RANGELAND MANAGEMENT SERIES Publication 8094

Guidelines for Monitoring the Establishment of Riparian Grazing Systems

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This monitoring document outlines methods that will assess current riparian conditions and quantify changes in a riparian area under new management. The monitoring plan outlined here is fairly involved and requires some technical expertise, and for that reason this publication is intended for those with technical experience in rangeland management, specifically UC Cooperative Extension (UCCE) advisors, Natural Resources Conservation Service (NRCS), U.S. Forest Service, and Bureau of Land Management staff, and professional rangeland managers. A secondary audience of land owners and managers can benefit from this information if they are willing to invest time and effort into learning the necessary tools.

Appendixes C1 and C3 at the end of the publication are blank forms that you can copy and use for your own data collection. We have also provided filled-out samples of these and other useful forms to give you a better idea of how to use them.

WHY MONITOR?

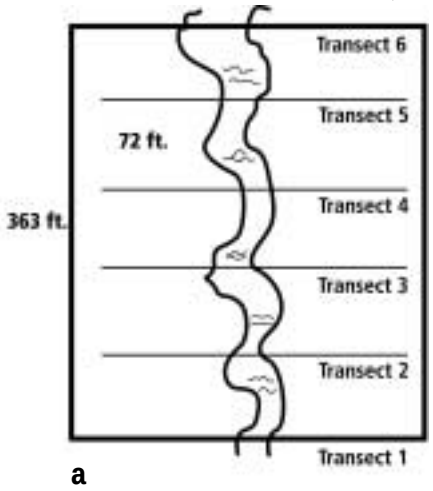
When establishing a new riparian grazing system, one would like to be able to compare the success of the new system with the old. Such a comparison can provide validation that the "new and improved" management system is positively affecting riparian health and is a successful project, or that more management changes need to be implemented in order to obtain desired goals, it is through the systematic monitoring of specific conditions that a land manager can assemble this kind of information. The decision left to the manager is, "What tools should I use to assess and monitor my riparian area?" There are a number of ways for managers to conduct their own monitoring, but up until now little guidance has been available as to which tools will best show the results of changes in riparian management. The paragraphs that follow provide an outline for monitoring that is based upon published methods that will provide feedback to changes in riparian grazing management.

SHOULD I MONITOR THE SAME THINGS AS MY NEIGHBOR?

There are distinct benefits to using the same monitoring methods on your property as are used on neighboring properties. If a number of land managers were to implement changes to their riparian areas and each were to select a different set of monitoring tools, they would not be able to compare the relative changes in riparian health between their areas. If, on the other hand, they were to use a common set of monitor tools to observe and record changes in the same items at all sites, they would be able to share information and learn from one another's efforts.

HOW SOON WILL I SEE RESULTS?

Some changes in riparian health can be documented in the short term (a few months to a year), depending on the status of the area at the time you implement management changes. Some changes in riparian health will be observed over the long term (2 years or more). For example, within a year there could be an increase in willow growth (short term), but a change in the tree canopy will not occur for many years (long term). Please see Appendix A for more information.



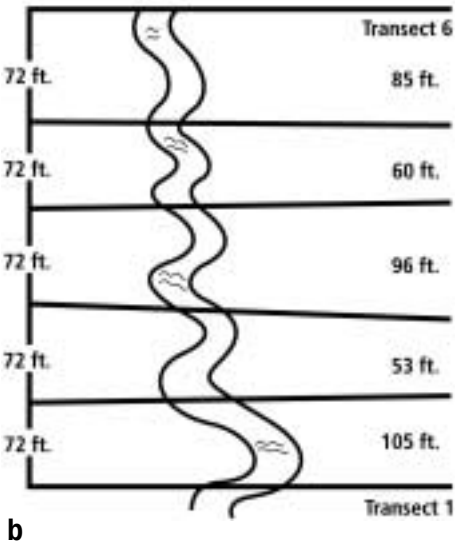


Figure 1. Overview of design layout. Transects are established on one side of the creek with their starting points 72 feet apart, providing a total of 360 linear feet (*a*). Transects should not cross each other, but depending on the site they need not be parallel (*b*). Be sure to make accurate note of the location of both ends of each transect so you will be able to find them again at a later date.

GETTING STARTED

Before starting, please review all of the published protocols and make sure that you receive any necessary training. Appendix B of this publication is a sequential outline of the steps necessary to complete the monitoring described here. If you do require training, please contact a UCCE, NRCS, or Resource Conservation District (RCD) office for assistance, possibly including assistance in getting the necessary equipment. The methods do require time and effort, especially during the first year when you first establish the transects. The time required can range from a half day to a full day for two people. Two two-person teams can divide the work and complete the monitoring in less time. It is important that you allow adequate time to collect the necessary data.

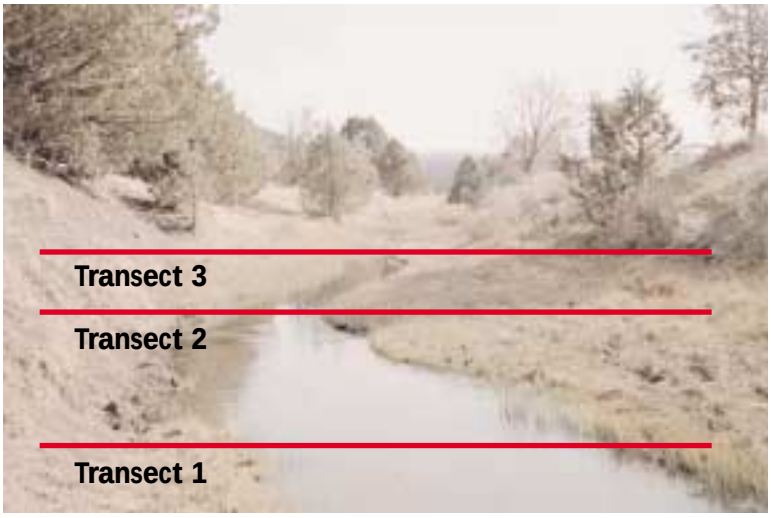
ESTABLISHING PERMANENT MONITORING TRANSECTS

To successfully document riparian health changes, you need to be able to examine the same geographical points repeatedly over time. This will ensure that apparent changes in riparian health are the actual results of management and not simply the unique conditions peculiar to different sites. You will need to select a representative section of the riparian area for monitoring; a total of 360 linear feet is required. Six transect lines going across the riparian area and spaced 72 feet apart are established perpendicular to the creek and can be marked using a variety of items such as existing fence posts, lengths of rebar, or wooden stakes painted a unique color (see Figures 1 and 2). When selecting the marker, give particular thought to the way the pasture is used, the marker's visibility, and its likely permanence over time. If you relate the markers to a benchmark (a permanent fixture such as a tree or large rock), it will be easier for you to find the location of missing markers later on. Record the bearing and distance from the benchmark to each marker.

Transects should encompass upland vegetation on both sides of the creek in order to document whether the width of the riparian vegetation area is increasing or decreasing over time. Because of this, transect lengths will vary from site to site. For example, transects for a mountain meadow system may be 200 feet long, whereas for an intermittent creek in the San Joaquin Valley they may be only 50 feet long. Once you have established the transects, you are ready to begin gathering data.

VEGETATION

To characterize the vegetation, use the USDA Forest Service's Greenline protocol. It is a standard system for classifying and characterizing vegetation and is well suited to



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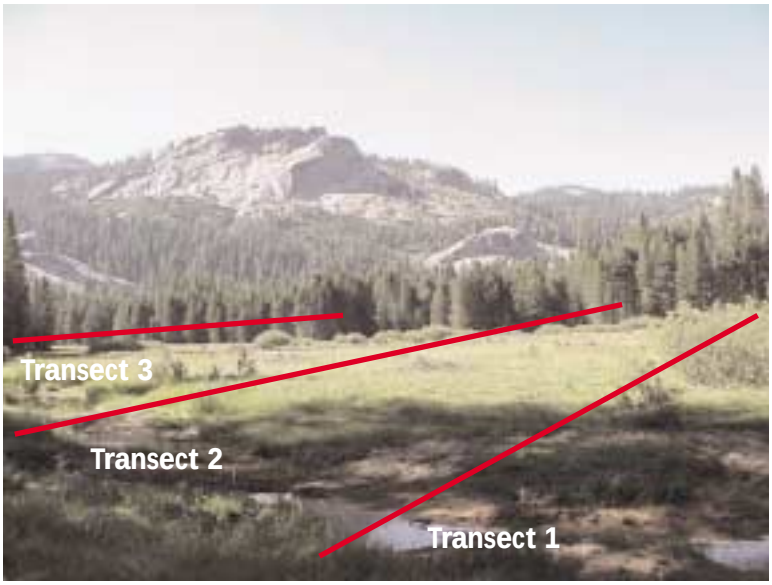

b

Figure 2. Examples of transects in the field at different sites (not drawn to scale): *a* has a limited riparian area and so requires shorter transects, while the transects in *b* cross the entire meadow.

the kind of work we are discussing. This protocol has been published, and you should make yourself familiar with its methods and seek out assistance and training if necessary. There is one change that you can make to the Greenline protocol to make it easier to use: key the vegetation according to functional groups instead of species to allow for ease of use while still providing documentation of trends in vegetation succession.

Greenline consists of three components. The first component, *vegetation cross-section composition*, provides information on the width of the riparian area. All six cross-sections are considered for this component. The second, *greenline composition*, was developed for perennial mountain meadows, but is useful for other systems. It documents changes in the permanent greenline along the stream. For example, annual systems may consist of oak trees as the permanent green vegetation. One would expect perennial grasses and other woody species to increase along the stream as management changes were implemented, thus providing a new greenline. The third component, *woody species regeneration*, accounts for any increases in willows, aspen, alders, or other woody plants that tend to provide more stability and canopy cover for the stream. The latter two components are conducted along the permanent vegetation areas of Transect 1 to 6 on both sides of the stream.

VISUAL ASSESSMENTS

Visual assessments are valuable for providing a quick examination of the habitat and hydrologic condition of a system. We recommend that you use two assessments: the U.S, Department of the Interior Bureau of Land Management's *Proper Functioning Condition* (PFC) and the University of California Cooperative Extension's *Riparian Health Assessment for Rangelands(RHAR)*. Published protocols and training opportunities are available for each method, and you should make sure to be familiar with the protocols and properly trained before you undertake these assessments.

The reason for using two assessments is that together they enable you to capture more information regarding the riparian system. There is some overlap between the two assessments, but when you use both you get a comprehensive picture.

It is important to note that not all streams have the same habitat potential. Ward et al. (2001) found that stream morphology affects the streams' habitat potential. For this reason, you should make comparisons only within the same morphology classification. Measurements to determine the *Rosgen classification* (a stream morphology classification system) (Rosgen 1996) should be recorded on the Riparian Grazing Case Study Data Sheet included in this packet.

Figure 3. Team in the field measuring channel morphology cross-sections. To provide an accurate representation, measurements should be taken at every break in slope or every few feet.

PHYSICAL PARAMETERS

The Riparian Grazing Case Study Data Sheet outlines the physical parameters you will have to observe and record. Some equipment is necessary for completion of this data sheet, but if you work with NRCS, RCD, or UCCE offices, this should not be a problem. To begin, you will measure the channel morphology cross-section at both the downstream and upstream transects (transects 1 and 6). Please refer to MacDonald et al. (1991) for the detailed description that begins on page 109. The equipment you will need consists of a stadia rod and scope. Take a reading at every break in slope or every 2 feet (Figure 3). Input the raw data into a computer spreadsheet program and generate a graphical representation of the stream cross-section (see Figures 4 and 5).

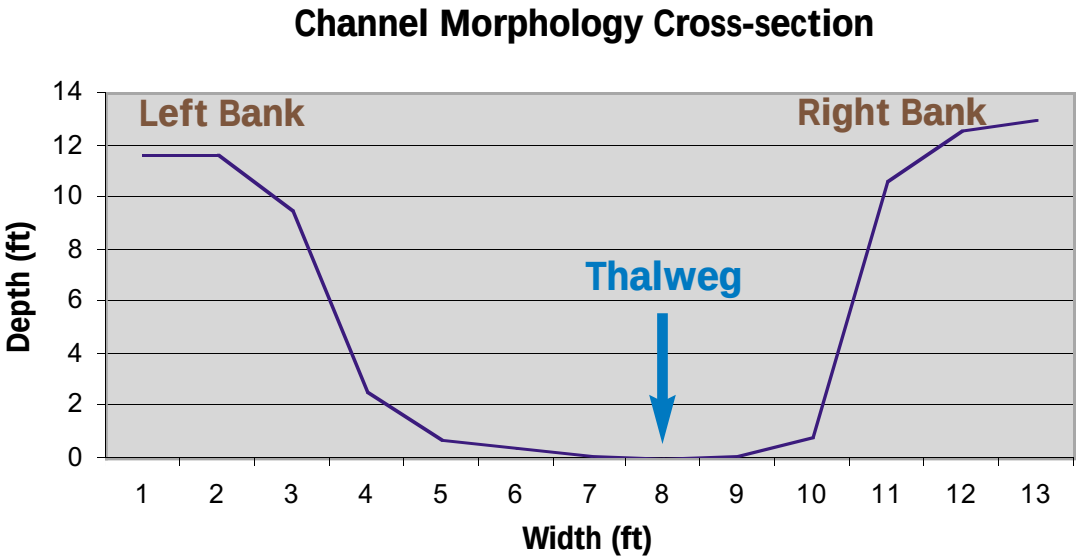

Figure 4. Measurements taken in the field can be converted to a graphical representation of the channel morphology. Labeling the banks and thalweg (the deepest part of the channel) helps keep the graph in perspective.

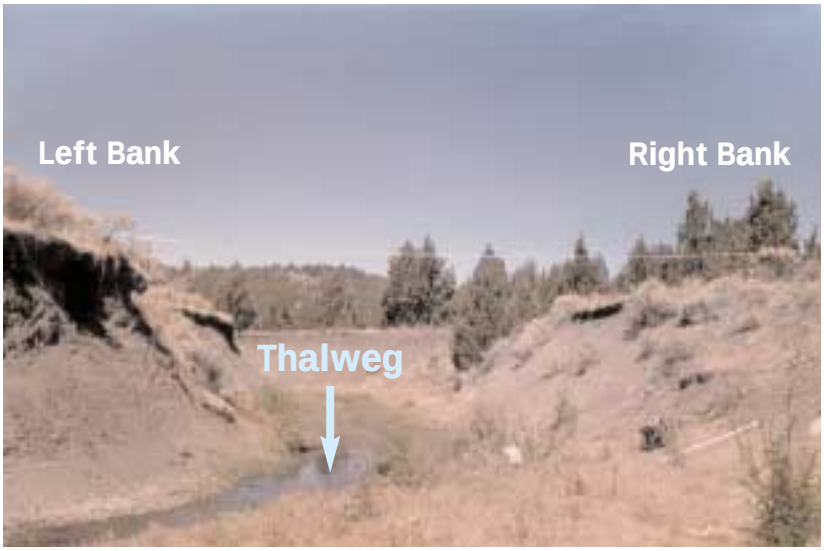

Figure 5. Actual site described graphically in Figure 4. The tape can be seen stretched across the stream, and left and right banks as well as thalweg are highlighted for reference.

Figure 6. Spherical densiometers are used to measure canopy cover.

Take canopy readings along transects, using a densiometer (Figure 6). Again, for specialized equipment and training in its use please contact a local NRCS, RCD, or UCCE office. The densiometer readings will indicate whether canopy cover is increasing.

You also want to document current air and water temperatures, and it is best if you take your readings in the same spot each time. Just select an arbitrary point along one transect and record the location on the data sheet.

HABITAT PARAMETERS

The habitat parameters include calculating the total linear feet of pools (water is deeper and slower moving), riffles (faster and shallower), and runs (sections where water depth and velocity remain more even) (Figure 7). This provides information on the three basic habitat features that are available to fish. In addition, you need to examine specific habitat features. A complete description of all of the parameters under the *Fish Shelter Ratings* section can be found in Flosi et al. (1998).

In determining the percent substrate exposed, you must carefully examine habitat substrates such as boulders, cobbles, woody debris, and the like. This information will vary from year to year with different flow regimes, artificial and natural, but it is important in determining how much habitat is potentially available to fish and macroinvertebrates.

Figure 7. A stretch of stream can contain riffles, runs, and pools, all important features for various habitats. Highlighted in this picture are examples of all three.

Collect specific information regarding three of the riffles in the reach. Consult the protocol for macroinvertebrate collections published by the California Department of Fish and Game (1999) for details. Even though you will not actually sample the macroinvertebrates, the information you collect can provide insight on potential habitat and should certainly be recorded. Length of the riffle as well as average width, depth, and velocity can all easily be recorded with the help of a tape measure, a stopwatch, and a float, such as an orange or a twig. Substrate complexity and embeddedness are examined for each riffle. Using RHAR, *substrate complexity* refers to question 5, Macroinvertebrate Habitat, and *embeddedness* refers to the High Gradient form, question 9. You will also estimate the percentage of each substrate's size and the degree of its consolidation for each riffle. Finally, you will use a clinometer to determine the gradient of the riffle.

MANAGEMENT SURVEY

Last of all, you will complete a management questionnaire. The Riparian Grazing Case Study Management Survey (Appendix C1) will help you as the manager outline current (*new management*) and historic management (*previous management*) as well as the watershed's characteristics, your goals for the riparian area, and your monitoring practices. The survey should be completed in detail since it will provide a road map of what management practices have been implemented. When you know what management practices are implemented, you have a better idea of what practices may improve a riparian area. Without this information, you will have a hard time comparing manage-

ment changes over time. Complete a new survey each time you change your management methods and you will build up a detailed, useful history.

WHEN SHOULD I REVISIT THE SITE?

You should revisit the case study site on a regular basis, though you will not have to collect data every year. You can expect to repeat the assessments every couple of years, when you implement management changes, or when you notice drastic changes during regular visits to the area.

CONCLUSIONS

By standardizing the data that you collect when you modify riparian grazing management, you will be able to compare various management systems and share ideas with other managers on what management practices have been successful and which have not. This kind of shared experience is one of the best learning opportunities available to land managers. For this reason, it is important that you take the necessary time and care when you gather your data. If you collect good data at the beginning, you can put it to good use for years to come.

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Appendix A

Riparian Grazing Case Study Monitoring Tools

Assessment	Short- or long-term trend	Parameter quantified
BLM Proper Functioning Condition	Long-term	Hydrologic function
UCCE Riparian Health Assessment for Rangelands	Long-term	Trout and macroinvertebrate habitat and hydrologic function
Greenline: Vegetation Cross-section Composition	Short- and long-term	Width of the riparian area
Greenline: Greenline Composition	Short- and long-term	Change in greenline vegetation
Greenline: Woody Species Regeneration	Short- and long-term	Change in woody species along the greenline
Channel Morphology Cross-section	Long-term	Change in width and depth of the channel
Densiometer	Long-term	Amount of canopy
Habitat Types	Short- and long-term	Three basic habitat types for fish
Physical Parameters	Short- and long-term	Variety of physical parameters

Appendix B

Check Sheet for Establishing Case Studies

I. Ahead of time
- a. Review protocols
- b. Receive training if necessary
- c. Gather required equipment
  - i. Stadia rod
  - ii. Hand lens
  - iii. Tape (300-ft if possible)
  - iv. Densiometer
  - v. Stakes, sledgehammer, and paint
  - vi. Compass
  - vii. Clinometer
  - viii. Make copies of necessary forms
    1. Six Vegetation Cross-section sheets
    2. One Greenline form
    3. One Woody Species Regeneration form
    4. One RHAR form
    5. One PFC form
    6. One Riparian Case Study Data Sheet
    7. One Riparian Grazing Case Study Management Survey

II. At site
- a. Select representative section within one Rosgen type
- b. Establish transects (Figure 1)
  - i. Record distance and bearing from benchmark
- c. Begin Greenline (three parts)
  - i. Vegetation cross-section transects
    1. Record canopy reading on densiometer at mid-channel for each transect
  - ii. Greenline composition transect
  - iii. Woody species regeneration belt transect
- d. Complete visual assessments (RHAR and PFC)
- e. Complete channel morphology cross-sections (Transects 1 and 6)
- f. Complete Riparian Grazing Case Study Data Sheet
  - i. Air and water temperature
  - ii. Stream morphology data (widths and depths)
  - iii. Feet of riffles, pools, and runs
  - iv. Fish shelter ratings
  - v. Riffle data
- g. Complete Management Survey

Appendix C1

Riparian Grazing Case Study Management Survey page 1

General Information

Ranch: _____

Name: _____

Address: _____

City, State, ZIP: _____

Phone number: _____

E-mail: _____

Ownership:

☐ Private ☐ Private lease
☐ U.S. Forest Service ☐ BLM
☐ Other public

How long under current ownership?

_____

If public-owned, is there regular communication with USFS or BLM Range Con ?

☐ Yes ☐ No

Type of operation:

☐ Cow-calf ☐ Stocker ☐ Sheep
☐ Farming ☐ Horses

Total size and number of pastures:

_____

Watershed Characteristics

Upstream watershed land uses:

☐ Urban ☐ Logging
☐ Ranching ☐ Farming
☐ Wildlands ☐ Recreation
☐ Roads ☐ Non-urban residential

Predominant ownership of watershed:

☐ Private ☐ U.S. Forest Service
☐ BLM ☐ Public

Past land disturbances in the watershed:

☐ Mining ☐ Floods ☐ Fire
☐ Logging ☐ Landslides

Management Unit of Concern

Name: _____

County: _____

Ownership:

☐ Private ☐ Private lease
☐ U.S. Forest Service ☐ BLM
☐ Other public

How long under current ownership?

_____

If public-owned, are there standards in place?

☐ Yes ☐ No

What are the standards?

☐ Utilization ____% ☐ Stubble height _____inches
☐ Browse ____% ☐ Trampling ____%
☐ RDM _____lbs/acre

Who monitors them?

☐ Range Con ☐ Rancher

Size and number of pastures in unit:

Acres: _____

Number of pastures: _____

How many pastures contain a section of creek?

_____

Are there any written plans for the unit?

☐ Ranch plan ☐ Water quality plan
☐ Economic plan ☐ EQIP
☐ AOI ☐ EA/EIS; IS/EIR
☐ Conservation agreement
☐ Land use plan ☐ Other

Goals for riparian pasture:

☐ Increase/maintain production
☐ Increase/maintain profit
☐ Maintain/improve water quality
☐ Aesthetics
☐ Sustainability
☐ Increase biodiversity
☐ Decrease weeds
☐ Improve/maintain fishery

Have you created a separate riparian pasture specifically to obtain achieve your goals?

☐ Yes ☐ No

If yes, how long did you allow the new pasture to rest before grazing was reintroduced?

☐ One season ☐ One year
☐ Two years ☐ Three years
☐ Four or more years

Are temporary exclosures utilized to meet your goals in the riparian area?

☐ Yes ☐ No

Riparian concerns that you have:

☐ Fish habitat ☐ Wildlife habitat
☐ Waterfowl habitat ☐ Water quality

Riparian Grazing Case Study Management Survey page 2

☐ Biomass production ☐ TMDL
☐ Endangered Species Act

Use of pasture:

☐ Holding area ☐ Calving
☐ Watering site ☐ Grazing
☐ Gathering ☐ Bedding
☐ Exclosure

Indicators used to move livestock in and out of riparian area (unit of concern):

☐ Dormant season of key plants
☐ Invasion of undesirable plants/Shading of desirables
☐ Bank soil moisture
☐ Presence and/or life cycle of key wildlife species?
☐ Browse on key woody vegetation
☐ Accumulation of liter layer
☐ RDM level
☐ Likelihood of floods/spring runoff
☐ Utilization of herbaceous vegetation
☐ Time of year (calendar dates)
☐ Rest period of other pastures

Current Management, Costs (days of labor/year), and Possible Cost Sharing, (for the particular pasture, not the entire ranch)

Type of operation and length of time under current operation.

☐ Cow-calf ☐ Stocker ☐ Sheep
☐ Farming ☐ Horses

Breed/type of animal: _____

Number of animals (range and average):

_____

Season of use:

☐ Spring ☐ Summer
☐ Fall ☐ Winter

Average in and out dates, or time between rotations:

_____

Grazing system:

_____

_____

_____

_____

Livestock distribution

☐ Herding ☐ Drift fence
☐ Trails ☐ Temporary exclosures
Off-site ☐ Feed or ☐ Salt/minerals

If you use off-site feeding and/or salt/minerals:
How far is the off-site feed/salt/minerals from the stream? (closest 1/2 mile is fine) _____

Do you observe evidence of livestock using off-site feed/salt/minerals?

☐ Yes ☐ No

In your opinion/observation has the off-site feed/salt/minerals reduced time livestock spend in the riparian area?

☐ Yes ☐ No

Is off-site water available:

☐ Yes ☐ No

If yes: ☐ Natural ☐ Human-made

Type of human-made:

☐ Pipeline ☐ Troughs
☐ Tanks ☐ Well
☐ Pond

How far is the off-site water from the stream? (closest 1/2 mile is fine)

_____

_____

Do you observe evidence of livestock using off-site water?

☐ Yes ☐ No

In your opinion/observation has the off-site water reduced time livestock spend in the riparian area?

☐ Yes ☐ No

Brush Management

☐ Fire ☐ Chemical ☐ Mechanical

Are you performing brush management practices to obtain/achieve your riparian goals?

☐ Yes ☐ No

Riparian Grazing Case Study Management Survey page 3

Road Management

☐ Maintenance ☐ Construction

☐ Culverts

Are you performing road management practices to obtain/ achieve your riparian goals?

☐ Yes ☐ No

Fencing

Type of fencing used:

☐ Barbed wire ☐ Electric, 5-strand

☐ Electric, 3-strand ☐ Electric, 2-strand

☐ Electric, 1-strand ☐ Temp. electric

☐ Range seeding

Stream crossings (interim):

☐ For livestock

☐ For roads (equipment, truck)

If for livestock, are they hardened?

☐ Yes ☐ No

How often are they utilized?

_____

Have they reduced damage to the stream banks in your opinion?

☐ Yes ☐ No

If for roads, are they hardened?

☐ Yes ☐ No

How often are they used?

Are they ☐ County? ☐ Private?

☐ Prescribed burning for forage improvement

☐ Irrigation water management

☐ Pasture clipping

☐ Sediment basins

☐ Grazingland mechanical treatments (renovating, contour furrowing, pitting)

☐ Length of time under current management?

_____

Restoration Efforts

Has there been any restoration in the unit?

☐ Yes ☐ No

If so, what was the objective?

☐ Decrease erosion

☐ Capture sedimentation

☐ Improve habitat

☐ Sustainability of the system

What restoration practices were utilized?

☐ Stream corridor improvement

☐ Bank protection

☐ Structural (such as rock riprap)

☐ Bioengineering(either solely vegetation such as willows, or a combination of vegetation and structural)

☐ Stream channel stabilization

☐ Grade stabilization

☐ Riparian planting for wildlife habitat

☐ Wildlife habitat in the upland

☐ Critical area planting for erosion

☐ Landslide treatments

☐ Do you purposely cull animals that “hug the stream” (“riparian huggers”)?

☐ Does anyone stock fish?

Historic Management and Costs (for the particular area)

Type of operation and length of time under historic operation.

☐ Cow-calf ☐ Stocker ☐ Sheep

☐ Farming ☐ Horses

Breed/type of animal: _____

Number of animals (range and average):

_____

Season of use:

☐ Spring ☐ Summer

☐ Fall ☐ Winter

Average in and out dates, or time between rotations:

_____

Grazing system description:

_____

_____

_____

_____

_____

Riparian Grazing Case Study Management Survey page 4

Livestock distribution

☐ Herding ☐ Drift fence

☐ Trails ☐ Temporary exclosures

Off-site ☐ Feed or ☐ Salt/minerals

If you used off-site feeding and/or salt/minerals,

How far was the off-site feed/salt/minerals from the stream? (closest 1/2 mile is fine) _____

Did you observe evidence of livestock using off-site feed/salt/minerals?

☐ Yes ☐ No

In your opinion/observation did the off-site feed/salt/minerals reduced time livestock spend in the riparian area?

☐ Yes ☐ No

Was off-site water available:

☐ Yes ☐ No

If yes: ☐ Natural ☐ Human-made

Type of human-made:

☐ Pipeline ☐ Troughs

☐ Tanks ☐ Well

☐ Pond

How far was the off-site water from the stream? (closest 1/2 mile is fine)

_____

Did you observe evidence of livestock using off-site water?

☐ Yes ☐ No

In your opinion/observation did the off-site water reduced time livestock spend in the riparian area?

☐ Yes ☐ No

Brush management (314)

☐ Fire ☐ Chemical ☐ Mechanical

Did you performing brush management practices to obtain/achieve your riparian goals?

☐ Yes ☐ No

Road management

☐ Maintenance ☐ Construction

☐ Culverts

Did you performing road management practices to obtain/achieve your riparian goals?

☐ Yes ☐ No

Fencing (382)

Type of fencing used:

☐ Barbed wire ☐ Electric, 5-strand

☐ Electric, 3-strand ☐ Electric, 2-strand

☐ Electric, 1-strand ☐ Temp. electric

☐ Range Seeding

Stream crossings (interim):

☐ For livestock

☐ For roads (equipment, truck)

If for livestock, were they hardened?

☐ Yes ☐ No

How often were they utilized?

_____

Did they reduced damage to the stream banks in your opinion?

☐ Yes ☐ No

If for roads, were they hardened?

☐ Yes ☐ No

How often are they used? _____

Are they ☐ County? ☐ Private?

☐ Prescribed burning for forage improvement

☐ Irrigation water management

☐ Pasture clipping

☐ Sediment basins

☐ Grazingland mechanical treatments (renovating, contour furrowing, pitting)

☐ Length of time under historic management?

_____

Restoration Efforts

Was there any historic restoration in the unit?

☐ Yes ☐ No

If so, what was the objective?

☐ Decrease erosion

☐ Capture sedimentation

☐ Improve habitat

Riparian Grazing Case Study Management Survey page 5

☐ Sustainability of the system

What restoration practices were utilized:

☐ Stream corridor improvement

☐ Bank protection

☐ Structural (such as rock riprap)

☐ Bioengineering(either solely vegetation such as willows, or a combination of vegetation and structural)

☐ Stream channel stabilization

☐ Grade stabilization

☐ Riparian planting for wildlife habitat

☐ Wildlife habitat in the upland

☐ Critical area planting for erosion

☐ Landslide treatments

☐ Did you purposely cull animals that "hug the stream" (Riparian Huggers)?

☐ Did anyone stock fish? _____

Current Monitoring

Types of monitoring, number of points and how often:

	Frequency (per yr)	Location
☐ Visual:	_____	_____
☐ Photo:	_____	_____
☐ Stream temp:	_____	_____
☐ Sediment	_____	_____
☐ Nutrient	_____	
☐ Habitat:	_____	
☐ Pathogens:	_____	
☐ Wildlife:	_____	

Objectives of monitoring:

☐ Establish base lines

☐ Document management over time

☐ Monitor wildlife/fisheries habitat

☐ Monitor vegetation: weeds and desirable grasses

☐ Protect ranching interests against environmental concerns

How are monitoring data used?

☐ To make management decisions

☐ Stored for future use

☐ Shared with agencies (Regional Board, NRCS, UCCE, RCD, FS, BLM, F&G, etc.)

Appendix C2

Filled-in Example of Appendix C1

Riparian Grazing Case Study Management Survey page 1

General Information

Ranch: UCCE Example site

Name: Agronomy & Range Science

Address: One Shields Ave

City, State, ZIP: Davis, CA 95616

Phone number (530) 752-4031

E-mail: _____

Ownership:

☒ Private ☐ Private lease

☐ U.S. Forest Service ☐ BLM

☐ Other public

How long under current ownership?

98 years

If public-owned, is there regular communication with USFS or BLM Range Con ?

☐ Yes ☐ No

Type of operation:

☒ Cow-calf ☐ Stocker ☐ Sheep

☐ Farming ☐ Horses

Total size and number of pastures:

3425 acres 15 pastures

Watershed Characteristics

Upstream watershed land uses:

☐ Urban ☐ Logging

☒ Ranching ☒ Farming

☐ Wildlands ☒ Recreation

☒ Roads ☒ Non-urban residential

Predominant ownership of watershed:

☒ Private ☐ U.S. Forest Service

☐ BLM ☐ Public

Past land disturbances in the watershed:

☒ Mining ☒ Floods ☒ Fire

☐ Logging ☐ Landslides

Management Unit of Concern

Name: UCE Example Creek

County: Yolo

Ownership:

☒ Private ☐ Private lease

☐ U.S. Forest Service ☐ BLM

☐ Other public

How long under current ownership?

98 years

If public-owned, are there standards in place?

☐ Yes ☐ No

What are the standards?

☐ Utilization ____% ☐ Stubble height _____inches

☐ Browse ____% ☐ Trampling ____%

☐ RDM _____lbs/acre

Who monitors them?

☐ Range Con ☐ Rancher

Size and number of pastures in unit:

Acres: 248

Number of pastures: 1

How many pastures contain a section of creek?

1

Are there any written plans for the unit?

☒ Ranch plan ☒ Water quality plan

☐ Economic plan ☒ EQIP

☐ AOI ☐ EA/EIS; IS/EIR

☐ Conservation agreement

☐ Land use plan ☐ Other

Goals for riparian pasture:

☐ Increase/maintain production

☐ Increase/maintain profit

☒ Maintain/improve water quality

☒ Aesthetics

☒ Sustainability

☒ Increase biodiversity

☒ Decrease weeds

☒ Improve/maintain fishery

Have you created a separate riparian pasture specifically to obtain achieve your goals?

☒ Yes ☐ No

If yes, how long did you allow the new pasture to rest before grazing was reintroduced?

☐ One season ☐ One year

☒ Two years ☐ Three years

☐ Four or more years

Are temporary exclosures utilized to meet your goals in the riparian area?

☐ Yes ☒ No

Riparian concerns that you have:

☒ Fish habitat ☐ Wildlife habitat

☒ Waterfowl habitat ☒ Water quality

Appendix C2
Filled in Example of Appendix C1 (continued)

Riparian Grazing Case Study Management Survey page 2

☐ Biomass production ☒ TMDL
☐ Endangered Species Act

Use of pasture:
☐ Holding area ☐ Calving
☐ Watering site ☒ Grazing
☐ Gathering ☐ Bedding
☐ Exclosure

Indicators used to move livestock in and out of riparian area (unit of concern):
☐ Dormant season of key plants
☒ Invasion of undesirable plants/Shading of desirables
☒ Bank soil moisture
☐ Presence and/or life cycle of key wildlife species?
☒ Browse on key woody vegetation
☒ Accumulation of liter layer
☒ RDM level
☐ Likelihood of floods/spring runoff
☒ Utilization of herbaceous vegetation
☐ Time of year (calendar dates)
☐ Rest period of other pastures

Current Management, Costs (days of labor/year), and Possible Cost Sharing, (for the particular pasture, not the entire ranch)

Type of operation and length of time under current operation.
☒ Cow-calf ☐ Stocker ☐ Sheep
☐ Farming ☐ Horses
for 98 years
Breed/type of animal: English
Number of animals (range and average):
50-100 normally 72

Season of use:
☐ Spring ☐ Summer
☒ Fall ☐ Winter
Average in and out dates, or time between rotations:
10/15 → 11/1
Grazing system:
Used in fall for two weeks every year. Cattle excluded rest of the year.

Livestock distribution
☐ Herding ☐ Drift fence
☐ Trails ☐ Temporary exclosures
Off-site ☐ Feed or ☒ Salt/minerals 1day/yr

If you use off-site feeding and/or salt/minerals:
How far is the off-site feed/salt/minerals from the stream? (closest 1/2 mile is fine) 3/4 mile

Do you observe evidence of livestock using off-site feed/salt/minerals?
☒ Yes ☐ No

In your opinion/observation has the off-site feed/salt/minerals reduced time livestock spend in the riparian area?
☒ Yes ☐ No

Is off-site water available:
☒ Yes ☐ No

If yes: ☐ Natural ☒ Human-made
Type of human-made:
☒ Pipeline ☒ Troughs
☒ Tanks ☐ Well
☐ Pond
How far is the off-site water from the stream? (closest 1/2 mile is fine)
1/2 mile

Do you observe evidence of livestock using off-site water?
☒ Yes ☐ No

In your opinion/observation has the off-site water reduced time livestock spend in the riparian area?
☒ Yes ☐ No

Brush Management
☐ Fire ☐ Chemical ☐ Mechanical
Are you performing brush management practices to obtain/achieve your riparian goals?
☐ Yes ☐ No

Appendix C2
Filled in Example of Appendix C1 (continued)

Riparian Grazing Case Study Management Survey page 3

Road Management
☐ Maintenance ☐ Construction
☐ Culverts

Are you performing road management practices to obtain/ achieve your riparian goals?
☐ Yes ☐ No

Fencing
Type of fencing used:
☐ Barbed wire ☐ Electric, 5-strand
☐ Electric, 3-strand ☒ Electric, 2-strand
☐ Electric, 1-strand ☐ Temp. electric
3 days /yr
☐ Range seeding

Stream crossings (interim):
☒ For livestock
☐ For roads (equipment, truck)
If for livestock, are they hardened?
☒ Yes ☐ No
How often are they utilized?
just when cattle are in the pasture.
Have they reduced damage to the stream banks in your opinion?
☒ Yes ☐ No

If for roads, are they hardened?
☐ Yes ☐ No
How often are they used?
Are they ☐ County? ☐ Private?

☐ Prescribed burning for forage improvement
☐ Irrigation water management
☐ Pasture clipping
☐ Sediment basins
☐ Grazingland mechanical treatments (renovating, contour furrowing, pitting)
☐ Length of time under current management?
6 months

Restoration Efforts
Has there been any restoration in the unit?
☒ Yes ☐ No

If so, what was the objective?
☒ Decrease erosion
☒ Capture sedimentation
☒ Improve habitat
☒ Sustainability of the system

What restoration practices were utilized?
☐ Stream corridor improvement
☐ Bank protection
☐ Structural (such as rock riprap)
☒ Bioengineering(either solely vegetation such as willows, or a combination of vegetation and structural) 3days willow plantings
☐ Stream channel stabilization
☐ Grade stabilization
☐ Riparian planting for wildlife habitat
☐ Wildlife habitat in the upland
☐ Critical area planting for erosion
☐ Landslide treatments
☐ Do you purposely cull animals that "hug the stream" ("riparian huggers")?
☐ Does anyone stock fish?

Historic Management and Costs (for the particular area)
Type of operation and length of time under historic operation.
☒ Cow-calf ☐ Stocker ☐ Sheep
☐ Farming ☐ Horses

Breed/type of animal: English
Number of animals (range and average):
50-100 normally 72

Season of use:
☒ Spring ☒ Summer
☒ Fall ☒ Winter

Average in and out dates, or time between rotations:
1/1 → 12/31
Grazing system description:
Continuous grazing system.
Occasionally some removed or more added

Appendix C2
Filled in Example of Appendix C1 (continued)

Riparian Grazing Case Study Management Survey page 4

Livestock distribution
☐ Herding ☐ Drift fence
☐ Trails ☐ Temporary exclosures
Off-site ☐ Feed or ☒ Salt/minerals 2 days

If you used off-site feeding and/or salt/minerals,
How far was the off-site feed/salt/minerals from the stream? (closest 1/2 mile is fine) 100 yds
Did you observe evidence of livestock using off-site feed/salt/minerals?
☒ Yes ☐ No

In your opinion/observation did the off-site feed/salt/minerals reduced time livestock spend in the riparian area?
☐ Yes ☒ No

Was off-site water available:
☐ Yes ☒ No

If yes: ☐ Natural ☐ Human-made
Type of human-made:
☐ Pipeline ☐ Troughs
☐ Tanks ☐ Well
☐ Pond
How far was the off-site water from the stream? (closest 1/2 mile is fine)

Did you observe evidence of livestock using off-site water?
☐ Yes ☐ No

In your opinion/observation did the off-site water reduced time livestock spend in the riparian area?
☐ Yes ☐ No

Brush management (314)
☐ Fire ☐ Chemical ☐ Mechanical
Did you performing brush management practices to obtain/achieve your riparian goals?
☐ Yes ☐ No

Road management
☐ Maintenance ☐ Construction
☐ Culverts

Did you performing road management practices to obtain/achieve your riparian goals?
☐ Yes ☐ No

Fencing (382)
Type of fencing used:
☐ Barbed wire ☐ Electric, 5-strand
☐ Electric, 3-strand ☒ Electric, 2-strand 1 day
☐ Electric, 1-strand ☐ Temp. electric

☐ Range Seeding

Stream crossings (interim):
☐ For livestock
☐ For roads (equipment, truck)
If for livestock, were they hardened?
☐ Yes ☐ No
How often were they utilized?

Did they reduced damage to the stream banks in your opinion?
☐ Yes ☐ No
If for roads, were they hardened?
☐ Yes ☐ No

How often are they used? _____
Are they ☐ County? ☐ Private?

☐ Prescribed burning for forage improvement
☐ Irrigation water management
☐ Pasture clipping
☐ Sediment basins
☐ Grazingland mechanical treatments (renovating, contour furrowing, pitting)
☐ Length of time under historic management?
97 years +

Restoration Efforts
Was there any historic restoration in the unit?
☐ Yes ☒ No
If so, what was the objective?
☐ Decrease erosion
☐ Capture sedimentation
☐ Improve habitat

Appendix C2

Filled in Example of Appendix C1 (continued)

Riparian Grazing Case Study Management Survey page 5

☐ Sustainability of the system

What restoration practices were utilized:

☐ Stream corridor improvement

☐ Bank protection

☐ Structural (such as rock riprap)

☐ Bioengineering(either solely vegetation such as willows, or a combination of vegetation and structural)

☐ Stream channel stabilization

☐ Grade stabilization

☐ Riparian planting for wildlife habitat

☐ Wildlife habitat in the upland

☐ Critical area planting for erosion

☐ Landslide treatments

☐ Did you purposely cull animals that "hug the stream" (Riparian Huggers)?

☐ Did anyone stock fish? _____

Current Monitoring

Types of monitoring, number of points and how often:

	Frequency (per yr)	Location
☒ Visual:	daily when cattle present, plus 4 times throughout year.	
☒ Photo:	2	4 spots
☐ Stream temp:	_____	_____
☐ Sediment	_____	_____
☐ Nutrient	_____	
☒ Habitat:	once every other year	
☐ Pathogens:	_____	
☒ Wildlife:	visual counts	

Objectives of monitoring:

☒ Establish base lines

☒ Document management over time

☒ Monitor wildlife/fisheries habitat

☒ Monitor vegetation: weeds and desirable grasses

☐ Protect ranching interests against environmental concerns

How are monitoring data used?

☒ To make management decisions

☒ Stored for future use

☐ Shared with agencies (Regional Board, NRCS, UCCE, RCD, FS, BLM, F&G, etc.)

Appendix C3

Riparian Grazing Case Study Data Sheet page 1

Stream: _____

Date/Time: _____

Completed by: _____

Channel Morphology Cross-Sections

Upstream		Downstream	
Ft.	Depth	Ft.	Depth

Densiometer Readings

upstream, downstream, left, right

Tran1	u	d
	l	r
Tran2	u	d
	l	r
Tran3	u	d
	l	r
Tran4	u	d
	l	r
Tran5	u	d
	l	r
Tran6	u	d
	l	r

Air Temp: _____

Water Temp: _____

Description of Site: _____

Bankfull Width: _____

Bankfull Depth: _____

Flood-prone Width: _____

Flood-prone Depth: _____

Slope: _____

Habitat Type

ft/step: _____ Total: _____

Pools: _____

Riffles: _____

Runs: _____

Appendix C3 (continued)

Riparian Grazing Case Study Data Sheet page 2

Transect Locations: (Lat., Long., distance and bearing from Bench Mark, etc.)

Tran. 1: _____

_____

Tran. 2: _____

_____

Tran. 3: _____

_____

Tran. 4: _____

_____

Tran. 5: _____

_____

Tran. 6: _____

_____

	Riffle 1	Riffle 2	Riffle 3
Riffle Length	_____	_____	_____
Avg. Riffle Length	_____	_____	_____
Avg. Riffle Depth	_____	_____	_____
Riffle Velocity	_____	_____	_____
Substrate Complexity	_____	_____	_____
Embeddedness	_____	_____	_____
Substrate Composition			
% Fines	_____	_____	_____
% Gravel	_____	_____	_____
% Cobble	_____	_____	_____
% Boulder	_____	_____	_____
% Bedrock	_____	_____	_____
Substrate Consolidation	_____	_____	_____
% Gradient	_____	_____	_____

Fish Shelter Ratings

% undercut bank	
% swd	
% lwd	
% root mass	
% terr. veg.	
% aqua. veg.	
% boulder curtain	
% boulder	
% bedrock ledge	

% Exposed Substrate

Appendix C4 (page 1)
Filled-in Example of Appendix C3

Riparian Grazing Case Study Data Sheet

Stream: UCCE Example Creek

Date/Time: 9/02/01 11:00am

Completed by: Don, David, Therese

Channel Morphology Cross-Sections

Upstream Ft.	Upstream Depth	Downstream Ft.	Downstream Depth
0	2.61	0	1.81
9.0	2.62	15.1	1.83
13.2	4.83	22.0	13.34
17.4	11.71	27.0	13.94
19.0	13.61	30.0	14.64
28.0	13.93	33.0	13.81
30.0	14.43	41.0	12.34
34.0	14.31	48.0	11.53
39.0	14.21	50.0	8.81
45.0	13.51	55.0	6.05
57.0	3.72	65.0	1.91
60.0	1.74	75.0	1.14
71.0	1.34	82.0	1.13

Densiometer Readings (upstream, downstream, left, right)

	u	d
Tran1	0	0
	l 0	r 0
Tran2	0	0
	0	0
Tran3	0	0
	0	0
Tran4	0	0
	0	0
Tran5	0	0
	0	0
Tran6	0	0
	0	0

Air Temp: 71° F

Water Temp: 58° F

Description of Site: taken along Tran1

Bankfull Width: 10ft

Bankfull Depth: 2 ft

Flood-prone Width: 30 ft

Flood-prone Depth: 4 ft

Slope: 2%

Habitat Type

ft/step: 2.5 Total:

Pools: 2, 3, 1, 5 11steps = 27.5'

Riffles: 4, 4, 7, 8, 1, 7, 5, 4 40steps = 100'

Runs: 4, 15, 11, 21, 11, 5, 11, 10, 14, 6, 20 128steps = 320'

Appendix C4 (page 2)
Filled in Example of Appendix C3

Riparian Grazing Case Study Data Sheet

Transect Locations: (Lat., Long., distance and bearing from Bench Mark, etc.)

Tran. 1: N41° 06' 01.8" W120° 22' 11.3" 10ft from rock outcrop bearing 210°

Tran. 2: N41° 05' 02.2" W120° 22' 10.1" 23.5ft from bench mark bearing 198°

Tran. 3: N41° 05' 04.3" W120° 22' 8.8" 39.4ft from bench mark bearing 183°

Tran. 4: N41° 04' 08.4" W120° 22' 07.9" 56.2ft from bench mark bearing 179°

Tran. 5: N41° 04' 07.9" W120° 22' 06.5" 92.4ft from bench mark bearing 163°

Tran. 6: N41° 04' 05.5" W120° 22' 05.3" 121.6ft from bench mark bearing 167°

	Riffle 1	Riffle 2	Riffle 3
Riffle Length	17.2'	15'	8'
Avg. Riffle Length	5'	7'	8'
Avg. Riffle Depth	0.33'	0.33'	0.5'
Riffle Velocity	2.8ft/sec	2.1ft/sec	1.5ft/sec
Substrate Complexity	16	16	17
Embeddedness	20%	40%	10%
Substrate Composition			
% Fines	15	25	10
% Gravel	30	35	55
% Cobble	55	40	15
% Boulder	-	-	20
% Bedrock	-	-	-
Substrate Consolidation	loose	moderate	loose
% Gradient	2%	2%	2%

Fish Shelter Ratings

% undercut bank	0
% swd	5
% lwd	0
% root mass	0
% terr. veg	50% of bank covered
% aqua. veg	50%
% boulder curtain	0
% boulder	5
% bedrock ledge	0

% Exposed Substrate: 5%

Appendix C5

Riparian Greenline Transect Data Form

RIPARIAN GREENLINE TRANSECT DATA

Forest / District _____ / _____ Date 9/7/01

Drainage VCCE Example Creek

Examiners David, Don, Theresa Photo No's _____

Complex _____

Location _____

Transect No. _____ Feet/Step 3/1

Community Type	STEPS (Left)	STEPS (Right)	TOTAL STEPS	% COMP.
bare bank / Rabbit Brush / Per grass / Sedge	35 13 1 14	3 1 5 4 5	81	26.8
Rush / Per grass	8 7	5	20	6.6
Per grass / Sedge / Rush	14 52 9	32 6 13 5 70	201	66.6
		Grand Total	302	

BARS WITHIN TRANSECT (Optional)

	STEPS	FEET
GRAVEL		
SAND		
SILT/CLAY		

$$\frac{\text{Total Steps ea. CT}}{\text{Grand Total}} = \text{Composition}$$

USDA Forest Service Gen Tech. Rep. RMRS-GTR-47.2000

Appendix C6 (page 1)
Low-Gradient Riparian Health Assessment for Rangelands Form

Low Gradient Riparian Health Assessment for Rangelands

Site: UCCE Example Creek Date: 9/2/01

1. Channel Condition	Natural channel, no evidence of down cutting.			Evidence of past channelization or down cutting, but significant recovery. Adequate access to the flood plain.			Channelization or down cutting extensive. Flood plain is restricted.			Channel actively down cutting or widening. Flood plain access prevented.		
Score:	12	11	10	9	8	7	6	(5)	4	3	2	1
2. Access to Flood Plain	Flooding every 1 1/2 to 2 years -- not incised			Flooding every 3-5 years -- limited incision			Flooding every 6-10 years -- deeply incised			No flooding. Deeply incised.		
Score:	12	11	10	9	8	(27)	6	5	4	3	2	1
3. Bank stability (each bank separately -Looking downstream, Left bank - Right bank)	Banks stable. Outside bends protected by roots.			Moderately stable. Infrequent, small areas of erosion, mostly healed over.			Moderately unstable. Outside bends actively eroding; banks high; high potential erosion.			Unstable. Actively eroding.		
Left Bank Score:	6	5.5	5	(4.5)	4	3.5	3	2.5	2	1.5	1	0.5
Right Bank Score:	6	5.5	5	4.5	(4)	3.5	3	2.5	2	1.5	1	0.5
4a. Riparian Zone-Perennial Creek (score each bank separately)	Natural vegetation extends at least two active channel widths (ex. sedges, rushes, willows, alders, aspen, cottonwoods, sycamores). Score higher if point bars are re-vegetating and all age classes of woody species present (seedling, young, mature, old)			Natural vegetation extends one active channel width. Or Covers flood plain.			Natural vegetation extends 1/2 active width. Or Filtering function moderately compromised.			Natural vegetation extends less than 1/2 of active width. Or Lack of regeneration. Or Filtering function severely compromised.		
Left Bank Score:	6	5.5	5	4.5	4	(3.5)	3	2.5	2	1.5	1	0.5
Right Bank Score:	6	5.5	5	4.5	4	3.5	(3)	2.5	2	1.5	1	0.5
4a. Riparian Zone-Intermittent Creek (score each bank separately)	Natural vegetation extends two active channel widths (ex. oaks, buckeyes, alders, cottonwoods, annual grasses, some sedges and rushes). Score higher if point bars are re-vegetating and all age classes of woody species present (seedling, young, mature, old)			Natural vegetation extends one active channel width. Bare spots common. Or Covers flood plain.			Natural vegetation extends 1/2 of active width. Bare spots common. Or Filtering function moderately compromised.			Natural vegetation extends less than 1/2 of active width. Or Lack of regeneration. Or Filtering function severely compromised.		
Left Bank Score:	6	5.5	5	4.5	4	3.5	3	2.5	2	1.5	1	0.5
Right Bank Score:	6	5.5	5	4.5	4	3.5	3	2.5	2	1.5	1	0.5

Appendix C6 (page 2)

Low-Gradient Riparian Health Assessment for Rangelands Form

5. Macroinvertebrate Habitat	Greater than 5 habitat types. Score higher if good diversity.	3-4 types	1-2 types	0-1 type
Cover types:	Boulders, cobbles, coarse gravel, leaf packs, fine woody debris, submerged logs, overhanging vegetation, macrophytes (aquatic vegetation)			
Score:	12 11 (10)	9 8 7	6 5 4	3 2 1
6. Macroinvertebrates Observed	Class I dominate. Score higher if good diversity and number.	Class II dominate.	Class III dominate.	No macroinvertebrates present.
Score:	12 (11) 10	9 8 7	6 5 4	3 2 1
7. Fish Habitat (if applicable)	Greater than 7 habitat type. Score higher if good diversity.	6-4 habitats present.	3-2 habitats present.	1-0 habitat present.
Cover types:	Logs/large woody debris, deep pools, overhanging vegetation, riffles, boulders/cobbles, thick root mats, isolated/backwater pools, dense macrophyte beds, undercut banks			
Score:	12 11 10	9 8 7	6 (5) 4	3 2 1
8. Pool Variability	Even mix large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep.	Shallow pools more prevalent that deep pools.	Majority of pools small-shallow or pools absent.
Score:	12 11 10	9 8 7	6 5 4	(1) 2 1
9. Pool Substrate	Mix of substrate (gravel, firm sand, etc.). Roots, submerged vegetation common.	Mix of soft sand, mud, and clay. Some submerged vegetation.	All mud, clay, or sand. Little to no root mats or submerged vegetation.	Hard-pan clay or bedrock. No roots or submerged vegetation.
Score:	12 11 10	(½9) 8 7	6 5 4	3 2 1
10. Channel Flow	Water reaches base of both lower banks, minimal substrate exposed.	Water fills >75% of the channel, <25% of substrate exposed.	Water fills 25-75% of the channel, riffle substrate mostly exposed.	Very little water in channel and mostly present in standing pools.
Score:	12 (½11) 10	9 8 7	6 5 4	3 2 1

Photopoint Monitoring

	Location Description	Compass Heading	Landmarks
Witness Point			
Photopoint 1			
Photopoint 2			
Photopoint 3			

Date /time	Photographer	Photo-point #	Camera/lens/ film speed	Roll #/ frame #	Observations

total score: 7.75

Appendix C7 (page 1)
PFC Standard Checklist Form

Standard Checklist

Name of Riparian-Wetland Area: UCCE Example Creek

Date: 9/2/01 Segment/Reach ID: _____

Miles: _____ Acres: _____

ID Team Observers: _____

Yes	No	N/A	HYDROLOGIC
✓			1) Active floodplain inundated in "relatively frequent" events (1-3 years) current floodplain is.
		✓	2) Active/stable beaver dams beaver activity but no dams.
✓			3) Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region)
✓			4) Riparian area is widening or has achieved potential extent is starting to widen.
✓			5) Upland watershed is not contributing to riparian degradation

Yes	No	N/A	VEGETATION
	✓		6) Diverse age-class distribution (recruitment for maintenance/recovery) no mature/old class
✓			7) Diverse composition of vegetation (for maintenance/recovery)
✓			8) Species present indicate maintenance of riparian soil moisture characteristics
✓			9) Streambank vegetation is made up of those plants or plant communities that have root masses capable of withstanding high streamflow events
X			10) Riparian plants exhibit high vigor beaver activity on the willows
	✓		11) Adequate vegetative cover present to protect banks and dissipate energy during high flows
✓			12) Plant communities in the riparian area are an adequate source of coarse and/or large woody debris

Appendix C7 (page 2)

PFC Standard Checklist Form

Yes	No	N/A	EROSION DEPOSITION
	✓		13) Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy
✓			14) Point bars are revegetating
✓			15) Lateral stream movement is associated with natural sinuosity
✓			16) System is vertically stable
✓			17) Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks (Rationale for Rating)

vegetation still not at level it should be.

Summary Determination

Functional Rating:

_____ Proper Functioning Condition

__✓__ Functional – At Risk

_____ Nonfunctional

_____ Unknown

Trend for Functional – At Risk:

_____ Upward

_____ Downward

__✓__ Not Apparent

Are factors contributing to unacceptable conditions outside the control of the manager?

Yes ____

No __✓__

If yes, what are those factors?

_____Flow regulations

_____Mining activities

_____Upstream channel conditions

_____Channelization

_____Road encroachment

_____Oil field water discharge

_____Augmented flows

_____Other (specify) _____

(Revised 1998)

Appendix C8 (page 1)

Six Cross Section Composition Forms and One Cross Section Summary Sheet

CROSS SECTION COMPOSITION
(Transect Data)

Forest / District _____ / _____ Date 9/2/01

Drainage UCCE Example Creek

Examiners David, Theresa, Don Photo No's _____

Complex _____

Location _____

Transect No. 1 Feet/Step 3/1

Community Type	NUMBER STEPS	TOTAL STEPS	FEET Optional
per grass / Rabbit Brush / Sedge mix	7 5	12	36
bare ground / per grass / Rabbit brush	5	5	15
per grass / Sedge / Rush / Forb	4	4	12
Creek	2	2	6
per grass / Rush / Forb	1	1	3
Bare ground	2	2	6

ESTIMATED AVERAGE HT.	Sprout	Young	Mature	Decadent	Dead

LINE INTERCEPT CANOPY OF WOODY SPECIES (optional) _____

TOTAL FEET OF RIPARIAN (optional) _____

USDA Forest Service Gen Tech. Rep. RMRS-GTR-47.2000

Appendix C8 (page2)

Six Cross Section Composition Forms and One Cross Section Summary Sheet

CROSS SECTION COMPOSITION
(Transect Data)

Forest / District _____ / _____ Date 9/2/01

Drainage UCCE Example Creek

Examiners David, Don, Theresa Photo No's _____

Complex _____

Location _____

Transect No. 2 Feet/Step 3/1

Community Type	NUMBER STEPS	TOTAL STEPS	FEET Optional
Bare ground / Rabbit Brush	12	12	36
Per grass / Rabbit Brush	7 6	13	39
Per grass / Rush / Forb	3	3	9
Creek	2	2	6
bare ground	3	3	9

ESTIMATED AVERAGE HT.	Sprout	Young	Mature	Decadent	Dead

LINE INTERCEPT CANOPY OF WOODY SPECIES (optional) _____

TOTAL FEET OF RIPARIAN (optional) _____

Appendix C8 (page3)

Six Cross Section Composition Forms and One Cross Section Summary Sheet

CROSS SECTION COMPOSITION
(Transect Data)

Forest / District _____ / _____ Date 9/2/01

Drainage UCCE Example Creek

Examiners David, Don, Theresa Photo No's _____

Complex _____

Location _____

Transect No. 3 Feet/Step 3/1

Community Type	NUMBER STEPS	TOTAL STEPS	FEET Optional
Bare ground / Per grass / Rabbit Brush	8 6	14	42
Rush / Sedge / Per grass	4 1 3	8	24
Willow	1 1	2	6
Creek	2	2	6
bare ground	3	3	9

ESTIMATED AVERAGE HT.	Sprout	Young	Mature	Decadent	Dead
		4'			

LINE INTERCEPT CANOPY OF WOODY SPECIES (optional) _____

TOTAL FEET OF RIPARIAN (optional) _____

USDA Forest Service Gen Tech. Rep. RMRS-GTR-47.2000

Appendix C8 (page 4)

Six Cross Section Composition Forms and One Cross Section Summary Sheet

CROSS SECTION COMPOSITION
(Transect Data)

Forest / District _____ / _____ Date 9/2/01

Drainage UCCE Example Creek

Examiners David, Don, Theresa Photo No's _____

Complex _____

Location _____

Transect No. 4 Feet/Step 3/1

Community Type	NUMBER STEPS	TOTAL STEPS	FEET Optional
Bare ground / Per grass / Rabbit Brush	9 4 6	19	57
Rush / Per grass / Bare ground	1	1	3
Creek	3	3	9
Rush	1	1	3
Willow	2	2	6
Per grass / Sedge / Rush	4	4	12

ESTIMATED AVERAGE HT.	Sprout	Young	Mature	Decadent	Dead
		36'			

LINE INTERCEPT CANOPY OF WOODY SPECIES (optional) _____

TOTAL FEET OF RIPARIAN (optional) _____

Appendix C8 (page 5)

Six Cross Section Composition Forms and One Cross Section Summary Sheet

CROSS SECTION COMPOSITION
(Transect Data)

Forest / District _____ / _____ Date 9/2/01

Drainage UCCE Example Creek

Examiners David, Don, Theresa Photo No's _____

Complex _____

Location _____

Transect No. 5 Feet/Step 3/1

Community Type	NUMBER STEPS	TOTAL STEPS	FEET Optional
Bare ground / Sage Brush	9 1 3	13	36
Per grass / Sage Brush	2 4	6	18
Per grass / Rush	1 1	2	6
Creek	3	3	9
Willow	2	2	6
Sedge / Per grass / Rush	3	3	9

ESTIMATED AVERAGE HT.	Sprout	Young	Mature	Decadent	Dead
			5'		

LINE INTERCEPT CANOPY OF WOODY SPECIES (optional) _____

TOTAL FEET OF RIPARIAN (optional) _____

USDA Forest Service Gen Tech. Rep. RMRS-GTR-47.2000

Appendix C8 (page 6)

Six Cross Section Composition Forms and One Cross Section Summary Sheet

CROSS SECTION COMPOSITION
(Transect Data)

Forest / District _____ / _____ Date 9/2/01

Drainage UCCE Example Creek

Examiners David, Don, Theresa Photo No's _____

Complex _____

Location _____

Transect No. 6 Feet/Step 3/1

Community Type	NUMBER STEPS	TOTAL STEPS	FEET Optional
Per grass/Sedge/Sage Brush	5 2	7	21
Bare ground/Sage Brush	5	5	15
Willow	2	2	6
Creek	2	2	6
Sedge/Forb/Rush/Per grass	4	4	12
Bareground	2 1 3	6	18
Rosebush	1	1	3

ESTIMATED AVERAGE HT.	Sprout	Young	Mature	Decadent	Dead
			14'		

LINE INTERCEPT CANOPY OF WOODY SPECIES (optional) _____

TOTAL FEET OF RIPARIAN (optional) _____

Appendix C8 (page 7)

Six Cross Section Composition Forms and One Cross Section Summary Sheet

CROSS SECTION SUMMARY SHEET

Forest/District _____ / _____ Date Compiled 9/2/01

Drainage UCLE Example Creek

Examiners David, Don, Theresa

Complex _____

Transect No's _____

Community Type	T_1 Steps	T_2 Steps	T_3 Steps	T_4 Steps	T_5 Steps	T_6 ~~10Pnt.~~	PCT COMPOSITION
Per grass / Rabbit Brush / Sedge mix	12						7.5
Bare ground / Per grass / Rabbit Brush	5		14	19			23.8
Per grass / Sedge / Rush / Forb	4					4	5
Bare ground / Sage Brush					13	5	11.3
Per grass / Rush / Forb	1	3					2.5
Bareground	2	3	3			6	8.8
Bare ground / Rabbit Brush		12					7.5
Per grass / Rabbit Brush		13					8.1
Rush / Sedge / Per grass			8	4	3		9.4
Willow			2	2	2	2	5
Rush / Per grass / Bare ground				1			0.6
Rush				1			0.6
Per grass / Rush					2		1.2
Per grass / Sage Brush					6		3.8
Rosebush						1	0.6
Per grass / Sedge / Sage Brush						7	4.4
Total							

Grand Total 160 100

TOTAL UNDISTURBED TYPES (PERCENT) 15

Total Steps ea. CT. / Grand Total Steps = Composition

✓ 15 Status (check)

_____ 0 – 15 = very early seral

_____ 16 – 40 = early seral

_____ 41 – 60 = mid seral

_____ 61 – 85 = late seral

_____ 85 + = PNC

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WOODY SPECIES REGENERATION

Forest / District _____ / _____ Date 9/2/01

Drainage UCCE Example Creek

Examiners David, Don, Theresa Photo No's _____

Complex _____

Location _____

Transect No. _____ Ft/Step = 2.5/1

Species	Seedling / Sprout		Young / Sapling		Mature		Decadent		Dead	
	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right
Willow	1	2	1	1	1	1				
Willow	1	2	1		1					
Willow	1		1		1					
Willow	1		1		1					
Willow					1					
Total	17	34	18	15	16	11				
Total (L&R)	5		33		27					

Average Height (Optional)

Tree Layer	
Shrub Layer	
Herb Layer	

Use dot count method to record numbers, e.g.:

⁘ = 4

⁞ = 8

⊠ = 10

FOR MORE INFORMATION

You'll find detailed information on many aspects of rangeland and riparian management in these titles and in other publications, slide sets, CD-ROMs, and videos from UC ANR:

California Guidelines for Residual Dry Matter (RDM) Management on Coastal and FoothillAnnual Rangelands, publication 8092

Sediment Delivery Inventory and Monitoring: A Method for Water Quality Management in Rangeland Watersheds, publication 8014

Visual Assessment of Riparian Health, publication 8089

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