

PROJECT HIGHLIGHTS, 2012-003



935 linear feet of fence encompassing livestock pond

1 water tank, 2 water troughs, 3800 linear feet pipeline

Project:	2012-003
Watershed:	Tomales Bay, East Shore
Practices:	Fence & Water Development (2 total)
Project Partners:	<ul style="list-style-type: none">▪ Marin Resource Conservation District (Marin RCD)▪ 319(h) State Water Resources Control Board (SWRCB)▪ Marin RCD, Marin County Measure A▪ United States Department of Agriculture Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP) 2013▪ Marin Agricultural Land Trust (MALT) Stewardship Assistance Program▪ Landowner

Project Overview

The **Livestock Pond Fence Exclusion and Water Development Project 2012-003** is part of an extensive regional effort entitled the Conserving Our Watersheds Program (COW). This particular project was designed to promote and support the advancement of water quality improvements by targeting sediment load reduction. The ranch is located on 512 acres of coastal rangeland situated within the Tomales Bay Watershed. The ranch has been in operation since 1958 with remnants of historical buildings and facilities suggesting the ranch once supported a small dairy operation at one time. Currently the land supports a livestock operation of 75 to 100 mother cows and a small number of bulls and heifers. The historical homestead is presently in use as a ranch home and hunting camp.

The Livestock Pond Fence Exclusion and Water Development Project involved the construction of an exclusionary fence encompassing an on-stream, 1 – 1.5 acre, livestock pond and developing an alternative water source for the beef cattle operation. The implemented conservation practices were established with the intent to improve pond habitat and reduce pond degradation as well as reduce sedimentation and pathogen transport into the unnamed stream discharging into Grand Canyon Creek a direct tributary to Tomales Bay (see Table 1 for stream measurements).

The ranch implemented a total of two (3) practices consisting of the following United States Department of Agriculture (USDA) NRCS conservation practices: 1) Regular Terrain Fencing, # 382; 2) Livestock Pipeline System, # 516 (pump, vent and bladder tank); and 3) Watering Facilities, # 614 (concrete water trough and water tank).

Table 1. Project 2012-003 site components.

Project Information	Area	Unit
Parcel Area	512	Acre
Area of Pond	1 to 1.5	Acre
Length of Adjacent Stream	From dam to Grand Canyon Creek: 1,841 Grand canyon creek to Tomales bay: 12,842	Linear feet

Ranch Location:

The ranch is accessible from State Highway 1, approximately five miles north of Point Reyes Station, Marin County, California (Fig. 1).

Project Location:

The project site is located north of the homestead/hunting camp, adjacent to an unnamed stream off of Grand Canyon Creek and a maintained ranch road (Fig. 1).

Environmental Conditions:

The ranch is situated on the coastal terrace along the east shore of Tomales Bay with elevations ranging from 150 - 550 feet. The dominate soils within the project boundary include: 140, Los Osos- Bonnydoon complex, 5 - 15 % slopes; 142, Los Osos- Bonnydoon complex, 30 - 50 % slopes; and 184, Tocaloma- Saurin, a very steep association with 30 - 50 % slopes. These soils are residuum weathered from sandstone or shale and well-drained to somewhat excessively well-drained soils. The vegetation throughout the rangeland consists of a mixture of annual and native perennial grasses and forbs, while the riparian corridors are vegetated with willows, hardwood trees and other riparian flora.

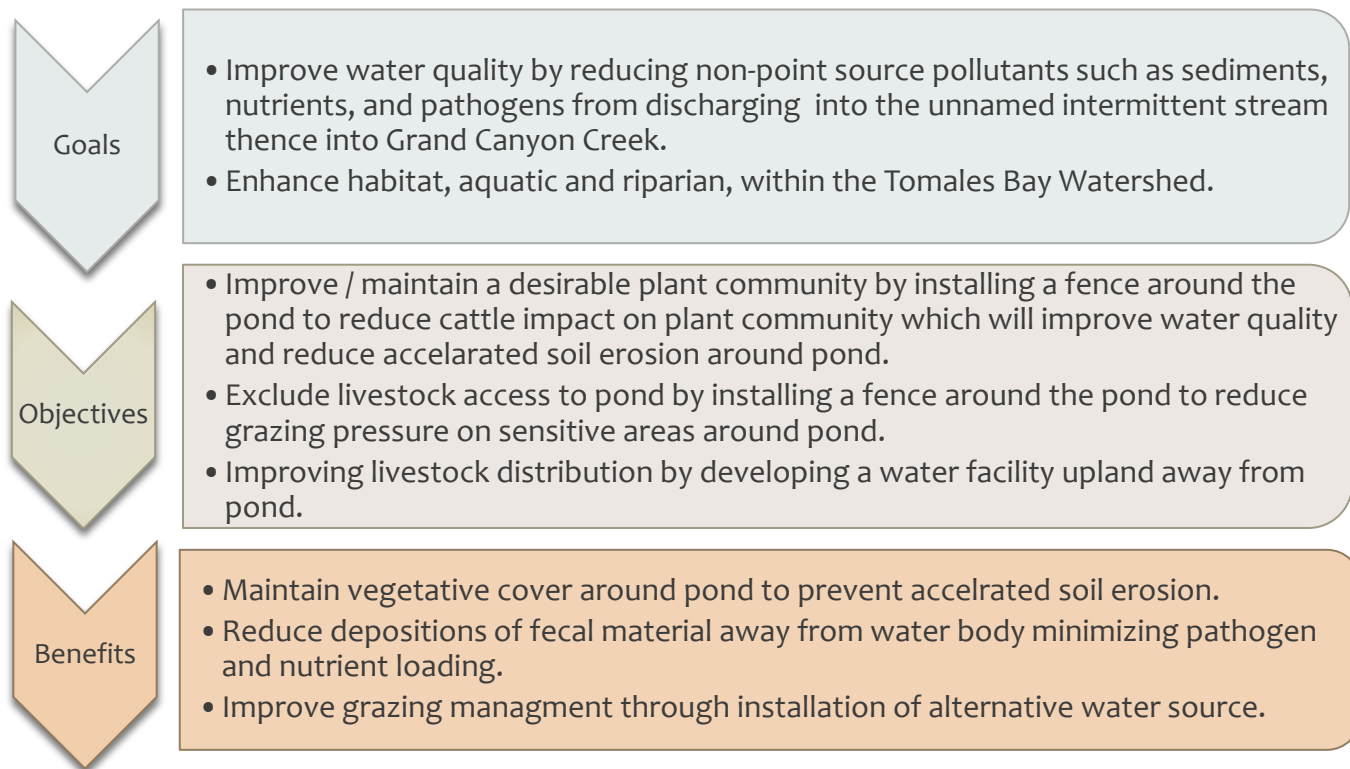
Historical Partnership and Commitment:

The ranch's Livestock Pond Fence Exclusion and Water Development Project is the first grant funded project collaboration between the landowner and Marin RCD. The ranch is protected by a MALT agricultural conservation easement and has previously participated in NRCS programs to improve and enhance the ecological value of the land.

Past and current projects with the RCD include:

- 2014/2015, EQIP 2012 Rangeland Management: Adverse and Regular Terrain Fencing (Fig. 1, 2, & 3)
 - MALT and NRCS funded project
 - Regular/Adverse Fencing: 3,400 Linear Feet planned fencing will be installed across the western portion of the ranch to improve pasture management.
- 2013, COW Phase II: Livestock Pond Fence and Water Development (see description below)

Phase I. Planning



Phase II. Design and Implementation

Design:

In the spring of 2012, the Marin RCD Conservation Scientist and USDA NRCS Rangeland Specialist developed a conservation design plan to meet the goals and objectives set by the landowner and partnering organizations. The design consisted of two main components: an exclusionary fence around the livestock pond and a water development. The design consisted of a suite of USDA NRCS conservation practices prescribed to meet the matching funding requirements of NRCS' EQIP.

NRCS practices and associated practices objectives included:

- 1) Construct an exclusionary fence encompassing a 1-1.5 acre livestock pond (Table 1).
Objective 1: Eliminate land impacts caused by livestock activity (Fig. 2).
- 2) Install a pump and piping system: pump (5 horsepower) at the pond, 1¼" PVC pipe (3,800 linear feet), air vents (2), and a bladder pressure tank (1).
Objective 2: The purpose of the piping system is to convey water up a steep slope to achieve the adequate capacity for livestock watering and distribution (Fig. 1).
- 3) Establish watering facilities: one water tank (5,000 gallons) and two remote concrete troughs (400 gallons).
Objective 3: Additional water sources in remote locations will provide drinking water to livestock and improve animal distribution while reducing non-point source pollutants and grazing pressure on sensitive areas near and around the livestock pond (Fig. 3).

Implementation:

During the winter of 2013, the Marin RCD Conservation Scientist and the NRCS Rangeland Specialist inspected the construction of the fence exclusion and water development.

Fence Exclusion:

Regular Terrain Fence (No. 382)

The constructed fence was measured at 935 linear feet, which was longer than the planned 450 linear feet of 5-strand regular terrain fence (Table 2). The difference in fence constructed vs planned was due to the contractor having to set the fence back further than what was originally planned in addition to a miscalculation of the fence footage. At the time of construction a slow leak was discovered in the dam causing a significant amount of water loss. The leak created difficult site conditions in the construction of the fence due to extremely saturated soils. This modification increased the total amount of fencing constructed (Fig. 1 & Fig. 2).

Water Development:

Piping System (No. 516) and Watering Facilities (No. 614)

The water development system included installing a five horsepower pump and pipeline, 1¼" PVC pipe, along the southwestern edge of the pond. The livestock pipeline system was designed to convey water up

a steep hill slope while adjusting for an elevation change of 350 feet. A trench was constructed to bury the livestock pipeline along the side of the ranch road which travels uphill and along the ridge in both directions. To regulate the volume, quality and rate of delivery, a bladder tank with a pressure-relief valve was installed halfway up the hillslope along with two air vents to prevent air locking which would protect the pipeline since the water was traveling a long distance from the source to concrete troughs. At the top of the ridge the pipeline split, traveling in two directions, to disburse water east to a water storage tank (5000 gallon) and west to two concrete troughs. The two concrete troughs were designed to meet the water supply requirements of the livestock operation and wildlife. The troughs were placed on durable firm foundations to protect the surrounding areas from resource concerns related to animal concentration and unexpected water overflow. Adequate access for wildlife was also incorporated by adding an escape ramp per NRCS standards and specifications (Table 2, Fig. 1 & Fig. 3).

Table 2. Completed conservation practices implemented at project site.

Conservation Practices	Practice (#)	Quantity	Measurement	Unit	Dimensions
Fence Exclusion	382	1	935	Linear Feet	
Water Development					60 ft. x 10 ft. = 600 ft ²
Pipeline	516	1	3,800	Linear Feet	1 ¼" PVC pipe
Electric Pump		1	5	Horsepower	
Bladder Tank		1			
Vents, 2"		2			
Water tank	614	1	3,000-5,000	Gallon	
Water Trough	614	2	400	Gallon	

The following permits were obtained for this project:

This project, #2012-003, went through MRCD' Permit Coordination Program for CEQA compliance.

- ☒ No permits required for project.
- ☐ §1600 CA Department of Fish and Wildlife
- ☐ §401 Water Quality Certification
- ☐ §404 US Army Corps Wetland
- ☐ County of Marin

Phase III. Monitoring

Landowner Questionnaire:

The Livestock Pond Fence Exclusion and Water Development Project successfully met the intended objectives, of the landowner. He stated "The cows are no longer entering the pond and are traveling to the top of the ridge as planned".

At the time of the interview the pond was still recovering from the construction (pond leak, fence, pump and pipe installation) and an unexpected drought year. The landowner was optimistic and expects the project to aid in water reduction and conservation for the ranch. He also anticipates the improvements to enhance the overall management of the ranch by reducing livestock impact at the pond thus decreasing

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water quality and distributing the livestock up to the ridge top and increase the pasture productivity which will reduce agricultural expenses such as feed.

By excluding the livestock from the pond the landowner expects that the project will aid in the reduction of any stress from natural resource concerns, but at this time it is too early to determine the true outcome. The landowner will continue to participate in Marin RCD projects as well as recommend others to participate in project coordination with RCD. The only recommendations for improvements were to scale down the length of time it took to actually design and implement the project. He said it took longer than he had anticipated.

Project Assessment Guide:

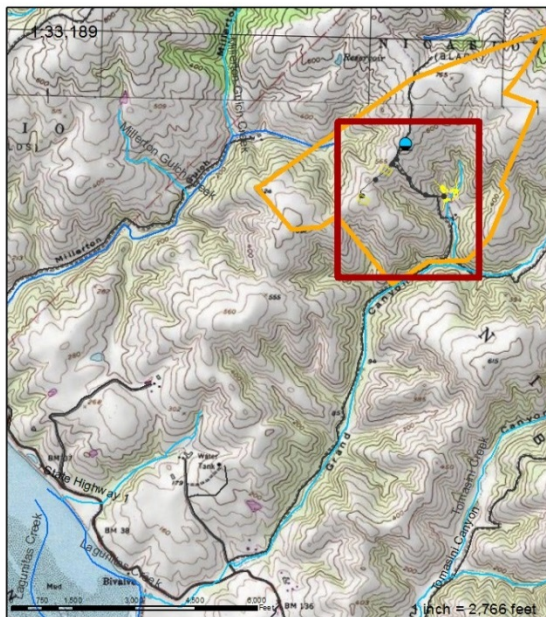
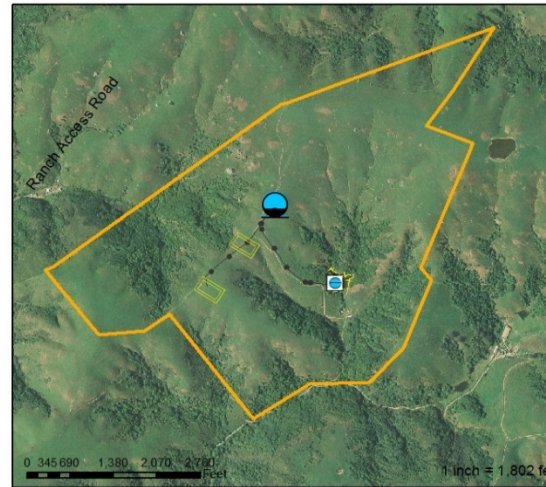
The overall project objectives of fencing the pond and implementing a water development were achieved. Both the fence and water development were installed and in excellent condition at the time of the evaluation. Due to unforeseen measures, a leak in the dam/pond and a drought year, the objectives of this project were rated fair; “Partially achieved most objectives- those not achieved were outside the control of practice.” The objectives were as follows:

- Improve / maintain a desirable plant community by installing a fence around the pond to reduce cattle impact on plant community which will improve water quality and reduce accelerated soil erosion around pond.
- Exclude livestock access to pond by installing a fence around the pond to reduce grazing pressure on sensitive areas around pond.
- Improving livestock distribution by developing water facility upland away from pond.

The project was evaluated one month post construction and too early to determine the overall effectiveness of the project. This will be re-evaluated one, three and five years post-construction to observe the conditions and recovery.



COWII: Conserving Our Watersheds



Legend

- Property Boundary
- Photo Monitoring Points
- Livestock Pond Exclusionary Fence
- Water Development**
 - Pipe to Solar Pump
 - Pressure Tank
 - Water Tank
 - Trough 1
 - Trough 2
 - Vent 1
 - Vent 2
 - Pipeline
 - MALT & NRCS Fence
- Streams**
 - Perennial
 - Intermittent
 - Contour 50ft



Author: Lynette K Niebrugge
Date: 8/11/2014
Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

Figure 1. Maps of Project 003, Left: Map labeled with current and past conservation practices implemented. Top right: COW project completed in partnership with MALT, NRCS and Marin RCD. Bottom right: USGS topography map with the property boundary highlighted in orange and a red box identifying the general location of the project.

Photo Monitoring:

Pre-construction Photos 05/2012

Pre-construction photo taken at Photo Point #2.

Point located adjacent to an old well house at the back of the pond. This photo point displays the encroaching weeds and pre dam leak conditions of the pond.



Post-construction Photos 12/2013

Post construction photo taken at Photo Point #2.

One month post-construction photo taken near the old well house at the back of the pond. The photo displays the livestock fencing surrounding the pond. Due to the leak and weed removal the pond level was low and slowly recovering.



Pre-construction photo taken at Photo Point #1.

Photo taken next to the pond entrance gate to show the existing fence and pre-construction project condition.



Post construction photo taken at Photo Point #1.

The pond one year post-construction documenting the completed project: exclusionary fence, pump and start of pipeline system and revegetation.



Figure 2. Photo-monitoring documentation of the practices installed at the pond. Post-construction photos were taken one month after implementation.

Project 2012-003

Livestock Pond Fence Exclusion and Water Development

Pre- Project Photo 05/2012

Pre-construction photo (1-year pre-project) taken from Photo Point#3.

Photo displaying the condition of the water development project site along the ridge top.



Post Project Photo 12/2013

Post-construction photo taken from Photo Point#3.

Displaying the restored pipeline trench and two water troughs in the distance along the ridge top.



Post Project Photo 12/2013

Photo of installed 5,000-gallon water tank.



Post Project Photo 12/2013

One of two concrete 400-gallon water troughs installed with a concrete pad and wildlife ramp.



Figure 3. Photo-monitoring documentation of the pasture water development.