

319 Success Story

Preventing Pollution from Livestock in Coastal Watersheds of Santa Cruz, San Benito and South Santa Clara Counties

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I. TITLE - Preventing Pollution from Livestock in Coastal Watersheds of Santa Cruz, San Benito and South Santa Clara Counties

II. WATERBODY IMPROVED

In Santa Cruz, San Benito, and South Santa Clara Counties, loads associated with livestock facilities (nutrients, pathogens and sediments) were reduced in the San Lorenzo River, Soquel Creek, Aptos Creek, Watsonville Slough, and Pajaro River Watersheds through the implementation of improved manure management practices. For the San Lorenzo River, Soquel Creek, Aptos Creek, Watsonville Slough, and Pajaro River Watersheds (Santa Cruz County) raw manure loads were reduced by 328,500 lbs/year, 344,925 lbs/year, 131,400 lbs/year, and 476,325 lbs/year respectively. Similarly, for the Pajaro River Watershed in San Benito and South Santa Clara Counties raw manure loads were reduced by 82,125 lbs/year. No estimations were made on sediment load reductions. All waters remain on the state's 303(d) list.

Some of the critical beneficial uses impacted include fisheries health, flora and fauna habitat, recreation and drinking water. The purpose of proposed project is to create cultural changes in livestock facility operations that provide immediate and lasting water quality and watershed improvements by reducing the off site mobilization of manure, urine, sediments, and associated nutrients and pathogens from livestock facilities.

III. PROBLEM

The Pajaro River, Soquel Creek, Aptos Creek, Watsonville Slough, and San Lorenzo River watersheds are located on the central coast of California. Within these watersheds there are twenty-one (21) waterbodies on the state 303(d) list, listed for nutrients, pathogens, and/or sediments. Potential pollutant sources identified are agriculture, urban, resource extraction, hydromodification, habitat/riparian modification, streambank modification, channelization, and channel erosion. For these central coast watersheds, there are fourteen (14) Total Maximum Daily Loads (TMDLs) in development and/or adopted. All of these waters eventually make their way to the Monterey Bay National Marine Sanctuary. Typical livestock facilities have a strong potential to contribute nutrients, pathogens, and/or sediments into local waterways. For example, in the San Lorenzo River watershed livestock contributes approximately six percent of the nutrient load.

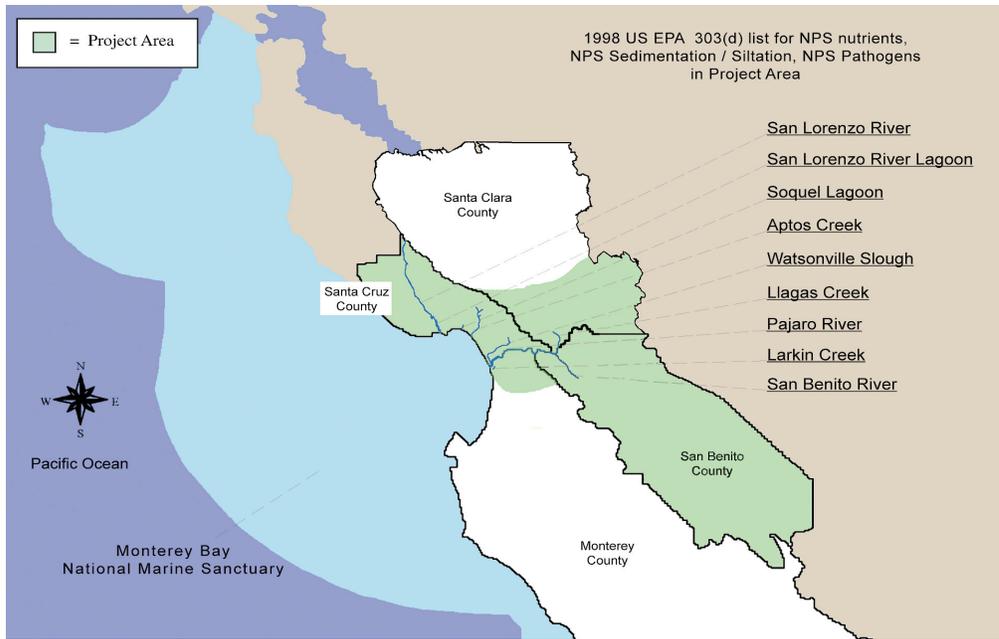


Figure 1: Project Area

IV. PROJECT HIGHLIGHTS

Ecology Action, along with the Santa Cruz County Resource Conservation District (RCD), conducted a project to achieve voluntary implementation of Best Management Practices (BMPs) by livestock facility owners in our region. Successful and lasting implementation will be accomplished with continued effort and assistance such as what has been achieved in this project. The project components implemented are based on the experience of similar programs throughout the Bay Area, and are built on lessons learned in initial local program efforts. The basic approaches used included:

- Technical training series and hands-on workdays focusing on reducing/eliminating water quality pollution
- Establishment of Demonstration Sites which highlight implementation of BMPs throughout the project region
- Strengthening peer-to-peer transfer of information via a peer leader program
- Conducting a market study to research how livestock owners in the region manage their manure
- Piloting a manure management program based on information collected during a market study

Ecology Action implemented this project in close partnership with the Santa Cruz County RCD. The project spanned three counties (Santa Cruz, San Benito and South Santa Clara) and implemented water quality protection programs in the San Lorenzo, Soquel, Aptos, Watsonville Slough, and Pajaro River watersheds.

V. RESULTS

The program implementation is successful. Workshop participation increased by 378 percent over the 2002 pilot program and participant interest in applying to implement management practice for Demonstration Site purposes increased by over 700 percent. The program increased the number of Demonstration sites from three (3) to sixteen (16).

Sixteen (16) demonstration projects resulted in a minimum of sixty-two (62) BMPs implemented by workshop participants. Types of management practices implemented include manure bunkers, regraded pastures and/or paddocks to re-direct runoff to a filter area, exclusionary fencing, improved drainage (grassed filter areas, swales and/or berms, gutters and downspouts, rock/energy dissipaters, French/subsurface drains, etc.), loading docks for manure management, retention/sediment basin, and reduction in number of animals living on the properties.

The properties represent 92 acres of land and 193 head of livestock (primarily horses). This amounted to approximately 1,757,475 pounds (878.7 tons) of manure per year being managed responsibly. The management of 878.7 tons of manure equates to approximately two (2) tons of nitrogen pollution being kept out of local waterways and ground water supplies. The projects did not monitor for sediment load reductions. Even with these load reduction the all water bodies remain listed.

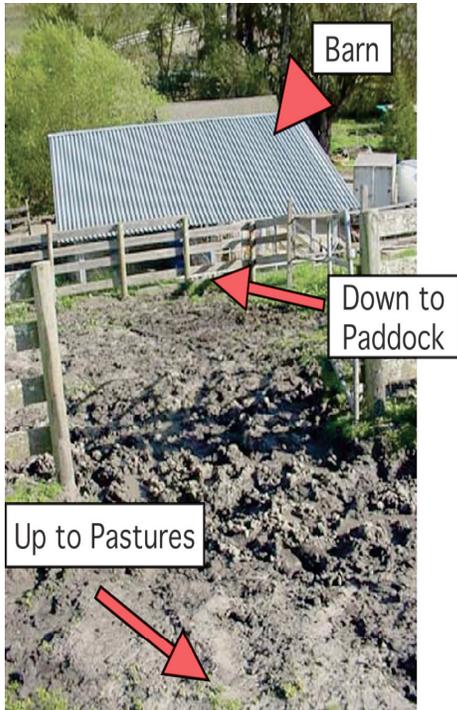
VI. PARTNERS and FUNDING

This project was completed because of several successful partnerships. Ecology Action was the lead agency and was supported through a strong alliance with the Santa Cruz County Resource Conservation District (RCD). Additional assistance was provided by the Loma Prieta RCD and San Benito RCD. Additionally, the key technical support was provided by the Natural Resource Conservation District, Certified Erosion Control Specialist and Registered Forester (Steve Butler), contractors (Carol Verbeek and Bruce Hortter) of 'Building the Equestrian Dream', and voluntary Technical Advisory and Strategic Advisory Committee members.

This Proposition 13 grant was awarded by the State Water Resources Control Board and administered by the Region 3 Water Quality Control Board. The grant was completed within the budget of \$651,400 and the project provided matching funds totaling \$148,871 for a total of \$800,271. The best management practices implemented for sixteen (16) Demonstration Sites totaled \$281,733. Each project site was required to provide a minimum of 40% match, but all of the work was completed for a total of \$143,610 in reimbursements to site owners. This equates to a 51% match by the site owners.

The water bodies addressed in this project cross Congressional Districts. Specifically, the major portions of these water bodies reside in the 14 and 17 Congressional Districts. There are small pieces of the water bodies in Congressional Districts 15 and 16.

Photos: Below is an example of project implementation. The first sets of photos “Mud Madness” show the state of the before project implementation. Subsequent photos show portions of the project before and after implementation.



MUD MADNESS

BEFORE

The horses had to slide down this muddy slope to get from the pastures above down to the barn every night for feeding. This mud was so thick it pulled your boots right off your feet. This was dangerous for the horses and was nearly impossible to clean up the manure.

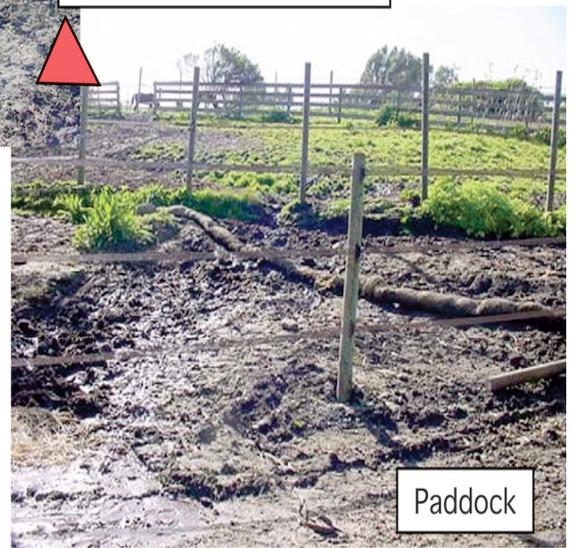


Because the barn and paddock were located at the base of the hill, all of the water that fell on the slope would flow down and collect there. This meant that as you got closer to the barn the muddier it became.

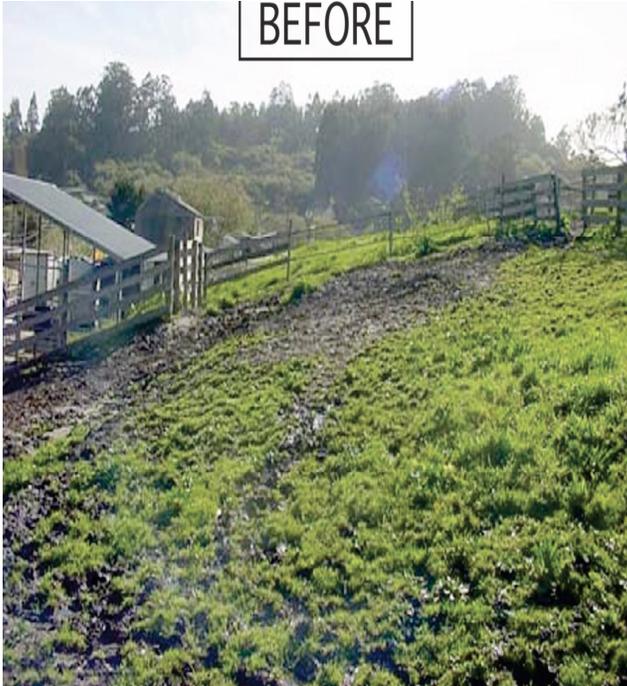


Upper entrance from the pastures to the paddock

Once it became muddy, it was nearly impossible to pick up the manure. As the manure became mixed in with the mud the area retained even more water. Thus the mud became even deeper.



BEFORE



CAPTURING WATER

The Participants have sacrificed a significant portion of their property in order to improve it. By taking this steeper slope permanently off-line and seeding it, the water that was sheeting down the bare muddy hill will now be partially absorbed by the grass and the rest will be captured in a French Drain buried along the new back wall of the paddock.



A new entrance to the paddock was built that takes a much more gradual approach to the barn.



AFTER



Once the wall was built and the drains were installed the paddock was ready to be regraded and resurfaced. The wall, drains and vegetation will manage the runoff so that the paddocks will stay dry. To add one more layer of protection, the owners erected a roof over their paddock and installed gutters which empty into the French Drain.





MANURE MANAGEMENT

AFTER

Manure Pile

BEFORE

Stream

The original manure pile was located just outside the paddock beside the stream. This area has been drastically changed. Where the old manure pile was approximately located, a sediment basin has been constructed. This area is a small depression that detains the outlet from the drains and allows the sediments to filter out before the clean water is released near the stream.

THE NEW MANURE MANAGEMENT PLAN:

1. Scoop all manure from paddock and barn - This was once considered impossible in the winter because of the deep mud and relentless deluge of water. With the installation of a roof over the paddock, a French Drain behind the wall and a vegetated strip above the paddock this is now a very real possibility.
2. Contain the manure pile in a bunker - The "Manure Castle" has a concrete floor, a roof and a roll down door. This design was chosen to keep all water from mixing with the manure. Rain cannot fall on top of it, water cannot seep in the sides and pathogens and nutrients cannot leach out the bottom.



AFTER

CONTACT INFORMATION:

For more information on the Nonpoint Source Program contact Howard Kolb, at (805) 549-3332 or hkolb@waterboards.ca.gov. Additionally, readers can visit the Central Coast Water Board's website at <http://www.swrcb.ca.gov/rwqcb3>.