

Partner Information

City of Sherwood

20 NW Washington St.
 Sherwood, OR 97140
 503-625-5522
www.ci.sherwood.or.us

Tualatin River National Wildlife Refuge

16507 SW Roy Rogers Road
 Sherwood, OR 97140
 503-590-5811

Friends of the Refuge

P.O. Box 1306
 Sherwood, OR 97140
 503-972-7714
www.friendsoftualatinrefuge.org

U.S. Fish and Wildlife Service

Oregon Fish and Wildlife Office
 2600 SE 98th Ave.
 Portland, OR 97266
<http://oregonfwo.fws.gov/>

Clean Water Services

2550 SW Hillsboro Hwy.
 Hillsboro, OR 97123
 503-681-3600
www.cleanwaterservices.org

Three Rivers Land Conservancy

P.O. Box 1116
 Lake Oswego, OR 97035
 503-699-9825
www.trlc.org

Sherwood Family YMCA

23000 SW Pacific Hwy.
 Sherwood, OR 97140
 503-625-9622

Tualatin Riverkeepers

16507 SW Roy Rogers Road
 Sherwood, OR 97140
 503-590-5813
www.tualatinriverkeepers.org

Sherwood Middle School Refuge Club

400 N. Sherwood Blvd.
 Sherwood, OR 97140
 503-925-2636

Tualatin River Watershed Council

P.O. Box 338
 Hillsboro, OR 97123
 503-846-4810
www.trwc.org

Thank You for Your Generous Support



METRO
 PEOPLE PLACES
 OPEN SPACES

www.metro-region.org



From Raindrops to Refuge

A Handbook for Taking Action in Sherwood's Watersheds

Sherwood Watershed Map	Inside cover
Welcome	2
Raindrops to Refuge	3
Watershed Action Plan.....	4
Projects to Date.....	4
You Can Get Involved!.....	5
Greenway Map	6
Sherwood's Greenways	7
What Good are Greenways?	7
City of Sherwood Open Space and Greenway Management Program	7
Cedar Creek Greenway Trail System - Enjoy It!	8
Protect These Fragile Areas	9
Volunteer	9
Become an Open Space Steward with the City of Sherwood	9
Learn About Watershed Health	10
What is a Watershed?	10
What is a Riparian Area?	10
What is a Wetland?	10
Control Erosion	11
Limit Impervious Surfaces.....	11
Care for Buffer Strips.....	11
Fight Invasive Species.....	12
Try Natural Gardening	13
Native Plants.....	13
Sample Site Plan.....	14
Right Plant, Right Place.....	15
Plant Diversity.....	15
Look at Your Lawn.....	15
Build Healthy Soil.....	15
Create Wildlife Habitat.....	16
Be Water Wise.....	17
Watering Your Yard.....	17
Water-Saving Tips.....	17
Car Care.....	18
Inside Your House.....	18
Tualatin River National Wildlife Refuge Map	19
Tualatin River National Wildlife Refuge	20
Upstream Impacts.....	20
Restoration Program.....	21
Friends of the Refuge.....	21
Group Projects	22
For and About Kids	23
Activities Just For Kids.....	24
"Monitor Your Watershed" Coloring Sheet.....	25
"Oregon Wetland Wildlife: Beaver and Wood Duck" Coloring Sheet.....	26
Resources	27
Partner Information	28
Tualatin Basin Watershed Map	Inside back cover

Welcome

Raindrops to Refuge is pleased to present this publication for the community. We hope you will enjoy learning about Sherwood's watersheds and tips to help protect water quality. This guidebook is meant to serve as a resource and reference. Please place it on your bookshelf and refer to it often.

Together we can make a difference in our community now and for generations to come.

Our special thanks go to Metro, Portland General Electric, Tualatin River Watershed Council, and the U.S. Fish and Wildlife Service for sponsoring this guidebook.



St. Charles Trail, Sherwood

Ken Huffer

Raindrops to Refuge
20 NW Washington St.
Sherwood, OR 97140
503-625-4223
www.raindrops2refuge.org

Credits

Cover
Ashton Naef

Copywriting
Janet Bechtold
Kay Blouke
Ron Garst
Ken Huffer
Chris Lapp
Noreen O'Connor
Amber Reese

Photos
Morley Blouke
Julia Crown
Christine Egan
Ken Huffer
Amber Reese
USFWS

Sample Site Plan
Virginia Maffitt

Illustrations
Ber Chapman
Clyde List

Reviewers
Julia Crown
Margot Fervia-Neamtzu
Ken Huffer
Mike Marxen
Noreen O'Connor
Amber Reese
Marilyn Stinnett
Kim Strassburg

Printing
Portland General Electric
Kinko's

Resources

Books

Exploring the Tualatin River Basin, Tualatin Riverkeepers, Oregon State University Press, 2002.

Gardening with Native Plants of the Pacific Northwest, Kruckeberg, University of Washington Press, 1996.

Naturescaping: A Landscaping Partnership with Nature, Oregon Department of Fish and Wildlife, 2001.

Naturescaping for Clean Rivers, City of Portland, Bureau of Environmental Services, Portland, OR, 1995.

Plants of the Pacific Northwest Coast, Pojar and Mackinnon, Lone Pine Publishing/British Columbia Forest Service, 1994.

Sherwood's Heritage Trail Guidebook, Sherwood Historical Society.

Sunset Western Garden Book, edited by Kathleen Norris Brenzel, Menlo Park, CA, Sunset Publishing Corp., 2001.

Watershed Stewardship: A Learning Guide, Oregon State University Extension Service, 2002.

Wild in the City: A Guide to Portland's Natural Areas, edited by Michael C. Houck and M. J. Cody, Oregon Historical Society Press, 2000.

More Helpful Websites

Bosky Dell Natives	www.boskydellnatives.com
Clean Rivers and Streams	www.cleanriversandstreams.org
Clean Water Services	www.cleanwaterservices.org
Environmental Protection Agency	www.epa.gov
Oregon Dept. of Fish and Wildlife	www.dfw.state.or.us
Plant Native	www.plantnative.org
Portland Metro Regional Services	www.metro-region.org
National Wildlife Federation	www.nwf.org





Oregon Wetland Wildlife:
Beaver and Wood Duck

Courtesy of US Fish and Wildlife Service

Raindrops to Refuge

Your Community Watershed Group

The City of Sherwood is one of the fastest growing cities in Oregon, with an increase in population from 2,500 in 1989 to over 14,000 in 2004. This growth has impacted the City’s public greenways, water quality, fish and wildlife habitat, and the Tualatin River National Wildlife Refuge.



Cedar Creek

Ken Huffer

Sherwood residents and stakeholder groups became increasingly concerned about the impacts of rapid growth in their community and its effect on watershed health. Raindrops to Refuge (R2R) was initiated in 2001 by a group of concerned residents along with representatives from the City of Sherwood, the Sherwood Institute of Sustainability, the U.S. Fish and Wildlife Service, the Tualatin River National Wildlife Refuge, and the Sherwood School District.

Raindrops to Refuge (R2R)’s mission is to inspire, educate, and facilitate community actions to assess, restore, and preserve the ecological health of Sherwood’s watersheds.

The Oregon Department of Environmental Quality has listed all three of Sherwood’s creeks as “water quality limited.” This means that the stream temperatures, bacteria levels, and dissolved oxygen levels are all too high.

Most of these problems are related to increased levels and velocity of stormwater runoff, pollution caused by heavy pesticide and herbicide use, lack of tree canopies along streams, and increased erosion due to runoff from development.

Sherwood’s rapid growth has increased these problems. R2R’s goals include educating homeowners and rural landowners on how they impact these natural resources. R2R provides residents and landowners the information and resources they need to become more actively involved in local decision-making regarding natural resource protection, and to change their own behaviors that impact the watersheds.

What is a Watershed?

The area that is confined by ridge tops that drains water into a given stream or river. Sherwood’s three watersheds, which cover approximately 23 square miles, are created by **Rock, Cedar, and Chicken Creeks**. The creeks run through a mix of suburban and rural land uses, including nurseries, tree farms, forests, and businesses, flowing through the City of Sherwood to the Tualatin River National Wildlife Refuge and then into the Tualatin River.



One Raindrop Makes a Difference!

Watershed Action Plan

R2R's activities are guided by a Watershed Action Plan designed by R2R and its partners. Stream surveys and fish and wildlife habitat modeling were used to identify sections of Sherwood's watersheds (known as "reaches") for priority in conservation and restoration. The Action Plan helps to focus the work of R2R and its partners in priority areas. By synchronizing the actions, resources, and planning for restoration, education, conservation, and outreach, R2R fills a need identified by its partners to better leverage resources, avoid duplication of effort, and build on each other's successes.

The Watershed Action Plan is divided into four components composed of 28 strategies to revive the health of Sherwood's watersheds. The four components are Restoration, Conservation, Education and Outreach, and Assessment/Monitoring. Each comprehensive strategy includes: a project description, project leads, potential partners and funding sources, target areas, relationships to other planning efforts or projects, benefits to conservation values or management goals, tools or types of source control, and potential challenges. A copy of the Action Plan may be viewed at the Sherwood Public Library, YMCA, or City Hall.



Residents Enjoy a Tour of a Sherwood Greenway

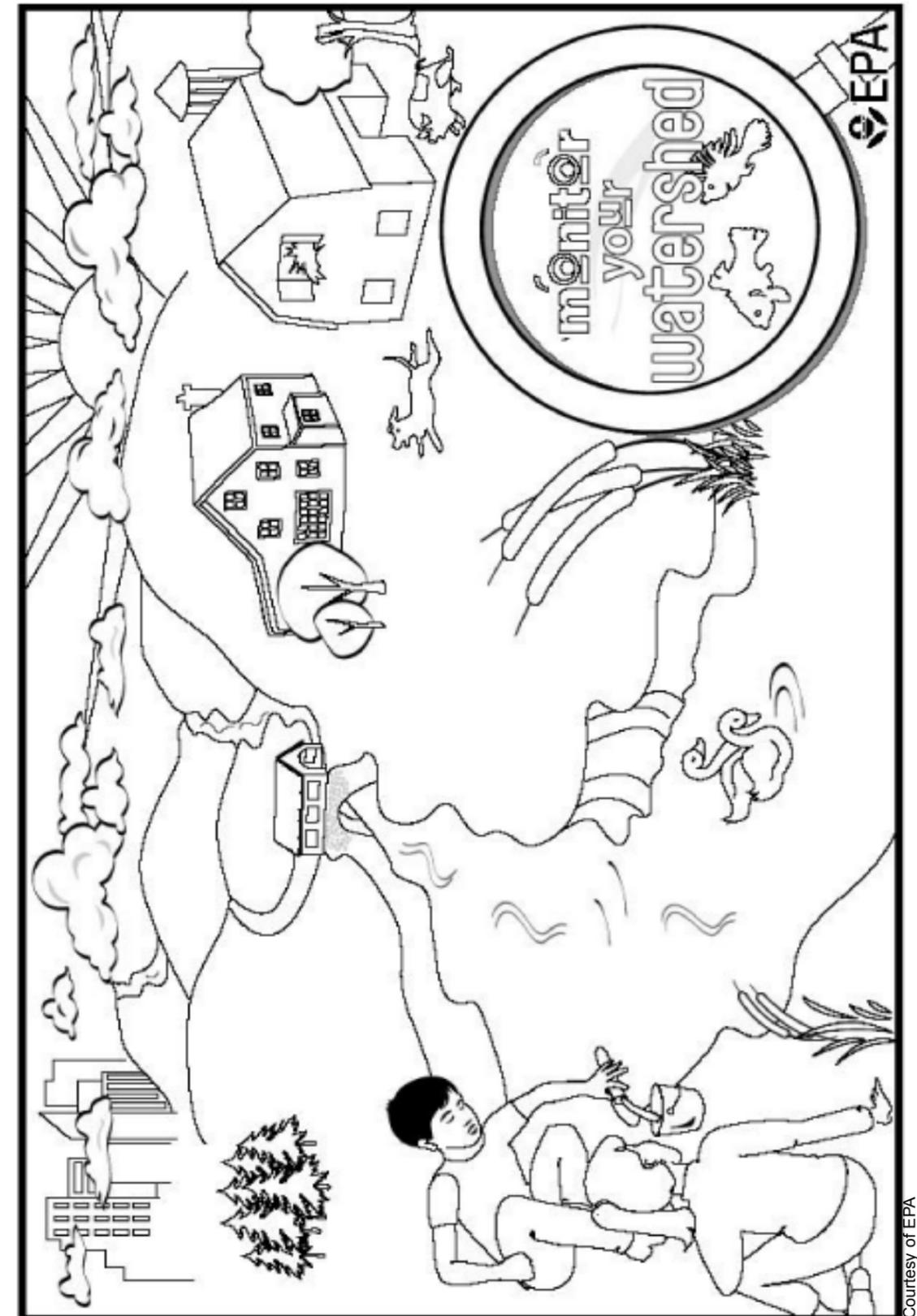
Morley Blouke

Projects To Date

Volunteer efforts to improve the health of Sherwood's watersheds have been gaining momentum since 2002. R2R's projects educate community members about the Tualatin River National Wildlife Refuge, City greenways and open spaces, watershed functions, fish and wildlife habitats, and the impacts of homeowner landscaping practices. This guidebook contains many ideas on how to help improve your environment.

R2R's watershed projects include:

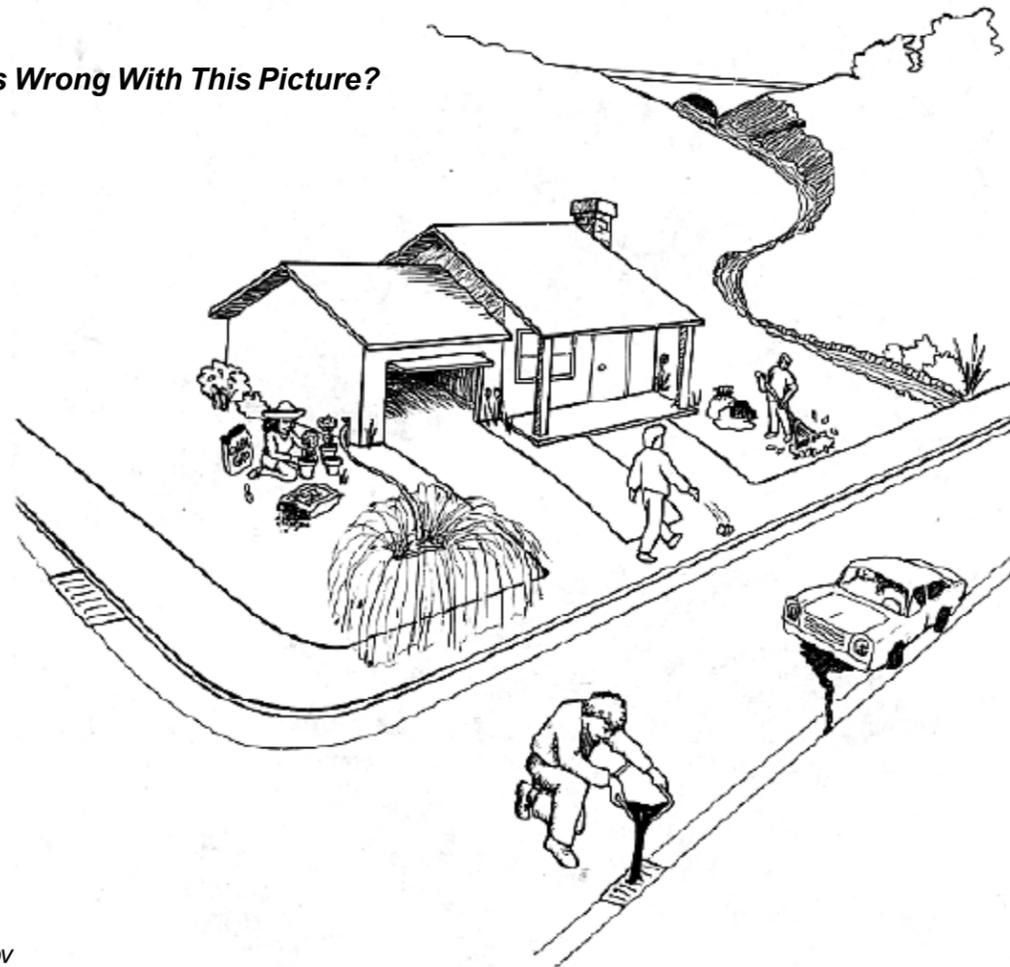
- Community workshops highlighting natural gardening, water conservation, and greenway stewardship.
- Production of informational brochures containing "helpful hints" for seasonal yard care, water savings, and alternative weed and pest management.
- Trail posts designed by local children that have been installed along the greenways, with watershed plants and wildlife depicted on colorful tiles.
- Volunteer plantings of native vegetation along creeks, helping to restore water quality.
- Future projects include stream surveys, culvert replacements, stream steward programs, and wetland restoration and enhancements.



Activities Just For Kids

1. Learn about the benefits that wetlands provide. Visit the Tualatin River National Wildlife Refuge (when open) or other local natural areas and see how many wetland characteristics you can identify.
2. Discover the different plants and animals that live in your watershed. Determine which are native, which are non-native invasives, and which are migratory. Start a scrapbook of pictures and information about each species.
3. Follow a nearby stream and notice how it changes, what grows and lives around it, and what happens to it when it rains. Note how it changes seasonally throughout the year.
4. Create a wildlife habitat in your backyard. Explore habitat and food preferences for the wildlife you would like to attract. Keep a record of the wildlife you see using your habitat.
5. Participate in a stream, wetland, or beach clean-up. Notice what kinds of trash are collected. Design your own sign or poster about litter.
6. Participate in local tree plantings and maintenance events planned by the City of Sherwood. Learn how these events contribute to healthy streams.
7. Get some friends together and brainstorm ways that you can make a difference to watershed health in your community. Contact Raindrops to Refuge for further guidance.

What's Wrong With This Picture?



You Can Get Involved!

In this guidebook, you can find ways to help improve your community. The responsibility to protect and restore Sherwood's watersheds belongs to all of us. Whether you live two feet or two miles from the nearest stream, your activities as a watershed resident impact the creeks and the Refuge and their ability to provide wildlife habitat and flood protection, improve water quality, and provide a safe and enjoyable place for people. Volunteers provide the extra workforce necessary to carry out R2R's mission. If you would like to get involved with R2R or learn more about our homeowner education workshops, youth education programs, restoration and conservation activities, and other opportunities, please contact us:

Raindrops to Refuge
City of Sherwood
20 NW Washington Street
Sherwood, OR 97140

Phone: 503-625-4223
Fax: 503-625-5524
Email: info@raindrops2refuge.org
Website: www.raindrops2refuge.org

Conservation



Cattails in Wetlands

Ken Huffer

Restoration



Planting at Woodhaven Park

Ken Huffer

Outreach



Watershed Model Demonstration

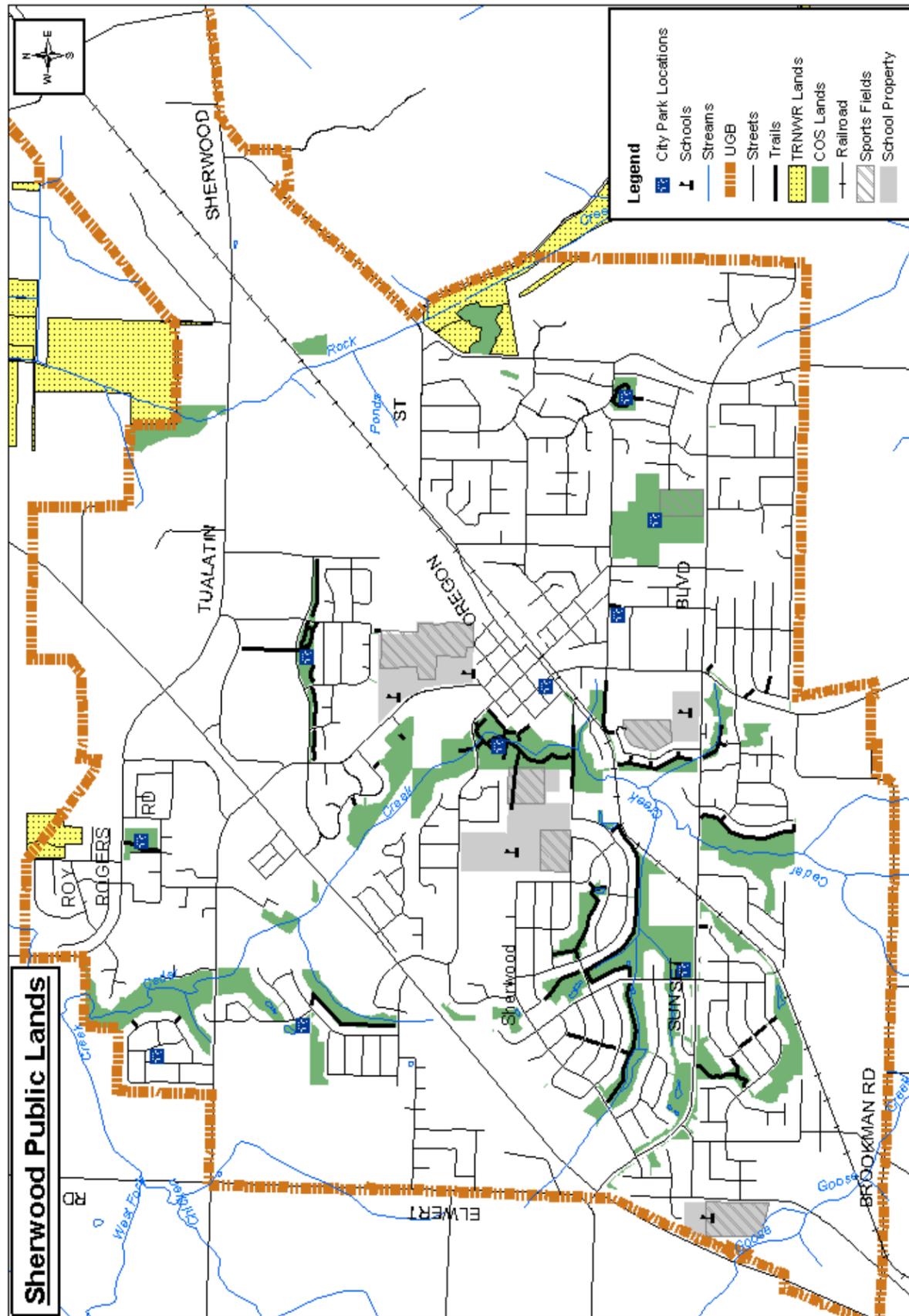
Julia Crown

Education



Studying Watershed Maps

Christine Egan



Map created by Ken Huffer

For and About Kids

Some Sherwood elementary school teachers teach lessons on water quality by exploring the stormwater retention ponds in our neighborhoods. Others have had their classes work on identifying non-native invasive species that are present on the greenway trails. These students made special identification books that are used during greenway tours. In 2001, Sherwood students designed porcelain tiles representing the natural world that decorate trail posts in our open spaces. The remainder of the tiles made a beautiful wall mural, which you can see next to Sherwood Middle School's front office.



Middle School students have the opportunity to join the Sherwood Middle School Refuge Club. This after-school club was formed three years ago. In the fall, students turn in their applications to join the Refuge Club. They must have an interest in and some knowledge about science and the natural world. Club members learn about the Refuge system and water issues in Sherwood, perform water testing, and learn about plant and animal identification. The Club goes on a field trip to the Refuge once a month.



Heatherwood Restoration Site

During the first year, Refuge Club members worked very hard to publish a field guide for the Tualatin River National Wildlife Refuge. This field guide was written "by kids - for kids". It focuses on the wildlife and plants most frequently seen on the Refuge. Since then, Refuge Club members have become expert tour guides of the Refuge, conducting tours for other students from kindergarten age to high school. This Club also gets down and dirty, collecting water samples to check the quality of the water entering and leaving the Refuge.

Additional natural science opportunities are also available at the middle and high schools. Middle school students do regular water testing at Cedar Creek in Stella Olsen Park. High school students monitor the water quality in Chicken Creek. All of this data is shared with government agencies that are concerned with water quality. You can also check out the Earth Service Corps program at the Sherwood YMCA's Teen Center.

Kids of Sherwood not only learn about the natural world around them, they help to preserve it and make it better!



Porcelain Tile Project

Amber Reese

Group Projects

Get involved in your neighborhood by organizing a work party to restore our common areas. **All work must be approved by the City of Sherwood.** Call 503-625-5522. Here are some ideas for group projects.



Girl Scout Planting Event

Ken Huffer

Storm Drain Stenciling

Storm drains empty directly into our local streams. Stencil storm drain covers to remind neighbors that hazardous chemicals that wash into storm drains can harm fish and wildlife and pollute water.

Tree Planting and Restoration Projects

Buffer strips and trees protect water quality by absorbing pollutants before they reach streams and other bodies of water.

Invasive Species Removal in Greenways

Removing invasive species allows our native plants to grow, providing food and habitat for fish and wildlife.

Neighborhood Clean-Up

Picking up trash and debris beautifies our neighborhoods, helping to keep trails and sidewalks safe.

Open Space Stewardship

Accepting responsibility for a small area near your home or business improves fish and wildlife habitat, improves ecosystem functions, and gives you a sense of accomplishment.



Woodhaven Restoration Site

Ken Huffer



Storm Drain Stenciling Kit

www.bmccatalog.com

Sherwood's Greenways

The City of Sherwood has made open space preservation a priority by acquiring properties to create a City Greenway System and helping lead the effort to establish the Tualatin River National Wildlife Refuge. As a result, Sherwood is noted for being very successful in protecting its natural areas and has one of the highest rates of open space in Oregon for each resident.



What Good are Greenways?

- Greenways preserve local streams, wetlands, and riparian corridors.
- Greenways preserve plants that provide shade and improve air quality by creating oxygen and by filtering air pollutants.
- Greenways protect the community from floods by serving as floodplains, and help wetlands hold and release stormwater slowly.
- Greenways provide habitat and migration corridors for wildlife.
- Greenways provide places where local students can interact with and learn about the natural environment close to home and school.

City of Sherwood Open Space and Greenway Management Program

Currently the City of Sherwood manages over 200 acres of open space, including most of the 100-year floodplain along Cedar Creek and its tributaries within the city limits as well as portions along Rock Creek. These spaces provide Sherwood with all of the benefits described above.

At first, the City focused its efforts on protecting and acquiring these properties. But now it is clear that these areas are being significantly impacted by poor water quality, excessive stormwater runoff, erosion, the loss of native plant communities, the spread of nonnative invasive plant and animal species, and direct human disturbance. To address these issues and restore ecosystem function to these areas, the City's focus has changed to effective management for all of its open spaces.



Quiet Places in Urban Settings Attract Wildlife

Julia Crown

What is a Greenway?

Greenways are corridors of open space areas, often along rivers or streams, that link recreational, cultural, and natural features; provide walkways; and help to protect wildlife habitat, forests, wetlands, and grasslands. They have abundant natural vegetation and provide opportunities to observe and enjoy natural areas close to home.

The City employed a Natural Resource Specialist to provide oversight for the City's Open Space Management Program. The program oversaw restoration projects and conducted community outreach programs to increase awareness of the local watershed. Additionally, the Natural Resource Specialist recruited/coordinated volunteer activities and advised the public and other city departments on issues related to forestry, environmental regulations, and wildlife issues. The Natural Resource Specialist served as the City staff's liaison to the Tualatin River National Wildlife Refuge, and worked to get partnerships and grant funding to support the City's restoration efforts. R2R hopes that funding will be restored to this vital position in the near future.

Cedar Creek Greenway Trail System - Enjoy It!

Currently, 6.5 miles of paved multi-use trails weave through many local greenways and neighborhoods. The trails provide recreational activities and offer an alternate means to get around town. Current trails link Old Town, city parks, the YMCA, and Sherwood's schools. Planning is underway for additional sections of the trail system. This will eventually provide access to the Library, Senior Center, and Tualatin River National Wildlife Refuge. You can see the current and planned greenway trails on page 6.

Trail Etiquette

- Leash and pick up after your pet.
- Do not litter.
- Stay on trails to preserve the vegetation.
- No motorized vehicles.
- Bicyclists yield to pedestrians.
- Do not harass wildlife.
- Report crime.

Help preserve the quality of our trails.



Greenway Path in Sherwood

Ken Huffer



Boardwalk in Stella Olsen Park

Ken Huffer

Enjoy your Greenways!

Restoration Program

A dynamic restoration program began in 1997 to recover losses of riparian and floodplain wetland habitats within the Tualatin River Watershed. To date, all of these restoration efforts improve existing habitat conditions for waterfowl, shorebirds, marsh birds, neotropical migratory birds, amphibians, mammals, and fish. The public gains environmental benefits through enhanced flood control, improved water quality, and overall watershed health.



USFWS



USFWS

Before and After Restoration of the Steinborn Unit

Since the completion of the Steinborn Unit restoration project in 1998 (visible from Highway 99W and Roy Rogers Road), active water and moist-soil management has stimulated a tremendous response by both wetland plant communities and associated fish and wildlife species. Most of the herbaceous wetland plants emerged from a 100-year-old seed bank that remained largely intact despite decades of cattle grazing and crop cultivation.

Prior to reconstruction in 1998, only 18 species of migratory birds were documented using this area, while 168 species have been identified to date.

The success of the restoration is monitored closely. The Refuge has documented more than three dozen beneficial wetland plant species such as smartweed, bulrush, cattail, beggarticks, water plantain, curly dock, millet, and a variety of rushes and sedges - all favored food sources for waterfowl.

Friends of the Refuge

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

To learn how you can help to restore and preserve this unique urban Refuge, contact FOR at:

Friends of the Refuge
 PO Box 1306
 Sherwood, OR 97140
 503-972-7714
www.friendsoftualatinrefuge.org



Proposed Wildlife Center

USFWS

Tualatin River National Wildlife Refuge

Sherwood's watersheds lead to the Tualatin River National Wildlife Refuge and into the Tualatin River. This urban Refuge is part of a 93-million-acre National Wildlife Refuge System managed by the United States Fish and Wildlife Service (USFWS). In the early 1990s, many local residents and leaders recognized that the Tualatin River Watershed had been highly modified by both agriculture and urbanization. This recognition fueled a desire to preserve open greenspace and create an area where future generations could enjoy outdoor recreation and interpretation, and leave an educational legacy for children. The USFWS began studying the idea to create a National Wildlife Refuge along the bottomlands of the Tualatin River. In February of 1992, the Tualatin River National Wildlife Refuge was established.



The Refuge is one of only ten urban refuges in the nation. The Refuge restores, protects, and manages wetland, riparian, and upland habitats for a variety of birds, fish, amphibians, mammals, threatened and endangered species, and other resident wildlife, as well as providing for the enjoyment of people. When fully acquired, the Refuge will total 3,058 acres of primarily floodplain habitats.



Restored Floodplains Provide Attractive Habitat for Waterfowl

USFWS

Chicken Creek, one of the three creeks in Sherwood's watershed, provides the water source for over 400 acres of restored floodplains on the Refuge.

High-priority goals for the Refuge are to protect and restore habitats for native species, migratory birds, and endangered and threatened species, as well as to provide high-quality education, interpretation, and wildlife-oriented recreation for the public. Special events, such as the Songbird Festival and National Wildlife Refuge Week, are held throughout the year. New visitor facilities and services are being planned and constructed. The Wildlife Center, when built, will explore the wildlife and habitats of the Refuge as well as the larger picture of watershed health and restoration.

Upstream Impacts

Like most urban streams, Chicken Creek is extremely susceptible to flash flooding due to an increase in development and impervious surfaces. During times of intense winter and spring rains, Chicken Creek reaches full flood stage in its lower tributaries where it bisects the Refuge. Such heavy flows cause uncontrolled flooding of the Refuge wetlands and interfere with the migration of fish heading to the upper reaches of the watershed for spawning.



Failed Diversion Structure

USFWS

Protect These Fragile Areas



Volunteer

There are numerous rewarding opportunities for you or your organization to volunteer at tree plantings, clean-up events, community outreach and education events, and other group or individual projects. To volunteer with Raindrops to Refuge, please contact us at 503-625-4223 or visit us at www.raindrops2refuge.org. Volunteer opportunities are also available with R2R's partners including: Tualatin Riverkeepers, Friends of the Refuge, Tualatin River National Wildlife Refuge, and the City of Sherwood. For contact information, please see page 28.

Become an Open Space Steward with the City of Sherwood

The Open Space Stewardship Program involves the citizens of Sherwood in the restoration, enhancement, and preservation of Sherwood's wetlands, riparian areas, streams, and upland areas. These areas benefit fish and wildlife habitat, water quality, and the community. People can sign up as individuals, families, businesses, or through church groups, schools, homeowners' associations, service clubs, and conservation organizations. Duties include cleaning up litter, removing weeds, planting native species, taking care of new plants, and performing other enhancements as needed.

Volunteers are essential to meet the mission and goals of the Open Space Management Program. In one year alone, over 466 volunteers donated 2551 hours, working on various projects throughout the City's open spaces. To volunteer for the City, please call 503-625-5522 or visit the City of Sherwood's website at www.ci.sherwood.or.us/community/environment.



Downed Wood Provides Healthy Habitat

Julia Crown

Open Space Stewardship Program

1. **BEFORE STARTING ANY WORK:** Call the City of Sherwood at 503-625-5522.
2. **ONE-YEAR COMMITMENT:** The steward(s) commit to at least a one-year period. Then you may renew, change, or terminate the agreement.
3. **PICK UP LITTER:** The steward(s) monitor the natural area for litter and commit to keeping it clean on a regular basis.
4. **KEEP A RECORD:** The steward(s) keep a record of volunteer hours.
5. **COORDINATE WITH THE CITY OF SHERWOOD:** The steward(s) must coordinate clean-ups, plantings, and all other activities with the Open Space Stewardship Program.

Learn About Watershed Health

Confused by the words we use to describe the watershed and how to keep it healthy? Here are a few helpful definitions:

What is a Watershed?

A watershed is the area that is confined by ridge tops that drains water into a given stream or river. Sherwood has three watersheds which cover approximately 23 square miles. They are created by Rock, Cedar, and Chicken Creeks. The creeks run through a mix of suburban and rural land, including nurseries, tree farms, forests, and businesses, and flow through the City of Sherwood to the Tualatin River National Wildlife Refuge and then into the Tualatin River.

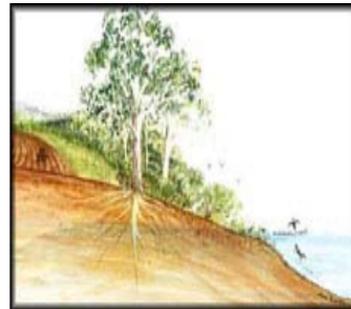


Watershed Model

www.oweb.state.or.us

What is a Riparian Area?

A riparian area is the area along a water source where the soil is wet, and includes the vegetation that grows there. Riparian areas provide tree canopies, contribute large wood to the stream where fish can hide, add organic material that provides food sources, stabilize stream banks, and slow floodwaters. The vegetation in riparian areas provide hiding places and food sources for wildlife, create corridors for travel, and provide dead standing trees (snags) for cavity-nesting birds and other wildlife. Quality of the water is improved by slowing floodwaters, providing shade to keep water temperatures cool, and filtering pollutants. Most of the City of Sherwood's greenways lie within a riparian area or wetland.

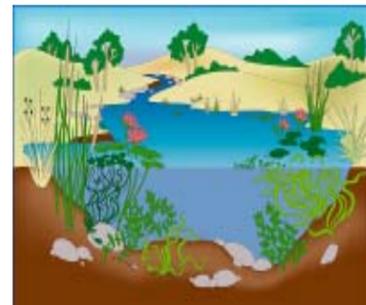


Riparian Model

www.rivers.gov.au

What is a Wetland?

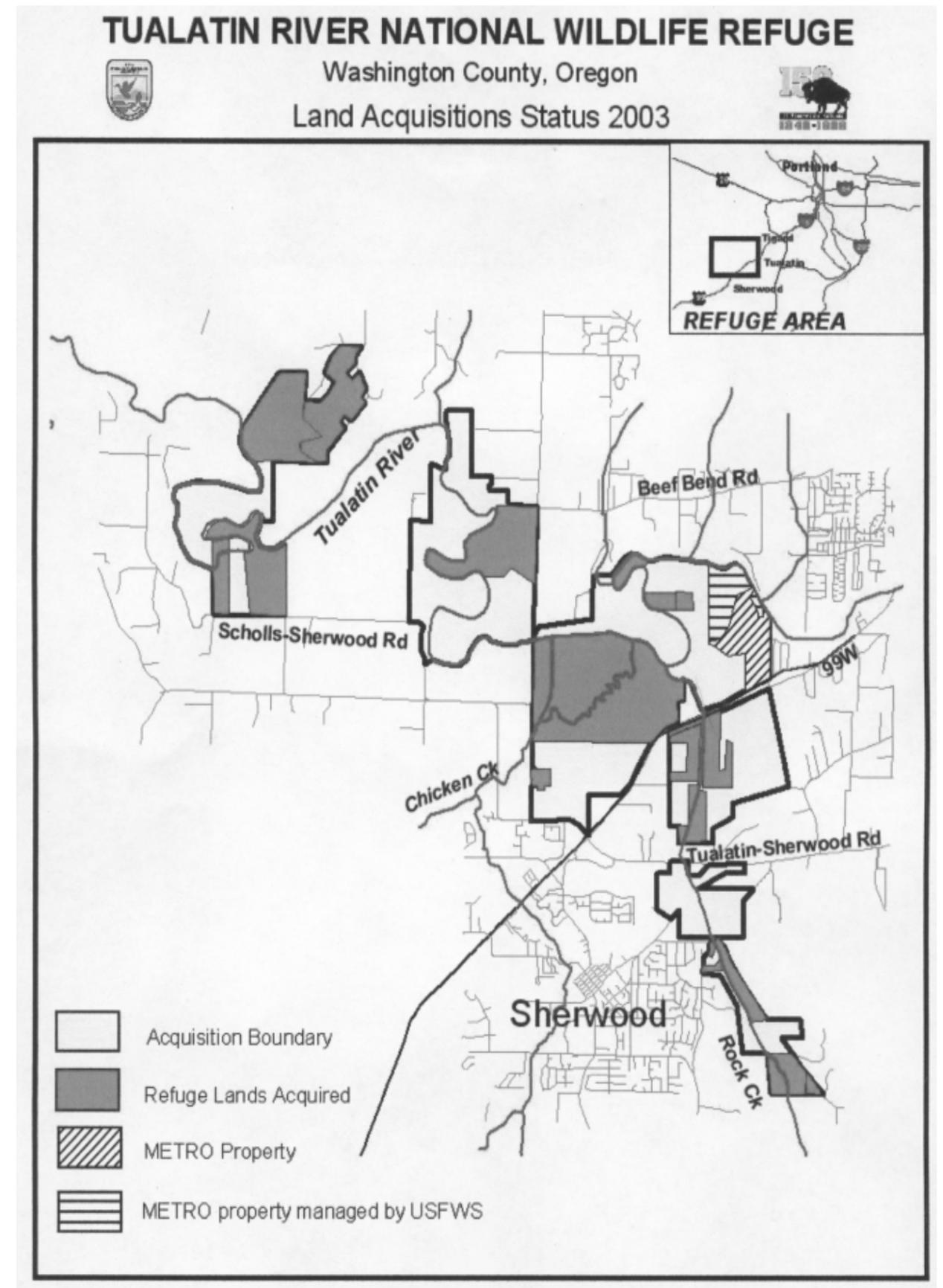
Wetlands are important ecosystems that support large numbers of birds, mammals, and amphibians, and are one of the most biologically productive natural habitats. These remain wet for at least part of the year, although some dry out for long periods or may appear dry on the surface but are saturated below ground. Think of wetlands as huge sponges and water filters.



Wetland Model

www.yvw.com.au

You can also attend a Raindrops to Refuge workshop to learn more!



Car Care

When washing your car, use a bucket of water or a hose with an on/off nozzle to save water. If possible, wash it on the grass to filter contaminants from the runoff. Or look for a commercial car wash that recycles water and properly disposes of runoff.



Keep your car in good repair and fix leaks promptly. Make sure that oil does not leak onto the ground. When it rains, oil and other fluids from your car are washed into storm drains that empty directly into our streams and rivers. One gallon of used motor oil can pollute up to one million gallons of fresh water!

Inside Your House

Saving water starts with an awareness of how you perform everyday household activities.

- Do you use your morning shower to wake up?

Try performing some stretches and breathing exercises before entering the shower and then keep your shower short. Install flow restrictors to minimize water use.

- Do you run the water while brushing your teeth?

Simply rinse your toothbrush and turn off the water until you are finished brushing.

- Do you run the water while waiting for it to get hot?

Keep a watering can handy to capture excess water and use it to water plants.

- Do you run full loads in your washing machine and dishwasher?

Wait until your machines are full before running them.

- Do you need to replace old appliances?

When purchasing new appliances, look for energy efficient models.



Sherwood Open Space

A family of four could save as much as 40,000 gallons of water every year by switching to efficient toilets and showerheads. Leaks waste almost 12% of an average household's yearly water consumption. Studies have indicated that less than 1% of the water on the earth is drinkable!

Ken Huffer

Control Erosion

Soil erosion can be an important natural process in watersheds for creating rich soils and for depositing wood, gravel, and sediments that assist salmon when spawning. But human activities such as cultivation, logging, grazing, urban construction, and road building speed up erosion, causing contamination of streams and a reduction in the oxygen content of water. When soil particles build up, they can change the course of the stream over time or cover habitats that nurture fish eggs as well as insect eggs, which are the food source for fingerlings (juvenile fish).



Erosion Due to Construction

Ken Huffer

How you can help: To control erosion, use mulch on exposed soil and revegetate to slow surface water and allow time for water to soak in. Use plants whose roots will hold the soil on steep slopes, or consider terracing.

Limit Impervious Surfaces

Impervious surfaces, such as streets and parking lots, don't allow water to be absorbed through soil and plant roots where it then can be released slowly. Instead it becomes "runoff." Rain falling on pavement has over 90% runoff. Lawns have about 25% runoff, and forests have about 10% runoff. As development expands, rainwater and irrigation water quickly run off into storm drains. The water empties directly into our streams, carrying with it pollutants picked up along the way, unlike water that has been filtered by pervious surfaces such as lawns, mulch, and natural groundcovers.



Gravel Driveways Prevent Runoff

Amber Reese

How you can help: Consider using gravel or pavers instead of concrete around your home, to allow water to soak into the ground. Till heavily compacted soil, and add soil amendments to improve growing conditions and filtration.

Care for Buffer Strips

Vegetated buffer strips along streams trap contaminants before they can enter the water source. The width of the buffer strip must increase as the slope down to the water increases. Planting native trees, shrubs, grasses, and wildflowers will improve runoff water quality, reduce erosion, and provide shade and habitat enhancement.

How you can help: Use fertilizers and pesticides sparingly to minimize the volume of contaminated water that runs off of your property. If you have a stream on your property, do not mow down to the edge of the water or throw debris into the water.



Stream with No Canopy

Ken Huffer

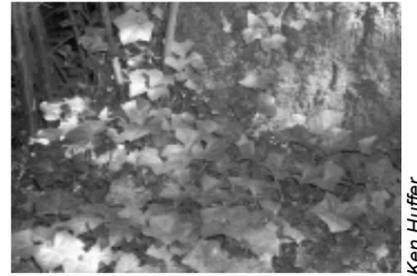
Fight Invasive Species

Invasive species are non-native plants and animals that spread quickly through an area, often crowding out native plants and animals. These species upset an area's natural ecological balance.

How you can help: Volunteer with the City of Sherwood, Raindrops to Refuge, Tualatin Riverkeepers, or Friends of the Refuge to remove existing stands of invasive plants in stream corridors. Do **not** plant any of the invasive non-native plants on the following list.

Invasive Plants

Scotch Broom (*Cytisus scoparius*)
 Tall Fescue (*Festuca arundinacea*)
 Ivy (*Hedera helix* and *Hedera* spp.)
 Himalayan Blackberry (*Rubus discolor*)
 English Holly (*Ilex aquifolium*)
 Yellow Water Iris (*Iris pseudacorus*)
 Ryegrasses (*Lolium* spp.)
 Bird's Foot Trefoil (*Lotus corniculatus*)
 Reed Canary Grass (*Phalaris arundinacea*)
 English Laurel (*Prunus laurocerasus*)
 Periwinkles (*Vinca minor*, *V. major*)
 Bamboo spp. (*several genera*)
 Bull Thistle (*Cirsium vulgare*)
 Purple Loosestrife (*Lythrum salicaria*)
 Japanese Knotweed (*Polygonum cuspidatum*)
 Morning Glory (*Convolvulaceae* sev. *genera*)
 Deadly Nightshade (*Solanaceae* sev. *genera*)



English Ivy

Ken Huffer



Himalayan Blackberry

Ken Huffer

How you can help: If you have these species on your property, check out www.invasivespecies.gov/geog/state/or.shtml to see what you can do.

Invasive Animals

Nutria (*Myocastor coypus*) eat enough to eliminate entire species of native aquatic plants.

Bullfrogs (*Rana catesbiana*) have enormous appetites and harm native frogs, turtles, and fish.

Largemouth Bass (*Micropterus salmoides*) prey on native turtles and frogs.

House Sparrows (*Passer domesticus*) compete for nesting sites with native birds.

European Starlings (*Sturnus vulgaris*) have aggressively taken over native bird habitat.



Nutria

www.nutria.com



Largemouth Bass

www.tpwd.state.tx.us

Be Water Wise

Watering Your Yard

Watering the lawn is usually the largest use of water in a single-family home. Being wise about the way you water your yard saves water, money, and time. Over- or under-watering can weaken plants and make them more susceptible to pests and disease. During the summer months, water use nearly doubles, and half of that extra water is wasted through evaporation, runoff, or overwatering.



Your lawn only needs one inch of water per week to stay healthy. To water more efficiently, determine your soil type. If you have clay soil, water one time each week. If you have loamy soil, water twice a week. To conserve more water, limit the amount of lawn in your yard. Look for other water-saving tips in your water bill.

Water-Saving Tips

- Use drip irrigation or soaker hoses for beds.
- Use mulch to conserve soil moisture.
- Make sure water is soaking in to avoid wasteful runoff.
- Turn off water when not in use.
- Use a hose with an on/off nozzle when watering.
- Avoid watering pavement or walls.
- Repair leaky faucets and hoses.
- Water between 5 a.m. and 9 a.m. to minimize evaporation.

All You Need Is An Inch

Here's how to determine how long your sprinkler system takes to supply an inch of water:

Step 1: Place empty tuna cans around your lawn and turn on the water for 15 minutes.

Step 2: Measure the water depth of each can and find the average depth.

Step 3: If the average depth is
 1/8" = water for 2 hours,
 1/4" = water for 1 hour,
 1/2" = water for 30 minutes,
 3/4" = water for 23 minutes,
 1" = water for 15 minutes.



Water Your Yard Wisely

Amber Reese

Create Wildlife Habitat

As human development expands, natural areas become smaller and more fragmented, causing habitat loss for native species and threatening biodiversity. By taking simple steps in your backyard, you can provide a haven for wildlife. The more you rely on pesticides and fertilizers to control your garden, the less friendly it is for wildlife.

Leave small twigs, leaves, and even branches scattered around your yard to provide places for wildlife to hide. Dead trees and hollow logs provide homes for birds, mammals, and amphibians. Nectar plants attract butterflies, bees, and hummingbirds. Bees pollinate many kinds of plants and can increase your fruit and vegetable yields.

Remember that all wildlife is vulnerable to pesticides and other chemicals.

To create habitat for particular wildlife such as birds, butterflies, and bees, find out what plants they require and then include those plants in your landscape plan. For some helpful hints, visit www.nwf.org. Your plan can be implemented in stages over several seasons to ease the transition, or begin with a small corner area and work outward.

THE FOUR BASIC ELEMENTS REQUIRED BY WILDLIFE

Food: berries, seeds, insects, nuts, nectar

Shelter: plant cover, rocks, cavities

Water: bird bath, saucer, pond

Territory: safe buffer zones

What types of wildlife can live in your yard?



Native Wildlife Habitat

Julia Crown



Birds Nesting in Snag

Ken Huffer



A Natural Garden

Julia Crown

Try Natural Gardening

Natural gardening is an approach to gardening that utilizes native trees, shrubs, and plants that have evolved to thrive in local conditions. These plants are resistant to pests and diseases, attract native wildlife, and require less care and time for busy individuals. Natural gardening creates a healthy habitat for both people and wildlife.



Native Plants

With the rich diversity of plants in the Pacific Northwest, you can easily create your own style of natural beauty in your yard. Native plant species historically found in the Tualatin River Basin are included in the list below.

Native Plants for the Sherwood Area

Species		Species	
Large Trees		Groundcover Shrubs	
Grand Fir (<i>Abies grandis</i>)	M, S	Lady Fern (<i>Athyrium filix-femina</i> var.)	M, S
Bigleaf Maple (<i>Acer macrophyllum</i>)	M, IM	Low Oregon Grape (<i>Mahonia nervosa</i>)	M, S
Red Alder (<i>Alnus rubra</i>)	M, IM	Sword Fern (<i>Polystichum munitum</i>)	M, S
Madrone (<i>Arbutus menziesii</i>)	D, IT	Bracken Fern (<i>Pteridium aquilinum</i>)	M, IM
Oregon Ash (<i>Fraxinus latifolia</i>)	W, S	Salal (<i>Gaultheria shallon</i>)	M, S
Black Cottonwood (<i>Populus balsamifera</i>)	M, IT		
Douglas-fir (<i>Pseudotsuga menziesii</i>)	D, IM	Wildflowers	
Western Crabapple (<i>Pyrus fusca</i>)	M, IM	Columbine (<i>Aquilegia Formosa</i>)	M, IM
Oregon White Oak (<i>Quercus garryana</i>)	D, IT	Asters (<i>Aster chilensis</i> ssp. <i>Hallii</i>)	M, IT
Western Red Cedar (<i>Thuja plicata</i>)	M, S	Western Corydalis (<i>Corydalis scouleri</i>)	M, S
Western Hemlock (<i>Tsuga heterophylla</i>)	M, S	Fireweed (<i>Epilobium angustifolia</i>)	D, IT
		Cow-parsnip (<i>Hera clum panadum</i>)	M, IM
Small Trees and Shrubs		Lupines (<i>Lupinus latifolius</i> , <i>L. polyphyllus</i>)	D, IT
Vine Maple (<i>Acer circinatum</i>)	M, S	Colt's Foot (<i>Petasites frigidus</i>)	M, S
Serviceberry (<i>Amelanchier alnifolia</i>)	M, IM	Heal-all (<i>Prunella vulgaris</i>)	M, IT
Red-osier Dogwood (<i>Cornus stolonifera</i>)	W, IM	Goldenrod (<i>Solidago canadensis</i>)	D, IT
Black Hawthorn (<i>Crataegus douglasii</i>)	M, IM	Meadow Rue (<i>Thalictrum occidentale</i>)	M, S
Tall Oregon Grape (<i>Mahonia aquifolia</i>)	D, IM	Youth-on-age (<i>Tolmiea menziesii</i>)	M, IM
Indian Plum (<i>Oemleria cerasiformis</i>)	D, IM	Inside-out Flower (<i>Vancouveria hexandra</i>)	M, S
Ninebark (<i>Physocarpus capitatus</i>)	W, S		
Bitter Cherry (<i>Prunus emarginata</i>)	D, IM	Grasses	
Cascara (<i>Rhamnus purshiana</i>)	M, S	California Brome-grass (<i>Bromus carinatus</i>)	M, IT
Red Flowering Currant (<i>Ribes sanguineum</i>)	M, IM	Blue Wildrye (<i>Elymus glaucus</i>)	W, IM
Baldhip Rose (<i>Rosa gymnocarpa</i>)	M, IM	Western Fescue (<i>Festuca occidentalis</i>)	D, IM
Nootka Rose (<i>Rosa nutkana</i>)	M, IM		
Clustered Wild Rose (<i>Rosa pisocarpa</i>)	M, IM		
Thimbleberry (<i>Rubus parviflorus</i>)	M, IM		
Salmonberry (<i>Rubus spectabilis</i>)	W, IM		
Blue Elderberry (<i>Sambucus cerulea</i>)	M, IM		
Red Elderberry (<i>Sambucus racemosa</i>)	M, IM		

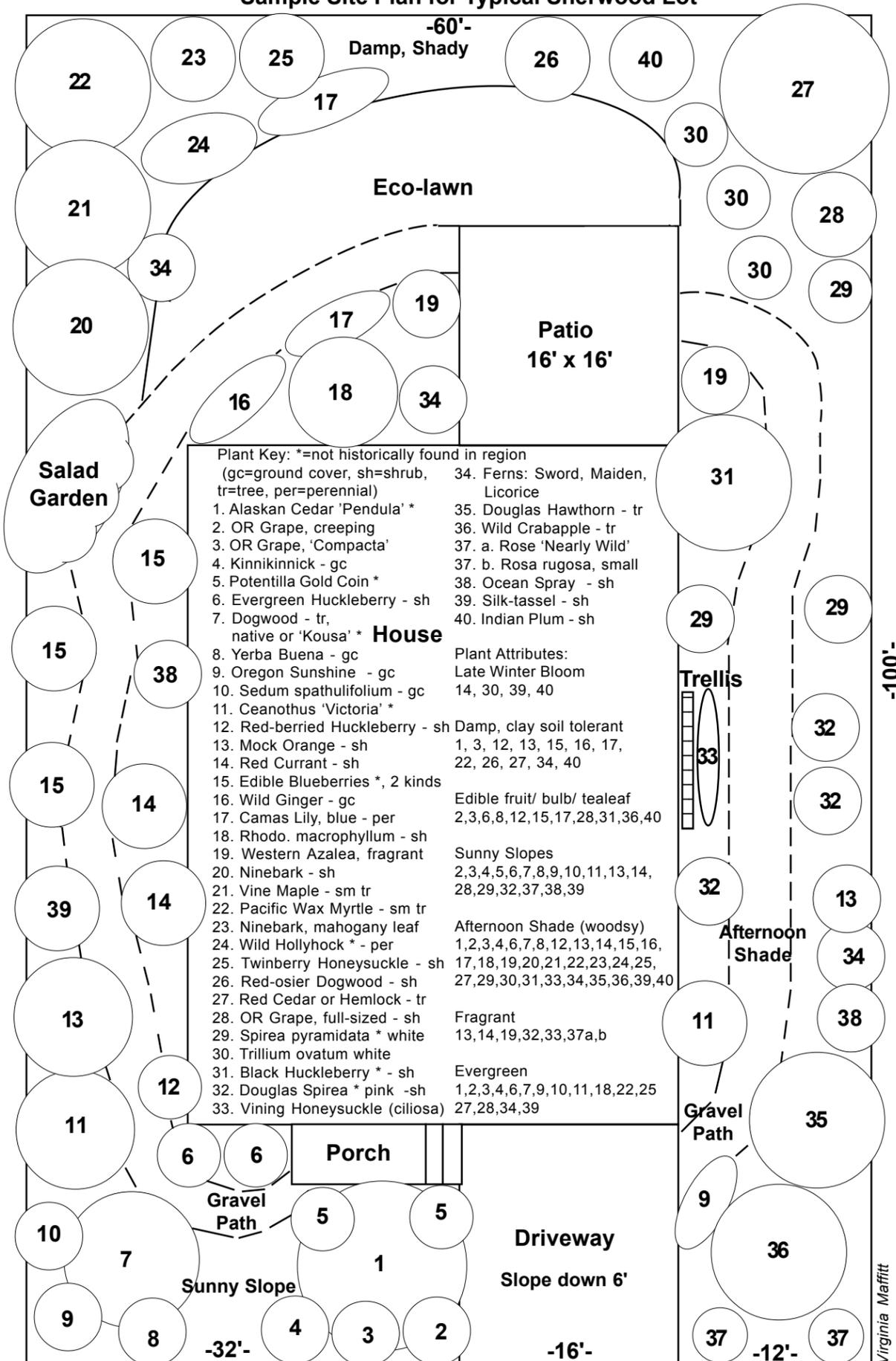
D = Dry Soil M = Moist Soil W = Wet Soil

S = Shade Tolerant IM = Intermediate Shade IT = Shade Intolerant

Data courtesy of Metro Regional Services



Sample Site Plan for Typical Sherwood Lot



Plant Key: *=not historically found in region
(gc=ground cover, sh=shrub, tr=tree, per=perennial)

1. Alaskan Cedar 'Pendula' *	34. Ferns: Sword, Maiden, Licorice
2. OR Grape, creeping	35. Douglas Hawthorn - tr
3. OR Grape, 'Compacta'	36. Wild Crabapple - tr
4. Kinnikinnick - gc	37. a. Rose 'Nearly Wild'
5. Potentilla Gold Coin *	37. b. Rosa rugosa, small
6. Evergreen Huckleberry - sh	38. Ocean Spray - sh
7. Dogwood - tr, native or 'Kousa' *	39. Silk-tassel - sh
8. Yerba Buena - gc	40. Indian Plum - sh
9. Oregon Sunshine - gc	
10. Sedum spathulifolium - gc	
11. Ceanothus 'Victoria' *	
12. Red-berried Huckleberry - sh	
13. Mock Orange - sh	
14. Red Currant - sh	
15. Edible Blueberries *, 2 kinds	
16. Wild Ginger - gc	
17. Camas Lily, blue - per	
18. Rhodo. macrophyllum - sh	
19. Western Azalea, fragrant	
20. Ninebark - sh	
21. Vine Maple - sm tr	
22. Pacific Wax Myrtle - sm tr	
23. Ninebark, mahogany leaf	
24. Wild Hollyhock * - per	
25. Twinberry Honeysuckle - sh	
26. Red-osier Dogwood - sh	
27. Red Cedar or Hemlock - tr	
28. OR Grape, full-sized - sh	
29. Spirea pyramidata * white	
30. Trillium ovatum white	
31. Black Huckleberry * - sh	
32. Douglas Spirea * pink -sh	
33. Vining Honeysuckle (ciliosa)	

Plant Attributes:	
Late Winter Bloom	14, 30, 39, 40
Damp, clay soil tolerant	1, 3, 12, 13, 15, 16, 17, 22, 26, 27, 34, 40
Edible fruit/ bulb/ tealeaf	2,3,6,8,12,15,17,28,31,36,40
Sunny Slopes	2,3,4,5,6,7,8,9,10,11,13,14, 28,29,32,37,38,39
Afternoon Shade (woody)	1,2,3,4,6,7,8,12,13,14,15,16, 17,18,19,20,21,22,23,24,25, 27,29,30,31,33,34,35,36,39,40
Fragrant	13,14,19,32,33,37a,b
Evergreen	1,2,3,4,6,7,9,10,11,18,22,25 27,28,34,39

Right Plant, Right Place

Locating the right plant in the right place is the key to successful gardening with native plants. Be aware of moisture and light requirements of individual plants as you plan your landscaping. Even a native will not thrive under a tree if it requires sun. The site plan on the previous page shows how you can use native plants to achieve attractive borders and beautiful floral displays, as well as provide a bountiful habitat for wildlife.



Oregon Sunshine

Julia Crown

Plant Diversity

Using a variety of plants in your yard helps provide food and cover for wildlife and reduces the impact of a particular pest or disease. Birds, bats, and beneficial insects can help to control the number of insect pests in your yard. Remember that pesticides kill the good bugs as well as the bad ones!

Think of your landscape in layers: the overstory (trees), the understory (shrubs), and the ground cover (small plants). Try to plant a balance of all three layers to provide homes and cover for wildlife. Analyze the areas surrounding your home to see if you can provide a link in your yard that will extend a wildlife corridor to help replace habitat that has been lost due to urban expansion.



Lawn and Border Using Native Plants

Julia Crown

Look at Your Lawn

Lawns use a large amount of chemicals and water to keep them green throughout our dry summers. Lawns provide little in the way of food or habitat to wildlife and are labor intensive for homeowners. Perhaps you can develop a site plan for your property that maintains greenery with less emphasis on lawn, or try new seed mixes that are less demanding of water and chemicals. If you need to fertilize, use organic fertilizers.

Build Healthy Soil

Healthy soil contains a mixture of clay, silt, sand, air, water, and organic matter. By adding two or three inches of organic matter to your soil every year, you provide food for the microscopic life that breaks down the organic material into elements useful for plants. Using mulch prevents weed growth, conserves soil moisture, regulates soil temperature, and protects it from erosion and compaction.

Mulching material can be found around your own yard. Grass clippings, leaves, and yard debris (avoid weed seeds) can be composted and make an excellent organic mulch. Wood chips and bark dust make an attractive cover for walkways or around trees and shrubs. Leave a few inches bare around the trunks to prevent pest and rot damage.

Virginia Maffitt