

OCT 2 2003

## Raindrops to Refuge Watershed Action Plan:

Chicken, Rock and Cedar Creek Watersheds  
(Sherwood, Oregon)



September, 2003

Prepared by:

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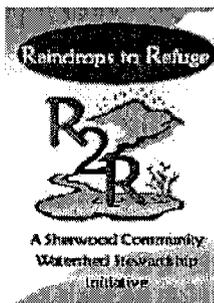
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### **Photo Credits**

Janet Bechtold, Christine Egan, Ken Huffer, Amber Reese, and Clean Water Services/Watersheds 2000 Survey

# *Raindrops to Refuge Watershed Action Plan:*

## *Chicken, Rock and Cedar Creek Watersheds (Sherwood, Oregon)*

### *Abstract*

"The Raindrops to Refuge (R2R) Watershed Action Plan covers Chicken, Rock and Cedar creek watersheds in the Sherwood, Oregon area. The Action Plan contains R2R's background, goals, objectives, and a series of strategies designed to protect, restore and enhance natural resources in the three watersheds, and engage and educate the public about issues related to watershed health. The Action Plan is intended to (a) provide information about R2R and ways to get involved, (b) provide a framework to support and focus the efforts of partners towards high priorities and needs, (c) use and build on existing plans and local knowledge, and integrate it into one document, (d) provide a means to track progress and changes over time, and (e) serve as a working document to change as issues, needs and opportunities evolve. It was developed by and for numerous partner organizations, including public agencies, non-profit organizations, private landowners, businesses and citizens throughout the Sherwood area. Other plans and programs that address related issues in the same geographical area were considered and used in developing priorities, strategies and lists of potential resources and partners."

### *Acknowledgements*

The completion of the R2R Action Plan for Sherwood's watersheds was accomplished through the combined efforts of citizens, volunteers, private and non-profit organizations, and public agencies.

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## Projects Completed or Initiated as of July 1, 2003

### Workshops

- October 12, 2002 Community Wide Workshop (Naturescaping Clean River Program), 40 attendees
- November 16, 2002 Neighbor to Neighbor Workshop, 11 attendees
- April 5, 2003 Neighbor to Neighbor Workshop, 6 attendees
- June 18, 2003 Neighbor to Neighbor Workshop, 11 attendees
- August 27, 2003 Neighbor to Neighbor Workshop, 15 attendees
- September 14, 2003 Community Wide Workshop, Watershed Fair
- February 2004 Neighbor to Neighbor Workshop

### Greenway Walks

- February 15, 2003 Urban Naturalist Mike Houck, bird walk, 28 attendees
- March 8, 2003 R2R Christine Egan, refuge walk, 11 attendees
- April 12, 2003 City of Sherwood, Natural Resources, Ken Huffer, restoration projects, 7 attendees.
- May 17, 2003 Backyard Birdshop, Jim Black, bird walk, 4 attendees
- June 21, 2003 Deputy Ranger Chris Lapp, refuge walk, 8 attendees
- July 19, 2003 Chris Neamtzu, Sherwood's historic trees, 2 attendees
- August 27, 2003 Bill Ryan, Twilight Creatures, 30 attendees
- September 13, 2003 Jim Closson, Open Space Conservation
- October 30, 2003 Kim Strassburg, Refuge Walk

### Watershed guidebook

We have received funding to print 300 copies from Portland General Electric. We have the outline done for the guidebook and are currently drafting the first copy. We are working with natural resource experts and others involved in watershed health to complete the sections. It will be approximately 30 pages in length and will be handed out to new Sherwood homeowners and current homeowners at our workshops and community events.

### **Water bill inserts**

In April, R2R's first water bill insert was mailed out to Sherwood citizens. It included tips on natural gardening, information on R2R, and a discount coupon to purchase native plants from a local nursery. The July/August insert contains water wisely tips and a coupon for Chevron's oil change and car wash package. Approximately, 4,700 inserts were sent out. We will be doing 1 more of these inserts in addition to 3 printed messages on the actual water bills. We received funding from Clean Water Services to do the printing of the inserts.

### **Website**

We have received financial help from the City of Sherwood to pay for the first year of service for R2R's website. Our web site was done by Julia Crown and can be viewed at [www.raindrops2refuge.org](http://www.raindrops2refuge.org)

### **Cedar Creek Guidebook**

Media Specialist Patty Sorenson at Middleton Elementary has been working with 4<sup>th</sup> and 5<sup>th</sup> graders to create a plant guidebook. Each student selected a plant to study. R2R has received five guidebooks for use on the Greenway Walks.

### **Demonstration Garden**

R2R has been working with the City of Sherwood and Murase Associates to incorporate native plantings in Synder Park for Phase 2 and Phase 3 construction. Ideas that have been presented include eco-roofs and eco-lawns, stormwater garden, courtyard with raised beds, arbors and benches, and pervious trail surfaces.

### **Community Events**

R2R has been involved with Migratory Songbird Day, the Sherwood Community Fair, Discovery Day, Music on the Green and others. We have used the Enviroscape display at these events to teach watershed health. On September 14, 2003, R2R held its first open house to help launch the Action Plan. The event was called the, Sherwood Watershed Fair. It was a family event that included a native plant sale, presentations for adults and children, free refreshments, and 15 partner educational tables and displays.

### **Restoration**

R2R has adopted a 3 acre upland site within Stella Olson Park for restoration activities. Invasive nonnative species will be removed and will be replaced with native trees and shrubs. Two planting dates have been selected (Feb. 28 & March 13, 2004) with maintenance dates to follow during the summer.

## Introduction to Raindrops to Refuge

The Raindrops to Refuge program was initiated in the summer of 2001 by a group of concerned residents, and representatives from the City of Sherwood, Sherwood Sustainability Institute, U.S. Fish and Wildlife Service, Tualatin River National Wildlife Refuge, Friends of the Refuge and Sherwood School District. These residents and stakeholder groups were concerned about the detrimental impacts of growth on their community, watershed health, water quality, floodplain management, wildlife habitat and corridors, and its result on the Tualatin River National Wildlife Refuge and the Tualatin River. They were seeking innovative ways to get actively involved in finding a solution. Within four months this group of stakeholders evolved into a formal Advisory Committee to form Raindrops to Refuge (R2R).

R2R is a local Sherwood community organization with the mission to inspire and facilitate community action and cooperation to protect and restore Sherwood's local watersheds. These watersheds are formed by three streams – Rock, Cedar and Chicken – and provide important watershed functions for fish and wildlife, water quality, ground water recharge, flood protection and passive recreation. The Tualatin River National Wildlife Refuge, one of ten urban refuges in the nation, lies at the confluence of these creeks and the Tualatin River. All three creeks supply water to the Refuge's most productive wetlands and Chicken Creek is one of two streams in the Sherwood sub-basin (720 square miles) to support spawning habitat for Endangered Species Act-listed Steelhead trout (Clean Water Services). As a result, the health of these watersheds not only affects quality of life in the urban areas of these watersheds, but also significantly impacts the Refuge's ability to provide high quality wildlife habitat, water quality, flood protection and a safe and enjoyable place for visitors.

### **Raindrops to Refuge, vision, mission, and goals:**

#### *Vision*

*The City of Sherwood and the surrounding watershed communities understand the importance of watershed protection and take actions that mutually benefit fish, wildlife and people.*

#### *Mission*

*To inspire, educate and facilitate community actions to assess, restore and preserve the ecological health of Sherwood's watersheds.*

#### *Goals:*

Education: To educate/inform youth and adults living and working in the Sherwood watersheds about watershed functions and fish and wildlife habitat and show them how their actions impact these natural resources. To lead and facilitate community actions to assess and conserve the health of the watersheds.

Outreach: To increase awareness and appreciation of those living and/or working in Chicken, Rock and Cedar Creek watersheds about how their actions impact watershed health and the Tualatin River National

Wildlife Refuge. To inspire and mobilize Sherwood residents, landowners, and developers to take private, voluntary actions to improve watershed health on both private and public lands.

Restoration: Collaborate with the City of Sherwood, local and regional stewardship groups, Refuge managers, and private landowners to organize and implement restoration activities on urban and rural lands, under both private and public ownership.

Conservation: Collaborate with the City of Sherwood and/or other conservation based organizations to conduct conservation planning, prioritize land acquisitions, and recruit local and regional land trusts to facilitate private voluntary conservation through acquisitions, dedications and conservation easements.

The Raindrops to Refuge organizational chart included in this document lists the subcommittees and their respected programs and partners. It also shows the relationships of the various organizations and agencies involved in the decision making processes.

## Process of the Action Plan

In January, 2002, Christine Egan served Raindrops to Refuge as its initial coordinator. At the inception of the group, the coordinator met with Raindrops to Refuge participants to learn about their concerns, ideas, and backgrounds; to gauge the capacity of individuals to participate in the group; and to develop a work plan. The coordinator organized the group into four working subcommittees: Conservation/Restoration; Youth Education; Public Education and Outreach; and Raindrops to Refuge Capacity building. She recruited additional individuals for each subcommittee. Meetings were held with organization and agencies to gather existing data and watershed action plans. These plans were reviewed for content and format, and based on this the coordinator selected a format for Raindrops to Refuge's action plan. The majority of the first year of Raindrops to Refuge was spent working with individual committees to draft the action plan. At the completion of this draft, in April, of 2003 Amber Reese became the new coordinator of Raindrops to Refuge. The goals for the new coordinator for 2003 are to have the action plan peer reviewed, and to solicit and incorporate public comments on the plan. Additionally, she is working to secure funding for action items listed in the plan.

### Data Sources

Primary information sources used include Clean Water Services' Watersheds 2000 data, Metro's Goal 5 Inventory and Parks and Greenspaces Regional System Map, the Washington County Soil and Water Conservation District's Lower Tualatin River Watershed Assessment, and Oregon Department of Fish and Wildlife Distribution of Fish and Crayfish and Measurement of Available Habitat in the Tualatin River Basin, and the City of Sherwood Natural Resources and Planning Departments. The expertise and local knowledge of committee members was also used to develop maps and priorities.

### Public Involvement

Raindrops to Refuge's involvement with the Sherwood community have occurred through outreach programs designed to educate local citizens and business leaders about the importance of watershed health and land stewardship. Outreach tools and projects have included: Neighbor to Neighbor Workshops, Community wide workshops, Greenway walks, water bill inserts, R2R's presentation display board, and creation of maps of Sherwood's watersheds. Also of special note is the inaugural speech from Metro President David Bragdon, on January 6, 2003. Metro provides planning services and land-use information to local governments, policy makers and residents of the region.

*An excerpt from his speech, "In 1995, the voters of the region taxed themselves to purchase what was hoped to become 6,000 acres of parks and greenspaces. That promise has been more than kept, with more than 8,000 acres of natural areas now set aside. Exceeding a goal is laudable, but the reward should be the promise's true fulfillment. Most of those greenspaces are still inaccessible, lacking trails or picnic tables or even basic interpretative signs, It is as if the voters of 1995, left us a generous inheritance tied with green ribbons, but hoped that we residents of the 21<sup>st</sup> century would open it and enjoy it. It is time to claim that inheritance. During the next two years, I will ask this Council and our fellow citizens to find the money to allow you to experience the beautiful natural areas which you already own. I will also ask that we continue the exemplary record of acquiring key new parcels from willing sellers."*

### **Essential Agencies and Organizations**

R2R will use its Action Plan to guide restoration, conservation, education and outreach activities, involving local, regional and federal partners. To ensure cooperation with these partners, R2R has invited them to participate on both its Advisory Committee and sub committees since its inception in April 2001. These partners have been intimately involved and are heavily invested in the Action Plan's conception and final strategies and recommendations. The resources, skills and volunteer efforts that will be needed to implement the recommended projects will rely on these partners and their support.

Agencies and organizations representing regional, state, and federal interests have various jurisdictions and roles to play in Sherwood's watersheds.

#### **Regional Level:**

##### **Friends of the Refuge (FOR)**

Friends of the Refuge is a community-based volunteer organization supporting the Tualatin River National Wildlife Refuge. FOR is dedicated to protection and restoration of the Refuge for the benefit of fish and wildlife, and for public education and recreation.

##### **Tualatin Riverkeepers (TRK)**

The Tualatin Riverkeepers is a community-based organization working to protect and restore Oregon's Tualatin River system. TRK builds watershed stewardship through public education, access to nature, citizen involvement and advocacy.

##### **Clean Water Services (CWS)**

A wastewater and stormwater utility committed to protecting water resources in Oregon's Tualatin River Watershed.

##### **City of Sherwood (COS)**

Currently the City of Sherwood manages over 300 acres of open space including most of the 100-year floodplain along Cedar Creek and its tributaries within city limits, as well as portions along Rock Creek. The lands were either purchased by or dedicated to the City to preserve local streams, wetlands, and riparian corridors, for the benefit of protecting water quality, preserving wildlife habitat and providing recreational and educational opportunities for the local community.

##### **Tualatin River Watershed Council**

The council's purpose is to foster better stewardship and understanding of the Tualatin River watershed resources, deal with issues in advance of resource degradation, and ensure sustainable watershed health, functions, and uses. It makes recommendations to decision-makers and managers on ways to protect and restore Tualatin River resources.

##### **Washington County**

Located on the western edge of the City of Portland, Washington County is the second largest and fastest growing urban county in Oregon, with approximately 460,000 citizens. Focused residential and industrial growth has enabled the county to preserve more than 75% of its agricultural and forestlands through utilization of the nationally acclaimed Urban Growth Boundary. The Planning Division is responsible for the preparation, maintenance and periodic update of County planning documents and ordinances, including the Comprehensive Framework Plan, the Rural/Natural Resource Plan, all community plans, the Transportation Plan, and

provides various economic and demographic analyses to County departments and outside agencies.

**State Level:**

Oregon Department of Forestry (ODF)

ODF regulates timber harvesting and forest regeneration on all non-federal lands. The department enforces policies that set requirements in regards to wildlife habitat, fish habitat, and water quality.

Oregon Department of Agriculture (ODA)

Under Senate Bill 1010, ODA assists farmers and ranchers through education and technical assistance for solving problems associated with non-point source water pollution.

Oregon Department of Fish and Wildlife (ODFW)

ODFW manages and protects fish and wildlife in Oregon. In addition, the department provides technical assistance for state regulatory agencies and watershed councils.

Oregon Department of Environmental Quality (DEQ)

A TDML (total daily maximum load) plan is being developed by the Department of Environmental Quality to reduce high water temperatures in the Sherwood Watershed.

Oregon Water Resources Department (OWRD)

OWRD regulates water withdrawal, issues over water rights, classifies, and regulates stream flow according to beneficial uses, and establishes minimum stream flow levels.

Division of State Lands (DSL)

DSL determines and issues permits required for the removal and fill of any state waterways and wetlands.

**Federal Level:**

U.S. Fish and Wildlife Service (USFWS)

The mission of the U.S. Fish and Wildlife Service is, *"To work cooperatively with others to protect, restore, and enhance natural habitats, supporting fish, wildlife, and plants for the continuing benefit of the American people."* USFWS is responsible for maintaining viable populations of plant and animal species. It also oversees the listing, restoring, and protection of endangered and threatened species.

Tualatin River National Wildlife Refuge (TRNWR)

TRNWR's primary purpose is the development, advancement, management, conservation and protection of fish and wildlife resources. Specifically, the TRNWR is being required to protect, enhance, and manage upland, wetland, and riparian habitats for a variety of migratory birds and resident fish and wildlife, as well as for the enjoyment of people.

National Marine Fisheries Service (NMFS) have now merged with the National Oceanic and Atmospheric Administration (NOAA)

NMFS is responsible for managing and sustaining living marine resources, including anadromous species.

**Project Prioritization**

During the collection and review process, the Restoration and Conservation subcommittee began what became the most difficult part of the process identifying what data, methodologies and criteria would be utilized and/or combined to determine priorities both geographically and by issue. At first, the group wanted to prioritize by stream reach and identify specific projects to address issues affecting each stream reach, but it soon realized that this process would be extremely difficult, require additional ground data collection, and could have the potential to miss key opportunities that may come up in the near future. The group chose to set priorities by watersheds, identify issues affecting the health of the watersheds, and create strategies (not projects) to address the issues. The purposes of the strategies are to solicit partners to initiate projects based on the findings and recommendations. The three watersheds in R2R's project area were prioritized in the following order: Priority 1: Chicken Creek; Priority 2: Cedar Creek; and Priority 3: Rock Creek. These priorities were determined based on the following:

1. Presence of endangered or threatened species listed under the Endangered Species Act.
2. Stream reaches that are characterized as being "Very Good" or "Good" by Clean Water Services' Watersheds 2000 survey.
3. Wildlife habitat areas that received a score of 8 or 9 on a scale of 0-9 with 9 being highest in ecological value in Metro's 2002 Goal 5-Wildlife Habitat Model.
4. Less than twenty percent effective impervious area based on Clean Water Services data.
5. Connectivity with already-protected lands.
6. Riparian corridors identified in Metro's Goal 5 Riparian Model ("primary" riparian) areas.
7. Existence of threats – encroaching development, nonnative invasive species, degraded wetland, erosion, and stormwater runoff, etc.

The action plan does not include an overall funding blueprint or project timeline. Each strategy needs to be researched individually for funding, implementation, and coordination because of the scope of potential projects available. All strategies listed are a priority for Raindrops to Refuge and a strategy does not necessarily take precedence over another. Strategies may get developed faster than others because of opportunities that may evolve.

This action plan is designed to be a working a document. R2R welcomes suggestions for future strategies and changes to existing strategies as they arise.

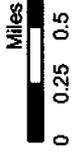
# Sherwood Area Watersheds

## Legend

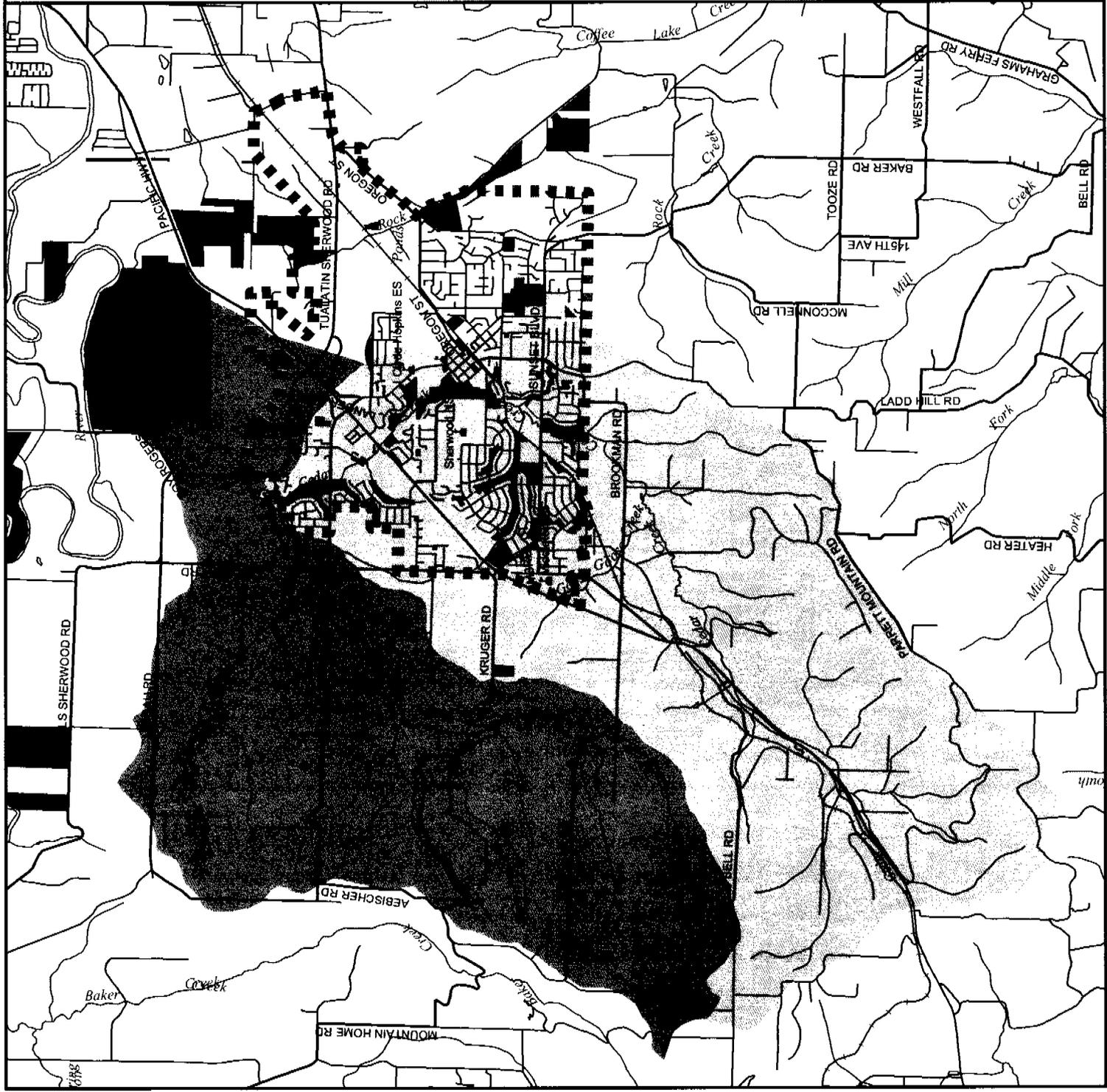
- Streets
- +— Railroad
- Streams
- Urban Growth Boundary
- COS Lands
- Tualatin River National Wildlife Refuge
- CEDAR CREEK
- CHICKEN CREEK
- ROCK CREEK (S WASH CO)



A Sherwood Community  
Watershed Stewardship



SOURCES: Washington County GIS, Metro RLIS LITE, Sherwood GIS



# Introduction to Sherwood's Watersheds

## Overview

R2R covers the Rock Creek, Cedar Creek, and Chicken Creek watersheds, which are located in the southwestern portion of the Lower Tualatin River Watershed. These three watersheds total approximately 23 square miles and of this total approximately 20% is within Sherwood's Urban Growth Boundary, 4% is within the boundaries of the Tualatin River National Wildlife Refuge, and the remaining area is comprised of farmland and undeveloped wetlands and forested areas. All three streams are identified as being 303d "Water Quality Limited", by the Oregon Department of Environmental Quality, for exceeding the Total Maximum Daily Loads (TMDL's) established for temperature, dissolved oxygen, and bacteria. These three creeks eventually empty into the Tualatin River. The following is an overview of the current conditions and characteristics of these watersheds and the management:

## Cedar Creek Watershed

Cedar Creek is the largest of the three watersheds (5792 acres) and has experienced the most urban development around its main stem and tributaries. Cedar Creek begins where Parrett Mountain and the Chehalem Mountains meet and flows northward through the City of Sherwood until its confluence with Chicken Creek. R2R has identified Cedar Creek as being a priority stream due to the direct threats posed to its health by encroaching development and urban water quality and wildlife habitat issues such as nonnative invasive species, degraded wetland and riparian plant communities, erosion, litter, stormwater runoff, pollution from overland runoff, loss of historic hydrologic function, and loss of uplands.

## Chicken Creek Watershed

Chicken Creek is a tributary to the Tualatin River and its watershed is the next largest of the three, comprising approximately 4836 acres. Of the three watersheds, it has experienced the least amount of development activities; instead the lands within this watershed are primarily used for agricultural purposes or have remained in a natural state. Chicken Creek is identified as "high priority" by R2R as it is the primary water source for some of the Tualatin River National Wildlife Refuge's most productive wetlands, containing many large tracts of intact and high quality riparian habitat, and potential spawning and rearing habitat for winter steelhead (*Oncorhynchus mykiss*).

## Rock Creek Watershed

Rock Creek is located adjacent to and east of the Cedar Creek watershed. The Rock Creek watershed is the smallest of the three, at 3994 acres, and is a tributary to the Tualatin River. Most of the uplands and floodplain areas around the downstream portions of Rock Creek are used for agricultural purposes. Residential and industrial development has occurred along its uplands as it flows through Sherwood's Urban Growth Boundary, but little to no development has occurred within its 100-year floodplain. The lands around the upstream portions and headwater areas of the watershed are primarily used for agricultural purposes and residential development. Over the years, Rock Creek has been significantly altered and impacted due to: nonnative invasive species, loss of or degraded wetland and riparian plant communities, encroaching development, pollution from overland runoff and direct human disturbance.

## **Land Management Agencies**

### **City of Sherwood**

Sherwood is located in Washington County and in the southwestern portion of the Portland Metro Area. Since 1989 Sherwood has been one of the fastest growing cities in Oregon (population 2,500 in 1989 to 16,000 in 2003). During this period of expansive growth the City has made open space preservation a top priority, and as a result Sherwood has one of the highest rates of open space per capita, within Oregon. Currently the City manages 300 acres of open space, including: parks; sports facilities; and tracts to remain undeveloped as passive open space. This includes most of the 100-year flood plain along Cedar Creek, as well as portions along Rock Creek. These floodplain and open space areas were dedicated to the City to preserve open space, wetlands, and riparian corridors for the benefit of wildlife habitat, clean water, passive and active recreational opportunities, and educational areas for the community's youth, and for their aesthetic value.

Many of these open space areas had already been significantly altered, due to prior uses (agricultural, residential, storage) or impacted by invasive vegetation, poor water quality, vandalism, erosion, and native vegetation loss, prior to dedication or purchase. The City of Sherwood has acquired these properties and development has occurred around these properties thus further contributing to their degradation. As a result, the creation of management strategies, to effectively begin restoration and enhancement activities to return these areas to a natural state and restore ecosystem function, has become a priority.

### **U.S. Fish and Wildlife Service: Tualatin River National Wildlife Refuge**

The Tualatin River National Wildlife Refuge was established in 1992 largely because of public interest and commitment to create a new National Wildlife Refuge within the Portland metropolitan area. The concept originated from local citizens, cities, and various governmental agencies. Recognizing the benefits a Refuge could provide to the community, officials from both the City of Sherwood and Washington County worked closely with the U.S. Congress to establish the Refuge and to initiate momentum for its development. Currently 1268 acres of the proposed 3058 acres are under management authority of the Refuge. One of ten urban refuges in the nation, Tualatin River National Wildlife Refuge serves a purpose to restore, protect, and manage wetland, riparian, and upland habitats for a variety of migratory birds, fish, threatened and endangered species, other resident wildlife, and for the enjoyment of people. In recent years, the Refuge has been impacted by the rapid growth of the surrounding urban areas and agricultural practices. Issues such as excessive stormwater runoff, poor water quality, loss of riparian and upland plant communities and the spread of nonnative invasive species have threatened the effectiveness of the Refuge's habitat conservation and restoration programs and the associated supporting infrastructure.

### **Washington County**

Washington County's Department of Land Use and Transportation (LUT) is an organization of professional people who strive to protect the health, safety and welfare of the public. LUT works to balance the desires of citizens, quality of life concerns, the natural environment and opportunities for economic development. Land Use & Transportation's Mission Is Twofold: (1) To plan, build and maintain the County's transportation system and (2) To prepare, implement and enforce land use plans, policies and related State and County mandates. Washington County's Comprehensive Plan, a set of documents that establish general land use and

transportation policies, contains a plan for natural resources which guides development outside the Urban Growth Boundary. Land is a vital long-term natural resource. The plan guides conservation and development according to the potential of the land and in accord with State and regional requirements.

## **Physical and Biological Characteristics**

The following summaries provide a general description of the area that this Action Plan is intended to address. The information provided is taken from and based on information provided in the Lower Tualatin Watershed Analysis (Hawksworth 2001), Distribution of Fish and Crayfish, and Measurement of Available Habitat in the Tualatin River Basin (ODFW 2001), Tualatin River Watershed Technical Supplement (Tualatin River Watershed Council 1998), and the following Geographic Information System sources: City of Sherwood, Metro's Regional Land Information System Database, Clean Water Services, and Washington County.

The lower Tualatin River watershed drains 97 square miles (62,300 acres) in the southeastern part of the Tualatin River sub basin. It includes the Tualatin River and its tributaries downstream of (but excluding) McFee Creek.

### **Topography**

The project area's topography includes flat to rolling terrain in the northern area, where elevations range from 200 – 500 feet, and transitions to hills and mountainous terrain in the south, where the maximum elevation is atop Parrett Mountain at about 1200 feet. The western portion of the project area is bordered by the Chehalem Mountains. Approximately 10% of the project area is located within the Tualatin Plain, where elevations are typically less than 300 feet.

Although stream gradients are steeper within the headwater areas, they seldom exceed 16% for any extended length. The streams within the project area experience little change in elevation, for example: Cedar Creek ranges from 350 feet, at Highway 99W and Haugen Rd, to 120ft at its confluence with Chicken Creek, as expressed by stream gradients that are generally less than 1%.

### **Geomorphology**

Tectonic folding and subsequent alluvial deposition characterize the geological structure of the area. Terrestrial lava flows overlaid the sedimentary formations east of the Coast Range. Subsequent folding of this area resulted in formation of anticline ridges such as the Chehalem Mountains and Parrett Mountain, as well as a synclinal trough, which became the Tualatin Plain. Subsequently, alluvial silts and clays settled in the plain. Additionally, sites of impeded drainage accumulated organic matter (Orr et al. 1992, Wilson 1997, Schlicker 1967).

At the far eastern portion of the watershed, volcanic vents formed subsequent to the formation of the Tualatin Plain. Eruptions from these vents resulted in localized lava flows. Geologists refer to the rock formation from these eruptions as the Boring lavas, as distinguished from the older Columbia River basalt. Surface rock types vary between hills and valleys in the watershed. Hills are typically characterized by Columbia River basalt interspersed with sedimentary formations. Aeolian silts often overlie the ridge tops.

The Tualatin Plain is composed of recent alluvial floodplains surrounded by thick beds of older alluvium, which are largely the result of Pleistocene flooding. The Missoula floods resulted

when massive lakes in the Rocky Mountain province burst through their glacial dams. Release of the impounded lake waters resulted in a flood wave that immersed the Tualatin Valley to an elevation of roughly 250 feet. The initial flood waves carried gravel, sand, silt and clay, much of which was deposited in the Tualatin Valley. Much of this water remained in the valley for a substantial period of time, forming Lake Allison. Subsequently, this lake deposited lacustrine silt/clay throughout the Tualatin Valley. Many of these deposits have low permeability, resulting in poorly drained conditions in many parts of the sub basin (Orr et al. 1992, Hart 1965).

Sherwood also contains an interesting geologic feature. The Tonquin scablands stretch from the Willamette River through the City of Wilsonville, and connect to the Tualatin River National Wildlife Refuge near Sherwood and Tualatin. It contains unique geologic depressions called "kolk ponds" and basalt "knobs" sculpted by ancient glacial flooding, Missoula Floods. (Metro's Open Spaces Land Acquisition Report to Citizens, July 2001).

### **Climate**

The climate is typical of the north Willamette Valley, characterized by warm, dry summers and cool, wet winters. The average annual precipitation is between 40 and 45 inches per year. At least 40% of the precipitation occurs during November, December, and January.

### **Soils**

The soils of the lower Tualatin River watershed are largely influenced by their parent material. In the mountains and foothills, most soils are silty loams from aeolian (wind-deposited) material. Soils in the Chehalem Mountains typically belong to the Laurelwood association, which includes soils built on Aeolian silts overlying Columbia River basalt (Natural Resources Council 1982).

Soils in the Tualatin Plain typically consist of fine alluvium in the silt and clay classes. On terraces and uplands, these soils typically belong to the Woodburn-Quatama-Willamette association, which forms on silty alluvium and clay material. The bottomland soils along the Tualatin River, downstream of Chicken Creek, are typically poorly drained Wapato-Verboort-Cove association.

Some soils in the Tualatin Plain are rich in phosphorus. In some cases, high phosphorus levels may indicate accumulation over many years from agricultural use. However, groundwater phosphorus levels in this region are naturally quite high, thus contributing to high soil phosphorus levels (TAC 1997).

### **Hydrology**

Streams within R2R's project area are subject to seasonal variations in discharge, with high peaks in winter and very low flows in summer. Lower drainages are affected by backwater influence of the Tualatin River. Flooding usually occurs between mid-November and mid-February, and results from rainfall and snowmelt. The low streambed gradients of Cedar Creek and Rock Creek do not allow floodwaters to drain quickly; thus, flooding peaks more slowly but remains longer than other areas. Additionally, ponding in the lowlands continues to be an important asset of the watershed's hydrology as well as preserving the hydrologic function.

Both unconfined and confined aquifers provide groundwater to the lower Tualatin River watershed. For the most part, the area lacks large aquifers, although some groundwater units are locally important for municipal and irrigation purposes. The most productive wells occur in the Columbia River Basalt (Orr et al. 1992, Hart 1965). Additionally, locally perched water tables occur on clay lenses in the watershed.

## Stream Channel

Stream channels vary with topography within the watershed. Reaches in the foothills are moderately steep. Typical gradients within these reaches range from 2-12%. Gradients exceeding 16% occur over short reaches of headwater streams. These high gradient stream reaches have a substantial capacity to carry sediments, with erosion and sediment transport being dominant fluvial processes. Under high flow conditions, the larger sediment fractions are deposited. These reaches tend to have a rocky substrate, ranging from gravel to bedrock. However, these coarse sediments are frequently embedded in finer material, such as silts and clays, which are delivered from surrounding banks and hillsides. As gradient decreases, the streams are less able to carry sediments, and finer sediments are deposited on the alluvial plain. Thus, most streams in the Tualatin Plain have substrates dominated by fine sand, silt, and clay as a result of both natural causes and economic land uses.

## Water Quality

All of the streams addressed by this Action Plan exceed the Total Daily Maximum Loads (TMDL's) established for the Tualatin Basin for temperature, dissolved oxygen, and bacteria. As a result, these streams are all identified as being 303d Water Quality Limited Streams by the Oregon Department of Environmental Quality. Section 303d of the Clean Water Act and the Environmental Protection Agency's regulation 40 CFR Section 130.7 requires each state to submit a TMDL priority list to the Environmental Protection Agency in even numbered years. Water quality is an important factor as water flows over the landscape eventually reaching the Tualatin River.

## Wildlife

### Aquatic

The suitability of aquatic habitat for sensitive cold water species is quite limited. High temperatures limit the ability of most stream reaches to provide suitable summer rearing habitat for salmonid species. Salmonid species found in the area include resident cutthroat trout (*Oncorhynchus clarki*) and steelhead trout (*O. mykiss*). Recent Oregon Department of Fish and Wildlife surveys identified larger numbers of salmonids (primarily resident cutthroat trout) present in the middle and lower reaches of Chicken Creek, small numbers present in the middle and upper reaches of Cedar Creek, and little to no occurrences in Rock Creek. Winter steelhead trout are considered by Oregon Department of Fish and Wildlife to have the potential to spawn and rear in Chicken creek (Oregon Department of Fish and Wildlife 2001) and have been listed as threatened under the federal Endangered Species Act.

Many other native fish species are also present in local streams, including the following: Western brook lamprey, Pacific lamprey, redbreast shiner, largescale sucker, threespine stickleback, reticulate sculpin, and crayfish. Additionally, several non-native species have been identified (primarily in Rock Creek and the lower reaches of Chicken Creek) including: mosquito fish, largemouth bass, and bluegill. (Oregon Department of Fish and Wildlife 2001)

Habitat diversity is limited in many reaches. Riparian degradation has contributed to a declining quality of aquatic habitats in the valleys. Loss of large trees has resulted in a reduced supply of large woody debris to streams, thus causing a loss in habitat diversity. Consequently, the stream's ability to dissipate energy and form pools has been diminished, resulting in a reduction of the number and size of pools. Additionally, reductions in riparian canopy have led to increased summer water temperatures. The weedy shrub species, such as Himalayan blackberry and Scotch

broom, have replaced the native riparian forest canopy in many sites. The sites are unable to provide adequate stream shading, bank stability and erosion control. Extensive monotype stands of Reed canary grass have invaded all noted stream reaches, affecting native aquatic plant diversity and natural stream flows.

## Terrestrial

Forests, fields, and riparian areas within the watershed potentially provide habitat for diverse animal species. These include mammals, such as blacktail deer, beaver, raccoons, skunks, and coyotes; avian species, such as mallards, Canadian geese, great blue herons, killdeer, downy woodpeckers, black-capped chickadees, black-headed grosbeaks, cedar waxwings, spotted towhees, steller's jays, redwing blackbirds, red-tail hawks, and many more; and reptile and amphibian species, including garter snakes, rubber boas, painted turtles, chorus frogs, red legged frogs and roughskin newts.

Wildlife habitat has changed, as urbanization and agriculture has reduced the extent, connectivity and diversity of natural vegetation. Vegetative communities are predominantly in early and mid-successional seral stages, and geographically fragmented. The patchiness of the current landscape is favorable to production of species that prefer "edge" habitat and those that are tolerant of human activity.

The amount and quality of riparian habitat has also declined in many parts of the project area and the ability of the remaining riparian stands to provide large woody debris has been reduced, resulting in a reduction of the amount of down wood and snags within the riparian zones. Many of the large trees that formerly surrounded streams have been cleared, resulting in reduced canopy and increased summer temperatures. This has negatively altered the habitat types available to species, especially those that benefit from cool, humid sites, such as amphibians. Additionally, these changes in habitat and the encroachment of human development have resulted in the introduction and promotion of many nonnative wildlife species including starlings, nutria, bullfrogs, and opossum.

## Vegetation

The vegetation throughout the project area is highly fragmented, resulting in a mixture of forested, agricultural, and urban landscapes. The largest contiguous tracts of forest vegetation are found in foothill and riparian settings, most notably on Parrett Mountain and along Chicken Creek.

Upland stands typically consist of mixed coniferous and deciduous species. Douglas-fir (*Pseudotsuga menziesii*) is typically the dominant conifer in these forests. Associated conifers include western red cedar (*Thuja plicata*) and grand fir (*Abies grandis*). Hardwood stands dominated by red alder (*Alnus rubra*) are common in riparian areas. Red alder is also common on disturbed sites. Bigleaf maple (*Acer macrophyllum*) is typically abundant on canyon walls, and often occurs as a stand component in upland Douglas-fir forests and drier portions of riparian forests. Oregon white oak (*Quercus garryana*) is common in drier locations.

The Tualatin Plain is primarily used for agriculture or is urbanized. Agricultural vegetation varies depending on drainage. Better-drained sites can sustain orchards, while the periodically inundated bottomlands are typically planted in row crops or pasture. Occasional patches of Douglas-fir, ponderosa pine (*Pinus ponderosa*) and Oregon white oak, along with grasslands, are interspersed with the agricultural areas. A diverse mix of native and exotic species characterizes vegetation within urbanized portions of the watershed.

Riparian zones in the lower reaches of the lower Tualatin River system are often dominated by Oregon ash (*Fraxinus latifolia*), black poplar (*Populus balsamifera ssp. trichocarpa*), willows (*Salix* spp.) and bigleaf maple. Where riparian tree species do not provide an overstory, the stream banks are often dominated by shrubs such as the native red-osier dogwood (*Cornus sericea*) and the introduced invasive Himalayan blackberry (*Rubus discolor*). Within urbanized portions of the watershed, other exotic species increasingly become part of the riparian landscape.

# Conservation

## General Description of the Category

The purpose of land conservation is to protect the natural resources that exist on the land, and those species that utilize these resources for sustaining life. Land conservation is important to consider especially in and around Sherwood where urbanization may negatively impinge on the health of the natural resources, and in turn, the health of fish and wildlife. In the Conservation Strategies section of the action plan, R2R addresses the concern for the health of Sherwood's Watersheds. R2R identifies opportunities to conserve, preserve and restore significant natural resource lands, while also providing strategies for striking a balance for healthy watershed conditions and smart urban development.

## Recommendations to be taken

Sherwood's Watershed needs and opportunities are most effectively addressed by a consistent, cooperative effort between the community, local organizations, and governmental agencies. In keeping with that principle the following recommendations are intended as general guidelines for cooperative efforts that can be undertaken to achieve R2R's goals. Identifying those natural resources that are significant, rare or otherwise at risk for loss or degradation, allows the planning for and conservation of important natural resource lands. Recommendations include protecting water quality and fish and wildlife habitat. These strategies are arguably the most effective methods to preserving healthy watersheds. Supporting property acquisition through local and regional bond measure initiatives in combination with volunteer and regulatory programs, and excellent homeowner stewardship, Sherwood's watersheds can continue to provide beneficial watershed functions that also support fish and wildlife. Conservation easements are another tool that can be implemented to conserve significant natural resource lands. Using all or any combination of these conservation methods will effectively reduce the adverse impacts to Sherwood's watersheds as urban development and on going land use decision continue to change the Sherwood's natural landscape.

## List of Strategies

The following lists strategies outlined in the Action Plan consistent with R2R's goals and potential partners. These are strategies that R2R volunteers and partners can work together on. The strategies are not absolute and the Action Plan can accommodate future ones.

<u>Strategy</u>	<u>Potential Partners</u>
C1 Acquisition/Easements within the City of Sherwood	COS, CWS,
C2 Acquisition/Easements outside Urban Growth Boundary	CWS, NRCS, Metro, TRLC
C3 Goal 5 Riparian Corridors and Wildlife Habitat	USFWS-Refuge, AFT
C4 Green Streets	Metro, TRK, USFWS-Refuge, TBPNP, WA.CO
	Residents, COS, Metro, CWS, PMHA

## C1. Acquisition/Easements within the City of Sherwood

Description: In 1986 the City of Sherwood adopted a floodplain protection policy to limit development within the 100-year floodplain and establish floodplain-zoning districts overlaying Cedar and Rock Creeks. As a result, these areas were designated as greenways. This policy has helped to protect residents and their property from flood damage and create recreational opportunities for residents to enjoy local trails and natural areas. Additionally, the public greenway and natural areas also provide essential, less visible, benefits by playing a key role in the City's efforts to manage stormwater runoff and improve water quality by naturally filtering pollutants and chemicals draining off of streets, roof tops and yards. Riparian and wetland areas within the greenway store and slow the release of stormwater into stream channels, thereby reducing erosion and allowing groundwater recharge. The greenway creates a continuous migration corridor for wildlife moving through, feeding and nesting in the greenway and the Refuge. Both the habitat and stormwater functions help the City of Sherwood meet legal requirements under the federal Clean Water Act and the Endangered Species Act, and 4d coverage from NOAA Fisheries, along with related state and regional mandates to protect riparian and habitat values. These areas also serve the public and add to the livability of the City of Sherwood.



Cedar Creek tributary, RSAT CD12. This unprotected stream channel is adjacent to the Sherwood YMCA and within the City of Sherwood

The City has plans to protect three to four key properties along its Cedar Creek greenway; these areas are represented in orange on the attached map. There are other areas, however, shown in red, which are also considered critical wildlife habitat and help to fill gaps to ensure connectivity among already protected lands, e.g. Greenway and the Refuge. Currently there are no existing efforts to conserve these resources. Both areas represented in red and orange are critical to protect water quality and habitat and manage stormwater runoff from urban areas.

Lead: Open

Potential Partners: R2R, City of Sherwood, Clean Water Services, Natural Resources Conservation Service and Three Rivers Land Conservancy

Potential Funding Sources:

- National Fish and Wildlife Foundation (NFWF) was established by Congress in 1984 and is dedicated to the conservation of fish, wildlife, and plants, and the habitat. The Foundation commits funds in the form of challenge grants, ensuring that the Foundation's funds are matched. Challenge grants are partially supported by congressionally appropriated dollars that must be matched by a ratio of one to one. Grants vary depending on the NFWF grant program and can range from \$1,500 to \$200,000.
- Programs administered by Tualatin Soil and Water Conservation District and Natural Resources Conservation Service include the *Conservation Reserve Enhancement Program (CREP)*, *Environmental Quality Incentives Program (EQIP)*, *Wetland Reserve Program*

(WRP), and *Wildlife Habitat Incentive Program* (WHIP) for projects that create, restore or protect riparian areas, wildlife habitat and wetlands. Contact: Bob App, Natural Resources Conservation Service District Conservationist at 503-648-3174 x101.

- The Oregon Department of Fish and Wildlife's *Wildlife Habitat Conservation and Management Program* and *Riparian Tax Incentive Program* provides technical help, wildlife plans and tax incentives for projects that create improve, or protect wildlife habitat.
- The local Oregon Watershed Enhancement Board Small Grants Team (Tualatin River Watershed Council, Tualatin Soil and Water Conservation District, West Multnomah SWCD and Tryon Creek Watershed Council) can provide funds for individual restoration projects (limited duration in 2003). Contact: Pam Herinckx at Tualatin Soil and Water Conservation District at 503-648-3174 x102.
- Tualatin Valley Water Quality Endowment Fund carries out and supports research, monitoring, education and other activities leading to the restoration, enhancement, and maintenance of the Tualatin River Basin and the State of Oregon.
- Metro Regional Parks and Greenspaces may be able to provide assistance if funds become available in the future. Metro may target lands identified on its Regional System concept for conservation and restoration.
- City of Sherwood, Park SDC Funds.

Target Areas: See attached map

Relationship to Other Planning Efforts or Projects: The acquisition and protection of lands identified in orange on the map are part of the City's Comprehensive Plan and the Parks and Open Space Master Plan, which seek to create a greenway system around Cedar and Rock Creeks and preserve open space for the benefit of the community. The Comprehensive Plan establishes protective measures around the 100-year floodplain area of local streams and protects the associated, as well as isolated, wetlands. The Parks and Open Space Master Plan promotes the acquisition of lands for parks, trail corridors, and significant natural areas, and preservation of open space. Both of these documents are updated and revised periodically to meet the demands of a growing community.

Clean Water Services is developing its *Healthy Streams Plan* to address the Clean Water Act and Endangered Species Act mandates to protect fish and wildlife and water quality. Land acquisitions and conservation easements may be included as a strategy.

The Three Rivers Land Conservancy completed its Strategic Plan for conservation in the Portland metropolitan area. Sherwood's three watersheds are one of seven priority areas identified by the regional land trust. R2R has been working closely with land trust staff to plan and pinpoint conservation opportunities based on the best available science, most recent surveys and watershed level planning.

The Refuge is still in the process of acquiring lands within the established refuge acquisition boundary. Acquisitions total 1218 acres with an additional 50 acres managed under agreement with Metro, leaving a total of 1790 acres remaining to be protected. Acquisitions have been and will be obtained only from willing sellers. Past funding to support land acquisitions, have come from private donations, the Land and Water Conservation Fund appropriations, emergency flood relief supplemental, and federal hydroelectric power mitigation funds, but as these funding sources become limited the Refuge will need to look for additional sources.

Benefit to Conservation Values or Management Goals: Conservation within the City of Sherwood will permanently protect: 1) Undeveloped riparian corridors and floodplains that support native vegetation, fish and wildlife habitat and contribute to stream health, 2) Any remnant unique, declining and highly valuable habitats, 3) Connectivity with existing riparian and wildlife corridors, and 4) Areas that help to reduce stormwater runoff.

Tool or Type of Source Control: Private voluntary land conservation tools, tax incentives, land transactions, bargain sales, riparian or wetland conservation easements, etc.

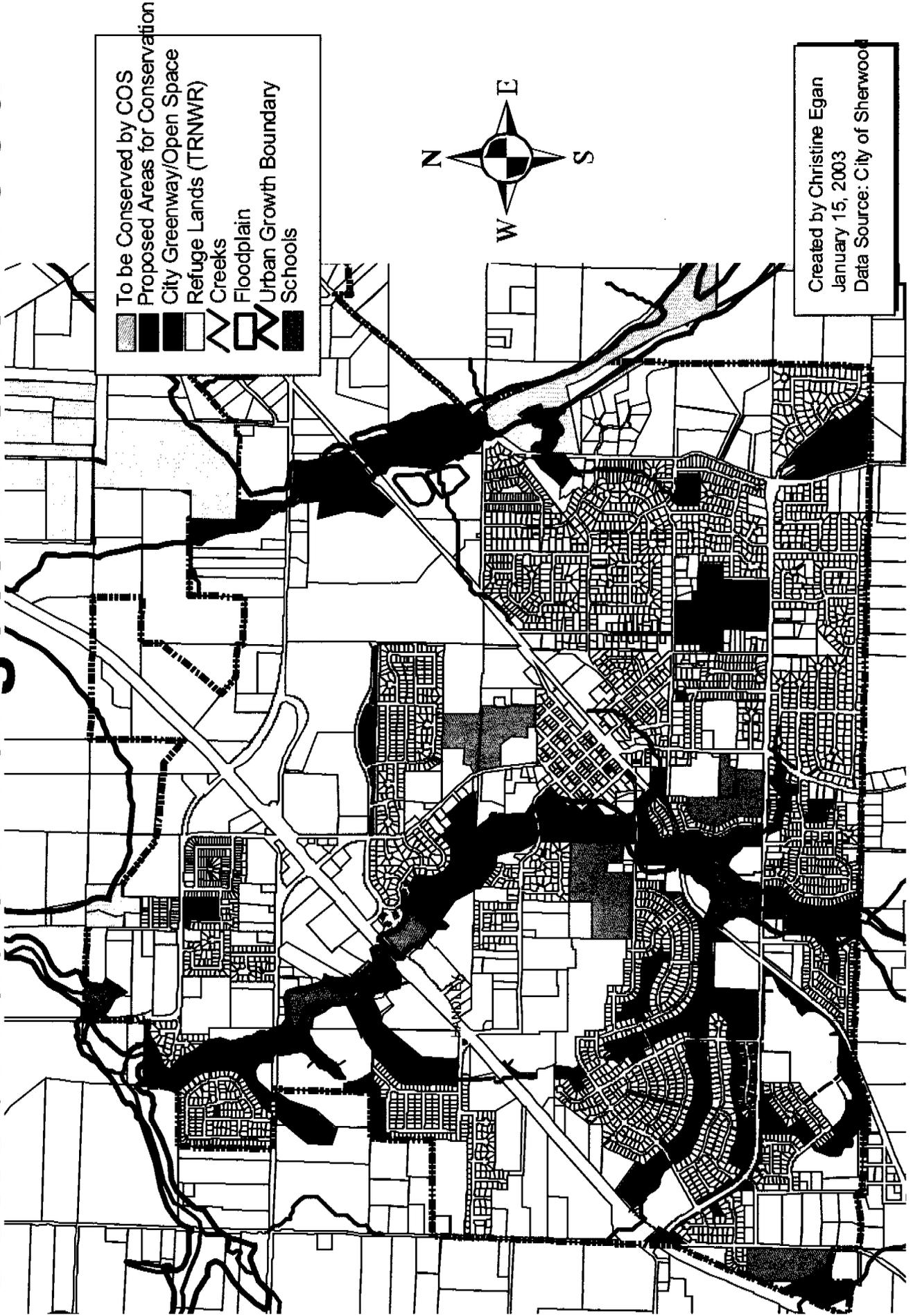
Potential Challenges: Properties adjacent to the urban growth boundary or proposed for Urban Growth Boundary inclusion can be extremely expensive. In addition, private landowners may be reluctant to donate, sell or limit development on their land for conservation purposes knowing that their property may be worth more to developers.

City of Sherwood's acquisition strategy is subject to City Council's approval, public needs, and the availability of maintenance/management funding. The City is already having difficulty finding the necessary funds to provide staff, equipment and materials to manage and maintain its existing parks and open spaces. City staff is actively searching for alternative funding sources and approaches to ensure an appropriate level of management for any newly acquired properties.

Funding sources for local land trusts to acquire land or easements is shrinking, especially in the case of private foundations, the Oregon Watershed Enhancement Board and individual contributions.

All acquired lands and easements will need to be monitored and actively managed and/or restored to enhance and protect natural resources, reduce potential impacts from adjacent land uses and enforce legal restrictions on development or land uses. Consequently, when a nonprofit land trust acquires land or a conservation easement, it also requires donation of funds to establish a "stewardship endowment" fund. The purpose of this endowment is to use the interest from the principal to cover the inherent and ongoing costs associated with monitoring, managing and/or legally defending a property or easement. Most land trusts have found it extremely challenging to secure an "endowment" from private landowners or to solicit foundations, most of which will not support "endowments" of any kind.

# Conservation Targets in Sherwood



## C2: Acquisition / Easements outside Urban Growth Boundary

### Description:

At present, Chicken, Rock and Cedar creek watersheds provide limited higher value habitat for fish and wildlife, forested riparian areas and wetlands, and contiguous wildlife migration corridors along main stem reaches. Metro has identified high value wildlife habitat in all three watersheds as part of its Goal 5 program. A significant number of reaches within Chicken and Cedar creeks are in good condition, according to Clean Water Services' Watershed 2000 stream survey.

Oregon Department of Fish and Wildlife reported in its *Distribution of Fish and*

*Crayfish, and Measurement of Available Habitat in the Tualatin Basin Analysis* (Oregon Department of Fish and Wildlife, 2002), that reaches in all three streams support potential spawning and rearing habitat for Endangered Species Act-listed, threatened steelhead, and resident cutthroat trout. Sherwood's watersheds also benefit from locally and federally protected areas. The Tualatin River National Wildlife Refuge, one of only ten urban refuges in the nation, encompasses 1,258 acres of primarily floodplain habitats, much of that within Sherwood's watersheds. Refuge lands encompass the confluences of Rock and Chicken Creek with the Tualatin River, and protect the majority of the creeks' 100-year floodplain areas from future development. The City of Sherwood's Greenway and Open Space System protects almost the entire portion of Cedar Creek's primary riparian and floodplain areas that are within the urban growth boundary, as well as many of the City's remaining wetlands.



Steelhead habitat along main stem of Chicken Creek, RSAT CN24, Watersheds 2000 Survey

The objective is to protect basic conservation strategies and apply them to an entire area or work on a segment by segment plan. Numerous opportunities exist to expand and protect fish and wildlife habitat, migration corridors, and water quality in Sherwood's three watersheds. Almost three-fourths of these three watersheds are privately owned. Most of these lands are being used for agriculture, forestry or rapidly increasing rural residential development. R2R will partner with willing landowners, local and regional land trusts and public agencies to conserve high priority fish and wildlife habitat, healthy forested riparian corridors, and headwaters within these three watersheds. Conservation tools may include land acquisitions and conservation easements to protect critical steelhead spawning and rearing habitat along the main stem of Chicken Creek. Areas of habitat that provide stream connectivity. Other high priority conservation areas are headwater stream reaches characterized as being in "good" and "very good" condition in the Watersheds 2000 survey. High priority areas also include wildlife habitat areas that received a score of 8 or 9 on a scale of 0-9 with 9 being highest in ecological value in Metro's 2002 Goal 5-Wildlife Habitat Model. Also, wetlands identified in the National Wetland Inventory and the City of Sherwood's Local Wetland Inventory that were located within or adjacent to "high priority" habitat and headwater areas are considered high priority conservation areas. All high priority targets have less than twenty percent effective impervious area and provide connectivity with the Refuge and the City of Sherwood's Greenway System. Riparian corridor dimensions for reaches outside the urban growth boundary follow Metro's Goal 5 Riparian Model (*primary riparian*) and include all land within the 100-year floodplain as delineated by the Federal

Emergency Management Agency. Of special note is the "high priority" target area just south of the City of Sherwood's urban growth boundary and north of Brookman Road. In December 2002 Metro Council approved including this area into the Urban Growth Boundary for future development. R2R elevated this area to "high priority" due to the threat of development, connectivity with the City's Greenway and Cedar Creek headwaters, high value wildlife habitat (score of 7), and intact forested riparian areas as shown in the attached aerial.

"Priority" conservation targets include areas that support high value wildlife habitat (score of 7) in Metro's Goal 5 Wildlife Habitat Model and stream reaches characterized as being in "good" condition in the Watersheds 2000 Survey, with the exception of headwater areas that were promoted to "High Priority" status. R2R has crafted a different strategy to address conservation targets within the urban growth boundary in recognition of the City of Sherwood's efforts to permanently protect the riparian and floodplain areas of Cedar Creek.

Leads: Three Rivers Land Conservancy and R2R

Potential Partners: Natural Resources Conservation District, Clean Water Services, Metro, USFWS, Refuge and American Farmland Trust.

Potential Funding Sources:

- National Fish and Wildlife Foundation (NFWF) was established by Congress in 1984 and is dedicated to the conservation of fish, wildlife, and plants, and the habitat. The Foundation commits funds in the form of challenge grants, ensuring that the Foundation's funds are matched. Challenge grants are partially supported by congressionally appropriated dollars that must be matched by a ratio of one to one. Grants vary depending on the NFWF grant program and can range from \$1,500 to \$200,000. Contact: Suzanne Piluso, local grant administrator
- Programs administered by the Farm Service Agency, Tualatin Soil and Water Conservation District, and Natural Resource Conservation Service include the *Conservation Reserve Enhancement Program (CREP)*, *Environmental Quality Incentives Program*, *Wetland Reserve Program (WRP)*, and *Wildlife Habitat Incentive Program (WHIP)* for projects that create, restore or protect riparian areas, wildlife habitat, and wetlands. Contact: Bob App, Natural Resources Conservation District Conservationist at 503-648-3174 x101.
- U.S. Fish and Wildlife Partners for Wildlife Program Contact: Amy Horstman, USFWS at [Amy\\_Horstman@fws.gov](mailto:Amy_Horstman@fws.gov)
- The Oregon Department of Fish and Wildlife's *Wildlife Habitat Conservation and Management Program* and *Riparian Tax Incentive Program* provide technical help, wildlife plans and tax incentives for projects that create improve, or protect wildlife habitat. Riparian lands up to 100 feet from a stream can be included in this tax exemption program.
- The local Oregon Watershed Enhancement Board Small Grants Team (Tualatin River Watershed Council, Tualatin Soil and Water Conservation District, West Multnomah SWCD and Tryon Creek Watershed Council) can provide funds for individual restoration projects (limited duration in 2003). Contact: Pam Herinckx at Tualatin Soil and Water Conservation District, at 503=648-3174 x 102.
- Tualatin Valley Water Quality Endowment Fund carries out and supports research, monitoring, education and other activities leading to the restoration, enhancement, and maintenance of the integrity of the waters of the Tualatin River Basin and the State of Oregon.

- Metro Regional Parks and Greenspaces may be able to provide assistance if funds become available in the future. The agency may target lands identified on its Regional System concept for conservation and restoration.

Target Areas: See attached map.

Relationship to Other Planning Efforts or Projects: Clean Water Services is developing its *Healthy Streams Plan* to address the Clean Water Act and Endangered Species Act mandates to protect fish and wildlife and water quality. Along with changes in policy and operations and maintenance, conservation may also help in meeting federal requirements.

Three Rivers Land Conservancy completed its Strategic Plan for conservation in the Portland metropolitan area. Sherwood's three watersheds, with special focus on upper reaches outside of the urban growth boundary, are one of seven priority areas identified by the regional land trust. R2R has been working closely with land trust staff to plan and pinpoint conservation opportunities based on the best available science, most recent surveys and watershed level planning.

The Refuge is still in the process of acquiring lands within the established refuge acquisition boundary. Acquisitions total 1218 acres with an additional 50 acres managed under agreement with Metro, leaving a total of 1790 acres remaining to be protected. Acquisitions have been and will be obtained only from willing sellers. Past funding to support land acquisitions, have come from private donations, the Land and Water Conservation Fund appropriations, emergency flood relief supplemental, and federal hydroelectric power mitigation funds, but as these funding sources become limited the Refuge will need to look for additional sources.

All acquired lands and easements will need to be monitored and actively managed and/or restored to enhance and protect natural resources, reduce impacts from adjacent land uses and enforce legal restrictions on development or land uses. The goal is to have the value rated at good condition to meet conservation management objective.

Benefit to Conservation Values or Management Goals: Partnerships and conservation projects will permanently protect: 1) Undeveloped riparian corridors and floodplains that support native vegetation, fish and wildlife habitat and contribute to stream health, 2) Any remnant unique, declining and highly valuable habitats, and 3) Connectivity with existing riparian and wildlife corridors, and 4) Areas that help to reduce stormwater runoff.

Tool or Type of Source Control: Private voluntary land conservation tools, i.e. tax incentives, land transactions, bargain sales, riparian or wetland conservation easements, etc.

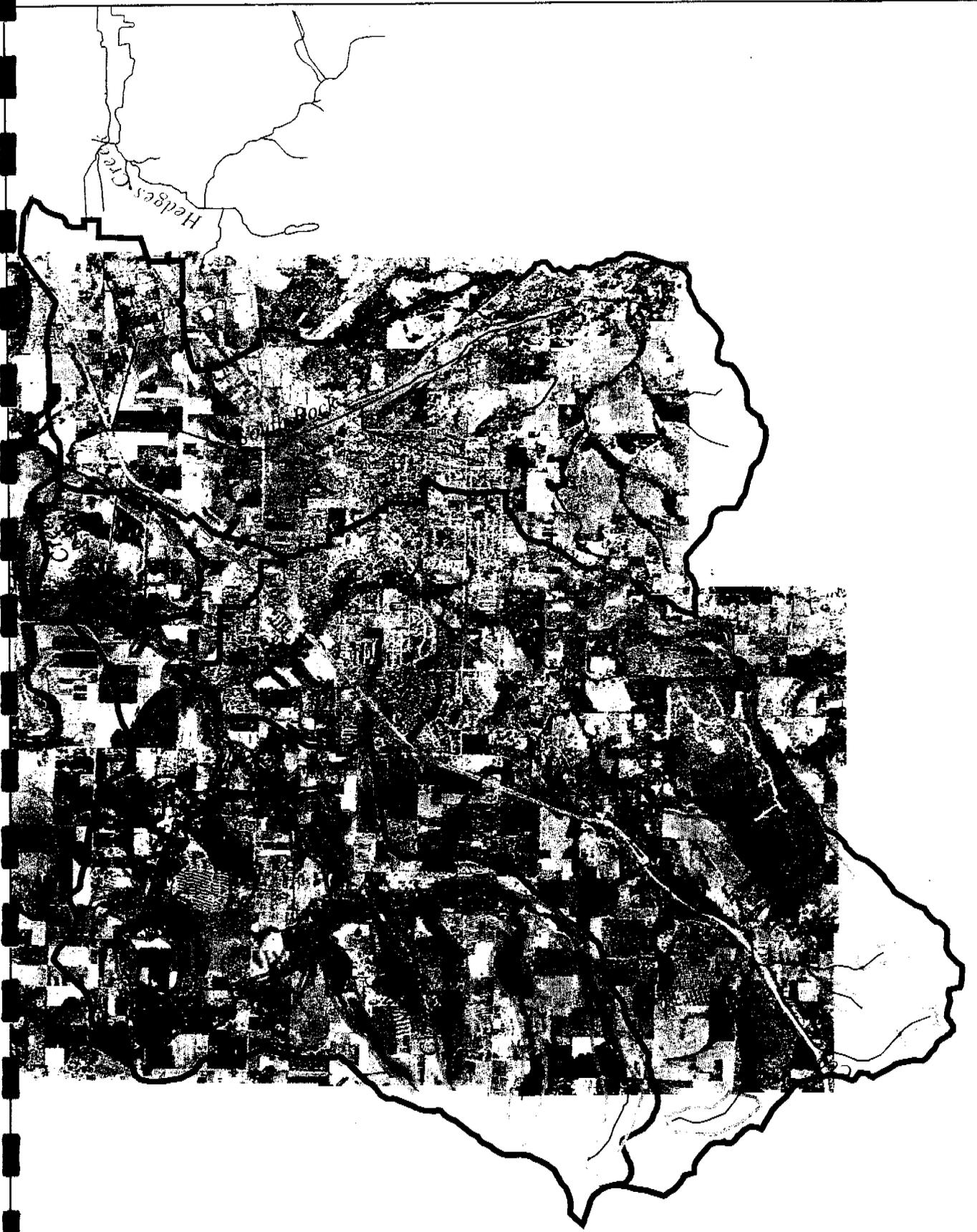
Potential Challenges: Properties adjacent to the urban growth boundary or proposed for Urban Growth Boundary inclusion can be extremely expensive. In addition, private landowners may be reluctant to donate, sell or limit development on their land for conservation purposes knowing that their property may be worth more to developers.

As with the U.S. Fish and Wildlife Service and its limited funds for expanding existing national refuges, funding for local land trusts to acquire land or easements is also shrinking, especially in the case of private foundations, the Oregon Watershed Enhancement Board and individual contributions.

All acquired lands and easements will need to be monitored and actively managed and/or restored to enhance and protect natural resources, reduce potential impacts from adjacent land uses and enforce legal restrictions on development or land uses. Consequently, when a nonprofit land trust acquires land or a conservation easement, it also requires donation of funds to establish a "stewardship endowment" fund. The purpose of this endowment is to use the interest from the

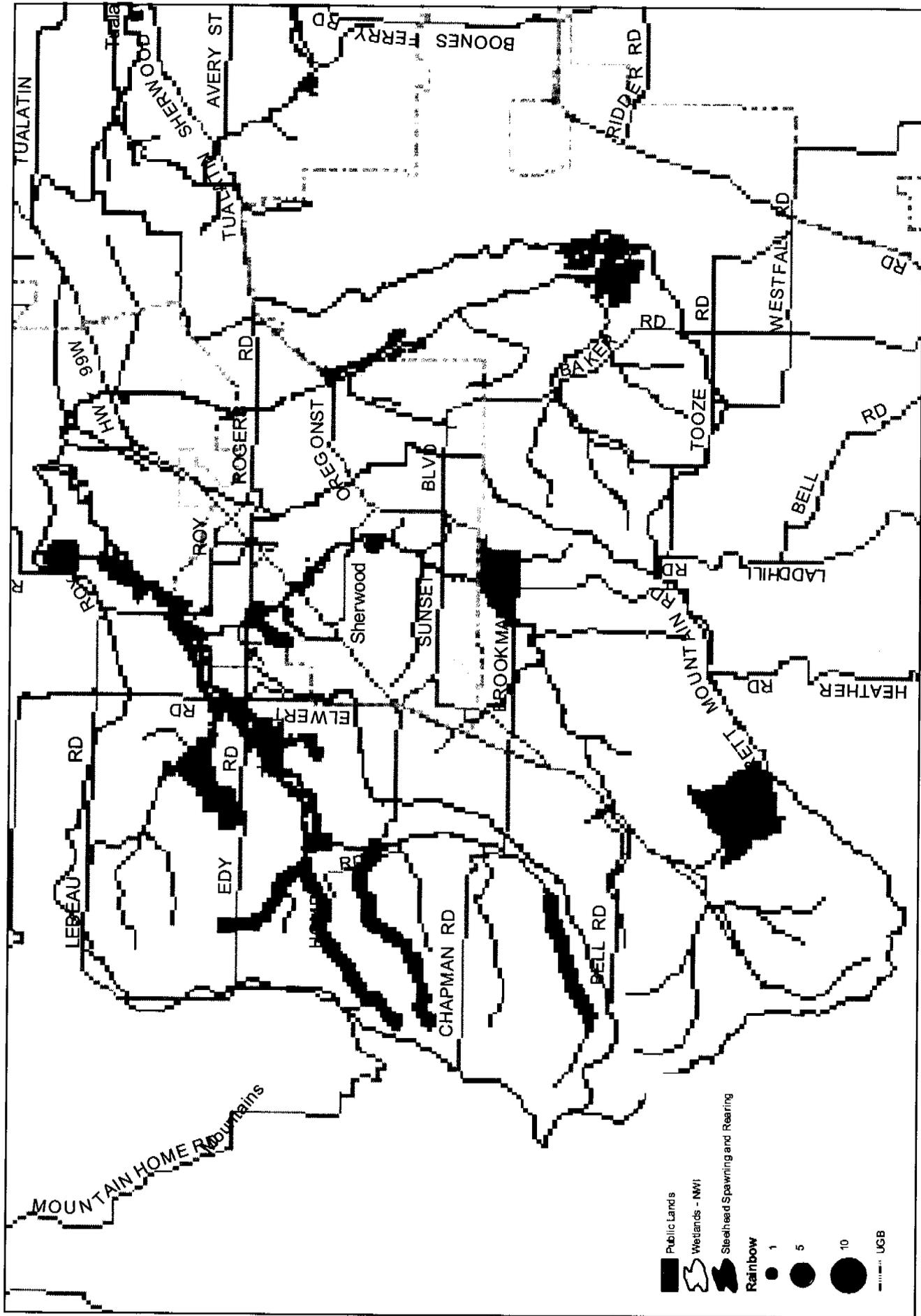
principal to cover the inherent and ongoing costs associated with monitoring, managing and/or legally defending a property or easement. Most land trusts have found it extremely challenging to secure an "endowment" from private landowners or to solicit foundations, most of which will not support "endowments" of any kind.

# Aerials



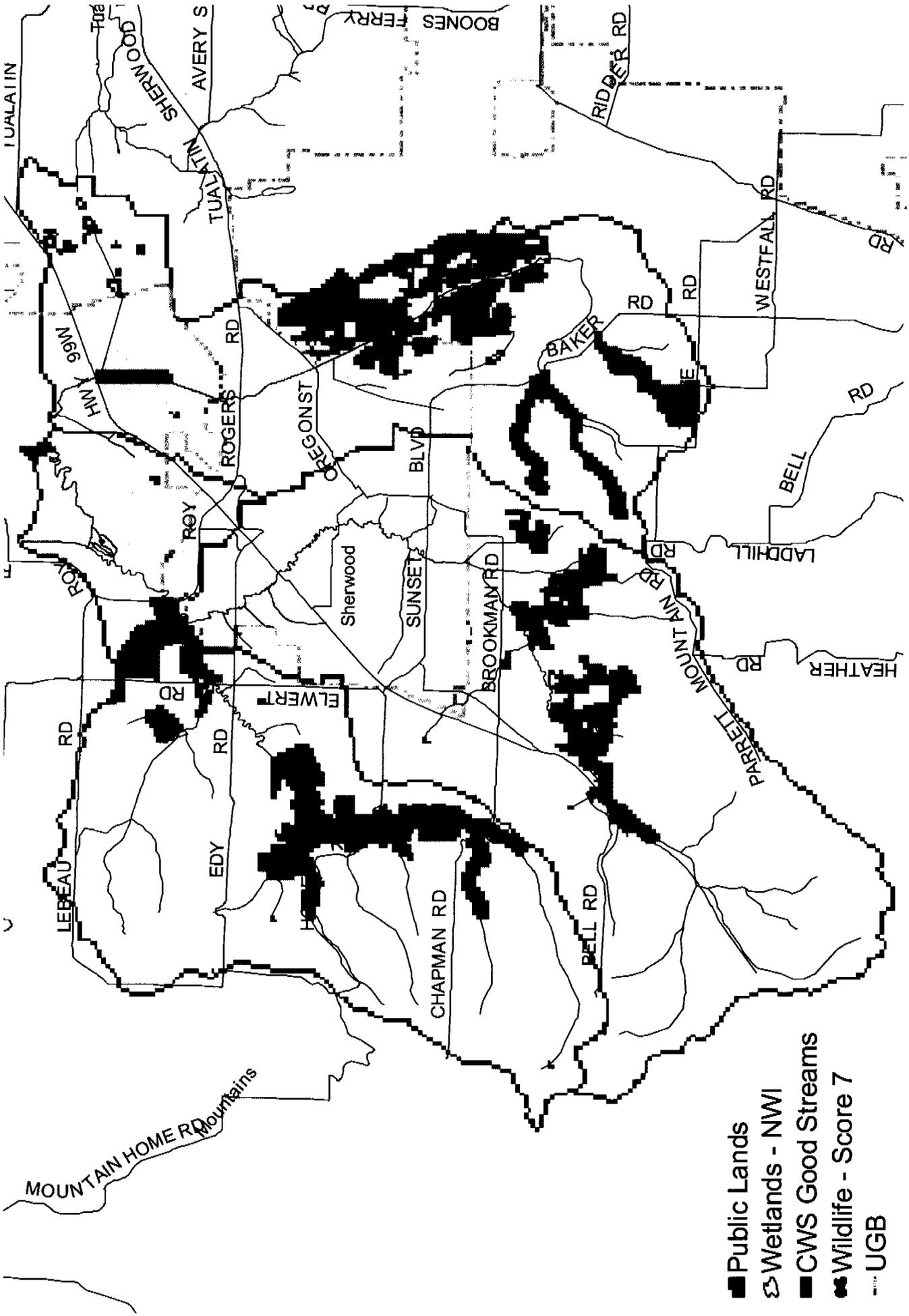
The information on this map was obtained from aerial photography taken in 1985. It is possible that the information on this map is out of date. The information on this map is for informational purposes only. It is not intended to be used for any other purpose. The information on this map is for informational purposes only. It is not intended to be used for any other purpose. The information on this map is for informational purposes only. It is not intended to be used for any other purpose.

# Raindrops to Refuge Conservation Analysis



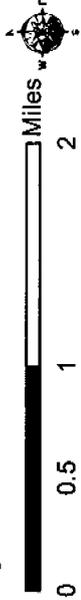
Raindrops to Refuge Conservation Analysis  
 High Priority

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- Public Lands
- ⊃ Wetlands - NWI
- CWS Good Streams
- Wildlife - Score 7
- - - UGB

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The information on this map was derived from the following sources: 1. Aerial photography from 2000 to 2005. 2. Wetlands from the National Wetlands Inventory (NWI) and the National Wetlands Inventory (NWI) and the National Wetlands Inventory (NWI). 3. CWS Good Streams from the Oregon Department of Fish and Wildlife (ODFW). 4. Wildlife - Score 7 from the Oregon Department of Fish and Wildlife (ODFW). 5. UGB from the Oregon Department of Fish and Wildlife (ODFW). 6. Public Lands from the Oregon Department of Fish and Wildlife (ODFW). 7. Roads from the Oregon Department of Transportation (ODOT). 8. Topography from the Oregon Department of Fish and Wildlife (ODFW). 9. Other information from the Oregon Department of Fish and Wildlife (ODFW). All data is as of the date of the map. The Oregon Department of Fish and Wildlife (ODFW) is not responsible for any errors or omissions on this map. The Oregon Department of Fish and Wildlife (ODFW) is not responsible for any errors or omissions on this map. The Oregon Department of Fish and Wildlife (ODFW) is not responsible for any errors or omissions on this map.

