.4 acres. Of the LSWs, eleven are of Special Interest for Protection, due to the presence of known habitat for rare, threatened, or endangered plant species. Non-locally significant wetlands total 1,360 acres, or 52 percent of the total wetland area. The average size of a non-locally significant wetland is 21.6 acres.

More than half of Corvallis' wetlands do not meet LSW criteria because large areas of wetlands are actively farmed. These wetlands may provide important functions, but do not meet the DSL LSW criteria.

Table 2. Local Wetland Inventory Summary

Wetland Type	Corvallis UGB	North	South	West Central	City of Corvallis	Benton County
Locally Significant Wetlands (LSW)	1,247	299	433	515	402	845
Non-Locally Significant Wetlands	1,360	182	890	288	146	1,214
Total Wetland Acres	**2,607**	**481**	**1,323**	**803**	**548**	**2,059**

Riparian Assessment

The inventory surveyed 140 Riparian Assessment Areas (RAA) totaling approximately 3,750 acres, or about 21% of the Corvallis UGB.

Riparian vegetation was classified by vegetation cover types using Adamus Resource Assessment (ARA) Vegetation Cover Types. For the purposes of the following table, natural vegetation includes all areas that are not dominated by agriculture, large landscaped open spaces, or developed areas. Within the RAAs, approximately 2,311 acres contain natural riparian vegetation, approximately 752 acres are now farmed or in pasture lands, and 688 acres are developed.

Table 1. Riparian Assessment Summary

Vegetation Cover Type	Corvallis UGB	North	South	West Central	City of Corvallis	Benton County
Natural Vegetation	**1,420**	**373**	**298**	**748**	**429**	**991**
Wetlands (LWI)	**891**	**220**	**132**	**539**	**161**	**730**
Agricultural/Pasture	**752**	**303**	**96**	**353**	**155**	**597**
Developed	**688**	**172**	**86**	**430**	**480**	**208**
Total Riparian Assessment Areas	**3,750**	**1,068**	**612**	**2,070**	**1,224**	**2,526**

In general, the RAAs of Corvallis are in relatively good condition, with the exception of reaches through agricultural fields, pasture areas and developed areas where there is a lack of woody vegetation. For many stream reaches, the dominant vegetation at the edge of the stream has generally greater structure than the vegetation within the entire RAA.

In the Riparian Condition Assessment, 51 (36 percent) RAAs were rated as Fully Functional, 66 (47 percent) were rated as Nearly Fully Functional, 21 (15 percent) were rated as Partially Functional, and only one (WC-DIX-R-1) was rated as Non-Functional. The Partially Functional and Non-Functional ratings are closely associated with adjacent land uses. Of the 22 RAAs, only one reach had undeveloped land adjacent to it. The other reaches were as follows: residential: 7 reaches; commercial/industrial: 6 reaches; agricultural: 9 reaches.

The discussion of each basin (below) includes tables that break out the individual elements of the RCA. These results generally show that only 28 (20 percent) RAAs are fully impinged by infrastructure and only 20 (14 percent) have heavy in-channel alterations. Fifty-eight (41 percent) RAAs have low or no large woody debris (LWD) recruitment, but only 27 (19%) have low or no shade potential.

The URIAG results show that many reaches retain functions that are essential to a healthy stream system. For example, 110 (79 percent) of the RAAs provide high water quality functions, with only one RAAs (WC-DIX-R-16L) providing low water quality functions. One hundred and eleven (79 percent) RAAs provide high or medium flood management functions. The prevalence of woody vegetation within the RAAs and hanging over the edge of the water likely accounts for the fact that 125 (89 percent) of the RAAs provide high or medium thermal regulation function. One hundred and twenty-seven (91 percent) of the RAAs provide high or medium wildlife habitat functions.

Wildlife Habitat Assessment (WHA)

Thirty-one (31) habitat sites ranging in size from 7.5 to 260 acres were evaluated within the Corvallis planning area. WHA sites throughout the UGB totaled 2,590 acres, with a mean site size of 82 acres. Eleven sites were located in North Corvallis (945 acres), eighteen in West/Central Corvallis (1,511 acres) and two in South Corvallis (133 acres).[2] Most (26) of the WHA sites are located outside the city limits in unincorporated Benton County, which is to be expected given that is where most of the undeveloped land is located. Six (6) of the WHA sites are publicly-owned parkland, which account for approximately 650 acres or 25 percent of WHA acreage.

WHA scores ranged from a high of 102 (Site N-9a, Jackson Creek/Chip Ross Park) to a low of 31 (Site N-2a, Lewisburg Ave North). The mean score for all sites in their existing condition was 64.6. Some sites have the potential to be enhanced. With enhancements, the mean score could be raised to 69.7.

2 Acreage figures include approximately 285 acres of wetlands, but do not include adjacent riparian areas.

Table 4. Wildlife Habitat Assessment Summary

	Corvallis UGB	North	South	West Central	City of Corvallis	Benton County
Total Acres	2,590	945	133	1,512	517	2,073
Average WHA Site Size (acres)	84	86	66	84	106	79
Average WHA Score (points)	64.6	59.2	81	62.8	66.2	64.3

Tree Grove Assessment

Tree Grove Assessments were conducted for all areas with trees that are predominantly 25 feet or more in height with continuous canopy cover of one-half acre or more that are located outside developed areas. Trees inside riparian areas were not included in this assessment. One hundred eighty (180) tree groves ranging in size from 0.5 to 136 acres were identified within the Corvallis UGB. Tree groves sites throughout the UGB totaled 1,908 acres, with an average site size of 10.78 acres. Seventy-three (73) sites were located in North Corvallis (873 acres), 95 sites in West/Central Corvallis (904 acres) and 9 in South Corvallis (131 acres). One hundred thirteen (113), or 63 percent, of the tree groves were located within wildlife habitat sites with the balance (67 sites) classified as isolated groves. Sixty-nine (69), or 62 percent, of the tree groves are located inside the Corvallis city limits, but these groves represent only 23 percent of the acreage because most of them are smaller- sized isolated tree groves.

Each tree grove was rated in terms of scenic, aesthetic, and other functional values that trees provide to the community. Overall TGA scores ranged from a high of 30 (Site WC-5a-E) to a low of 12 (Site N-TG-31). The average score for all groves was 18.7. Dominant tree species varied widely with 44 different species or species mixes noted. Although rare within the Willamette Valley, Oregon white oak was the predominant species, with 80 groves surveyed. Douglas fir was the second most common species noted, with 65 fir groves surveyed.

Table 5. Tree Grove Assessment Summary

	Corvallis UGB	North	South	West Central	City of Corvallis	Benton County
Within WHA site	1,810	835	130	845	370	1,440
Isolated Grove	139	43	1	95	90	49
Total Tree Groves	**1,949**	**878**	**131**	**940**	**460**	**1489**
Average Size Within WHA site	16.02	16.37	16.25	15.65	16.09	16.00
Average Score Within WHA site	18.8	17.7	23.9	19.2	19.8	18.6
Average Size of Isolated Grove	2.07	2.06	1	2.12	1.96	2.34
Average Score of Isolate Grove	18.4	16.2	21	19.4	18.8	17.6

Access for Field Surveys

The goal was to survey all sites or at least a portion of the site that appeared to be representative or typical of the conditions in that resource site. Field surveys were conducted on-site where access permission was obtained. Where access was not obtained, assessments were "field verified" with observations from adjacent roads, public lands, or properties that had granted access. For difficult to observe sites, an off-site assessment was conducted using aerial photographs and existing data sources. Table 6 provides a breakdown between the on-site, field verified and off-site surveys for each resource.

Table 6. Field Survey Methods

	On-Site		Field Verified		Off-Site	
Resource	**No. of Sites**	**%**	**No. of Sites**	**%**	**No. of Sites**	**%**
Wetlands	59	49%	43	36%	19	15%
Riparian Areas	104	74%	25	18%	11	8%
Wildlife Habitat	18	58%	11	35%	2	7%
Veg Subareas	61	37%	73	44%	32	19%
Tree Groves						
Inside WHA	41	36%	51	45%	21	19%
Isolated	-	-	67	100%	-	-

Quality Control and Quality Assurance

Quality Control and Quality Assurance are important to establish the reliability or integrity of the inventories. Careful attention was paid to ensure consistent application of the inventory methodologies throughout the Corvallis UGB. The field surveys were conducted by experienced scientists who have conducted similar inventories for other jurisdictions.

At the start of each resource inventory, all participating field staff visited selected calibration sites (e.g., individual wetlands) that represented the likely range of conditions for each type of resource found in the Corvallis UGB. The purpose of visiting calibration sites as a group was to ensure that all personnel were interpreting the assessment methodology and data elements in the same manner. To determine if this was the case, each person assessed each site independently, then the results were immediately compared and discussed to identify possible reasons for any differences. This calibration process resulted in written clarification to the methodologies.

As the fieldwork was being completed, property owners and others were given opportunities to discuss the field survey findings and to give immediate input to the field inventory scientists. Throughout the inventory process, lead scientists reviewed the work of the other team members to continue to assure consistency in the methodology and findings of the team members.

A Public Review Draft of the inventory reports, maps, and data sheets was released in January, 2003. Notices were mailed to property owners and other interested parties to inform them about the draft inventory report and opportunities to provide comments and corrections. Copies of the

January Public Review Draft were presented in public open houses, at the Corvallis – Benton County Library, at City Hall, and on the project website. A committee of local peer reviewers with expertise in each inventory specialty provided review comments and corrections.

In addition to responding to public and peer review comments on the January 2003 Public Review Draft, each resource site map was reviewed a second time to make further adjustments and refinements to the site boundaries. The Local Wetland Inventory and Riparian Assessment databases were re-checked and revised to update the inventories. This revised information was used to prepare the May 2003 draft that is going through an additional review by City staff, property owners and the general public, and the peer review team to form the basis of the June 2003 final inventory report.