Conducting a Water Quality Self-Assessment

for Napa River & Sonoma Creek Watersheds

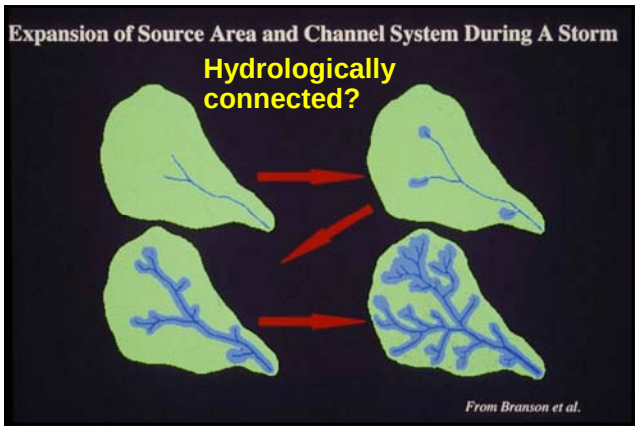
Michael Lennox
UCCE Ranch Planning & Conservation Monitoring Coordinator
March 15, 2012

RANCH WATER QUALITY PLANNING

SELF-ASSESSMENT

SELF ASSESSMENT

- Pasture/Ranch Assessment
  - Erosion and Sediment Sources
  - Nutrient and Pathogen Sources
- Stream Assessment
  - Riparian Areas, Gullies, Wetlands and Waterways



Template for Ranch Water Quality Plans

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Ranch/Farm Goals – Page 9
Pasture Inventory – Page 10
Pasture/Ranch Assessment – Page 11 *
Stream Assessment – Page 12 *
Completed Water Quality Projects – Page 13
Future Water Quality Projects – Page 14 *
Mapping Ranch/Farm – Page 15 *
Monitoring – Page 17 *
Annual Certification – Page 18 *

* = required page


RANCH WATER QUALITY PLAN, COMPLIANCE MONITORING & ANNUAL CERTIFICATION TEMPLATES

for

CONDITIONAL WAIVER OF WASTE DISCHARGE REQUIREMENTS FOR GRAZING OPERATIONS IN THE NAPA RIVER & SONOMA CREEK WATERSHEDS IN THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN FRANCISCO BAY REGION

January 2012

Pasture/Ranch Assessment (p 11)

- Sediment
- Nutrients & Pathogens

PASTURE/RANCH ASSESSMENT (required and kept on-site)

Date(s) Updated: _____

The following questions are intended to help assess ranch/farm water quality and potential sources of pollution in the watershed. It is important to note that identified pollution sources may not be caused by current livestock grazing activities. This assessment is intended to be used on each pasture/field utilized for agricultural production purposes on the ranch/farm. Multiple fields or the entire ranch may be assessed at once. Describe the condition and pasture/field location. Note any recorded problem conditions as caused by: Current livestock management (**C**); a Historic legacy site (**H**); or Natural causes (**N**).

Question	Potential Source	Location (*pasture/field*) & Describe Condition	Cause (*C, H, or N*)
SEDIMENT			
RANGELAND & PASTURE/CROP FIELDS			
Bare soil visible throughout the rainy season?	Yes No Not Sure		
Rill or sheet erosion present?	Yes No Not Sure		
Gullies, slumps, or headcuts present?	Yes No Not Sure		
ROADS			
Surface erosion present on road(s) (rills, gullies)?	Yes No Not Sure		
Culverts or ditches cause gullies or erosion?	Yes No Not Sure		
Sediment fills drainage ditches after winter?	Yes No Not Sure		
PATHOGENS AND NUTRIENTS			
LIVESTOCK DISTRIBUTION			
Storm runoff from corrals connects to stream?	Yes No Not Sure		
Corrals used throughout the winter?	Yes No Not Sure		
Feeding, salting, or watering areas near stream?	Yes No Not Sure		
Do livestock congregate in the stream?	Yes No Not Sure		
MANURE MANAGEMENT			
Manure stockpile runoff connects to stream?	Yes No Not Sure		
Manure applied to pasture less than 2 weeks before a runoff generating rain storm?	Yes No Not Sure		
Manure applied to pastures is stored (aged) less than one month?	Yes No Not Sure		

Stream Assessment (p 12)

- Channel
- Temperature
- Nutrients

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This assessment is intended for perennial or intermittent streams that provide habitat for fish or frogs or support riparian vegetation. If you do not have streams with riparian vegetation, assess the larger intermittent stream channels that flow during the entire rainy season. Assess ranch/farm streams while standing near the creek. It is important to note that concerns identified may not be caused by current livestock grazing activities. Describe the condition and location. Note any recorded problem conditions as caused by: Current livestock management (**C**); a Historic legacy site (**H**); or Natural causes (**N**).

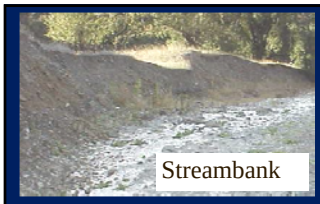
Question	Potential Concern	Location (*pasture/stream*) & Describe Condition	Cause (*C, H, or N*)
STREAM CHANNEL			
Bare soil along banks of stream?	Yes No Not Sure		
Unstable or eroding stream banks?	Yes No Not Sure		
Does the stream have the potential to support trees (look for remnant trees/shrubs along the channel)?	Yes No Not Sure		
Are crossings for livestock unstable?	Yes No Not Sure		
Grazing in riparian areas takes place all season?	Yes No Not Sure		
STREAM TEMPERATURE			
Is stream exposed to full sun?	Yes No Not Sure		
Wide and shallow streams?	Yes No Not Sure		
Does stream flow appear inadequate, given stream channel size?	Yes No Not Sure		
NUTRIENTS			
Algae growth excessive in stream?	Yes No Not Sure		

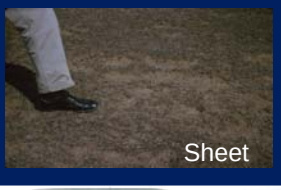
Remember: Look for potential problems & causes before prescribing fixes & conservation practices

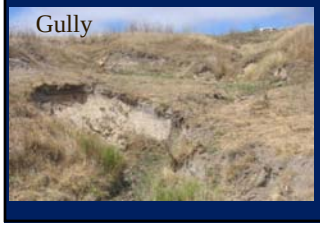
Erosion and Sediment Sources

- Rangeland & Pastures
- Roads
- Historic, Natural and Upstream Land Use

Erosion Types


Streambank


Sheet


Gully


Rill

Rangeland Sources

- Overgrazing
- Bare Soil
- Sheet and Rill Erosion
- Gullies and Headcuts

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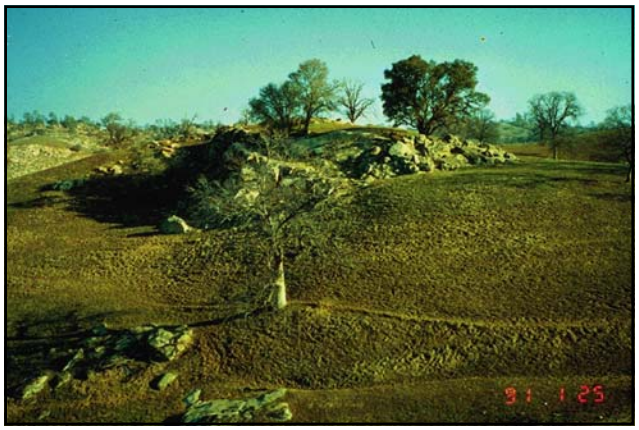

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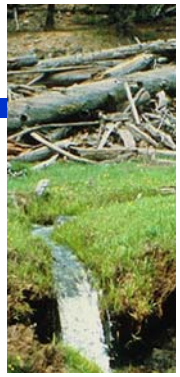
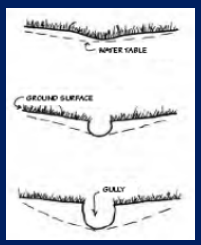
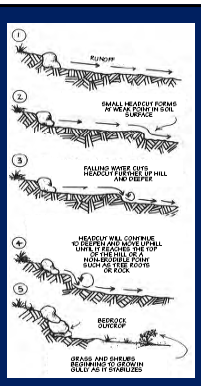


Gully Headcut Movement





Groundwork : A Handbook for Small-Scale Erosion Control in Coastal California (Marin RCD & PCI)

Roads

- Surface erosion from dirt roads
- Surface erosion from gravel roads
- Gullies or soil movement caused by unprotected culverts
- Eroding roadside drainage ditches
- Roads draining directly into streams
- Sediment from mudslides or landslides caused by roads

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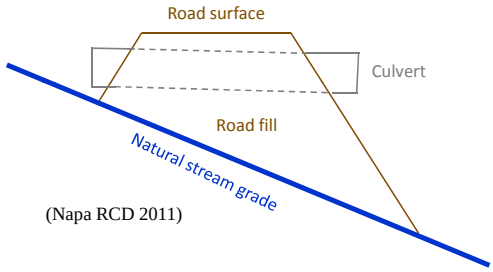
Stream crossings may be sources of sediment delivery



(Napa RCD 2011)

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Armored fill crossings may be sufficient on seasonal-use roads

Before

After

(Napa RCD 2011)

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- Surface erosion from gravel roads
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Decommissioned crossings reduce sediment from unused roads

(Napa RCD 2011)

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Historic, Natural and Upstream Land Use

- Sediment from land uses upstream from your property
- Sediment caused by past land uses on your property
- Sediment from mudslides or landslides caused by farm, ranch or forest practices
- Sediment from landslides caused by natural forces

Nutrient and Pathogen Sources

- Livestock distribution &
- Manure management

Livestock Distribution & Manure

- Concentration of livestock in or near creeks
- Corrals located near creeks
- Feeding areas, water troughs, salting areas or favorite shade trees
- Manure stockpiles located where runoff could flow into creeks

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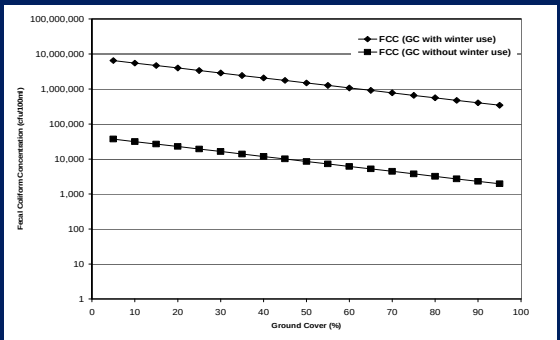
Ground Cover and Winter Use



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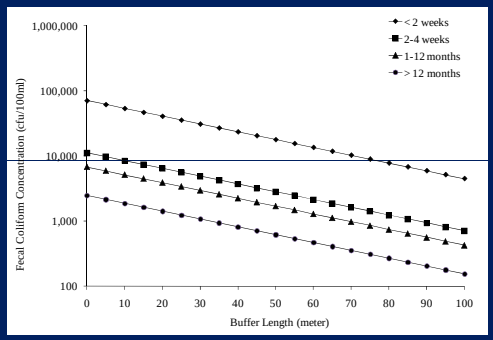
Pastures with Buffers & Fertilizer



(Lewis et al. 2010)

Pasture/Ranch Assessment (p 11)

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Riparian Areas and Streams

- Historic and upstream uses
- Streambank erosion
- Stream temperature
- Nutrient loading

Stream Assessment (p 12)

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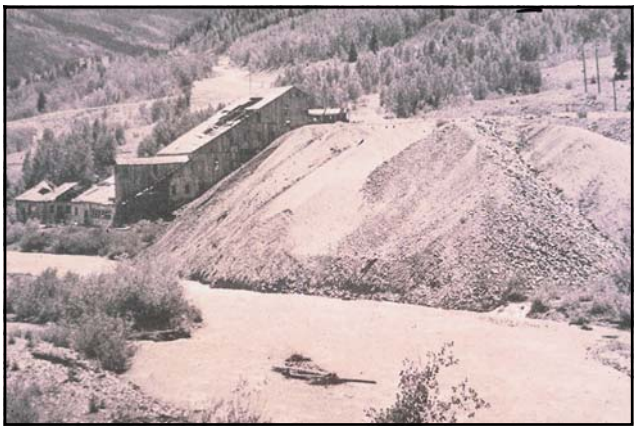

Riparian Areas and Streams

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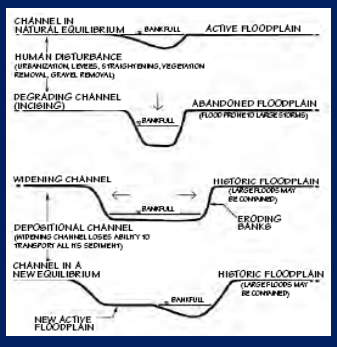
Streambank Erosion

- Bare soil along streambanks
- Unstable streambanks caused by inadequate woody vegetation
- Does the streambank have the potential to support trees
- Unstable streambanks caused by inadequate non-woody vegetation
- Mud or sediment filled stream bottoms
- Cattle trails along the creek
- Cattle grazing in riparian area all season



Stream Channel Change

- ❑ Stable
- ❑ Unstable
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- ❑ Stable?

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Unstable Streambanks:

Generally identified by the following morphological features :

- breakdown if clumps of bank are broken away and banks are unvegetated,
- slumping if banks have slipped down recently,
- tension cracks or fracture if a crack is visible on the bank, or
- vertical and eroding if the bank is mostly uncovered, in other words, less than 50 percent covered by perennial vegetation, roots, rocks of cobble size or larger, or logs of 0.1 meter in diameter or larger.

Streambanks with an angle >80 degrees are generally unstable

45-80 degrees may be at risk of instability

banks that are at an angle of less than 45 degrees (1:1) are stable

(Overton et al. 1997, Rosgen 2001, Gerstein and Harris 2005)

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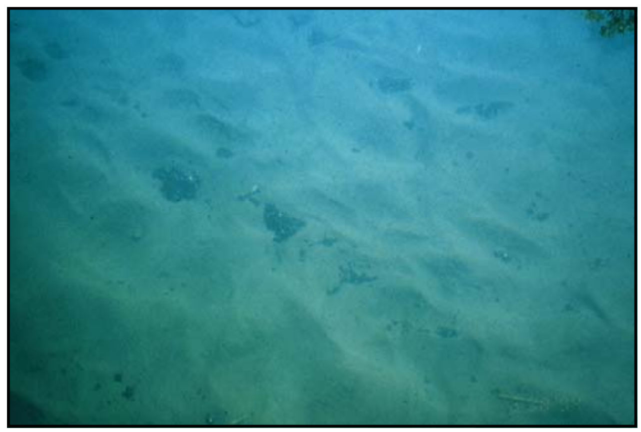

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Stream Temperature

- Inadequate canopy cover to shade streams from full sun
- Wide and shallow streams
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January 2012

Thank you

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