

**Jackson Soil & Water
Conservation District's**



Natural Resource Stewardship Handbook

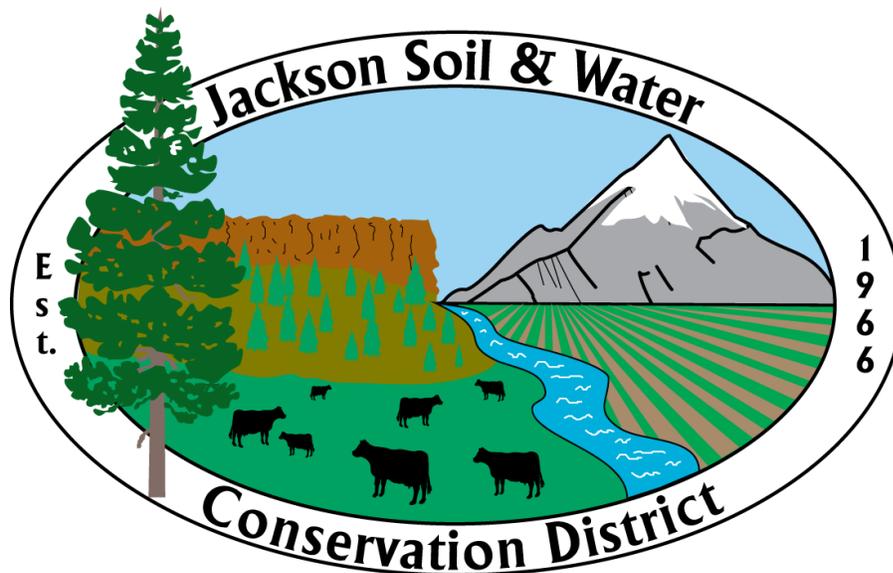


**Prepared and distributed by Jackson Soil & Water Conservation District in
collaboration with our partners**

89 Alder Street, Central Point, OR 97502

Jackson Soil & Water Conservation District's

Natural Resource Stewardship Handbook



Revised December 2018

Printing funds provided by the Jackson Soil & Water Conservation District, the Rogue River Watershed Council, and a generous donation from the REMAX Integrity Foundation.



Contents

Looking for topical information? We can help!

Use our color coded pages to help you find information on specific resource concerns, from updating your home's energy efficiency to those pesky weeds in your yard.

	Wildlife & Livestock
	Your home, your community, & interactions with the environment
	Soil & Composting
	Plants, Including Native plants, Landscaping, Gardening, & Pasture Management
	Water, Including Irrigation, Agricultural Water Management, & Low Impact Designs
	Weeds

Topical Sections

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Check out our *Book of Maps* pages 83-86 for maps outlining important management considerations in Jackson County.

Resource Directory

Cities

Ashland
www.ashland.or.us..... (541) 488-6002
Butte Falls
www.oregoncities.us/buttefalls..... (541) 865-3262
Central Point
www.centralpointoregon.gov (541) 664-3321
Eagle Point
www.cityofeaglepoint.org (541) 826-4212
Gold Hill
www.ci.goldhill.or.us (541) 855-1525
Jacksonville
www.jacksonvilleor.us/.(541) 899-1231
Medford
www.ci.medford.or.us..... (541)774-2000
Phoenix
www.phoenixoregon.gov.(541) 535-1955
Rogue River
www.cityofrogueriver.org..... (541) 582-4401
Shady Cove
www.shadycove.net..... (541) 878-2225
Talent
www.cityoftalent.org..... (541) 535-1566

Jackson County Fire Departments

Ashland (541) 482-2770
Butte Falls..... (541) 865-4383
Central Point (541) 826-7100
Eagle Point (541) 826-7100
..... 541) 826-3773
Evans Valley..... (541) 582-0678
Gold Hill..... (541) 826-7100
..... (541) 582-4411
Jacksonville..... (541) 899-7246
Medford.....(541) 774-2300
Phoenix (541) 535-2883
Rogue River Rural (541) 582-4411
Talent..... (541) 535-4222

White City..... (541) 826-7100
Burning Information..... (541) 776-7007
Wildfire and Smoke Hotline (541) 552-2490
<https://www.ashland.or.us/Page.asp?NavID=17394>

Jackson County Departments

Animal Control/Services (541) 774-6654
Exposition Park (541) 774-8270
Health and Human Services (541) 774-8200
Planning & Zoning..... (541) 774-6907
Building..... (541) 774-6927
Septic (541) 776-6214
24-Hour Inspection Request Hotline
..... (888) 299-2821
Roads..... (541) 774-8184
Soil maps www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?stateId=OR
Surveyor (541) 774-6191
Vector Control..... (541) 826-2199
Vegetation Management..... (541) 774-8184
Watermaster (541) 774-6880
Website..... www.jacksoncountyor.org

Watershed Councils

Applegate (541) 899-9982
Seven Basins (541) 261-7796
Rogue River Watershed Council..... (541) 423-6158
Watershed Network
..... www.oregonwatershed.com

Oregon State Agencies

Department of Agriculture
Agricultural Water Quality ... (503) 986-4718
Confined Animal Feeding Operations.(503) 986-4792
Integrated Weed Management (541)-291-2680
Natural Resources Division . (503) 986-4700
Dept. of Environmental Quality..... (541) 776-6010
Dept. of Fish and Wildlife (541) 826-8774
Dept. of Forestry..... (503) 664-3328
Dept. of Transportation..... (541) 774-6299

Resource Directory

Water Resources Dept. (541) 774-6880
Department of State Lands (503)-986-5200
Website www.oregon.gov

Other

Chamber of Medford/ Jackson County
www.medfordchamber.com..... (541) 779-4847
Medford Water Commission (541) 774-240
After Hours Emergency Line (541) 779-7611
Jackson County Library Services...www.jcls.org
.....(541) 774-8679

Jackson County Recycling (541) 608-1023
Rogue Transfer & Recycling (White City
.....(541) 779-4161
Rogue Disposal & Recycling (Medford
.....(541) 779-4161
Recology Ashland (Ashland)..... (541) 482-1471
Rogue Valley Council of Governments
www.rvcog.org (541) 664-6674
Southern Oregon Historical Society... www.sohs.org
.....(541) 773-6536
Southwest Oregon Integrated Weed Management Coordina-
tor
..... (541)-291-2680
Southern Oregon Research and Extension Center
www.extension.oregonstate.edu/sorec (541) 776-7371
Southern Oregon Land Conservancy
www.landconserve.org.....(541) 482-3069

United States Agencies

Department of Agriculture, Farm Services Agency
www.fsa.usda.gov (541) 423-6156
Natural Resources Conservation Services
www.nrcs.usda.gov
Local Office Central Point (541) 423-6157
US Forest Service www.fs.fed.us
..... (541) 618-2200
Department of Interior Bureau of Land Management
Medford District www.or.blm.gov

..... (541) 618-2200
US Fish & Wildlife Service www.fws.gov
..... (541) 957-3474
Army Corp of Engineers (541) 776-3573
Bureau of Reclamation (541) 482-2266

Irrigation Districts

Talent Irrigation District..... (541) 535-1529
Medford Irrigation District..... (541) 899-9913
Rogue River Valley
Irrigation District (541) 773-6127
Eagle Point Irrigation District..... (541) 826-3411
Gold Hill Irrigation District (541) 659-2070
Grants Pass Irrigation District..... (541) 476-2582
Little Butte Irrigation Company (541) 826-9332

Free Online Mapping Tools

Google Earth
Google Maps
Earth Explorer
Oregon Explorer Map Viewer
OWRD Water Rights Mapping Tool
Jackson County Interactive Mapping
Medford Land Information System
Web Soil Survey

Jackson Soil & Water Conservation District

89 Alder Street, Central Point, OR 97502
541-423-6159, jswcd.org

Introduction

The *Natural Resource Stewardship Handbook* was born out of the desire to bring together our previous *Rural* and *Urban Living Handbooks* to create one comprehensive handbook for the residents of Jackson County. So often we unintentionally reinforce the divide between rural and urban communities, when in Jackson County the two are inextricably connected. The landscape of our county invites interaction between residents and natural resources; between producers and consumers. If you're not convinced, check out the photo on the front cover taken from Roxy Ann Peak. Providing one handbook for our community allows for greater resource understanding, neighborly interactions, knowledge consistency, and increases the potential for real, sustainable resource conservation.

Whether you have 200 acres or .2 acres, you will find useful information in this handbook, like planting a rain garden, conserving water in your home, sharing your property with wildlife, improving your soil, or just better understanding the natural resources around you.

We want our handbook to add to your knowledge and skills, improve your practices, increase understanding of your neighbors, and encourage you to seek assistance in areas that you may need additional input.



Jackson Soil & Water Conservation District is here to assist you in turning natural resource concerns into opportunities.

A Note From the District Manager

Manager's Note

It is with great pleasure and excitement that we present this updated and combined version of our *Rural and Urban Living Handbooks* into this *Natural Resource Stewardship Handbook*. Jackson Soil and Water Conservation District (District) has grown dramatically since the first handbook was published in 2006. With 8 fulltime staff, the District is able to offer a wide range of educational programs and technical assistance for both rural and urban landowners. Assistance is available and tailored to landowner needs, in the form of answering questions on the phone to one-time site visits to helping develop full scale stewardship plans for your urban or rural property, farm, or ranch.

The District has a great working partnership with the USDA Natural Resource Conservation Service to help implement landscape level projects. The Rogue River Watershed Council is co-located in the District building and has truly enabled us to provide broad-based stewardship for individual, as well as multiple landowner projects. Additionally, we work closely with Oregon State University's Southern Oregon Research and Extension Center, Southern Oregon University, other Watershed Councils, and state, federal, and local organizations to help "Turn Natural Resource Concerns into Opportunities".

The following pages are filled with information and resources to help ensure your natural resource project is successful. You will find guidance on topics from stormwater management to improving your pastures and a multitude of other subjects to help enhance water quality, decrease soil erosion, improve our streams, rivers and other waterbodies, and manage natural resources for yourself and the surrounding community.

We hope you thoroughly enjoy reading this valuable resource.

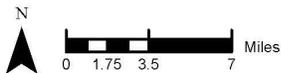
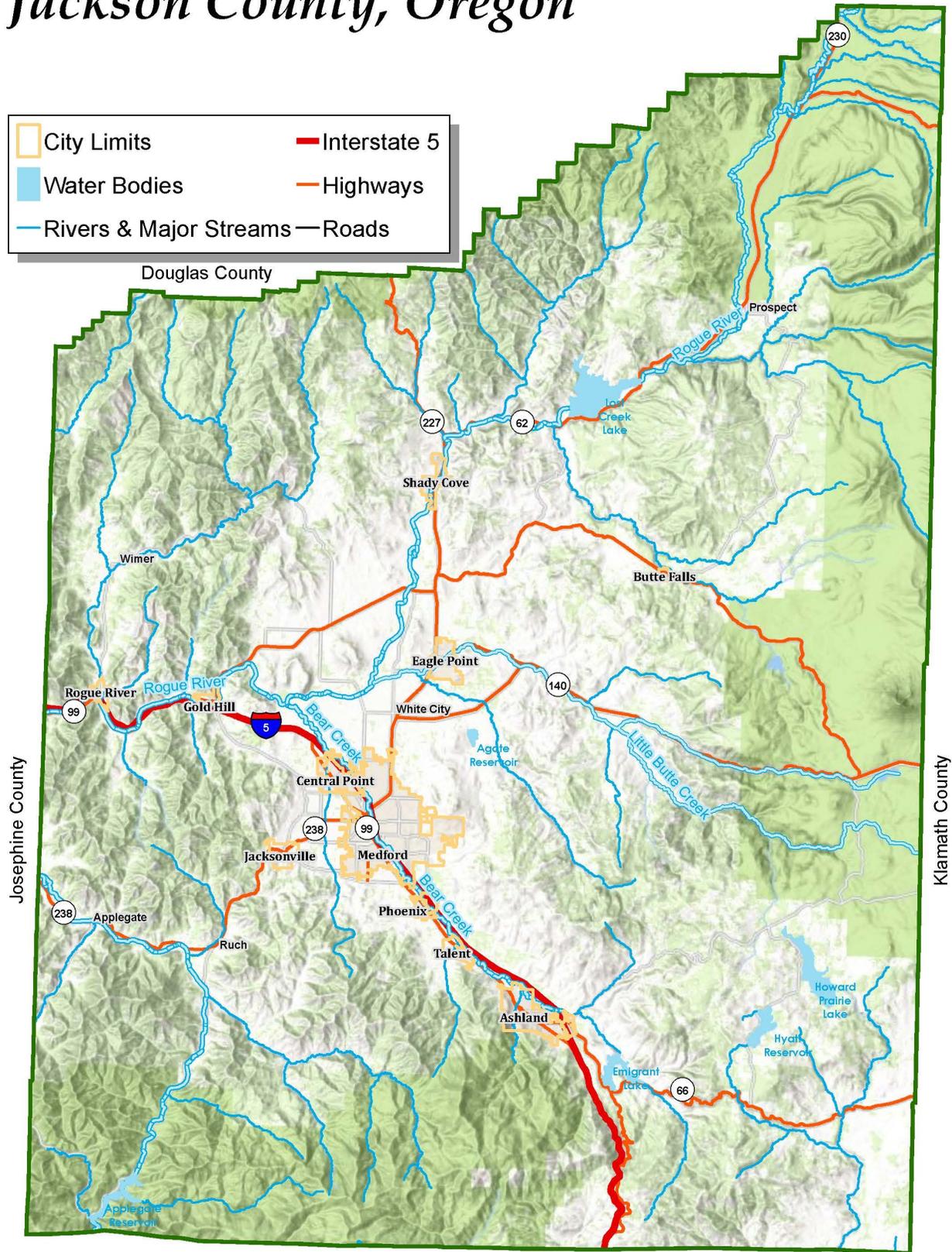
Sincerely,

Randy White
District Manager



Jackson County, Oregon

 City Limits	 Interstate 5
 Water Bodies	 Highways
 Rivers & Major Streams	 Roads



Siskiyou County (CA)

Who we are & what we do

The Jackson Soil and Water Conservation District (JSWCD) serves many roles in our community.

- We are a leader in providing scientifically based technical assistance to landowners.
- We provide financial resources to both rural and urban landowners to assist in resource conservation.
- We strive to enhance the natural environment while protecting Jackson County's cultural, social, and economic values.
- We provide education and resources to the students and citizens of Jackson County, ensuring the conservation of our local resources through citizen understanding, action, and engagement.



Who We Help

Jackson Soil and Water Conservation District works directly with Jackson County residents, cities, and educators to employ the best conservation practices for each situation.

Our Relationships

Collaborative working relationships are what makes our work possible. We work with partners on the local level including non-profits, schools, cities, the county, irrigation districts, businesses, and landowners; and partners on the state and federal levels including the Bureau of Land Management, Natural Resources Conservation Service, Oregon State University Extension Services, Oregon Department of Environmental Quality, Oregon Department of Agriculture, and Oregon Department of Forestry.

Current projects include:

- Implementing and managing the Oregon Agricultural Water Quality Management Act
- Little Butte Creek Watershed Agricultural Focus Area—soil and water quality improvements
- Pesticide Stewardship Partnership with Oregon Department of Environmental Quality—1 of 9 locations throughout the state monitoring in-stream pesticide levels.

How We Work

The Jackson Soil and Water Conservation District maintains an actively involved board, employs a professional staff, and uses volunteers, natural

resource experts, partner organizations including nonprofits and federal, state, and local agencies to improve natural resource stewardship. We achieve our goals by:

- Providing technical support, through personal, on-the-ground site visits
- Developing personalized management plans
- Seeking and providing project grants
- Offering classes and workshops

The Jackson Soil and Water Conservation District employs a District Manager, an Administrative Specialist, an Office Assistant, a Soil & Water Conservation Engineer, a Rural Natural Resource Planner, an Urban & Community Planner, an Education & Outreach Coordinator, and a Natural Resource Technician.

Measure No. 15-67

In 2006, the voters of Jackson County approved a permanent tax rate limit of \$0.05 per every \$1,000 assessed value of Jackson County property. The rate limit began fiscal year 2007-2008 and provides the District the financial capacity to meet the needs of the growing population of Jackson County. Our District customers include rural and urban private landowners, educational institutions, and towns and cities. With the financial support of Measure No. 15-67, we have been able to expand staffing, create more effective partnerships, and better meet the needs of Jackson County to conserve natural resources for cultural, economic, and ecological needs.

Jackson County: A brief History



Hanley Farm (Photo courtesy of Southern Oregon Historical Society # 9473.) The Hanley farmhouse still stands and is just NE of OSU's Extension Center.

The natural and cultural history of Jackson County is diverse and fascinating. The landscapes we see today were formed over millions of years by glacial ice migrations, massive floods, and lava flows, and are deeply tied to the cultural history of those who have lived here for generations.

Jackson County: A brief history

Native peoples, including the Modoc, Shasta and Rogue River tribes, were the first to live in the region now defined by Jackson County. These tribes were intimately connected to their resources, managing forested- and grass-lands for their greatest productivity, including the use of fire in oak woodlands. They were primarily hunter-gatherers. The men were experts in the use of bow and arrow as well as a fork tipped harpoon for fishing. Women harvested berries, fruit, nuts, and roots. Acorns were collected to produce flour used in bread, puddings, and soup.

The discovery of gold in the Rogue and Illinois River valleys lead to an influx of non-native settlers who flooded into the region. Soon a wagon road was completed which connected the remote region to California and Douglas County, Oregon. In the 1850's, tensions over land lead to a period of conflict and war resulting in hundreds of casualties and the removal of the Rogue River tribe to the Siletz Reservation. During the next two years, several small bands of Native Americans were moved to the Grande Ronde Reservation west of Salem.

Chinese immigration was considerable from 1850 to the 1870's. The Chinese worked in some of the most labor intensive industries. They were scapegoated and faced virulent discrimination.

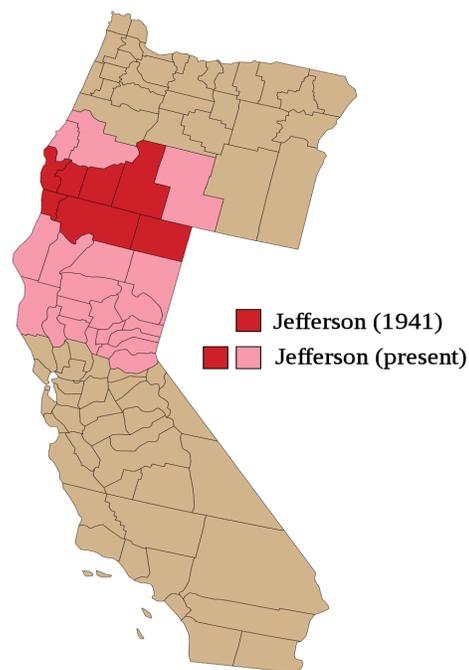
The agricultural history of Jackson County details how the industry grew to today's value of \$64+ million. The first commercial orchards were planted in 1885. See page 8 for more information on agriculture in Jackson County.

The Territorial Legislature created Jackson County—named after President Andrew Jackson—on January 12, 1852 from the southwestern portion of Lane County and the unorganized area south of Douglas and Umpqua Counties. In 1853, Jacksonville became the first county seat. In the 1880's, the construction of the Oregon and California Railroad bypassed the city, ultimately setting Medford up to become the

county seat in 1927.

The voters of Jackson County approved a home rule charter in the general election of 1978. The adoption of a home rule allowed Jackson County to govern its public service activities independent of the state's governing board. The primary change was a governing body consisting of a board of three commissioners, which continues to constitute the legislative and principal policy making agency of the county. To this day, Oregon counties have the greatest degree of local discretionary authority of any other state.

The area is geographically, ecologically, and socially a domain unto itself, seeing eruptions toward separation in *The State of Shasta* (1852), *The State of Klamath* (1853), *The Pacific Republic* (early 1860's) and *The State of Siskiyou* (1909). Even now, the area is called the *State of Jefferson* by residents, referring to the last effort toward creating a separate State in 1941.



Proposed State of Jefferson

Jackson County Facts

Our county is surrounded by the Cascade and Siskiyou Mountain ranges and includes 2,801 square miles (1,792,640 acres). It extends south to California, west to Josephine County, north to Douglas County, and east to Klamath County. It is centrally-located along Interstate 5, between Portland and San Francisco, just hours from the Pacific Ocean.

Major points of interest include the Oregon Shakespeare Festival, the historic town of Jacksonville, Southern Oregon University, the Britt Music Festival, the Rogue River, Lithia Park, and the Table Rock Mountains.

Jackson County is the sixth largest county in the State of Oregon in population. Approximately 70% of Jackson County residents live in the 11 incorporated cities (see table to the right). The county's principal industries are wood products, agriculture, manufacturing, health care, and recreation.

Medford is the largest city within Jackson County and serves as its County seat. The Rogue Valley is known throughout the country and the world for its pear orchards and roses.

The second largest city in our county, Ashland, is home of the internationally famous Oregon Shakespeare Festival which runs from February through October and sells more than 350,000 tickets each season. Ashland is also the location of Southern Oregon University.

Another tourist destination is Jacksonville, just five miles

west of Medford. The entire city is on the National Historic Registry and is home to the Britt Festival, one of the largest summer music festivals in the United States.

Jackson County—2015	
Total Jackson County population 215,567	Gold Hill 1,080
Ashland 21,505	Jacksonville 2,655
Butte Falls 445	Medford 77,240
Central Point 17,165	Phoenix 4,855
Eagle Point 8,790	Rogue River 2,090
	Shady Cove 2,865
	Talent 6,680

The county's other wonderful towns are popular locations for accessing nearby recreation and wilderness areas.

Our region has moderate weather. Unlike many western regions in Oregon, Jackson County receives only around 19 inches of rainfall a year. The average temperature in January is 39.1°F and 72.7°F in July. There are four distinct seasons, but the weather is relatively mild.

Jackson County offers breathtaking scenery in every direction, moderate weather, and superior quality of life.

Adapted from: Jackson County Homepage



Agricultural Production in Jackson County

Jackson County's agricultural production is diverse and includes: grains; beans; vegetables; melons; potatoes; tree fruits and nuts; Christmas trees; hay; beef products; cow milk; pork products; meat, milk and wool products from sheep and goats; horses; cannabis; and nursery products.

Every five years, the United States Department of Agriculture conducts an Agricultural Census of the U.S., encompassing every county in every state. The table below summarizes agricultural production in Jackson County in 2012. The 2017 USDA Agricultural Census was opened in January 2018. Data from the 2017 census will be available in 2019.

Jackson County Agricultural Facts

Total Area of Land in Jackson County	2,801 square miles (1,792,640 acres)
Total # of Population Operating Agricultural Productions	1,719
Average Age of Agricultural Producers	61.6 years
Number of Farms	1,722 (13% decrease from 2007)
Average Acreage of Farms	124
Total Acres of Farmland	214,079
Plant Crops (Sales)	\$36,955,000
Animal Products (Sales)	\$27, 172,000
Total Sales	\$64,127,000
Average Sales/Farm	\$37,240



Living in Jackson County

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Buying Property to Meet Your Expectations

Purchasing property is a big commitment. And deciding how you are going to use that property is a big, important decision. Because of Jackson County's many attractions, including wide-open vistas with picturesque, rolling hills; growing downtown cultures; agricultural products; and growing footholds in the medical and technical fields, a wide variety of individuals find themselves attracted to this area. And as we often see in our work, many people come here because it is possible to buy a little piece of land and bring a dream to life. For some this may mean raising grass-fed beef or starting a farm stand, for others it may be getting a few hens for your backyard and growing veggies to share with your friends, family, and neighbors. Whatever reason brings you to Jackson County, we want to help you realize the greatest potential of your property with the fewest headaches as possible. Consider the following if you're planning a move.

- **Know your capacity.** This includes your, your partner's, and your family's capacity. Do you have the physical fortitude to manage whatever it is you are planning? Do you have the financial backing to cover planned expenditures? What about unplanned expenditures?
- **Know your land.** If you are making the move to an urban property, do you know the city's particular zoning regulations, like how many hens you can have or if that mother-in-law cottage is legal? To a rural piece? Is the soil on your 5 acres healthy and able to support your dream farm-stand business? When is the last time the trees on your property were thinned?
- **Know your plants.** Jackson County plays host to a variety of invasive and noxious plant species. Save yourself time, money, and frustration by knowing what weeds to look out for and how you might manage them if you end up with a whole pasture full. Check out pages 66-68 for a pictorial guide to the county's biggest culprits.

- **Check the boundaries.** Who will your neighbors be? Are you adjacent to federal lands, state lands, or city lands? Did you just buy 2 acres along the Urban Growth Boundary? Do your neighbors like having neighbors?

- **Expand your knowledge.** We're never too old to learn! Read this handbook cover to cover, take some educational classes, and pay a visit to us at Jackson Soil & Water Conservation District or our neighbors at Oregon State University Extension Services.

We don't highlight these points to scare you or overwhelm you, but to help support you in securing property that fits your needs and capacity. Remember that we have resources for you. Our job is to help you be a responsible steward of our natural resources.

Looking to expand your knowledge?

Check out these programs!

- Oregon State University Extension's Land Steward's Program. *A 10 week, 1 day a week intensive program covering topics ranging from basic soil science to managing your own small-farm business. Look for registration in July.*
- Oregon State University Extension's Pasture Management Course. *An 8 week, 1 night a week intensive course to introduce and expand holistic pasture management techniques. Look for registration in January.*
- Oregon State University Extension's Living on Your Land Conference. *A weekend day-long conference hosting natural resource professionals to help you better manage your land. Look for registration in March.*
- ...And many others offered through Oregon State University Extension in Jackson County, JSWCD, and other community organizations.

Jackson County Planning, Zoning, & Building

Before selling, buying, or building on your property, check out Jackson County's Planning & Zoning information for your property. You can research using address, map ID, or tax account number. If you don't have access to the internet in your home, each branch of the Jackson County Library System provides free internet workstations for public use.

Commonly Asked Questions or Concerns

□ "How do I find setback regulations and allowed uses on a specific property?"

You can find this information in the Jackson County Land Development Ordinances under the Planning tab. All proposed building on your property must be reviewed and approved by the Jackson County Planning Department. However, you may not need a building permit based on the size of the structure or its use for agricultural purposes. You are encouraged to submit complete and accurate information with your application to assist with timely processing.

□ "What is zoning and how does it affect my property?"

A property's zoning designation determines how a property may be developed, like how many structures and what kind of animals are allowed on a parcel.

To be developed, a parcel must have been lawfully established and existing structures must have been properly permitted if further development is to be allowed.

Once Planning has authorized your proposal, you may apply for your building, electrical, plumbing, and sanitation permits.

Use Jackson County's *Property Data Online* to Find Information on:

- prior building
- zoning
- septic permits issued
- sales information
- plot maps
- tax assessment records
- property maps with specific overlays including soil type and flood plains

□ **Multiple landscape features**

If your property has certain landscape features of concern like wetlands, vernal pools, flood plains, or proximity to urban growth boundaries or airport landing areas, it is important that you understand the regulations and conditions associated with each component. Doing your due diligence ahead of time will save many headaches down the road.

□ **Property Access**

For development purposes, parcels must have legal access in accordance with requirements in effect at the time the parcel was created. Practical, physical access to the site must be possible. You will want to consider your property's fire danger when assessing access. Will your access road have adequate vegetation clearance and slope? Can you create a sufficient fire break around your structures? See pages 21-24 for more info on fire preparedness.

Local Resource

Jackson County Development Services

10 South Oakdale Avenue, Room 100

Medford, OR 97501

Planning: (541)774-6907

Building:(541)774-6927

Being Neighborly

Living in the communities of Jackson County offers the opportunity to know and work with your neighborhood closely. Neighbors play an important role in our community and our lives.

- Will your new tree shade out the neighbor's vegetable garden?
- How might your pets or livestock impact your neighbors?

Meeting Your Neighbors

By definition, a neighbor is someone who lives close by you, but "close" is a relative term. A "neighbor" may be different for urban residents and rural residents. Also, neighbors are not necessarily limited to those people living on your street. They may include the shop owners and people who work or go to school nearby.

When you move to a new neighborhood, make sure to introduce yourself. Find out if there are neighborhood activities, meetings, or groups to join. If you're involved in a project, performance, benefit, or volunteer effort, extend an invitation to those around you. The easiest approach is to take advantage of opportunities to interact as they arise — when you are shoveling snow, walking the dog, or working in the garden. A wave of the hand or a smile can go a long way in establishing trust and approachability.

Being a Good Neighbor

Good neighbors are respectful and considerate of the people around them. They avoid keeping others awake with loud parties and barking dogs. They consider how their actions might affect those around them.

Example neighborly considerations:

- How does the drainage of your roof impact your neighbor's yard?

Working Together

Good neighbors help and look out for others. This idea is illustrated in communities throughout the United States who have developed Neighborhood Watches. Their goal is to keep watch on each other's homes and if something suspicious arises a watchful neighbor calls the proper authorities.

Some problems are too big for one person to solve but there is strength in numbers. Consider forming a neighborhood coalition to tackle challenges such as traffic, weed control, street plantings, or flooding issues.

Building Community

- Get to know your neighbors.
- Plan time together as a neighborhood by organizing a BBQ or social event.
- Take pride in your community — learn about its history and be active in helping to shape its future development.
- Keep your neighbors informed if you are doing projects that will affect them.



Living Near an Orchard or Vineyard

Orchards: Facts & Tips

Nearly 5000 acres of orchards exist in Jackson County, most of these are pear orchards with some peaches and other tree fruit. These orchards contribute significantly to land-use and agricultural production in the Rogue Valley.

- **Orchards are private property.** Do not access your neighbor's property without permission. There are times when entering an orchard may be dangerous to your or your pets' health.
- **Winter is pruning time.** Workers will be throughout the orchard. In late January and February, pest control begins for dormant trees with applications of oil and sulfur to control insects and diseases. Expect to see signs warning about the chemicals being used and entry restrictions. You may hear or see wind machines used to mix layers of air to prevent frost damage to opening buds.
- **Spring is bloom time.** To protect yields, frost protection continues into May until the threat of frost is over. Sprays are applied at this time to manage insects and diseases.



Sprays used in orchards and vineyards are frequently tested for efficacy and safety and have strict use requirements. Recently some non-toxic pest control products have been adopted in commercial orchards such as kaolin clay (above) which gives pear trees a dusty white appearance but protects fruit from insect pests and sunburn.

Additional Orchard & Vineyard Information

Contact the OSU Southern Oregon Research and Extension Center at (541) 776-7371 or visit www.extension.oregonstate.edu/sorec



You may see pheromone misters hanging in orchards. Misters disrupt the mating of codling moth and have contributed to reduced use of broad-spectrum insecticides.

- **Summer is irrigation and fertilization time.** The fruit grows rapidly during this time. Orchardists will apply the last sprays for damaging insects.
- **Fruit is picked beginning in August.** Look out for trucks hauling fruit from orchards and on roads nearby.
- **After harvest, orchardists apply fertilizers, oil, and sulfur to feed and protect trees through the winter.**

A pesticide may only be legally used in accordance with its label. Pesticide drift off an orchard/vineyard onto your property or off your property onto an orchard/vineyard, violates this law. Oregon Department of Agriculture can receive concerns, investigate, and enforce this regulation. Contact ODA's Pesticide Division at: 503-986-4635 to make claims or for more information.

For information about pesticide risks and safety, call the National Pesticide Information Center: 1-800-858-7378

This section contributed by OSU Extension General Ag Agent Gordon Jones, PhD

Living Near an Orchard or Vineyard

Vineyards: Facts & Tips

In Jackson and Josephine Counties, there are approximately 3500 acres of wine grape vineyards, and new vineyards continue to be planted.

Like other farming operations, vineyards generate noise and dust from field equipment. Vineyard neighbors should recognize that these are normal operations and are protected by the state's Right to Farm Bill.

- **Winter is pruning time in wine grape vineyards.**
- **Some viticulturists choose to apply pre-emergent herbicides to berms (area where the vines are planted) in March, prior to bud-break.**
- **April marks the beginning of frost protection.** Wind machines or overhead sprinklers may be used. An additional herbicide application is often made at this time. In general, frost concerns are over and herbicide sprays are completed by mid-May.
- **May marks the beginning of tilling, mowing, fertilization, and spraying.** Workers will be busy moving foliage wires and tucking shoots into the trellis.
- **Come June, the vines bloom, and the fruit sets.** Many vineyards typically begin irrigating at this time. While most vineyards are now irrigated with drip systems, a few older plantings are still irrigated with sprinklers.
- **In August, the canopies are mechanically hedged, and the fruit begins to soften and change color.**
- **Vineyards do spray pesticides.** The most common pesticide used in our vineyards is sulfur to control powdery mildew. It may be applied throughout spring and summer (typically from April to August). While sulfur smells like rotten eggs, its toxicity is low to humans and pets.
- **As a vineyard neighbor, know that phenoxy-type herbicides (such as 2, 4-D or Crossbow) can be devastating to vineyards.** These compounds are often used to control poison oak, blackberry, and broadleaf weeds in pastures or lawns. These herbicide may volatilize during high temperatures and be carried on the wind



Symptoms of advanced powdery mildew infection on grape leaves during summer.

for miles. Even very low concentrations of these herbicides can significantly damage vineyards and other broadleaf plants. Herbicides containing dicamba also pose a volatilization risk and can severely damage nearby vineyards.

- **Harvest begins in early fall** and may continue through October. Although most vineyards in the Rogue Valley are still harvested by hand, mechanical harvesters are becoming more common.

If you have questions or concerns about nearby orchards or vineyards, attempt to get in touch with the land owner or manager. Managers are not required to disclose what they are spraying in an orchard or vineyard, but many are willing to discuss this or warn you in advance of when they plan to spray.

Jackson County Ordinance No. 2002-21 requires that property owners control diseases and insect pests of fruit trees on their property to limit the spread of those pests and their economic costs to nearby orchards.

Thank you to Phil VanBuskirk for his contribution to previous versions of this section of the handbook.

Cannabis & Hemp in Southern Oregon Agriculture

Legalization History

In 2014, Oregon residents voted to allow those over age 21 to possess, cultivate, and sell cannabis and related products in the state. In January of 2016, the state of Oregon began accepting applications for licensure for the production, processing and sale of cannabis. Several agencies are directly involved with this new industry. The Oregon Health Authority (OHA) regulates medicinal cannabis. The Oregon Liquor Control Commission (OLCC) regulates recreational cannabis. The Oregon Department of Agriculture regulates the production and processing of cannabis and hemp including the management and enforcement of:

- Water quality
- Food safety
- Pesticide use
- Weights and measures

Cannabis & Hemp in Agriculture

Cannabis and hemp cultivation utilizes a variety of methods and practices, ranging anywhere from small-scale potted indoor medical/recreational gardens to large-scale outdoor grows and row-cropped hemp fields. Types of cannabis cultivation sites may include indoor gardens, outdoor gardens, and greenhouse gardens, used for growing cannabis for commercial or personal use.

Regulations surrounding the cultivation, processing, possession, and sale of cannabis can vary by counties and municipalities, so check with local regulatory agencies for the most up-to-date regulations.

Water Rights

The Water Resources Department regulates water use in Oregon, and cannabis is subject to the same water rights laws as other agricultural crops. All use of surface and groundwater sources (except some springs) requires a water right to be put to use for crop cultivation. The local Watermaster's office can determine if a property has a water right. In some cases, a new water right can be obtained for a property. See page 45 for more information on water rights.

Terms to Know

Medical Garden—a cannabis growing operation intended for distribution to medical cannabis dispensaries or patients with a medical cannabis card.

Recreational Garden—a cannabis growing operation intended for distribution to recreational cannabis dispensaries, or for personal use.

Cannabis—a genus of flowering plants that are cultivated, processed, and marketed in the State of Oregon for medical and recreational use.

Hemp—Cannabis with a low concentration of psychoactive compounds (THC) grown specifically for plant fiber, seeds, and/or the high CBD content.

THC—tetrahydrocannabinol, the psychoactive compound in cannabis.

CBD—cannabidiol, a medicinal compound found in cannabis, non-psychoactive.

Sediment—soil that washes off fields and streambanks and deposits in streams.

Special exemptions and regulations concerning water use include:

- Springs that do not form a natural channel and flow off the property at any time of the year
- Rainwater that is collected from an impervious surface such as a roof
- Groundwater specific regulations:
 - ◇ Up to 5,000 gallons per day for commercial or industrial use, but *not* for growing crops,
 - ◇ Up to 0.5 acre of irrigation water for non-commercial lawn and garden use. The 0.5 acre rule applies to *any* crop grown for personal use. **Any crop intended for sale cannot be irrigated by a domestic well.**

Cannabis & Hemp in Southern Oregon Agriculture

Pesticides and Fertilizers

Excess application of pesticides and fertilizers can run off and pollute local streams and other water bodies. Improper use and storage of these chemicals can lead to groundwater contamination. The following best management practices help producers prevent contamination of ground and surface water, and maintain local water quality:

- The EPA has not listed any pesticides for use in the production of cannabis; therefore it is illegal to use commercially available pesticides on cannabis plants. ODA has developed a list of state-approved products that can be used. Find it here. <https://tinyurl.com/yayyh16v>
- Always follow the labels for pesticide and fertilizer application rates. Excess application can degrade water quality if irrigation water runs off into nearby water bodies.
- Never store pesticides and fertilizers in well houses or other buildings that have a connection to groundwater sources. Do not flush these chemicals into septic systems.

Land Grading and Erosion

Grading of land can cause erosion that contributes to sedimentation of streams and water bodies, impacting local water quality, recreational activities, quality of drinking water, and quality of suitable fish and wildlife habitat. Removing vegetation alongside streams also increases sedimentation. Creating roads and growing sites in fields previously cropped can permanently destroy the fertile soil beneath. Consider the following practices:

- Avoid or minimize grading whenever possible to reduce erosion and sedimentation. Use sediment fences, straw bales, or other erosion control methods to reduce soil loss.
- Reseed any area of bare soil as soon as possible after disturbance.
- Retain all riparian vegetation along stream banks at a width of at least 50'.
- Preserve agricultural soils by building grow sites and roads on marginal soils or at the edge of fields.

Light Pollution

Artificial lighting systems can generate light pollution

which disrupts the natural circadian rhythm governing the biological processes of all life forms, including vegetation and wildlife. Light pollution can be a serious detriment to local life-forms and rural aesthetics. The following practices can mitigate some of these impacts:

- When using artificial light at night, use blackout tarps or other light deprivation systems to contain light within the greenhouse.
- Observe local ordinances concerning operation of greenhouse lighting systems.

Neighborliness

Aside from potential impacts to natural resources, the production of cannabis can have other impacts on neighbors and the community. Producers should keep the following in mind while managing their cannabis growing operation:

- Maintain access roads to reduce dust and prevent erosion.
- Cannabis plants may have a strong odor, especially during the flowering phase of the growth cycle. The natural odor of cannabis is not regulated, nor enforceable.
- Keep the facility clean and organized. Unsecured equipment or supplies encourage theft or vandalism, and uncontained waste and soil amendments can attract vermin.
- Build structures and conduct operations at ordained distances from fence lines to reduce impacts to neighboring properties. Planting fast growing native trees and shrubs can create an aesthetic barrier for sight and sound.

Regulatory Agencies

Oregon Health Authority

Oregon Liquor Control Commission

Oregon Department of Agriculture

Oregon Water Resources Department

Oregon Department of Environmental
Quality

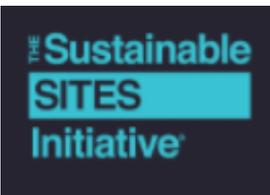
Jackson County

Local Municipalities

Creating More Sustainable Communities

Sustainable Sites Initiative & Leadership in Energy and Environmental Design

The Sustainable Sites Initiative (SITES) and Leadership in Energy and Environmental Design (LEED) are compatible to one another. SITES focuses on sustainable practices in landscapes with or without buildings, while LEED focuses on the built environment and creates a system for measuring the sustainable design of buildings and communities.



SITES began as a cooperative effort to promote best management practices and ecological design of the landscape. The SITES guidelines provide an excellent starting point for making

landscape decisions that improve ecosystem health. There are many practices that can lessen our impact on the landscape, from salvaging plants on construction sites to restoring soils after development. The complete Guidelines and Performance Benchmarks are available at the Sustainable Sites Initiative's website: www.sustainablesites.org.

LEED has become an industry standard, with companies and homeowners striving to achieve the Silver, Gold, or Platinum certifications for green buildings. The more points you rack up in your project the higher your score. The certification can also make your home more marketable. LEED also awards points for landscape choices, such as providing access to bike paths, open spaces, and trails, connecting the community, and reducing dependence on automobiles. LEED also strives to promote stormwater management and to prevent soil erosion. For more information refer to the U.S. Green Building Council's website: www.usgbc.org.

Many of these principles can be applied to landscape projects in your home, business, and community. Check out the standards, rating system and checklists for LEED development for homes at the US Green Building Council's website: www.usgbc.org.



Oregon Lifelong Housing

“Sustainability” can represent the social environment as well, in relation to the liveability of homes and communities. According to AARP studies, about 90 percent of older Americans wish to stay in their homes for as long as possible. It is therefore important to make accommodations to the home, and to even look for certain features before you buy.

Rogue Valley Council of Governments, in partnership with AARP of Oregon, offers Lifelong Housing Certifications for new and remodelled homes.

There are 3 Levels of Certification:

1. **Visitor Accessible.** The main entertainment area, including entrance, a bathroom and hall, are accessible for a person in a wheelchair.
2. **Enhanced Accessible.** Includes level 1 features. In addition, the kitchen, a bathroom, and at least 1 bedroom are fully accessible. A person in a wheelchair can perform all personal and housekeeping functions.
3. **Custom Accessible.** The home has been customized for personal accessibility, such as a chair lift or ceiling track. Includes all features in levels 1 and 2.

If you are interested in learning more about Lifelong Housing, and how you or a loved one can maintain independence in your own home, contact your local Senior and Disability Services of Rogue Valley Council of Governments at 541-423-1383, or Lifelonghousing@rvcog.org. Visit lifelonghousing.org for more information.



Enhancing Communities

Urban Communities

Building community helps us feel connected, enjoy our urban areas, and work together to enhance our natural resources. You can become more involved in your urban community by doing the following:

- **Block parties** are an easy and fun way to get to know your neighbors. See the info box below on how to put together your own block party.
- **Neighborhood plans** are action-oriented and created by residents in a neighborhood. The plans outline step-by-step for each person involved. Medford has a Neighborhood Resource Division. Past projects have included neighborhood parks, street light improvements, sidewalks, recreational centers, and even providing a facility for homeless youth. See the info box below. You can also contact the JSWCD for assistance in planning and implementing your project.
- **Neighborhood Improvement Grants** are available in Medford for projects that encourage community and neighborhood participation. Projects can include Neighborhood Street Tree Partnerships where neighbors come together to plant and maintain street trees. Other projects focus on physical improvement projects for recreation, public safety features, public spaces, and community gardens. Check with your city for similar programs.

Adapted from: City of Medford
www.ci.medford.or.us

Local Resources

- For an idea kit on starting a block party and for a Special Event Permit see: www.ci.medford.or.us
- If you are interested in developing a Neighborhood Improvement Plan in Medford contact the City Manager's office at (541) 774-2000 or citymanager@cityofmedford.org

Rural Communities

Communities in rural areas are different than urban areas. Neighbors may reside further away from your property than an urban neighborhood. Properties tend to be larger, and your dependence on your natural resources tend to be stronger. Connecting with neighbors is essential in rural areas. Simply talking across the fence is a great place to start. Increased communication and collaboration will build trust with neighbors.

- **Communicate** with your neighbors. If you are working on a project (such as irrigation conversion), make sure to notify your neighbors
- **Collaborate** with neighbors on projects
- Develop rural community work groups
- Host neighborhood potlucks

Ideas to Develop Community

- Attend local city or county meetings to participate in your community's decisions and direction. Go to your local city website to look up meeting times, or visit the Jackson County's event calendar at jacksoncountyor.org for county meetings, located in Medford.
- Share your mechanical or food preserving skills with neighbors and create skill-sharing centers.
- Look for volunteer and community service opportunities that address issues you care about.
- Take time to develop a sense of place by learning the area's natural and cultural history.
- Support local businesses and services.
- Be a leader in your community and take steps to make things happen.
- Participate in or help plan events like potlucks and festivals.

Nature Centers, Camps, & Community Festivals

Nature centers are created to encourage communities to better understand the natural history of their community. Local nature centers in Jackson County offer special programs and classes for adults, families, and schools.

Coyote Trails School of Nature

Previously known as the Jefferson Nature Center. Learn about the unique ecology of the Rogue Valley through immersive educational experiences. The educational center is located in South Medford behind the US Cellular Fields. Programs, classes, and events are available for adults and children throughout the year. On-site demos include a solar pavilion and pollinator gardens. Check out their website for more information and an updated schedule of classes.

<http://www.coyotetrails.org/>

North Mountain Park Nature Center

Visit North Mountain Park to see demonstration gardens, wildlife areas, and Bear Creek. The parks hosts classes and events for adults and children, including local natural and cultural history, gardening, nature crafts, and sustainability. Check out their website for more information and an updated schedule of classes.

www.northmountainpark.org

Festivals and activities are a great way to learn more about the environment and to make local connections. Look for:

Bear Creek Festival

This all ages festival focuses on educating participants about the ecological and cultural significance of Bear Creek and its tributaries through hands on experiences, storytelling, and entertainment.

Bear Creek Stewardship Day

Join your neighbors and community businesses in cleaning up the Bear Creek Greenway. Look for fall and spring clean-up events and sign-up the whole family.

Rogue Valley Earth Day

Learn about and experience energy conservation, solid waste reduction, local food and farms, green products and building materials, renewable electricity sources, transportation alternatives, and more.



Two “Coyote Pups” explore nature with Coyote Trails School of Nature. Photo Credit: Coyote Trails Facebook page.



Students learn about nature by acting it out in a game at North Mountain Park Nature Center.

Rogue Valley Bird Day Celebration

This event, coordinated by the Klamath Bird Observatory, Rogue Valley Audubon, and the City of Ashland, offers outdoor learning opportunities for birders.

JSWCD Forest & Range Day Camp

Jackson Soil & Water Conservation District hosts the week-long Forest & Range Day Camp each summer. See the JSWCD “Events” webpage for more information.



Campers at our 2015 day camp take a break from collecting macroinvertebrates for a photo.

Living With Wildfire in Southern Oregon

Fire Ecology

Southern Oregon is fire country. With our hot, dry summers and abundant fuels, it is not a matter of “if” wildfire will occur, but “when” and “where.” While wildfire can threaten homes, property, and lives, it is important to recognize that wildfire plays important ecological roles, from reducing fuels to improving nutrient cycling and encouraging germination of new trees and wildlife habitat creation.



Steep slopes, weather patterns, and abundant fuels drive fire behavior in southwest Oregon.
Photo credit: ODF

Historically, fires occurred frequently in this region, every 5 to 14 years depending on location, ignited by both dry lightning storms and by Native Americans who used fire as a landscape management tool. These fires tended to be low in intensity and kept woodland and forest areas relatively open. Today, after decades of fire suppression and limited logging activity, many forest and woodland areas have grown denser and fuels have accumulated. As a result, when fires occur, they tend to burn hotter and are harder to control.

For landowners living in the wildland-urban interface (WUI), living with wildfire means protecting your home and property from fires while managing forests and woodlands to be more fire-resistant. For communities, it means suppressing wildfires when and where necessary, but also encouraging the use of fire where appropriate.

Firewise Communities

Whether you live in the fringes of the city or the country, you need to prepare for wildfire. The fire protection district you live in can help you and your community become a Firewise community. See page 83

to identify your fire protection district. Firewise communities develop an action plan to reduce the risk of wildfire to the homes in your community. Firewise communities can also access resources to assist with removing wildfire fuels in and around the community. For more information contact your local fire protection agency, the Oregon Department of Forestry, or www.nfpa.org/firewise.

Terms to Know

Wildland-Urban Interface (WUI)—urban areas intermingled with surrounding forests or wildlands

Home Ignition Zone (HIZ)—the home and everything within a 200 foot radius

Defensible Space—buffer between the home and the wildland area where fuels are reduced

Ladder Fuels—Low-hanging limbs or small trees beneath larger trees that carry fire from the forest floor to the forest canopy

Simple Fire Prevention Measures to Manage the Home Ignition Zone

Personal Wildfire Preparedness

- **Have an evacuation plan that includes the Six P's.**

The Six P's of Wildland Fire Preparedness:

1. People and pets, including livestock
2. Papers, phone numbers, important documents
3. Prescriptions, vitamins, eyeglasses
4. Pictures and irreplaceable memorabilia
5. Personal computer hard drive and disks
6. Plastic (credit and ATM cards) and cash

- **Know your neighbors.** Establish phone trees to spread information about wildfire activity in your area.

- **Stay informed.** Oregon Dept. of Forestry maintains www.swofire.com,

Living With Wildfire in Southern Oregon

Making Your Home Fire Resistant

- Your roof should be made of fire resistant material, such as metal or asphalt shingles. Wooden shake shingle roofs can ignite under ember showers or from radiant heat.
- Keep leaves, pine needles, and other debris off roofs, out of gutters, and away from siding. Litter can catch falling embers and ignite.
- Attic and crawlspace vents should be screened with mesh no larger than 1/4".



Adequate preparation helped save this home from wildfire. Photo credit: ODF

Around the Home

- **Make your address visible from the road.** Firefighters can't defend what they can't find.
- **A firefighter's first responsibility is their own safety.** They will not defend a structure if they cannot do so safely. Keep vegetation away from your driveway. Have a way for large vehicles to turn around or have a second exit.
- **Never plant vegetation that generate large amounts of dead material, such as juniper or cypress, near the home.** Many native plants are fire resistant.
- **Never store firewood next to the home during fire season.**

Before and after photos of a fuels reduction treatment. Note the tree on the left and the downed log in the foreground on the right. The home in the background can now be seen. Photo credit: ODF.

- **Pay attention to flammable items on and near your home.** Welcome mats, flammable patio furniture, and wooden fences increase the risk of fire reaching your home.

The 3 Ways Fire Can Reach Your Home:

Radiant heat- extreme temperatures caused by burning vegetation or structures adjacent to your home

Surface fire – flames reaching your home from burning landscaping, falling branches, or other fuels

Embers – hot ash that may fall on structures from burning material nearby

Fire Resistant Forest Management

- Reduce, but do not entirely remove, surface fuels, such as small branches and other debris, from the forest floor.
- Remove small trees and prune low hanging limbs to reduce ladder fuels that could spread fire to the forest canopy.
- Create spaces between islands of trees through selective thinning.



Living With Wildfire in Southern Oregon

Fire Prevention Agencies

The Oregon Department of Forestry is responsible for wildland fire protection and suppression on all State owned and private forest and range lands in unincorporated Jackson County. These responsibilities include regulating outdoor burning and industrial operations on forest lands and providing landowners assistance by inspecting and offering advice on fire prone rural properties.

The Rogue River Siskiyou National Forest District and local Bureau of Land Management offices are responsible for fire protection on national forests and rangelands. They will cooperate to assist other agencies in fire suppression.

Jackson County rural fire protection districts provide fire protection within their respective district boundaries. Highly trained firefighters respond to wildland and structural fires. Their primary responsibility is the protection of lives and improved property. However, they also respond to wildland fires and will assist other agencies.

Firewise Communities

Whether you live in the fringes of the city or the country, you need to prepare for wildfire. The fire protection agency in your Fire District can help your community become a Firewise community. Firewise communities develop an action plan to reduce the risk of wildfire to the homes in your community. Firewise communities can also access resources to assist with removing wildfire fuels in and around their community. For more information contact your local fire protection agency, the Oregon Department of Forestry, or www.nfpa.org/firewise.

READY SET GO!

Oregon has adopted an easy to remember method for alerting the public about evacuation levels in their area:

READY – Have your evacuation plan in place and stay alert for information on fire activity in your area.

SET – Pack your emergency kit and be prepared to leave at a moment's notice. Remember to follow *The 6 Ps* !

GO! – Leave immediately and follow your wildfire evacuation plan.



Use the diagram above to help you conceptualize defensible space for your property. Remember that even urban properties should consider fire safety and proper property planning where appropriate. Illustration credit: cityofalbany.net

Living With Wildfire in Southern Oregon

Follow the Rules

Oregon's Defensible Space Act, or Senate Bill 360, requires that landowners within forestland-urban interface areas create defensible space by reducing excess vegetation around homes and other structures and in some cases maintain fuel breaks along property lines and roadsides. Visit www.oregon.gov/ODF to learn more about Oregon's laws regarding owning rural property in and near wildlands.

Jackson County Ordinance Sections 8.7 and 9.5 outline specific wildfire safety requirements for properties identified within the Hazardous Wildfire Area Map developed by the Planning Division. They include setbacks around homes, compositional requirements for roofs, spark arresters for chimneys, property address signage, and setbacks along driveways and access roads. Visit www.jacksoncountyor.org/ds to learn more about Jackson County's laws regarding owning rural property in and near wildlands.

Open Burning

A common method of treating woody debris and yard waste, open burning is tightly controlled in Jackson County. While it is an effective means of disposal, it can contribute to unhealthy air quality levels during certain times of the year. Always contact your local fire district before you burn. Call (541)-776-7007 to verify your daily burn status in Jackson County.

Open burning is prohibited in Jackson County during fire season. Fire season varies from year to year, but generally begins in June and ends in October.

Open burning is also prohibited:

- throughout Jackson County when the National Weather Service declares an air stagnation advisory.
- within the Air Quality Maintenance Area (AQMA) from November to February. Visit www.oregon.gov/deq/aq for a map to see if you live in the AQMA.



Signs like this alert you to the current fire danger in your area. Smoke from a nearby fire is visible in the background.

- within many incorporated cities. Contact your local fire department for information on open burning in your area.
- when certain materials, such as tires, plastic, wet garbage, petroleum and petroleum treated materials, asphalt, and industrial waste, are burned. Burning these materials is prohibited as they create dense smoke and/or noxious odors.

Alternatives to Open Burning

If you cannot burn woody debris in your area, consider the following options:

- **Chipping.** Wood chips make excellent landscape and mulch material. They conserve moisture in the soil, maintain soil temperature, and reduce weeds.
- **Composting.** Leaves and other fine woody material can be composted to create excellent soil amendments.
- **Waste disposal.** Most waste disposal services accept yard waste, and some even process it into energy or compost

Living in a Watershed

We All Live in a Watershed

We all live in a watershed, whether we live within a city's boundaries or off the grid.

For some people, "watershed" may be an unfamiliar term; you might even picture a small outbuilding housing a pump and all its attendant pipes, tanks, and gauges. A watershed, however, is simply the entirety of a geographic area whose rainfall and snowmelt drains into a common body of water. Most of Jackson County is found in the Rogue River watershed; the rain and snow that falls on this area eventually runs into the Rogue River, which ultimately drains into the Pacific Ocean.

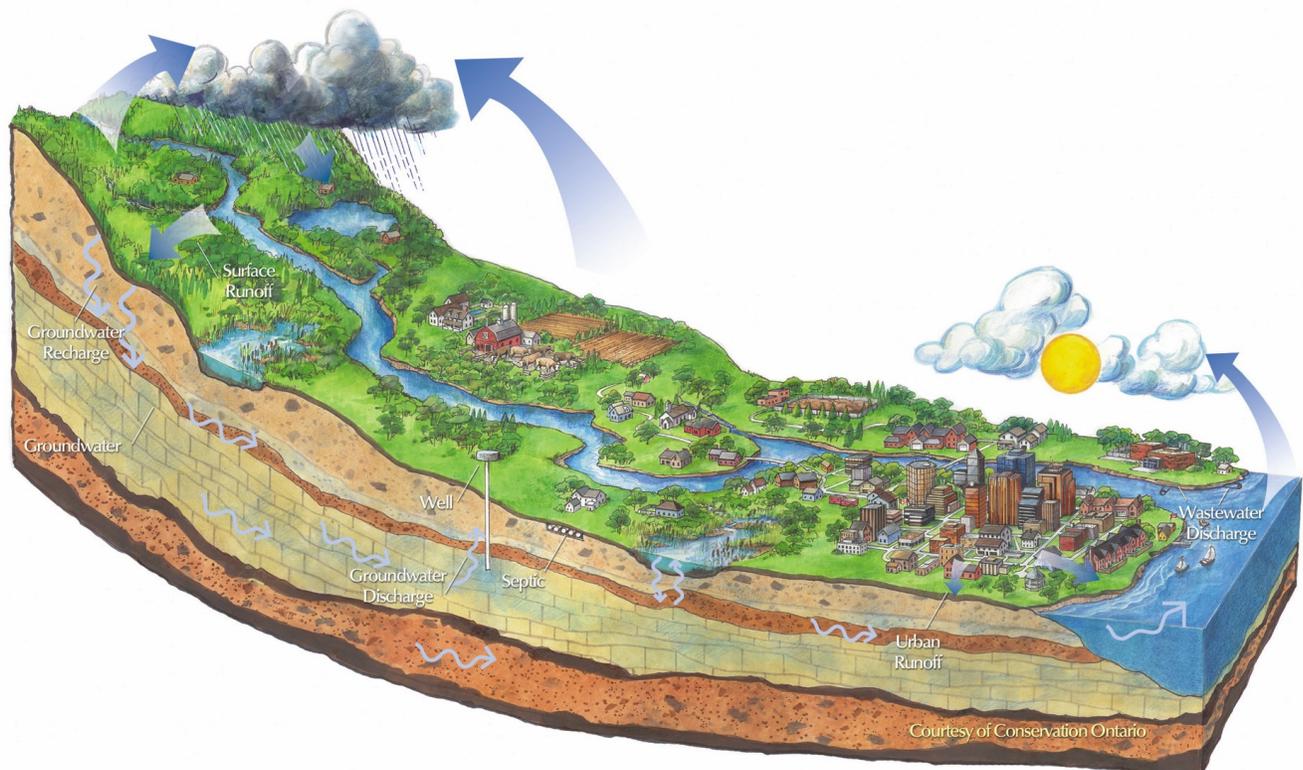
Your Watershed Address

However, unless you live right on the bank of the Rogue, you probably live in at least one additional smaller watershed – a subwatershed of the larger Rogue River watershed. For example, your property might drain into a creek that drains into a larger creek that ultimately drains into the Rogue. Your watershed "address" might be the Yankee Creek watershed, which is a subwatershed of the larger Antelope Creek

watershed, which is part of the larger Little Butte Creek watershed, which is, in turn, a subwatershed of the Rogue River watershed.

Watershed Health is Directly Tied to the Health of Our Rivers and Streams

Regardless of which subwatershed you live in, all of your activities affect the watershed(s) in which you live, and thus the health of our rivers and streams. Motor oil dumped down a storm drain in Medford ends up in Bear Creek, negatively affecting the water quality in it and the Rogue River. Sediment from construction projects in Shady Cove end up in the Rogue. Pesticides and fertilizers from farmlands in Sam's Valley may wash down into Rock Creek, then on to Sam's Creek, and then the Rogue. Livestock waste from a horse farm near Applegate may run down into Thompson Creek, to the Applegate, and eventually to the Rogue. Everything is connected in a watershed.



Living in a Watershed

Why you should be concerned about your watershed's health

Everything that happens in a watershed affects the quality of its waters, both surface water and groundwater – the primary sources of drinking water for all humans, pets, livestock, and wildlife. Surface water in our rivers, streams, and lakes also provide essential habitat for numerous plant and animal species such as the threatened Coho Salmon; recreational opportunities for residents and visitors alike; and water for our region's agricultural and manufacturing industries. Once these waters become degraded we put our personal health, ecological health, and the region's economy at risk.

What you can do to improve and protect watershed health

There are many things residents of the county, both rural and urban, can do to improve and protect watershed health. Here are just a few actions to consider:

- Know your watershed address; know your watershed council.
- Follow directions for safe application of fertilizers, herbicides, and pesticides; look for less toxic alternatives.
- Don't dump anything down a storm drain.
- Protect against erosion and sedimentation during any construction project.
- Don't dump grass clippings or any other landscaping debris into any water body.
- Don't recreate on wet or highly erosive soils.
- Plant barren and eroded areas with native plants.
- Fence livestock away from streams and wetlands; provide off-channel watering facilities for them.
- Sweep driveways and patios instead of hosing them down.
- Convert your driveway and walkways to pervious surfaces (e.g., gravel, grass, permeable pavers).
- Service your septic system every three years.
- Leave trees and vegetation along stream and river

banks; avoid planting lawn all the way to the water's edge

- Improve irrigation efficiency
- Don't litter – ever!
- Pick up after your pet and dispose of the waste in the trash or your toilet
- Keep manure piles away from waterways and cover them during the rainy season
- Become a member of or volunteer for your local watershed council
- Consult with your local watershed council and Jackson Soil & Water Conservation District to see how you can better manage your properties for watershed health

Local Resources

Jackson Soil & Water Conservation District

89 Alder Street
Central Point, OR 97502
541-423-6159
Website: <https://www.jswcd.org/>

Applegate Partnership & Watershed Council

P.O. Box 899
Jacksonville, OR 97530
Phone: 541 899-9982
E-mail: contact@apwc.info
Website: <http://www.applegatepartnershipwpc.org/>

Rogue River Watershed Council

89 Alder Street
Central Point, OR 97502
Phone: 541-423-6158
E-mail: info@rogueriverwc.org
Website: <http://www.rogueriverwc.org/>

Seven Basins Watershed Council

P.O. Box 909
Gold Hill, OR 97525
Phone: 541-601-4202
Website: <http://www.7basinswc.org/>

Resource Conservation in Your Home

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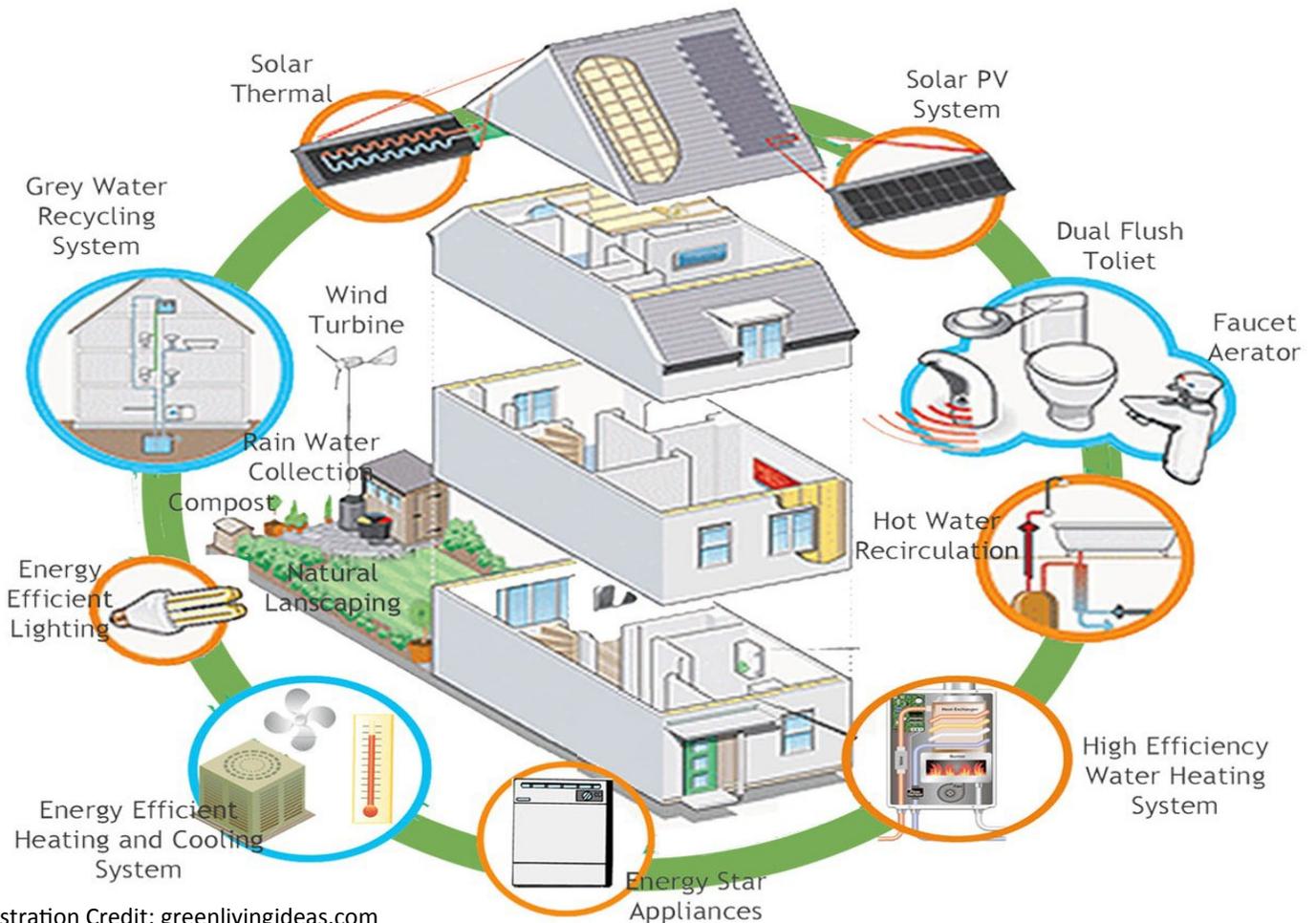


Illustration Credit: greenlivingideas.com

Resource Conservation Starts at Home

We can have the greatest impact on our natural resources through the choices we make at home. By considering how we build or remodel our homes and use our property we can reduce our impacts on the environment and save money in the long-term.

Realizing Cost-Efficiency through Efficient Resource Use

- Energy efficiency and water conservation are realized over the lifetime of the home.
- Resource efficient landscaping such as xeriscaping and native plant gardens can reduce water use.
- Home energy audits can help you and your family identify where you are doing well, and where you may need to make some changes.
- Check with local City Governments and energy suppliers for available rebates that you may be eligible for when you convert to more efficient practices.

Using Alternative Energy Sources

Many options exist today to help you and your family tap into the earth's renewable energies. Consider making the conversion to:

- Solar
- Wind
- Biomass
- Geothermal



Build or Remodel with Conservation as the Goal

- Replace old, inefficient appliances and plumbing features with those EnergyStar and Water Sense rated or otherwise designed to save money and energy
- Consider purchasing salvaged construction materials such as bricks, pavers, and wood rather than new materials.
- Check that new materials are harvested or produced with sustainable practices.

A Healthier, more Sustainably Conscious Home

- Complete painting projects with low-toxin paints, look for “Low Odor” & “Zero VOCs.”
- Consider how much ventilation and/or filtration your home has. Can you add houseplants, roof vents, or air filters?
- Purchase products that are: made in the USA; feature certifications such as Sustainable Forestry Initiative or EnergyStar; or made from recycled materials.
- Recycle and reuse all that you can.
- Purchase quality over quantity. This will reduce waste and the hassle of re-purchasing cheaply made products.
 - Look for products that use minimal packaging. Or use your own containers and buy in bulk. Find a reusable container like a peanut butter jar, take it to a cashier, have them get an empty “tare” weight, and fill it with your desired product and label with the item number.
 - Take reusable bags every time you shop. Most stores offer discounts for the use of reusable bags—usually about 5 cents per bag used.

Reduce, Reuse, then Recycle

Reduce: One of the easiest ways to conserve is to cut back on what you use daily. Think before you buy something:

“Do I really need this?”

“Can I borrow or rent this instead?”

Buy less, think more, be resourceful!

Reuse: Finding multiple uses for something can drastically reduce the amount of waste you produce. Any time you buy or sell an item second-hand using resources like garage sales, online classifieds, auctions, or thrift stores, you are providing an additional use for a product. Consider what can be repaired rather than replaced. Look for opportunities to be thrifty and creative.

- Can your old clothes become a scarecrow for your garden?
- Can you refurbish old furniture rather than getting new?

Recycle: When you have exhausted all use from a product make sure to recycle it where facilities exist.



Solid Waste Disposal & Recycling Options

Several options for recycling and waste disposal exist in the Rogue Valley. The city you live in will determine your recycling and reuse disposal provider.

Make sure to follow your recycling provider's guidelines to ensure that recycling loads are not contaminated with non-recyclables. See the contact information below.

Rogue Disposal & Transfer and Recycling

www.roguedisposal.com

(541) 779-4161

8001 Table Rock Road, White City.

Service Area: Medford, Central Point, Phoenix, White City, Jacksonville, Applegate, & surrounding rural areas.

Recology Ashland Sanitary Service

www.recologysanitaryservice.com

(541) 482-1471

170 Oak Street, Ashland



Ashland Recycling Center

(541) 482-1471

220 Water Street, Ashland

Service Area: Ashland, Talent, & surrounding rural areas

Southern Oregon Sanitation

(541) 826-5691

42 Ball Road, Eagle Point.

Service Area: Eagle Point, Sam's Valley, Gold Hill, Shady Cove, Butte Falls, Prospect, & surrounding rural areas.

Valley View Transfer Station

(541) 482-1471. 3000 Valley View Road, Ashland.

Accepts electronic waste, recyclables, & bulky items.



Water Conservation at Home



Illustration Credit: nocoenergystarhomes.com

Water is a precious resource. Only about .05 % of water on Earth is available for drinking. As the Rogue Valley's population continues to grow, conserving water becomes ever more important.

As you begin to make water efficiency changes, watch your water bill and see the savings add up!

Consider making a few of these changes in your home to conserve water:

Throughout Your Home

- **Check faucets and pipes for leaks.** A small drip from a worn faucet washer can waste 20 gallons of water per day. Larger leaks can waste hundreds of gallons—a leak that fills a liter container in 30 minutes will waste 2,192 gallons of water/year.
- **Use your water meter to check for hidden water leaks.** Read the house water meter before and after a two-hour period when no water is being used. If the meter does not read exactly the same, there is a leak to find!
- **Install faucet aerators.** For about \$5-10, water flow from faucets can be cut up to 50%. All household faucets can be fit with aerators. This is an excellent economic home water conservation method.
- **Insulate water pipes.** Easily and affordably

insulate pipes with pre-split foam insulators. You'll get hot water faster and save electricity and water. Insulate all hot water pipes — and the first six feet of cold water pipes .

In the Kitchen

- **Wait for full loads to run the dishwasher.** Consider replacing your old dishwasher with an **Energy Star®** model to save even more water, and energy too.
A load of dishes cleaned in a dishwasher can use 37% less water than washing dishes by hand. If you must wash dishes by hand, avoid running the water when scrubbing dishes. Try filling the basin with clean water for rinsing rather than running water for each dish.
- **Minimize use of kitchen sink garbage disposal units.** Start a compost pile instead.
- **Keep a container of drinking water in the refrigerator, instead of letting the faucet run until the water cools down.**
- **Avoid letting the water run when rinsing vegetables, cleaning dishes, or defrosting food.**

Adapted from: Greg Seaman, www.eartheasy.com

Water Conservation at Home

In the Bathroom

- ❑ **Install water-saving shower heads.** Older showerheads use 5 to 10 gallons of water every minute. Modern showerheads use less than 2.5 gallons per minute. WaterSense models use even less.
- ❑ **Take shorter showers and save many gallons of water.** The average 8 minute shower uses approximately 17 gallons of water. Shortening your shower to 5 minutes could save approximately 10 gallons of water!
- ❑ **Don't use the toilet as an ashtray or wastebasket.** 3 to 5 gallons of water are wasted each time you flush a piece of trash.
- ❑ **Check your toilets for leaks. A leaky toilet can waste 10,000+ gallons of water/year!** Put a bit of food coloring in your toilet tank. If, without flushing, the color begins to appear in the bowl within 30 minutes, you have a leak that should be repaired.
- ❑ **Increase toilet efficiency.** Replace an old toilet with a Watersense toilet and cut water use by up to 70%.
- ❑ **Save 10+gallons of water/day!** Put an inch or two of sand or pebbles inside two plastic bottles to weigh them down. Fill the bottles with water, screw the lids on, and put them in your toilet tank, safely away from the operating mechanisms.



- ❑ **Turn off the water while you brush.**
- ❑ **Rinse your razor in the sink.** Put a few inches of water in the sink basin for rinsing.

In the Laundry Room

- ❑ **Wait until you have full loads of laundry to run your washing machines.** Or, adjust the water level to fit the size of the load.
- ❑ **Replace old washing machines with efficient Energy Star models,** which can use 40 - 75%, less water and energy than older machines.

In Your Yard

- ❑ **Use a broom instead of a hose to clean off the driveway, patio, or deck.**
- ❑ **Cut back on landscape water use with the use of a rain barrel or native plantings.**

Using Graywater

Water from your shower and faucets can be used to flush toilets. Water from washing machines can also be used to water your landscape.



Using Rainwater

Rainwater collected off your roof into a tank can be a great way to store water for future use on your landscape.

Check with your utility for resources or incentives and to find out if any permits are necessary.

Information provided in part by: City of Ashland's Julie Smitherman & Medford Water Commission, medfordwater.org

Energy Conservation at Home

Fight the Light

Keep lights off when no one is in a room. When you leave a room, turn off the light. For lights frequently left on, make a sticker or a sign to hang next to the switch that says "Lights Out."

When possible, use compact fluorescent light bulbs (CFLs). **These lights use 1/4 of the electricity as incandescent bulbs**, while putting off the same amount

of light. Make sure you dispose of CFLs properly, such as at your local hardware store, as they contain mercury, a dangerous heavy metal able to contaminate many gallons of water. For a longer lasting option and more ecologically conscious light, consider LED lights.



CFL bulbs, above left, are an energy efficient alternative to incandescent bulbs. LED bulbs, above right, are another alternative that lasts longer than CFLs and are mercury free.

LEDs are more expensive in the short-term, but save replacement and electricity costs over time and are free of mercury.

If you need to leave a security light on over night, change the incandescent bulb to a compact fluorescent. It will last months, maybe years, and save energy and money. Some compact fluorescent bulbs come in yellow so they won't attract bugs.

Batteries

Americans use an average of eight batteries a year per person. Batteries contain heavy metals—like lead, arsenic, zinc, cadmium, copper, and mercury— and when disposed of improperly can contaminate water and soil for years. Instead of throwing batteries in the trash, take them to a toxic waste disposal area or find a battery recycling program at a local business.

Reduce your impact by purchasing rechargeable batteries and limiting your use of battery-powered devices.

In the Office or Living Room

Turn off the TV when no one is watching. The same goes for computers, stereos, and appliances

— if no one is using it, turn it off.

Most electronic devices continue to draw electricity even when turned off. To combat this energy leak, plug devices into a powerstrip and turn the entire strip off when devices are not in use.

In the Kitchen

Use a microwave to save energy and heat smaller portions of food. Microwave ovens use around 50% less energy than conventional ovens. For large meals, however, the stove is usually more efficient. In the summer, using a microwave creates less heat in the kitchen, which saves money on cooling costs.

In the Yard

If you have a small lawn, consider getting a manual push mower, rather than a gasoline or electric powered mower. Use a rake instead of electric or gasoline leaf blowers.

Quick Tip!

Is your refrigerator leaking cold air?

Close the door on a dollar bill, and then see how easily the dollar slips out. If the dollar slides out easily, the door is probably leaking. Consider replacing the gasket.

Is an energy hog lurking in your garage?

An old refrigerator in the garage could be costing your family \$120/year to operate!

Adapted from: The California Energy Commission

Heating & Cooling Energy Conservation

Many of us use twice as much energy as necessary to heat and cool our homes. With a few simple changes you can realize big savings.

No-cost / Low-cost Improvements

- **Use a programmable thermostat and set it to automatically fit your schedule.**
- **In Winter, wear a sweater and set your thermostat at 65-68 °F during the day and 58-60 °F at night.**
- **In warm weather, set your thermostat to 78 °.** When no one is home, set the thermostat at 85°
- **In summer, turn on ceiling fans or other fans.** Moving air can make you feel 5 degrees cooler without running the air conditioner.
- **Have your furnace and gas appliances serviced annually by a qualified contractor to ensure efficiency and safety.** For a list of certified contractors call NW Natural at (877) 243-5855.
- **Replace or clean your furnace filters monthly during high-operating season (a minimum of four times a year).** Keep your furnace clean, lubricated and properly adjusted.
- **Keep heating vents and air returns clear.**
- **Seal your ductwork to save energy and improve air quality.** Leaking ducts can waste as much as 30 % of the heat produced.
- **Adjust vents to keep specific rooms in your home at a desired temperature.** Do not close more than two vents in an average sized house to avoid overworking your furnace.
- **Use bathroom or kitchen fans only as long as needed to vent moisture or fumes.** In just one hour, these fans can blow away a houseful of warm or

cool air.

- **Caulk small holes and cracks around plumbing pipes, fans, vents, and fireplaces.**
- **Seal door and window frame leaks with caulk or weather-stripping. Use spray foam to seal air leaks in and around your basement, attic, and crawl space.** Take a ribbon and hold it to the edges of all doors and windows. If the ribbon blows, you've found a leak!
- **Use draperies, awnings, or blinds to slow the loss of warm or cool air through windows.** In winter, keep window coverings open on sunny days to let in the sun's warmth and close them at night to insulate against cold outside temperatures. In summer, keep coverings closed to avoid solar heating.
- **Close dampers when the fireplace or woodstove is not in use, but wait several hours after the fire dies down.**

Smart Investments

Some improvements qualify for cash incentives through the Energy Trust of Oregon as well as state or federal tax credits. Look for the Energy Star label for help determining the energy savings of products.

Adapted from: NW Natural www.nwnatural.com.



Energy Rebate & Incentive Programs

Pacific Power's Wattsmart Incentives for Oregon

Pacific Power, with **EnergyTrust** of Oregon, has services and cash incentives available to its customers in Oregon.

Visit: pacificpower.net under the "Residential" tab for more information.

Be **wattsmart**
Begin at home



Avista's Rebates for Oregon Customers

Avista Natural Gas has partnered with **EnergyTrust** of Oregon to provide its residential customers with cash incentives for new energy-efficient upgrades. If you own a business, consider making upgrades for efficiency through Avista's "Business Upgrades" cash incentives program.

Visit: myavista.com under the "Save Energy" tab for more information



City of Ashland Water & Energy Rebates

In an effort to aide their customers in making the transition to energy efficient appliances, the City of Ashland offers several cash rebates.

- **Energy Star** appliance rebates
 - ⇒ Electric Dryer
 - ⇒ Washing Machine
 - ⇒ Refrigerator/Freezer

- **WaterSense** 1.28 gallon/flush toilets

- **Simple Steps Northwest** lighting program instant rebates
 - ⇒ simplestepsnw.com



Visit: ashland.or.us for more information

Medford Water Commission Toilet Rebates

Get up to \$85 back for every toilet replaced with a WaterSense 1.28 gallon/flush toilet model.

Visit: medfordwater.org under the "Conservation" tab for more information

Call: 541-774-2436



Using Alternative Energy at Home

Alternative energy enables us to use the sun, the wind, and plant and waste materials to power our daily energy needs. While no single approach will solve all of our resource concerns, diversifying our energy sources will ultimately reduce our impact on the environment while saving money.

Solar Energy Step outside on a hot, sunny day and you'll experience the power of the sun's heat and light. You can use solar energy to:

- Heat your home through passive solar. The orientation of the house itself along with strategically placed windows, skylights, and plants heat and light your home.
- Use an active or passive solar heating system to heat your water for baths or a pool
- Generate your own electricity with solar panels.
- Dry your clothes on a clothesline
- Install solar powered gates and fences.
- Try solar garden lanterns or holiday lights.

Wind Energy Human beings have harnessed wind energy for hundreds of years — from windmills for pumping water or grinding grain to today's electricity generating wind turbines. If you live in an area with consistent, steady breezes of 10 mph you may be able to consider using wind for your renewable energy upgrade.



Passive Solar housing design takes advantage of the sun's energy by the way the structure is oriented and the strategic placement of windows and trees.

Ways to Use Biomass Energy Any time we use plant matter or animal waste as a source of fuel we are using biomass energy. Most often we think of firewood as our primary source of biomass for heating our homes. But, we can also use biomass to fuel vehicles, generate electricity, and develop bio-based products.

Biofuels Ethanol and biodiesel are the most common biofuels, often made from corn or recycled vegetable cooking oils. Large U.S. automobile manufacturers offer several models as flexible fuel vehicles, at little or no additional cost.

Biopower You can buy clean electricity generated from biomass. Electricity is generated from the burning of organic materials that would otherwise end up in a landfill. Ask your utility company for options.

Bioproducts Visit www.biopreferred.gov for more information on buying biobased products. Products include: detergents, inks, fertilizers, and bioplastics—biodegradable plastic.



Managing your Property's Resources

If you are a landowner, you are a land manager. Whether that land is a city lot or 100 acres, you are responsible for its health and functioning. Use the resources and checklists in this section to assist you in creating a plan for your property, better manage stormwater, learning common native and nonnative plants, and much more.

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Creating a Site Plan for Your Property

Introduction to Site Plans

A site plan maps out your property, which will help you visualize existing features on your property, and where you can improve.

Materials Checklist

- Graph Paper
- Pencil
- Ruler
- Optional: printed aerial photo of your property

1. Make a Base Map

Walk around your house and measure, or pace out, the distances of physical features. Mark said features on your graph paper, or your aerial photo. Determine your scale. Your base map can include the following:

- Buildings
- Downspouts
- Paved Areas

2. Add Layers and Physical Features:

Next add layers of trace paper over the map, or photocopy your drawing, and begin drawing other features of the landscape. Such layers could include:

- Soil Type
- Slopes and Low Spots
- Trees and plants

3. Map the Conditions of your area:

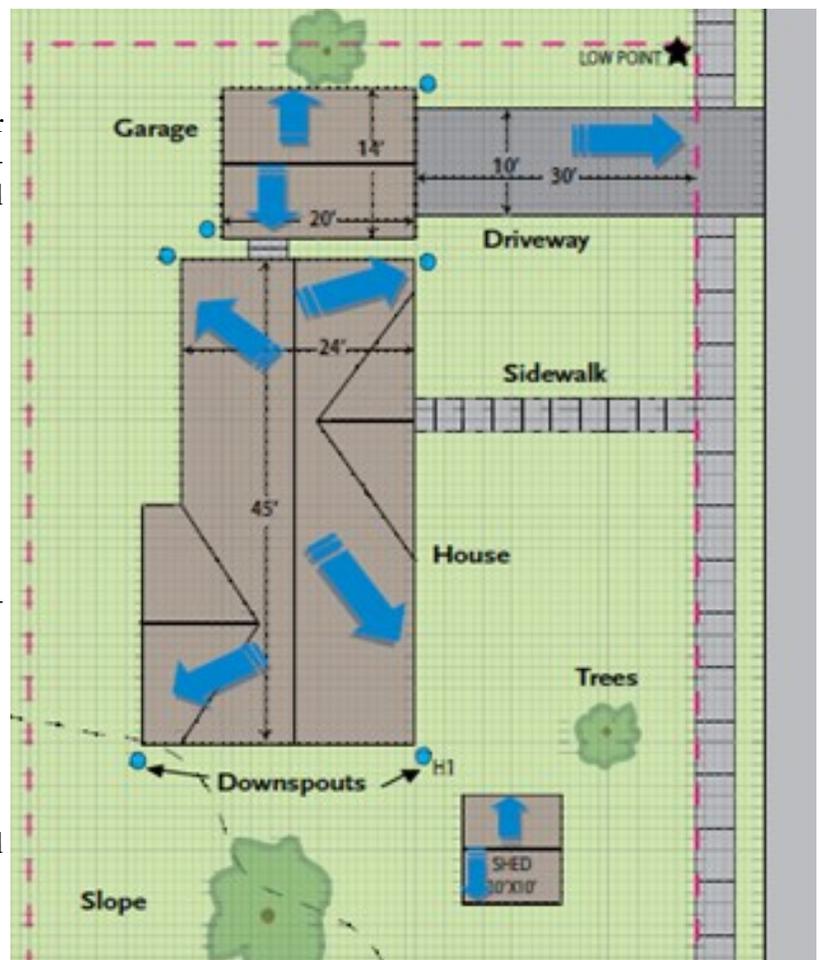
- North Arrow
- Sunny and shady areas
- Rain flow direction
- Mark direction off of roof and other impervious surfaces

4. Start to Plan Improvements

- Determine areas of interest
- Determine style preferences
- Determine existing use of yard (do you need to keep any lawn for children or pets?)

Things to consider as you plan:

- Determine average rainfall for your area.
- Look for flooding and erosion problems.
- Permits, laws, local codes, and regulations.
- Preserve views from house, porches, and decks.
- Know the depth to the water table.
- Mark septic system location if not on city sewer.
- Record well location if not on city water.
- Distance to forest or surrounding properties.
- Seasonal changes in sunlight.
- Direction of prevailing winds.
- Entertainment areas (seating or play areas).
- Privacy screen(s) and fences.
- Rain gardens or rain barrel locations.
- Ideal viewing areas for watching wildlife.
- For rural properties, follow rules and regulations regarding raptor or heron nesting areas and winter range considerations for deer and elk. Call ODFW for more information ,(541) 826-8774.



Example Site Plan showing water flow, downspouts, and measurements of structures.

Understanding & Managing Your Soil

Rich, healthy soil is teeming with life—moles, pillbugs, beetles, earthworms, and teeny tiny microscopic bacteria, fungi, and protozoa are all likely to call a healthy soil home. One teaspoon of fertile soil contains over 1 billion bacteria. One handful of soil can contain more creatures than there are people on the planet. These soil organisms are critical to nutrient cycling and the conversion of plant waste into soil. Without healthy soil organisms, we cannot have healthy topsoil. No topsoil leads to a wasteland of dustbowl-like conditions, with unfertile soil unable to grow the plants we need for food and medicine.

Why Learn about Soil?

Understanding your soil can help you to grow a thriving garden, conserve water, and prevent erosion. Knowing your soil type is the first step for making important decisions on your property, such as where to build a house or plant a garden. Your soil's depth to the water table or bedrock often limits how your property can be used.

Understanding the soil on your property is key to beginning to solve problems on your property, such as compaction, erosion, or water ponding.

In Jackson County, there are at least 110 different types of soil originating from a diversity of parent-rock material!

Soil Characteristics

Soil is rarely made of one single component of either sand, silt, or clay. Instead, soil is often a mix of the three components. The ratio of soil components determines how fast water infiltrates to plant, tree, and shrub roots and the availability and quantity of nutrients.

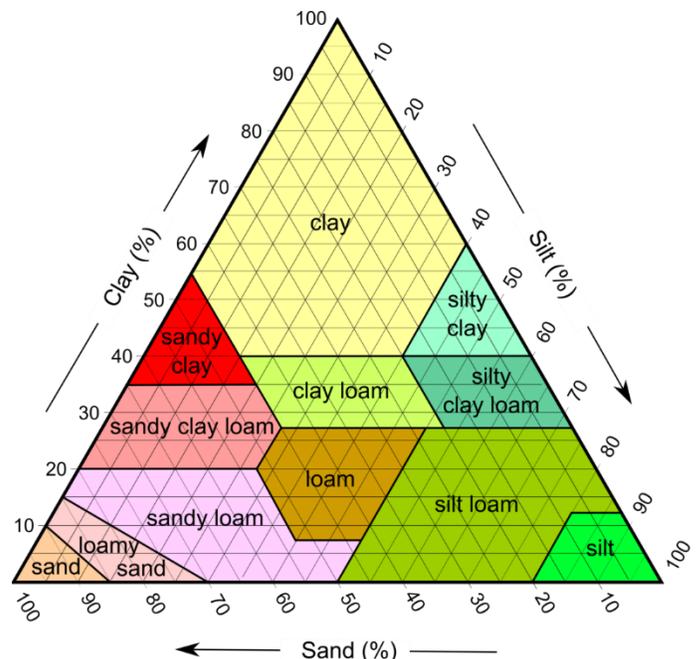
Sandy Soils absorb water quickly without puddles forming on the surface; however this trait also means they dry out quickly. Plants growing in sandy soil need to be watered more often than in other soils. Too much water all at once will leach out nutrients. Instead, water

frequently with less water.

Silt Soil particles are much smaller than sand particles. Silt soil holds onto nutrients more easily than sandy soil. Silt soil drains well and holds moisture well.

Clay Soil particles are different from sand and silt. They are tiny and close together, making water infiltration slow. With clay, you will need to water less frequently to allow soil to partially dry. Water slowly to allow infiltration. Overwatering plants in clay soil can lead to root rot and diseases. There are plants and trees that are best suited to this type of soil.

Loam Soil is a balanced combination of 40% sand, 40% silt, and 20% clay. Loam absorbs water evenly with little puddling or runoff. It holds moisture longer than sand. Many plants thrive in this rich soil.



A soil texture triangle can assist you in visualizing how your soil may be interacting with your plants, irrigation, and rain water.

Understanding & Managing Your Soil

Soil Structure

Soil structure refers to how the soil particles come together to form aggregates or 'clods'. Some soils, like beach sand, have very little or no structure, while clay soils create large solid masses impenetrable by roots. Soil that has aggregates somewhere between these two extremes provides the best root space for plants to grow in. They also provide better permeability for water (see below).

To determine your soil structure, dig up a few shovel of soil and get your hands dirty! Look for soil aggregates that can fit in your hand without breaking off of larger masses.

Porosity & Permeability

Porosity measures how much pore, or open, space soil has. Soils that have greater porosity, such as clay soils, can **store** more water than soils with less porosity, such as sandy soils.

Permeability measures the ability of water to **move** through the soil. So while clay particles have greater porosity, their permeability is much less than that of sand.

Test this out by pouring a cup of water out over sandy soil and then again on clayey soil.

Due to the permeability differences, you will find that the water permeates much faster on the sandy soil compared to the clayey soil. This means that in your garden or pasture, if you have too much sand, your irrigation water might just run through the soil before the plants' roots can take it up. Or if your soil is high in clay, that water may sit too long on the roots, causing them to effectively suffocate.

Because of these factors, it is important that the soil you intend to grow in has a happy balance of porosity and permeability. A soil suitable for growing plants will have moderate porosity, one that holds some but not an excessive amount of water, and moderate permeability allowing the soil and plants adequate drainage.

Soil Problems and Solutions

Compacted Soil

- Caused by construction, excess mechanical tilling, or foot traffic.
- Leaves little space for air and water in soil, making it difficult for plants to access nutrients.
- Mitigate by adding layers of mulch and organic matter. Organic matter will encourage the return of a healthy soil organism community.

Overwatered Soil

- Mitigate by grouping plants with similar water needs to reduce unnecessary watering.
- Install a properly designed irrigation system to further reduce overwatering and minimize nutrient loss.

Overuse of Fertilizers

- Save money and protect soil organisms with the use of compost or other organic nutrients instead of synthetic fertilizers.
- Get your soil tested to see what, if any, nutrients are lacking before adding nutrients.
- Use compost in place of chemical fertilizers. Compost will provide nutrients as well as organic matter, which will improve soil and soil organism habitat.



Understanding & Managing Your Soil

Working With Your Soil

Identifying the Soil on Your Property

There are several ways to discover what kind of soil you have on your property.

- Look up information about your property's soil online and print a helpful map that delineates your property's soils. Search "Web Soil Survey" to print your own soils map. Stop by the JSWCD office for help interpreting your map.
- Perform at home, do it yourself, basic soil tests (read further for more detail)
- Send off a sample to a professional soil analysis lab for more comprehensive composition analysis, including nutrient and mineral content.

Basic Soil Testing

You can learn a lot about your soil by adding water to it!

- Collect a sample of soil from below the organic layer of the surface.
- Sample several places in your yard and mark the results of the simple tests below on a map.

Feel Test: Rub moist soil between your finger tips. **Sand** will feel gritty, **silt** will be smooth, and **clay** will be sticky.

Ribbon Test: Moisten soil to a putty-like consistency and make a soil ribbon, or rolled strand, using your fingers.

- **Sand** will not form a ribbon.
- **Silt** will make a weak ribbon.
- **Clay** will make a long, strong ribbon.

Mason Jar Test: Conducting a quick mason jar test will show you approximately how much of your soil is **clay, silt, and sand**.

1. Collect a sample of soil from the desired area. You will want enough to fill the jar about 1/2 full.
2. Fill the jar with water, leaving enough room to shake to mix.
3. Tighten lid and shake vigorously for a few minutes.
4. Leave the jar to settle out for several hours or overnight.
5. Return to your jar and measure the full height of the settled soil (it should now appear in layers).
6. Next, measure each consecutive layer of your soil's components. The soil sample will have settled out into layers of silt, clay, and sand.
7. Calculate the % of each component by dividing each smaller height, by the total height, and multiplying by 100. These numbers will be the approximate percent of each component

Use the soil texture triangle on page 39 to see what your soil's composition is.

Local Resources

For more soil testing assistance including pH testing, nutrient testing, and fertility testing for farms and gardens contact OSU Extension's Southern Oregon Research & Education Center.

Call: (541) 776-7371

Stop by: 569 Hanley Road, Central Point

Stormwater Management: Low Impact Design Strategies

As we create more impervious surfaces, such as buildings, roads, and parking lots, less rain is able to enter the soil. Instead, water flows over these hardened surfaces, carrying trash, oil, leaves, and other pollutants into our streams and rivers. Fortunately, we can combat many of the negative consequences of poor stormwater management with simple design changes and improvements to our water-use practices.

Conventional Stormwater Systems

Rain has long been seen as a nuisance in urban neighborhoods, and as a result many systems have been designed to move rain water out of sight as quickly as possible—roof gutters which connect to underground piping to quickly move water to storm drains and sloped roadways to move water off the road and/or into storm drains. Doing so has greatly altered the way water returns to its natural system.

Consequences of poor stormwater management:

- Increased flow of pollutants like oil, detergent, pesticides, and animal feces into surface waters.
- Slower re-charge of natural groundwater systems, leading to a lower water table and less water available to crops and other vegetation.
- Increased nutrient loading via the transportation of fertilizers and other organic materials into surface waters.
- Faster rates of erosion along roadways and

streambanks.

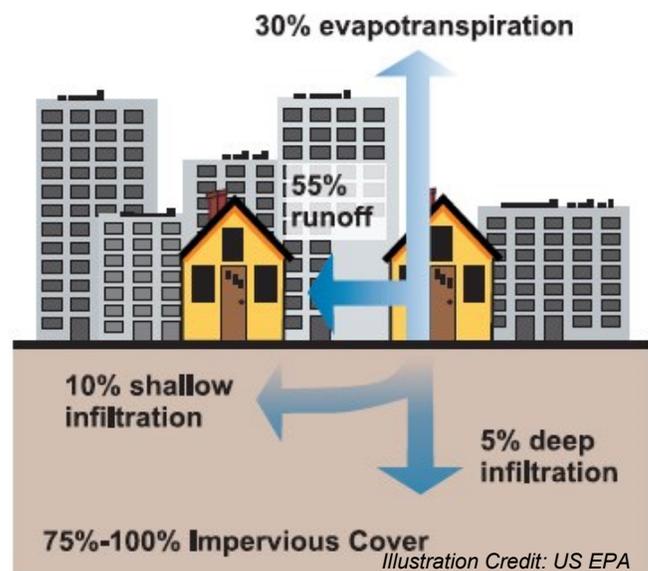
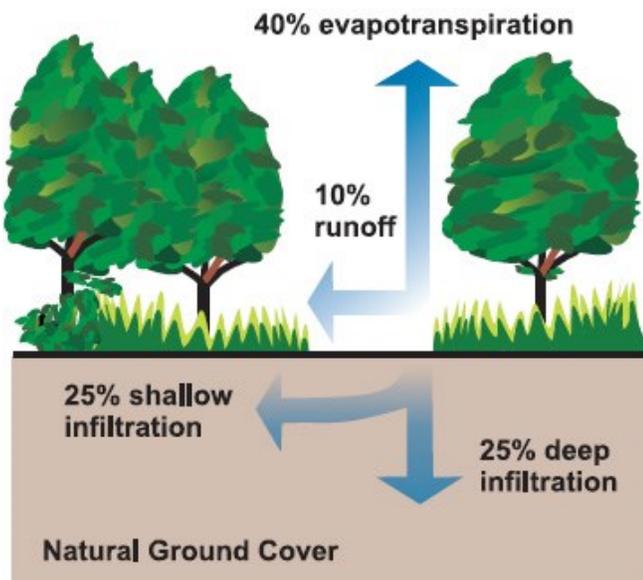
- Overall decrease in health of soil and in-stream habitats



Stormwater goes into gutters and down storm drains directly to creeks and other surface waters without being cleaned.

Pervious Pavement

Pervious pavement reduces stormwater runoff and flood risk by allowing water to infiltrate into the soil. This reduces the negative impacts of poor drainage on your property, and also reduces contaminants such as car oil, from washing into storm drains and nearby streams. Pervious pavement can be found in concrete, asphalt, flagstone, and gravel styles.



The illustrations above show how stormwater behaves differently between natural and manmade environments. Precipitation that falls on natural surfaces better infiltrates the soil, compared to precipitation falling on manmade, impervious surfaces, where the majority of water runs off.

Stormwater Management: Low Impact Design Strategies

Rain Gardens

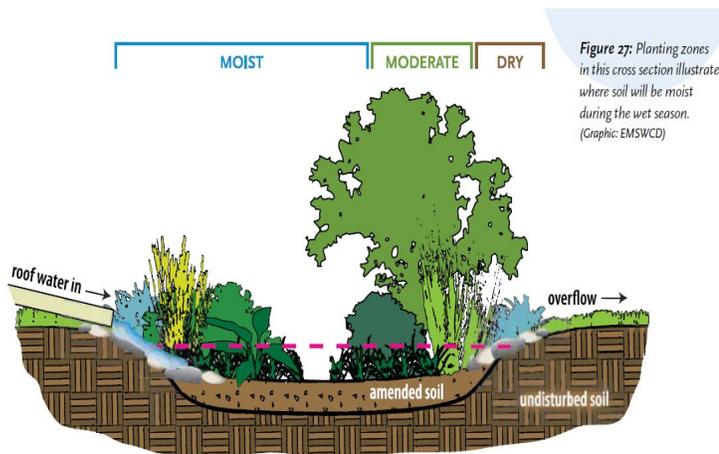
A rain garden is a sunken garden bed that collects and treats stormwater runoff from impervious surfaces. It captures and filters out sediment and other pollutants using native plants, and allows the water to be absorbed by soil.

There are two main types of rain gardens:

1. **Infiltration:** *cleans, detains, & reduces* stormwater runoff and infiltration, vegetated

2. **Filtration:** engineered version of infiltration, *detains* stormwater run-off by using piping.

Bioswales



Rain garden schematic showing soil moisture gradient and associated plant types. Source: Oregon Rain Garden Guide.

Bioswales are linear, vegetated depressions in the landscape that transport and treat runoff from a variety of surfaces. Runoff may be piped or channeled. Bioswales can be “dry” or “wet”, where the former has an underlying filtering bed that allows them to drain more rapidly between storms.

Important considerations in rain garden and bioswale construction are soil type, infiltration rate, slope, location, and plant selection. To learn how to build a rain garden download a copy of [The Oregon Rain Garden Guide](#) from JSWCD’s website.



Bioswale at Twin Creeks, Central Point.

Terms to Know

Stormwater—water that comes from a precipitation event. It may soak into natural surfaces, increase erosion rates, or run-off of hardened manmade surfaces.

Groundwater—water stored under the soil’s surface. It may be stored between layers of rock, clay, or in the crevices of rock.

Water table—the depth that soil becomes saturated by groundwater. The depth may vary, or remain constant, influenced by soil type, rock type, and precipitation rates.

Nutrient loading—the process by which surface and ground waters receive excess nutrients from manmade or influenced processes. Sources of nutrients include fertilizer, detergents, manure, and yard clippings.

In-stream habitats—important aquatic habitat necessary for healthy populations of aquatic insects and native fish, including sculpin, Pacific lamprey, coho and chinook salmon, and steelhead.

Stormwater Management: Low Impact Design Strategies

Harvesting Rainwater

Rainwater can be captured throughout the rainy season to be used as landscape irrigation throughout the dry season with a rain barrel. Rain barrels can attach directly to your downspout to collect rain.



Rain barrel demonstration at North

Planters

Infiltration planters are structures or containers with open bottoms to allow stormwater to slowly infiltrate into the ground. They contain a layer of gravel, soil, and vegetation, often water-filtering rushes or sedges. Stormwater runoff temporarily pools on top of the soil, and then slowly infiltrates through the planter into the ground. Infiltration planters come in many sizes and shapes, and are made of stone, concrete, brick, plastic lumber, or wood.

Infiltration planters work best in well-draining soils. If your soil is largely clay, use a flow-through planter instead. Flow-through planters temporarily store stormwater runoff on top of the soil and filter sediment and pollutants as water slowly infiltrates down through the planter. Excess water collects in a perforated pipe at the bottom of the planter and drains to a destination point or conveyance system (*City of Portland*).

Green Roofs

Green roofs are vegetated roof systems including a waterproof membrane, a drainage layer, an engineered growing medium or soil, and a layer of plants. Green roofs minimize stormwater runoff, reduce building cooling bills, decrease noise, and improve air quality.

Rainbarrel checklist:

- Make sure the barrel is covered, has a spigot, allows for overflow, is on an elevated, stable surface, and has a system to remove debris.
- Check with your city for any required permits.

Remember, rainwater may only be collected from roofs (ORS §455.060).



Stormwater planters aid in slowing the percolation of precipitation into the ground, filtering out potential pollutants. The above planter is found at the JSWCD office.



Green roof digital rendering for a building in Portland. Illustration Credit: City of Portland

Water Rights

Water Rights Primer

A water right is a legal authorization to use a quantifiable amount of water, at a specific location, for a particular use. The State of Oregon requires users of public water to obtain approval prior to use of the water. The approval is granted in the following forms: Permit, Certificate, Limited License, or a Registration. The Water Right will indicate the season of use and the maximum diversion rate, the place of use and point of diversion or appropriation (for a well), the use, and if for irrigation, the number of acres. Contact the Oregon Water Resources Department (OWRD) for further information or to have water right research preformed. The information below is strictly for informative use and shouldn't stand in place for a conversation with your water

Surface Water Rights

A surface water right is necessary to divert any amount of water from surface water such as lakes, streams, rivers, and springs.

Exemptions Include:

- **Natural springs**, that under natural conditions exists on a parcel, where the waters of that spring do not flow into a well defined channel that flows off said parcel.
- **Stock watering** which occurs directly out of a stream with no diversion or modification of the source. Stock may also be watered from a permitted reservoir to a tank or trough, and under certain conditions, use of water piped from a surface source to an off-stream livestock watering tank or trough.
- **Fish hatchery requirements.** Water used for fish screens, fishway bypass structures, and egg incubation projects under the **Salmon and Trout Enhancement Program (STEP)** does not require a right.
- **Emergency fire fighting training.**
- **Forest management activities** including: slash burning and pesticide mixing. To be eligible, a user must notify OWRD and the Oregon Department of Fish and Wildlife. Users must also comply with any restrictions imposed by OWRD relating to the source of water to be used.
- **Land management where water use is not the primary intended activity.**
- **Rainwater collection and use** from impervious surfaces.

Ground Water Rights

A ground water right is necessary for withdrawal of water from a well or sump. Submittal and approval of a transfer application to OWRD may provide changes to a water right.

Exemptions Include:

- **Stock watering**
- **Irrigation of less than ½ acre of noncommercial lawn or garden**
- **Single or group domestic well use of less than 15,000 gallons per day.**
- **Single commercial or industrial well use of less than 5,000 gallons per day.**

Other Water Right Considerations

Most ponds require a water right to store water. A water right is also required to use the water stored in the pond.

In general, no new water rights are available in Southern Oregon. However, if a landowner has access to the Rogue River or Applegate River an individual can enter into a contract with the Bureau of Reclamation for release of stored water from Lost Creek or Applegate reservoirs and apply for a water right to use that stored water from OWRD.

Irrigation: Understanding your Resource

What is Irrigation?

Irrigation is the intentional application of water for the purpose of sustained plant growth and/or optimized production.

Irrigation does not only apply to large agricultural productions, and includes the irrigation of lawns and backyard gardens.

Jackson County is one of the top 10 counties in the nation for the amount of acres of irrigated pear orchards and in the top 50 for wine grapes. However, the majority of irrigated land is used for forage (hay and pasture) .

Irrigation accounts for the greatest use of water by humans in Jackson County.

There are many tips and tricks to use your water the most effectively, but there is no cheap ‘magic wand’ that will lead to perfect water use. All irrigation systems take time and effort to optimize the use of this limited resource effectively.

Here, we’ve provided some information to get you thinking about this resource and some strategies for efficient irrigation water use.

Poor management of irrigation water can lead to:

- Weeds, like water-loving rushes and dry-loving medusa head or yellow star thistle.
- Reduced Crop Yield
- Water Quality Issues
- Reduced Soil Health
- Higher Irrigation Pumping Costs
- Higher Fertilizer Costs
- Unhappy Neighbors

Proper management of irrigation water can lead to:

- Increased Crop Yields
- Efficient Fertilizer Applications
- Higher quality forage and hay
- Improved Soil Health
- Lower Irrigation Pumping Costs
- Improved curb appeal

Most of the water used in Jackson County for irrigation is considered surface water. Reservoirs and canals allow water to be stored and distributed throughout the



You may get water from an Irrigation District, Private/Shared Ditch, or directly from the source.

growing season. Groundwater is typically only used for domestic or livestock purposes.

Check out the Irrigation District Map on page 84.

District 13 Water Master Shavon Haynes

10 S Oakdale, Rm 309A
Medford, Oregon 97501
Phone: 541-774-6880
Fax: 541-774-6187

Irrigation: Understanding your Resource

New Landowners or Prospective Buyers interested in learning IF and WHEN you can use your irrigation water:

- Contact Oregon Water Resources District (OWRD) District 13 to ensure you are legally able to irrigate before dropping a pump in the nearby creek or canal. Contact your Irrigation District for specific irrigation information.
- Contact JSWCD.
- Talk with the previous owner and neighbors. Always locate and verify legal documents and information by contacting OWRD.

When can I use my irrigation water?

April 15th thru October 15th is typical. Check your water right with OWRD or contact your Irrigation District.

How often can I irrigate?

Flood Irrigated lands or those on shared and lateral ditches are typically on a 'rotation'. Whereby you are allowed to irrigate a certain number of hours every 2 weeks. Contact your Irrigation District or your Private/Shared Ditch for information about your rotation. 'On-demand' means you are able to irrigate when your crop needs it. If you're not on a set 'rotation' then you are 'on-demand'

How much water can I get?

1.47 million gallons of water or (4.5 acre-ft), per acre, per year is the typical maximum volume allowed. Check your water right documents or talk with your District for your maximum flow rate and maximum volume.

How much does Irrigation Water Cost?

Payment for water varies by District and location. Talk to the District that serves your property to establish current costs. Expect the cost for water to increase each year to account for inflation and increasing needs for

system improvements.

Cost of water is also directly tied to pumping. If you are able to pump less water, you can significantly decrease costs.

Three Main Principles of Irrigation

Frequency*—How often to irrigate.

Depends on crop water use, water holding capacity of the soil, crop rooting depth.

- Changes throughout the season based on weather and crop water use.
- Clay soils with grass pasture require approximately 7 to 15 days between irrigations. Sandy soils with grass pasture require approximately 3 to 7 days between irrigations.

*Frequency is typically the only thing needing adjustments through irrigation season. Especially if you are growing pasture/hay, pears, grapes or other perennial crops.

Duration—How long to irrigate.

Determined by the irrigation system intensity, crop, soil type, and management style or labor availability.

- With wheel lines approximately 8 to 12 hours.
- With pods approximately 12 to 24 hours

Intensity (application rate)—How quickly can water be applied to a field before runoff occurs?

- Expressed in inches/hour (in/hr) and influence by the soil type, soil health, and amount of vegetation on the soil.
- Application rates of sprinkler systems are usually around 0.15 to 0.4 inches/hour.



Photo: 1000 Friends of Oregon



Photo: Harry & David

Irrigation: Optimizing your Resource

Irrigation Types

Surface Irrigation

Surface irrigation, also known as flood irrigation, is an irrigation method employing gravity to move water down and across the area to be wetted. Flood irrigation in Jackson County is typically characterized by the following:

- Large volumes of water are placed onto the field from canals or head ditches, for a certain amount of hours, once every 2 weeks. On 'rotation'.
- Contour Ditch Style flood irrigation is typical.
- Pasture, hay or other grasses are the typical flood irrigated crop.
- Least efficient method of irrigation.
 - Water lost as runoff and water lost through deep percolation (water drains under the root zone).
- Simple, Least amount of Equipment or Devices, Low Energy Use
- Labor intensive, the land manager must chase the water to get it where it is needed.
- Tailwater or Runoff refers to excess flood irrigation water that runs off the bottom of the field during/after an irrigation. Tailwater ultimately ends up in a creek or river, often negatively affecting water quality.
- Water Quality Concerns
 - Erosion Potential
 - Tailwater is often high in bacteria, warm, and contains nutrients which reduce water quality for wildlife and domestic drinking water.
- Light, shallow, and frequent watering is almost impossible.
- Uneven disbursement of water, leading to wet and dry spots throughout pasture or field.

The contour ditch method employs small ditches that run along the contours of the field. The ditch at the top of the field is known as the head ditch. Water is stopped up in the head ditch to allow it to flow over and/or through the banks, where it moves down the slope as a sheet of water until it is collected at the next ditch. These subsequent ditches are known as spreader ditches because they collect the incoming flood water and re-spread it so it flows in a sheet down to the next ditch.

Ways to Improve Surface Irrigation

- Spend more time in the field when you irrigate, watching where the water goes. Bring a shovel. Experiment with shutting water off when it reaches three-quarters of the way down the field.
- Re-establish existing ditches, rather than allowing the water to re-route itself as it pleases.
- Clean out the vegetation from your ditches before the season, during the season, and at the end of the season. Use a water safe herbicide or mechanical means.
- Keep livestock out of ditches using temporary electric fencing and by providing easier and cleaner water sources such as a stockwater tank. Reshape ditches each year if livestock are allowed access.
- Experiment with water indicators in the field to notify you when water has reached certain locations.
- Replace open ditches with Gated pipe or Poly pipe to help improve efficiency.
- Replace cut banks in your head ditch with spiles. A spile is a 4" diameter, 2ft long pipe with a slide gate entrance buried in the ditch bank.
- Contact JSWCD for more detailed information on flood irrigation practices and possible improvements.

Irrigation: Optimizing your Resource

Sprinkler Irrigation

There are many different types of sprinklers used for many different applications but most require pressures of 30psi to 100psi to operate effectively.

Types of Sprinkler Irrigation

The most common type of sprinkler irrigation systems in Jackson County are wheel lines, hand lines, pods, center pivots, and big guns. Landscaping uses solid set sprinklers. Each system has varying levels of efficiency with center pivots and solid set being the most efficient and least labor intensive.

For more information on which system may be best for you, contact a local irrigation contractor or JSWCD.



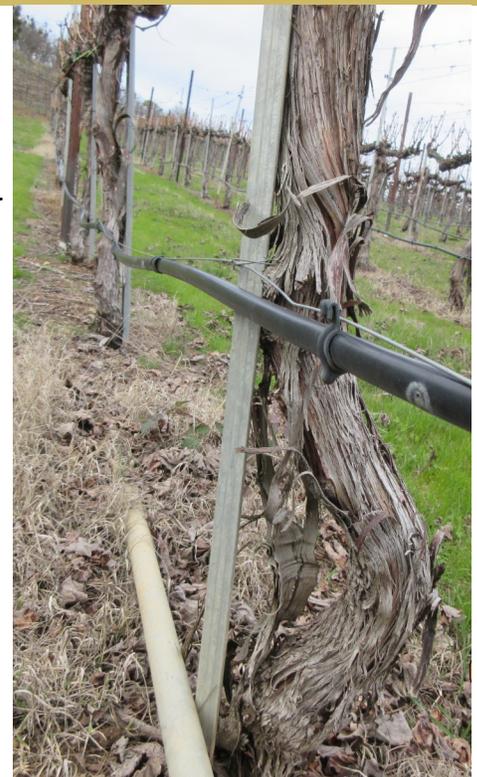
A pasture irrigated with pod sprinkler lines. Pod sprinkler lines greatly improve irrigation efficiency and distribution.

Ways to Improve Sprinkler Irrigation

- Know your system. What is the application rate (inches per hour)? What is the flow rate per sprinkler? What pressure is best for your sprinklers?
- Monitor soil moisture and crop water use using soil moisture sensors, or a step probe.
- Maintain equipment by replacing worn fittings, broken sprinklers.
- Use an irrigation timer and automatic control valve to prevent over watering

Drip/Micro Irrigation

Used on orchards, vineyards, row crops, and gardens. This is considered to be the most efficient and most expensive form of irrigation.



Ways to Improve Drip/Micro Irrigation

- See 'Ways to improve sprinkler irrigation'
- Filtration is very important so spend the extra money to get the better filter up front. Clogging is the main cause of problems for this type of irrigation.

Additional Information

Improving irrigation systems is a balance between cost and your desired level of management. Know your goals and budget for your irrigation system.

- JSWCD can assist with improving your existing irrigation through technical assistance, cost estimates and whole farm planning. Ask JSWCD about grants.
- NRCS may have technical and financial assistance to help improve your irrigation system. Check the NRCS Oregon website for updates regarding local programs or call the local office.

Permaculture

What is Permaculture?

Permaculture is an integration of many fields including horticulture, agriculture, architecture, forestry, and planning. The term refers to a combination of "permanent agriculture" and "permanent culture." A philosophy for sustainable living, permaculture presents ecological design strategies for every scale — from backyards to watersheds. Solutions are derived from nature, science, and traditional cultural knowledge. The design strategies are often practical, tailored to the local environment, and easy to install.



An edible urban yard designed with permaculture in mind. Image by Karen Taylor.

Steps for Permaculture

1. Maintain Design

- Water : rainwater catchment, increase infiltration, stormwater features (swales, rain gardens)
- Access: road placement
- Structures: efficiently placed homes (relevant to sunlight, drainage patterns, and topography)

2. Sector Analysis: incoming energies to the property (sun, wind, rain along flood zones, fire danger, noise, chemical pollution from neighbouring sites, unpleasant views, pleasant views, wildlife areas)

3. Zone Planning: location placements for permaculture features, beginning at the home (most managed) to outside perimeter (unmanaged)

- Zone 0: House, dwelling or settlement
- Zone 1: Areas needing continual observation and frequent visits
- Zone 2: Less intensively managed areas
- Zone 3: Occasional visited areas that still form part of the system
- Zone 4: Wild food gathering, wood cutting for fuel, self-seeded trees
- Zone 5: Natural unmanaged areas

4. Workflows: understanding how to design the property based on use and flow. Consider diagram below.

5. Analysing & Connecting Components: list all features of each permaculture component (think functionality)

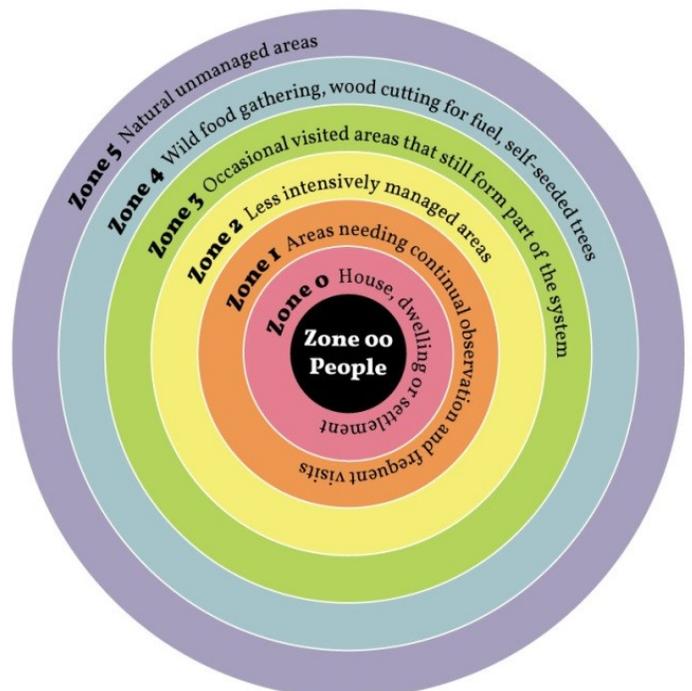


Illustration Source: trybackyardfarming.com

The illustration above conceptualizes how one might design their permaculture zones. From most input to least.

Xeriscaping

What is Xeriscaping?

Also known as “water-wise landscaping”, a xeriscaped yard strives to use less water than a traditional yard. A xeriscaped yard may include dry climate plants or more lush varieties. Xeriscaping’s 7 primary steps are found below.

Step 1 – Plan and Design

- ⇒ Make a skeleton map of the area to be landscaped.
- ⇒ Consider how you use each area.
- ⇒ Begin placing plants on your skeleton map, group plants according to their light needs, water requirements, and size.
- ⇒ Remember to give each plant room to grow.
- ⇒ Designs can be formal, informal, or natural.

Step 2: Create Practical Turf

Xeriscaping is about creating practical turf and being water-wise, not necessarily removing all lawn in one’s yard.



For example...

- ⇒ Replace lawn with shade-tolerant native plants in the shady areas of your yard
- ⇒ Replace lawn with native plants helpful for erosion control along a hillside.
- ⇒ Consider artificial turf alternatives if you desire a lawn aesthetic.

Step 3: Group Similar Plants

It is important to group plants together according to their micro-climate (sun exposure, water requirements, soil type).

For example...

- ⇒ Put plants that have higher water needs next to down-spouts, in low-lying areas, or areas that don’t drain as quickly.
- ⇒ Put plants that prefer sunlight and dry conditions on

elevated areas or those with south or west exposures.

Step 4: Improve the Soil

Depending on soil type, amendments may be needed.

- ⇒ Clay soils can be amended with compost, peat moss
- ⇒ Sandy soils can be amended with humus, peat moss, manure
- ⇒ Silt soils can be amended with compost, aged manure/straw

Step 5: Mulch

Mulch is essential for keeping soil and roots cool. Cool soil and roots reduces plant water loss through evapotranspiration. Mulch also helps prevent weeds and soil erosion.

Step 6: Efficient Irrigation

To minimize your water use:

- ⇒ Water in the morning or evening when the wind is still and evaporation rates are lowest.
- ⇒ Use drip, micro-sprays, bubblers, or emitters to deliver water. When sprinklers are necessary, use sprinklers that keep the water close to the ground, and use rotary (side-to-side) or stationary sprinkler heads.
- ⇒ Inspect the irrigation system regularly for leaks, broken emitters, or sprinklers that aren’t adjusted properly.
- ⇒ Change your irrigation schedule with the weather. Generally, you should do this at least once a month. Turn off your irrigation if a storm moves in, and don’t turn it back on until plants need to be watered.

Step 7: Maintain the Landscape

Regular maintenance for a xeriscaped yard includes:

- ⇒ Keeping bushes trimmed and trees pruned
- ⇒ Regular weeding
- ⇒ Deadheading perennials
- ⇒ Mowing lawn high to promote strong roots
- ⇒ Checking pipes and hoses for leaks
- ⇒ Managing irrigation schedules based on seasonal need



Native Plants

Our urban landscapes, community neighborhoods, and often our backyards are made up of the plants we choose because they look nice. More often than not, these plants are non-native, ornamental varieties that come from environments far different than Southern Oregon's. By learning how to incorporate native plants into our constructed landscapes, we can help conserve water and soil, provide food for wildlife, reduce pollution, and decrease maintenance costs and energy use.

Why Natives?

Native plants are ideally suited for the climate, weather, and soils of a given region. Plants native to our region are able to withstand rainy seasons and long periods of drought once established. These region specific adaptations make native plants easier to maintain than classic horticultural varieties.

Native plants are also better for the region's ecology. Non-native horticultural plants such as purple loosestrife, Japanese knotweed, and butterfly bush all started out as beautiful yard ornamentals, but now escaped, they are wreaking havoc on local ecosystems. Escaped ornamental plants can alter water systems, animal behaviors, and can threaten human activities by taking over large areas of land.

Native plants have developed specific relationships with the area's climate and other species. Planting natives reduces human impact on local plant and animal communities adjacent to our homes and communities.

Bringing Native Plants Back

Use the tips below and the following pages to begin your native plant landscaping:

- Jackson County has a variety of soils. Get to know your property's soils and select plant species that will do best in your soils.
- Match plants with the right growing conditions. Group plants that require full sun throughout the day, those that need sunlight only part of the day, and those which prefer shade most or all of the day. Make sure to consider moisture availability as well. A plant native to a wetter environment may not do well in a non-irrigated part of your landscape.
- Try planting multiple plants of the same species in a group,

then return to see which one is thriving the best from the clump and transplant the others.

- Space plants according to the size they will be when mature.
- Cover soil around the plants with 3 inches of mulch, such as shredded bark or leaves, which will stay in place and keep in moisture.
- Give native plants care for the first 2 or 3 years while they get established. This includes watering, mulching, and weeding the area.

Resources to Help You Get Started

- Contact the Native Plant Society of Oregon: www.npsoregon.org
- Contact the local OSU Extension Office for gardening classes and plant ideas (541) 776-7371
- Contact JSWCD for additional resources, including assistance interpreting soil maps/descriptions, additional plant lists, and other resource concerns like irrigating your landscape.

Native Plants for Pollinators

Common Name	Scientific Name	Bloom Time	Photo
Aster	<i>Symphotrichum</i> (variety)	July—October	
Buckwheat	<i>Eriogonum</i> (variety)	May-October	
California Fuschia	<i>Epilobium canum</i>	August-October	
Camas	<i>Camassia quamash</i>	April-May	
Common Sunflower	<i>Helianthus annuus</i>	Mid-Late Season	
Cutleaf Beardtongue	<i>Penstemon richardsonii</i>	Mid-Late Season	

Native Plants for Pollinators

Common Name	Scientific Name	Bloom Time	Photo
Deerbrush	<i>Caenothus integerrimis</i>	May-June	
Fireweed	<i>Chamerion angustifolium</i>	June-August	
Flowering Currant (Red-flowering Currant)	<i>Ribes sanguineum</i>	February-April	
Giant Goldenrod	<i>Solidago gigantean</i>	July-October	
Lewis' Mockorange	<i>Philadelphus lewisii</i>	May-June	

Native Plants for Pollinators

Common Name	Scientific Name	Bloom Time	Photo
Lupine	<i>Lupinus (variety)</i>	Early-Mid Season	
Mountain Monardella	<i>Monardella odoratissima</i>	June-August	
Narrowleaf Milkweed	<i>Asclepias fascicularis</i>	June-September	
Nettle-leaved Horsemint	<i>Agastache urticifolia</i>	May-June	
Oceanspray	<i>Holidiscus discolor</i>	May-July	

Native Plants for Pollinators

Common Name	Scientific Name	Bloom Time	Photo
Onion	<i>Allium</i> (variety)	Early-Mid Season	
Oregon Eryngo	<i>Eryngium petiolatum</i>	Mid Season	
Oregon Grape	<i>Mahonia</i> (variety)	March-May	Photo: Oregon Flora Project 
Oregon Sunshine	<i>Eriophyllum lanatum</i>	May-August	
Purple Sage	<i>Salvia dorii</i>	Mid-Late Season	
Rubber Rabbitbrush	<i>Ericameria nauseosa</i>	July-October	

Native Plants for Pollinators

Common Name	Scientific Name	Bloom Time	Photo
Showy Milkweed	<i>Asclepias speciosa</i>	June-July	
Stonecrops	<i>Sedum (variety)</i>	Early Season	
Strawberries	<i>Fragaria (variety)</i>	Early Season	
Western Coneflower	<i>Rudbeckia occidentalis</i>	June-September	
Yarrow	<i>Achillea millefolium</i>	Mid-Late Season	

Trees & Urban Forests

All of the trees in our neighborhoods, parks, and backyards comprise what is called the urban forest, or a community forest. The trees and plants we include in our homes and parks are an invaluable part of our urban landscape.

Benefits of Urban Trees

- **Water Quality** – Street trees intercept thousands of gallons of rainwater per tree, reducing stormwater runoff and removing pollutants.
- **Air Quality** – Trees work to remove pollutants from the air, such as dust and other particulates that cause respiratory illnesses.
- **Wildlife Habitat** – Urban forests provide food and cover for hundreds of species, including birds, insects, and mammals.
- **Decreased Heat Island Effect** – Summer temperatures can be abnormally high as concrete and rooftops warm in urban areas. Temperatures can be significantly reduced by the shade and evaporative cooling provided by trees.
- **Increased Economic Return** – Maintaining an urban forest has initial costs but the economic return in ecological services (such as air and water quality) outweighs the initial investment.
- **Higher Property Values** – Trees, parks, and open space are often key selling features of homes. Research suggests a direct correlation between healthy neighborhood trees and the value of the surrounding homes.
- **Combating Climate Change**– Trees absorb atmospheric carbon dioxide in their tissue, reducing the amount of emissions in the air.
- **Sense of Community** - Green space, parks, and old trees add character, increasing community pride and identity.
- **Health Benefits** - Trails, walking paths, and inviting landscapes can encourage physical activity.
- **Improved Business** - Research from the University of Washington suggests that people are willing to spend more time and money in downtown areas that have healthy trees.

The Right Tree in the Right Place

Traffic, heat, concrete, and pollutants are just a few of the challenges to urban trees. Matching the best tree species to a site will go a long way in ensuring the long-term survival of the tree and will reduce maintenance. Some considerations for planting:

- Plant a diversity of species. This will help the trees resist disease, and attract more wildlife.
- Consider the tree's moisture, soil, and heat requirements. Consider planting native tree species that are naturally adapted to the area's climate.
- Look for species that are proven to be non-invasive.
- Pay attention to the types of fruits and seeds your tree will produce. Fruits attract wildlife but can be messy.
- Consider what the plant will look like in different seasons. Will it have bright fall color? Will it bloom in spring?
- Know the tree's mature height and shape and plan to give it plenty of room to grow.
- Look for long-lived, disease resistant, strong trees.

What You Can Do

Plant a Tree

One of the best places to start is your own backyard. Visit local nurseries and pick out your favorite tree to plant. Make sure it is one that will work for your site!

Participate in a Restoration Project

There are many projects going on in Jackson County to restore stream banks, wetlands, and forest habitat. Check out Rogue River Watershed Council and other nonprofit groups to learn about current projects and volunteer opportunities.

Neighborhood Street Tree Program

Your neighborhood is an excellent place to contribute to the urban forest. Ask your neighbors to participate in a Neighborhood Planting Project.

For Medford residents, the Neighborhood Street Tree Partnership program can help you organize, fund, and design your project. Contact the City of Medford at 541-774-2690 for more information.

Not in Medford? Contact JSWCD to get started.

Growing a Healthy Forest

A healthy forest is characterized by vigorous trees that are resistant and resilient to fire, disease, insect infestation, and animal damage. The trees are spaced far enough apart to reduce competition, allow sunlight to reach the understory, and are comprised of a diversity of species. In a healthy forest, the ecological processes are represented and functioning and the land manager recognizes that a “messy” look, with woody debris on the forest floor is a necessary part of the picture. If your property includes a stand of trees consider the following section for best management practices.

Tips For a Healthy Forest

By maintaining a diversity of trees appropriate to the site, you will encourage the overall health of your forest. When selecting tree species for your forest consider factors such as aspect, slope, soil conditions, existing plant communities, and overall climate of the site. Newly planted seedlings will have a higher survival rate if they are fenced to prevent browsing by wildlife. The removal of competitive vegetation within a three foot or greater diameter circle around seedlings will also improve their survival rate until the trees are tall enough to out compete other vegetation.

Thinning trees to the right density improves the growth, health and vigor of your forest. Thinning reduces competition and loss of trees due to pathogens by allowing more light, water, and nutrients to reach the remaining trees. Additionally, thinning encourages understory development which increases forage for livestock and wildlife. Thinning encourages species diversity and improves resistance to wildfire. Remove heavy accumulations of downed material (slash) to reduce fire hazard.

In many situations, large, healthy trees should be left as seed stock for future cohorts. Some standing dead trees, known as snags, should be left for wildlife habitat, except where the snag poses a safety hazard and risk to falling on a house or other valuable areas. Large logs and a few brush piles can be retained to provide habitat for wildlife and facilitate forest nutrient cycling.

Access roads should be located away from streams and consider factors like drainage, surfacing, grade, and slope. Cut slopes and exposed soil should be reseeded or mulched promptly to reduce erosion, water sedimentation, and weed infestations.

Continuously grazing livestock on forest land can compact soils and damage trees. Proper grazing techniques can reduce fuel hazards, invasive species outbreaks, and increase native plant vigor.

Terms to Know

Resistant—able to repel or survive the effects of a given disturbance. For example, a ponderosa pine is able to resist wildfire because of its thick bark.

Resilient—the ability to rebound from a disturbance after a given amount of rest. For example, madrone trees are able to sprout from a stump after a fire. So while a resilient species may not be able to resist succumbing to a disturbance, they can return naturally.

Ecological Processes—the services provided by the landscape when all of the living and nonliving components are intact.

Forest Insects & Diseases of Oregon

Some of the most prevalent threats to trees in southwest Oregon include bark beetles, wood borers, dwarf mistletoe, root/heart rot and a variety of diseases related to stress (such as moisture stress). Oregon Department of Forestry produces Forest Health Notes that have information about insect and disease prevention and management. As well as guides for managing slash to discourage insects and disease.



Dwarf mistletoe is a parasitic, leafless plant that relies entirely on its host tree. Dwarf mistletoe reduces wood quality, and poses an increased wildfire risk due to its large “brooms”.

Small Woodland Management

If you have recently purchased 20 acres or more of forest land, you may be faced with the daunting task of managing these resources. Luckily, unlike seasonal farming or gardening, small woodlands tend to operate over longer time frames of years rather than months, so you can take some time to understand your resource and your land before you take action.

Developing a Management Plan

The best way to start is to walk your land. Begin to inventory and familiarize yourself with the various resources on your property. You can learn to do this with the help of classes and programs offered through the Oregon State University Extension, with the help of a local small woodlands association, or a neighbor. Once you have explored your property begin to create a list of management goals to help guide your future decisions. Remember that it is ok if these goals change over time.

Consider the following:

- Identify dominant/co-dominant tree species
- Identify functioning ecosystem processes
- Identify degraded ecosystem processes
- Identify and mark invasive species
- Create a list of long-term goals for property
- Create a list of short-term goals for property

Information Sources

The Oregon Department of Forestry administers the Oregon Forest Practices Act, which guides all forest activities in the state. All forest operations require a notification to be filed with the local ODF office. Foresters with ODF also offer technical advice through their Service Forestry program, which administers most cost-share subsidies for completing various non-commercial forest and resource management activities.

Other sources of information include the local chapters of the Oregon Small Woodland Association, watershed councils, the Jackson Soil & Water Conservation District, environmental organizations, trade publications, and federal agencies such as NRCS, the Forest Service and Bureau of Land Management.

Assistance in Managing Your Forest

- Private forestry consultants can conduct inventories, write long-term forest management plans, design engineering projects, perform restoration projects, set up timber sales and help you achieve your forest management goals.
- Southern Oregon Research and Extension Center offers landowner assistance and training in conjunction with the Small Woodland Owners Association.
- Natural Resources Conservation Service provides technical and financial assistance through the Environmental Quality Incentives Program (EQIP) and Wildlife Habitat Incentive Program (WHIP)
- The Farm Services Agency provides assistance for riparian buffers through the Conservation Reserve Enhancement Program (CREP).



Best Management Practices, including harvesting, thinning, brush and weed control, and erosion control allow for healthy forests.

Thank you to Nick Haile for his contributions to this section for the 2018 edition.

Gardening

Community Gardens

One of the best ways to garden if you have limited space is to join a community garden. Each year you can rent and be responsible for your own gardening plot. These programs often have communal tools to share and even the occasional potluck! If there isn't a garden in your area, consider starting one in your neighborhood or a park.

Community Gardens in Jackson County Include:

- ❑ ACCESS Food Share Gardens (Medford)
- ❑ Don Jones Memorial Park (Central Point)

Find more community gardens in Jackson County by visiting the American Community Garden Association website.

Ashland Community Gardens

- ❑ Ashland Creek Park at 27 E Hersey Street
- ❑ Scenic Park at 603 Scenic Drive
- ❑ Clay Street Park at 491 Clay Street
- Garden Way Park at 1620 Clark Street

Phoenix Community Garden

- ❑ Blue Heron Park

Talent Community Garden

- ❑ Talent's Great Green Garden on South 2nd Street

Grow Your Own Garden

Whether you live in an apartment or a large residential home, you can take advantage of the benefits of growing your own food. Suggestions for growing gardens in smaller spaces include hanging tomato planters, herb gardens, window planter boxes, and planting in pots or barrels. Larger gardens can take advantage of a wider vegetable pallet, from berries and fruit trees to homegrown squash and carrots.

See page 63 for step by step instructions for constructing your own raised beds.

Local Resources

- The OSU Master Gardener's program offers classes in home gardening at: <http://extension.oregonstate.edu/mg/>
- To sign-up for a space at an Ashland Community Garden call the North Mountain Park Nature Center at 541-488-6606



Backyard Vegetable Gardens

Planning Your Garden

A backyard garden can be a fun and rewarding experience for the whole family. To make sure you get the most out of your garden consider the following:

- Most garden plants, like tomatoes and peppers, need at least 6 hours of full sun/day. Do you have an area in your yard that receives this much sun?
- Your garden will require regular irrigating. Consider water saving practices including
 - Drip irrigation for individual plants or groupings
 - Evening waterings. Watering in the evening prevents water waste through evaporation and protects wet leaves from sunburn.
 - Burying a plastic gallon jug with holes punched in it in your garden bed. Leave the top level with the soil and fill the jug with water. This will reduce evaporation and

encourage your plants' roots to dig deep.

- For in-ground gardens consider getting your soil tested for heavy metals.
- For raised beds, limit your containers to 4' across so that you can easily access your veggies.
- Plan for hungry wildlife, including deer and birds. Build a 7' deer fence to keep deer out and use netting to discourage birds from eating ripening tomatoes and other soft-fleshed fruits.

Always Call-Before-You-Dig: 1-800-332-2344 or 811



Backyard Vegetable Gardens

Making Framed Garden Beds

Raised garden beds provide a more accessible way to garden, reduces weeds, prevents compaction, increases drainage, and provides aesthetics.

Designs of raised beds vary, and are chosen depending on desired function.

Steps to Create a Framed Garden Bed

1. **Determine your needs:** desired height of beds, length of beds, possible accessibility needs.
2. **Consider your Site plan and plan the beds:** distance between beds, irrigation setup, clear grass and level ground.
3. **Construct your raised bed:** cut and assemble the base frame, attaching the frame with screws and installing supportive posts and stakes.
4. **Fill your raised bed:** soil mix with high organic matter, nutrients, and high water-holding capacity.
5. **Irrigate efficiently:** use water efficient systems such as soaker hoses or drip irrigation.
6. **Maintain regularly**

Source: Oregon State University Extension Service “Raised Bed Gardening”



Raised bed reinforced with stakes. Image: OSU Extension.

Materials & Tools

- Lumber: 4 boards, 4 posts, mid-span post if bed exceeds 8 feet in length
- Fastenings: 6 screws for each corner (24), two for each mid-span post (if applicable)
- Cross Supports: aluminum flat stock cut and placed to connect mid-span posts (if applicable)
- Tools: shovel, hand saw, square, level, mallet, screwdriver, hacksaw, drill, measuring tape

Construction Considerations

- Pick an appropriate frame: frame materials vary from natural woods (cedar, juniper, pine, redwood) to recycled plastic.
- Determine bed dimensions: beds can vary up to 3 feet tall. Commonly beds are 11 inches, the same height as two stacked 2 x 6 inch boards.
 - ⇒ Consider soil depth requirements for vegetable roots
- In order to maintain integrity, reinforce beds longer than 6 feet and taller than 18 inches with cross cables, stakes, or another supporting mechanism .
- Consider mulching pathways between beds to suppress weeds.



Leveling the bed



Bed reinforced with cross-cables. Images: eartheasy.com

Composting

Why Compost?

Composting is a great way to enhance your garden while also reducing the waste that would otherwise end up in our landfills. There are many different ways to compost your food and yard wastes. Here we will help you get started with a basic compost bin. Look for compost classes to learn more techniques.

Composting happens naturally all around us. For example, leaves fall off trees and are layered with organic material on the forest floor, to be gradually decomposed by soil organisms, like earthworms and bacteria, into nutrient rich soil.

Without active composting, it can take 500 years to create an inch of top soil. Composting speeds this process by creating habitat for all of the microorganisms that make decomposition possible. Worms and insects chew the material so that it is small enough for microorganisms to eat. Then, bacteria and fungus process the leftovers. A well-maintained compost pile creates the perfect setting for these interactions. When you compost vegetable scraps and yard clippings, you are feeding the soil food web which, in turn, makes nutrients available to plants.

A Balance of Carbon and Nitrogen

Each time you add material to the compost pile you add lots of carbon and some nitrogen, since these are the basic building blocks of organic matter. Think of the *green materials* (such as grasses, fruits, and vegetables) as nitrogen rich, and the *brown materials* (such as leaves and woodchips) as carbon rich. As you add materials to your pile try to balance each green material with 2 or 3 times as much brown material (see the chart to the right). For example, for every 5-gallon bucket of food waste add three 5-gallon buckets full of dry leaves or shredded newspaper.

Too much carbon will slow down decomposition. Too much nitrogen creates an unpleasant odor.

What to Compost, What to Avoid

Green Materials (High Nitrogen)

Vegetable scraps

Garden waste

Freshly cut grass, flowers, and leaves

Coffee and tea

Fresh manure from horses or chickens

Most kitchen scraps

Brown Materials (High Carbon)

Dried leaves

Straw or hay

Wood chips from shrubs and trees

Sawdust

Newspaper (shredded)

Cardboard

Materials to Avoid

Black Walnut leaves and bark

Meat, bones, and dairy products



Demonstration of a multi-bin system at North Mountain Park Nature Center in Ashland.

Controlling Noxious & Invasive Plants

Weeds can not only ruin a garden, they can spread out of control to creeks, parks and your neighbors' property. Help control weeds in your community by knowing what you're up against.

What is a Weed?

A weed is defined as a plant growing in a place in which it is not wanted. Most plants classified as weeds are persistent and hard to keep out of a garden, lawn, or field. Plants that are harmful to animals, water, or humans are referred to as **noxious** weeds. Plants that spread aggressively outside of their range, outcompeting native plants, are called **invasive**. Invasive and noxious weeds threaten ecosystems. If native plants are displaced, the ecology of an area changes, impacting wildlife, soil quality, water availability, and the fire regime.

Prevention

Prevention is the most effective and most economic way to fight weeds. Homeowners greatly impact the plant community on their properties with their garden planting choices, crop management choices, and overall maintenance of their plant and soil resources. In fact, some of the most persistent weeds of our time were planted intentionally, like Himalayan blackberry and English ivy. Once plants destined to become weeds escape cultivation, they are very expensive to control. To learn about alternatives to invasive garden plants, pick up a copy of *Garden Smart Oregon: A Guide to Non-Invasive Plants* at the JSWCD office.

Tips for Combatting Weeds Before They Establish

- Provide strong competition from desirable plants. This will increase the competition for space, moisture, and nutrients.
- Keep your garden planted throughout the year. Annual gardens are difficult to manage because they do not maintain a stable population of plants to compete with weeds.
- If a perennial garden is not an option, mulch your garden to make it more difficult for unwanted seeds to establish themselves.

Weed Control

If weeds are already established on your property you have several options for combatting them:

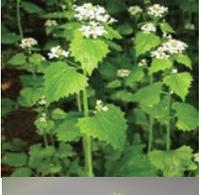
- Mow or pull weeds before they go to seed.
- Once mowing and pulling has been completed several times, replant the area with desirable species.
- As a last resort, you may have no choice but to apply herbicides. Remember that this is a costly, short-term solution.
- Consider teaming up with your neighbors to control weeds in your area. All your hard work means nothing if your neighbor's field or yard is supplying weed seeds.
- JSWCD can help you create a plan of attack.

Learn the Most Not-Wanted List

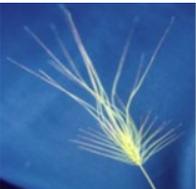
Educating yourself on the most invasive plants will help you spot them if they appear on your property. Some of the most aggressive weeds to be on the lookout for are: Purple Loosestrife, Canada Thistle, Scotch Broom, Japanese Knotweed, Spotted Knapweed, Puncture Vine, and Garlic Mustard. If you find invasive plants on your property please call JSWCD for advice for removing them. You can also call the Oregon Department of Agriculture's (ODA) Invasive Species Hotline at 1-866-INVADER.

You may also want to take this handbook on your next neighborhood walk, or out into your yard or pasture and use the next few pages to familiarize yourself with your weedy neighbors.

Noxious & Invasive Weed Identification

Common Name	Scientific Name	Picture	Common Name	Scientific Name	Picture
Armenian blackberry*	<i>Rubus armeniacus</i>		English ivy*	<i>Hedera helix</i>	
Buffalobur	<i>Solanum rostratum</i>		Eurasian watermilfoil	<i>Myriophyllum spicatum</i>	
Bull thistle*	<i>Cirsium vulgare</i>		Field bindweed*	<i>Convolvulus arvensis</i>	
Butterfly bush	<i>Buddleja</i>		French broom	<i>Genista monspessulana</i>	
Canada thistle*	<i>Cirsium arvense</i>		Garlic mustard	<i>Alliaria petiolata</i>	
Cutleaf teasel	<i>Dipsacus laciniatus</i>		Hairy whitetop	<i>Lepidium appelianum</i>	
Dalmatian toadflax	<i>Linaria dalmatica</i>		Hoary cress	<i>Lepidium draba</i>	
Diffuse knapweed	<i>Centaurea diffusa</i>		Houndstongue	<i>Cynoglossum officinale</i>	
Dyer's woad	<i>Isatis tinctoria</i>		Italian thistle	<i>Carduus pycnocephalus</i>	

Noxious & Invasive Weed Identification

Common Name	Scientific Name	Picture	Common Name	Scientific Name	Picture
Japanese knotweed	<i>Polygonum cuspidatum</i>		Musk thistle	<i>Carduus nutans</i>	
Johnsongrass	<i>Sorghum halepense</i>		Myrtle spurge	<i>Euphorbia myrsinites</i>	
Jointed goatgrass	<i>Aegilops cylindrica</i> L.		Parrots feather	<i>Myriophyllum aquaticum</i>	
Kockia	<i>Kochia scoparia</i>		Perennial peavine	<i>Lathyrus latifolius</i>	
Leafy spurge	<i>Euphorbia esula</i>		Perennial pepperweed	<i>Lepidium latifolium</i>	
Meadow knapweed*	<i>Centaurea pratensis</i>		Poison hemlock	<i>Conium maculatum</i>	
Mediterranean sage	<i>Salvia aethiopsis</i>		<i>warning: plant is very poisonous to humans</i>		
Medusahead rye*	<i>Taeniatherum caput-medusae</i>		Puncturevine*	<i>Tribulus terrestris</i>	
Milk thistle	<i>Silybum marianum</i>		Purple loosestrife*	<i>Lythrum salicaria</i>	
			Ragweed*	<i>Ambrosia sp.</i>	

Noxious & Invasive Weed Identification

Common Name	Scientific Name	Picture	Common Name	Scientific Name	Picture
Rush skeletonweed*	<i>Chondrilla juncea</i>		Spotted knapweed	<i>Centaurea maculosa</i>	
Russian knapweed	<i>Acroptilon</i>		St. John's wort*	<i>Hypericum perforatum</i>	
Saltcedar	<i>Tamarix gallica</i>		Sulfur cinquefoil	<i>Potentilla recta</i>	
Scotch broom*	<i>Cytisus scoparius</i>		Tansy ragwort	<i>Senecio jacobaea</i>	
Scotch thistle	<i>Onopordum acanthium</i>		Tree-of-heaven	<i>Ailanthus altissima</i>	
Shiny geranium	<i>Geranium lucidum</i>		Velvetleaf	<i>Abutilon</i>	
South American waterweed	<i>Egeria densa</i>		Water primrose	<i>Ludwigia hexapetala</i>	
Spanish broom	<i>Spartium junceum</i>		Whitetop	<i>Cardaria draba</i>	
Spiny cocklebur	<i>Xanthium spinosum</i>		Yellow flag iris	<i>Iris pseudacorus</i>	

Backyard Wildlife

Meeting Basic Habitat Needs

To meet the basic requirements of wildlife habitat, a habitat must provide:

Food—The variety of foods available in the habitat you create will determine the type of wildlife you attract and provide for.

- Plant native fruit and nut bearing shrubs and trees such as choke cherry, red-flowering currant, black and white oak, hazelnut, and native blackberry.
- Plant native wildflowers to encourage visits from wild bees and migrating monarchs.



A Cedar Waxwing enjoys a meal of choke cherries. Choke cherry is native to our area and makes a great addition to your landscaping with white flowers in the spring and red fruit in the fall.

Water—Different wildlife need varying amounts of water. How much and where you place water sources will determine the wildlife that uses the habitat.

- Set up bird baths and keep water clean and cool.
- Make water features in your yard more inviting with the use of native plants.

Cover—Wildlife cover needs vary across species and seasonally. The greater variety you provide, the more wildlife you're likely to see.

- Create brush and limb piles for small mammal habitat.
- Leave downed trees for amphibian and small mammal habitat.
- Landscape with native grasses, flowering plants, and shrubs to encourage native wildlife to use your yard.
- Build or buy bat houses, bee houses, and bird houses. Place them in species appropriate locations, for example elevated areas that receive early morning sun.



A simple bee house can provide much-needed habitat for solitary, native bees in your garden.

Space—Larger animal species need more space, as do more territorial and less social species. What kind of space can your property provide?



Other animals, including honeybees, will benefit from additional water supplies, especially during the hot summer months.

Improving Wildlife Habitat

Habitat Fragmentation

One of the greatest challenges to wildlife is habitat fragmentation. The crisscrossing fences, roads, and neighborhoods of our human communities results in the carving away of native habitats, leaving behind isolated patches, or fragments, of land. As a forest or other important ecosystem is divided into small pieces the ecology changes and is vulnerable to edge effects. Edge effects include change in temperature, plant composition, and increased predation on species that require the safety of a contiguous habitat. Many animals are unable to survive in fragmented habitat. Migratory birds are a particularly sensitive group to fragmentation.

Most sensitive species to disturbance need large areas, often of 100 acres or more, to reproduce successfully, so it is important that humans work to understand how their communities impact the wildlife around them.

When creating your property site plan, especially on larger acreages, consider where important wildlife habitat might exist or be improved.

- Can you leave large areas of shrubs and trees undisturbed?
- Can you mitigate disturbances by planting native trees, shrubs, grasses, or flowering plants?
- Do water features like ponds and creeks exist on your property? What can you do to improve these areas for wildlife use?

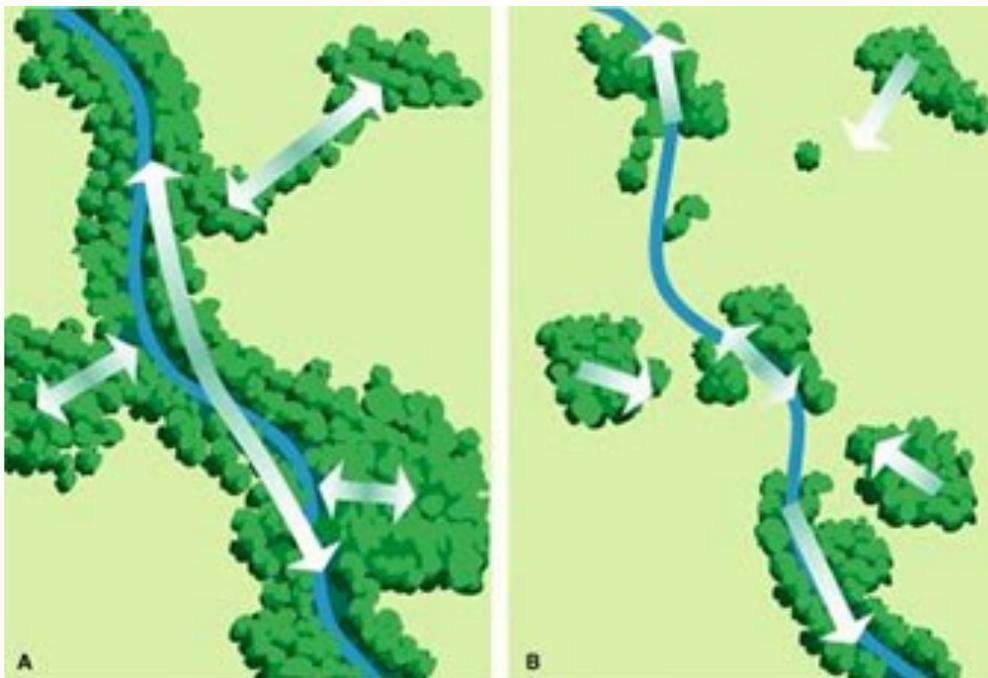
Corridor Creation

One of the best ways to help wildlife is to link large patches of habitat together, like a patchwork quilt. Open spaces can be linked using trees and plants as pathways to provide cover. Streams are also very important wildlife corridors. The wider the protected passageway the better. Consider teaming up with your neighbors to improve wildlife corridors in your area. Look for habitat improvement grant opportunities through the Oregon Watershed Enhancement Board or your local Watershed Council.

Improving Pollinator Habitat

Butterflies, bees, and moths are just a few examples of what may be the most under appreciated contributors to our society — pollinators. Almost every plant, including 1/3 of our food sources, depends on pollination to survive. Each plant species requires its own specific set of pollinators to reproduce. Unfortunately, many of our native pollinators are in decline, ultimately negatively impacting our agricultural crops.

You can help local pollinators by providing nesting sites, choosing plants for your yard that benefit native pollinators, leaving hedgerows, or planting a butterfly garden. See pages 52-57 for more information on native plants.



By connecting habitat, wildlife may be better able to move through systems with fewer negative interactions with humans. Illustration credit: conservationcorridor.org

Wildlife Concerns

Predators

Remember that Jackson County is home to cougars, bears, coyotes, wolves, fox, and other, perhaps unwanted, backyard visitors. There are steps you can take to minimize the chance of attracting these animals. Keep in mind that many species have “territory” and you may be moving in on their turf.

Minimize conflict by following these guidelines:

- Feed your pets inside.
- Pick up fallen fruit from trees.
- Remove accumulated bird seed.
- Take trash outside in the morning.
- Control odors from compost bins and trash.
- Consider fencing options for garden areas.
- Do not provide feed for prey animals, like deer.
- Keep your cats and dogs inside at night. Except for specific livestock guardian dogs.
- Use sturdy fences and shelters for chickens and other smaller animals, especially when you have young or sick animals.
- Be sure to remove any carcasses before scavenging animals are attracted, this includes any afterbirth from calving and other livestock births.
- Consider getting a guard dog for your livestock

Managing Urban Wildlife Conflicts

Deer

- Select plants that deer do not prefer (ask your nursery for lists of such varieties).



- Create an invisible fence with foul tasting or smelling deer deterrents available at most garden/home improvement stores.
- Construct a deer fence, at least 7 feet tall.

Raccoons and opossums

- Keep trashcans secured away and tightened with metal screws.
- Check your house to see if there are loose boards or other tempting hideaways. Seal up any entries to deter animals from making a home in an unwanted area.

Preventing Disease

It is our responsibility to do our best to improve or minimize our impact on wildlife health. Follow these tips to help keep wildlife disease limited.

- Use plastic or metal bird feeders and clean with a 10% bleach solution regularly.
- Prevent seeds from becoming contaminated with feces on the ground by using a wire cloth attached to 2” x 4”s, or use a tarp to catch and remove fallen seed.
- Do not provide supplemental feed to larger wildlife like deer. Doing so can spread disease and increase human-wildlife conflicts.

Local Knowledge

- For wildlife questions contact the Oregon Department of Fish and Wildlife (541) 826-8774 or Jackson County Wildlife Services (541) 679-1231.
- For a no-cost consultation about creating wildlife habitat in your backyard contact JSWCD (541)423-6159.
- For more information on pollinators visit xerces.org or OSU extension on Hanley Road.

Vernal Pools

Vernal pools provide unique habitat for plants and wildlife, and are an ecologically important topographic feature found in the Agate Desert area of Jackson County, just north of Medford.



An Agate Desert vernal pool outside of Medford in the wet phase.

Description

Vernal pools, literally meaning “pools of the springtime,” are a distinctive type of ephemeral wetland occurring in areas of the West Coast where Mediterranean climactic conditions and unique soil characteristics coincide.

These seasonal depressional wetlands form in areas where a hardened sub-surface soil layer, known as duripan, prevents rainwater from draining into lower soil horizons, thus trapping the water in shallow depressions causing pools to form on the soil surface.

Vernal pools are characterized by three distinct phases:

The wet phase, which generally occurs throughout the winter and early spring seasons when precipitation is abundant and rainwater fills the depressions in the landscape.

The flowering phase, which generally occurs in the springtime as temperatures rise and the pools begin to dry out, providing unique habitat for a diversity of native wildflowers.

The dry phase, which lasts through the summer and autumn, during which the pools appear brown, cracked, and barren until the winter rains return moisture to the vernal pools again.

Ecological Importance

The assemblages of plants and animals found in the Agate Desert of Jackson County are so unique that many of them can only be seen here. Several species have adapted to the extremes of this area’s intense Mediterranean climate. Three federally listed species are associated with vernal pools in Jackson County, including two plants, large-flowered woolly meadowfoam (*Limnanthes pumila* spp. *grandiflora*) and Cook’s desert parsley (*Lomatium cookii*), and one animal, the vernal pool fairy shrimp (*Branchinecta lynchi*).

Diminishing Habitat

Only 23% of the original vernal pool topography and hydrology in the Agate Desert remains. Residential, commercial, and industrial development and land leveling have claimed nearly 60% of the historic range of this unique landform. The remainder of the habitat is either severely altered by historic and continuing land uses, or occurs along the fringes of the landform where vernal pools are weakly expressed.

Did you know?

Vernal pools are wetlands and are protected by local, state, and federal regulations.

Living Along a Waterway

For many, living along a stream or river is the ultimate Oregon dream. Watching for migrating salmon; splashing around in the cool waters during the heat of the summer; listening to the merry sounds of rushing and falling water; and being enthralled by the show Mother Nature provides during a high water event are just some of the delights streamside property owners can enjoy. As idyllic as this may seem, living along these bodies of water also presents risk and critical responsibilities. Streamside property owners should understand the dynamic nature of streams and rivers, know the laws and ordinances that govern their use and protection, and be prepared and willing to take the steps necessary to maintain or improve the health of their stream and its associated riparian area and floodplain.

What is a riparian area?

Riparian areas are those lands bordering a stream, river, lake or wetland where the soil and vegetation are highly influenced by the presence of water. A healthy riparian area has lush, diverse, native vegetation growing as a buffer along the water's edge.

Why is a healthy riparian area important?

Riparian vegetation reduces water pollution by trapping and filtering out sediments, chemicals, and extra nutrients from runoff before they can enter the stream.

Plants along streambanks slow water movement and help stabilize banks to prevent erosion and property loss.

Riparian areas reduce the impact of floods by intercepting storm water, retaining the water, and then releasing it slowly, allowing for enhanced stream flows and groundwater recharge.

Trees in riparian areas provide shade, which keeps water cool in the summer time – a factor important to our native salmon, steelhead, and trout.

Riparian areas provide food and habitat for numerous fish, insect, and wildlife species, as well as important migratory corridors for various avian and terrestrial wildlife species.

Aesthetically, these scenic landscapes offer recreational opportunities and increased property values.

What is a floodplain?

The area of land near streams, rivers, and other bodies of water that takes on excess water in times of flood is called a floodplain. When managed wisely, these lands

can help reduce the risk of damage when water overflows its banks.

Why are floodplains important?

Flooding is a natural and necessary stream process. Floodplains allow water to spread out and slow down, reducing its erosive force and potential property damage. This process encourages groundwater recharge as water seeps into the soil.

Healthy vegetated floodplains also act as filters for runoff and over-bank flows. These areas are nutrient rich from accumulated sediment deposits, which build fertile soils. As a result, these nutrient rich, deep soils are often prized by agricultural producers and land developers. This conflicting reality is important to understand as it affects the way communities view and interact with their waterways. It is important for all those living along waterways to understand that:

- **Streams change over time;** this is their nature. They meander over floodplains, erode banks, deposit sediments, change course, and make new channels. Storm events, like those seen in winter months can produce significant change. Manmade alterations can exacerbate these natural processes. Consider how your property might be effected.
- **Compromised riparian habitat affects us all.** Removing floodplain and riparian vegetation, riprapping stream banks, channeling or straightening streams, building dams, and eliminating the connection of a stream from its floodplain all result in unhealthy stream systems. Erosion is exacerbated, habitat is lost or degraded, and water quality becomes compromised

Please remember that conducting any in- or near-stream work without a permit or professional guidance can result in significant fines and may exacerbate existing concerns.

Do your due diligence before beginning any project.

Living Along a Waterway

Maintaining or Improving Stream Health, Riparian Areas, and Floodplains

While streamside property is inherently more difficult to predictably manage, streamside property owners can adopt some or all of the practices below to improve their stewardship:

- **Maintain or increase the buffer width of your riparian areas** by planting native trees and shrubs. Fifty feet of buffer traps eroded soils; 100 feet filters pollutants; 200-300 feet provides wildlife corridors.
- **Exclude livestock from riparian areas** and provide off-channel watering facilities.
- **Remove and manage noxious weeds legally and appropriately.** Acquire necessary permits from your municipality and Oregon Department of Fish & Wildlife. Use only water-safe herbicides.
- **Delay mowing grassy areas until late July** when birds are done nesting.
- **Accept a messy look.** Leaving wood and other natural materials in the stream provides habitat for fish and macroinvertebrates, while encouraging natural hydrologic behavior.
- **Don't straighten channels or place riprap on streambanks.**

- **Consider increasing the complexity of your stream's habitat** by reshaping streambanks, and incorporating logs, large woody debris and boulders in-stream. However, be sure to consult with your local watershed council prior to any such work.

Riparian Enhancement Programs

Check with the Jackson SWCD, USDA Farm Service Agency, and your local watershed council about opportunities for improving the health of your stream and riparian environments. They can assist you with referrals to appropriate resources, including financial assistance for in-stream and near-stream projects.

Stream and Riparian Protection through Ordinance and Law

Some watershed restoration work – especially that which involves instream activities – are regulated by various government agencies. State or federal approval may be required for certain work, and county or city ordinances may limit what can be done in riparian areas. It is important to contact the agency that issues permits for the type of work you are planning to find out what your responsibilities are. Jackson SWCD and your local watershed council can help you identify which department or agency to contact.



Open Range & Livestock Districts

Open Range Areas- What you need to know

If you live in an open range area and don't want other people's livestock on your property, you have the responsibility to build fences or other barriers to keep livestock off your property or out of areas where you do not want them. Sometimes livestock will use roadways to get around the countryside. You have the responsibility to avoid hitting them on the road. If you do hit them, you must reimburse the owner for the cost of the animal.



Livestock within an open range area can lawfully access any lands not fenced to exclude their passage.

Livestock Districts- What you need to know

In livestock districts, the livestock owner has the responsibility to keep animals on their own property. Liability for damage to property falls on the owner of the animal. If you live in a livestock district and find an animal on your property, try and contact the owner of the animal. If you cannot locate the owner, contact the Oregon Department of Agriculture's livestock identification office at 503-986-4681. See page 85 to identify your livestock district.



Within livestock districts, livestock owners must enclose their livestock on their own property or property they have legal access to.

Terms to Know

Livestock- animals of the bovine species, horses, mules, asses, sheep, goats, and swine

Class of livestock- class, species, genus, or sex of livestock, including a class, species or genus of neutered livestock

Livestock district- an area wherein livestock or a class of livestock cannot lawfully run at large

Open range- area wherein livestock may lawfully run at large

Estray- livestock of any unknown person unlawfully running at large or being permitted to do so, or trespassing on land enclosed by an adequate fence.

Grazing & Pasture Management

Grazing as a Management Tool

More than any other input, healthy pastures require proper management. A healthy pasture, whether you grow hay for market or provide forage for livestock, protects soil from erosion and compaction, produces higher forage yields, excludes weeds, and minimizes the potential environmental impact of production.



Grazing management is the most important element in maintaining healthy, productive pastures.

Management Intensive (Rotational) Grazing

Rotational grazing requires more intensive management, but results in improved yields and builds healthy pastures. Pasture managers (or graziers) using rotational grazing methods allow livestock to start grazing in a paddock when the forage has grown 8–12 inches tall.

After livestock have grazed the forage down to approximately 4 inches, the grazer moves the livestock to another paddock to allow the recently

Rule of Thumb- In at 12” out at 4”. Begin grazing when forage is 12” tall and remove livestock when forage reaches 4”.

grazed plants to rest. This leaves adequate plant leaf area to collect photosynthetic energy, allowing more rapid regrowth. Ultimately the land manager will see more vigorous plants and increased production per acre.

Rotational grazing also encourages more uniform grazing of all forage species, further increasing per acre production while decreasing undesirable weed species.

Grazing Methods

Improved grazing management that controls the timing, intensity, and duration of livestock grazing can have a dramatic impact on individual plant health and vigor as well as overall pasture and livestock production.

Grazing management typically takes two forms:

Continuous Grazing

Continuous grazing allows a varying number of animals to graze a certain number of acres for a given length of time. This method of grazing, although less labor intensive than rotational grazing, depletes pastures of healthy vegetation as cattle selectively graze the more



Continuous grazing decreases overall productivity of a pasture and allows weeds to colonize.



Managed (rotational) grazing provides greater yields, healthier soils, and fewer weeds.

Grazing & Pasture Management

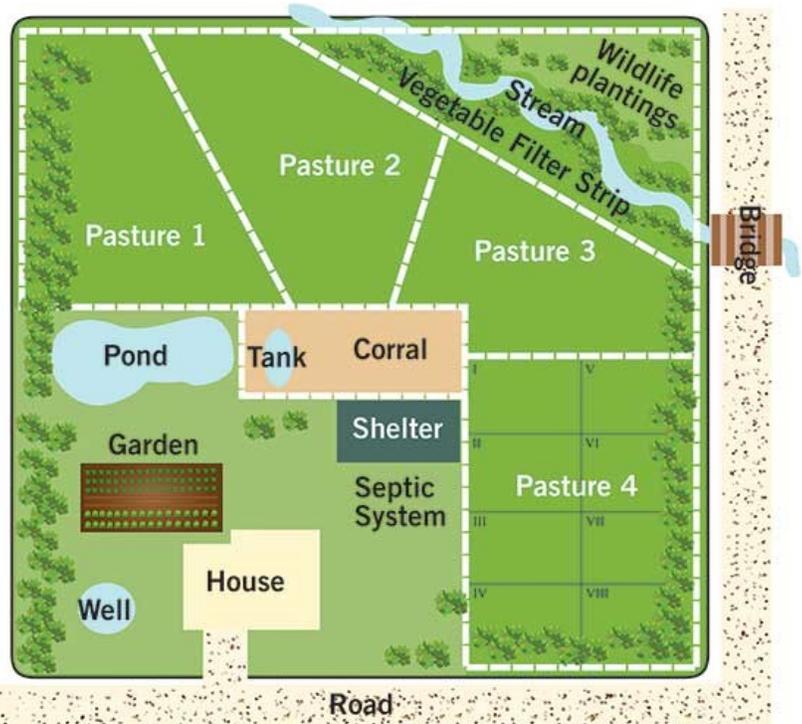
Setting up for Rotational Grazing

Set your pasture up for 6 paddocks.

- **Graze each paddock for no more than 5 days.** This will allow each paddock a month of rest between grazing periods.
- Monitor paddock health and make changes as appropriate.
- **Follow the “In at 12” , out at 4” “ rule.** Doing so allows plants adequate recovery time. Turn your livestock in to a paddock when the grass height has reached 12 inches, rotate them out when the grass reaches 4 inches.

Basic Management Tips & Practices

- Know the nutrients in your soil. Regular soil tests (every 2 to 3 years) will guide your fertilizer applications so you avoid over or under applying amendments.
- Know your soil type. Several on-line tools can inform you about your soil texture, rooting depth, potential productivity, and other helpful information (see the Soils section of this handbook).
- Use tillage practices only when necessary (i.e. heavily compacted soils). Minimize compaction and erosion by planting an appropriate forage species on any bare ground and reducing equipment traffic.
- Seed only when necessary. Seed only as a last resort to renovate an unproductive pasture or introduce a new variety of forage. Instead, use livestock and proper management to encourage the establishment of the existing seed bank.
- Know your weeds (ID and biology) and the proper control methods for each (see the Weeds section in this handbook).
- Regularly measure forage yields using the clip and weigh method, pasture or grazing sticks, and visual assessments. Document the rotation length and livestock type and numbers and adjust your stocking rate to match your yield.
- Know your livestock. Cattle can remain on a single pasture all day as long they are moved regularly to avoid overgrazing individual plants. Horses



The above diagram shows a 4-paddock system, complete with a riparian filter strip along a stream and fence to prevent livestock from drinking directly from the stream.

Illustration credit: motherearthnews.com

however should only be allowed to graze a few hours a day, to protect both the pasture and the horse's health.

- Improve your irrigation management (see the Irrigation section in this handbook).



Measure forage regularly, both as a tool to manage grazing and as a way of documenting production from year to year

Grazing & Pasture Management

Heavy Use Area Protection

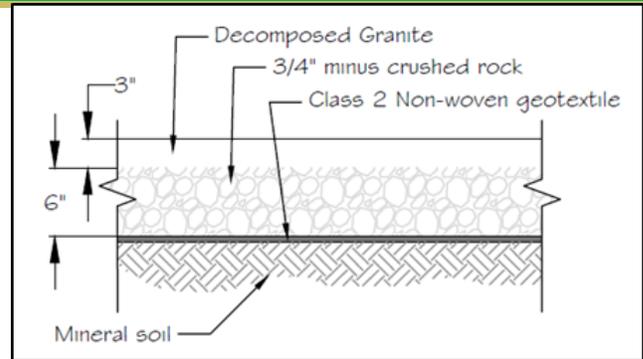
Heavy use areas, or sacrifice areas, provide a place for animals to stay when pasture conditions cannot support grazing. Grazing heavily saturated soils, in winter for example, can lead to compaction, erosion, and introduce weeds. Horses can severely damage pastures if allowed to continuously graze because of how they bite a plant.

Heavy use areas typically use several inches of aggregate (like decomposed granite) over a geotextile fabric to create a surface that can withstand heavy hoof and vehicle traffic while still allowing water to pass through to prevent ponding.

Perforated pipes at the perimeter of the area route water away from the pad. Heavy use areas can also make horse manure management simple by keeping manure from mixing with soil and water.



Heavy use areas provide a place for livestock to congregate when pastures cannot support grazing.



Schematic of a typical heavy use area cross-section.

Manure Management

Manure management is important to protect animal health as well as manage waste that could potentially pollute waterways. Manure deposited in fields can replenish nutrients depleted from grazing or harvesting, but can also cause uneven grazing when animals avoid grazing places where they have defecated. Regular dragging of fields breaks up these manure deposition sites, allowing them to decompose faster and incorporate into the soil.

Composting provides a better method of managing manure, and is a must for properties that use heavy use areas to manage horse grazing activity. Manure should be collected from heavy use areas, sacrifice pastures, riding areas, and other handling facilities daily, or at a minimum every three days to break the pest hatching cycle.

Composting manure can reduce the overall volume of manure by as much as 50%. The resulting product can be used as an amendment to fields or garden beds.

Make sure you are not in violation of the 1993 Agricultural Water Management Act! See page 81 for more information on this important act and tips to help you stay in compliance!

Successful Manure Composting Requires:

Air – turn the pile regularly

Heat – between 131° F and 150° F

Water – a handful of the pile should feel like a wrung out sponge

Nitrogen – Less bedding, more manure

Grazing & Pasture Management

Fencing

Your management strategy must include well planned and well maintained fencing.

□ Perimeter Fencing

Fencing around the perimeter of your property should be permanent and adequate to contain the type of livestock you own.

□ Electric Fencing

Use electric fencing to create paddocks to rotate your animals as part of a managed grazing system. Some types of livestock can learn to respect even a single strand of electric wire. You can use electric fences to graze areas for short durations, such as riparian areas, but never allow livestock to grazing a riparian area unrestricted or for extended periods of time.



You may find that electric fencing is a critical component to efficiently managing your rotational grazing paddocks.

□ Wildlife Considerations

Consider the impact your fence will have on the movements of wildlife. Migrating herds of deer or elk can destroy the best of fences in a single season. Wildlife attempting to jump tall fences can catch their legs in the top strand and become snared in the wire. Young or smaller animals can get caught in fences with bottom strands near the ground. Allow for the movement of wildlife instead of fixing fences year after year. In general:

- Keep the top wire no higher than 42” from the ground to ease deer crossings.

- Keep the top two wires spaced 12” apart to allow for animals to pass between the two wires easier.
- Keep the bottom wire 10” to 16” from the ground to allow for young wildlife to pass easily between the wire and ground.
- Mark new fences with flagging or reflective clips to make fences more visible to wildlife.
- Consider building a fence with sections that can come down when the fenced area is not in use to ease passage for wildlife.

Shade, Water, and Supplements

Think about where you place shade structures, stock water tanks, and mineral supplements. These are important features in a pasture, however animals congregate around them more than other areas of a pasture. The increased hoof traffic can trample forage and compact soil, ultimately limiting the potential for productive plant growth.

Place these features away from each other and consider protecting the areas with crushed rock over geotextile fabric to reduce compaction and soil disturbance. Protective measures are especially important at watering locations. This will also encourage livestock to move from one area to another regularly, minimizing the disturbance of any one area over another.



Failing to protect the soil surface around your livestock watering area can result in a mess like this. Not only does this compact soil, but it can also introduce manure run-off into surface waters.

Water Quality & Agriculture: Your responsibilities as a landowner

Senate Bill 1010 Ag Water Quality Management Act

In 1993 the Oregon legislature passed Senate Bill 1010, otherwise known as the Agricultural Water Quality Management Act. Designed to meet the goal of the 1972 federal Clean Water Act, this legislation required the Oregon Department of Agriculture (ODA) to help reduce water pollution from agricultural sources. Non-point source pollution can come from several sources, such as:

- Bacteria and nutrient runoff from animal waste
- Soil erosion from crop and pasture lands
- Irrigation runoff
- Commercial fertilizer and sediment finding its way into waterways
- Removal or destruction of streamside vegetation
- Improper pesticide use

Enforcement and Technical Support

The Oregon Department of Agriculture prefers to work with landowners on a voluntary basis, assisting them in meeting the standards set down in Senate Bill 1010. If ODA receives a complaint against a landowner, they will inspect the site for evidence of a water quality violation. If they identify a concern, they direct the landowner to several sources of technical and financial support to remedy the concern. Only when the landowner consistently refuses to address the concern does ODA resort to enforcement actions, including civil penalties.

Technical assistance comes from several sources. Every county in Oregon has at least one Soil & Water Conservation District (SWCD) like Jackson SWCD. These SWCDs work with landowners on a non-regulatory basis to implement sound conservation practices that protect natural resources including water quality. Local watershed councils can also provide technical and financial assistance to landowners who need to restore vegetation along streams and other stream related concerns. Both organizations can also assist with finding funding to cost-share implementation of best management solutions.

A federal agency within the US Dept. of Agriculture (USDA), the Natural Resources Conservation Service

(NRCS) provides planning and financial assistance to landowners within their regions. The Farm Service Agency, another agency of the USDA, can provide financial assistance for conservation practices that improve water quality.

Terms to Know

Non-point source pollution—pollution caused by precipitation runoff that carries pollutants into streams, lakes, or other water bodies

Agronomic rates—how much of a soil amendment to apply to a field based on crop needs

Ag Water Quality Management Area Plans

In order to implement the Agricultural Water Quality Management Act, ODA formed local advisory groups to develop regional Ag Water Quality Management Area plans. These non-prescriptive plans outline what agricultural practices may contribute to water quality pollution and provide suggestions for how to prevent them. Each landowner ultimately determines how they protect water quality on their land.

Inland Rogue Ag Water Quality Management Area Plan

For most of Jackson County, several local landowners, representatives of governments, agencies and organizations, and ODA created the Inland Rogue Ag Water Quality Management Area Plan. This plan meets the Agriculture Water Quality Management Act by specifying what water quality concerns are present in Jackson County and makes regionally appropriate suggestion as to how to address them. This plan includes the following sub-basins:

- Upper Rogue (headwaters of the Rogue River to Little Butte Creek)
- Middle Rogue (Rogue River from Little Butte Creek to Grants Pass)
- Applegate River
- Illinois River
- Bear Creek

Water Quality & Agriculture: Your responsibilities as a landowner

Water Quality Concerns

The Inland Rogue Ag Water Quality Management Area Plan has identified the following concerns as potential sources of pollution in this area:

- Drainage and runoff
- Livestock management
- Irrigation
- Croplands
- On-farm storage

These sources of pollution can reduce water quality for irrigation, municipal water supplies, recreational activities, and wildlife habitat. Pollutants and their sources include:

- Bacteria from unmanaged livestock access to streams and poor manure storage practices
- Excess sediment from erosion along stream banks or poorly managed pastures and fields
- Phosphorus and nitrates from fertilizer application in excess of agronomic rates*
- Increases in natural stream temperatures from lack of streamside vegetation and flood irrigation return flows

Best Management Practices

Agricultural producers have several options available to them to protect water quality. Here are a few:

- Keep drainages well vegetated to filter out pollutants
- Use fencing to manage grazing on fields and near streams
- Convert to a pressurized irrigation system
- Apply fertilizers and pesticides at appropriate rates and times
- Cover and store manure away from streams



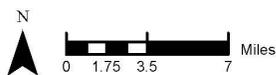
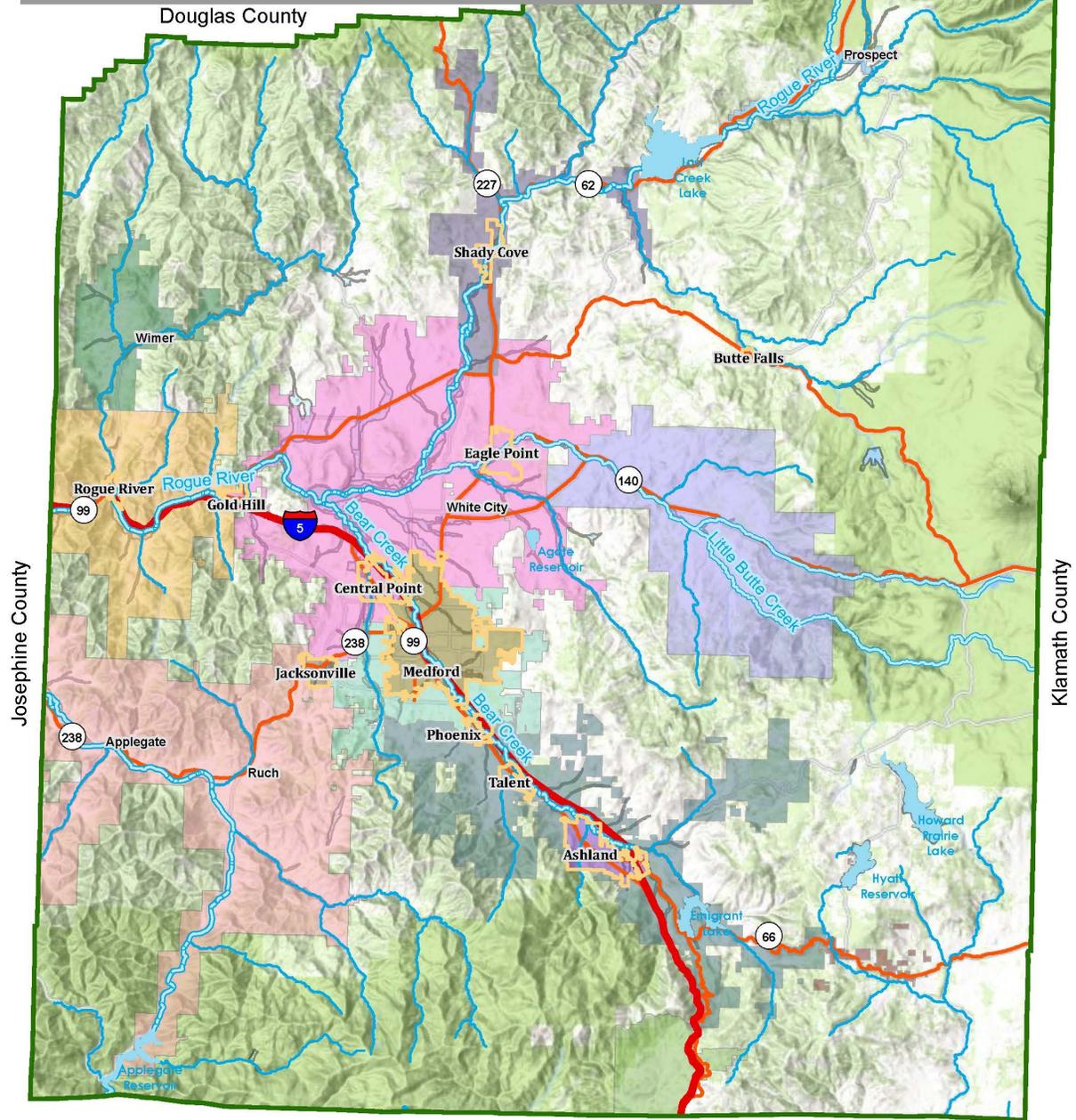
This manure storage facility keeps manure contained and away from nearby surface waters.



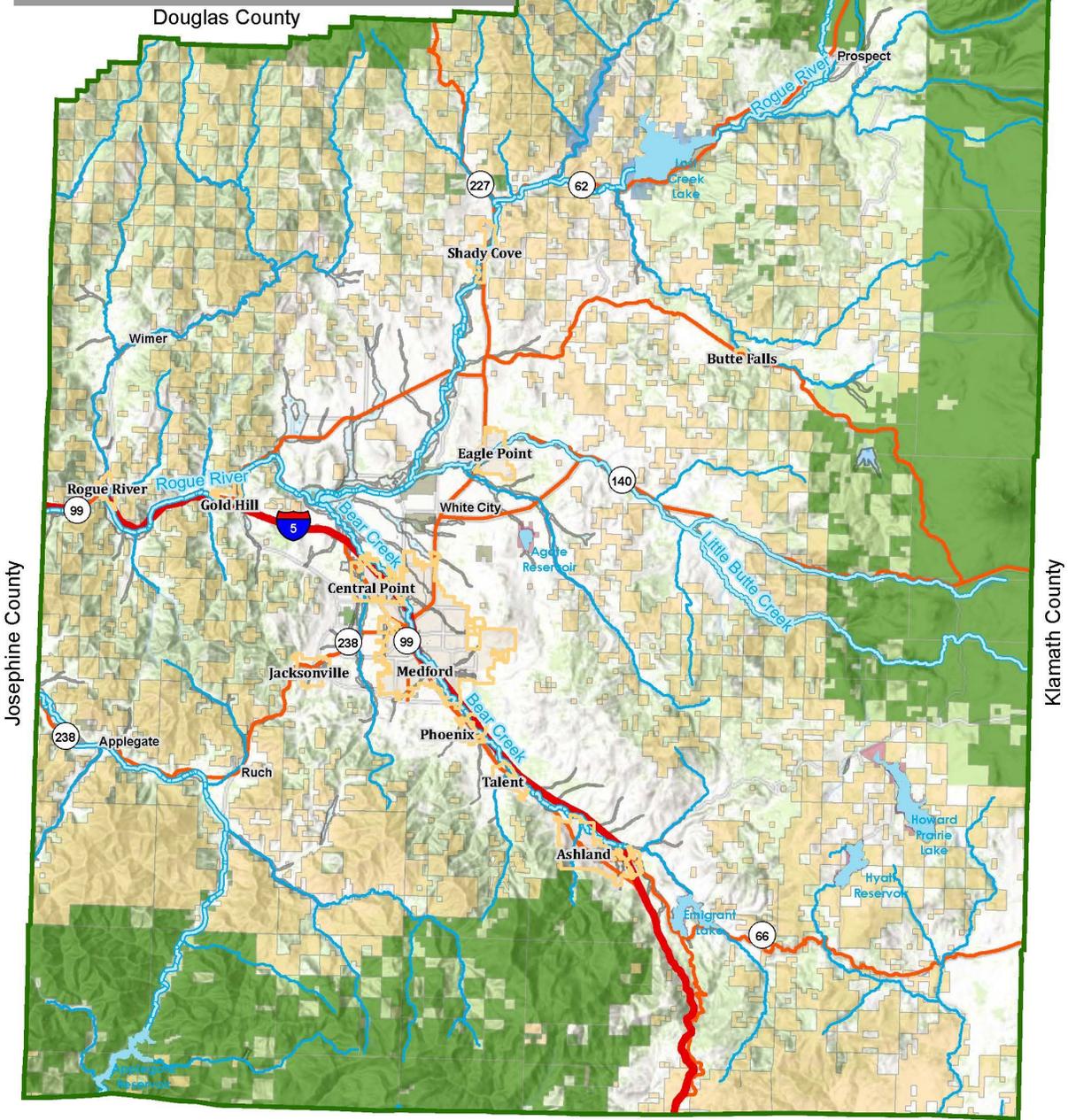
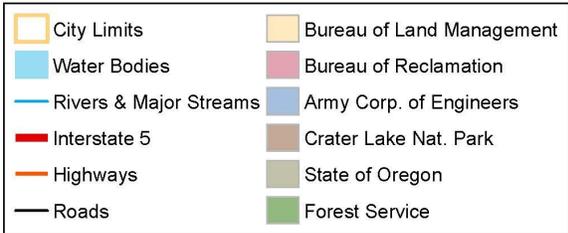
This manure pile remains uncovered through the winter, during which time it becomes saturated by winter rains. The result is a steady leaching of bacteria and sediment into the nearby creek and local groundwater supply.

Fire Protection Districts

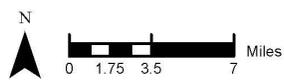
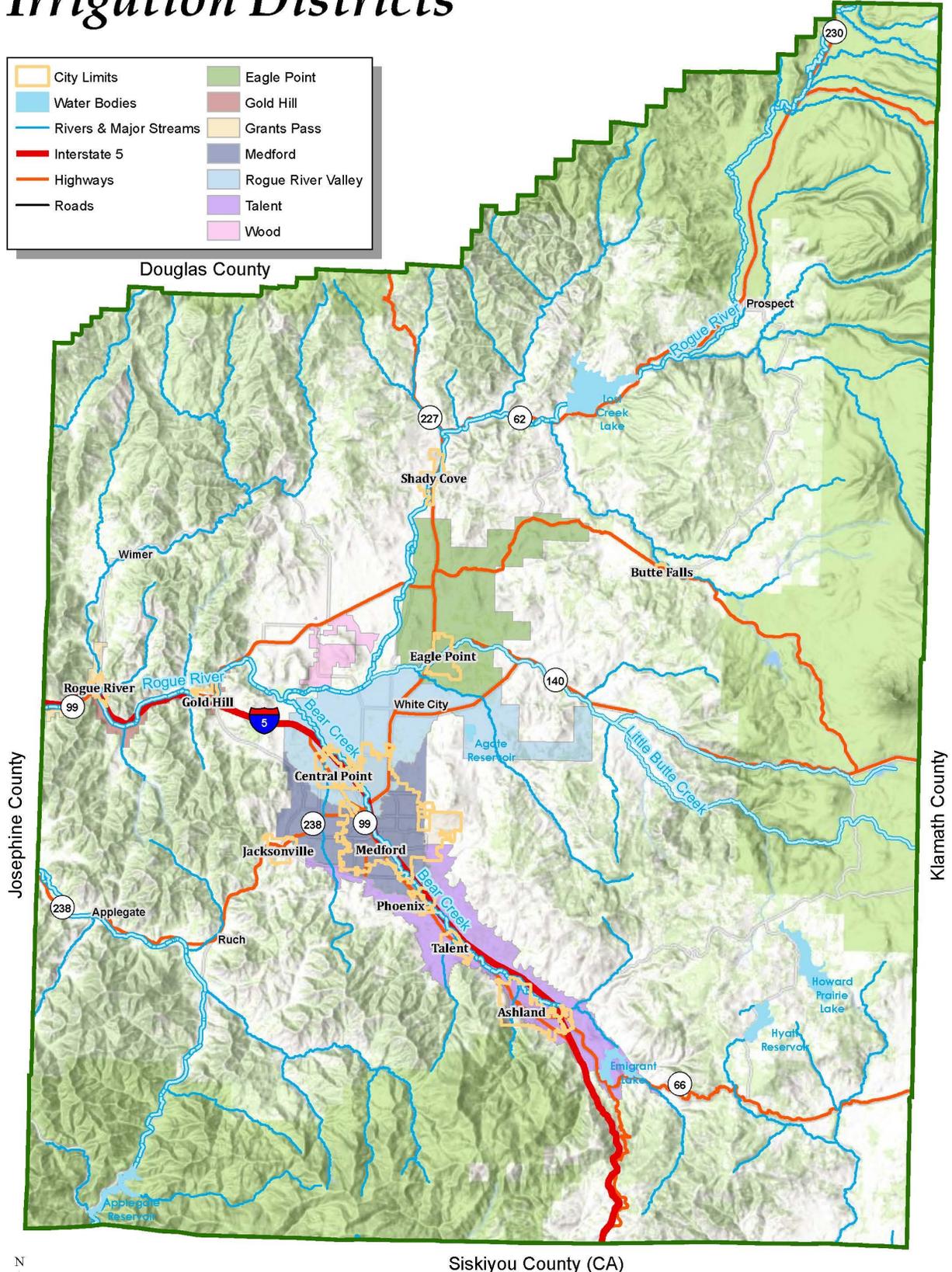
City Limits	Ashland Fire Department	Fire District #6
Water Bodies	Butte Falls Fire Department	Fire District #9
Rivers & Major Streams	Coe Stein Fire District	Greensprings Fire Department
Interstate 5	Fire District #1	Jacksonville Fire Department
Highways	Fire District #2	Lake Creek Fire District
Roads	Fire District #3	Medford Fire Department
	Fire District #4	Prospect Fire Department
	Fire District #5	



Federal & State Lands

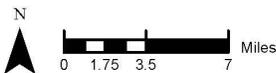
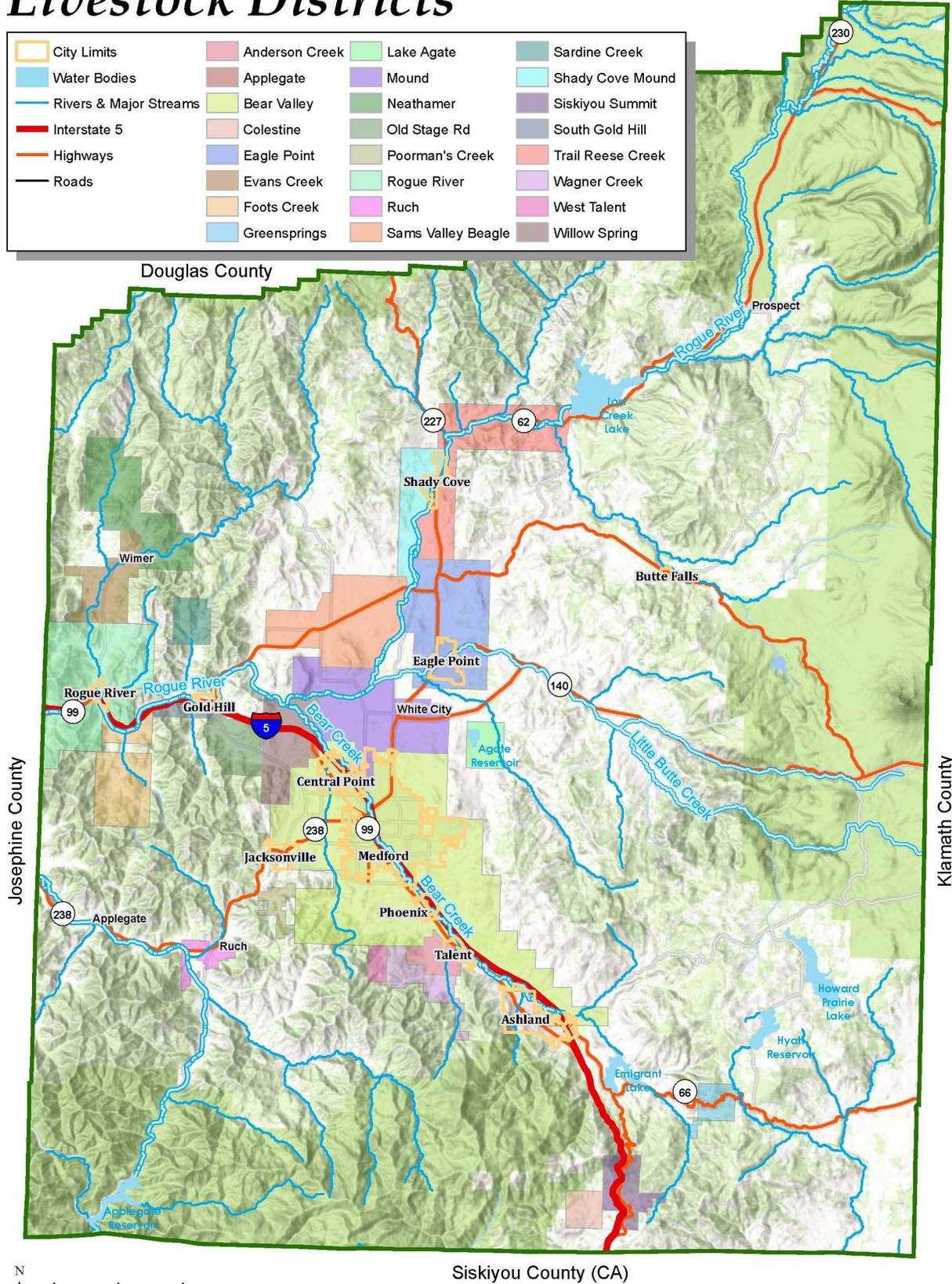


Irrigation Districts



Livestock Districts

City Limits	Anderson Creek	Lake Agate	Sardine Creek
Water Bodies	Applegate	Mound	Shady Cove Mound
Rivers & Major Streams	Bear Valley	Neathamer	Siskiyou Summit
Interstate 5	Colestine	Old Stage Rd	South Gold Hill
Highways	Eagle Point	Poorman's Creek	Trail Reese Creek
Roads	Evans Creek	Rogue River	Wagner Creek
	Foots Creek	Ruch	West Talent
	Greensprings	Sams Valley Beagle	Willow Spring



Notes

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Contributors to this Publication

The first edition of the *Natural Resource Stewardship Handbook* is the Jackson Soil & Water Conservation District's first go at capturing what our staff feels is important information for all residents of Jackson County to know as they interact with our diverse landscape and their neighbors. Special thanks to the following individuals for their hours spent editing, researching for, and creating the handbook. Please contact our office with further questions, comments, or suggestions.

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Thank you for being a responsible steward of our natural resources!



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