



Tips

ON LAND AND WATER MANAGEMENT

For SMALL FARM AND LIVESTOCK OWNERS

IN WESTERN WASHINGTON



Help

**Maintain
What's Best
About Western Washington**

- ◆ Productive agricultural land
- ◆ Clear streams ◆ Native plants
- ◆ Healthy forests ◆ Wildlife

About This Publication

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Your local conservation district office...

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Planning

Western Washington is a great place to live, and you can help keep it that way by learning why land and water management is important to you

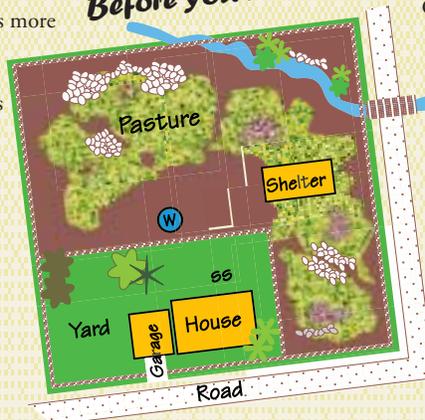
- 1) Are you a livestock owner who buys more feed each year due to declining land productivity?
- 2) Have you had the good fortune to buy a beautiful place on a creek and desire to maintain the health of that creek?
- 3) Are you seeing less and less wildlife and interested in bringing it back to your property?

There's a lot to know about owning and managing land. One needs to know even more when raising livestock. With a little time and knowledge you can make a plan for managing your property. With a little money you can implement your plan to have a "picture perfect" place, one you can be proud of while also protecting Washington's land and water. This booklet can help you begin a planning process for managing your property. Refer to different sections for information on sustaining the productivity of your land, reducing pollution, enhancing fish and wildlife habitat. Remember, we're all part of a neighborhood. Our actions can affect others. Our actions can also greatly improve the health of our natural resources. Read on for suggestions.

► Planning and the Economic Value of Good Land Management

- Saves money because your farmland is more productive over the long term
- Ensures better water quality for you, your animals, fish and your neighbors
- Provides wildlife habitat
- Produces more grass for grazing
- Improves the health of your livestock
- Improves your property value
- Makes your place more attractive
- Keeps your neighbors happier
- Satisfies your responsibility to care for the land

Before You Plan...



► What Are Your Goals For Your Property?

Goals will help focus your planning process. Consider the following when defining your goals:

- What do you want to accomplish,
- How do you want your place to look in a few years,
- What uses can your land support,
- Will your livestock require grazing,
- Do you have good water quality,
- Are your trees healthy,
- Are your plants native,
- Is there quality fish and wildlife habitat,
- Are you concerned about something else?

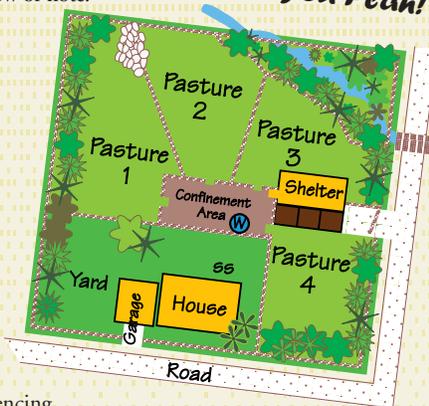
In the end you may have to modify some of your goals because they are not realistic for your property.

► Look At What You Have

Any landowner needs a management plan. 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 confinement areas
- Buildings
- Wells (human or stock)
- Septic system and drain field
- Streams, wetlands, ponds
- Bare ground
- Weeds
- Lawn, pasture, or crop land
- Trees or shrubs
- Neighboring land uses
- Flat or sloped ground
- Soil type

After You Plan!



Develop A Plan for Your Land

Once you've looked at your property and identified your goals, you need to develop a management plan for reaching your goals. Remember, even if you like things just 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.

In the "after" drawing, pasture cross-fencing promotes increased forage production through better management of livestock grazing; manure bins are used to compost livestock waste; the stock water tank in the new confinement area provides access to water from all pastures; the fence, and tree and shrub plantings along the stream prevent erosion, replace weeds and provide wildlife habitat; and the hedgerows along the property boundary function as livestock barriers while providing excellent wildlife habitat.

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For Help

Your local conservation district and NRCS office staff are available to develop farm plans and in some cases offer classes to help landowners write a farm plan. Call (360) 407-6200 to locate your local conservation district. In King County call (425) 277-5581.

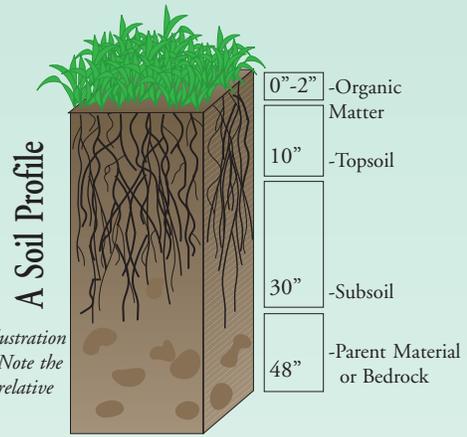
Soils Your Key to a Better Pasture

There is an old saying,

"Take care of your soil and your grass will take care of itself".

Soils vary widely, even across your backyard and pastures. So to begin, you must know your soil type and its capacity. The amount of water that soil can hold will determine when you can put your animals out in the field in the spring and affects grass yields in the summer. Soils also determine:

- ◆ the filtering of nutrients from animal and human wastes
- ◆ the amount of fertilizers and/or composted manure to apply
- ◆ the placement and durability of structures
- ◆ if your land has a wetland
- ◆ plant and tree rooting depths



A generalized illustration of a soil profile. Note the layers and their relative depths.

For Help

For information about soil testing and your soil type refer to your local Soil Survey, available at local libraries or from the Natural Resources Conservation Service (NRCS). Call (360) 753-9454 for your local NRCS number or visit NRCS online at <http://www.nrcs.usda.gov>. In King County call (425) 277-5581.

Pastures Are Your Pastures Properly Managed?

- 1) Does your livestock have prolonged access to pastures in the spring before the grasses are 6" in height?
- 2) Are your animals prone to colic or respiratory problems?
- 3) Do your animals waste grass by not grazing to 3"?
- 4) Do you manage all of your pastures the same even if they have different soils or slopes?
- 5) Are your animals allowed to roam freely year-round?
- 6) Are you being bankrupted by high feed bills?

If you answered "yes" to any of these questions, you need a new pasture management program which will provide grass throughout the growing season, save you money in lower feed costs and vet bills, and protect your resources!



Continuous grazing allows weeds to grow where grass roots have been weakened.

Pasture rotation and good grazing management produces more grass, fewer weeds, and no bare ground.

How Grazing Affects Root Growth

	Percent Grass Plant Removed	Percent Root Growth Stopped
Overgrazing occurs when 50% or more of the grass plant is removed all at once.	10%	0%
Overgrazing stops root growth and reduces grass production.	20%	0%
	30%	0%
	40%	0%
Look what happens when you try to sneak another 10 percent "harvest"---50 percent of the roots stop growing!	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.

Tips To Increase Your Pasture Production

Pastures contain mostly non-native species of grass. For increased production, pasture requires grazing management, mowing, dragging, weed control, fertilization, and replanting.

- ◆ Establish a grazing program to protect pasture health and production.
- ◆ Mow pastures to a uniform 3" height after grazing to stimulate equal growth of all plants.
- ◆ Drag or harrow to spread nutrient-rich manure. This also helps promote uniform grazing.
- ◆ Control weeds.
- ◆ Reseed. Contact your local conservation district to determine the most productive seed mixture for your pastures.
- ◆ Fertilize according to NRCS and soil test recommendations. Believe the soil test! Overfertilizing is not better and can damage water quality.

Tips For A Successful Grazing Program

- ◆ Eliminate continuous season-long grazing.
- ◆ Do not graze on flooded or saturated soils.
- ◆ During winter and droughty months hold animals in a confinement area.
- ◆ Confine livestock and feed them hay until your pasture grasses are 6" to 8" high. Move livestock when 50% of the grass plants have been eaten and 3" height remains. Confine animals until grasses are at least 6" high (will take 2 to 6 weeks).
- ◆ Allow rest periods and use a high-intensity, short duration grazing system to rejuvenate poor condition pasture.
- ◆ Livestock do not need 24 hour access to feed or forage. Their nutrition needs can be met with shorter daily grazing periods on good pasture. Confine animals for a portion of the day to prevent overgrazing and extend your pasture forage.
- ◆ Subdivide large pastures into smaller pastures and develop a pasture-rotation grazing system.
- ◆ Provide access to a water source from each pasture.
- ◆ On limited acreage, you may have only enough pasture to exercise your animals and will need to feed hay year-round.
- ◆ Mowing helps retard seed heads and levels the field for regrowth.



Grazing

A Sample Schedule

For a One Herd

Multiple-Pasture System

In Western Washington, livestock are generally grazed April through October during the plants' growing season with longer resting periods in mid-summer when irrigation is not available. Begin grazing when plants are 6" to 8" in height. Move livestock after 50% has been eaten, but not below 3" in height. 2 - 6 weeks are needed between grazing periods depending on the rate of grass growth. You may need to confine livestock and feed them hay until the pasture regrows or move them to a new pasture with 6" to 8" of grass.



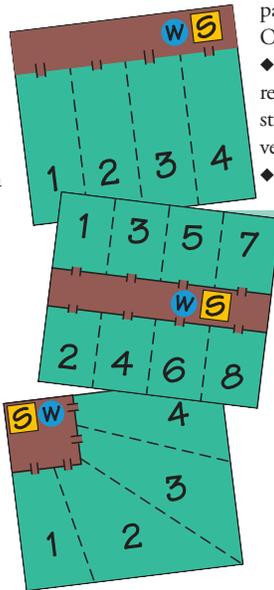
Grazed each pasture no shorter than 3" in length then take 2 - 6 weeks off.

G Graze R Rest H Provide Hay

Sample Designs

For a Multiple-Pasture Grazing System

- S** Shelter in confinement area
- W** Water in confinement area
- G** Gate
- Confinement or Sacrifice Area
- Pasture
- Pasture fence



Stockwater

Systems are 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 all pastures. Clean, fresh water is essential for good animal health.

Options for stockwater development include:

- ◆ Pipe water to a stock in each pasture or a centralized location. It is highly recommended (and may be required) that you fence your livestock away from streams to keep manure out of the stream, protect and maintain streamside vegetation, and control erosion (see Streams and Wetlands on page 7).
- ◆ Use a nose pump to draw water from a stream or pond.

For Help

Obtain publications from county extension offices on livestock production, farming, gardening, and 4-H programs. Assistance is available from your local conservation district and NRCS office, and private consultants to:

- ◆ Design mud management systems
- ◆ Design a grazing system
- ◆ Increase hay and pasture production
- ◆ Design a livestock waste disposal or utilization program
- ◆ Design stock watering facilities
- ◆ Help you meet water quality standards

Basic Types of Livestock Fencing

Fencing

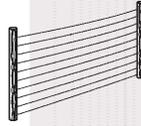
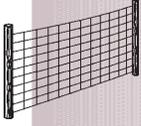
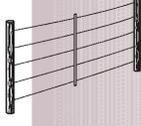
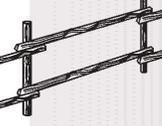
A Grazing Management Tool

Choosing The Right Fence

"Build your fence horse high, pig tight and bull strong," the old saying goes. But with so many types of fencing, how does one decide which kind of fence to build? Remember that no two persons' fencing needs are exactly alike, just as no two properties are exactly alike. No single factor determines the best type of fence to use. You may find that a combination of two types of fencing works best for you. Some points to consider when selecting a fence are:

- ◆ Purpose - type of animal(s) you're keeping in or out and their habits
- ◆ Type of soil material - rocky, loamy or mucky
- ◆ Topography and terrain
- ◆ Cost of materials and labor
- ◆ Availability of power
- ◆ Maintenance requirements
- ◆ Aesthetics and visual appeal
- ◆ Weather - flooding and moisture
- ◆ Safety and people access
- ◆ Vegetation control

There are many types of fencing. Each will have advantages and disadvantages. If you make your fence to suit your individual needs and preferences it will become a distinctive part of your property.

	Advantages	Disadvantages
	Barbed Wire 4 or 5 strand Good control of cattle and sheep. Inexpensive.	May injure horses and llamas.
	Smooth/Coated Wire Less harsh than barbed wire. Inexpensive and easy to build.	Needs more strands to be equivalent barrier to barbed wire. Needs periodic maintenance. Less visible to horses.
	Woven Wire Good control for horses and sheep. May be combined with electric strand. Variety of sizes and types for specific animals.	Maintenance is difficult and fence is easily damaged by falling trees and floods. Needs to be combined with electric wire offset for horses. Harder to keep tight. More expensive.
	Portable Electric Lightweight and easy to move for pasture rotation. Inexpensive.	Requires a power source. Not very durable. Not a physical barrier. Not recommended for perimeters.
	High Tensile Electric (New Zealand Style) Inexpensive and requires little maintenance. Good control of all animals. Can be built to withstand floods.	Less of a physical barrier if there are power outages.
	Rail Visually attractive. Little maintenance and very durable.	Very expensive to purchase and install. Susceptible to rot and chewing by horses. Easily damaged by falling trees and floods.

Feed

Do You Have Enough Feed and Forage For Your Livestock?

Western Washington livestock are generally grazed during the growing season, April through October, depending on precipitation and forage availability, and then fed hay from November through March.

Forage is what your animals consume by grazing. Forage production is measured in animal unit months (AUMs). One AUM is equivalent to the amount of forage consumed by a 1000 pound animal in one month.

Feed is the hay that you provide an animal when forage is not available. Hay production is measured in tons per acre.

Average requirements are listed below, but may vary with season, level of use, and the age and size of the animal.

	FEED (HAY) TONS/MONTH	FORAGE AUMS OF GRAZING/MONTH
1 cow	.50	1.2
1 horse	.45	1.0
1 sheep	.10	0.2
1 llama	.15	0.3
1 goat	.10	0.2

Average production figures are listed below, but production may be more or less depending on your grazing program.

SOIL CONDITIONS	FEED (HAY) TONS/ACRE/YEAR	FORAGE AUMS/ACRE/YEAR
Shallow, rocky or droughty soils	1-2	2-4
Deep loam bottomlands	3-5	6-11
Rolling hills, silty, loamy or clay soils	2-3	4-6

Mud

Causes Problems for You, Your Livestock and Your Neighbors

- ◆ Mud harbors bacteria, fungal organisms and other pathogens which cause diseases such as abscesses, scratches, rain scald, or thrush.
- ◆ Mud is a breeding ground for insects such as Culicoides (No-See-Ums), filth flies, and mosquitoes.
- ◆ If fed on the ground a horse can ingest mud or sand with hay which can cause sand colic.
- ◆ Standing in mud can lower an animal's body temperature which causes unthriftiness and even hypothermia.
- ◆ Mud is a slick, unsafe footing especially for horses.
- ◆ Mud makes chore time difficult and unpleasant.
- ◆ Muddy farms are unsightly for neighborhoods and communities and cause an increase in odors and flies.
- ◆ Mud can be damaging to the environment — runoff of sediment contaminates surface water and is detrimental to fish and aquatic wildlife.

Gutter Talk

- **Divert** CLEAN rainwater away from animal confinement areas to stock watering tanks, rain barrels, dry wells, unused pasture areas, or a swale.
- **Plan** your gutter system to handle the amount of rainfall for your area.
- **Protect** downspouts from animal and livestock damage — you can use heavy PVC pipe, hot wire or a permanent barrier.

Poor Conditioned Pastures Affect Livestock Health

Some of the problems unhealthy pastures can cause are:

- Colic problems from eating dirt
- Respiratory problems from breathing dirt
- Weight loss from poor nutrition and parasites
- Parasites from mud and manure (pages 4-5)
- Poor coat from poor nutrition and health
- Possible poisoning from eating plants which are normally avoided (see weeds page 6)

Tips

For Improving Your Feed and Forage

- ◆ Use crossfencing and rotational grazing
- ◆ Limit access to pastures
- ◆ Manage nutrients
- ◆ Buy additional feed or rent pasture
- ◆ Reduce your number of animals
- ◆ Seek assistance



For Help

Consider Custom Farming as a Way to Improve Your Pasture

Many landowners find it too expensive to own their own farm equipment for preparing the soil, seeding, harvesting, or baling. Ask your neighbors if they know custom farmers or ranchers in the area who will follow your instructions for improving your pasture. Contact your local conservation district. In King County call (425) 277-5581.

Tips

For Reducing Mud

- ◆ Use footing material, such as hogfuel or crushed rock, in high traffic areas such as paddocks and in front of stalls. Footing needs to be 6 to 12 inches deep. Avoid using hogfuel in very wet areas where it will turn into muck.
- ◆ Create a winter paddock or confinement area and use it to take horses and livestock off pastures in the winter. Also use paddock areas when pastures are grazed down to 3" during the summer months.
- ◆ Pick up manure every 1 - 3 days in stalls, paddocks and outdoor arenas.
- ◆ Install gutters and downspouts on all buildings and then divert the water away from confinement areas.
- ◆ Practice good pasture management techniques so you have a healthy pasture — avoid overgrazing and creating bare spots that turn to mud.
- ◆ Fence animals out of creeks, wetlands, and lakes; provide watering systems away from streams; create water crossings or watering points.
- ◆ Maintain or plant trees and moisture-loving shrubs outside of winter paddocks. Trees 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.
- ◆ Maintain a grassy area of at least 25 feet in width around winter paddocks; increase this dimension if near a stream. The grass will serve as a filter for any runoff that does occur.
- ◆ Use a "Green Band-Aid" for any bare spots that do occur by scattering grass seed in those areas.

See rainfall chart on next page...

For Help

Contact your local conservation district and NRCS office for more tips on mud management, farm plans, educational activities, technical assistance, annual tree sale, stream fencing, watering points, cost sharing — or, get on their newsletter mailing list to learn more! In King County call (425) 277-5581.

Manure More Than a Few Reasons to Manage

Livestock Manure On Your Property

- ◆ Living in manure creates 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 diseases or can cause serious allergies.
- ◆ Internal parasites hatch from the manure as often as every 3 days allowing for parasite reinfestation as soon as 24 hours after worming.
- ◆ 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 composted manure back to pastures creates a natural nutrient cycle – one horse's annual production of manure represents about \$150 in fertilizer value per year.



See bin design on page 11

REMEMBER — your compost system should smell “earthy” and not unpleasant. Odors and flies are associated with fresh manure and once manure is a part of the composting process there shouldn't be a problem. If your compost is not heating up or if it has a bad odor it means something is not composting properly — check to be sure it is not too wet or too dry.

Tips On Disposal of Manure and Stall Waste

- ◆ Collect raw manure from pastures, confinement areas, and stalls every 1-3 days. A shovel or manure fork and wheelbarrow works well for collecting.
- ◆ Store manure year round and apply it to pastures during March to August. You'll need a storage bin or area that is covered or tarped; a means to spread it (such as a manure spreader hitched to a tractor or pickup truck or a rake); and a good deworming program (since you aren't composting to kill parasites and worm eggs).
- ◆ Compost manure and stall waste and apply to pastures, gardens, and flower beds during March to August. You'll need a compost bin or appropriate area that is covered or tarped with access to water; a means to spread the finished compost, such as a manure spreader and tractor — or the energy to spread the manure by hand! Follow this general *rule of thumb* when applying finished compost— apply about 1/2” at a time, no more than 3-4” per year and ONLY during the growing season.
- ◆ Sell or give away composted manure and stall waste to neighbors, community gardens, local garden clubs, nurseries, and topsoil and composting businesses. You will need an appropriately sized, located, and covered storage bin or area where people can pick up the finished compost; equipment, such as a tractor, to assist with the loading; and advertising by word of mouth, posted flyers, and announcements in local newsletters and papers.
- ◆ Utilize a manure exchange program to market your finished compost. Contact your local conservation district, cooperative extension office or county livestock programs to see if they operate a manure exchange program. Or consider starting a program in your neighborhood where you organize a yearly spring event that offers compost to all who want it. Maybe you and your neighbors can collect old feed sacks to give away as bags!
- ◆ Haul your compost to topsoil or compost businesses. You will need an appropriately sized, located, and covered storage bin or area and a truck and a tractor with a bucket. Plan to have manure removed from your site at least twice a year (spring and fall). *Don't let it become a mountain.* Consider renting a container from a compost facility for monthly pickup.

Did You Know - Annual Rainfall in Inches

Aberdeen - 83	Bartleground - 51	Bellingham - 43	Bothell - 39
Bremerton - 51	Buckley - 49	Cathlamet - 106	Centralia - 47
Cushman Dam - 101	Elma - 67	Grapeview - 52	Greenwater - 56
Kent - 37	Longmire - 81	Longview - 45	Monroe - 49
Mount Vernon - 33	Olympia - 51	Packwood - 56	Port Angeles - 25
Puyallup - 40	Quilcene - 54	Sea-Tac Airport - 37	Shelton - 64
South Bend - 87	Tacoma - 38	Toledo - 44	Vancouver - 39

Tips For Successful Composting

- ◆ Begin by building a pile of manure and stall waste that is at least 3'x3'x3'
- ◆ Cover the pile or area with a roof, tarp or sheet of plastic (a cover keeps it from getting too wet in the winter or dried out in the summer).
- ◆ Keep the pile as damp as a wrung out sponge — no wetter or drier!
- ◆ Add air to the pile turning it by hand, with a tractor, or passively by inserting a few PVC pipes (or similar item) into the center of the pile like chimneys.
- ◆ When the pile gets as big as you want it for manageability, start a second pile and allow the first to continue composting.
- ◆ Add garden waste and lawn clippings to your compost. Don't let grass clippings clump together — spread clippings out so air can permeate through them.
- ◆ Kitchen scraps are best managed in a worm bin so that you don't end up attracting rats or other unwanted pests to your horse and livestock area.
- ◆ Use only herbivore manure in your composting system. Carnivores, such as our household dogs and cats, may share similar pathogens with humans so their manure needs to be handled and treated differently.
- ◆ Don't place composting structure where surface water flows can reach it.

It is Finished!

Your compost could be ready to use in as little as one month's time depending how often you turn it and whether it stays damp. Most likely, it will take a couple months in the summer and three to five months in the winter when temperatures slow down the microbial activity. You will know your compost is ready when it has reduced in volume about 50% and the material looks evenly textured and crumbly like soil and no longer like the original material.

Weeds

Give Your Land A Health Exam

How much of these do you have on your property?

- ◆ Healthy ground cover (forest, shrubs, grass)
- ◆ Weeds or plants that hold the soil poorly (dandelion, English ivy) or provide little value for livestock and wildlife
- ◆ Bare ground

	1	2	3
◆ Healthy ground cover (forest, shrubs, grass)	A lot	Some	A little
◆ Weeds or plants that hold the soil poorly (dandelion, English ivy) or provide little value for livestock and wildlife	A little	Some	A lot
◆ Bare 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.

Weed Control Weeds spread fast, so regularly look for new weed patches on your property and act immediately to treat them by using one or more of the weed control practices listed below. Team up with neighbors to improve effectiveness. Remember, 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 promote desirable vegetation and keep weeds under control. Buy only weed-seed-free hay, plant only certified seed, wash your vehicle after being in a weed-infested area. Look for weeds on your property and promptly remove them when discovered. Managed grazing will also inhibit weed establishment while promoting healthy development of pasture grasses.

Livestock Transport. Because livestock and wildlife can easily carry and spread 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.

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

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

Chemical Control. Herbicides may be expensive and can harm the environment if used incorrectly, but are effective when applied in the proper amounts and at the proper time of year. Read all label instructions carefully and follow directions. Keep herbicides away from water to prevent adverse health effects to you and your animals and to prevent pollution of streams and ground water. Be sure herbicides will not reach and kill desirable trees and shrubs. Call your noxious weed control board to find out about hiring custom chemical applicators to spray your weeds. Some WSU Cooperative Extension Offices can recommend an herbicide for your particular problem. Call your local hazardous waste hotline for info on proper disposal of leftover chemicals. *Remember the alternatives. Many annual and biennial weeds can be controlled easily without herbicides.*

Know Your Weeds Before They...

- Choke out desirable plants
- Reduce the productivity of your pasture and our wildlands
- Spread RAPIDLY!
- Affect the health of your livestock



Scotch Broom



Reed - Canary Grass



Tansy-Ragwort



Common Tansy



Poison Hemlock



Japanese Knotweed



Canadian Thistle



Bracken Fern



Foxglove

Some Toxic Weeds in Western Washington

Plant Species	Poison Symptom	Livestock Affected
Bracken Fern	Cattle: Hemorrhage, Death Horses: Stupified, Collapse	Cattle, Horses, Sheep
Creeping Buttercup	Mouth Blisters	All Livestock
Foxglove	Labored Breathing, Convulsions, Death	All Livestock
Poison Hemlock	Paralysis, Death, Birthdefects	All Livestock
Tansy Ragwort	Liver Lesions, Weakness, Death	All Livestock
Thistle	Brain damage, Face swelling, Unable to hold or chew food or drink	All Livestock

For Help

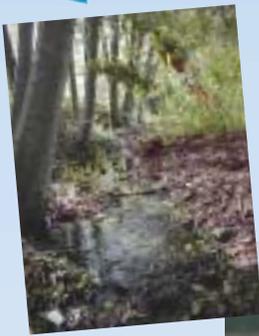
Contact your county Weed Control Board or WSU Cooperative Extension Office to obtain a list of noxious weeds in your local area and recommendations on how best to control them. The Washington State Noxious Weed Control Board will help you locate your local weed board. Call (206) 296-0290.

Contact your local conservation district and NRCS office for help on preventing weed establishment on your property. In King County call (425) 277-5581.



Creeping Buttercup

Streams & Wetlands



The moist and often wet soils adjacent to streams and wetlands support the growth of water loving plants. This vegetation is called a riparian area when it grows along a stream or river, and a wetland buffer when it grows around a marsh or pond.

Livestock impacts to streams and wetlands are many. The most common is the loss of vegetation due to grazing or trampling.



➤ **A Healthy** riparian area or wetland buffer is the key to a healthy aquatic system. Lush vegetation along the water's edge will:

- **Reduce** water pollution by filtering sediment and absorbing nutrients,
- **Stabilize** stream banks and prevent erosion,
- **Attenuate** storm events by slowing flood water and promoting percolation into the soil,
- **Recharge** groundwater,
- **Reduce** summer water temperatures,
- **Provide** essential fish and wildlife habitat.

Fact: Over 300 species of wildlife in Washington (~85%) depend on riparian areas during some portion of their lives. Riparian and wetland vegetation provides food, nesting, and hiding places for fish, turtles, river otter, eagles, ducks, songbirds, frogs, insects, and more.

For Help

Funding may be available for certain types of livestock management and water quality improvements, including fencing and stream bank stabilization. Contact your local conservation district and NRCS office for further information. In King County call (425) 277-5581.

A number of grant programs through the U.S. Fish and Wildlife Service fund projects that enhance or restore wetlands and riparian areas on private property. Website: www.fws.gov/pacific/westwafwo

Your County Health Department can answer questions about installing and maintaining septic systems and drinking water wells. In King County call (206) 296-4600.

Contact your city and county governments for information on local codes and regulations addressing water quality, riparian areas and other sensitive areas. In King County call (206) 296-6759 for information about the critical areas ordinance.

The Washington Department of Ecology can provide information on state and federal water quality laws, and on some of the permits required to work in or near a stream, lake or wetland. The agency also publishes *The Permit Handbook* (publication No. 90-29) that lists some of the permits which must be obtained before initiating any activity in or near a stream, lake, or wetland. Call (360) 407-6000.

Tips On protecting streams, wetlands, and water quality

- ◆ Eliminate livestock access to streams and wetlands by fencing their buffers. Fencing alternatives are detailed on page 3.
- ◆ Water livestock away from streams and wetlands by using stockwater tanks, nose pumps or other watering methods.
- ◆ Plant and maintain native trees, shrubs, and groundcovers in stream and wetland buffers, and around animal confinement areas to trap and absorb pollution-laden runoff before it reaches surface or groundwater.
- ◆ Compost livestock manure and bedding wastes, then spread it on your land during the growing season when soils are not saturated or frozen. These practices will reduce your need for expensive commercial fertilizers.
- ◆ Test your soils and develop a nutrient management plan to guide application of compost or fertilizer on your land.
- ◆ Locate livestock confinement areas, compost bins, and septic systems away from streams and wetlands, and 100 feet downslope of your drinking water well.
- ◆ Use farming practices that reduce soil erosion and increase water infiltration such as filter strips and grassed waterways.
- ◆ Dispose weed control chemicals, used motor oil, or other toxic substances at approved locations so they will not leach into surface or groundwater. Contact your county health department for disposal locations in your area.
- ◆ Avoid excessive fertilizer and pesticide applications. These products are a source of surface and groundwater pollution when over-applied.

Does Your Property Have A Wetland?

Wetlands are protected from land management activities that would destroy them or change their function.

Wetlands are determined by specific soil, vegetation, and hydrologic characteristics. Your local Conservation District, Natural Resources Conservation Service Office, or County Government can help you determine if your wet area is a wetland.

Drinking Water How Safe Is Yours?

- 1) Do you have a septic drainfield or livestock confinement area less than 100 feet from your drinking well or stream?
- 2) Do your well tests show fecal or nitrate contamination?
- 3) Do you use more than recommended amounts of fertilizer, manure, or agricultural chemicals for pest control?

If you answered "yes" to any of these questions, you will want to take immediate action to address these problems. Get help from your local conservation district. In King County call (425) 277-5581.

➤ Uncertain About the Safety of Your Drinking Water?

If you have a question concerning the quality of your drinking water, contact your local water district or municipal water supplier. If you have a private well, contact your county Public Health Department. In King County call (206) 296-4600.

Your local WSU Cooperative Extension office also has information on how to test your drinking water quality.

Wiedefe Is Your Property Inviting?

- 1) Are there a variety of vegetation types, such as tall grasses, short grasses, shrubs, and trees for food, cover, nesting, and shelter?
- 2) Is there a pond, stream, or stockwater tank available to wildlife?
- 3) 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 maybe even deer and elk.

Tips For Creating Wildlife Habitat on a Western Washington Small Farm

- ◆ Use native plants for landscaping and maintain existing native trees and shrubs. Wildlife, such as squirrels and birds, depend on native plants for food and shelter.
- ◆ Create brush piles by collecting branches blown off trees and shrubs. Brush piles provide cover for animals like snakes, field mice, and small birds.
- ◆ Create rock piles from stones removed from paddocks and pastures. Place short pieces of PVC pipe at the bottom of the pile—they make great hiding spaces! Toads, field mice, snakes and weasels all love these areas.
- ◆ Save snags and downed trees. We are learning how important these non-living materials are in the ecosystem.

For example: Animals that create nesting cavities, such as woodpeckers, need dead or dying trees. Many other species of birds, such as chickadees, nuthatches, swallows and wrens, make their own nesting holes, and also use the cavities abandoned by woodpeckers.

- ◆ Consider creating hedgerows along fence lines, in corners of pastures, along driveways, and in clumps in your pastures. Plant native roses, hawthorn, serviceberry, Oregon grape and other species to form a hedge. Towhees, shrews, voles, pheasants, and rabbits are examples of animals that use these areas for food and shelter.
- ◆ Save and protect vegetated buffer areas along streams, wetlands, and ponds. These zones are homes for salamanders, frogs, and many species of waterfowl. These areas also provide important food, water, and shelter for larger animals like muskrats, raccoons, deer, and in some cases, bear and cougar. A wetland that holds water from December to May will provide an important habitat for amphibians and other wildlife.
- ◆ Be careful with and limit chemical use on your farm. Always read labels and handle chemicals very carefully. Consider reducing your chemical needs by using a weed burner or hand pulling weeds, and using compost and manure for fertilizer. Remember, never spray in or near a source of water.
- ◆ Create feeding stations for hawks by mowing swaths in tall, grassy areas adjacent to tall trees. This provides an area where hawks can sit and easily spot rodents.
- ◆ Build and hang bird, bat, and bee houses.
- ◆ Collect horse and dog hair as nesting material for birds. Place hair in a wire mesh suet feeder up and away from cats in the early spring — then sit back and watch as the birds swoop and dart to snatch up bits to build their nests.

What are the benefits of wildlife on a small farm?

- Natural insect control — encourage insect-eating birds. One swallow consumes about 6,000 insects per day! Bats eat 600 mosquitoes an hour!
- Natural rodent control — encourage hawks and owls.
- Food production — crops and plants such as herbs, berries, nuts, and fruits that encourage birds, bees, and butterflies are also good for people.
- Wildlife is free — there are few animals we can have that are as low cost and low maintenance as wildlife.
- Native plants that encourage wildlife are more disease tolerant, lower in maintenance, preserve water quality through natural bio-filtration, and can prevent soil erosion.
- Trees — can provide you with a timber crop, firewood, windbreaks, mud control, a buffer between neighbors, and they can help save on heating and cooling costs for buildings.
- Wildlife provides us with moments of relaxation, enjoyment, and education from watching and caring for them.
- Wildlife can be seen as an extension of our environment, our farms and animals — as farmers we share a bond with all animals and nature.

IMITATE NATURE ° MESSY IS OKAY ° ENJOY

Habitat = Food + Water + Cover + Space

FOOD requirements vary but include seeds, berries, vegetation, and insects as well as other animals.

WATER is needed by all living things. This could be a stream, wetlands, pond, or man-made area like a stock watering tank or birdbath.

COVER is needed to hide from predators, to travel, for nesting, and for shelter. Cover can be dense shrubs, live or dead trees, a brush pile, tall grass, or a rock pile for borders. SPACE More and more wildlife habitat is being lost as houses, cars, shopping malls, gas stations, parking lots, people, livestock, dogs, and cats move into new areas. Landowners, and particularly farm owners, can help offset this loss of habitat by setting aside an area to grow a diversity of vegetation that provides food and cover for wildlife.

A word of caution:

Bats are the only carriers of rabies in Washington, and 1/2 of 1% of bats actually have the disease. Consult your veterinarian on vaccinating livestock against this disease.

Controlling Deer and Elk Damage

Attracting wildlife may also mean deer and elk damage to gardens, ornamental plants and young trees. Ways to avoid these problems include:

- Avoid planting certain types of trees, such as Cedar, which almost surely attract deer. If you plant Cedar or other young trees in an area used by deer, protect the trees with wire cones or products designed for this purpose.
- Use trees and plants that deer aren't as likely to eat. For information on these plants contact your library or local wildlife officials.
- Investigate commercial deer repellents.
- Consider putting your family dog to work by allowing it to patrol your fenced-in areas throughout the night (however, do not allow dogs to roam and chase deer).



You can discourage unwanted wildlife by controlling their available habitat. Store all feed in aluminum cans with secure lids. Put away dog and cat food at night. Plug holes in out-buildings to limit unwanted access. Keep cats in the barn at night to deter rodents and to keep the cats safe from coyotes.

For Help

- ◆ To develop a plan for improving wildlife habitat on your property, contact your local conservation district office and NRCS office, local wildlife officials or visit your library or local bookstores.
- ◆ Purchase native trees and shrubs through your local conservation district annual tree sale, other plant sales, or from native plant nurseries.
- ◆ For more information on the Backyard Wildlife Program contact the State Fish and Wildlife Sanctuary Program at 16018 Mill Creek Blvd., Mill Creek, WA 98012, or visit <http://wdfw.wa.gov/wlm/backyard/>.

Woodlots Is Yours Healthy?

- 1) Are your trees free of animal damage, disease, or problem insects?
 - 2) Are your trees spaced far enough apart to allow sunlight to reach the plants growing on the ground?
 - 3) Are there plants growing on the ground?
 - 4) Is there more than one age or size of tree present including seedlings, poles, and mature trees?
 - 5) Is there more than one tree species present?
- If you had all "yes" answers, your woodlot is looking good. If not, read on...

➤ Animal Damage, Disease and Insects



Livestock with free access to areas where trees grow can damage trees and leave them susceptible to disease and insect infestation.



Both large and small animals compact soils around trees. Compacted soils reduce the health of tree roots and subsequently the entire tree.



Compaction also results in erosion, exposing tree roots to further damage and increasing their susceptibility to disease.



Disease also enters trees where animals rub and chew on them. And girdling damage caused by the loss of bark around the entire trunk will kill the tree.



An unhealthy tree due to root damage and associated root rot will have a thin dying top.



Signs of insect infestation include partial to complete defoliation due to feeding larvae.



And wood dust, also called frass, on the trunk of a tree indicates the presence of wood boring beetles.

➤ Protect Your Home and Outbuildings from Windthrow and Dying Trees

Learn to recognize the signs of damage and disease that indicate an unhealthy tree.

Remove dead or dying trees and prune overhanging or dying tree limbs that pose a hazard to structures or people.

Protect pruned trees from disease by sealing cut areas.

Consult an arborist or forester before topping trees.

Avoid placing trees too close to structures and each other when planting.

Tips

For a Healthy Woodlot

- ◆ Reduce losses of trees to disease and problem insects by removing infected trees and slash as soon as possible.
- ◆ Thin trees to improve growth, health, and vigor. Thinning can also improve wildlife habitat. Leave the large and healthy trees as well as seedlings and intermediate sized trees for regeneration.
- ◆ Protect trees from browsing, rubbing, trampling and soil compaction by livestock. Such damage can be prevented by protecting trees and vegetation with permanent or temporary fences and barriers.
- ◆ Leave snags (standing dead trees) and larger downed logs for wildlife and forest nutrient cycling.
- ◆ When controlling weeds with chemicals, take special precautions not to kill native trees and shrubs.
- ◆ When planting trees and other vegetation, select species adapted to your particular site. Care for newly planted trees and shrubs, until they become established by watering regularly and removing competing vegetation within a 1-foot radius around the trunk.
- ◆ When planning to harvest your trees, seek help to handle the various permits; and monitor the harvest process to ensure regulations and sale terms are observed and the remaining stand is in good shape when the harvest is over.



Fencing, temporary or permanent, protects trees and seedlings that border a pasture.



Rock barriers protect tree roots and trunk from livestock damage.

For Help

The Forest Stewardship Program provides advice, technical assistance, financial assistance, and educational workshops on developing forest management plans. For details call Washington State Department of Natural Resources at 1-800-527-3305 ext. 112.

Contact your city and county governments for information on local codes and regulations addressing woodlot and forest land management. Call (206) 296-7820 or -7821 for information on the King County Forestry Program.

Your local Conservation District and the NRCS office can provide assistance in developing a farm plan to manage riparian areas and other forested buffers on your property.

Private forestry consultants can conduct forest inventories, set up and monitor timber sales, and help you achieve your forest management goals. A directory of consultants is available from Washington State University Cooperative Extension (509) 335-2857 or the Washington State Department of Natural Resources at (800) 527-3305.

Visit the following website for information on controlling pacific northwest plant diseases - <http://plant-disease.ipcc.orst.edu/index.cfm>.

Building

New Home? New Barn?

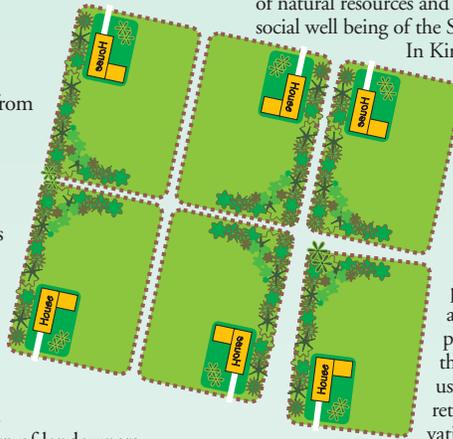
Here are some things to consider...

- 1) Is the site a floodplain or close to a stream?
 - 2) Could your access road cause hillside erosion, or cause sediment to enter a stream?
 - 3) Will your new homesite disturb wildlife habitat?
 - 4) Does your neighborhood lack covenants that will protect the land, water, and future aesthetics of the area?
 - 5) Does topography or vegetation indicate surface or groundwater problems?
- If you answered "yes" to any of these questions, you have some planning to do.

Tips

For Developing a Homesite

- ◆ Plan for minimum impact before building.
- ◆ Locate homes and roads on stable soils away from streams and steep slopes.
- ◆ Avoid disturbing wildlife corridors, wetlands, and riparian areas.
- ◆ Orient your home and outbuildings where the sunshine and prevailing direction of winds will be comfortable for you and your animals.
- ◆ Locate a water source, either a well or service provider. You will need a certificate of availability before building in King County.
- ◆ Determine how you will dispose of your waste. If you are planning to use a septic system, you will need a septic feasibility study.
- ◆ The illustration to the right shows how a group of landowners can work together to conserve open space, enhance wildlife habitat, and improve recreation by locating buildings in the corners of lots.



You and your neighbors can plan together for the benefit of all involved.

What are the Open Space Programs for Landowners that Reduce Taxes?

Washington is a great place to live! However, as more people are visiting, buying land, and moving here, the open spaces that make Washington so special are shrinking. You can help keep Washington green by conserving open space on your property.

The Open Space Taxation Act, of 1970 (RCW 84.34) allows Washington property owners to value their open space, farm and agriculture and timberlands at their current use rather than the appraised value used for regular taxation purposes. The Act states, "It is in the best interest of the State to maintain, preserve, conserve, and otherwise continue in existence adequate open space lands and to assure the use and enjoyment of natural resources and scenic beauty for the economic and social well being of the State and its citizens."

In King County and other counties, a Public Benefit Rating System (PBRS) has replaced the open space program.

PBRS provides a scoring system with a number of points being assigned to specific open space resources, through which a calculation of the current use assessment value is based. For a property to be approved as open space under this program, either the potential for use or additional development must be present. An incentive for participation is the reduction in assessed value, current use, and the tax reduction received in return for resource protection or conservation. For information contact your county assessors office about open space and current use taxation. In King County contact PBRS at (206) 205-5170.

What To Know As A Washington Landowner

State Environmental Policy Act (SEPA): SEPA is a process (not a permit) to ensure that environmental impacts are evaluated by state and local government officials when making decisions about projects. A SEPA application may be required prior to the issuing of permits for a proposed project.

Water Rights: You must have a water use permit before diverting, impounding, or withdrawing any surface water (or ground water if used to irrigate a lawn or non-commercial garden more than 1/2 acre in size or if the withdrawal equals or exceeds 5,000 gallons per day).

Water Quality Protection:

Long-Term you are responsible for preventing livestock manure, pesticides, sediment, and other pollutants from reaching groundwater, wetlands, and waterways. The use of Best Management Practices will minimize the loss of soil and nutrients from your property, reduce the need for pesticides, and in turn, reduce or prevent the pollution of nearby surface and ground water.

Short-Term Short term activities in or near water such as construction, dredging, forestry, or other activities, including chemical applications, may require a Temporary Modification of Water Quality Criteria (Water Quality Modification).

Protection of Streambed and Banks: Any and all development and restoration activities, undertaken in, on, or near any waterbody, may require one or more permits. We strongly recommend you contact the permitting offices of your local county, state, or federal agencies before beginning the planning stages of your project.

Hydraulic Permit: Work, construction, development or other activities that will use, divert, obstruct or change the natural flow or bed of any fresh or salt waterbody may require a written Hydraulic Project Approval. This permit is also needed when discharging water from gutters into streams and wetlands.

Shoreline Permit: Land use, work, construction, development or other activities and projects within the 100 year floodplain or within 200 feet of the shoreline of certain wetlands, water bodies, floodways, and river deltas may require a Shoreline Substantial Development Permit.

Floodplain Development Permit: You must have a floodplain development permit before doing any construction work within the 100 year floodplain.

Wetlands Protection: You must have a permit to fill, drain, or dredge any "waters of the U.S.," including wetlands.

Stocking Fish in Your Pond or Stream: You will need a permit to stock any species of fish in a private pond or stream.

Control of Noxious Weeds: Washington's weed law mandates the control of many weed species. Find out which weeds are noxious in your county and how best to control them.

Septic system Installation: An on-site sewage disposal permit is required before disposing of any sanitary sewage through septic tanks and drainfields.

Building Construction: Permits to construct permanent buildings or additions to existing facilities are required by counties and cities, except under certain circumstances.

Forest Practices: Forest practices including harvesting, re-forestation, road building, fertilizing, preventing and suppressing diseases and insects, salvaging trees, controlling brush, and applying chemicals may require a Forest Practice Approval.

Air Quality Protection: Authority over open burning may be local, state, or federal and is generally based upon the location and type of material to be burned. Some areas of the state do not allow any burning whatsoever or restrict it to certain times of the year. The use of fireplaces and wood stoves may also be restricted.

Who To Contact

Contact the Washington Department of Ecology's Environmental Review Section. SEPA Board (360) 407-6922.

Contact the Washington Department of Ecology Regional Office, Water Resources Program.
NW Region (425) 649-7000, SW Region (360) 407-6300.

Contact your local conservation district to learn about recommended Best Management Practices for your land.
Conservation Commission State Office (360) 407-6200.

Contact the Washington Department of Ecology Regional Office, Water Quality Program.
NW Region (425) 649-7000 SW Region (360) 407-6300.

Contact the Washington Department of Fish and Wildlife.
Washington Fish and Wildlife Headquarters (360) 902-2200.

Contact your local Planning, Building, or Public Works Department.

Contact your local Planning, Building, or Public Works Department.

Contact the U.S. Army Corps of Engineers.

Contact the Washington Department of Fish and Wildlife.

Contact your state or county weed board or local weed district.
Noxious Weed Control Board (360) 902-1901.
Contact your local health department.

Contact your local City/County Planning Department

Contact the Washington Department of Natural Resources Regional Office at (800) 527-3305.

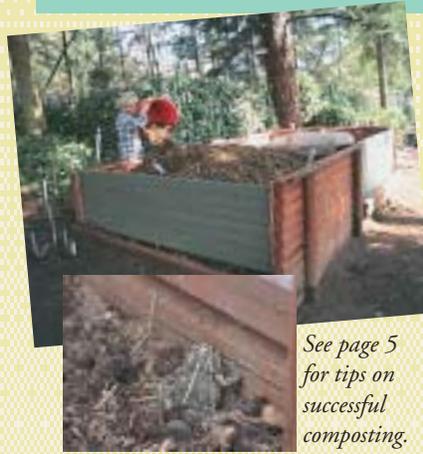
Contact your local air authority for information on permits and burn bans. Puget Sound Region (800) 552-3565, NW Region (800) 622-4627, Olympic Region (800) 422-5633, and SW Region (800) 633-0709.

Composting

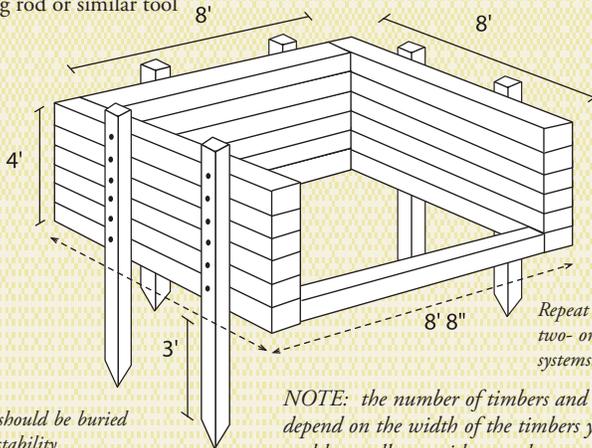
Build A Simple Backyard Bin

For two 4'x8'x8' bins, the following list of supplies and equipment are needed:

- 70 - 8' landscape timbers
- 10 - 6' - 6x6 pressure treated posts (or similar wood)
- post hole digger
- 140 - 5/16" x 5 1/2" lag screws
- drill and bit (1/4" - 5" long)
- plastic sheet or tarp to cover top
- ratchet and socket set
- carpenter's level
- power or hand saw
- tamping rod or similar tool



See page 5 for tips on successful composting.



Supports should be buried 2'-3' for stability.

NOTE: the number of timbers and lag screws will depend on the width of the timbers you purchase and how tall you wish to make your bins.

Repeat design for two- or three-stage systems.

For Help

- ◆ Your local conservation district and the NRCS office offer technical assistance in choosing a manure management option suitable for your situation as well as help designing a composting bin or manure storage area.
- ◆ Your local WSU Cooperative Extension office may offer classes on composting or manure management.
- ◆ Contact the Master Gardener program through Cooperative Extension to locate a possible source for stall waste and bedding.
- ◆ Your local county solid waste division may also offer a master composter course to help you with composting and waste reduction.
- ◆ Libraries have many books on composting.
- ◆ A good source for information on agricultural composting is the *On-Farm Composting Handbook*, distributed by Northeast Regional Agricultural Engineering Service, 152 Riley-Robb Hall, Cooperative Extension, Ithaca, NY, 14853-5701. Phone (607) 255-7654 or FAX (607) 255-4080, or Email at NRAES@cornell.edu.

Education Landowner Services & Education Programs in King County

➤ King Conservation District workshops and educational services: (425) 277-5581

- Farm Education Series including classes, workshops and informational materials
- Farm Planning
- Carpentry for Critters Instruction Booklet
- Soil Sampling Interpretation
- Farm Tours

➤ WSU Cooperative Extension training programs: (206) 296-3900

- Livestock Advisors
- Master Gardeners
- Forest Health & Planning Workshops
- 4-H Youth Education
- Land & Water Stewards

➤ Additional Workshops and Educational Programs in King County:

- Horses for Clean Water (425) 432-6116
- King County Solid Waste - Master Recycler Composter Program, (206) 296-4466
- King County Critical Areas Ordinance and Permit Process Classes, (206) 296-7149
- Rural Stewardship Program (206) 296-6519



Hands-on demonstrations and classes.



Working with the landowner on farm planning.



Educational workshops and materials.