



# Tips on Land & Water Management

**for Small Farm and Livestock Owners  
in Tehama County, California**



# Tehama County is a Great Place to Live, and You Can Help Keep It That Way!

We are richly blessed in Tehama County with plentiful natural resources such as fish, wildlife, soil, water, and sunshine. Community members with livestock on their property have a big responsibility to manage land and livestock in a way that is protective of those resources.

This guide introduces recommended practices that landowners like you can use to maintain and improve local water quality and to minimize negative environmental impacts of your agricultural practices. You will find that what protects our environment also protects the health of livestock and can save you money too!

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# Resource Protection and Farm Planning

Farmers, landowners, and land users who want to achieve a healthy working landscape can benefit by developing farm plans or conservation plans. A conservation plan is a customized, living document that outlines the use and best management practices of the natural resources on your property. The plan identifies and explains the resources in a simple and easy to understand manner. Typically a plan will include land use maps, soils information, an inventory of resources, engineering notes, and other supporting information. You, the landowner, make all the decisions, but you do not have to tackle resource problems alone. The Natural Resources Conservation Service, or NRCS, can help you develop a conservation plan one step at a time, and there is NO COST to you, the landowner. A conservation plan can result in more viable and productive land, earning the farmer a higher income.

For details about conservation plans, Tehama County residents should contact their local NRCS office at (530) 527-3013 or visit <http://www.ca.nrcs.usda.gov>. For information on agricultural crops, animal agriculture, home & landscape, or gardening, residents should contact: the Tehama County Cooperative Extension office at (530) 527-3101 or visit <http://cetehama.ucdavis.edu/>.

## Good Land Management Pays

Good land management improves the value of your property in the following ways:

- \* Saves you money because your farmland is more productive over the long term
- \* Ensures better water quality for you, your animals, and your neighbors
- \* Provides fish and wildlife habitat
- \* Produces more grass for grazing
- \* Improves and protects water quality for fish, wildlife, agriculture, and recreation
- \* Improves the health of your livestock
- \* Improves your property value
- \* Makes your place more attractive
- \* Keeps your neighbors happier
- \* Fulfills your responsibility to care for the land
- \* Reduces public expenditures to clean up impacts of agricultural operations

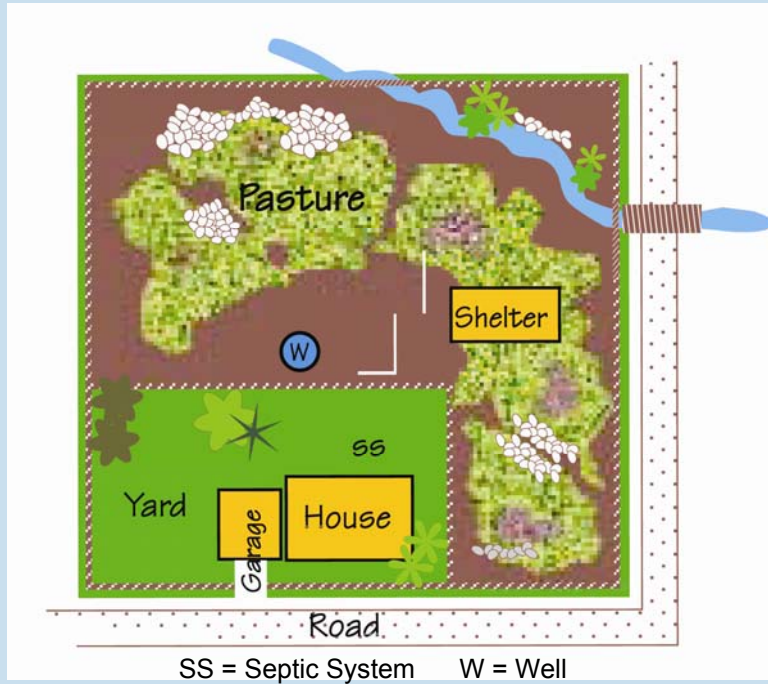
## Important Management Considerations

In order to develop a farm conservation plan, you need to be aware of how all the components of your property work together and how your operations affect resources on and off site. **Take a walk around your property**, noting locations and conditions of fences, livestock confinement areas, wells, septic system, sloped ground, vegetation next to watercourses, manure storage area, muddy areas and bare ground. What is the proximity of those things in relation to critical areas on or near your farm? Most surface waterbodies (i.e. streams, ditches, swales, wetlands, ponds) are conduits to other areas, such as streams, the Sacramento River, etc. and therefore must be protected.

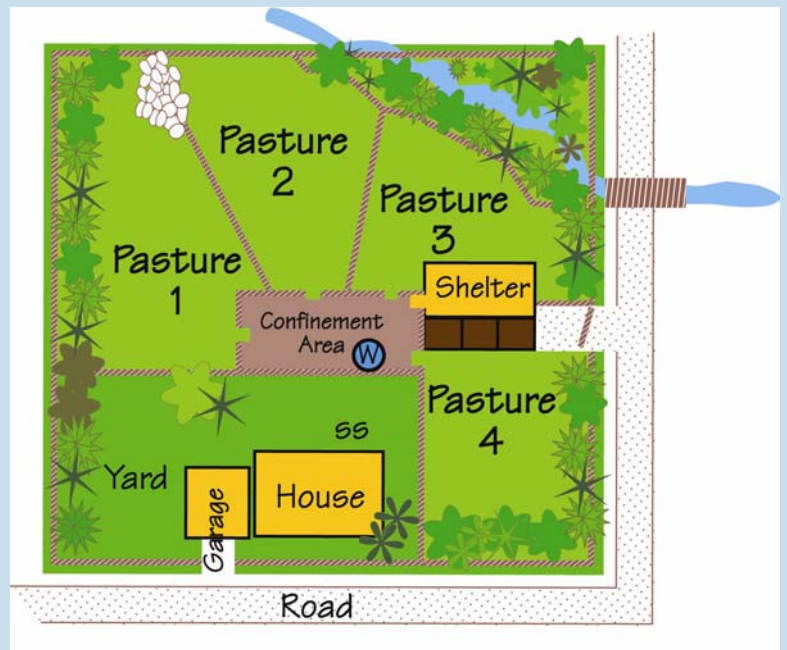


2 Look at your land...make a plan

# Thoughtful and careful planning can turn this...



into this...



Look at your land...make a plan

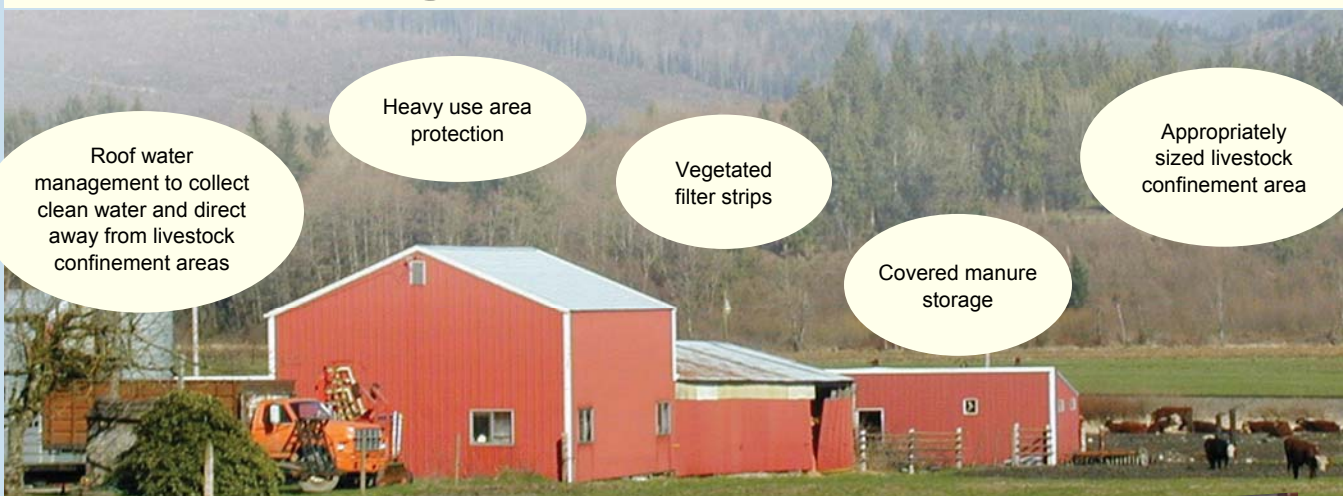


# The Farmstead

## What do I need to know about impermeable surfaces?

Impermeable surfaces are buildings or surfaces on the land that create a physical barrier to the penetration of water into the ground. Rain that falls on impermeable surfaces immediately flows overland in the direction of the slope, carrying along with it pollutants in its path. Building roofs, paved areas, and concrete slabs in manure storage and/or animal confinement areas are impermeable surfaces.

## Best Management Practices = BMPs



If your barn roof dumps rain water into your animal confinement area, that clean rain water becomes contaminated as it mixes with manure and contributes to muddy conditions. Contaminated rain water then runs off the confinement area and may find its way to the nearest surface water.



## Quiz! Go Ahead!

√ Are any of your existing barns and impermeable surfaces located where they may contribute to contaminated runoff into critical areas (i.e. surface water, wetlands, septic drain field)?

If you answered “yes” to this question, there are practices you could adopt that will improve chore efficiency, reduce mud, and protect sensitive areas and water quality!



## Tips! for Protecting Water Quality

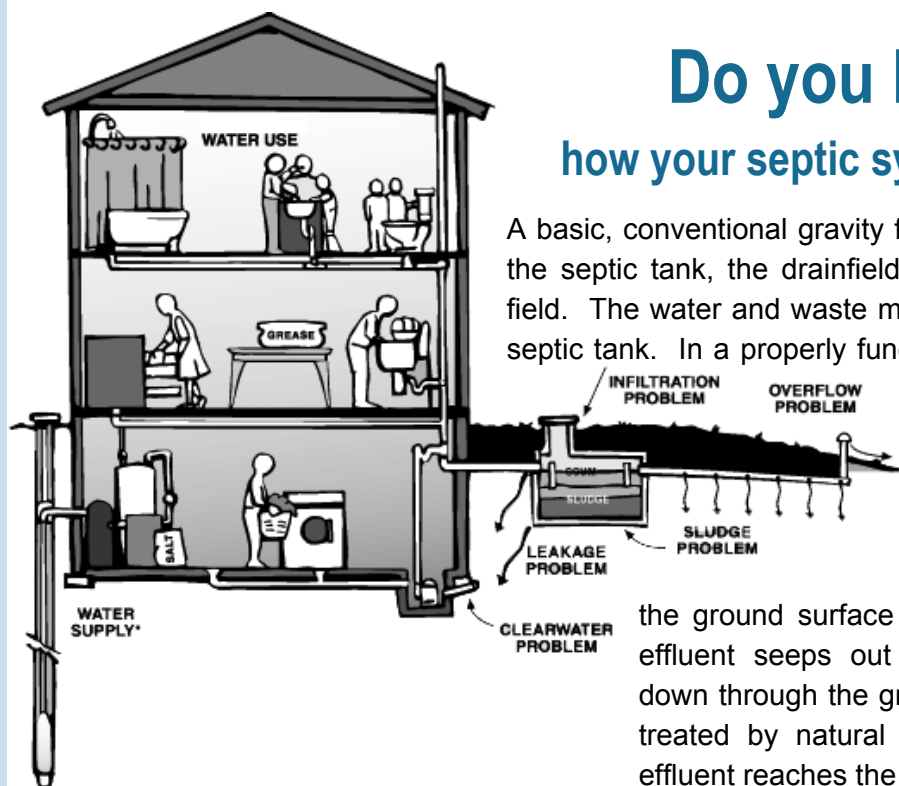
**Protect water quality on and off your farmstead by keeping clean water clean and by preventing polluted runoff from reaching critical areas:**

- ◆ Keep clean rain water clean by diverting roof water away from animal confinement areas to stock watering tanks, rain barrels, or unused pasture areas, and to existing wetlands and water bodies.
- ◆ For existing barns and slabs, best management practices (BMPs) can be implemented to ensure environmental resource protection, while reducing mud and improving the health of your livestock. (See Animal Confinement Areas section for more guidance).

## Buildings and Paved Areas



# Septic Systems - An Important part of Your Farmstead



## Do you know

### how your septic system works?

A basic, conventional gravity fed septic system has three parts: the septic tank, the drainfield, and the soil beneath the drainfield. The water and waste mix from your home first enters the septic tank. In a properly functioning system, the settling process yields a sludge layer, a scum layer, and the liquid effluent. The effluent flows to the drainfield made up of perforated pipe laid out just under

the ground surface in gravel-filled trenches. As the effluent seeps out the perforated pipes, it trickles down through the gravel into the underlying soil to be treated by natural biological processes, before the effluent reaches the water table.

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### How do I know if I have a septic system problem?

All septic systems are designed to operate with routine maintenance. Don't wait for signs of failure (i.e. drainfield seepage, soft ground, surfacing effluent, sluggish pipes, bad smells, evidence of compaction) before servicing your septic. By the time the system shows obvious signs of failure, it's most likely beyond repair. It is very expensive to replace a failing septic system with a new system.

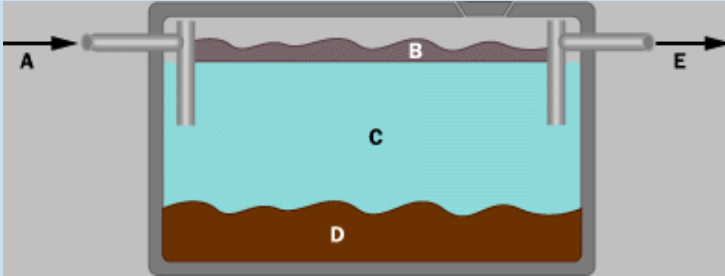
## Quiz! Go Ahead!

- ✓ Do you know where your septic system is located?
- ✓ Have you had your septic tank pumped in the last 4-6 years?
- ✓ Is your septic drainfield free of standing water?
- ✓ Do you know how far away your wells are from your septic tank and drainfield?
- ✓ Are livestock and machinery excluded from your septic drainfield?

If you answered "no" to any of these questions there are practices you can adopt that will protect the life and reliability of your septic system, protect the health of you and your livestock, and protect sensitive areas and water quality!

# The soil in your septic drainfield is important!

It is in the soil pores - the tiny spaces between individual soil particles - where microscopic creatures live and consume the harmful bacteria and water-borne disease organisms from your wastewater. The treated effluent eventually enters our county's groundwater or surface water. Septic system failure commonly happens when a portion of the system, or the soil itself, becomes clogged with waste solids due to compaction or clogging.



- A – Wastewater in
- B – Scum Layer
- C – Water
- D – Sludge layer
- E – To drain field

## FACT:

Septic systems harbor household hazardous substances, bacteria, viruses, and other microorganisms potentially harmful to people. Septic failures create health hazards and contaminate our groundwater, drinking water, streams, and rivers.

## Tips!

### for Protecting Your Farm's Septic System

- ◆ Knowing where your on-site sewage system (OSS), or septic system, is located is essential to ensuring that the system functions as it should. While a home septic system can be a highly effective, long term wastewater treatment system, it must be cared for properly to keep it working the way it is supposed to.
- ◆ Have your septic system inspected on a schedule of every 4-6 years, along with a complete evaluation of the system components and/or property to determine functionality and maintenance needs depending on the type of system you have
- ◆ Have your septic tank pumped regularly (every 4-6 years).
- ◆ Direct surface runoff away from septic drainfield.
- ◆ Avoid compacting soil in the drainfield. Keep vehicles and livestock off tank and drainfield areas.

# Septic Systems

## What's wrong with this picture?



Poor farm management practices allow nutrients, sediment, and pathogens to enter surface water such as this seasonal drainage.

## What are the potential impacts of owning livestock?

### Nutrient pollution of water

Animal waste contains nutrients (nitrogen and phosphorous).

- Surface water - Rain can wash nutrients off land and into the nearest, stream, lake or wetland. These excess nutrients use up the dissolved oxygen that fish need to survive.
- Groundwater - Nitrogen in the form of nitrate is easily dissolved in and carried with rainfall through our permeable soils to groundwater. High nitrate concentrations can present a significant human health risk, particularly to the very old and young.

### Sediment pollution to surface water

- Animals allowed free and continuous access to vegetation, quickly graze-out and trample pasture grasses and forbs. The resulting bare

ground is subject to erosion from wind and water. Contaminated runoff from these areas can enter water bodies and wetlands and interfere with fish and wildlife habitat.

### Pathogen pollution of water

Manure contains bacteria and other pathogens.

- Bacteria and pathogens from manure can make water unfit for drinking without treatment, and can make water unsafe for recreational activities such as fishing and swimming.

### Degradation of riparian areas

- Uncontrolled grazing and livestock trampling of riparian areas damages and removes important riparian vegetation, thus reducing the ability of the riparian vegetation to do its job of protecting water quality and providing habitat.



# Livestock Confinement Areas - Got Mud?



Confined livestock areas are outdoor, nongrazing (or very minimal grazing) areas in which livestock are confined by fences or structures. Most or all feed is brought to the livestock, and the nutrients deposited through livestock manure exceed crop need, if

a crop is grown at all. Confined livestock areas go by many different names. Cattle producers may call them feedlots, handling corrals or calving areas. For horses they may be referred to as arenas or paddocks. Confinement areas can also be called pens, yards, sacrifice areas, or heavy use areas.

## Diet Pens for Horses

Also known as sacrifice areas or paddocks. Horses may require special management to protect their health and prevent founder, without neglecting the health of pastures. Keep horses off pasture during the peak growing season, usually during March, April, and sometimes May. This is good for both horse health and the pasture, allowing grasses and clovers to grow.

## Do you have the right amount of space for your livestock confinement area?

The chart below provides general guidelines for you to use in figuring out your livestock space needs. It's best to minimize the size of your confinement area, which has the highest potential for mud and manure build up. Minimizing the size of your confinement area ensures chore efficiency for manure removal and maximizes your opportunity for healthy, usable pasture areas outside your confinement area.

## Lot space needed per animal

Animal (lbs)	Earthen Lots (sq ft)	Paved Lots (sq ft)
<b>BEEF</b>		
Cow-calf	500	75
Calf (600)	250	50
Grown (600-1,400)	350	60
<b>SHEEP &amp; GOATS</b>		
Rams & Bucks (180-300)	40	16
Ewes & Does (150-200)	40	16
Feeder Lambs & Kids (3-130)	30	10

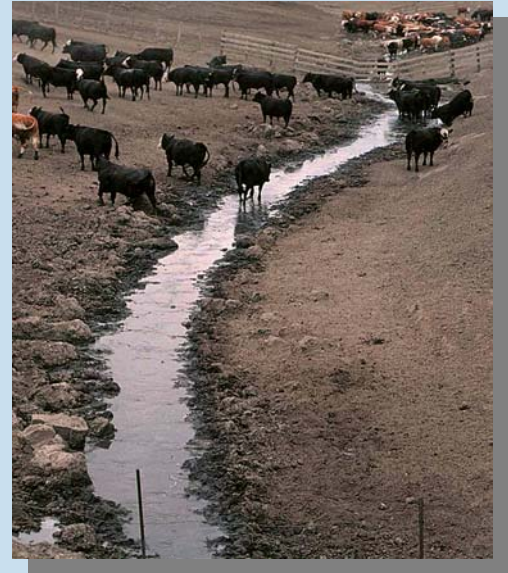
Animal (lbs)	Earthen Lots (sq ft)	Paved Lots (sq ft)
<b>SWINE</b>		
Nursery Pigs (30-75)	75	8
Finish Pigs (75-275)	150	15
Gestating Sow	200	20
Boar	200	40
<b>HORSES</b>		
Horse (1000)	300 - 400	N/A
Also for horses: 20-30 ft wide by up to 100 ft long paddocks provide room for exercise and play.		

# Livestock Confinement

## Quiz!

## Go Ahead!

- ✓ If roof water drains on to confinement areas, do ponds and/or channels form and does it add to the build up of mud?
- ✓ Does water from outside of livestock confinement areas (such as from fields, hillsides, driveways and roads) run on or through your confinement areas?
- ✓ Does surface runoff from your livestock confinement enter nearby streams, ditches, and/or wetlands?
- ✓ Are confinement areas difficult for livestock to move through, due to the build up of mud?
- ✓ Do livestock have health problems as a result of contact with mud and manure in confinement areas?
- ✓ Does contact with mud and manure by livestock in confinement areas result in increased energy (feed) requirements?



If you answered “yes” to any of these questions, there are practices you could adopt that will reduce mud, protect the health of your livestock, save you money in vet bills, and protect sensitive areas and water quality!

## Tips!

### for Reducing Mud

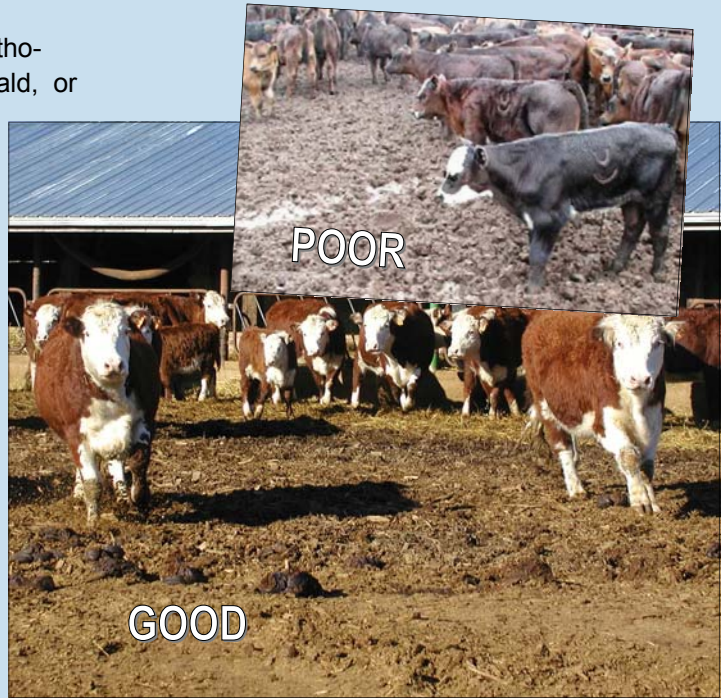
- ◆ Remove manure every 1 - 3 days from stalls, livestock confinement areas, and outdoor arenas.
- ◆ Use footing material such as wood chips, a mixture of bark and wood fiber, or crushed rock in high traffic areas such as paddocks and in front of stalls. Footing needs to be 6 to 12 inches deep. Investigate the best type of footing material for your livestock type.
- ◆ Install gutters and downspouts on all buildings and then divert the rain water away from confinement areas. This helps to keep clean water clean and reduces the amount of water contributing to muddy conditions.
- ◆ Plan your gutter systems 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.



# Livestock Confinement

# Excess Mud and Manure Cause Problems for You, Your Livestock and Your Neighbors

- Mud harbors bacteria, fungal organisms and other pathogens that cause diseases such as abscesses, rain scald, or thrush.
- Mud is a breeding ground for insects such as Cullicoides (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 and lead to intestinal parasites.
- Standing in mud can lower an animal's body temperature which causes increased feed requirements 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 lead to surface erosion and to muddy streams.



## for Managing Livestock Confinement Areas

### Roof Runoff Structures

Roof runoff structures collect, control and transport precipitation runoff from roofs away from animal confinement areas. This reduces mud and contaminated runoff from confinement areas and improves water quality.

Installing gutters and downspouts on a 30 ft x 75 ft barn in a typical Tehama County area with 21.5 inches of rain per year could divert and keep clean almost 30,172 gallons of roof-water! That amount is equal to a football field covered in 0.8 inches of water.

(Tips continued on page 13)



*This gutter and downspout system intercepts rainwater from the barn roof before it reaches the confinement area. The clean water is re-directed to a vegetated area. The downspouts are protected from livestock damage.*

# Livestock Confinement



# for Managing Livestock Confinement Areas

(Continued from page 12)

## Underground Outlet

A conduit installed beneath the surface of the ground to collect and convey surface water to a suitable outlet.

## Diversion

A channel constructed across a slope generally with a supporting ridge on the lower side. A diversion is used to intercept surface and shallow subsurface flow and divert the water away from livestock confinement areas.

## Subsurface Drain

A conduit, such as corrugated plastic tubing, installed beneath the ground surface to collect and/or convey drainage water and to improve water quality by regulating the water table.

## Windbreak or Shelterbelt

Single or multiple rows of trees or shrubs that provide shelter for livestock, enhance wildlife habitat and aesthetics, and manage snow deposition.

## Heavy Use Protection

Areas frequently and intensively used by people, animals or vehicles may be stabilized by surfacing with suitable materials (i.e. wood chips, gravel, rice straw, or crushed walnut shells) to improve water quality, aesthetics, and animal health. Wood chips or bark are available at local landscape and excavating companies. Sometimes chips may be available for free or low cost. Ask local tree trimming or yard maintenance companies if they have chips. Inquire of local agencies if they have any upcoming projects that will be generating chips. Remember local vegetation removal projects may contain poison oak, so if you're allergic be sure to ask about the contents of the chips. Spread chips right way, don't let them sit in a pile as they can create heat and combust. Following is a list of agencies to inquire about any upcoming projects generating wood chips: Manton Fire Safe Counsel, 474-3368; Ishi Conservation Camp Cal Fire, 597-2352.



*Heavily used areas may be protected by surfacing with suitable materials or by installing needed structures. Stabilization practices may be used on land areas intensively used by people, animals, and vehicles.*

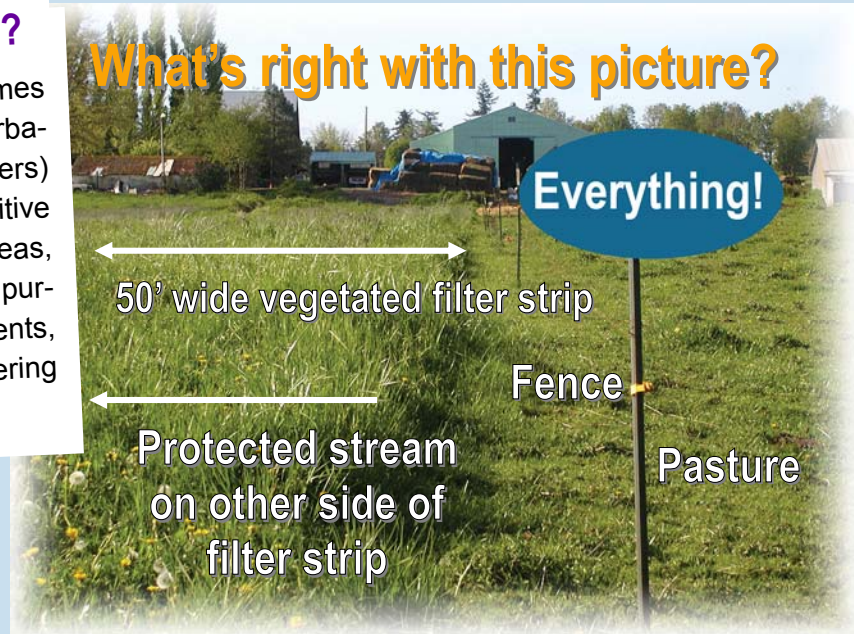


# Control Runoff with Vegetated Filter Strips

## What is a vegetated filter strip?

A vegetated filter strip, sometimes called a buffer strip, is an area of herbaceous vegetation (e.g. grasses & clovers) situated between environmentally sensitive areas and livestock confinement areas, crop land, or grazing land. The main purpose of a filter strip is to intercept nutrients, sediment and pathogens from entering surface water.

## What's right with this picture?



## What is runoff and why worry about it?

As water falls onto a surface and travels along a slope, it picks up contaminants (sediment, nutrients, bacteria) in its path. These contaminants can pollute surface water and are detrimental to fish, other aquatic life and humans. Causing contaminated runoff to surface water can be a violation of State law.

## How do filter strips reduce fecal coliform and other pathogens?

One of a filter strip's most important functions is to help keep fecal coliform bacteria that is contained in livestock manure out of ditches, streams, and rivers.

Maintaining permanent filter strips with dense growth between manure application areas and watercourses slows the flow of runoff water.

Harmful pathogens can not last long on the soil surface under dry, sunny and warm conditions or below the surface where soil organisms consume them. But if pathogens make it to water, they can survive for much longer periods perhaps as long as 10 months!

## What's wrong with this picture?



## Filter Strips



# Control Runoff with Vegetated Filter Strips

## How are filter strips managed?

- **Width** - A general recommendation on buffer width is difficult, due to site specific differences. As the rate at which water flows through a buffer strip increases, it's ability to absorb nutrients decreases, and the wider the strip needs to be. A filter strip 35 to 50 feet wide is desirable, but any size filter strip is better than none at all.
- **Grazing** should not be permitted in the filter strip unless a prescribed grazing system is implemented. Select harvesting such as haying or mowing can be part of a management system. Some prescribed grazing system criteria are discussed on page 25.

## Why manage?

- Filter strips need managing to effectively remove nutrients from water. Growing vegetation uptakes nutrients such as Nitrogen and Phosphorous, and is a good interceptor of bacteria such as E. coli. A filter strip, if left unmanaged, can become a sink as plant material decomposes. If plant material is not removed, the filter strip can accumulate high amounts of Nitrogen, Phosphorous, and organic carbon which can leave the strip and end up in our waterways.

## Managing

- In order to optimize filter strip efficiency, we need to manage the vegetation. Prescribed grazing, such as short in and out grazing, or cutting and removal of vegetation are good tools to remove biomass in the filter strip and prevent the strips from becoming a source of nutrients that may leach into water. Filter strip vegetation needs to be actively growing to use nutrients. Filter strip vegetation may consist of native or annual grasses. Native grasses are preferred, but annuals tend to be easier to establish and something is better than nothing. Fescue, Rye, Orchard Grass, or any dense vegetation (preferably not weeds) will work and can be managed as time allows.



### For detailed guidance

See the Natural Resources Conservation Service's Practice Standards "Prescribed Grazing" (Code 528), and "Filter Strip" (Code 393). For more information see the University of California's, Agricultural and Natural Resources publication "Irrigated Pasture Production in the Central Valley of California" (Publication # 21628) available at <http://anrcatalog.ucdavis.edu/FieldCrops/21628.aspx>, or contact the Tehama County Cooperative Extension office at (530) 527-3101, <http://cetehama.ucdavis.edu/>.

## Filter Strips



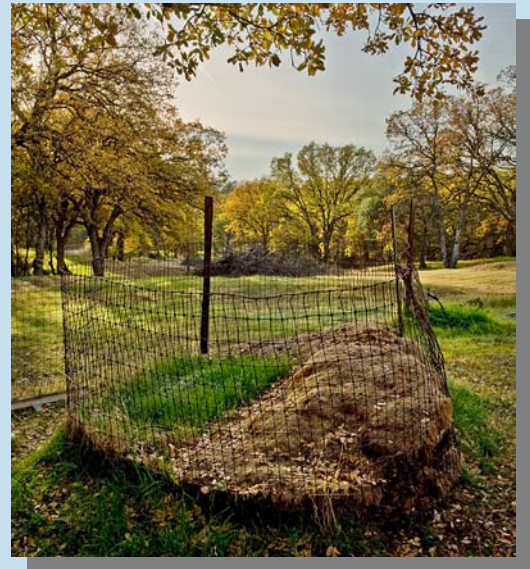
## Section 2

# Manure collection and storage

### Why Manure Management Is So Important

In Tehama County we use both surface water and groundwater sources for drinking, for recreation, and for agriculture uses such as watering livestock, irrigating crops and processing food. Clean water is also vital for fish and wildlife and is home to many aquatic organisms.

It is very important that animal wastes be properly managed, even on small farms with few animals! Proper storage and utilization of manure is necessary in order to prevent it from entering a stream or ditch. Good manure management also results in optimum use of manure as a fertilizer. Clean water, less mud, drier paddock areas, and healthier livestock can result if you follow these recommended practices.



### Average waste production per day for livestock

Livestock	Manure Produced	Bedding Used	Storage Required Five Months (Nov-March)
Horse	0.7 cu. ft./1000 lbs bodyweight	0.4 - 0.8 cu. ft	166 - 226 cu. ft
Beef Cattle	1.1 cu. ft./1000 lbs bodyweight	0.25 cu. ft	204 cu. ft
Sheep	0.65 cu. ft./1000 lbs bodyweight	0.35 cu. ft	151 cu. ft
Swine	0.5 cu. ft./1000 lbs bodyweight	0.20 cu. ft	106 cu. ft

## You Make a Difference

Proper management of livestock waste usually can be accomplished with minimum investment. Your efforts do make a difference!

## Manure Handling and Storage

# Could my manure management be impacting water quality?

## Quiz! Go Ahead!

- ✓ Is your manure handled and stored in a way that prevents runoff?
- ✓ Is your manure pile covered?
- ✓ Are your manure storage and livestock confinement areas located at least 100 ft from all watercourses (streams, ditches, swales, wetlands, ponds, etc.)?
- ✓ Do you divert clean rain water away from your manure piles?
- ✓ Do you have enough storage for manure (See “Average waste production per day for livestock” chart, page 17 to determine storage needs)?



If you answered “no” to any of these questions, there are practices you can adopt that will improve chore efficiency, reduce mud, and protect sensitive areas and water quality!

## Tips!

### for Successful Manure Management

- ◆ Remove manure every 1-3 days in stalls, paddocks, and outdoor arenas.
- ◆ Reduce stall waste by reducing the amount of bedding that you use. Simply use less bedding, use rubber mats in stalls or try an alternative bedding product.
- ◆ Cover your manure pile and choose its location carefully. You’ll want to choose a high, dry, level area away from flood prone areas, slopes, streams, ditches, wetlands, or other water bodies to prevent runoff and to make it easier for equipment access to the pile.

## Manure Handling and Storage

# What is Composting and Why Do It?

All organic matter (like manure and bedding) eventually decomposes. Composting speeds up the process by providing an ideal environment for microorganisms to assist with decomposition. Composting reduces flies, odors, and the volume of your pile. The composting process kills worm eggs, parasites, and pathogens that can cause disease, as well as weed seeds. You also end up with a great soil amendment to use on your property!



**How fast your fresh manure composts depends on the following:**

- \* Size of your pile
- \* Amount and type of bedding it contains
- \* Method of composting
- \* Maintenance routine

## When is it 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 of 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.

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.



## Spreading of Composted Manure: Local Rule of Thumb – Composition Dependent

- 10 tons composted manure/acre/year
- Fall (Mid-November to Mid-January) Nitrogen (N) favors grass
- Spring (Mid-March to April) Phosphorus (P) favors legumes
- Rains make Nitrogen, Phosphorus and Potassium (K) available when grasses are growing
- Apply before emergence and to grazed areas resting after livestock removed



# Composting

# Tips!

## for Successful Composting

- ◆ Begin by building a pile on an impervious surface or compacted site. See the waste production table on page 17 for size recommendations.
- ◆ Cover the manure 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.  
**NO MEAT IN COMPOST!**
- ◆ 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 the composting structure where surface water flows can reach it.
- ◆ For more information contact: Tehama County Land Fill at (530) 528-1103 or [tehamacountylandfill.com](http://tehamacountylandfill.com).

## Section 3

# Pasture management

Managing pastures is an active and dynamic process. Many factors affecting pasture management vary considerably from year to year and are impossible to control, so be prepared to make changes. Try to learn about the grazing behaviors of the type of stock you raise to be sure you're meeting their specific needs. When in doubt, let your grasses be your guide: what's good for them is generally good for your stock, the profitability of your operation, and the environment.



### Quiz!

### Go Ahead!

- ✓ After most forages have been grazed/harvested to 3" height, do you allow continued grazing/harvest without allowing time for forage to produce 4 to 6 inches of new growth?
- ✓ Is 25% or more of your pasture and hayland lacking suitable forages for livestock?
- ✓ Is forage quality reduced for your animals because the animals avoid grazing plants that are too mature?
- ✓ Do you manage all of your pastures the same even if they have different soils or slopes?
- ✓ Are your animals allowed to roam freely year-round?
- ✓ Do you have to feed hay and/or grain most of the time, even during the permanent pasture grazing season (April – Oct)?
- ✓ At the end of the grazing season (Oct) is there less than 3 inch minimum stubble height left in your fields to filter contaminants in surface runoff?

Some pasture management criteria include:

- Managing for type of animal, animal number, grazing distribution, and length of grazing periods. Do not allow animals onto pasture when there is standing water or when the ground is wet enough for livestock to leave hoof prints.
- Locating livestock feeding, handling and watering facilities to protect soil and water resources.
- Managing grazing animals to maintain adequate vegetative cover and density to maintain filtering capacity of vegetation. If you can throw a handful of change into your pasture and find it, you don't have adequate groundcover.

If you answered "yes" to any of these questions, you may want to consider 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!

## Pasture Management

# TIPS!

## to get more feed from pasture

- ◆ The GRAZIER'S GOLDEN RULE: Provide time for regrowth after grazing: Controlled and well-timed grazing does not weaken or destroy pasture forages. But not providing adequate time for regrowth after the grazing occurs does destroy pasture forages. After plants are grazed, they recover and regrow by using energy from sunlight to make food. Plants can only recover and regenerate when their leaves have grown large enough to start collecting a sufficient amount of the sun's energy. Most forages need to produce at least 4 to 6 inches of new growth before they can be grazed again without harm.
- ◆ Limit permanent pasture access during the winter: Low light levels and low temperatures reduce forage growth from November through March. During that time livestock hooves readily destroy desirable forages (which are then replaced by weeds) and compact the soil to a degree that diminishes optimal conditions for forage growth.
- ◆ Shade is important during hot days and should be available to livestock so they can get out of direct sunlight if they need to.
- ◆ Keep forages in an active stage of growth: Forage feed value and palatability decline rapidly once plants begin heading out (entering the reproductive growth stage). Stock at proper rates to ensure an efficient harvest that leaves a minimal amount of unconsumed plants and/or clip mature plants so they are forced back to vegetative growth stage.
- ◆ Good feed comes from good seeds: When weeds and less desirable, lower yielding forages are the major plants present in a field, it may make sense to reseed or overseed in order to improve forage quality.
- ◆ Recovery times for irrigated pasture (approximate because species composition is the key factor: Late Fall/Winter 40-60 days; Spring 14-20 days; Summer 15-30 days; Fall 20-30 days).
- ◆ Watering facilities and salt blocks should be arranged to encourage animals to move throughout the whole pasture and prevent loafing in one area. Careful placement and regular movement of mineral supplements can encourage animals to visit under utilized areas.

### FACT:

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!



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.

## Pasture Management



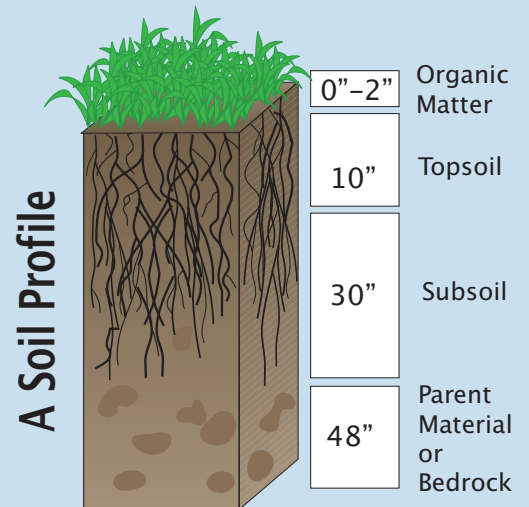
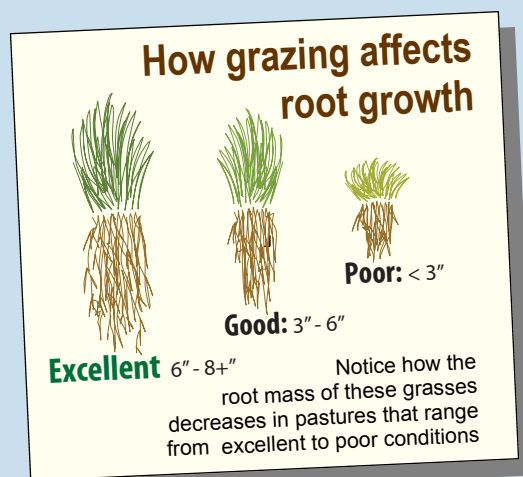
# Soil Characteristics

Soils vary widely, even across your backyard and pastures. To begin to know how best to manage your pasture, you must know your soil type and its water carrying (or holding) capacity, texture, and productivity. Luckily, there is a USDA Soil Survey of Tehama County, California that is available. The Soil Survey can provide you with good information about what soil(s) is/are mapped on your property and about what the capabilities and limitations of different soil types are. The Soil Survey is available online at <http://websoilsurvey.nrcs.usda.gov/app/>, or contact our local Natural Resource Conservation Service office at 527-3013 x 3.

The amount of water that your soil type can hold will determine when you can put your animals out in the field in the spring. Some soil types drain well; others do not. Poorly drained soils are more prone to becoming muddy during the wet season. Soil type also affects your grass/crop yields in the summer.

## Soil type determines:

- \* Filtering of nutrients from animal and human wastes
- \* Amount of fertilizers and/or composted manure to apply
- \* Placement and durability of structures
- \* If your land has a wetland, when considered together with vegetation and hydrology (see Wetlands Management section of this booklet)
- \* Plant and tree rooting depths



## Maintain soil fertility

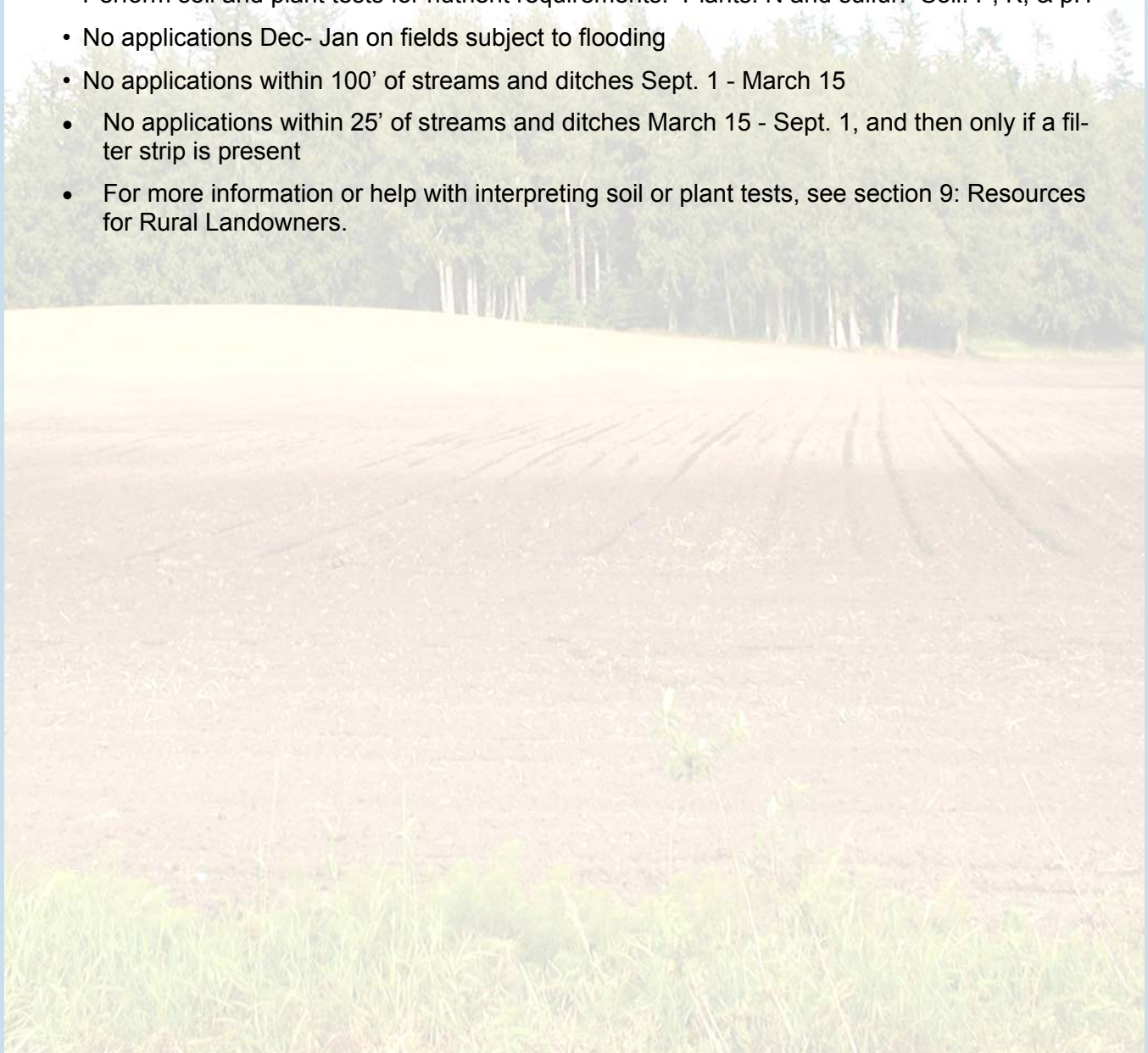
Over time the level of soil nutrients that plants require for optimum growth, such as nitrogen (N), phosphorus (P) and potassium (K), become depleted, and soil pH also tends to decline (i.e. become more acid). Test the soils in fields every 3 to 5 years to evaluate the fertility status and pH of individual fields.

You can increase both forage quality and quantity by applying manure and/or fertilizer, by including clover and/or other legumes in seeding mixes (they can also be overseeded into existing fields), by adding lime to raise soil pH where needed, and by frequently moving portable water troughs and feed racks.

# Nutrient Management

As a general rule, don't apply manure as a fertilizer if a storm is on its way – watch the weather forecast! Other general guidelines to observe when applying solid manure as a fertilizer include:

- No applications when soils are saturated, frozen and/or snow covered
- Perform soil and plant tests for nutrient requirements. Plants: N and sulfur. Soil: P, K, & pH
- No applications Dec- Jan on fields subject to flooding
- No applications within 100' of streams and ditches Sept. 1 - March 15
- No applications within 25' of streams and ditches March 15 - Sept. 1, and then only if a filter strip is present
- For more information or help with interpreting soil or plant tests, see section 9: Resources for Rural Landowners.



# Prescribed Grazing

In practice, prescribed grazing (also referred to as rotational grazing) generally means that stock access to pastures is based on carefully matching forage production with feed requirements over a relatively short period - generally no more than 7 days and ideally even less. Livestock are not reintroduced to the field until plants have had sufficient time to regrow enough to recover from the previous grazing. The amount of regrowth necessary varies by forage species (usually 4 to 6 inches) and the time required by the season (14+ days in spring to 20+ days in summer).

At first, establishing a prescribed grazing system can be challenging. A fair amount of trial and error learning can be expected, but it provides the following advantages over less controlled approaches:

**Higher yields and improved efficiency** - In continuous grazing systems, as opposed to prescribed grazing systems, animals selectively choose which plants they eat. Plants that livestock don't eat the first time around become less palatable and nutritious as they mature and so become even more likely to be avoided later in the grazing season. In prescribed grazing systems, animals are provided with smaller areas to graze and are therefore forced to be less selective and eat all forages available.

**Improved plant performance** - In order to thrive, plants need time to regrow after grazing. Desirable forage species are weakened when regrowth is inadequate. This results in lower yields and an increased likelihood that desirable species will be displaced by weeds. Prescribed grazing management systems are planned to ensure that the desirable forage plants have adequate time to regrow.

**Higher feed quality** - Forages achieve their optimum feed value during the latter part of their vegetative growth stage (shortly before seed head emergence). The goal in prescribed grazing management systems is to keep animals moving (rotating) through fields so their arrival coincides with the late vegetative stage and their departure occurs prior to the onset of the reproductive stage.

**Stock at proper rates** - If you under stock fields by supplying animals with more forage than can be consumed, and unless the surplus can be conserved as silage or hay, then some feed will be wasted for a year. If you over stock fields by supplying less forage than is needed by your animals, then potential production may be lost for years to come as a result of the damage caused by over grazing.



## Stockwater

Developing a stockwater system is 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:

1. Pipe water to a stock tank in each pasture or a centralized location. Fencing your livestock away from surface water helps keep manure out of the water, protects and maintains streamside vegetation, and helps control erosion.
2. Use a self watering device, such as a nose pump, to draw water from a stream or pond that your livestock is fenced away from.



*Nose pump*

# How much forage do livestock need?

Average requirements are listed below, but will vary with the year (due primarily to rainfall), level of management, and the age and size of the animal.

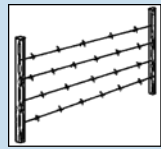
## Forage Requirements for 6-month Season

Type of Animal	Acres of Irrigated Pasture Required to Meet Need through Grazing Season (six months Summer Season)	Acres of Non-irrigated Rangeland Required to Meet Annual Need (six months Winter Season)
Cow (1,200 lb) and calf	1.25 – 2.0	8 – 15
Horse (1,200 lb) mature, lightly worked	1.25 – 2.0	8 – 15
Mare and foal	1.25 – 2.0	8 – 15
Sheep (175 lb)	0.2 – 0.4	1.6 – 3

# Fencing

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

## Basic Types of Fencing in Tehama County

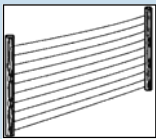


### Barbed Wire

4 or 5 strand. Good control of cattle and sheep. Less expensive.

### Disadvantages

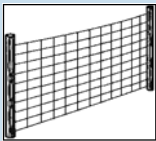
May injure horses and llamas.



### Smooth/Coated Wire

Less harsh than barbed wire. Inexpensive and easy to build.

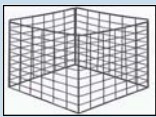
Needs more strands to be equivalent barrier to barbed wire. Needs periodic maintenance. Less visible to horses.



### Woven Wire

Good control for horses and sheep. May be combined with electric strand. Variety of sizes and types for specific animals.

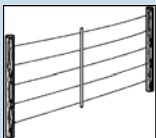
Maintenance is difficult and fence is easily damaged by falling trees and floods. Needs to be combined with electric wire offset for horses. Harder to keep tight. More expensive.



### Hog & Cattle 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. Needs reinforcement.

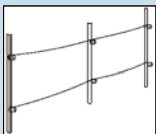


### High Tensile Electric

(New Zealand Style)

Inexpensive and requires little maintenance. Good control of all animals. Can be built to withstand floods.

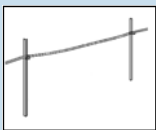
Less of a physical barrier if there are power outages.



### Portable Electric

Lightweight and easy to move for pasture rotation. Inexpensive.

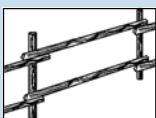
Requires a power source. Not very durable. Not a physical barrier. Not recommended for perimeters.



### Plastic Hot Wire

Best used for goats in controlled grazing situations. Goats can be difficult to contain in traditional electric fencing systems as they find ways to fit through very tight places. This system eliminates areas where they can escape.

More expensive than a traditional electric fencing system.



### 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.



# Fencing

# Weed Control

## Weeds - the thief in the field

Weeds reduce potential yields by out competing desirable forages for space, light, nutrients and water. Some weeds are also toxic to livestock. Applying good pasture management practices is generally the best way to prevent weed infestations from occurring. Weeds often gain their foothold when desirable forages are damaged as a result of overstocking and winter access. Injury to plants from hooves is of particular concern when soils are wet. Control weeds, which often invade from the field perimeter, by clipping and/ or applying appropriate herbicides before they spread. Replanting infested fields is another option, but be sure soils are firm and plants are well rooted before stock are reintroduced.



Weeds spread fast, so regularly look for new weed patches on your property and act immediately to treat them. 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!

**Noxious Weeds** are non-native plants that have been introduced to Tehama County from other parts of the world. Because of their aggressive growth and lack of natural enemies in the state, these species can be highly destructive, competitive, or difficult to control. These exotic species can reduce crop yields, destroy native plant and animal habitat, damage recreational opportunities, clog waterways, lower land values, create erosion problems and fire hazards, and poison humans and livestock. For more information on noxious weeds contact the Tehama County Cooperative Extension Office or Natural Resource Conservation Service.

### 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



*Fiddleneck, a toxic weed, is poisonous to livestock.*

# Some Toxic Plants in Tehama County

Plant Species	Poison Symptoms	Livestock Affected
Yellow Star Thistle	Drowsiness, difficulty eating and drinking, twitching of the lips, tongue flicking, and involuntary chewing movements.	Horses
Fiddleneck	Weakness, uncoordination, photo sensitization, and jaundice with a yellow color of mucus membranes, or liver damage.	All Livestock, goats may eat very small amounts
Milk Weed	Depression, weakness, and staggered gait. Difficulty in breathing with expiratory grunting sounds. Dilation of pupils. Rapid, weak pulse or other cardiac arrhythmias. Loss of muscular control, elevated temperature, violent spasms, bloating, respiratory paralysis, congestion of visceral organs, renal tubular degradation and necrosis, and gastroenteritis.	All Livestock
Cocklebur	Rapid, weak pulse, labored breathing, nausea, vomiting, and spasmodic contractions of the legs and neck muscles.	All Livestock
Common Groundsel	Symptoms are the same as fiddleneck poisoning.	All Livestock, goats may eat very small amounts
Oleander	Abdominal pain, sweating, severe diarrhea, trembling, weakness, difficulty breathing, arrhythmia, or death.	All Livestock
Larkspur	Nervousness, weakness and staggering gait; animal may fall suddenly, salivation, muscular twitching, nausea and vomiting may occur, bloating may occur, rapid, irregular pulse, animal may die. Excitement and physical exercise intensifies all signs of poisoning. Minimal gross lesions (bloat and pulmonary congestion)	All Livestock
Lupine	Birth deformities	Calves

## Use Caution....

- \* Be cautious when feeding yard waste to livestock. Some ornamental plants may be toxic to them.





## Section 4 Orchard and Cropland management

### Irrigated Lands Program

In 2003, the Central Valley Regional Water Quality Control Board established a program to address the discharge of irrigation water and stormwater runoff from irrigated agricultural lands. This program is referred to as the Irrigated Lands Regulatory Program (ILRP). Commercial agricultural landowners and operators that discharge irrigation water or stormwater to surface waters have the following options for compliance with the Regional Board program requirements: (1) join an area Coalition that has a conditional waiver of waste discharge requirements, (2) seek an individual waiver of waste discharge requirements, or (3) a Regional Board issued waste discharge requirements.



Most owners/operators have chosen to join a Coalition. In the northern Sacramento Valley area, the Shasta-Tehama Watershed Education Coalition is the applicable group for Irrigated Lands Program compliance. Coalitions charge a membership fee that is used for program administration, and for water quality monitoring and reporting. Monitoring is being conducted at selected sites on streams in Shasta and Tehama counties. If monitoring shows exceedence of state water quality standards, the Coalition is required to prepare a management plan to address the cause of the water quality exceedence (if caused by agricultural discharges).

For more information on the Shasta-Tehama Watershed Education Coalition call 530-527-4208.

### Pesticide Regulation

What is a pesticide? A pesticide is any substance intended to control, destroy, repel, or attract a pest. Any living organism that causes damage, economic loss, transmits or produces disease may be the target pest. Some common pesticides (and their target pests) include: Insecticides (that are targeted at insects and other “bugs”). Herbicides (weeds and other unwanted plants). Rodenticides (mice, rats). Molluscicides (snails, slugs). Repellents (mosquitoes, ticks). Disinfectants and sanitizers (bacteria, mildew and other microorganisms). Fungicides (plant diseases, molds). By their very nature, most pesticides create some potential risk of harm because they are designed to kill or otherwise adversely affect living organisms. At the same time, pesticides are useful to society, as pesticides can kill potential disease-causing organisms and control insects, weeds, and other pests.

The U.S. Environmental Protection Agency (U.S. EPA) evaluates and registers (licenses) new pesticides before use anywhere in the U.S. They also evaluate and re-register older pesticides. In California, pesticide sales and use is controlled by the California Department of Pesticide Regulation. At the local level, pesticide law is enforced by County Agricultural Commissioners. For more information, refer to the California Department of Pesticide Regulation website, <http://www.cdpr.ca.gov>. Check out the following links for DPR’s community guide <http://www.cdpr.ca.gov/docs/dept/comguide/index.htm>, about DPR <http://www.cdpr.ca.gov/docs/dept/factshts/main2.pdf>, and other fact sheets in English and Spanish <http://www.cdpr.ca.gov/docs/dept/factshts/factmenu.htm>.

## Wellhead Protection

In California, we have a state law to help protect well water from inadvertent contamination of pesticides. Title 3 in the California Code of Regulations Section 6609, states:

- (a) Except as provided in subsection (b), the following activities shall be prohibited within 100 feet of a well (including domestic, municipal, agricultural, dry or drainage, monitoring, or abandoned wells):
  - (1) mixing, loading, and storage of pesticides.
  - (2) rinsing of spray equipment or pesticide containers.
  - (3) maintenance of spray equipment that could result in spillage of pesticide residues on the soil.
  - (4) application of pre-emergent herbicides.
- (b) Wells shall not be subject to the requirements in (a) if they are:
  - (1) sited so that runoff water from irrigation or rainfall does not move from the perimeter of the wellhead toward the wellhead and contact or collect around any part of the wellhead including the concrete pad or foundation; or
  - (2) protected by a berm constructed of any material sufficient to prevent movement of surface runoff water from the perimeter of the wellhead to the wellhead.
- (c) Application of pre-emergent herbicides shall be prohibited between the berm and the wellhead.

For more information contact the Tehama County Department of Agriculture or the Tehama County Department of Environmental Health.

## Agricultural Burning

### What is agricultural burning?

The burning in the open of materials produced wholly from operations in the growing and harvesting of crops or raising of fowl or animals for the primary purpose of making a profit. As an example, if you are selling nuts, fruits, cattle, etc. for profit, then burning prunings, pasture, ditch banks etc. would require an Air Pollution Control District Burn Permit.

### Agricultural burning is regulated.

You can not burn items such as petroleum products, demolition debris, tires, tar paper, garbage, almost anything processed or manufactured, not produced in a agricultural operation.

### State law requires the regulation of agricultural burning.

The California Air Resources Board declares if it is a Permissive Burn Day. Your Agricultural Burn Permit is valid only on Permissive Burn Days.

## Who may burn agricultural waste?

Only the owners and/or operators and/or employees of agricultural operations.

## Where do I get a valid air pollution burn permit?

From the Tehama County Air Pollution Control District Office, located at 1750 Walnut Street, Red Bluff. It is valid for one (1) year. (As of May 1st when fire season starts, a burn permit is also required from California Department of Forestry and Fire Protection, or Rural Fire Department. In order to receive a permit from them, you must show your valid Air Pollution Burn Permit.)

## What are the burning hours?

- Non-Fire Season** Rice Fields 10:00 am to 3:00 p.m.  
Other field crops 10:00 a.m. to 5 p.m.  
Orchard prunings 8:30 a.m. to 5 p.m.
- Fire Season** 8:30 a.m. to 12 noon - Unless you have a variance from the California Department of Forestry and Fire Protection or Rural Fire Department.

## Agricultural Burn Program

The Tehama County Air Pollution Control District allows burning of vegetation from orchards through the Agricultural Burn Program for a nominal fee. The Agricultural Burn Program covers burning of vegetation that is incidental to growing crops for purpose of sale or off site consumption. Growers can contact the District (527-3717) or visit the office at 1750 Walnut St in Red Bluff to obtain a permit. As part of the program, on weekdays by 8:30am, District staff determines whether vegetation burning will be allowed for the day. The determination takes into account local meteorological conditions, fire danger, and the potential impact on the local community due to smoke dispersion.

## Stationary Diesel Engines Used in Agriculture

Stationary diesel engines greater than 50 hp used for agricultural purposes (such as irrigation), are required by state law to participate in the District's engine registration program. Participation in the program also allows older engines to be eligible for grant money for engine replacement through the District's Carl Moyer Program. For information on registering your engine, or on the Carl Moyer Program, call 527-3717.



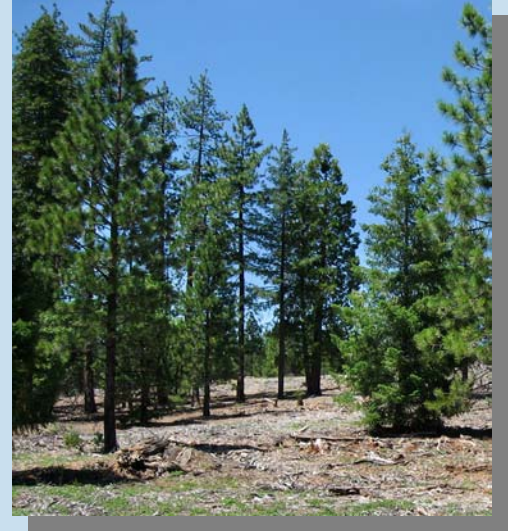
## Section 5 **Forest** management and wildfire protection

# Is your Forest Healthy?

**Quiz!**

**Go Ahead!**

- ✓ 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?



Even if you answered “yes” to all these questions, there still may be opportunities to enhance your woodland. Read on...

**TIPS!**

for a healthy forest

- ◆ 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.

(Tips continued on page 36)

**Forest Management**



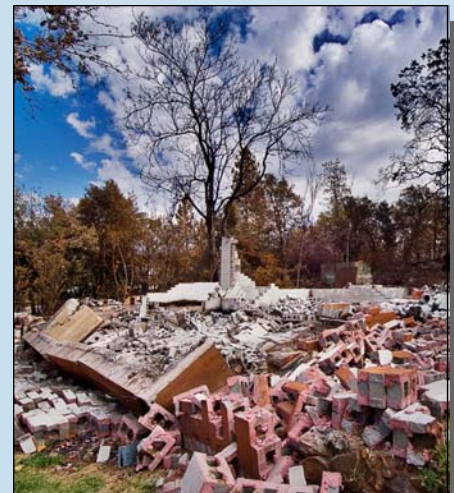
## for a healthy forest

(Continued from page 35)

- ◆ 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!

## Protect Your Home From Wildfire

- Maintain a 30’ envelope around your home in a non-burnable condition consisting of green lawn or fire resistant plants and maintain 70 - 100’ of defensible space outside of that.
- Prune the lower branches of trees below 12’ to remove “ladder fuels” that can cause a ground fire to become 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 California Department of Forestry and Fire Protection office for more information on home fire protection.



## For Help

- Contact the California Department of Forestry and Fire Protection (CalFire).
- Contact the Tehama County Cooperative Extension Office.
- The USDA Natural Resources Conservation Service (NRCS) provides conservation planning that includes forestry. The NRCS and Farm Services Agency (FSA) administer forestry cost-share programs through your local USDA Service Center.
- Private forestry consultants inventory forests, set up timber sales, and help meet your goals. Check the yellow pages in your phone book for consultants.

# Wildfire Protection

### ★ Definition:

"Riparian" refers to the areas adjacent to a waterbody (such as a stream, lake, or marine waters). Riparian areas contain vegetation that influences the health of the water and its living and non-living components (the aquatic ecosystem).

Dense riparian vegetation along the water's edge will slow and protect against flood flows; secure food and cover for fish, birds and wildlife; and keep water cooler in summer.



## Why Are Riparian Areas Important?

**Healthy riparian areas perform many functions important to our aquatic resources and to overall stream health.**

Lush native riparian and wetland vegetation adjacent to waterbodies will:

- Contribute to and maintain good instream fish habitat by providing large woody debris. The woody debris helps to form deep pools with cover (preferred salmon and trout habitat), spreads out the water's energy to reduce potential for harming salmon and trout nests, and provides cover for fish to escape from predators.
- Protect water quality by providing shade to maintain cooler water temperatures and by filtering sediment, chemicals, and nutrients from runoff water as the runoff moves towards the water body. Tehama County has a buffer zone requirement for certain pesticides. The requirements are explained to those obtaining a pesticide permit. For more information contact the Tehama County Department of Agriculture.
- Decrease the magnitude of floods and reduces damage from high water levels
- Trap and store sediments as well as protect banks and shorelines from erosion
- Provide leaf litter to the water to serve as food for aquatic insects. In turn, the aquatic insects are eaten by fish and other aquatic organisms.
- Provide habitat for riparian dependent wildlife including many species of birds, amphibians, and other wildlife.
- Trap and store water, thereby reducing flood flows and increasing the amount of water that is absorbed into the ground. Increased infiltration can recharge groundwater, which increases the amount of water that can be released during the summer and fall low stream flow periods.

## No stream or ditch is too small to be important.

Even smaller streams drain to larger streams, lakes or marine waters that provide critical spawning and rearing areas for salmon and trout, and support other important aquatic life such as shellfish. Ideally, smaller streams provide a constant supply of water to larger downstream rivers, lakes and marine estuaries.



## How Can Your Livestock Harm Riparian Areas?

If animals are allowed unrestricted access to a stream, ditch or other water body, the manure from horses and livestock contaminate the water. Animals allowed access to water bodies can eat the riparian vegetation and trample the vegetation and roots of plants in the riparian area. The destruction of the vegetation and soil leads to erosion, habitat destruction, decreased shade, and decreased ability for the riparian area to perform its habitat protection and pollution filtering functions. The bottom line is that you have to keep your animals and their waste out of streams, ditches, swales, and other surface water and protect existing riparian vegetation along the water bodies. Installing and maintaining fencing to exclude livestock from streams and ditches will protect water quality and riparian habitat.



## How Can you Help Riparian Areas Do Their Job?

You can help riparian areas do their job by protecting them as buffer areas that exist between the waterbody and your farming activities. The most desirable buffer area is one thickly vegetated with native trees and shrubs. This type of buffer provides for the full range of riparian functions, including filtering sediment, nutrients and contaminants, as well as contributing to fish and wildlife habitat. An acceptable buffer area may be a “filter strip” of grass between the water body and your farming activities.

# Riparian Management



## Quiz!

## Go Ahead!

- ✓ Do your livestock have access to streams, ditches, and other waterbodies?
- ✓ Do you utilize farm machinery that may cause sediment and manure discharge to watercourses?
- ✓ Are your stream banks eroding and/ or do you have exposed soil or bank slumping?



If you answered “yes” to any of these questions, you may want to take immediate action to protect sensitive areas and water quality!

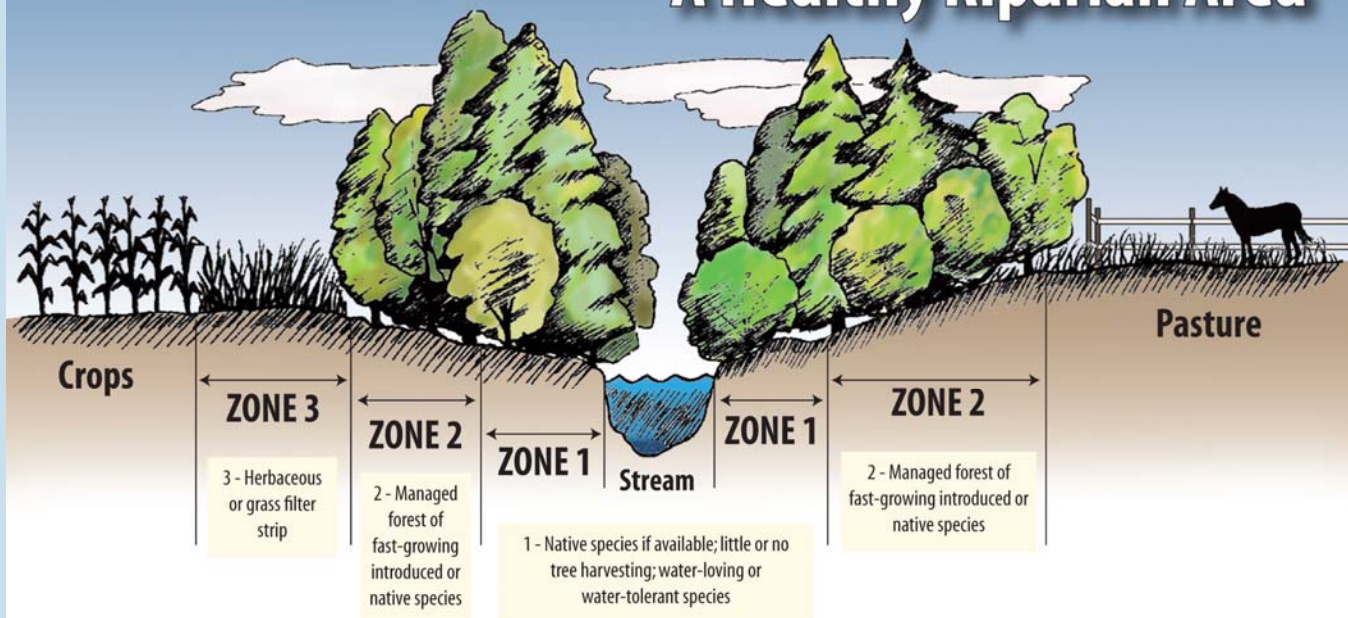
## Tips!

### for protecting riparian areas

- ◆ Plant and maintain native trees, shrubs, groundcovers along streams to maintain or improve salmon habitat, and around animal confinement areas to trap and absorb pollution-laden runoff before it reaches streams or groundwater.
- ◆ Fence your animals out of streams, ditches, and riparian vegetation areas to protect water quality and to protect the functions of critical areas. Refer to “Fencing” section for more information on fencing options.
- ◆ Locate livestock confinement areas and septic systems away from streams and 100 feet downslope of your drinking water well.
- ◆ Use farming practices (i.e. planting and maintaining healthy riparian areas, establishing filter strips, etc.) that reduce soil erosion and increase water infiltration.
- ◆ Avoid excessive fertilizer and pesticide applications where they may enter streams or other waterbodies, potentially becoming a source of groundwater and surfacewater pollution. Have your soil tested to develop a nutrient management plan which best reflects the nutrient needs of your pasture.
- ◆ Establish salting/mineral stations away from riparian areas and in flat areas, because livestock, especially cattle, will tend to congregate in these locations. If the area has a slope, salt could end up in the stream during rain events.

# Riparian Protection

# A Healthy Riparian Area



A **Riparian Forest Buffer** includes **Zone 1** - the area closest to the waterbody or course, and **Zone 2** - the area adjacent to and up gradient of Zone 1. Trees and shrubs in Zone 1 provide important wildlife habitat, litter fall for aquatic organisms, and shading to lower water temperature. This zone helps stabilize streambanks and shorelines. Trees and shrubs in Zone 2 (along with Zone 1) intercept sediment, nutrients, pesticides, and other pollutants in surface and subsurface water flows. Zone 2 can be managed to provide timber, wood fiber, and horticultural products. A third zone, **Zone 3**, is established if periodic and excessive water flows, erosion, and sediment from upslope fields or tracts are anticipated. Zone 3 is generally of herbaceous plants or grass and a diversion or terrace if needed. This zone provides a "first defense" to assure proper functioning of Zones 1 and 2.

## Riparian Protection

## Section 7

# Wetland management and protection

Marshes, seeps, abandoned stream channels, margins of ponds or lakes, vernal pools, fens, wet meadows or pastures are examples of types of wetlands.

### What is a wetland?

Wetlands are characterized by three factors:

**Hydrology** - The area is inundated or saturated by surface or groundwater

**Vegetation** - Water is present long enough, or frequently enough, to support vegetation that is adapted to saturated soil conditions.

**Soil** - The area has soil that has been affected by the continued presence of water.



### Why are wetlands important?

Wetlands play an important role in the ecology of natural systems. They perform important hydrologic functions as well as provide food, habitat, and shelter for many fish and wildlife species. Wetlands also play an important role in human affairs. Their ability to lessen flood damage, control erosion, support fish and wildlife, and store water, provides tremendous economic benefits to Tehama County. Wetlands also offer opportunities for recreation, education, and research.

### Functions performed by wetlands include:

- \* Help control flooding by acting as natural reservoirs providing storage for incoming storm water
- \* Improve water quality by filtering nutrients, sediment, and other contaminants
- \* Maintain streamflows by gradually releasing stored water back into the streams after floods and after the wet season
- \* Recharge groundwater
- \* Help to maintain lower water temperatures in nearby streams.
- \* Provide critical habitat for fish and wildlife
- \* Create places for recreation, education, scientific study, and aesthetic appreciation

## Quiz! Go Ahead!

- √ Do livestock have access to wetlands that directly connect to streams and ditches, and are nutrients, pathogens, sediment and other contaminants allowed to enter the wetlands?
- √ Do livestock have access to wetlands that are isolated from streams and ditches, and are nutrients, pathogens, sediment and other contaminants allowed to enter the wetlands?
- √ Are your activities potentially degrading the wetland? These include filling, draining, grading, or clearing which may introduce nutrients, pathogens, sediment and other contaminants?



If you answered “yes” to any of these questions, you will want to take action to protect wetlands and water

## Tips!

### for protecting wetlands

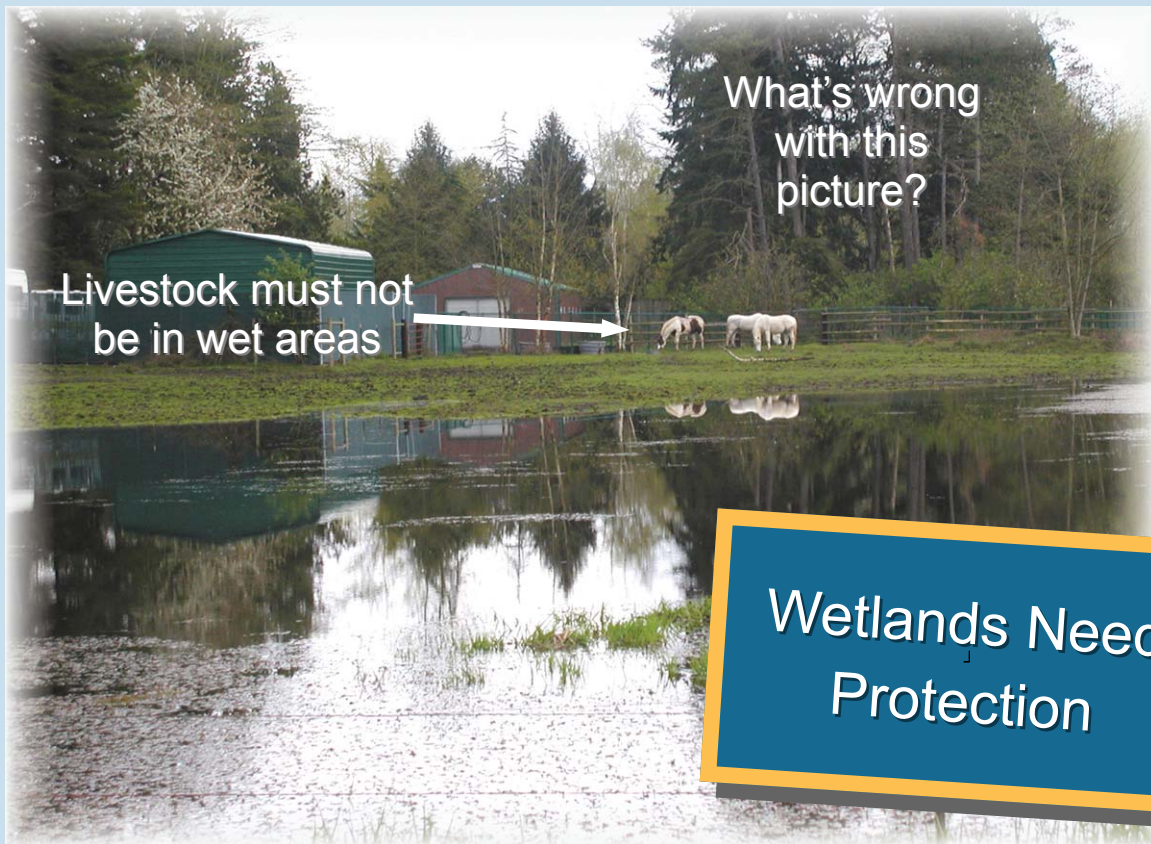
- ◆ Carefully manage grazing of wetlands during the wet season. Well managed grazing can benefit wetlands, their component plant species, and wildlife; however livestock should not be at high densities, or otherwise excessively confined when wet conditions will lead to excessive mud and vegetation damage. Wetlands are highly productive ecosystems that can benefit both livestock and wildlife, but must be protected to maintain their optimal functions.
- ◆ Find out how to best manage wetlands to retain their existing functions and values. Consider applying a permanent approach to maintaining them in perpetuity such as a conservation easement.
- ◆ 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.

# Wetland Management

# Does Your Property have a Wetland?

If your property shows the likelihood of wetland presence, you should investigate further before doing anything that could potentially negatively affect the wetland's functions; including letting your livestock have access to wetland areas.

One option is to hire a professional to delineate the wetland boundaries and to educate you about the type of wetland you are dealing with. Wetlands are protected from land management activities that would destroy them, or would change or reduce their function.



Your Wetland



## 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 beauty**, enjoyment, and opportunities for observing and learning.
- **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.

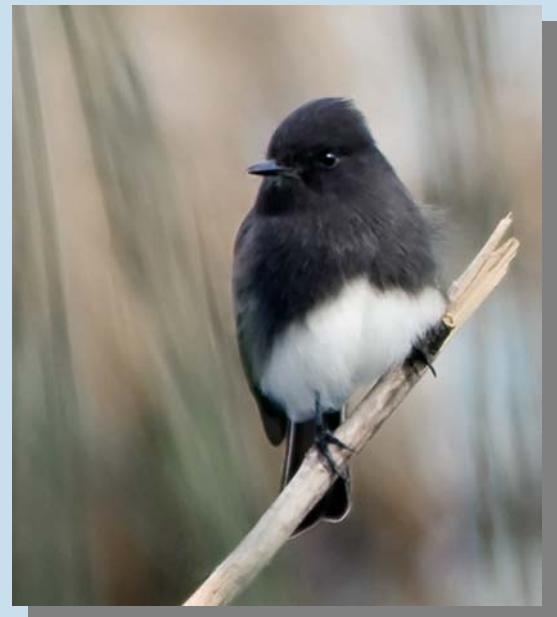
### Habitat = Food + Water + Cover

Wildlife habitat is being lost as more land is subdivided, bringing houses, people, livestock, dogs, cats, and other intrusions. Landowners can help offset this loss of wildlife habitat by growing a diversity of vegetation that provides food and cover for wildlife.

**FOOD** requirements will naturally vary by wildlife species, from seeds and berries required by birds, to the grasses, forbs, and shrubs preferred by deer.

**WATER** on or near your property in the form of a pond, stream, or developed stock-water will increase the variety of wildlife you can attract.

**COVER** is needed for hiding from predators, travel corridors, nesting, and shelter.



# Is your Property Attractive to Wildlife?

## Quiz! Go Ahead!

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



Photo by Len Blumin

The more “yes” responses you had, the more likely you will enjoy the company of birds, small mammals, and possibly deer.

## 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.



# How to attract ...

## 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 stock-tanks can provide water. Place a stationary ramp in stocktanks to prevent birds from drowning while watering. For information on constructing effective wildlife escape structures contact the Tehama County Resource Conservation District.

**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.** Toads, frogs, lizards, turtles, and snakes eat plants, insects, and small animals. 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.

## 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 40-50 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 .... if you want to attract deer.

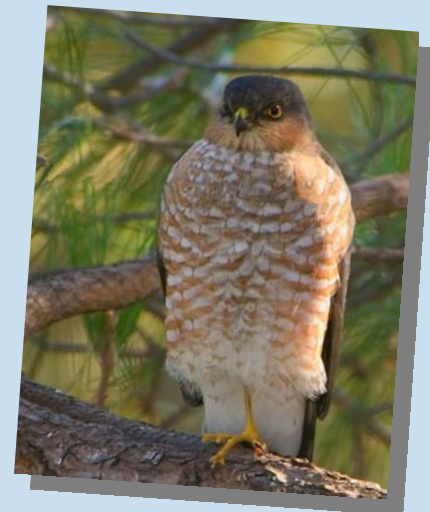
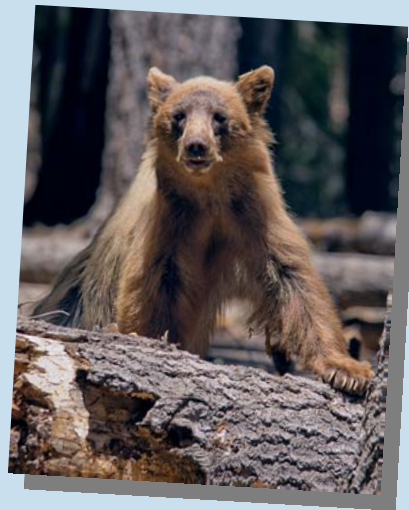
**Provide food.** Deer are primarily browsers. Browse consists of a variety of trees and brush. Creating openings in the brush will increase grass and shrub growth for deer. In winter, deer look for warmer areas free of snow where grasses are exposed – that may be in **your** pasture or yard! After feeding, deer look for thickets of brush or stands of trees to rest and stay warm.

**Provide cover.** When deer feed in the open, they like being no more than 100 yards from trees and brush for hiding. Consider maintaining areas of brush 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 need a fence, build a low one with a smooth top and bottom wire with the bottom wire at least 15” from the ground. This is easier for them to cross.



## For Help

- For more information contact the California Department of Fish and Game.
- Order native trees and shrubs for wildlife habitat from the Sacramento River Discovery Center or your local nursery.
- Develop plans, ponds, and streamside areas for wildlife habitat through the Tehama County Resource Conservation District, local watershed groups, USDA Natural Resources Conservation Service, and the US Fish and Wildlife Service.



The best resource is YOU, your friends, neighbors and children!



A high school class plants acorns for an oak restoration project.

## Riparian Enhancement

Contact Tehama County Resource Conservation District (TCRCD) (530) 527-3013, ext. 3, or visit their website at [www.tehamacountyrcd.org](http://www.tehamacountyrcd.org). Also, look in your local phone directory for environmental consultants and/or contractors.

## Weed Control

Contact Tehama County Department of Agriculture (530)-527-4504, [www.co.tehama.ca.us](http://www.co.tehama.ca.us) and click on Dept. of Agriculture.

The California Invasive Plant & Pest Council (510) 843-3902

Tehama County Cooperative Extension Office (530)-527-3101, <http://cetehama.ucdavis.edu/>

## Air Quality

Tehama County Air Pollution Control District is the regional agency responsible for enforcing air quality laws in Tehama County. Contact them for information on burn permits and burn bans. Phone (530) 527-3717, [www.tehcoapcd.net](http://www.tehcoapcd.net)

## Water Quality

Regional Water Quality Control Board, 415 Knollcrest Drive, Suite 100, Redding, CA 96002, (530) 224-4845.

CA Department of Water Resources, Northern District, 2440 Main Street, Red Bluff, CA 96080, (530) 529-7300.

Tehama County Mosquito & Vector Control District, (530) 527-1676.

## Water Quantity

Tehama County Flood Control & Water Conservation District (530) 385-1462, [www.co.tehama.ca.us](http://www.co.tehama.ca.us) click on Dept. Flood Control/Water Conservation  
Early flood warning, flood control and drainage, hazard reduction, comprehensive planning, preparedness and response, repair and maintenance, National Flood Insurance Program

The Tehama County Resource Conservation District (TCRCD) (530)-527-3013, ext. 3 provides a free evaluation of your irrigation system and a confidential report on system efficiency and distribution uniformity. Visit the website: [www.tehamacountyrcd.org](http://www.tehamacountyrcd.org)

## Soils

The USDA Natural Resources Conservation Service (NRCS) (530)-527-2667 can provide natural resource information related to soils, crops, and water.

## Native Trees and Shrubs

The Sacramento River Discovery Center offers native plants for sale. The proceeds go toward their Intern Garden Program helping local high school students. Students from Red Bluff High School come to the center every school day for the afternoon to participate in programs and work on projects related to Natural Resources. For more information call (530) 527-1196, visit their website <http://www.srdc.tehama.k12.ca.us>, or stop by 1000 Sale Lane, Red Bluff, CA 96080.

The Red Bluff Garden Center, located at 766 Antelope Blvd., Red Bluff, usually has a selection of native plants for sale as well as garden supplies. For more information, call (530) 527-0886.

The CA Native Plant Society, Shasta Chapter: call 530-221-0906

## Forestry

Information related to the management of private timber lands can be obtained from the University of California Cooperative Extension Forestry program at 530-224-4902 or by visiting the UCCE Forestry Program office at 1851 Hartnell Avenue Redding, CA 96002.

Matters relating to commercial timber harvest regulations or requirements of the California Forest Practices Act should be directed to the Cal Fire Tehama-Glenn Unit Forester at 530-528-5199 or by visiting the Cal Fire Unit Headquarters office located at 604 Antelope Blvd. Red Bluff, CA 96080.

## Wildlife

### Wildlife and Fish

Contact the U.S. Fish & Wildlife Service - Red Bluff Fish & Wildlife Office, (530) 527-3043, 10950 Tyler Rd., Red Bluff, CA 96080.

Department of Fish and Game, call 530-225-2300.

### Wildlife Habitat Enhancement

The following Natural Resources Conservation Service's (NRCS) websites contain useful information for homeowners and farmers.

<http://www.ca.nrcs.usda.gov/homeowners.html>

<http://www.ca.nrcs.usda.gov/farmers.html>

### Wildlife Rescue

Tehama Wild Care rescues injured wildlife and gives them a second chance at life. To report injured wildlife, call (530) 347-1687. For information visit their website at [http://www.shastarootsnshoots.com/Tehama\\_Wild\\_Care.htm](http://www.shastarootsnshoots.com/Tehama_Wild_Care.htm)



Monitoring stream flow

## Wildfire Protection

For information related to the Tehama County Community Wildfire Protection Plan stop by the office of the Tehama County Resource Conservation District at 2 Sutter Street Suite D Red Bluff, CA 96080 or contact the Tehama County Fire/Cal Fire (see contact information below).

Questions related to Fire Safety Building Standards should be directed to the Tehama County Fire Marshall at 530-528-5199. The address is 604 Antelope Blvd, Red Bluff, CA 96080. Also see the website <http://www.co.tehama.ca.us>, click on Departments, then Fire – Tehama County.

## COMPOSTING

Tehama County / Red Bluff Landfill can provide information on composting. Group presentations on composting are available. For information call (530) 528-1103 or visit the web site [www.tehamacountylandfill.com](http://www.tehamacountylandfill.com),

Master Gardeners can answer local gardeners' questions relating to plants, pests, gardening and more. Shasta College has a Master Gardeners program. For information call (530) 242-2219 or visit their website <http://www3.shastacollege.edu/scmg/>

## FARM PLANNING and CONSTRUCTION

### Best Management Practices

The Tehama County Resource Conservation District assists citizens with managing, conserving, and improving the natural resources of Tehama County. For technical assistance or information on land management practices, call (530) 527-3013 x 3. The address is 2 Sutter St., Suite D, Red Bluff, CA 96080, or visit the website <http://www.tehamacountyrcd.org>

The Natural Resource Conservation Service (NRCS) helps private land owners and managers conserve their soil, water, and other natural resources. For help creating a conservation plan for your land, or for more information, contact your local NRCS office at (530) 527-3013 x 3, located at Sutter St., Suite D, Red Bluff, CA 96080, or visit the website at <http://www.nrcs.usda.gov/>

### Building Construction

Permits to construct permanent buildings, including barns and storage buildings, or additions to existing facilities are required by counties and cities, except under certain circumstances. County residents should contact Tehama County Planning Department, (530)-527-2200, or visit [www.co.tehama.ca.us](http://www.co.tehama.ca.us) and click on Planning Dept. or Building Dept.

### Septic Systems

Tehama County Environmental Health Department (530)-527-8020, [www.co.tehama.ca.us](http://www.co.tehama.ca.us) click on Dept. Environmental Health

# ENVIRONMENTAL RULES, PERMITS and LAWS

## What to know, who to call

### State Water Quality

California Regional Water Quality Control Board, (530) 224-4845

Website: <http://www.waterboards.ca.gov/centralvalley/>

California Department of Fish and Game (530) 225-2367 or visit the website [www.dfg.ca.gov/](http://www.dfg.ca.gov/)

### Water Rights

You must have a water use permit before diverting, impounding, or withdrawing any surface water. Contact State Water Resources Control Board (916) 341-5300, [www.swrcb.ca.gov](http://www.swrcb.ca.gov) for more information.

### Streambed and Banks

Any and all development and restoration activities, undertaken in, on, or near any waterbody, may require one or more permits. For more information contact California Department of Fish and Game (530) 225-2367 or visit the website [www.dfg.ca.gov/](http://www.dfg.ca.gov/)

### Well Head and Drinking Water Protection

Tehama County Environmental Health Department at (530) 527-8020 has information on how to test your drinking water quality. Further information about drinking water is available via the website [www.co.tehama.ca.us](http://www.co.tehama.ca.us) click on Dept. Environmental Health

### Tehama County Ordinances

Contact Tehama County Planning Department (530)-527-2200, or visit [www.co.tehama.ca.us](http://www.co.tehama.ca.us) click on Planning Dept. and Tehama County Building Dept.

### Animal Carcass Disposal

Tehama County / Red Bluff Landfill takes animal carcasses for disposal. For information call (530) 528-1103 or visit the web site [www.tehamacountylandfill.com](http://www.tehamacountylandfill.com)

We are each responsible for preventing livestock manure, pesticides, sediment, fertilizers and other pollutants from reaching groundwater, wetlands, and surface water.

## Tehama County RCD

2 Sutter Street, Suite D  
Red Bluff, CA 96080  
(530) 527-3013, Ext. 3  
Fax: (530) 527-7451  
www.tehamacountyrcd.org

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Cathie Benjamin	GIS Analyst	(530) 527-3013, Ext.113
David Button	Intern	

# Tehama County is a Great Place to Live, and You Can Help Keep It That Way!

## • *Manage Manure* • *Fence livestock* • *Establish buffers*

Adapted from *Tips on Land & Water Management For Small Farms & Ranches in Montana* by Montana Department of Natural Resources and Conservation, and *Tips on Land & Water Management For Small Farm & Livestock Owners in Western Washington* by King Conservation District. This publication is funded by the CalFed Bay-Delta Watershed Program, administered by the State Water Resources Control Board.

Tehama County RCD  
2 Sutter Street, Suite D, Red Bluff, CA 96080  
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**Good Management**  
and stewardship of the land helps  
protect and maintain healthy  
livestock, healthy land, and healthy  
streams and rivers.



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Healthy Livestock, Healthy Land, Healthy Streams