

*A Collaborative Approach to  
Comprehensive Ranch  
Planning and Improvement  
through the Fish Friendly  
Ranching Program*

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**The Fish Friendly Farming Environmental Certification Program began in Mendocino and Sonoma Counties in 1997.**

**Collaboration between farmers, regulatory agencies and scientists.**

**FFF program is now in 8 counties and is under development in 5 other counties. Total enrollment has reached 130,000 acres on over 1000 farms.**

**In 2009 we started creating a similar program for rangeland in Napa, Sonoma, Mendocino, Solano and El Dorado counties.**

**Fish Friendly Ranching was developed with a committee of ranchers, regulators who serve as the certifiers and scientists including Dr Larry Ford who served as a consultant to CLSI**

Like the Fish Friendly Farming program, FFR is intended to provide compliance with Clean Water Act Total Maximum Daily Loads (TMDLs) particularly listings for fine sediment, temperature and pathogens.

TMDLs –

- Russian River - fine sediment and temperature; and in some locations, pathogens (also termed indicator bacteria) and nutrients
- Navarro River - fine sediment and temperature
- Gualala River - fine sediment and temperature
- Garcia River - fine sediment
- Eel River - fine sediment and temperature
- Napa River - fine sediment, pathogens and nutrients
- Sonoma Creek - fine sediment, pathogens and nutrients
- Tomales Bay - fine sediment and pathogens

and improvements to stream habitats to support endangered salmonids

## **Goals set by committee**

Maintain good water quality and aquatic and riparian habitat conditions

Create a program to comply with environmental rules but which also sustains economic use of the land

Create one program that addresses many regulations to reduce paper work and time expended

Keep compliance costs down by seeking cost share and grant funding to cover technical and project costs

Create a program which will provide a long term defensible plan for owner and which sustains water quality

Maintain privacy of detailed ranch information

**By working together to create the Fish Friendly Ranching Program the concerns of ranchers, regulators and scientists are all incorporated and compromises were made to recognize each other's concerns**

## **STEPS IN RANCH PLAN PROCESS**

- **Rancher signs up or enrolls property, CLSI creates maps for site**
- **Rancher attends series of 3 BMP workshops**
- **Site Visit with CLSI scientist – sediment source inventory and creek assessment, rancher describes operation**
- **CLSI completes maps and ranch plan template and rancher reviews**
- **CLSI revises plan and sets up certification**
- **Certification by objective third party – National Marine Fisheries Service and Regional Water Quality Control Board in coastal counties; Natural Resource Conservation Service and County Ag Commissioner in Sierra foothill program**
- **Rancher implements ranch plan; CLSI works with rancher to design, permit and find grant funding for projects**



# **RANCH CONSERVATION PLAN**

**Element I - General Site Features**

**Element II - Managing Grazing Areas and Livestock**

**Element III - Roads**

**Element IV - Creek/River Corridors**

**Element V - Photo-monitoring**

## ELEMENT 2 - MANAGING GRAZING AREAS AND LIVESTOCK



# Ranch Plan documents:

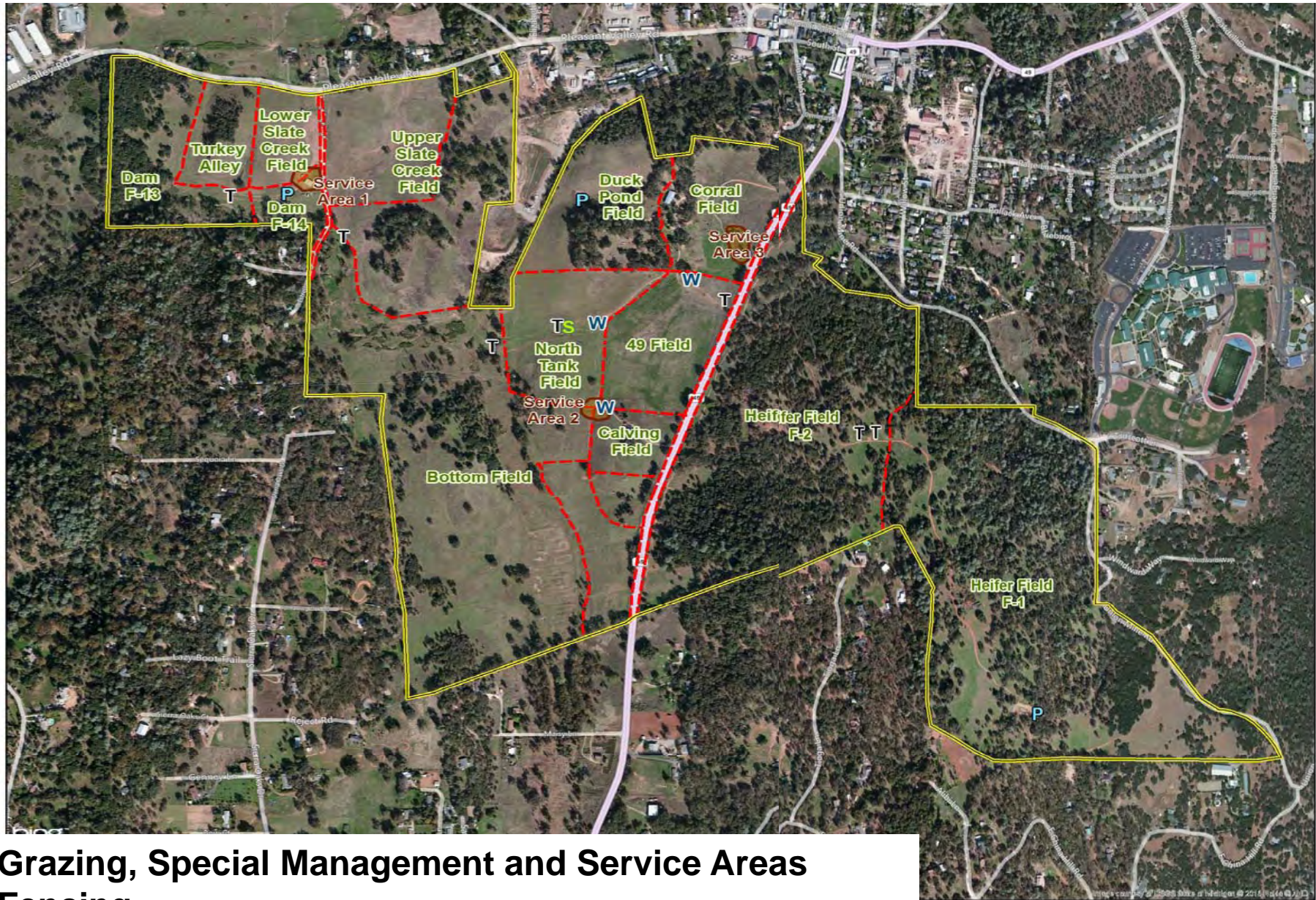
**Grazing Area Use**

**Operation Type**

**Timing of grazing**







- Grazing, Special Management and Service Areas
- Fencing
- Grazing related buildings and shelters
- Water sources, mineral/supplement sites
- Feeding areas

Features	
T	Trough
S	Spring
W	Well
P	Pond
- - -	Fence
○	Service Area
□	Property



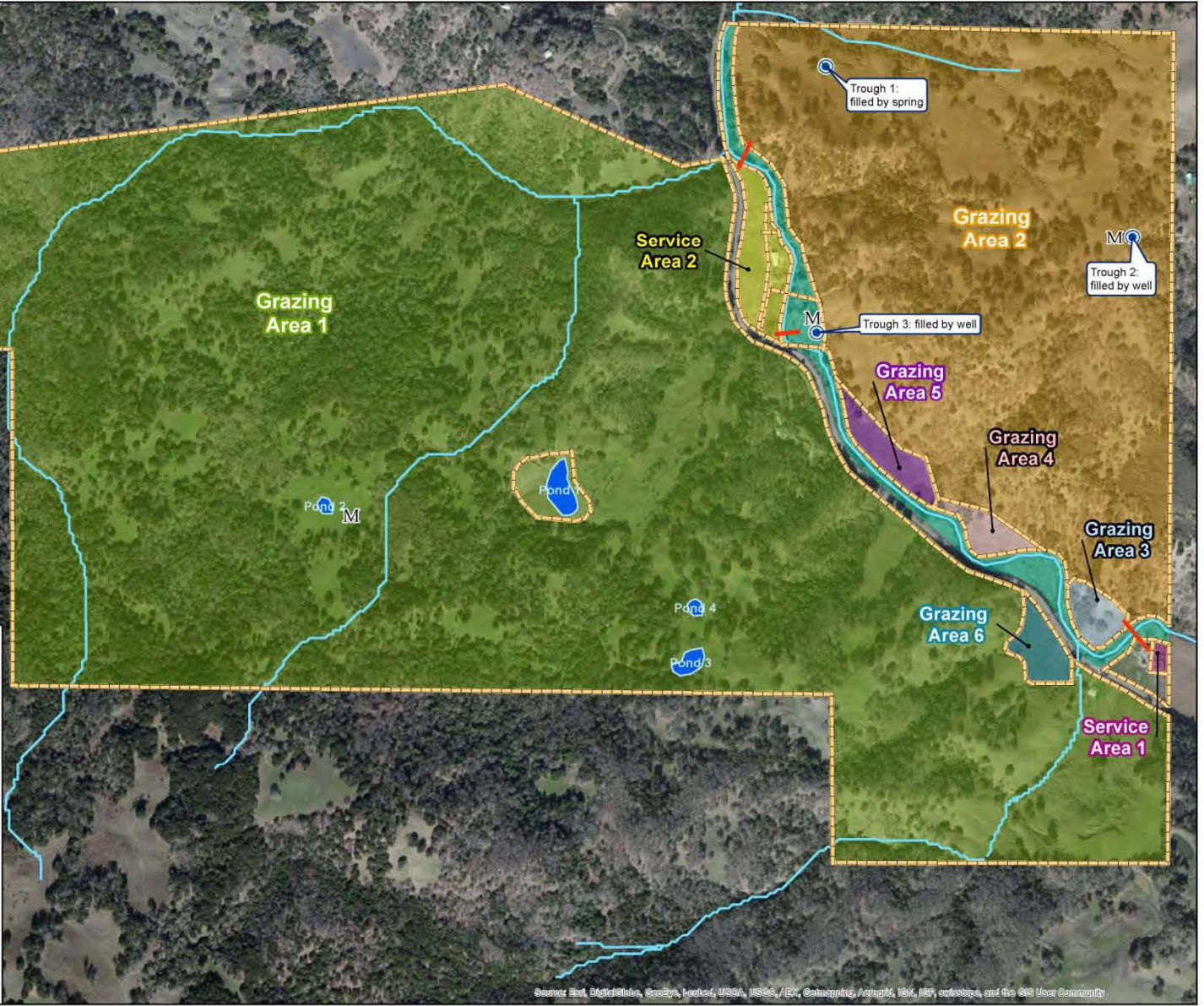


**RANCH CONSERVATION PLAN**

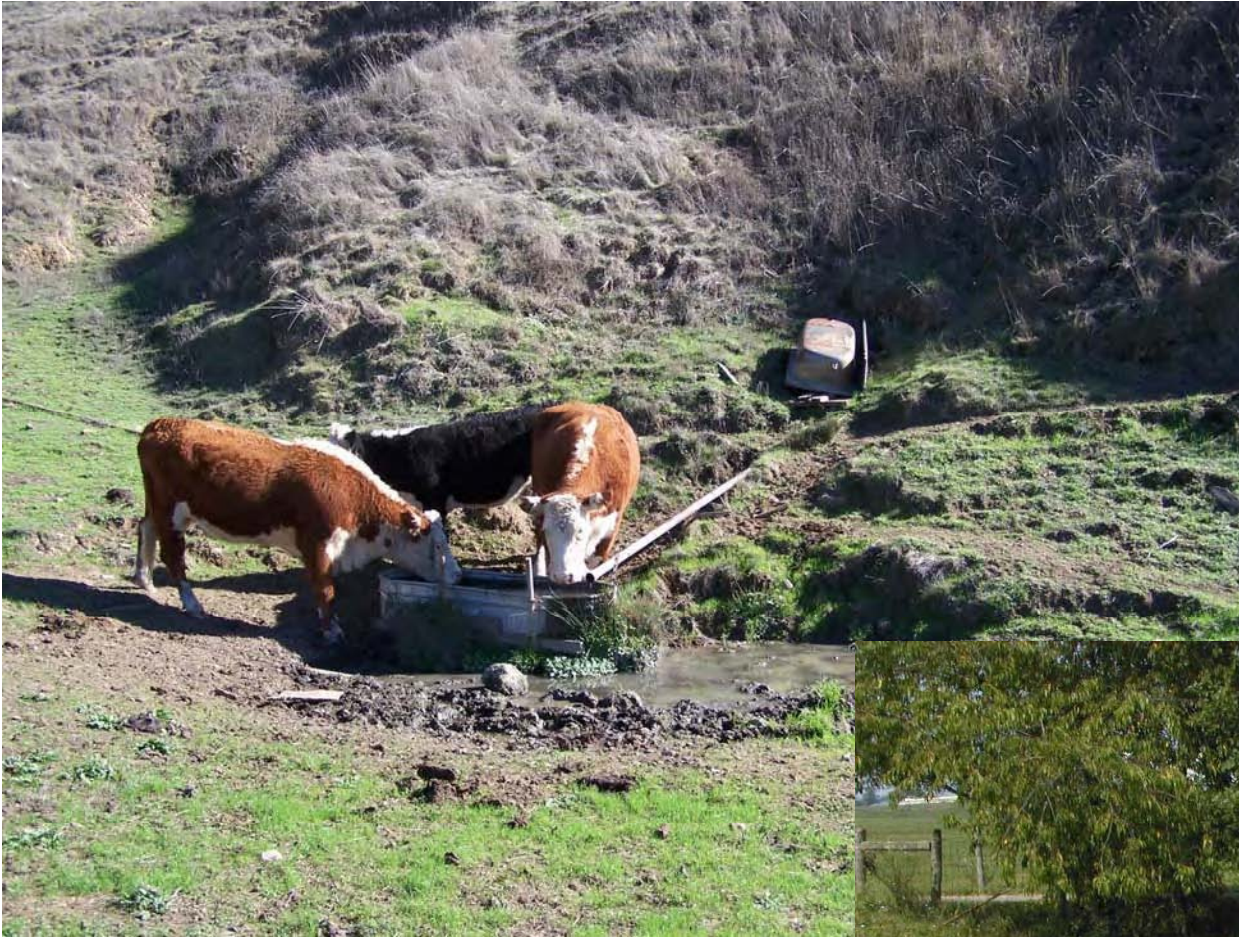


**Ranch Areas and Features**

-  Trough
-  Mineral Lick
-  Cattle Crossing
-  Fencing
-  Ponds
-  Seasonal Streams
-  Service Area 1
-  Service Area 2
-  Wooden Valley Creek Corridor
-  Grazing Area 1
-  Grazing Area 2
-  Grazing Area 3
-  Grazing Area 4
-  Grazing Area 5
-  Grazing Area 6



Source: Soil, Digital Elevation, GeoEye, Landsat, USDA, USGS, /ESRI, Caltopographic, Arcsworld, ISX, IRI, webbase, and the GIS User Community



**Water sources**



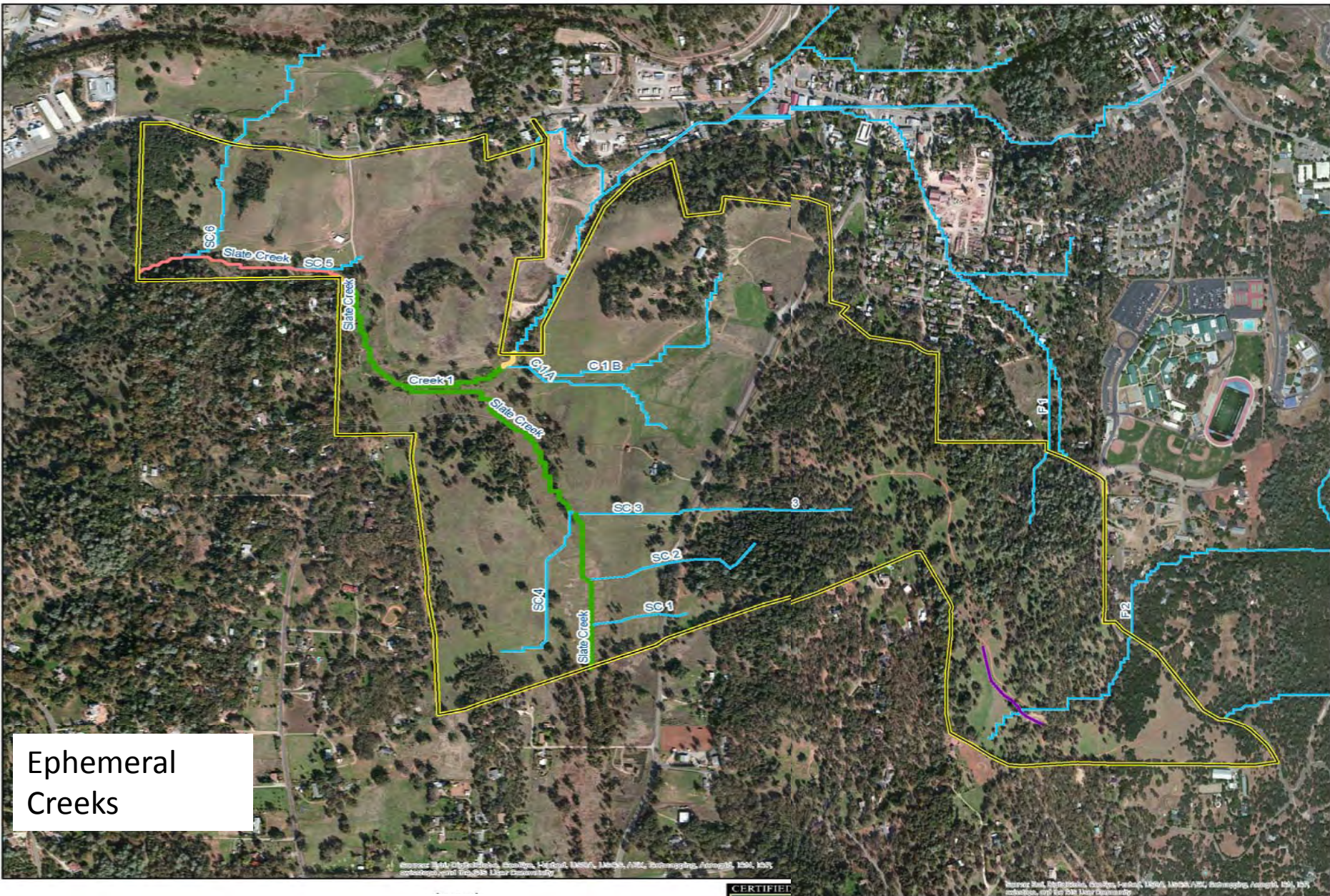
**Service area without an adequate buffer to filter fine sediment from runoff**



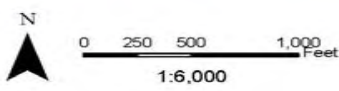
**Service area with an adequate buffer to filter fine sediment from runoff**



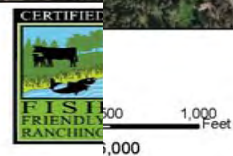
**Special management field with wetlands that require limited seasonal grazing (Sonoma County)**



Ephemeral  
Creeks



- ▬ Property Boundary
- ▬ Ephemeral Stream
- ▬ Confined Stream
- ▬ Partially Confined Stream
- ▬ Unconfined Stream



- ▬ Property Boundary
- ▬ Ditch
- ▬ Ephemeral Stream
- ▬ Confined Stream
- ▬ Partially Confined Stream
- ▬ Unconfined Stream









**Stable  
unconfined  
ephemeral creek  
with grass cover**

**Eroding unconfined  
ephemeral creek  
delivering fine sediment  
into water**



## Steep confined ephemeral creeks



## Erosion sites - Debris flow in terracettes



**CHECKLIST OF STANDARDS FOR CONTROLLING FINE SEDIMENT POLLUTION FROM GRAZING OPERATIONS**

<b>ALREADY BEING APPLIED</b>	<b>NEEDS TO BE APPLIED</b>	<b>BMP</b>
		<b>Grazing area maps and inventory are complete and grazing areas are described.</b>
		<b>Special management areas are defined where needed and are managed to protect the area.</b>
		<b>Water sources, attractants, herding, fencing, timing and duration of grazing or other measures are used to distribute livestock over grazing areas.</b>
		<b>Residual dry matter is assessed in early fall and grazing practices are altered based on RDM levels and climatic conditions.</b>
		<b>Service areas are located away from waterways or surrounded by vegetated filter strips.</b>
		<b>Ephemeral creeks that are accessible to livestock are stable and vegetated.</b>
		<b>Active erosion sites are evaluated and needed BMPs are applied.</b>
		<b>Supplemental activity sites are evaluated for erosion potential and BMPs are applied.</b>

**For ranches near to water supplies calves under 4 months old must be restricted from the creek**



## CHECKLIST: ELEMENT 2: MANAGING GRAZING AREAS TO REDUCE PATHOGENS

ALREADY BEING APPLIED	NEEDS TO BE APPLIED	BMP
		If ranch is upstream of a surface water drinking supply, fence calves less than 4 months old out of all creek/river corridors.
		Relocate livestock attractants away from creeks into uplands or areas where surface runoff will not flow into a creek/river.
		Manage livestock to limit use of waterways to a few crossings and develop water sources in upland areas where surface runoff will not flow into a creek/river.
		Relocate service areas (corrals, feeding areas) to areas outside of the creek corridor where surface runoff will not flow into a creek/river

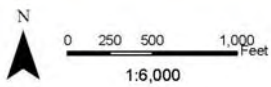
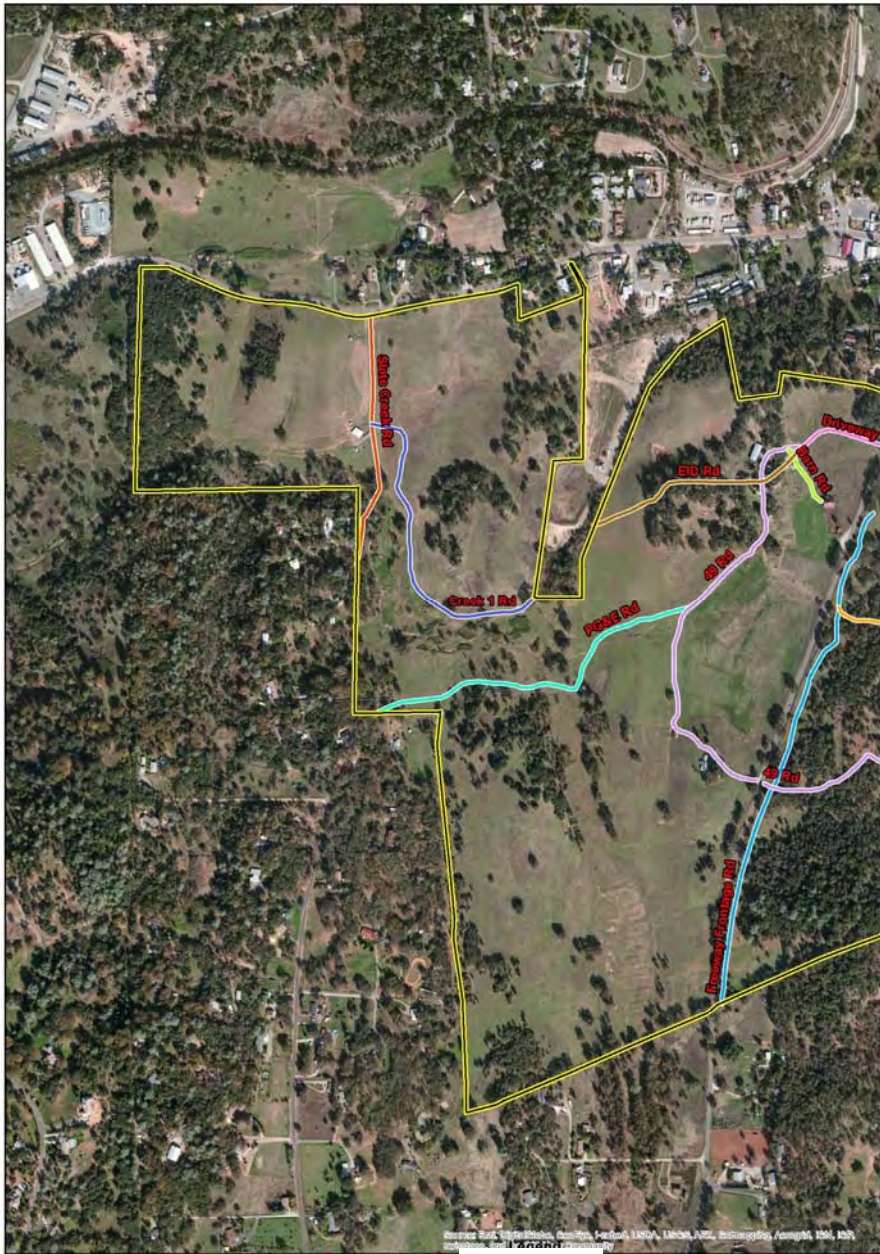
**16. SUMMARY OF ACTIONS: ELEMENT 2, MANAGING GRAZING AREAS TO REDUCE FINE SEDIMENT**

<b>ACTION/BMP</b>	<b>TIMELINE</b>

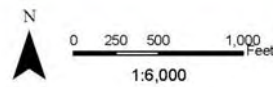
**ELEMENT 3 - ROADS.** Roads are the main source of fine sediment pollution to creeks. FFR staff complete a road assessment and prioritize actions for sites with a high likelihood of delivery of sediment into a creek





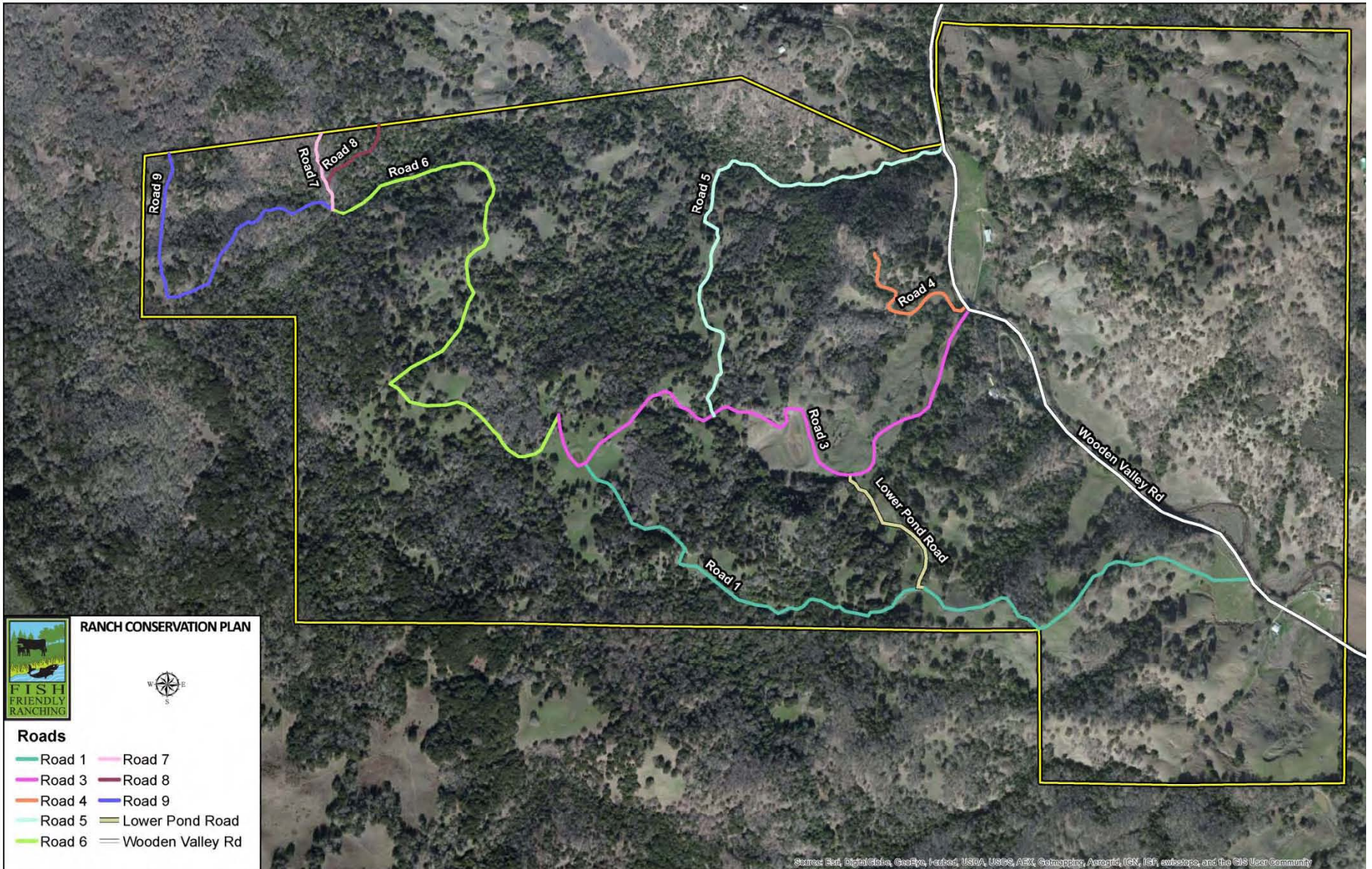


- ▬ Property Boundary
- ▬ Creek 1 Rd
- ▬ 49 Rd
- ▬ Barn Rd
- ▬ Driveway
- ▬ EID Rd
- ▬ Heifer Field Rd
- ▬ Highway Frontage Rd
- ▬ PG&E Rd
- ▬ Slate Creek Rd



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- ▬ Slate Creek Rd





## CHECKLIST: ELEMENT 3 ROADS

ALREADY BEING APPLIED	NEEDS TO BE APPLIED	BMP
		Completion of road survey and identification of road problems.
<b>Road repair and improvement program including:</b>		
		<ul style="list-style-type: none"> <li>• Changes in road drainage and surface design (for example, inslope to outslope).</li> </ul>
		<ul style="list-style-type: none"> <li>• Replacement and repair of ditches, ditch relief culverts, energy dissipaters.</li> </ul>
		<ul style="list-style-type: none"> <li>• Increase in frequency of water bars, rolling dips, or ditch relief culverts.</li> </ul>
		<ul style="list-style-type: none"> <li>• Closure or relocation of roads with continual erosion problems, those built on unstable ground, or too close to creeks.</li> </ul>
		<ul style="list-style-type: none"> <li>• Repair/replacement of stream crossings with a minimum of seasonal crossings and use of bridges for year-round creeks.</li> </ul>
<b>Road maintenance and inspection program including:</b>		
		<ul style="list-style-type: none"> <li>• All culverts, energy dissipaters, road surfaces, stream crossings, and ditches.</li> </ul>
		<ul style="list-style-type: none"> <li>• Winterization of all seasonal roads.</li> </ul>
		<ul style="list-style-type: none"> <li>• Winter inspection of stream crossings and removal of wood and debris to avoid failures.</li> </ul>
		<ul style="list-style-type: none"> <li>• Periodic maintenance of road system with regular inspection program.</li> </ul>
		<ul style="list-style-type: none"> <li>• New road design/construction program, reconstruction program, or road restoration program (if applicable)</li> </ul>



## **ELEMENT 4: CREEKS AND RIVERS**

## Potential Effects of Livestock on Stream Corridors

Reduction of vegetative cover and biodiversity in riparian area

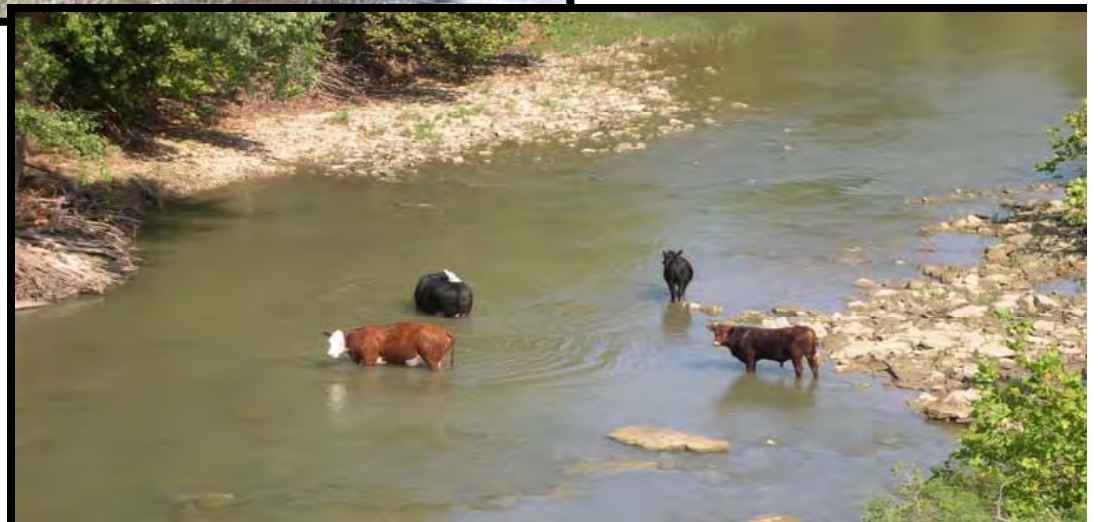
Loss of shade canopy adequate to maintain low temperatures for salmonid habitat

Erosion of stream banks

Pathogens in creek

Nutrient loading

Effects are limited to locations where livestock spend time in creeks/river or use the creek during certain seasons









**Fencing out livestock from all creeks is very expensive and difficult in the hilly rangelands of California**

**Scientific study of the effects of livestock on creeks shows that unlimited access in all seasons will degrade the riparian corridor and result in a loss of stream shade.**

**However there is little research defining the level of grazing allowable in riparian areas that will sustain adequate shade canopy for salmonid habitat or defining management practices to apply to protect water quality**

**Some research suggests livestock can be managed in unconfined creek areas to reduce effects on the riparian corridor without having to fence every creek.**

## Research Findings

- Other than by direct deposit of feces into the streams by livestock and other animals, pathogens are transported into the streams when heavy rains result in overland flow carrying fecal material
- Larsen's (1996) review of the scientific literature found that rangeland improvement practices that attract livestock away from riparian zones and associated streams were effective in reducing exposure of the livestock to the waters, and thus in protecting water quality.
- Tate (2010) described an experimental application of an optimal grazing management plan focused on improving and maintaining water quality at a coastal ranch in Southern California. The grazing system would rotate cattle to: the upland fields for the winter where the least risk of soil compaction, run-off to carry pollutants to streams, and direct exposure to waters occur; then to the swale-riparian fields with off-stream water development for the spring and early summer where there is the least impact to sensitive riparian woodland and wetlands; then to the floodplain fields away from creeks for the summer.

George's (1996) review of the scientific literature found that construction and maintenance of fencing can be prohibitively expensive. Fencing can also be impractical or ineffective:

- on steep and unstable hillsides;
- on the banks of unstable stream channels
- on forested rangelands where falling trees and limbs frequently damage fences.
- Exclusion can be counter-productive—by promoting the growth and spread of pest plants, increasing fire fuels, and reducing forage availability.
- Rangeland livestock operations are typically based on small profit margins



A recent study by T.A. Ward Becchetti (2002) looks at sites in California using several “rapid visual assessment” methods to document aquatic habitat health, geomorphic conditions and a survey of rancher’s management practices.

The Ward study primarily used the EPA (1999) method of visual assessment of stream conditions used with benthic macroinvertebrate (BMI) sampling, the Rosgen stream classification system (Rosgen 1994), and a ranchers’ survey to document management practices. These factors were evaluated to determine the management measures associated with good & poor instream habitat conditions.

This study found that high stock density and frequent grazing had the greatest negative effect on the assessment results for aquatic habitat conditions. Rest between grazing, herding to achieve better distribution, less use of the riparian area, and increased time by the rancher providing attractants outside the riparian area had the greatest effect to produce high quality aquatic habitat.

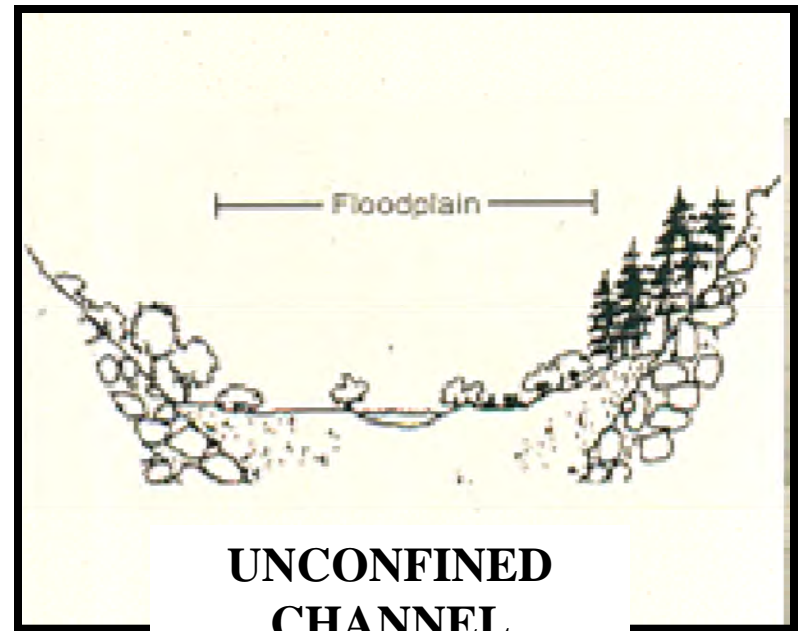
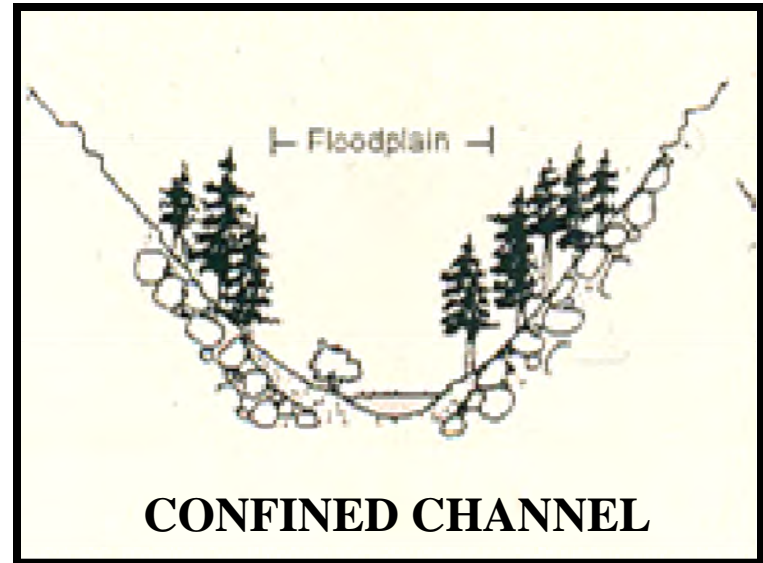
The FFR program uses geologic features to determine the level of confinement in the creek channel as the physical processes of sediment transport and channel erosion vary with the level of confinement.

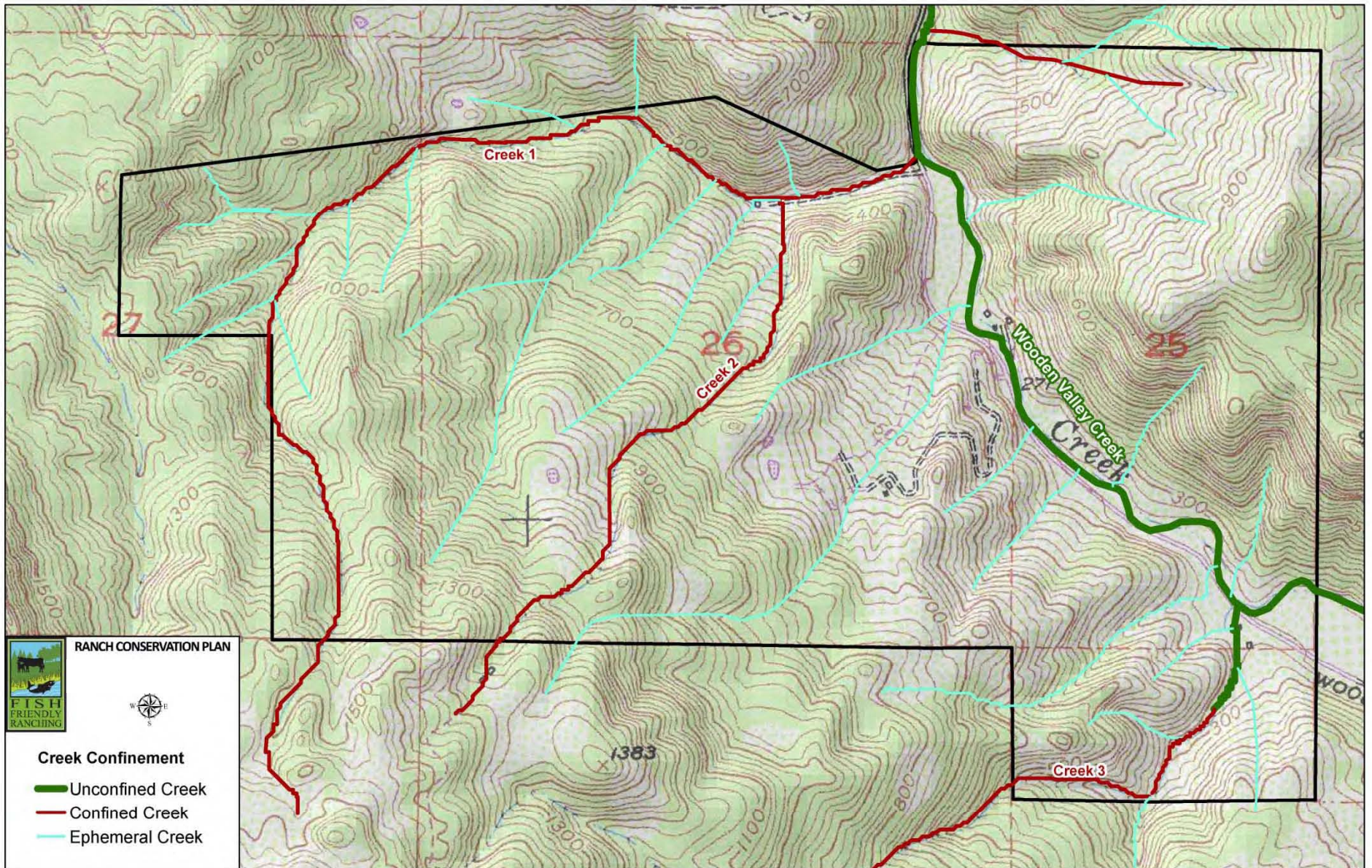
Additionally confined channels can be steep and inaccessible to livestock. A confined channel is in a canyon or has a bedrock channel. An unconfined channel flows through an alluvial valley or floodplain. Partially confined channels have both a floodplain and bedrock.

**CONFINED CHANNEL**



**UNCONFINED CHANNEL**

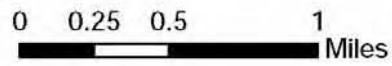




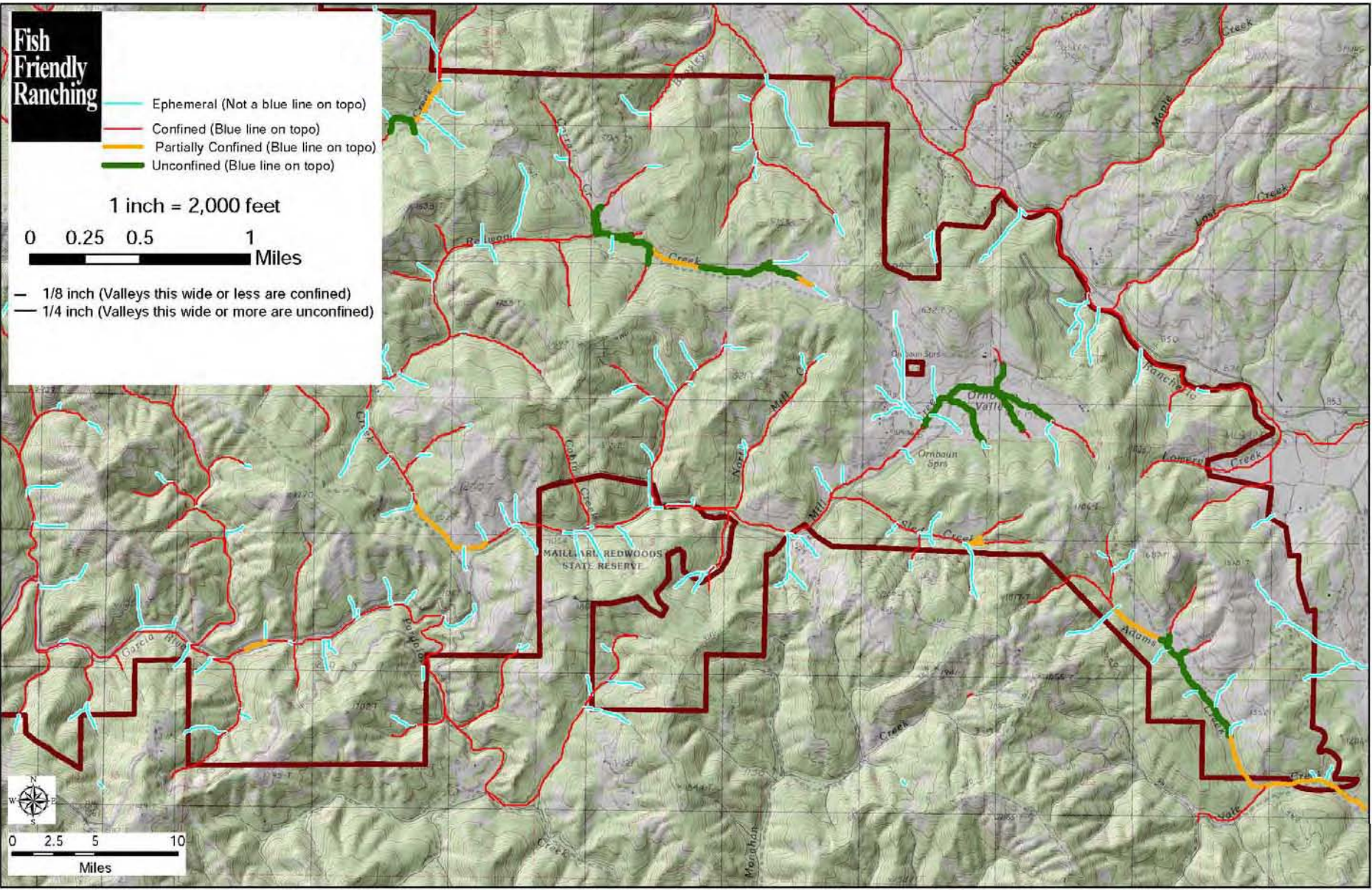
# Fish Friendly Ranching

- Ephemeral (Not a blue line on topo)
- Confined (Blue line on topo)
- Partially Confined (Blue line on topo)
- Unconfined (Blue line on topo)

1 inch = 2,000 feet



- 1/8 inch (Valleys this wide or less are confined)
- 1/4 inch (Valleys this wide or more are unconfined)





The goal of the FFR ranch plan is to orient and adjust grazing practices and facilities to protect water quality while sustaining the ranching operation

### Livestock Management Measures for unconfined creeks

- Revision of season of use of riparian area
- Revision of number of animals using area
- Locating service areas, watering troughs, and corrals away from stream channels and in low slope areas
- Reducing livestock creek crossings to the minimum number required
- Retention of vegetative cover, herbaceous and woody to serve as a filter strip between grazing areas and waterways to intercept sediment
- Use of distributed alternative water supplies
- Use of livestock attractants such as mineral supplements
- Changing kind and class of livestock
- Culling misbehaving livestock
- Herding
- Installation of barriers
- Fencing

**Grazing adjacent to creek is carried out in late Winter/Spring with alternative water supplies located away from the creek**



## Distributed Alternative Water Supplies





**Minerals/ Supplements located away  
from the creek**





**Herding and  
Culling misbehaving  
livestock**



## Defined livestock crossings





**Exclusionary  
fencing of  
unconfined  
alluvial stream**







**CHECKLIST: CREEK/RIVER CORRIDORS ELEMENT — UNCONFINED, ALLUVIAL AND PARTIALLY CONFINED ALLUVIAL CHANNELS**

<b>ALREADY BEING APPLIED</b>	<b>NEEDS TO BE APPLIED</b>	<b>BMP</b>
		Completed inventory of corridor condition and other factors with maps and required information included.
		Current management practices are reviewed.
		Assessment of necessary width for sustainable corridor is completed.
		Identification of Proposed Additional Livestock Management Practices
		Upslope or river channel processes affecting the stream corridor are identified and owner will work with the Fish Friendly Ranching program to address any problem.
		Identification of Channel Restoration and Revegetation Measures if applicable
		Completion of Implementation Timeline and Evaluation of Funding Sources with FFR Program.

## Summary

**Collaborative programs must take into account the needs of all participants**



**Program must balance economic uses of land with protection and improvement of habitat and water quality**

**Best management practices (BMPs) need to be based on the best available science that is applicable in California's Mediterranean climate**

**Collaboration requires developing working relationships between participants - ranchers talking with regulators during certifications; scientists working with regulators to determine best practices; scientists and regulators working with ranchers to accommodate their needs while protecting the environment**