LANDSMART™ FOR RANGELANDS
RANCH PLAN
[RANCH NAME]

Prepared for:

Prepared by: Sonoma Resource Conservation District

[Date]

SONOMA
RESOURCE CONSERVATION DISTRICT

LandSmart
Productive lands. Thriving streams.

CONTENTS

INTRODUCTION

This LandSmart ™ for Rangelands template, in conjunction with workshops and one-on-one assistance (as needed), is intended to guide you through the process of inventorying property features such as paddocks, pastures, and waterways and roadways, documenting conservation practices that you currently use, and helping you to select additional conservation practices, when needed, to protect water quality, water quantity, and other natural resources. The resulting plan is intended to be a working document to record your decisions and your progress. The plan will help you to identify locations where photo monitoring should be conducted to document your use of conservation practices. These photos along with records you keep can help you evaluate how various conservation practices work within your ranch and, if needed, they can help you demonstrate to others the steps you have taken to protect and improve natural resources. Lastly, the plan will provide you with an easy to reference summary of conservation practices that you use and that you intend to implement.

The LandSmart ™ for Rangelands Ranch Plan Template consists of several worksheets that you will complete. The top of each worksheet has information and/or directions, and as you work your way through the worksheet additional instructions may be provided based upon your responses to some questions. The questions and follow-up instructions are designed to help you identify which areas of your property could receive the most benefit from implementation of additional conservation practices. Potential conservation practices to implement reference the Natural Resource Conservation Service conservation practice standards. The worksheets also include tables to help you document existing and planned practices. You will be able to complete some of the worksheets quite easily. Other worksheets will take more time and will involve some field assessment, perhaps even some assistance from a resource professional (NRCS, RCD, or other professional).

This template purposefully covers topics of interest to most rangeland managers and has been developed with a focus on water quality. The LandSmart™ for Rangeland template builds upon the "Ranch Water Quality Plan, Compliance Monitoring & Annual Certification Templates" developed by the University of California Cooperative Extension (UCCE) for the Conditional Waiver of Waste Discharge Requirements for Grazing Operations in the Napa River & Sonoma Creek Watersheds. This document is referenced throughout the LandSmart™ template as "UCCE Plan." There are many sections where, if you have already completed the UCCE Plan, you can attach the completed plan and skip those sections here. Other sections of the LandSmart™ Plan are additional to the information in the UCCE Plan, and those should be completed here.

You may have additional conservation and land management interests beyond water quality regulations. The LandSmart ™ for Rangelands program is intended to help you with those interests as well. If you need assistance to meet your land management and conservation goals,

whether or not the topic is covered in this ranch plan template, please do not hesitate to contact your local Resource Conservation District (RCD) office.

Contact Information

NRCS Napa Field Office: 707-252-4189
NRCS Petaluma Field Office: 707-794-1242

Napa County RCD: 707-252-4188
Sonoma RCD : 707-569-1448
Mendocino County RCD: 707-462-3664

PROPERTY DESCRIPTION

PROPERTY INFORMATION

Basic Information (Page 8 of the UCCE Plan). If you have completed the UCCE Plan, please attach that plan and skip this section.

<table>
<tr><th colspan="3">Ranch/Farm Location</th></tr>
<tr><td colspan="3">Ranch/Farm Name:</td></tr>
<tr><td colspan="2">Mailing Address, or P.O. Box:</td><td>County:</td></tr>
<tr><td colspan="2">City, State, Zip Code:</td><td rowspan="3">What Water Board region(s) is the ranch/farm in?
☐R1 (North Coast)
☐ R2 (San Francisco Bay)
☐R3 (Central Coast)
☐ R4 (Los Angeles)
☐R5 (Central Valley)
☐ R6 (Lahontan)
☐ R7 (Colorado River)
☐R8 (Santa Ana)
☐ R9 (San Diego)</td></tr>
<tr><td>Phone:</td><td>Size (acres):</td></tr>
<tr><td colspan="2">List all Assessor Parcel Numbers (APNs) or legal description (Township, Range, Sections) for each parcel, pasture, or silage field included in this plan:</td></tr>
<tr><th colspan="3">Owner</th></tr>
<tr><td colspan="3">Name(s):</td></tr>
<tr><td colspan="3">Mailing Address or P.O. Box: ☐ same as ranch address</td></tr>
<tr><td colspan="3">City, State and Zip Code:</td></tr>
<tr><td colspan="3">Phone: E-mail (optional):</td></tr>
<tr><th colspan="3">Tenant/Manager (if not owner)</th></tr>
<tr><td colspan="3">Name(s):</td></tr>
</table>

Mailing Address or P.O. Box: ☐ same as ranch address	
City, State and Zip Code:	
Phone:	E-mail (optional):

Plans & Certifications			
Check the box for the plans, certifications or other documents that exist for the ranch:			
☐ Conservation Easement	☐ Dairy Quality Assurance Program	☐ Erosion Control Plan	☐ Fire Mngt. Plan
☐ Fish Friendly Farming	☐ Grass-Fed Certification	☐ Grazing Mngt. Plan	☐ UCCE Ranch Plan
☐ Salmon Safe Certification	☐ NRCS Conservation Plan	☐ Dairy Nutrient Mngt.	☐Dairy Waste Mngt. Plan
☐ Timber Harvest Plan	☐ Organic Certification	☐	☐
☐	☐	☐	☐

Operations and Land Use (this information is additional to the UCCE Plan)

Land Use Activity	*Area/Length*		*Notes*
Livestock (note type):		acres	How many?
Livestock (note type):		acres	How many?
Livestock (note type):		acres	How many?
Grazed/Rangeland		acres	
Roads (paved and unpaved)			
Other paved areas and buildings		Acres	
Forest/Woodland/Chaparral		Acres	
Open Space/Fallow/Undeveloped		Acres	
Reservoir/Pond (footprint)		Acres	

Stream/River/Creek/Riparian (USGS blue-line)			
Stream/River/Creek/Riparian (non USGS blue-line)		feet	
Drainage Ditch/Canal		feet	
Other Farming Facilities		acres	
Other Land uses			
Total Acres			

RANCH GOALS (OPTIONAL)

Page 9 of the UCCE Plan. If you have completed the UCCE Plan, please attach that plan and skip this section.

Ranch goals are divided into production, quality of life and natural resource goals. These goals should reflect what you are trying to accomplish on your property. They are used to identify management strategies and practices for accomplishing your goals as well as to help you identify goals that might conflict with each other. Check any goal statements below which reflect your plans, reword them if needed and/or write-in your own words.

Production
☐ pass on the farm/ranch to the next generation
☐ reduce family/farm debt
☐ expand farm/ranch enterprises
☐ develop new enterprises
☐ increase farm/ranch profitability
☐ reduce operating costs
☐ purchase or lease more ranch/farm property
☐ other:
Quality of Life
☐ reduce energy consumption in the farm/ranch operation
☐ provide for our children's college education
☐ provide financial or other support for community organizations
☐ reduce household operating expenses
☐ build an emergency fund
☐ raise livestock or crops during retirement
☐ build a retirement fund
☐ other:
Natural Resources & Water Quality
☐ manage rangeland to protect soil from erosion
☐ manage cropland, pastureland or forestland to protect soil from erosion
☐ manage ranch roads to reduce movement of sediment into streams and other water bodies
☐ reduce erosion of streambanks and gullies

☐	manage to increase tree cover and/or ground cover in riparian areas or along streams
☐	reduce concentration of livestock in or near streams, wetlands, or other water bodies
☐	manage to reduce entry of sediment, nutrients and pathogens to streams or wetlands
☐	reduce wildfire hazard
☐	maintain or enhance oak woodland, native grass, or other plant communities
☐	maintain or enhance wildlife or fisheries habitat or other aquatic resources
☐	reduce/manage invasive weeds
☐	reduce/manage predator impacts on the ranching operation
☐	meet water quality regulations
☐	improve water holding capacity of your soil, increase forage production
☐	utilize alternative water storage, water conservation strategies

Off-site Conditions Outside of Landowner Control (this information is additional to the UCCE Plan)

If there are any upslope and/or upstream land uses or conditions within the watershed that are out of your control that may influence your ability to effectively implement conservation practices to protect water quality on your property, please describe them below.

Describe as needed:

RANCH MAP SUMMARY

Maps will be an important part of your LandSmart™ for Rangelands Plan and will serve as an easy reference for you. Maps should be prepared on a topographic map, an aerial photograph, or a Google Earth image (minimum 1" = 1,000' or 1:12,000 scales). More than one map may be used to display the information needed to complete your plan. A more detailed map (scale of 1" = 500' or 1:6,000' may be needed to accurately depict stream channels, riparian corridors, or other small scale features. Each map should have a legend and should clearly display the features that are identified in your plan.

You may already have maps of the property to meet the mapping needs identified below. In this case, you may wish to include (or reference) existing maps in your Ranch Plan and alleviate the need to prepare new maps.

If you need assistance with mapping, RCD staff is available to assist you.

The below tables provide a summary of features mapped for inclusion in your Ranch Plan. Please indicate below which features are displayed on your Ranch Plan map(s) by checking the boxes as indicated. Maps should be kept with the Ranch Plan.

Page 15 from the UCCE Plan. If you have completed the UCCE Plan, and you completed this optional section, please attach that plan and skip this section. If you have completed the UCCE Plan, but did not complete this optional section, please complete it here.

Mapping
Watershed Assessment
What types of stream(s) are on the ranch/farm? ☐ Seasonal (intermittent) ☐ Perennial ☐ Both Name(s) of stream(s) on your ranch/farm (if named): _____ Name of sensitive river, waterbody or wetland downstream (lake, bay, etc.): _____

Is a municipal or domestic water supply source downstream? ☐ Yes ☐ No ☐ Not Sure

The below information is additional to the UCCE Plan.

Mark X if mapped, or N/A if not applicable		**Notes**
	Topography (identify area with slope <5% and areas with slope >30%)	
	Areas under consideration for future pasture	
	Non-livestock land uses	
Ranch Facilities – *Give each area/feature a name or number for easy reference.*		
	Equipment yards and/or staging areas	
	Manure Storage Areas	
	Areas for manure spreading	
	Composting area	
Soils, Erosion Control, Management & Structures – *Give each area/feature a name or number for easy reference.*		
	Soil type(s) with erosion rating(s) (map from http://websoilsurvey.nrcs.usda.gov)	
	Drainage system (diversion ditches, storm drains, and underground outlets with inlets and outlets)	

	Sediment/attenuation/energy dissipation basin(s)	
	Vegetated buffer strips/filter strips	
	Erosion features on land associated w/ the ranch facility (i.e. gullies, rills, landslides, mudflows, rock falls)	
	Other:	
Waterways – ***Give each area/feature a name or number for easy reference.***		
	Human-made Waterways (non-roadside ditches)	
	Swale(s)	
	Spring(s)	
	Wetland Area(s)	
	Reservoir/Pond/lake(s) (indicate pipe or open channel spillway location)	
	Known barriers to fish migration	
	In-stream structures that may affect stream morphology or cause erosion	
	Erosion features in waterways associated with the ranch facility and roads(i.e. streambank erosion, channel incision)	
Roads - ***Identify with a name and indicate if public, private and/or easements***		
	Surfaced (paved, gravel, etc.) roads	
	Unsurfaced (dirt, vegetated etc) roads	

	Abandoned (tail or non-used) roads	
	Waterway crossings (indicate whether freespan bridge, culvert, ford, etc.)	
	Roadside ditches	
	Road drainage structures (ditch relief culverts, waterbars, rolling dips, etc.)	
	Erosion features on land associated with roads (i.e. gullies, rills, landslides, mudflows, rock falls)	
	Other:	
Other areas to map – ***Give each area/feature a name or number for easy reference.***		
	Equipment storage areas	
	Agrichemical mixing areas	
	Agrichemical storage areas	
	Maintenance and repair locations	
	Refueling locations	
	Motor oil recycling	
	Fuel Storage	
Monitoring Photo-points – ***Give each point a number for easy reference.***		
	Photo-points for annual monitoring	
	Photo-points for management practice implementation and annual maintenance	
	Photopoints of points of discharge	

	Photo-points to demonstrate condition downstream of discharge points	
	Photo-points to track “areas to watch” – e.g. areas with erosion or invasive weeds that you want to track over time	

FIELD/PASTURE INVENTORY

Page 10 from the UCCE Plan. If you have completed the UCCE Plan, and you completed this optional section, please attach that plan and skip this section. If you have completed the UCCE Plan, but did not complete this optional section, please complete it here.

Describe each pasture, paddock and open rangeland on the ranch/farm with estimations of area, slope, and woody vegetation cover. Large or complex pastures may be subdivided into subsection units for management and/or mapping purposes. Estimate the minimum objective for Residual Dry Matter (RDM) monitoring using Tables 1-3 from http://anrcatalog.ucdavis.edu/RangelandMonitoringSeries/8092.aspx. Note the season(s) or months when livestock are moved in/out of the pasture each year and soil types(s) or series(s) if known.

Field #	Location (Name or #)	Season(s) of Use	Soil(s)	Size *(acres)*	Slope (%)	Woody Vegetation Cover (%)	RDM Minimum (lb/ac)

PASTURE AND WATER MANAGEMENT

Background: Pastures are areas where grass is grown for forage for livestock and maintained to prevent erosion and protecting a pasture's soil and vegetative cover will help to maintain pasture productivity. Soil erosion usually occurs when vegetative cover is removed and soil is left unprotected during the winter months. Soil erosion in pastures is usually the result of poor grazing management. Over stocking a pasture and allowing livestock to graze forage down to bare ground is probably the single fastest way to destroy the pasture and soil resource. Livestock can be very disruptive to soil in other ways as well. If animals are allowed to graze during periods of irrigation or heavy rainfall they can compact the soil and destroy plant cover. Livestock trails can also cause the soil to erode specially on steeper slopes where runoff water finds its way into the ruts that are formed by the animals. Areas along water courses such as streambanks are particularly susceptible to erosion caused by livestock, especially if alternate watering facilities are not adequate. Riparian areas are also prone to overuse by livestock seeking shade and riparian growth to browse on. If livestock are not well distributed over the pasture the likelihood of overgrazing and potential for soil erosion becomes greater. While adverse conditions in these areas may not be caused by current livestock grazing activities, it is important to describe all conditions accurately, regardless of cause.

There are a number or ways ranchers can improve water management on pastures through their irrigation delivery systems and crop and soil management. Improvements in irrigation scheduling, delivery and management, and matching water supply to crop needs can be utilized. Systems can be created that require less water or make better use of what's available via aquifers, streams, rivers, ponds or precipitation.

Purpose: Identify practices currently in use and that are intended for implementation to:

- ✓ Maintain grass cover on pastures (can be dry grass at the end of the season) to protect soil from erosion and to maintain plant vigor.
- ✓ Control livestock access to creeks and ponds when possible; provide other sources of drinking water.
- ✓ Provide extra protection in riparian areas to prevent erosion and over-use.
- ✓ Practice rotational grazing; divide up pastures and move livestock from one to another to allow pastures to rest and recover.
- ✓ Develop water sources, shade structures or other attractants to attract livestock to remote portions of pastures.
- ✓ Manage weeds for pasture health and animal health.
- ✓ Manage soil for water holding capacity. Applying practices that build soil quality, resulting in a porous, well-structured soil that allows water to infiltrate and holds it there for use by plants.
- ✓ Manage plants and livestock to maximize water availability. Selecting plants, such as drought-tolerant species and native varieties that maximize water availability in crop rotations or pastures.

- ✓ Manage water carefully. Treating water like a precious resource, capturing, conserving and recycling it, where appropriate, among farming enterprises.

Pasture/Ranch Assessment (Adapted from page 11 of the UCCE Plan). If you have completed the UCCE Plan, please attach that plan and skip this section. Where potential concerns are identified, please reference the conservation practice recommendations noted below.

Question	Potential Concern (Source)	Location (*pasture/field*) & Describe Condition	Cause* (*C, H, or N*)
SEDIMENT			
RANGELAND & PASTURE/CROP FIELDS			
PM1. Bare soil visible throughout the rainy season? *If potential concern noted, consider practices #1 and 2 listed in table PM1 below*	☐Yes ☐No ☐Not Sure		
PM2. Rill or sheet erosion present? *If potential concern noted, consider practices #1, 2, and 3 listed in table PM1 below*	☐Yes ☐No ☐Not Sure		
PM3. Gullies, slumps, or headcuts present? *If potential concern noted, consider practices #1, 2, 4, 6 and 7 listed in table PM1 below*	☐Yes ☐No ☐Not Sure		
ROADS (see Roads & Crossings section later in this document)			

PATHOGENS AND NUTRIENTS			
LIVESTOCK DISTRIBUTION (see Stormwater Management section later in this document for additional questions)			
PM4. Corrals used throughout the winter?	☐Yes ☐No ☐Not Sure		
PM5. Feeding, salting, or watering areas near stream? *Please indicate these areas on your facility map. If potential concern noted, consider practices #5 and 6 listed in table PM1 below*	☐Yes ☐No ☐Not Sure		
PM6. Do livestock congregate in the stream? *If potential concern noted, consider practices #5through 8 listed in table PM1 below*	☐Yes ☐No ☐Not Sure		
MANURE MANAGEMENT (see Manure Storage & Nutrient Management section later in this document)			

***C**urrent livestock management (**C**); a **H**istoric legacy site (**H**); or **N**atural causes (**N**).

PM7. Do you monitor your pastures for Residual Dry Matter (RDM)?
RDM is the old plant material left standing or on the ground at the beginning of a new growing season. It indicates the combined effects of the previous season's forage production and its consumption by grazing animals of all types. RDM remaining in the fall will influence subsequent species composition and forage production. The purpose of RDM monitoring is to collect information in a practical manner that is adequate to assess grazing objectives and make management adjustments when needed.

☐ Yes, describe below.

☐ No (Consider practice # 1, listed in Table PM1 below and refer to the **RDM and Photo Monitoring Form** on page 65.)

PM8. Do you practice rotational grazing?

☐ Yes
☐ No (Consider practice #2 in Table PM1 below)

PM9. Does the livestock have direct, unlimited access to drainage ways, stream channels or ponds?

☐ Yes (Consider practices #5 through 7 in Table PM1 below) ☐ No

PM10. Is the livestock moved from the pastures when necessary to protect the pastures from erosion and damage to grass? (i.e. when the soil is saturated or when they have grazed it to 4 inches or lower.)

☐ Yes ☐ No (Consider practices# 2 and 3 in Table PM1 below)

PM11. Do you manage your pastures to limit or control weeds?

☐ Yes ☐ No (Consider practice #11 in Table PM1 below)

PM12. What type of shade is provided for livestock on pastures? How far is it located next to surface water? (Consider practice #5 in Table PM1 below)

Water Sources and Management

PM13. Check all sources of water that are utilized.

☐ Surface Water

☐ Ground Water

☐ Municipal Water

☐ Reclaimed / Recycled Water (from off-site)

☐ Reclaimed / Recycled Water (from site)

☐ Harvested Rainwater

☐ Other (list)

Describe as needed:

PM14. What water sources are provided for livestock on pastures? How far are they located from surface water? Please indicate water sources on your facility map. (Consider practice # 6 in Table PM1 below)

Describe as needed:

PM15. Are pasture areas irrigated?

☐ Yes (Consider practice # 9 in Table PM1 below, and answer A through F below) ☐ No (Skip to Question PM17.)

A. Irrigation systems were designed by an agricultural engineer, irrigation consultant or other professional.

☐ Yes
☐ No (Consider practice #20 in Table PM1 below)

Describe as needed:

B. Irrigation is scheduled and applied according to plant needs as determined by water monitoring and management tools (e.g., soil moisture sensors, weather stations, etc.) and visual observations.

☐ Yes
☐ No (Consider practices # 10 and 11, in Table PM1 below)

Describe as needed:

C. Water management techniques such as delayed onset of irrigation or dry farming are considered and used to meet ranch conservation goals.

☐ Yes
☐ No (Consider practices # 10,11 and 12, listed in Table PM1 below)

Describe as needed:

D. Irrigation systems are monitored for leaks and performance, and maintained regularly.

☐ Yes

☐ No (Consider practices # 13, listed in Table PM1 below)

Describe as needed:

E. Water use is monitored with a flow meter and documented.

☐ Yes
☐ No (Consider practices # 14 and 15, listed in Table PM1 below)

Describe as needed:

F. Reclaimed, recycled and harvested water are utilized to the extent practicable with consideration of the areas where agricultural irrigation with recycled water is shown to be safe for humans and ecosystems.

☐ Yes
☐ No (Consider practice # 16 and 17, listed in Table PM1 below)

Describe as needed:

PM16. Do you plan early for determining your animals' forage needs?

☐ Yes ☐ No (Consider practice #18 in Table PM1 below)

Describe as needed:

PM17. Riparian buffers, filter strips, grassed waterways, or other types of conservation buffers near streams or other sources of water are established and maintained.

☐ Yes ☐ No (Consider practice # 19 in Table PM1 below)

Describe as needed:

Table PM1: Conservation Practices for Pasture and Water Management

The following table provides an assortment of management practices that are intended to protect water quality. Implementation of all practices is not necessary or required. Selection of practices must be done on a site-specific basis and an assortment of practices to protect water quality and to suit your circumstance should be selected. NRCS Practice Titles are provided for your reference.

Conservation Practice	*NRCS Practice Title*	*Practice Implementation Date*	*Location*
1.Monitor for RDM			
2. Divide pastures for rotational grazing	Fence (382) Animal Trails and Walkways (575)		
3.Provide a stable, non eroding surface for areas frequently used by	Heavy Use Area Protection (561)		

animals			
4. Stabilize active gullies	Grade Stabilization Structure (410)		
5. Provide additional salting and feeding and shade areas to animals to improve distribution			
6.Provide additional water sources to animals to improve distribution	Watering Facility (614) Livestock Pipeline (516)		
7.Install riparian fencing to control animal access to waterways	Fence (382)		
8.To provide protection against stream erosion	Range Planting (550)		
9. Conduct an irrigation audit and implement system improvements accordingly (every 3 years recommended)	Irrigation Water Management (449)		
10. Install and utilize soil moisture monitoring devices	Irrigation Water Management (449)		
11. Install and utilize a weather monitoring system or utilize a near-by CIMIS weather station.	Irrigation Water Management (449)		
12. Upon reseeding, consider more drought tolerant plant species			
13. Conduct periodic monitoring during the season of use and repair as necessary	Irrigation Water Management (449)		
14. Install and utilize flow meters to monitor and record water use	Irrigation Water Management (449)		

15. Inspect and calibrate flow meters			
16. Consider options for reclaimed / recycled water, including possibility of recycled water from local treatment plants that may be available for trucking			
17. Consider rainwater harvesting and storage, particularly if there are large buildings on-site			
18. Contract early to make sure you will have enough hay during dry times or find alternative feed sources			
19. Establish and maintain vegetation near stream for water storage for later use.			
20. Consult a professional			

STORMWATER DRAINAGE

Background: Rainwater flowing across the land, or in channels or pipes is called Stormwater Runoff. If stormwater runoff is allowed to erode soil from bare areas or run through manured areas, it becomes polluted and must not be allowed to enter a stream. High use areas, such as buildings, corrals, holding facilities, etc., are areas that must be managed to keep clean water from becoming polluted. Diverting fresh water around high-use areas will keep the "clean water clean" and minimize the runoff from high-use areas. By keeping the size of high-use areas small, managing polluted water can be reduced. It is much easier to manage the clean water than treat the water once it becomes polluted.

Purpose: Identify practices currently in use and that are intended for implementation to:

- ✓ Keep clean water clean.
- ✓ Do not mix with waste water or allow it to run through any confinement areas.
- ✓ Convey stormwater drainage such that erosion and soil loss are prevented

Roof Drainage (if applicable)

* Note there are approximately 7.5 gallons of water in a cubic foot. Therefore a 100 square feet (10 foot x -10 foot) of impervious area, such as a roof, will capture, yield approximately 62.5 gallons of rainwater with each inch of rainfall. This statistic may prove helpful in evaluating your current runoff management from barn roofs.

SW1. Do you have gutters and down spouts on all barn roofs?

☐ Yes ☐ No (Consider practice #1 in Table SW1 below)

If yes, where do the gutter outlet?

SW2. Do the down spouts tie into a drainage system that keeps the clean water away from contaminants such as bare ground?

☐ Yes ☐ No (Consider practices # 2 and 3, listed in Table SW1 below)

SW3. If you do not have gutters on every building, is the clean water kept out of the contaminated areas (areas with manure or bare ground)?

☐ Yes (If so, how?) ☐ No (Consider practices # 1 and 4 listed in Table SW1 below)

Describe as needed:

Property Drainage

SW4. Do you have drainage systems installed on your property?

☐ Yes (Please indicate these systems on your site plan map) ☐ No

SW5. Do you have a back up plan in case of system failure? Please explain below.

☐ Yes ☐ No

Describe as needed:

SW6. Do all of the drainage systems that carry contaminated water outlet into a filter area? Please explain.

☐ Yes ☐ No (Consider practice #5 in Table SW1 below)

Describe as needed:

SW7. Do you combine your clean and contaminated water into the same outlet area? Please explain.

☐ Yes ☐ No

Describe as needed:

The following question is adapted from page 11 of the UCCE Plan. If you have completed the UCCE Plan, please attach that plan and skip this section. Where potential concerns are identified, please reference the conservation practice recommendations noted below.

Question	Potential Concern (Source)	Location (*pasture/field*) & Describe Condition	Cause* (*C, H, or N*)
PATHOGENS AND NUTRIENTS			
LIVESTOCK DISTRIBUTION			
SW8. Storm runoff from corrals connects to stream? *If potential concern noted, consider practices # 2 and 5, listed in Table SW1 below*	☐Yes ☐No ☐Not Sure		

***C**urrent livestock management (**C**); a **H**istoric legacy site (**H**); or **N**atural causes (**N**).

Table SW1: Conservation Practices for Management of Stormwater Drainage

The following table provides an assortment of management practices that are intended to protect water quality. Implementation of all practices is not necessary or required. Selection of practices must be done on a site-specific basis and an assortment of practices to protect water quality and to suit your circumstance should be selected. NRCS Practice Titles are provided for your reference.

	NRCS Practice Title	*Practice Implementation Date*	*Location*
1. Install roof gutters and down spouts	Roof Runoff Structure (558)		
2.Divert water away from contaminated areas	Diversion (362)		
3.Tie down spouts into a drainage system	Roof Runoff Structure (558)		
4.Install a roof or cover to divert clean water from animal management areas	Roof and Covers (367)		
5.Plant a vegetative filter strip	Filter Strip (393)		
Other:			

NATURAL WATERWAYS, DITCHES, AND SPILLWAYS

Waterways, channels and streams, swales, ditches, and riparian areas are sensitive to agricultural, forest, and other land use activities and practices. These waterways also may act as a conduit for sediment and other pollutants. Healthy riparian zones provide a number of environmental benefits and may protect streambanks from erosion. Riparian areas also buffer waterways from the effects of potential nutrient, pesticide, pathogen and sediment runoff.

Purpose: Describe the condition of natural stream channels, riparian areas, and human-made waterways (non-roadside ditches and pond/basin spillways) on the property including the rate of bed and/or bank erosion, channel incision, head-cutting and the condition of human-made structures in the channel. While adverse conditions in these areas may not be caused by current livestock grazing activities, it is important to describe all conditions accurately, regardless of cause. Describe the conservation practices being implemented to protect waterways from water quality degradation.

W1.The waterways on the property that are on or adjacent to the ranch facility are:

☐ All natural ☐ Mixed ☐ All ditches and spillways ☐ No Waterways (Continue to Question W19)

W2. Complete this inventory of waterways on the property

Waterway Name (Labeled on Map)	**Channel Top Width (ft)** 0-10, 11-25, 26-50, 51-100, 101-200, 200+	**Channel Condition** Stable, incising, head cutting, widening, aggrading/bank slough	**Riparian Corridor Width (ft)** 0-10, 11-25, 26-50, 51-100, 101-200, 200+	**Riparian Corridor** Minimal, sparse vegetation, dense veg, overgrown

W3. Activities and/or features (e.g. vegetation removal, equipment turnarounds) are within County-required setbacks and in compliance with County requirements.

Describe as needed:

Managing Erosion and Water Quality in Natural Waterways

Adapted from Page 12 of the UCCE Plan. If you have completed the UCCE Plan, please attach that plan. Where potential concerns are identified, please reference the conservation practice recommendations noted below.

Question	Potential Concern	Location (*pasture/stream*) & Describe Condition	Cause* (*C, H, or N*)
STREAM CHANNEL			
W4. Bare soil along banks of stream? *If Potential Concern noted, consider practices # 1, 3, 4 and 5, listed in Table W1 below.*	☐Yes ☐No ☐Not Sure		
W5. Unstable or eroding stream banks? *If Potential Concern noted, consider practices #1 , 2, 4 and 5, listed in Table W1 below and refer to Sediment Delivery Inventory and Monitoring guidance located here: http://anrcatalog.ucdavis.edu/pdf/8014.pdf*	☐Yes ☐No ☐Not Sure		
W6. Does the stream have the potential to support trees (look for remnant trees/shrubs along the channel)?	☐Yes ☐No ☐Not Sure		
W7. Are crossings for livestock unstable? *If Potential Concern noted, consider practices # 1 and 6, listed in Table W1 below*	☐Yes ☐No ☐Not Sure		

W8. Grazing in riparian areas takes place all season? *If Potential Concern noted, consider practices # 1, 7 and 8, listed in Table W1 below*	☐Yes ☐No ☐Not Sure		
STREAM TEMPERATURE			
W9. Is stream exposed to full sun? *If Potential Concern noted, consider practices # 1 and 3 through 5, listed in Table W1 below*	☐Yes ☐No ☐Not Sure		
W10. Wide and shallow streams?	☐Yes ☐No ☐Not Sure		
W11. Does stream flow appear inadequate, given stream channel size?	☐Yes ☐No ☐Not Sure		
NUTRIENTS			
W12. Algae growth excessive in stream? *If Potential Concern noted, consider practices # 1, 4, 5, 7, and 8, listed in Table W1 below*	☐Yes ☐No ☐Not Sure		

* Note any recorded problem conditions as caused by: **C**urrent livestock management (**C**); a **H**istoric legacy site (**H**); or **N**atural causes (**N**).

W13. Agricultural supplies (heaters, trellis parts, irrigation supplies, machinery, etc.) are stored outside of the required waterway setback during winter months.

☐ All supplies
☐ Some supplies
☐ No supplies (Consider practice #9, listed in Table W1 below)

Describe as needed:

Table W1: Conservation Practices to Reduce Erosion in Natural Waterways

The following table provides an assortment of management practices that are intended to protect water quality. Implementation of all practices is not necessary or required. Selection of practices must be done on a site-specific basis and an assortment of practices to protect water quality and to suit your circumstance should be selected. NRCS Practice Titles are provided for your reference.

Practice	*NRCS Practice Title*	*Implementation Date*	*Location*
1.Consult a Professional			
2. Apply treatments to stabilize and protect streambanks	Streambank and Shoreline Protection (580)		
3.Remove invasive riparian plants	Restoration & Management of Declining Habitats (643)		
4.Establish native riparian trees and shrubs	Riparian Forest Buffer (391)		
5.Establish native riparian grasses and forbs	Riparian Herbaceous Cover (390)		
6. Provide stable livestock crossings	Stream Crossing (578)		
7.Provide additional water sources to animals to improve distribution	Watering Facility (614) Livestock Pipeline (516)		
8.Install riparian fencing to control animal access to waterways	Fence (382)		
9.Provide more space to the stream by setting back structures and storage areas			
Other:			

Enhancing Native Vegetation, Fish and Wildlife Habitat in Natural Waterways and Riparian Areas (Optional)

W14.Riparian areas have a variety of native vegetation that includes grasses, forbs, trees and shrubs.

☐ All banks
☐ Some banks
☐ No banks (Consider practices # 2, 3 and 4, listed in Table W2 below)
☐ Not Applicable

Describe as needed:

W15.Riparian areas have non-native/invasive plants.

- ☐ All banks (Consider practices # 1 through 4, listed in Table W2 below)
- ☐ Some banks
- ☐ No Banks
- ☐ Not Applicable

Describe as needed:

W16. There are structures within waterways known or suspected to cause obstruction to fish passage.

- ☐ Yes (Consider practices # 1 and 5, listed in Table W2 below)
- ☐ No
- ☐ Not Applicable

Describe:

W17. There is habitat complexity with the stream channel, including deep pools that stay wet even if/when the rest of the stream channel is dry and structures such as wood, boulders, and over-hanging roots that slow down fast-moving water in high flows and provide shelter in pools when flows are lower.

- ☐ All waterways
- ☐ Some waterways
- ☐ No waterways (Consider practices # 1 and 6, listed in Table W2 below)
- ☐ Not Applicable

Describe as needed:

Table W2: Conservation Practices to Enhance Native Vegetation, Fish and Wildlife Habitat in Natural Waterways and Riparian Areas

The following table provides an assortment of management practices that are intended to enhance waterways and riparian areas. Implementation of all practices is not necessary or required. Selection of practices must be done on a site-specific basis and an assortment of practices to protect water quality and to suit your circumstance should be selected. NRCS Practice Titles are provided for your reference.

Practice	*NRCS Practice Title*	*Implementation Date*	*Location*
1.Consult a Professional			
2.Remove invasive riparian plants	Restoration & Management of Declining Habitats (643)		
3.Establish native riparian trees and shrubs	Riparian Forest Buffer (391)		
4.Establish native riparian grasses and forbs	Riparian Herbaceous Cover (390)		
5.Modify instream structures to improve fish passage	Stream Habitat Improvement and Management (395)		
6. Install in-stream structures to enhance habitat	Stream Habitat Improvement and Management (395)		

Other:			

Managing Erosion and Water Quality in Non-Roadside Ditches

W18.Ditch beds are stable (not sloughing, downcutting, nor eroding).

☐ All banks
☐ Some banks
☐ No Banks (Consider practices # 1 through 5, listed in Table W3 below)
☐ Not Applicable

Describe as needed:

Table W3: Conservation Practices to Reduce Erosion and Manage Stability and Conveyance in Non-Roadside Ditches

The following table provides an assortment of management practices that are intended to protect water quality. Implementation of all practices is not necessary or required. Selection of practices must be done on a site-specific basis and an assortment of practices to protect water quality and to suit your circumstance should be selected. NRCS Practice Titles are provided for your reference.

Practice	*NRCS Practice Title*	*Implementation Date*	*Location*
1.Consult a Professional			
2.Establish native grasses and forbs	Riparian Herbaceous Cover (390)		
3.Line an eroding swale or diversion ditch	Lined waterway or outlet (468)		
4.Install rock check structures to dissipate hydraulic energy	Structure for Water Control (587)		
5.Plant a vegetative filter waterway	Grassed Waterway		

	(412)		
Other:			

Managing Erosion from On-Farm Pond/Basin Spillways

W19.There is an on-farm pond or basin (including sediment and attenuation basins) on the ranch facility.

☐ Yes ☐ No

Describe as needed:

W20.Open channel spillways are stable (not eroding) and/or properly armored to prevent erosion.

☐ All Spillways
☐ Some spillways
☐ No spillways (Consider practices # 1 through 5, listed in Table W4 below)
☐ Not Applicable, all spillways are piped

Describe as needed:

W21. Piped and open channel spillways from on-farm ponds contain pond overflows.

☐ All Spillways
☐ Some spillways
☐ No spillways (Consider practices # 6 and 7, listed in Table W4 below)
☐ Not Applicable, all spillways are open channels.

Describe as needed:

W22.The alignments of spillway outlets, both piped and open channel, are in line with the downstream waterway.

☐ All Spillways
☐ Some spillways
☐ No spillways (Consider practice # 8, listed in Table W4 below)
☐ Not Applicable

Describe as needed:

W23. Spillways, pipe and open channel, from on-farm ponds have energy dissipaters prior to re-entering the downstream waterway.

☐ All Spillways
☐ Some spillways
☐ No spillways (Consider practices # 5 and 6, listed in Table W4 below)
☐ Not Applicable

Describe as needed:

Table W4: Conservation Practices to Manage Spillways

The following table provides an assortment of management practices that are intended to protect water quality. Implementation of all practices is not necessary or required. Selection of practices must be done on a site-specific basis and an assortment of practices to protect water quality and to suit your circumstance should be selected. NRCS Practice Titles are provided for your reference.

Practices	*NRCS Practice Title*	*Implementation Date*	*Location*
1.Consult a Professional			
2.Install a rock weir to control in-channel flow	Grad Stabilization Structure (410)		
3.Widen/enlarge the spillway	Pond (378)		
4.Stabilize the open channel spillway	Pond (378)		
5.Plant a vegetative filter waterway	Grassed Waterway (412)		
6.Install a rock lined plunge basin	Structure for Water Control (587)		

7.Install bank protection at the spillway outlet	Streambank Protection (580)		
8.Realign the existing spillway with the downstream waterway			
Other:			

ROADS AND CROSSINGS

Background: Roads that drain toward waterways can be major contributors of sediment. Roads must be safe to travel while having a minimal effect on waterways in the watershed. Practices to address erosion from roads aim to reduce the concentration of flow from roads, slowing the rate of water running off of the land and discharging accumulated waters more frequently to areas away from waterways.

Purpose: To identify practices currently in use and intended for implementation to slow, spread and sink runoff from the roads, particularly unpaved roads. Identify priority road reaches that may discharge directly to waterways so that no more than 25% of roads are connected in 20 years.

The following questions are adapted from page 11 of the UCCE Plan. If you have completed the UCCE Plan, please attach that plan and skip this section. Where potential concerns are identified, please reference the conservation practice recommendations noted below.

Question	Potential Concern	Location (*pasture/field*) & Describe Condition	Cause* (*C, H, or N*)
ROADS			
R1. Surface erosion present on road(s) (rills, gullies)? *If potential concern noted, consider practices listed in Table R2 below*	☐Yes ☐No ☐Not Sure		
R2. Culverts or ditches cause gullies or erosion? *If applicable, please complete the Road Stream Crossing Data Form as noted below. Make a copy of the data form for each crossing. Consider practices in Table R1 below, as appropriate.*	☐Yes ☐No ☐Not Sure		
R3. Sediment fills drainage ditches after winter? *If potential concern noted, consider practices listed in Table R2 below*	☐Yes ☐No ☐Not Sure		

* Note any recorded problem conditions as caused by: **C**urrent livestock management (**C**); a **H**istoric legacy site (**H**); or **N**atural causes (**N**).

ROADS ON THE PROPERTY (additional to UCCE Plan)

R4. Roads on the property cross waterways.

☐ Yes (Please complete the **Road Stream Crossing Data Form** that follows. Make a copy of the data form for each crossing. Consider practices in Table R1 below, as appropriate.)

☐ No

R5. All roads on the property are necessary and utilized.

☐ Yes

☐ No (Consider practice #14, listed in Table R2 below)

Data Form R1. Road Stream Crossing Data Form

Complete this data form for each place that roads cross a waterway. The instructions and definitions following the form may be helpful. Make a copy of the form, including treatment options if applicable, for each crossing.

ROAD STREAM CROSSING DATA FORM (2014)						
GENERAL	Site #:	Mapped (Y/N):	Road ID/Name:	Landowner:	Date:	Site located up-stream of pond/reservoir (Y,N):

CROSSING TYPE	Bridge (go to Bridge, Arch, Box info section)	Bottomless Arch (go to Bridge, Arch, Box info section)	Box culvert (go to Bridge, Arch, Box info section)		
	Culvert (go to Culvert info section)	Oval culvert (go to Culvert info section)			
	Ford (go to Ford or Armored Fill info section)	Armored Fill (go to Ford or Armored Fill info section)			
	Fill (if so then go to Fill or Pulled info section)	Pulled crossing (if so then go to Fill or Pulled info section)			
	Photos taken (Y, N):				
BRIDGE, ARCH, BOX INFO	Bridge/Arch/Box/ height (ft):	Bridge/Arch/Box/ width (ft):	Wing walls (90^0&15^0, 30^0-75^0, 0 extension up ch.)		
CULVERT INFO	Circular culvert diameter (in):	Oval culvert height (in):	Oval culvert width (in):	Culvert type (P, S, A, C):	Trash rack type (none, SP, MP, Screen): (If none or Screen see treatment options 11, 12 in Table R1)
	Headwall height (ft):	Rust/silt line at inlet (in): (If greater than 50% of diameter see treatment options 4, 5, 8 in Table R1).	Culvert grade (%): (If significantly shallower than stream grade see treatment option 8 in Table R1).	Inlet (O, C, P, R): (If C, P, or R see treatment options 3, 7, 8 in Table R1).	
	Plug potential (H, M, L) (If M or H see treatment options 4, 5, 6, 8, 12 in Table R1)	Interior (O, C, R, or S): (If C, R, or S see treatment options 3, 7, 8 in Table R1)	Are fill slopes actively eroding (Y, N): (If yes see treatment option 3, 13 in Table R1)	Outlet (O, C, P, R): (If C, p or R see treatment options 3, 7, 8 in Table R1)	
	Does the stream channel below outlet appear to be scoured (Y, N): (If yes see treatment option 13 in Table R1).	Is culvert in line with stream channel (Y, N): (If no see treatment option 8, 13 in Table R1)	Diversion potential (Y, N, Critical dip present): (If yes see treatment options 9, 10 in Table R1)		

Ford or Armored Fill info	Is crossing dipped wide enough to keep flows within natural stream channel (Y, N): (If no see treatment option 3 in Table R1)	At Armored Fill crossing, is armor adequate enough to prevent fill material from eroding (Y, N): (If no see treatment option 13 in Table R1)
Fill or Pulled Crossing info	Does crossing look to be actively eroding (Y, N): (If yes see treatment options 3, 13 in Table R1)	

STREAM INFO	Avg. stream grade (%):	Avg. stream channel width (ft):	Average steam channel depth (ft):

ROAD DRAINAGE TO STREAM CROSSING	**Left** road length(s) draining down to site (ft): (If greater than 150ft see treatments options in Table R2)	Road length ends at (WB, RD, DB):	Avg. width (ft):	Road Surface (paved, rocked, native):	Road use (Year round, Dry weather, No recent use):
	Left vineyard avenue length(s) draining down to site (ft): (If greater than 150ft see treatments options in Table R2)	Ave. length ends at (WB, RD, DB):	Avg. width (ft):	Ave Surface (rocked, grassed, native):	Ave use (Year round, Seasonal, turn around):
	Right road length(s) draining down to site (ft): (If greater than 150ft see treatments options in Table R2)	Road length ends at (WB, RD, DB):	Avg. width (ft):	Road Surface (native , rocked, paved):	Road use (Year round, Seasonal, No recent use):
	Right vineyard avenue length(s) draining down to site (ft): (If greater than 150ft see treatments options in Table R2)	Ave. length ends at (WB, RD, DB):	Avg. width (ft):	Ave Surface (rocked, grassed, native):	Ave use (Year round, Seasonal, turn around):

COMMENT ON STREAM CROSING AND ASSOCIATED ROAD LENGTH(S):

COMMENT ON OTHER ROAD RELATED ISSUES THAT YOU WOULD LIKE ADDRESSED:

Road Stream Crossing Data Form Instructions and Definitions

GENERAL

Site#: Please assign a number to each site

Sites are defined as features that may deliver sediment to a stream channel. A ***Stream crossing*** (or crossing) is where a road crosses a natural drainage channel or unchanneled swale. In this data form the term *site* refers to a *stream crossing* or *crossing*.

Mapped: has the site location been identified on a map? (Yes or No):

Road ID/Name: give each road on the property an individual name or numeric identifier so that sites can be grouped for future treatment.

Landowner: give the name of the landowner or public agency so that sites can be grouped for future treatment.

Date: Record the date that this site was assessed (mm/dd/yy).

Site located up-stream of a pond/reservoir: is the site located on a stream channel that drains down into a pond or reservoir (Yes, No)

CROSSING TYPE

Please circle the type of crossing at the site. If there are different types of drainage features at a crossing then check each. Definitions of each crossing type follow.

Bridge is a bottomless structure that has abutments built on both of the stream banks or uses the natural stream banks as abutments.

Bottomless Arch culvert is a bottomless structure that has abutments built down by the active stream cannel. The difference of this structure from a bridge is that it is usually a continuous arch from the active channel up to its apex.

Box culvert functions much like a bridge except that it has a bottom built into it. Most box culverts do not have abutments associated with them. They are usually placed in the stream channel and have fill material compacted around them.

Culvert is a circular pipe or structure that is placed in the stream channel to convey flows under fill material that is compacted around it.

Oval culvert is the same as above but is an oval shape.

Ford crossing (wet crossing) is designed so that the vehicle travels across the stream bed. No fill or armor material is placed in the stream bed to accommodate the crossing.

Armored fill usually constructed on streams with high stream banks that would require the excavation of substantial ramps to get vehicles down to the streambed. An armored fill crossing (wet crossing) is designed so that the stream flow travels across the road prism but the road fill is armored with rock, concrete or other hardened materials so that the fill material cannot be eroded by the stream flows.

Fill crossing (wet crossing) is a stream crossing where the road crosses a stream and no drainage structure has been constructed. This definition may also apply to stream crossings that have drainage structures but they have failed or washed out to the point that the drainage structure is no longer functioning. These crossing types are assumed to be actively eroding.

Pulled crossing is a stream crossing that has been decommissioned in the past. Decommissioned stream crossings are crossings whose drainage structure and fill materials have been excavated (pulled) from the stream channel, allowing for the stream to flow through the area as it had before the road was constructed. These crossings may need to be evaluated to determine if adverse 'adjustments' are occurring at the site and further treatment would be needed to reduce sediment delivery.

Photos taken (Y, N): photos can be very helpful in describing current conditions of a site and can also be used to document changes over time. It is usually helpful if there is a photo of the up-stream and down-stream sides of the crossing as well as the road approaches to the crossing. There is a section in the LandSmart plan that allows for photo descriptions. Descriptions should include what is in the photo (ex. inlet, outlet, left road, right road, etc.) and at what location the photo was taken (ex. up-stream of the inlet, on right bank, in center of crossing on the road, etc.). The use of a GPS or marking on a map the locations of the photo points can help in re-occupying these locations.

BRIDGE, ARCH, BOX INFO

Bridge/Arch/Box/ height (ft): is a measurement in feet from the stream channel to the bottom of the structure. If the structure is an arch then give the maximum height. The purpose of this measurement is to determine capacity of the crossing.

Bridge/Arch/Box/ width (ft): is a measurement in feet of the width of void space of the structure,

usually the side walls or the abutments. If the abutments are sloping then give the average width. If the crossing is an arch then give the max width. The purpose of this measurement is to determine capacity of the crossing.

Wing walls (90°&15°, 30°-75°, 0 extension up channel): some of these stream crossings may have concrete or rock walls projecting beyond the inlet. How these walls are constructed influence the capacity of the stream crossing. The angle of the wall you are asked to describe are relative to stream flow. So a 90° wall would be perpendicular to stream flow and a 0° wall would be parallel.

CULVERT INFO

Circular culvert diameter: is measured in inches. Circular culverts usually come in sizes of 6" increments. The diameter should be given as it was constructed and not the diameter relative to how crushed or buried it may be. If there are multiple culverts at the crossing give the diameter of each.

Oval culvert height: is measured in inches. Give the maximum height as the culvert was constructed and not relative to how crushed or buried it may be. If there are multiple culverts at the crossing give the height of each.

Oval culvert width: is measured in inches. Give the maximum width as the culvert was constructed and not relative to how crushed or buried it may be. If there are multiple culverts at the crossing give the width of each.

Culvert type: give the type of material the culvert is made of; plastic, steel, aluminum, or concrete. If there are multiple types of culverts at the site then check each type.

Trash rack type: (none present, single post, multiple post, screen). A ***trash rack*** is placed above the inlet of the culvert and is used to reduce plugging of the culvert by debris. Also see *plug potential* below.

Headwall height: is given in vertical feet, to the nearest ½ foot increment. The headwall height is measured from the bottom of the culvert inlet/stream bed to the location where, if the crossing were to flood, the flow would exit into the inboard ditch or onto the road surface. This location may or may not be directly above the culvert inlet, this is dependent on how the road travels through the crossing. This measurement can be achieved by using a measuring tape and clinometer. Take the slope angle (degrees) and the length (feet).

Slope *sin*(length) = vertical height

Rust or silt line at inlet: The height of the rust/silt line at the inlet gives an indication of the average flow depth that the crossing receives. A rust/silt line greater than 50% of the diameter of the culvert

may be an indicator that the crossing is undersized. Though rust/silt line height may also be a result of how shallow the culvert is relative to stream channel grade.

Culvert grade: measured in percent grade. Use a hand held clinometer and look through the inlet or outlet of the culvert to determine its grade. The reason for collecting this data is to see if the culvert is significantly shallower than the stream grade. Culverts that are significantly shallower tend to have greater plug potential.

Inlet: is it open, crushed, plugged and/or rusted? For the inlet to be defined as *crushed* or *plugged* it should be greater than 20%. For the inlet to be defined as *rusted* you should observe rust holes through the culvert.

Plug potential: at the inlet. Culverted stream crossings tend to have a higher plug potential than other sites because their void space is usually narrower than the stream channel. Another way to think of a culverted stream crossing is as an 'earthen dam with a hole at the bottom'. It is important to remember that stream channels do not just transport water but also carry woody debris and sediments. Some of the factors to consider when determining plug potential are:

1) *Setting*. Is the crossing in a forested, chaparral, or grassland setting? The more woody material in the stream channel above the crossing the greater the plug potential.
2) *Culvert grade relative to stream grade*. The shallower the culvert grade is relative to stream grade the more likely woody debris and sediments are to settle out at the inlet.
3) *Trash rack at inlet*. If there is no trash rack above the inlet and the culvert diameter is smaller than the stream channel width you have an increased likelihood of plugging. A single post trash rack above the inlet can greatly reduce the likelihood of woody material plugging the inlet of a culvert. Multiple posts above the inlet can also reduce plug potential but they may also initiate scour around the outer posts as material collects along the posts. Having a screen across the inlet of your culvert can actually increase plug potential because you are preventing any material to pass through the culvert.

Interior: is it open, crushed, plugged, rusted, and/or separated? For the interior to be defined as *crushed* or *plugged* it should be greater than 20%. For the interior to be defined as *rusted* you should observe rust holes through the culvert bottom. *Separation*: culverts usually come in 20' lengths, over time these sections can become uncoupled and allow flow to exit the culvert. If the interior of the culvert cannot be observed from either the inlet or outlet due to the condition of either of these locations than assume the same condition for the interior as either of the openings.

Are fill slopes actively eroding: Yes or No. Based upon observations of the fill slopes around the culvert inlet and outlet are they:

1) Showing signs of rilling or Gullying?
2) Do you see tension cracks or slumps?

3) Or are the fillslopes well protected with vegetation, rock armor, concrete or other hardscape?

Outlet: is it open, crushed, plugged and/or rusted? For the outlet to be defined as *crushed* or *plugged* it should be greater than 20%. For the outlet to be defined as *rusted* you should observe rust holes through the culvert.

Does the stream channel below outlet appear to be scoured: Yes or No. This is usually the case when the outlet of the culvert is a substantial vertical distance above the stream channel, often referred to as 'shot-gunned'. When the culvert outlet is shot-gunned the water coming out of it can scour out the channel below and cause the surrounding stream banks to fail.

Is culvert in line with stream channel: Yes or No. above inlet does the stream have to make a sharp turn to enter the culvert? Is the outlet pointed at either of the stream banks? These situations will help you to determine whether or not the culvert is aligned with the stream channel.

Diversion potential: Yes, No or Critical dip present.Usually only exists at culverted stream crossings. You would answer *Yes* there is diversion potential if the crossing floods at the inlet, water would flow down the road or inboard ditch beyond the stream crossing's hinge line, even if it would re-enter the same natural stream channel at some distance downslope. You would answer there is *No* diversion potential if the water would flow straight across the road and spill back into the same stream channel. The presence of a critical dip to reduce diversion potential would allow you to answer *No* to diversion potential. See section of 'Road lengths draining down to site for further check.

STREAM INFO

Average stream grade: is given in % slope and is an average of the overall grade. Enter the average slope of the stream channel upstream from the site beyond any aggraded sediments that may exist near the inlet of the crossing.

Average stream channel width (ft): is given in feet. This measurement is achieved by walking up-channel from the stream crossing, beyond any aggraded sediments. The average width is determined by measuring the channel bottom width, the top of bank width and dividing by 2 (W^1+W^2/2). In smaller stream channels there may be only one width observable.

Average stream channel depth (ft): is given in feet. This measurement is calculated at the same location as the previous section. Measure the height from the channel bottom to the top of bank (bank full).

ROAD DRAINAGE TO STREAM CROSSING

If you are using a map that can be written on it may be helpful to map all road/avenue lengths draining down to each site. This can be done by using a bracket ([ ]) symbol to indicate start of road length with an arrow symbol (→) pointing toward the site. Ex. [→ → site# ← ←]

Road/vineyard avenue lengths draining down to the site: Standing on the road surface, above the stream crossing and looking down stream, record the total distance of road length(s) draining down to the site. *Left* road length and *Right* road length are relative to looking down stream. Include road intersections and spur road lengths. If the road continues downhill through the site then cut-off your road length at the site and count the road length draining away as 0ft. Road surface drainage features that effectively end the road length include functional waterbars, rolling dips, and natural drainage break (divides and dips). If a culverted stream crossing has 0 Left or Right road length s draining to the site then the crossing has *Diversion potential*.

Vineyard avenue lengths should be assessed the same way as described in the roads section above. Vineyard avenues are separated in this data form because they may fall under the treatment recommendations of an erosion control plan for the vineyard block and they tend to receive different traffic use (tractor turn-arounds and so forth).

Average width: of the road length(s) draining down to the site, measured in feet. Take a represented measurement of the width of the road from the cutbank to the outside edge of the road prism. For vineyard avenues, take a represented measurement of the width of the avenue from the end of the vinerow to the outside edge of the vineyard block.

Road/Ave surface: ***Paved*** roads have either asphalt or concrete surface and is adequately covered to protect against rain-drop impact and allows for wet-season use. ***Rocked*** roads/avenues have a surface that is adequately covered with road-base rock to protect against rain-drop impact and allows wet-season use. ***Grassed*** avenues are adequately covered (during rainy season) with vegetation to protect against rain drop impact. ***Native*** roads/avenues are unsurfaced or dirt, with minimal vegetative cover, even though they may contain some natural rock.

Road/Ave use: ***Year round*** use means roads/avenues are driven when they are wet. ***Dry weather*** use means the roads/avenues are not driven when they are wet. ***Turn around*** use means that the avenue is not driven but rather used as a tractor turn around between vine rows. ***No recent use*** is for roads that have not been driven in at least the past 5 years.

COMMENTS ON PROBLEM

This is an optional field. This section is available for you to describe in more detail characteristics of the site that may or may not have been covered earlier in the data form. The summary comments for each

site generally describe the nature of the erosion problem as well as other important site characteristics. Remember there is a real difference between the cause and the symptom of many erosion problems. Wherever feasible, it is important to treat the cause of the problem rather than the symptom. You may want to refer to specific photos of the site in this section as well. A discussion on the historical maintenance needs of the site may help in determining treatment options and prioritization.

COMMENTS ON OTHER ROAD RELATED ISSUES

This is an optional field. This section is available for you to describe other road related issues that you have been experiencing but were not covered in this data form. These issues may be transportation concerns or chronic maintenance site that may or may not have impacts to water quality.

RCD use only	Fish barrier (NA, N, P, D):	Q:	Undersized (Y, N, Site requires further engineering to determine capacity):	Recommended size:	Site requires further engineering to determine capacity and or fish passage.
	Total chronic erosion vol. (yds^3):	Eposodic future volume (yds^3):	Episodic Erosion Potential (H, M, L)	Total future erosion vol. (yds^3):	
	Treat Priority. (H, M, L, No treat):	ASAP (Y, N):	Upgrade	Decommission See typical drawing 14	

RCD Use Only Instruction and Definitions

Fish barrier if anadromy is known or likely on the section of the stream that the site is located then a fisheries biologist should be consulted to determine if the crossing is a barrier to fish passage. *Non-applicable* would be selected to identify that the site is not located on an anadromous stream. *No* means that the structure does not inhibit fish passage for all life stages of anadromous fish species. *Partial* means a barrier to anadromous fish species at some or all life stages or at certain flow events. *Definite* means a complete barrier to anadromous fish migration.

Q is the discharge at the stream crossing for a given storm event. This value can be derived by using a variety of methods such as the Rational Method or USGS Regional Regression Equations.

Undersized once you have determined the discharge at the site you can now look at the existing capacity of the crossing and determine if it is undersized. Answer *Yes, No* or *need further engineering*. Stream crossings draining larger watershed areas may require engineering beyond the abilities of the RCD to determine the best design. See Cost effectiveness in *Treatment priority* section.

Recommended size if the crossing is undersized then based upon the discharge of the site what is the recommended size or void space to adequately drain the stream.

Site requires further engineering for fish passage design. Stream crossings draining larger watershed areas or that are along anadromous stretches of streams may require engineering beyond the abilities of the RCD to determine the best design. See Cost effectiveness in *Treatment priority* section.

Chronic erosion volume is measured in cubic yard on either an annual or decadal timeline. Chronic erosion is sediment production from road surfaces and cutbanks during storm events that produce runoff. This erosional process is termed chronic because it occurs annually. Chronic erosion is calculated by taking the road length and multiplying that by a width and surface lowering rate. This erosion will occur through a combination of:

1) Cutbank erosion (i.e., dry ravel, rainfall, freeze-thaw processes, cutbank failures).
2) Inboard ditch erosion and sediment transport.
3) Mechanical pulverizing and wearing down of unpaved road surface.
4) Erosion of unpaved road surface if driven during wet weather periods.

Episodic erosion volume is measured in cubic yards. Stream crossing wash-out is termed ***episodic*** because it occurs in response to storm events or other triggers. This erosion may occur once, or in pulses over an indeterminate time period. The volume of fill material with the stream crossing will need to be determined by doing a volume calculation. The fill volume within the stream crossing is always assumed to be 100% delivery to the stream system.

If a stream crossing is identified as being adequately sized and looked to be structurally intact, then it is considered 'storm-proofed'. Therefore no future ***episodic*** erosion volume will be assigned to that site.

Stream crossings with diversion potential make it difficult to accurately determine episodic erosion volume. When this occurs the roadbed, hillslope, and/or stream channel that receive the diverted flow may become deeply gullied or destabilized. Road and hillslope gullies can develop and enlarge quickly and deliver large quantities of sediment to stream channels. Stream flow that is diverted onto steep unstable slopes may also trigger hillslope landslides and large debris flows. Because of the variability of erosion that can occur due to diverted stream flows it is difficult to accurately determine the future erosion volume at these sites. For the purpose of this data form, the episodic erosion volume at stream crossings with diversion potential will be quantified the same way as stream crossings without diversion potential.

Episodic erosion potential only applies to the ***episodic*** erosion volume because the ***chronic*** erosion volume is assumed to be occurring annually. Episodic erosion potential is a qualitative evaluation of the likelihood of the stream crossing to wash-out, during a given storm event(s), based on surficial observations. It is a subjective probability estimate, expressed as "low," "moderate," or "high," and not an estimate of how much erosion is likely to occur. More than one erosional process may be occurring at a site, therefore the erosion potential should reflect the most important erosional feature or mechanism. Factors to observe in determining erosion potential are:

1) Gullying or eroding fillslopes.
2) Tension cracks or slumps observed on the fillslopes or road surface.
3) Are the fillslopes well protected with rock armor, concrete or other hardscape?

4) How undersized a crossing is for a given storm event.
5) At culverted crossings, how significantly; crushed, plugged, separated, or rusted through is the culvert.
6) Erosion potential is also a function of stream power relative to the amount of fill in the stream crossing. But don't underestimate stream power for large storm events.
7) Road use. If the road is unused then it is assumed that erosional processes are occurring unchecked. Therefore given enough time, even low erosion potential factors can completely wash-out a stream crossing.

Total future erosion volume is the sum of the episodic and chronic erosion volumes for each site.

Treatment priority is a professional evaluation of how important it is to quickly perform erosion control or erosion prevention work at a site. It is an integral part of an assessment because it is the basis for prioritizing treatment sites prior to implementation. Treatment priority is designated as "high," "moderate," or "low," indicating the relative degree of urgency to treat the site before it erodes or fails. Sites that require further engineering to determine capacity will not be given a treatment priority until such work has been done. Criteria for evaluating treatment priority include:

1) *Erosion potential*, or whether there is a low, moderate, or high likelihood for future ***episodic*** erosion at a site. Remember that only the ***episodic*** erosion volume has an erosion potential whereas the ***chronic*** erosion volume is assumed to be occurring on an annual basis.
2) *Sediment delivery volume*, which is an estimate of the sediment volume projected to be eroded from the site and the associated road lengths. It is entirely possible to have large ***episodic*** erosion volumes but because it has a *low* erosion potential, the site may be classified with a low (L), moderate-low (ML) or moderate (M) treatment priority.
3) *Diversion potential* at culverted stream crossings. These sites should be given a higher treatment priority than sites with similar characteristics but without diversion potential.
4) *Stream crossing capacity*, weather it us undersized or not for a given storm event (example the 100-year peak storm flow). This should be looked at on a magnitude basis, i.e. 'how much is the crossing undersized for a given storm event. Crossing sizing not only determines its capacity to carry water during peak flows but also influences plug potential.
5) *Evaluation of the sites for fish passage* on anadromous streams. If the site poses a barrier to salmonid fish migration then the site should receive a "High" treatment priority regardless of its erosion volume or potential. Also take into consideration the amount and quality of habitat that would be made available.
6) The *value or sensitivity of downstream resources* being protected. In general, all sites located up stream of an instream pond or reservoir are identified as 'disconnected' and should be given a *Low* treatment priority. These sites are deemed 'disconnected' from the anadromous portions of the watershed because these instream structures act as sediment basins for upstream erosional process and are barriers to anadromous fish species.

7) C*ost effectiveness* may be analyzed, along with transportation needs, to prioritize treatment sites or locations for implementation. Cost effectiveness is not only a necessary consideration for environmental protection and restoration projects for which funding may be limited, but is also an accepted and well-documented tool for prioritizing potential treatment sites in an area. A quantitative estimate for cost effectiveness is determined by dividing the cost of accessing and treating a site by the volume of sediment prevented from being delivered to local stream channels (the sediment savings). The resulting value provides a comparison of cost-effectiveness among sites, and an average for the entire project area. For example, if the cost to develop access and treat an eroding stream crossing is projected to be $5,000, and the treatment will potentially prevent 500 yd^3 of sediment from reaching the stream channel, the predicted cost effectiveness for that site would be $5,000/500$yd^3$, or $10/$yd^3$. At sites that pose barriers to anadromous fish passage, cost effectiveness could be looked at from the standpoint of amount and quality of upstream habitats that would be made available to the species.

ASAP treat as soon as possible (Yes or NO). This would exceed a 'High' treatment priority and would suggest an emergency fix.

Upgrade would indicate that the treatment recommended for storm proofing would incorporate continued vehicle use and maintenance of drainage features.

Decommission could be a suggestion made if the landowner indicated that the road had not been used in the last 5 years. This would indicate that the treatment recommended for storm proofing would incorporate the idea of long term winterization where vehicles would no longer travel these sections. Road decommissioning is a cost effective way to storm proof a road because it does not require regular maintenance of drainage features. It should be noted that road decommissioning, like road upgrading, does require monitoring for the first couple of years and after large storm events to ensure no significant adjustments have occurred in the treatment areas. Road decommissioning should not be thought of a *permanent* closure because the road prism still exists and the stream crossings could have new drainage features installed if the road were needed again. See typical drawing 14.

Table R1: Treatment Options to Reduce Erosion and Manage Stability at Stream Crossings

The following table provides an assortment of management practices that are intended to protect water quality. Implementation of all practices is not necessary or required. Selection of practices must be done on a site-specific basis. An assortment of practices to protect water quality and to suit your circumstance should be selected. NRCS Practice Titles are provided for your reference and you may contact your local NRCS or RCD field office for technical and/or possible financial assistance.

Practices *(at stream crossing)*	*NRCS Practice Title*	*Implementation Date*	*Location* *Site#*
1. No treatment at site	--	--	
2. Consult a Professional			
3. Excavate soil	Earthfill (903)		
4. Install bridge	Stream Crossing (578)		
5. Construct Armored-fill crossing *(See typical drawings 5a, 5b, 6, 7)*	Stream Crossing (578)		
6. Construct a Ford crossing *(See typical drawing 5a)*	Stream Crossing (578)		
7. Repair culvert	Access Road (560)		
8. Install or replace culvert *(See typical drawing 2, 4)*	Access Road (560)		
9. Construct critical dip *(See typical drawing 1c)*	Access Road (560)		
10. Install critical culvert	Access Road (560)		
11. Remove screen from culvert inlet	Access Road (560)		
12. Install trash rack (SB, GP, I-B)	Access Road (560)		

(See typical drawing 3)			
13. Armor fill face *(See typical drawing 1b, 4)*	Lined Waterway or Outlet (468) and Rock Riprap (907)		
14. Armor below outlet *(See typical drawing 1b)*	Lined Waterway or Outlet (468) and Rock Riprap (907)		
15. Other			

Table R2: Treatment Options to Reduce Erosion from Road Surfaces

The following table provides an assortment of management practices that are intended to protect water quality. Implementation of all practices is not necessary or required. Selection of practices must be done on a site-specific basis. An assortment of practices to protect water quality and to suit your circumstance should be selected. NRCS Practice Titles are provided for your reference and you may contact your local NRCS or RCD field office for technical and/or possible financial assistance.

Practices *(along road lengths)*	*NRCS Practice Title*	*Implementation Date*	*Location Site#*
1. No treatment at site	--	--	
2.Consult a Professional			
3. Construct rolling dips *(See typical drawings 10, 11, 19a-c.)*	Access Road (560)		
4. Install Speed bumps on paved road	Access Road (560)		
5. Outslope road & remove ditch *(See typical drawings 9a-c)*	Access Road (560)		
6. Outslope road & retain ditch – ensure that outlet is located in a stable location *(See typical drawings 9a-c)*	Access Road (560)		
7. Inslope road – ensure that ditch outlets to a stable location *(See typical drawings 9a-c)*	Access Road (560)		
8. Crown road *(See typical drawings 9a-c)*	Access Road (560)		
9. Install/Replace ditch relief culvert – ensure that outlet is located in a stable location	Access Road (560)		

(See typical drawing 8)			
10. Cut/clean ditch	Diversion (362) and Access Road (560)		
11. Rock armor ditch – ensure that ditch outlets to a stable location	Lined Waterway or Outlet (468)		
12. Construct Water bars *(See typical drawing 20*)	Access Road (560)		
13. Construct cross road drains *(See typical drawing 17)*	Access Road (560)		
14. De-compact road surface *(See typical drawing 17)*	Road/Trail/Landing Closure and Treatment (654)		
15. Other			

MANURE STORAGE & NUTRIENT MANAGEMENT

Background: Although animal waste are organic biodegradable materials, many of their biological and chemical properties can be detrimental to fish, insects and other aquatic life if those wastes get into local waterbodies. Ranch owners should develop a waste management plan to ensure clean and safe facilities, protect creeks and ground water, reduce odors and insect breeding opportunities. Effective manure management helps protect water quality.

Purpose: Identify practices currently in use and that are intended for implementation to:

- ✓ Keep surface runoff (stormwater) away from manure storage areas; divert clean water away from manured areas in a non-erosive manner.
- ✓ Keep manure storage areas away from drainages and water bodies.
- ✓ Keep drainage from manure from percolating down into soil- especially in areas where groundwater protection is a priority.
- ✓ Cover manure.
- ✓ Make access to storage areas convenient, size them adequately and have a contingency plan for when waste volume exceeds capacity.

The following questions are adapted from page 11 of the UCCE Plan. If you have completed the UCCE Plan, please attach that plan and skip this section. Where potential concerns are identified, please reference the conservation practice recommendations noted below.

Question	**Potential Concern**	**Location (*pasture/field*) & Describe Condition**	**Cause* (*C, H, or N*)**
PATHOGENS AND NUTRIENTS			
MANURE MANAGEMENT			
M1. Manure stockpile runoff connects to stream? *If potential concern noted, consider practices #1 and 2 in table M1.*	☐Yes ☐No ☐Not Sure		
M2. Manure applied to pasture less than 2 weeks before a runoff generating rain storm? *If potential concern noted, consider practice #5 in table M1.*	☐Yes ☐No ☐Not Sure		

M3. Manure applied to pastures is stored (aged) less than one month? *If potential concern noted, consider practices #6 and 7 in table M1.*	☐Yes ☐No ☐Not Sure		

***C**urrent livestock management (**C**); a **H**istoric legacy site (**H**); or **N**atural causes (**N**).

Manure Storage Areas (if applicable)

M4. Are manure storage areas located on high ground, above likely flood levels?

☐ Yes ☐ No (Consider practice #1, listed in table M1 below)

M5. Is your manure storage area covered by a roof?

☐ Yes ☐ No (Consider practice #3, listed in table M1 below)

M6. Is your manure storage area located near a drainage way, spring, pond, creek or other waterbody?

☐ Yes, (Please answer A and B below) ☐ No.

A. How far is the nearest waterway/waterbody? _____feet

B. Is there a vegetated (grass or other) filter strip between the storage area and the waterway/waterbody?

☐ Yes ☐ No (Consider practice # 2 in table M1 below)

M7. Is your manure storage area located near a water supply well? Make sure to identify the locations of wells on your site map.

☐ Yes, (Consider practice #1, listed in table M1 below) ☐ No.

M8. Please list other manure stockpiling/storage plans or strategies not identified above.

Describe as needed:

Nutrient Management

M9. Do you spread or plan to spread manure on site?

☐ Yes (Please answer A through H below and consider practice #5, listed in Table M1 below)

☐ No

A. Describe the location, frequency and method of spreading.

B. Is the manure being spread as fertilizer or soil conditioner or both?_____

C. Will it be disked? When? During the wet season or under what conditions?

D. What equipment is available to do this work?_____

E. What type of vegetation is present where and when the manure is to be spread?

F. How many years have you been spreading manure in the same location?_____

G. Describe your contingency plan if your storage capacity is exceeded before manure can be spread.

H. Is there a vegetative buffer strip or grass filter strip between the spreading area and drainage ways, wells, or water bodies to trap pollutants?

☐ Yes ☐ No (Consider practice #2, listed in Table M1 below)

M10. Do you apply nutrients/fertilizers other than manure/composted manure?

☐ Yes (List other sources) ☐ No

List:

M11. Fertilizer amount and application timing is prescribed based on crop needs, identified by inspection and/or testing.

☐ Yes ☐ No (Consider practices # 4, listed in Table M1 below)

M12. Fertilizer(s) are applied with calibrated equipment.

☐ Yes ☐ No (Consider practice #5, listed in Table M1 below)

Describe as needed:

Table M1: Conservation Practices for Manure Storage and Nutrient Management

The following table provides an assortment of management practices that are intended to protect water quality. Implementation of all practices is not necessary or required. Selection of practices must be done on a site-specific basis and an assortment of practices to protect water quality and to suit your circumstance should be selected. NRCS Practice Titles are provided for your reference.

Practices	*NRCS Practice Title*	*Implementation Date*	*Location*
1.Move manure storage areas to high ground and/or away from waterways and water supply wells			
2.Plant a vegetative filter strip	Filter Strip (393)		
3. Cover pile with tarp when saturated			
4. Consult and follow UCCE crop requirements	Nutrient Management (590)		
5. Time manure/fertilizer application to reduce runoff and leaching	Nutrient Management (590)		
6.Compost animal manure on a containment facility	Composting Facility (317)		
7.Monitor compost temperature	Composting Facility (317)		

AGRICHEMICALS (IF APPLICABLE)

Background: Agrichemicals (organic and/or synthetic nutrients and/or pesticides, including herbicides and sulfur) that move from the site of application into surface water can affect water quality by negatively impacting human, animal and/or non-target organism health. Nutrient sources associated with agricultural production practices may include organic and inorganic fertilizers, biodegraded crop residues, and agricultural wastes (grape pomace and waste directly generated by animals). Wind and water erosion of soil or aerial drift from agrichemical applications may contribute to pesticide movement away from the target area. Agrichemcials may enter surface waters during overland runoff and tile drainage either as water-soluble residuals or adsorbed to sediments. Nutrients from these sources become pollutants when they are transported off-site into nearby streams and lakes or percolate in excessive amounts of groundwater. Nitrates and phosphates in surface water bodies contribute to eutrophication, the increases in aquatic plants and algal blooms that deplete dissolved oxygen, impacting aquatic organisms. All shall be maintained free of toxic and biostimulatory substances in lethal or detrimental concentrations.

Purpose: To identify practices, currently in use or intended for implementation, ensure agrichemicals (fertilizers, soil nutrients, compost and pesticides) are stored, mixed and applied in a manner consistent with all applicable regulations, including those required by the California Department of Pesticide Regulation (DPR) and the County Agricultural Commissioner, and in a manner that prevents excess agrichemicals from reaching surface and groundwater.

A1. Agrichemicals are stored properly (per the label) on-site.

- ☐ Yes
- ☐ No (Consider practice # 1, listed in Table A1 below)
- ☐ No- agrichemicals are stored on-site. Skip this section.

Describe as needed:

A2. Agrichemical mixing, loading, and rinsing are conducted on a containment facility.

- ☐ Yes
- ☐ No (Consider practices # 2 through 5, listed in Table A1 below)
- ☐ No mixing, loading, or rinsing on-site.

Describe as needed:

A3. Agrichemicals not handled on a containment facility are mixed, loaded and rinsed away from aquatic habitat and wells.

- ☐ Yes
- ☐ No (Consider practices # 2 through 5, listed in Table A1 below)
- ☐ No agrichemicals are stored on-site.

Describe as needed:

Table A1: Conservation Practices for Agrichemical Storage, Preparation and Disposal

The following table provides an assortment of management practices that are intended to protect water quality. Implementation of all practices is not necessary or required. Selection of practices must be done on a site-specific basis and an assortment of practices to protect water quality and to suit your circumstance should be selected. NRCS Practice Titles are provided for your reference.

Conservation Practice	*NRCS Practice Standard Title*	*Implementation Date*	*Location*
1. Consult a Professional			
2.Use an impervious containment pad for agrichemical handling	Agrichemical Handling Facility (309)		
3.Provide securable agrichemical handling	Agrichemical Handling Facility (309)		
4.Move agrichemical handling away from aquatic habitat and wells	Nutrient Management (590)		
5.Train employees on safe agrichemical handling	Nutrient Management (590)		
Other:			

Pest Management

P1. The facility operates under a current Pesticide Use Permit filed with the County Agricultural Commissioner.

☐ Yes, provide Pesticide Use Permit # and attach a copy of permit to this Ranch Plan.

☐ No (Consider practices # 1 and 2, listed in Table P1 below)

Describe as needed:

P2. UC-IPM guidelines are followed (http://www.ipm.ucdavis.edu/PMG/selectnewpest.small-grains.html)

☐ Yes, indicate current practices below. ☐ Some

☐ No (Consider practices # 3 through 6, listed in Table P1 below)

Describe as needed:

P3. Alternative, non-chemical pest control methods are used when and where practical.

☐ Yes, indicate practices below

☐ No

Describe as needed:

Table P1: Conservation Practices for Pest Management Practices

Practice	*NRCS Practice Standard Title*	*Implementation Date*	*Location*
1. Consult a Professional			
2.Apply pesticides under a Pesticide Use Permit			
3.UC-IPM: Implement appropriate guidelines for small grains	Integrated Pest Management (595)		
4.UC-IPM: Scout for pests	Integrated Pest Management (595)		

5.UC-IPM: Maintain pest management records	Integrated Pest Management (595)		
6.UC-IPM: Use chemicals that are lowest risk to water quality	Integrated Pest Management (595)		
7.Calibrate application equipment (sprayers and injectors) regularly	Integrated Pest Management (595)		
8.Dispose of containers properly	Integrated Pest Management (595)		
9.Train employees per OSHA & MSDS	Integrated Pest Management (595)		
Other:			

RESIDUAL DRY MATTER (RDM) AND PHOTO MONITORING

Adapted from Page 17 of the UCCE Plan. If you have completed monitoring associated with the UCCE Plan, please attach completed sheets and continue that monitoring.

Visual Inspections

Annual monitoring consists of:

1) Wet season inspections of the ranch monthly or following storms (Dec.-April).
2) Two dry season inspections including one in September of the entire ranch prior to the rainy season.
3) One stream survey above and below or upstream and downstream of the ranch.

Use these inspections to decide if further management practices are needed to improve water quality on the ranch/farm. Start the yearly task of monitoring on the ranch in December with the wet season inspections. Follow these up with two dry season inspections (one in September) to make preparations and implement conservation practices before the winter rains arrive. To make monitoring more efficient conduct the stream survey above and below the ranch during one of the wet season or dry season inspections. For more information on indicators of rangeland and pasture health, refer to ftp://ftp-fc.sc.egov.usda.gov/GLTI/technical/publications/IIRH_v4_8-15-05.pdf.

Note monitoring activities below for 1) field observations of potential water quality concerns found during visual inspections, 2) estimates of Residual Dry Matter (RDM), and 3) photo-monitoring dates.

Residual Dry Matter (RDM) & Photo-Monitoring

Estimate RDM by visual and clip/dry/weigh methods (http://www.wildlandsolutions.com/rdm/). Interpret data as less (<), equal, or above (>) the minimum RDM objective for each pasture using the Pasture Inventory on page 10 (http://anrcatalog.ucdavis.edu/RangelandMonitoringSeries/8092.aspx).

Photographs are taken from the same location over time to document 1) RDM monitoring, 2) dates when management practices were implemented, and 3) improvements at a site over time such as increased vegetation cover. List and describe the locations of photo-points and attach photos if possible (http://californiarangeland.ucdavis.edu/Publications%20pdf/8067.pdf).

Date	Location (pasture #/name)	RDM Estimate (check method & if photo taken)	Visual Inspection Observations, RDM Explanations & Notes
		RDM=_____ lb/ac ☐ > minimum ☐ = min. ☐ < min. ☐ Visual ☐ Clip ☐ Photo	
		RDM=_____ lb/ac ☐ > minimum ☐ = min. ☐ < min. ☐ Visual ☐ Clip ☐ Photo	

		RDM=__________________ lb/ac □ > minimum □ = min. □ < min. □ Visual □ Clip □ Photo	
		RDM=__________________ lb/ac □ > minimum □ = min. □ < min. □ Visual □ Clip □ Photo	
		RDM=__________________ lb/ac □ > minimum □ = min. □ < min. □ Visual □ Clip □ Photo	
		RDM=__________________ lb/ac □ > minimum □ = min. □ < min. □ Visual □ Clip □ Photo	
		RDM=__________________ lb/ac □ > minimum □ = min. □ < min. □ Visual □ Clip □ Photo	

COMPLETED WATER QUALITY PROJECTS/CONSERVATION PRACTICES (OPTIONAL)

Adapted from page 13 of the UCCE Plan. If you have completed the UCCE Plan, please attach that plan and skip this section.

List all past water quality concerns on the ranch/farm and describe the issue. A concern does not indicate that livestock grazing or current management caused it. Describe any previously implemented management practice(s) intended to fix the problem. This includes steps to plan or receive technical/financial assistance, actual implementation or management changes, and the maintenance of projects or ranch infrastructure (cleaning culverts, scraping corrals, weed removal, etc.). Evaluate if more work is needed to improve water quality for each listed concern. Attach any old photographs of the concern including work completed if available. Use additional sheets if needed.

Water Quality Concern		**Location (pasture/ field)**	**Conservation Practice(s) Completed (with NRCS Practice Names and Numbers, if applicable)**	**Maintenance Needs**	**Evaluation (Is more work needed?)**	**Photo Avail.?**
#	**Describe**					

FUTURE WATER QUALIYT/CONSERVATION PROJECTS

Adapted from page 13 of the UCCE Plan. If you have completed the UCCE Plan, please attach that plan and skip this section.

List all future potential water quality concerns on the ranch/farm with the expected pollutants from each. A concern does not indicate that livestock grazing or current management caused it. This includes locations where your current maintenance prevents problems such as maintaining ranch roads following winter storms. Consider multiple options for fixing water quality concerns such as implementing new practices, and changing management or maintenance routines. Estimate the approximate cost of each option as well as the amount of time needed to conduct maintenance. Give each project a priority, relative to other potential projects, indicating preferred order implementing the project. Assignment of priority recognizes that the availability of financial and technical assistance determines when work is done. List the steps taken to plan for the project including participation in technical & financial assistance programs (ranch visits, meetings, applications, expected contract dates, etc). Use additional sheets if needed.

Water Quality Concern		**Location (*pasture/ field*)**	**Options for Maintenance, Management Changes, or Practice(s) to Implement (with NRCS Practice Names and Numbers, if applicable)**	**Estimate Cost of Each Option**	**Priority**	**Implementation Planning**
#	**Describe**					

NRCS PRACTICE STANDARD SHEETS

MAPS

FACILITY DOCUMENTS

PHOTO PLATES