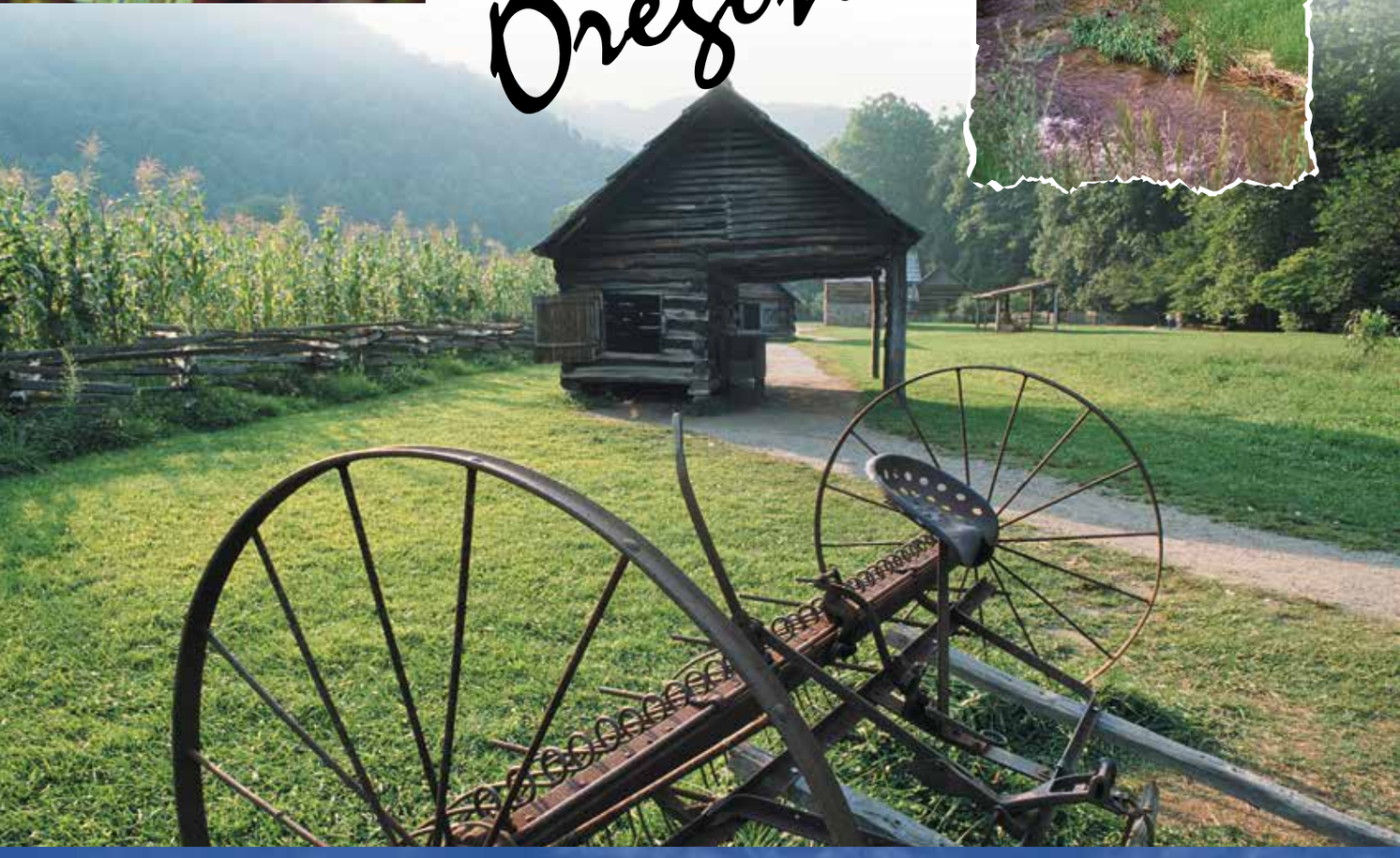
On Land & Water Management for Small Acreages in Oregon



HELP Maintain WHAT'S BEST about Oregon

- *Productive agricultural land*
- *Wildlife habitat*
- *Clear streams*
- *Native plants*
- *Healthy forests*

STEPS for Healthy & Sustainable Rural Living on Small Acreages in Oregon

Are You Ready to Take the Next *Steps*?

Improving natural resources on your land

Request a copy of the ***STEPS for Healthy & Sustainable Rural Living*** workbook to help you start taking action.

The *STEPS* workbook can help you further evaluate conditions on your land and identify the options that are right for you, your family and your property. *STEPS* provides detailed self-assessment materials, alternative land management strategies, and resources for assistance.

The workbook will help you:

- Enhance your quality of life
- Raise healthy domestic animals
- Maintain your rural property
- Improve wildlife habitat
- Protect water quality
- Increase your property's scenic value
- Control weeds
- Find conservation assistance

To request a copy of the Steps Workbook, contact your local Soil and Water Conservation District or Natural Resources Conservation Service office.

Photo Credits:
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Montana Department of Natural Resources and Conservation
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To request copies of this brochure:

Contact your local Soil and Water Conservation District or Oregon Association of Conservation Districts at www.oacd.org for a complete listing.

Reprinting made possible through funding by Oregon Department of Agriculture, USDA Natural Resources Conservation Service and Clackamas County Soil and Water Conservation District.

PLAN

Why Is Land and Water Conservation Important To You & Oregon?

Oregon is a great place to live, and you can help keep it that way!

DO YOU RAISE HORSES and wonder why you have to buy more feed each year as your land's productivity declines, leaving muddy ground and weeds?

DID YOU buy a place on a creek, but wonder how to care for your stream and improve it for fish?

DID YOU JUST FIND OUT that those pretty yellow flowers along your fence are noxious weeds and threaten the productivity of your land and your neighbor's land?

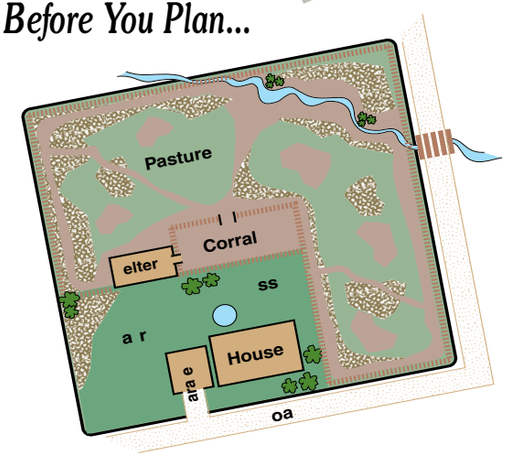
There's a lot to know about owning and managing land. This booklet will give you lots of information and ideas for a place that you can be proud to own. We're all part of a watershed and our actions can affect others. The things that you and your neighbors do can greatly improve the health of the resources we all appreciate about Oregon.

Look At What You Have

Any landowner needs a management plan. A management plan is a set of strategies and actions to help you maintain and improve the natural resources on your property. Before developing your plan—look around, make a sketch, and take a few notes about your property. In your sketch, show or note:

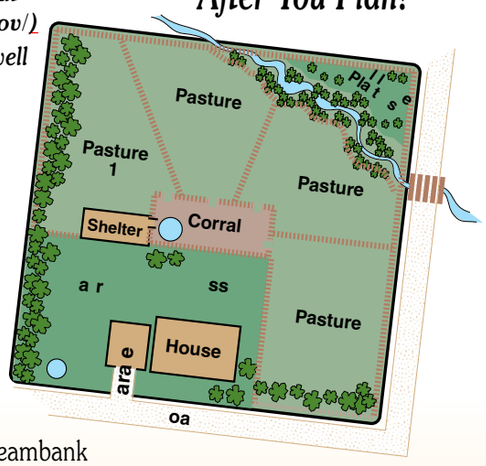
- *Property boundaries*
- *Fences and corrals*
- *Buildings*
- *Wells (human or stock)*
- *Septic system*
- *Streams, wetlands, ponds*
- *Bare or muddy ground*
- *Weeds*
- *Lawn, pasture, or cropland*
- *Trees or shrubs*

Before You Plan...



- ***Soil type (Look up your soil type at http://websoilsurvey.nrcs.usda.gov/)***
- ***Depth to groundwater (Check with well driller)***
- ***Neighboring land uses***
- ***Flat or sloped ground***

After You Plan!



The four pastures in this "After" drawing allow better management of livestock grazing and increased forage production. A **stockwater tank** located in the corral is accessible from all pastures and reduces streambank trampling. Shrub and tree plantings along the streambank prevent erosion, replace weeds and bare areas, and provide wildlife habitat.

Benefits of a Management Plan

Saves money as your land becomes more productive

Conserves natural resources for you, your animals, and your neighbors

Increases your property values

Enhances open space and wildlife habitat

Improves plant and animal health

Makes your place more attractive and promotes good neighbor relations

Promotes the health and safety of your family

What Are Your Goals?

Livestock grazing? How many?

Wildlife habitat?

Good water quality?

Healthy fish?

Healthy forest?

Native plants?

A 4-H or FFA project?

Something else?

You may find that you have to modify some of your goals because they are not realistic for your property.

Make A Plan For *YOUR* Land

*Once you've looked at your property and identified your goals, you can develop a management plan for reaching your goals. Even if you like things the way they are, you will need to **do something** to keep weeds from coming in or to keep the water clean. This booklet provides useful information on developing the many different parts of your management plan.*

Jump start your plan by using a guide called "STEPS for Healthy & Sustainable Rural Living on Small Acreages in Oregon." Check the back cover for details.

Contents

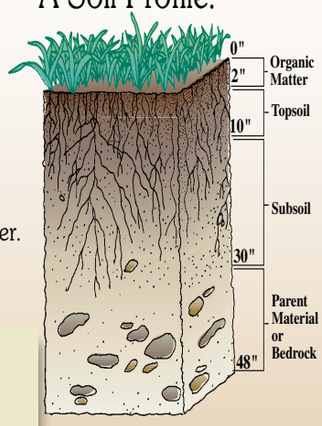
SOIL

Know Your Soil

Soils vary widely, even across your backyard. The type of soil you have will influence:

- Type and quantity of grass/crops/trees your land can produce.
- How easily soil may erode.
- If the soil will filter human and animal wastes before they reach groundwater.
- How often you need to irrigate.
- Possible problems with building foundations.
- Whether the area is a wetland.

A Soil Profile:



Is Your Soil Covered?

Vegetation protects the soil from erosion, increases water uptake by soils and holds soils in place on slopes and along streams.

How Fertile Is Your Soil?

Contact your local Natural Resources Conservation Service or county extension office to find out how to take a soil sample and where to send it for testing.

For More Information

For information about your soil type, refer to your county's soil survey available at http://websoilsurvey.nrcs.usda.gov/.

WEEDS

Weed Control

Weeds spread fast, so regularly look for new weed patches on your property. Act immediately to treat them by using one or more of the weed control practices listed below. Team up with neighbors to improve effectiveness. Weed control by itself is not enough. It is also necessary to modify the practices that caused weeds to become established in the first place!

Prevention. Good land management will help keep desirable vegetation healthy and weeds under control. Avoid over-grazing that leaves bare spots for weeds, buy weed-free hay, plant certified seed, wash your vehicle after being in a weed-infested area, and respond quickly to any new weed infestations.

Biological. Biological control attempts to find something in nature that can weaken or eventually kill a weed plant. Successful bioagents include certain fungi and insects that weaken weeds by attacking seed heads and other plant parts.

Mechanical. Mow weeds annually before they go to seed. Pull small weed patches and weeds near streams by hand.

Livestock Grazing. Graze weeds before they go to seed. Because livestock can easily carry weed seed on their coats or in their feces, avoid moving livestock from a weedy area to a weed-free area. Some weed species, if eaten, will make livestock sick.

Chemical Herbicides. Read label instructions carefully and follow directions. Use chemicals away from water to avoid harming you, your animals or wildlife, and to prevent pollution of streams and groundwater. Only certified pesticide applicators can use restricted herbicides. Call a local farm supply store to find out about hiring custom chemical applicators to spray your weeds. Be sure herbicide will not kill desirable trees and shrubs. Dispose of leftover chemicals at hazardous waste facilities.

Contact your county weed control district, Oregon State University Extension Service (OSU), or the Oregon Department of Agriculture Noxious Weed Program at http://www.oregon.gov/oda/plant/weeds to find out the noxious weeds in your local area and how to best control them.

QUIZ

Give Your Land A Weed Exam

How much of these do you have on your property?

	1	*2*	*3*
Healthy ground cover (forest, shrubs, grass, or cropland)	*A lot*	*Some*	*A little*
Patches of weeds and undesirable plants	*A little*	*Some*	*A lot*
Bare or muddy ground	*A little*	*Some*	*A lot*

If all of your answers are in the first column, your land earns an "A" for health. If most of your answers are in the second column, it is in average condition. If you have any responses in the third column, your land needs immediate help! Read on to learn about conservation practices that will improve your land's health.

Statewide Weeds of Significance

Control your weeds before they:

- Reduce the productivity of your pasture and land
- Cause water pollution and soil erosion because they're less effective at holding the soil
- Spread RAPIDLY!

Tansy ragwort

Garlic mustard

Perennial Pepperweed

Yellow starthistle

Knapweeds (spotted, Russian, diffuse)

Canada thistle

Japanese knotweed

The noxious weeds pictured above are aggressive and competitive. They should be removed immediately!

Quiz Are Your Grazing Animals Properly Managed?

	Y	N
Do you have so little grass in your pastures that animals consume dirt while trying to graze?	☐	☐
Are animals browsing on trees, shrubs, fences, or barns?	☐	☐
Are animals trampling the streambank?	☐	☐
Do animals have scruffy coats?	☐	☐
Do you have a weed problem?	☐	☐

*If you answered "yes" to **any** of these questions, you need a new grazing program that will provide more grass and healthier animals. This will save you money in lower feed costs and lower veterinarian expenses!*

Continuous grazing allows weeds to grow where grass roots have been weakened. A less dense leaf canopy allows sunlight to reach invading weeds.

Pasture rotation and good grazing management produces more grass, fewer weeds, and a minimum of bare ground.

Tips For a Successful Grazing Program

- *Eliminate continuous season-long grazing.*
- *Subdivide large pastures into smaller pastures (see sample grazing designs on page 4) and develop a pasture-rotation grazing system.*
- *Move livestock into a pasture when grass is 6"- 8". Move them out when grass is 3"- 4".*
- *During winter months, hold animals in a corral to avoid compacting saturated soils. If soils are well-drained and pasture is actively growing, continue your rotation to distribute manure and feed wastes evenly across your pastures.*
- *Allow long rest periods or use a high-intensity, short-duration grazing system to rejuvenate poor-condition pasture.*
- *Provide a water source for each pasture (see page 4).*
- *Irrigate each pasture (if you have irrigation) immediately after grazing to get plants growing again. Do not graze on wet soils.*
- *Horses do not need 24-hour access to feed or forage. Their nutrition needs can be met with only a few hours of grazing on good pasture each day. Corral animals for the remainder of the day to prevent overgrazing.*
- *On a limited acreage, you may have only enough pasture to exercise your animals and will need to feed year-round.*

Poor Pastures Cause

- *colic and respiratory problems from eating dirt*
- *weight loss*
- *parasites*
- *poor coat*
- *polluted runoff*
- *lost wildlife habitat*

How Much Feed and Forage Do Your Livestock Need?

In Oregon, livestock are usually grazed April through October and fed hay November through March. Times will vary from eastern to western Oregon.

Forage is what your animals consume by grazing. **Feed** is the hay that you provide an animal when forage is not available. Generally, livestock will need to consume 2.6 to 3.0 percent of their body weight per day in forage and feed. For example, a 1000-lb. cow will need to eat between 26 and 30 pounds of forage per day or approximately 900 pounds per month. This is often referred to as an **Animal Unit Month (AUM)**. The AUM is used to calculate the stocking rate and balance the amount of forage produced with the amount of forage required by the animal.

The amount of forage and feed needed to support an animal for a year is measured as an **Animal Unit (AU)**. The forage and feed requirements among different types of livestock can be compared by the **Animal Unit Equivalent**. This allows pasture managers to match the number of animals with the amount of available forage and feed required.

The average forage and feed requirements of an Animal Unit are listed below but may vary with the age and size of the animal. For example, five sheep are equal to one cow. This means a sheep eats about 20% of the forage a cow will eat in one month.

Animal Class	AU Equivalent (by head)	AU Equivalent (by percentage)	Total lbs. forage/feed required per month (per AU)	Total lbs. forage/feed required per year (per AU)
cow	1.0	1.0	900	10,800
horse	0.8	1.25	1, 125	13,500
sheep	5.0	0.2	180	2,160
llama	4.0	0.25	225	2,700
goat	5.0	0.2	180	2,160

Please consult with your local Soil and Water Conservation District or USDA/Natural Resources Conservation Service Field Office for help in determining how much forage your pasture can produce. Balancing the amount of pasture required with the amount of forage produced is the first step in properly stocking your pasture to avoid overgrazing.

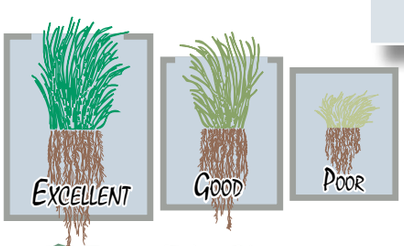
This information will help you determine if you need to:

- **Buy additional feed or rent pasture**
- **Increase your forage pasture production**
- **Improve your grazing management**
- **Reduce your number of animals**

How Grazing Affects Root Growth

Overgrazing occurs when more than 50 percent of the grass plant is removed all at once. Overgrazing stops root growth and reduces grass production. Look what happens when you try to sneak in another 10 percent "harvest"—50 percent of the roots stop growing!

Percent Grass Plant Removed	Percent Root Growth Stopped
10%	0%
20%	0%
30%	0%
40%	0%
50%	**2-4%**
60%	**50%**
70%	78%
80%	100%
90%	100%



Notice how the root mass of these grasses decreases in pastures that range from excellent to good to poor condition.

PASTURE Grazing Schedule

For A One-Herd Multiple-Pasture System

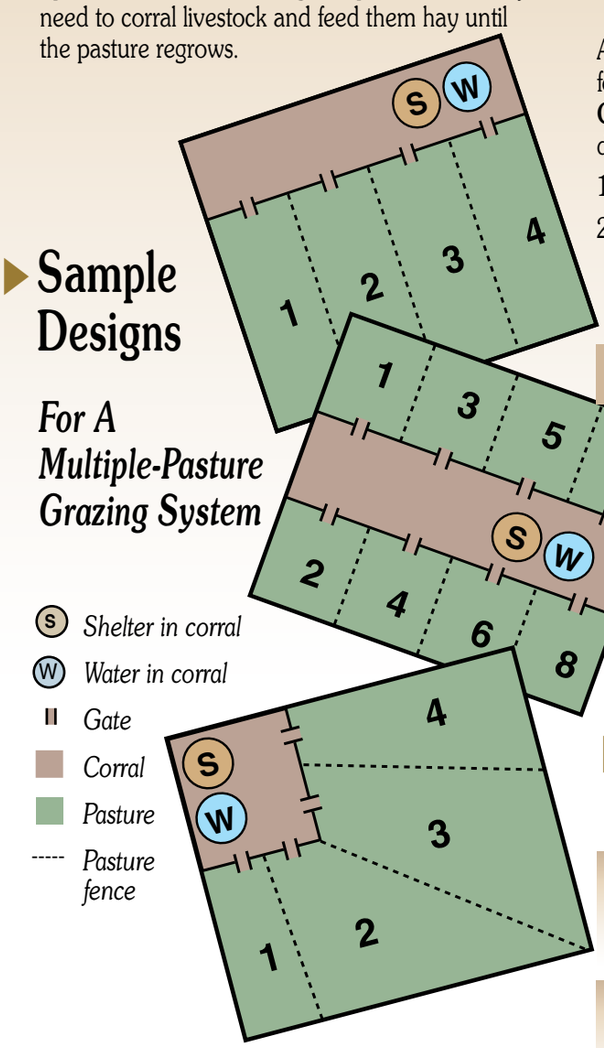
In Oregon, livestock usually graze April through October during the plants' growing season. Begin grazing when plants are 6" to 8" in height. Move livestock after 50 percent has been eaten (3" to 4" remains). A minimum of 30 days is needed between grazing periods on irrigated pasture and up to 3 months for nonirrigated pasture. You may need to corral livestock and feed them hay until the pasture regrows.

	MONTHS											
Pasture	A	M	J	J	A	S	O	N	D	J	F	M
1	G			G			G					
2		G			G			G				
3			G			G			G			
4				G			G			G		

G *Graze* — *Rest* — *Provide feed/hay*

Sample Designs

For A Multiple-Pasture Grazing System



Stockwater Development

An Essential Part of Your Grazing and Animal Health Programs

As you divide your acreage into several pastures, establish separate water sources for each pasture or a single water source that is accessible from several pastures. **Clean, fresh water is essential for good animal health.** Options for stockwater development include:

1. A stock tank or nose pump (check on status of water rights).
2. For small acreages, it is highly recommended that you fence your grazing livestock away from streams to keep manure out of the stream, protect and maintain streamside grasses and shrubs, and control erosion.

For More Information

Obtain publications from county extension offices on livestock production, farming, gardening, 4-H, and FFA programs.

Assistance is available from the local soil and water conservation district, USDA-NRCS, and private consultants to:

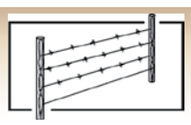
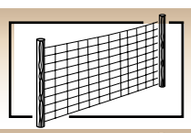
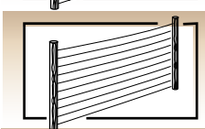
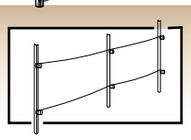
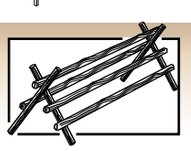
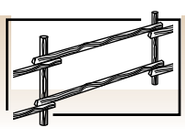
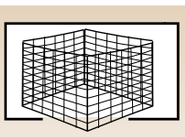
- ***Design a grazing system, stockwater developments, and a livestock waste disposal program***
- ***Increase hay and pasture production***
- ***Help you meet water quality standards***

FENCING A Grazing Management Tool

When selecting a fence, consider:

- Purpose (type of animal you're keeping in or out)
- Type of soil material (rocky or deep loam)
- Terrain
- Material and labor costs for construction
- Availability of power
- Maintenance requirements
- Weather
- Visual impact
- Wildlife. Smooth wire is safer for wildlife than barbed or woven wire. Space wires at 16", 22", 28", and 40" from the ground to allow antelope, deer, and elk to get through with reduced fence damage. The 12" gap between the top two wires keeps animals from getting tangled in the wires.

Types of Fencing

	Advantages	Disadvantages
	**4-STRAND BARBED WIRE** Good control of cattle.	• Barbed wire can injure horses, llamas and wildlife. Place wire to allow wildlife to safely pass. Labor and material costs high. Periodic maintenance required.
	**WOVEN WIRE** Good control of sheep. Add 2 upper strands of barbed wire for cattle. May keep some predators out.	• Extremely unsafe for wildlife. Limit use to small areas near buildings. Labor and material costs high. Some maintenance necessary.
	**4- to 10-STRAND SMOOTH WIRE** 4- to 5-strand good for horses, less harmful to wildlife. 8- to 10- strand will contain large, exotic animals. Durable.	• Labor and material costs high. Periodic maintenance required.
	**ELECTRIC** Good for establishing pasture rotation program on small acreages. Lightweight, portable, easy to set up or dismantle before and after irrigation. Less expensive.	• Weathers poorly. Don't use in lengths over 1,000 ft. Requires regular maintenance. Needs solar or electric power source.
	**JACKLEG** Aesthetically appealing. Very durable. Withstands heavy snow. Good in areas where it is hard to dig or drive posts. Can be adapted for marshy, wet areas. Low maintenance.	• High labor and material costs during construction.
	**POST AND POLE (RAIL FENCE)** Durable. Withstands heavy snowfall. Low maintenance, less harmful to wildlife.	• High labor and material costs. Less durable in high rainfall areas.
	**HOG PANELS** Can be formed into a small, portable pen. Wheels may be attached to make moving easier. Good for establishing rotation grazing for a couple animals on a small acreage.	• Inexpensive and easy to construct. Appropriate for only a few sheep or other small animals. Should be moved once or twice each day.

IRRIGATION

What are Your Water Rights?

Who owns the water? If you plan on using water, make sure you have the right to do so.

Check out water rights information at www.wrd.state.or.us.

To Increase Your Pasture Production

A pasture is a grazing area for animals enclosed by a fence and often planted to nonnative forages.

- *If you have a water right, irrigate at the right time and amount. Under-irrigating will shorten the life of your pasture; over-irrigating wastes energy, water, nutrients, and your time.*
- *Allow soils to dry before grazing.*
- *Fertilize according to OSU Fertilizer Guides and soil test recommendations (http://extension.oregonstate.edu/catalog/). Overfertilizing can hurt water quality.*
- *Maintain at least 3" of plant height after haying or grazing.*
- *Drag or harrow to spread nutrient-rich manure.*
- *Control weeds with a dense, healthy pasture.*
- *Reseed. Contact your local soil and water conservation district, USDA Natural Resources Conservation Service, or OSU Extension Service office to determine the most productive seed mixture for your purpose and location.*
- *Graze properly. See previous page for details.*

By knowing when and how much to irrigate, you can save soil, fertilizers, and pesticides (by reducing runoff and leaching), save water and electricity costs, increase crop production, and ensure more water for fish.

Irrigation Systems

Drip irrigation uses the least amount of water and is the most efficient. This system requires good water quality to avoid emitter plugging, some maintenance, and an initial investment. It is used for trees and other single plants.

Sprinkler irrigation (includes handlines, wheel lines, and center pivots) uses a moderate amount of water. This system requires labor to move the pipe, some maintenance, and an initial investment.

"Big gun" sprinkler irrigation applies excess water and doesn't work well on clay-type soils. This system requires high electrical costs, some maintenance, and minimal labor.

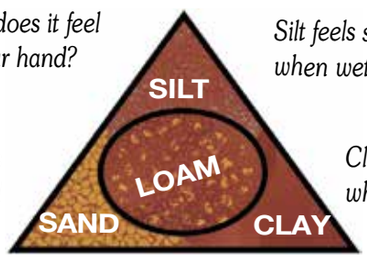
Flood irrigation uses lots of water and is least efficient. This system requires labor to turn water on or off the land, is low maintenance, and is the least expensive (if irrigation ditches are present).

Add fish screens to irrigation intake pipes and diversions so that fish don't get sucked in!

Irrigation Management
Depends on Soil Texture

How does it feel in your hand?

Silt feels silky smooth when wet.



Sand feels coarse and gritty.

Clay feels sticky when wet.

Loam is a combination of all of these.

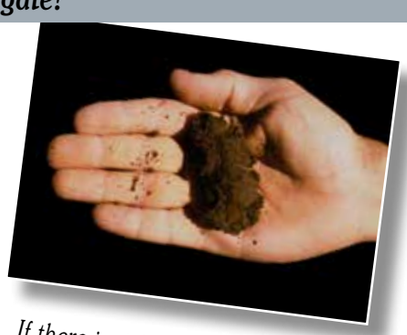
Irrigation
How Much and How Often?

Soil Texture	Moisture to be replaced in the 2-foot rooting zone when soil is at 50% of its water-holding capacity*	Average Peak Season (July/August) Irrigation Frequency (adjust for weather)
Loamy sand	1.4"	5 days
Sandy loam	2.3"	8 days
Loam	3.1"	10 days
Clay loam	3.2"	11 days
Clay	3.1"	10 days

** These estimates are for an alfalfa/grass hay crop. Amounts may vary for other crops. Irrigation is most important for alfalfa during the seedling stage and immediately after cutting. If your soil depth is less than 2', you'll need to irrigate more often and apply less water.*

Q: When do I need to irrigate?

A: Irrigate when the soil moisture drops to about 50 percent of its water-holding capacity in the top 2' of soil. Check your soil moisture by squeezing several handfuls of soil taken at 6", 12", and 18" depths in your field. Irrigate before the soil at the 18" depth begins to crumble in your hand, since most of the plants' roots are above 18".



If there is staining on your fingers from squeezing the soil, wait a couple days and test the soil again. If the soil feels only slightly moist, forms a slightly crumbly ball when squeezed in your hand, and there is no staining, then it is time to irrigate (see picture).

Q: How long should I irrigate?

A. In general, irrigate sandy soils for short periods (2-3 hours) and clay soils for longer periods (9-12 hours). Ask your farm supply store or local NRCS office to recommend the correct size spray nozzle for your soil type and your irrigation system. When it rains, see if the rain has gone deeper than the soil surface before considering it a source of water for your crop.

To determine exactly how long to run your system: (1) Place several straight-walled cans at various locations under your sprinkler system. (2) Run the system for one hour. Average the depth of the water in the pans. This is your hourly application rate. (3) Divide the inches of water to replace by the hourly application rate.

EXAMPLE: *Loam needs 3.1" of water replaced in the top 2 feet when it is at 50 percent of its water-holding capacity (see irrigation table). If your irrigation system's application rate is 0.3"/hour, you will need to run your irrigation system for ten and a half hours to deliver 3.1" to the soil, since 3.1" ÷ 0.3"/hour = 10.5 hours.*

MANURE

More Than a Few Reasons to Manage Livestock Manure on Your Property

- Manure problems create an unhealthy environment for horses and livestock. Poor health may mean more vet bills and increased feed bills for unthrifty animals.
- Leaving manure on the ground creates more mud.
- Manure, like mud, creates a breeding ground for insects, especially filth flies. Insects are annoying at best and, at worst, carry disease or can cause serious allergies.
- Internal parasites hatch from the manure as often as every 3 days and can reinfest animals as soon as 24 hours after worming.
- Mud and manure problems are inconvenient for the farm owner, can make chores difficult, and are unpleasant for neighbors.
- Nutrient runoff from manure has a negative impact on the environment. It contaminates surface water and groundwater, is detrimental to fish and other aquatic wildlife, and fertilizes aquatic weeds.
- Applying manure back to pastures creates a natural nutrient cycle; one horse's manure represents about $150 in fertilizer value/year.

MUD

How to Reduce Mud

- Fence animals out of creeks, wetlands and lakes.
- Provide watering systems away from streams.
- Practice good pasture management techniques so you have a healthy pasture—avoid overgrazing and creating bare spots.
- Create a sacrifice area and use it to confine livestock in the winter. Also, use the sacrifice area when pastures are grazed down to 3" during the summer months.
- Pick up manure every 1-3 days in sacrifice areas and outdoor arenas.
- Use footing material, such as hogfuel or gravel over geotextile fabric, in high traffic areas such as sacrifice areas and in front of stalls. Avoid using hogfuel in very wet areas where it will turn into muck.
- Maintain a grassy area of at least 25 feet in width around the sacrifice area. Increase this dimension if near a stream. The grass will serve as a filter for any runoff that does occur.
- Install gutters and downspouts on all buildings and divert water away from sacrifice areas.
- Maintain or plant trees and moisture-loving shrubs outside of sacrifice areas.Trees can drink a lot of water, 100-250 gallons per day for a mature tree.This can aid in keeping an area drier and reducing surface runoff.

Gravel and geotex fabric example

TIPS

On Using Manure & Stall Waste

- Collect raw manure and stall waste from barnyard areas and stalls. "Patty-picking" manure every 1 to 3 days prevents animals from re-ingesting parasites and can break the parasite cycle.
- Store manure in a covered area during the winter months. A roof or tarp over your manure pile will prevent rain from leaching away valuable nutrients.
- Store manure in a location that makes it easy for equipment to turn, haul and load compost or non-composted manure.
- Use a good deworming program if manure is not composted (composting is a process that generates heat killing parasites, worm eggs and weed seeds).
- Take soil and manure tests to apply manure at the right rates for plant needs. Overapplying manure nutrients can be harmful for animal health and the environment.
- Apply manure and compost to flower beds, cropland and pastures during the growing season when plants can take up valuable manure nutrients (April to October).
- Sell or give away composted manure and stall waste to neighbors, community gardens, local garden clubs, organic farms, nurseries, or topsoil and composting businesses.

Is your farm "manure tight?" Some state and federal laws are aimed at keeping manure on the land as a fertilizer and out of surface and groundwater. Check with your local Soil and Water Conservation District to find out about regulations pertaining to manure management in your area.

Quiz Is Your Stream Healthy?

	Y	N
• Is streamside vegetation diverse, vigorous, and native to the area?		
• Does the water flow out onto the floodplain every couple of years?		
• Does more than 50% of the streambank length have trees and shrubs?		
• Is the stream stable with little (less than 10%) or no bank erosion?		

If your answers are "yes," then you probably have a healthy stream—read on to find out how to maintain your stream. Even one "no" answer can indicate an unhealthy stream—read on to find out what you can do to improve your stream.

Riparian Areas

are the green borders found along streams, lakes, and wetlands. They are made up of water-loving plants such as alder, willow, cottonwood, and sedges.

Grazing removes important near stream vegetation and may cause streambank erosion and water quality degradation.

Riparian areas make up less than 5 percent of the landscape, yet contain much of the plant and animal diversity by providing food, water, and shelter:

- In eastern Oregon, 74% of the wildlife depend on riparian zones.
- In western Oregon, 94% of the wildlife use riparian zones.

Leaving these areas in a healthy condition will protect benefits we all enjoy.

A Healthy Riparian Area

The key to a healthy stream system. Lush and diverse riparian and wetland vegetation along the water's edge will:

Slow flood flows and reduce erosion and property loss.
Secure food and cover for fish, birds, and other wildlife.
Keep water cooler in the summer.
Reduce water pollution by filtering out sediment, chemicals, and nutrients from runoff.
Provide important breeding habitat for birds.
Hold more water in the soil, slowly releasing it for longer season streamflows and groundwater recharge.

Fish Need Healthy Streams

What do fish need to thrive?

- Riparian buffers to filter nutrients and sediment.
- Rocks and riffles to churn and add oxygen to the water.
- Clean cold water.
- Overhanging vegetation and large pieces of wood to hide under.
- Deep pools provide coldest water in the summer and least likely to freeze in the winter.
- Riparian vegetation to shade and cool water.

Tips To Enhance Riparian and Wetland Areas

- Delay mowing or haying grassy areas until late July when birds are done nesting.
- Increase the buffer width around open water. In general, studies show that widths of 50 feet trap eroded soils, 100 feet filter pollutants, and 200-300 feet provide wildlife corridors.
- Avoid applying fertilizers, herbicides, and pesticides in the buffer to keep pollutants from running into water.
- Fence livestock away from water areas to protect streambanks, reduce erosion, and protect water quality.
- Provide offstream water sources using a nosepump or trough in the pasture. Cattle gain weight faster on clear, unpolluted water.
- Look at an undisturbed riparian buffer or wetland in your area and preserve or plant the same native vegetation in your area.
- Try removing noxious weeds and invasive plants by mechanical rather than chemical means. Invasive weeds include purple loosestrife and reed canarygrass. Replace with native plants.

Does Your Property Have A Wetland?

Wetlands provide wildlife habitat, absorb pollutants, and reduce flood damage. Wetlands have wet soils, plants, and water that may be on top of the ground or just below the surface. To protect wetlands and their benefits, some laws may limit activities within wetlands. Check with agencies on page 11 for technical assistance to enhance your wetland.

Tips For A Healthy Stream

- Consider protecting the stream corridor and associated wetlands from land use activities to give them a break—"passive restoration."
- Leave large pieces of wood in the stream channel that will not increase flooding.
- Maintain fences and practice appropriate grazing management.
- Protect water quality by keeping a wide vegetated buffer next to the stream.
- Preserve floodplains for slowing and filtering flood water.

Quiz Is Your Property Attractive to Wildlife?

	Y	N
Are there a variety of native vegetation types, such as wildflowers, tall grasses, shrubs, and trees for food? For cover?	☐	☐
Is water accessible to wildlife all year?	☐	☐
Can wildlife avoid predation from domestic animals, such as cats and dogs?	☐	☐

The more "yes" responses you had, the more likely you will enjoy the company of birds, small mammals, and possibly deer and elk

Tips For Creating Wildlife Habitat

- Plant a diversity of vegetation types and heights.
- Plant shelterbelts and fence rows with evergreens and fruit-bearing shrubs.
- Leave snags and down, woody material for perching, hiding, and nesting.
- Plant small grains or large-seeded grasses for wildlife food.
- Develop ponds or other watering facilities.
- Build or modify wildlife-friendly fences.

Upland Birds and Raptors

Provide food and water. Areas of tall grass, thickets of shrubs, and plots of wheat, barley, and other small grains provide food and habitat diversity for quail and other field birds. When harvesting crops, begin cutting from the center of the field outward to flush the birds away.

Trees and shrubs can provide seeds, fruits, and berries that birds like. Streams, ponds, or stocktanks can provide water. Place a stationary ramp in stocktanks to prevent birds from drowning while watering.

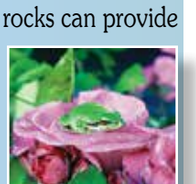
Provide nesting areas and cover. Song birds require a diversity of vegetation heights (tall grass, shrubs, trees) and a variety of foliage densities (evergreen and deciduous trees) for nesting and safety from predators.

Plant tall grass along roadsides and ditchbanks and shrubs along fencelines or as part of a windbreak to provide nesting and cover. Since some of these birds nest on the ground in the spring, avoid mowing or using weed control chemicals on your tall grass until birds are out of the nest in mid-July. (Some weeds should be sprayed prior to July 15 to control their spread effectively, so weigh your priorities.)

Perches of different heights, such as old snags, fences, and telephone poles, are used by many birds (from bluebirds to hawks) for resting and searching for food.

Amphibians and Reptiles

Provide food and cover. Water-holding structures like well-vegetated ponds, rain puddles, logs, and rocks can provide drinking water and a source of food.



Provide habitat. Reptiles and amphibians are cold-blooded animals. They need sunny areas to warm up in the morning and cool areas in the heat of the day. Rock piles in the sun provide basking areas. Stumps, logs, shaded rocks, and groundcover provide cool areas.

Pollinators

Native bees are valuable pollinators that can boost crop yields and provide insurance when honey bees are scarce. To increase the number of native bees on your land, here are some things you can do:

Provide Food – Bees eat nectar and pollen. They rely on flowers throughout the growing season. Consider planting native plants that are early and late-season bloomers to provide food when flowers are few. Native flowering plants will also support local honey bee populations.

Protect Nest Sites – Different native bees build different nests. Wood-nesting bees often nest in hollow twigs or beetle tunnels in dead trees. Ground-nesting bees favor undisturbed bare ground. Bumblebees make use of small spaces such as rodent burrows. Consider preserving snags or dead trees, leaving areas of untilled ground and making bee blocks.

Be Prudent with Pesticides – Insecticides directly kill bees. Consider minimizing the use of pesticides or select less toxic insecticides and formulations (granules or solutions.) Try to spray on dry evenings and soon after dark, when bees are not active.

Doing More – Plant hedgerows and stream buffers with a variety of flowering plants, leave untilled and unsprayed areas next to fields and roadsides and work with neighbors to protect natural areas around your farm.

For more information on pollinators, visit the Xerces Society website, www.xerces.org.

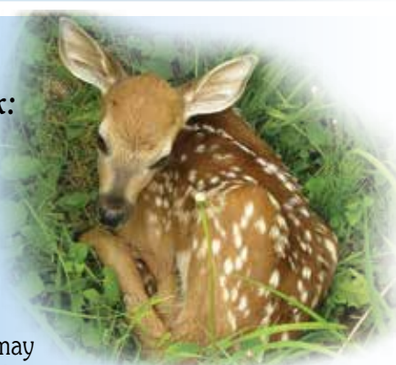
Waterfowl

Provide food. Waterfowl like aquatic plants, small insects, snails, and crustaceans. They also feed on grains and other green forage.

Provide water. Ponds are a natural for attracting ducks, geese, and other waterfowl. Ponds should have shallow and deep areas and well-vegetated banks. Vegetated islands are the safest and preferred for nesting.

Provide nesting areas and cover. Large 40- to 50-acre areas of tall, dense, undisturbed vegetation near open water are needed for successful nesting. A tangle of dead plants from last year's growth will hide nesting hens from predators. This dense, dead vegetation also creates better temperature and moisture conditions for egg hatching.

Deer and Elk



If you want to attract deer and elk:

Provide food. Deer and elk are primarily browsers and grazers. Browse consists of a variety of trees and shrubs. Creating openings in the forest will increase grass and shrub growth for deer and elk. In winter, deer and elk look for windblown areas where grasses are exposed— that may be your pasture! After feeding, elk and deer look for thickets of shrubs or stands of trees to rest and stay warm.

Provide cover. When deer and elk feed in the open, they like being no more than 600 feet from trees and brush for hiding. Consider maintaining large areas of dense shrub or trees on your property for hiding and shelter, especially near pastures. Areas of dense timber are cooler in the summer and warmer in winter than open areas. If you want to accommodate deer and elk and need a fence, build a low one with a smooth top wire. This is easier for them to cross.

Is Your Forest Healthy?

Quiz

	Y	N
• Is your property free of noticeable disturbances from insect, disease, or animal damage?	☐	☐
• Do you have at least two snags and down logs per acre for wildlife and long-term productivity?	☐	☐
• Are your roads well maintained without active signs of erosion?	☐	☐
• Are streamside areas well vegetated with trees and brush and protected during management operations?	☐	☐

If you had all "yes" answers, there still may be opportunities to enhance your woodland.

Read on...

For A Healthy Forest

Tips

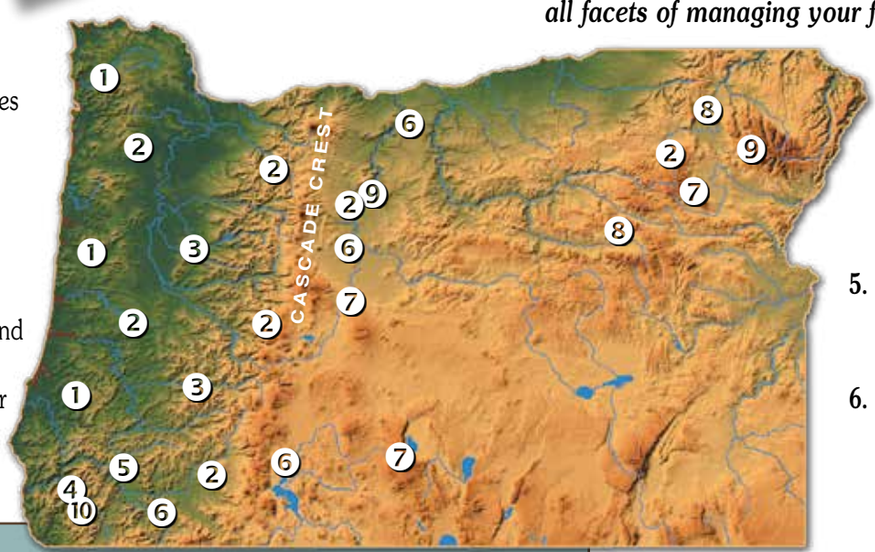
- *Maintain diverse tree ages and tree species that are native and well-suited to the site.*
- *Prevent insect and disease buildup through timely salvage. Keep in mind that these natural disturbances create valuable snags and down logs for wildlife. Contact a forester for assistance.*
- *Thin trees to improve growth, health, and vigor. Leave the largest and healthiest trees for timber, as well as some trees with defects for wildlife (i.e., broken tops, cavities).*

- *Locate access roads away from streams. Design, construct, and maintain roads to provide drainage, prevent erosion, and reduce costs.*
- *When planting trees, prepare the site, select native species suited to the site, handle planting stock carefully, and plant to the proper depth without "J-rooting." Control competing vegetation and protect seedlings from grazing by livestock and wildlife until trees become the dominant vegetation.*
- *When using chemicals to control competing vegetation, avoid damage to your trees or other resources such as water quality. Make sure you use the right chemical for the job, follow all label directions, and obtain the necessary permits.*
- *Dispose of large amounts of slash (logging debris) to reduce fire hazard. Pruning trees can also reduce fire hazard and improve the looks and timber quality of your stand.*

Seek advice from a forest professional in all facets of managing your forestland!

Forest Insects and Disease

Use the key to identify the numbered locations on the map at the right.



1. Swiss needle cast reduces growth of Douglas-fir in coastal forests.
2. Root diseases reduce growth and kill trees in western Oregon forests.
3. White pine blister rust and balsam woolly adelgid (exotic pests) damage or kill trees throughout the state.
4. Port-Orford-cedar root disease (an exotic pest) kills Port-Orford-cedar on wet sites.
5. Bark beetle outbreak and fire risk are high in over-stocked stands.
6. Root diseases and dwarf mistletoe increase where past harvest practices and fire suppression increase the number of susceptible trees.
7. Bark beetles kill trees in overstocked pine stands.
8. Risk of root disease, dwarf mistletoe, and bark beetle increase from overstocking and species changes from fire suppression and selective cutting.
9. Western spruce budworm populations have collapsed in the state, but outbreaks will occur in the future.
10. Sudden Oak Death, caused by a pathogen called *Phytophthora ramorum*, attacks many types of trees and shrubs common to the Pacific Northwest.

For More Information

- **The Oregon Department of Forestry (ODF) provides on-site technical planning and administers the Forest Practices Act and several cost-share programs. A plan will help you reach your goals while protecting all resources on your forested properties.**
- **The OSU Extension Service offers forestry workshops, publications, and over-the-phone assistance. See your local OSU Extension Service office.**
- **Soil and water conservation districts and the USDA Natural Resources Conservation Service provide conservation planning that includes forestry.**
- **Private forestry consultants inventory forests, set up timber sales, and help meet your goals. Check the yellow pages in your phone book for consultants.**
- **Contact your local small woodland association for more information: www.oswa.org.**

Quiz How Safe Is Your Well and Septic System?

	No	Yes
Is your well at least 50 feet away from the septic tank and 100 feet from the drainfield?	☐	☐
Has a well test within the last year shown acceptable results for bacteria and nitrate?	☐	☐
Do you keep fertilizers, pesticides, fuel tanks, and animals away from your well?	☐	☐
Are you sure there are no old, unused wells on your property?	☐	☐
Has it been less than 5 years since you last pumped the septic tank?	☐	☐
Do you know how to maintain your well and septic system to protect your drinking water and avoid costly repairs?	☐	☐

*If you answered "no" to any of the questions, consider a Home*A*Syst evaluation. You will find out how to protect your drinking water supply, your family's health, and the investment in your rural property. Contact your OSU Extension Service agent for more information.*

Protect Your Home From Wildfire

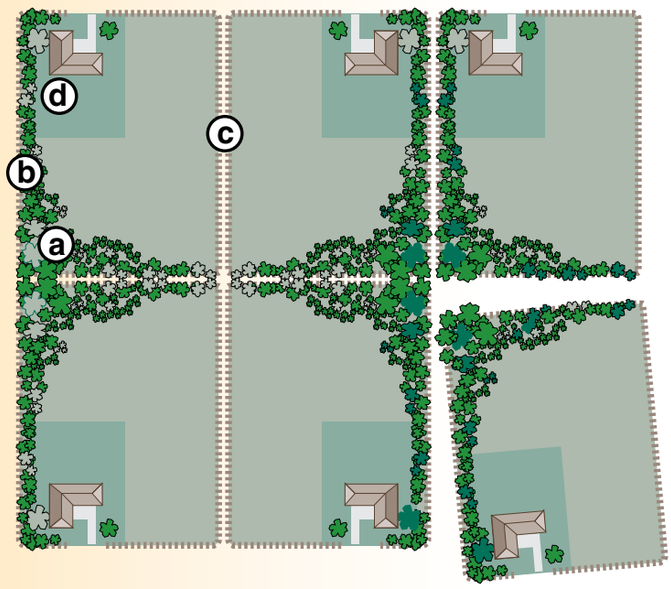
Maintain 30' of green lawn or fire-resistant plants around your home.

Prune the lower branches of trees below 12' to remove "ladder fuels" that can cause a ground fire to become a more destructive and harder-to-control crown fire.

Have water and firefighting tools available.

Avoid using wood shakes for roofing or storing firewood next to your house.

Contact a USDA Forest Service or Oregon Department of Forestry office for publications on making your home more defensible against wildfire:
www.fs.fed.us/,
www.oregon.gov/ODF



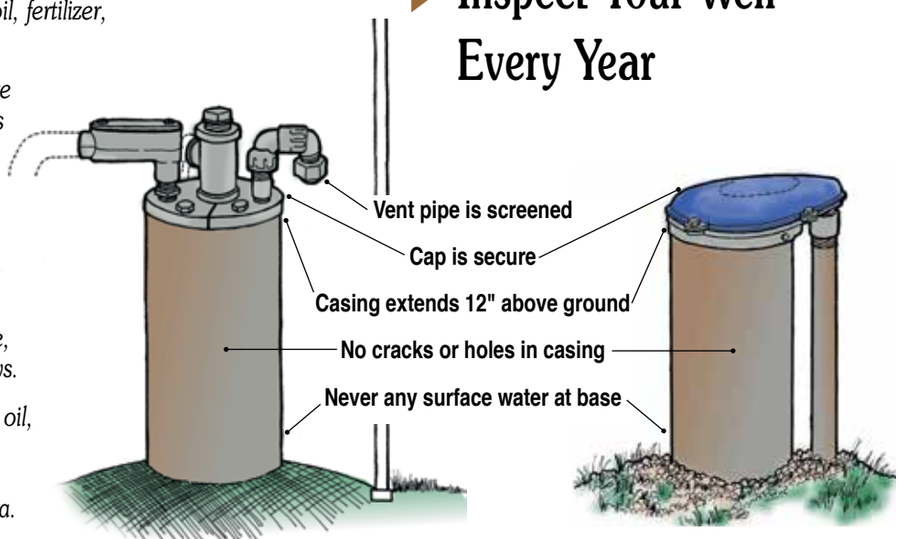
Tips For Planning A Homesite

- *Plan for erosion control before building.*
- *Site homes and roads on stable soils away from streams. Avoid steep slopes and floodplains.*
- *Provide adequate distance between your well and septic system.*
- *Avoid disturbing wildlife corridors, wetlands, and riparian areas.*
- *Control pets so they don't disturb livestock or wildlife.*
- *Maintain or plant native vegetation or other suitable species.*
- *As a neighborhood working together, provide the diversity that birds, butterflies, and mammals need for food, cover, and nesting:*
  - **(a)** Plant small corner wood-lots.
  - **(b)** Establish shelter-belts edged with shrubs along property boundaries.
  - **(c)** Connect with meadows of native grasses or pasture land.
  - **(d)** Locate house and lawn in a corner of your property to minimize wildlife disturbance.

Tips *To Prevent Water Pollution*

- *Establish and maintain shrubs and grasses along streams and around animal confinement areas to trap and absorb pollution-laden runoff before it reaches streams or groundwater.*
- *Locate manure piles, corrals and other livestock confinement areas away from wells and streams. Use water gaps or off-stream stockwater tanks to minimize livestock trampling of streambanks.*
- *Avoid over-irrigation that can cause valuable topsoil, fertilizer, and pesticide runoff into streams.*
- *Cover manure piles to retain nutrients. Test manure for nutrients. Apply manure to pasture when plants are actively growing and can use this natural fertilizer. To avoid polluted runoff, do not spread manure on wet soils or frozen ground.*
- *Pump septic tank every three to five years.*
- *Use farming practices that reduce soil erosion and increase water infiltration, such as: minimum tillage, contour farming, filter strips, and grassed waterways.*
- *Do not mix, apply, or dispose of pesticides, motor oil, or other toxic substances near wells or streams. Contact the Oregon Department of Environmental Quality for the best method of disposal in your area.*

Inspect Your Well Every Year



Protecting Watersheds

A watershed is an area of land from which water drains to a common point, be it a stream, river, wetland, or lake. Because all water in a watershed is connected, activities on the land are reflected in water quality and quantity. As water flows downhill, it can carry eroded soils, fertilizers, pesticides, motor oil, and other pollutants directly into surface water and groundwater.

We all live in a watershed and have an impact on natural resources. When we protect our resources, we give back to the land, water, air, plants, and animals. In doing so, we ensure a healthy watershed that will sustain us for generations to come. Take action on what you have learned, contact the listed specialists if you need additional help, and inquire about other laws that may apply to your property or proposed activities.

What You Need To Know As A Rural Landowner	Who To Contact	Websites
Building Codes and Permits – Before building, contact your city or county planning department for zoning requirements and permits.	• City/county planning • Local building official	
Buried Utilities – Oregon law requires that you notify utility companies no less than two days and no more than 10 days before you start to dig.	• Oregon Utility Notification Center	• www.digsafelyoregon.com
Fence Laws – Know open and closed range laws. Check for fence height or view ordinances.	• Local building official • Oregon Department of Agriculture	 • www.oregon.gov/ODA/
Floodplain Protection – Permits may be required for work within a 100-year floodplain. Insurance and financing may be restricted.	• County planning/building	
Forest Practices – Oregon regulations require that you notify ODF at least 15 days before you begin any forest activities. After harvest, trees must be replanted.	• Oregon Department of Forestry	• www.oregon.gov/ODF/
Open Burning – Permits may be required in sensitive airsheds. Bans occur during fire hazard or air pollution periods.	• Local fire district • Local forestry district • Oregon Depart. of Environmental Quality	 • www.oregon.gov/DEQ/
Septic Systems – Counties approve soil suitablility, design, and installation. Permits may be needed for repair and replacement of older systems.	• Local planning/building official • Local health department • OSU Extension Service	 • http://extension.oregonstate.edu/
Streambank and Wetland Protection – Permits are required to fill, drain or dredge water areas and to modify stream channels, streambanks or wetlands.	• Local soil and water conservation district • USA Natural Resources Conservation Service • Oregon Division of State Lands • US Army Corps of Engineers	• www.oacd.org • www.or.nrcs.usda.gov/ • www.oregon.gov/DSL/index.shtml • www.usace.army.mil/
Trash Recycling and Disposal – Locate licensed landfills, private trash disposal companies, and recycling centers. Burning or burying household trash on private land is not allowed.	• Recycling centers • Local garbage disposal companies • Licensed landfills • Oregon Dept. of Environmental Quality	 • www.oregon.gov/DEQ/
Water Quality – You are responsible for managing manure, erosion, pesticides, fertilizers, irrigation and near-stream areas to protect surface water and groundwater quality. Rules for your local watershed are in effect under the Oregon Agricultural Water Quality Management Act.	• Local soil and water conservation district • USDA Natural Resources Conservation Service • OSU Extension Service • ODA Natural Resources Division • Oregon Dept. of Environmental Quality • Local watershed council • Local farm service agency	• www.oacd.org • www.or.nrcs.usda.gov/ • http://extension.oregonstate.edu/ • www.oregon.gov/ODA/NRD • www.oregon.gov/DEQ/ • www.oregon.gov/OWEB/WSHEDS/index.shtml • www.fsa.usda.gov
Water Rights – A permit is needed for commercial or industrial uses of more than 5,000 gallons of water per day, more than 1 acre irrigated, and for ponds.	• Local watermaster • Oregon Water Resources Department	 • www.wrd.state.or.us
Weed Control – Noxious weeds crowd out forage and destroy wildlife habitat. Eradicate these invasive and destructive plants.	• Local Weed Control Officer • OSU Extension Service • ODA Noxious Weed Control	 • http://extension.oregonstate.edu • www.oregon.gov/ODA/
Wells – Wells need to be registered with the local watermaster and constructed to Oregon Water Well Construction Standards.	• Local watermaster • Oregon Water Resources Department • Oregon Health Division	 • www.wrd.state.or.us • www.oregon.gov/DHS/ph/
Wildlife Protection/Endangered Species – The law protects threatened and endangered species. Your land management may be affected if these species are present.	• Local Audubon Society Chapter • Oregon Department of Fish and Wildlife • US Fish and Wildlife Service • National Marine Fisheries Service	• www.audubon.org/states/index.php • www.dfw.state.or.us • www.fws.gov • www.nmfs.noaa.gov