

The Ecoagriculture Snapshots series highlights the work of different organizations around the world to implement ecoagriculture landscape management approaches.

A Watershed Approach to Vineyard Management for Creek Restoration and Endangered Species Protection in California's Napa County, USA



The rolling, semi-arid hills of Napa County, California, USA, are one of the most productive wine grape growing regions in the world. With the success of the winery industry in the mid-1980s, much of Napa County's agricultural lands – which had once been dominated by grazing lands for sheep and dairy cattle – were switched over to vineyards. In transforming the landscape from grasslands to vineyards, soil tilling and tree-removal caused severe erosion, negatively impacting local Huichica Creek, critical habitat for the endangered freshwater shrimp and important spawning ground for steelhead and rainbow trout. However, the rapid turnover of land ownership also created a unique opportunity for local, state, and federal agencies to work with the new vineyard managers to develop long-term resource management plans which will benefit the entire 4500 acre Huichica Creek watershed, as well as the local agricultural economy.

Napa County is situated at the north end of San Francisco Bay, on the west coast of California, and shares the region's Mediterranean climate and mixture of chaparral and oak woodland. European settlers first arrived in the area in the 18th century, though large-scale agricultural development did not begin until the mid 19th century. The Napa River carves a valley north to south which extends the entire length of the county, and one of its tributaries, Huichica Creek, flows for 7.5 miles through the Carneros region of southern Napa County. The area is a mixture of natural, urban, and cultivated lands, with about 130,000 acres of the total 480,000 acres in Napa County being in agricultural production. The county's agriculture is carried out predominantly on a patchwork of medium-sized farms, with the average farm being 163 acres. Despite a handful of parks in the county, before the formation of the Huichica Creek Stewardship Project fewer than 48,000 acres were publicly or privately protected, and private ownership dominated the landscape.



Huichica Creek in 1990, suffering from soil erosion and lined with invasive grasses. The wide, shallow, slow-moving water revealed poor creek health. Source: Napa Resource Conservation District



Huichica Creek in 1995, with native plantings to stabilize the banks and reduced agricultural inputs in nearby vineyards resulting in a cleaner, healthier creek ecosystem. Source: Napa Resource Conservation District

Before the Huichica Creek Stewardship project, the creek ecosystem suffered from channel degradation, seasonal flooding, soil erosion, and loss of native trees and shrubs. Many species rely on the health of Huichica Creek, including the endangered California freshwater shrimp (*Syncaris pacifica*). Steelhead and rainbow trout also use the creek as spawning grounds. Though little is known about the habitat requirements for the freshwater shrimp, trout require clean, cool, gravelly streambeds to successfully spawn. Hence, the recent conversion to vineyards and the resulting erosion of top soil into the creek has threatened the trout population. Because of the predominance of moderately-sized farms and private landownership there was little incentive for local growers to protect water quality, restore the natural capacity of the creek, or work toward the long-term stewardship of the watershed.

Local and state government authorities began mobilizing to protect the creek as the rapid transformation of the landscape from grazing lands to vineyards was taking place. The Napa County Resource Conservation District (RCD) and the Napa Field Office of the USDA National Resources Conservation Service (NRCS) approached growers in 1986 with several ideas for conservation schemes. Though growers were initially skeptical, the listing of the freshwater shrimp as endangered in 1988 mobilized many landowners to reform their land-use practices before regulatory action was taken. Sixty-three landowners joined a Stewardship Council, including representatives from several large commercial growers such as Mondavi, Sterling, and Buena Vista. This stewardship approach allowed a much more comprehensive outlook that addressed the land use ethic as a central point, and developed technical solutions to resource problems as a means of furthering that ethic. This “bottom up” approach was more flexible and less restrictive than traditional “top down” approaches to land management plan construction. The Stewardship Council produced a habitat conservation plan for the California freshwater shrimp which encouraged government funding, and the project has grown to include over a dozen federal, state, and local agencies.



The demonstration vineyard, exhibiting alternate-row-tillage (“green manure” with bell beans showing) and non-tillage (perennial grasses with zorro fescue as a nurse crop). Source: Napa Resource Conservation District

According to Phill Blake, District Conservationist with the USDA Natural Resources Conservation Service (NRCS), federal and state agencies were impressed with the goals of the Stewardship Council, as no one had really tried to manage biodiversity at a watershed scale before in California. The United States Environmental Protection Agency (EPA) financed most of the restoration. Other agencies involved included California Department of Fish & Game (CDFG), the U.S. Fish and Wildlife Service, and the Napa County Ag Commissioner. Napa RCD budgeted around \$150,000 per year between 1996 and 2000, with money largely coming from water quality grants from EPA.

The Stewardship program encouraged growers to implement a variety of methods to address soil erosion and contamination by pesticides. To regulate water use, an automated stream gauge was installed so that growers can find out when they can pump water and how much they can pump. To improve water quality, a number of measures were introduced: the cultivation between vine rows of native grass cover crops that increase biodiversity and reduce erosion, and streambank erosion control programs that help keep topsoil in place instead of finding its way into the streams. The implementation of non-point source pollution reduction measures and the planting of thousands of native shrubs and trees help reduce the pesticide load in the creek. The building of new roosts and nest boxes created habitat for flying predators. These new natural elements also provide

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Close-up of the native California annual *Bromus carinatus* found between the vineyard rows. Source: Napa Resource Conservation District

habitat for beneficial insects that consume insect pests and for birds of prey that eat rodent pests, helping reduce the need for pesticides and poisons. Trees also help prevent erosion and provide shade to keep the creek cool, which is important for steelhead and rainbow trout to survive.

As an outgrowth of the efforts and programs of the stewardship, the Napa RCD also purchased a 21-acre (about 8.5 hectares) parcel of land in 1991 in the watershed with a grant from the State Coastal Conservancy in order to create the Huichica Creek Vineyard Sustainable Agriculture Demonstration Project. The land was purchased to develop a vineyard to demonstrate the compatibility of natural systems with commercially viable agricultural systems that are properly designed and maintained and to implement a riparian and wetland restoration project. In the early years the property was developed almost entirely with volunteer labor and donations from growers, contractors, and vendors. Later the necessary capital to complete the development was borrowed from the California State Revolving Fund. As of 2007, the demonstration project is still running and many growers have adopted methods first developed on the demonstration vineyard.

Another spinoff of the Huichica Creek Stewardship Council, which may prove to be its most important legacy, is the Napa Sustainable Winegrowing Group, which formed in 1995. This group of wine grape

growers, vintners, local government agencies, and educational organizations continues to be coordinated by the Napa County Resource Conservation District and works to identify and promote winegrowing practices that are economically viable, socially responsible, and environmentally sound.

As a result of the shift to more sustainable agricultural practices in the Huichica Creek watershed, vast improvements were made to the creek ecosystem health, including the reestablishment of steelhead and rainbow trout spawning and the survival of the endangered California freshwater shrimp. Wildlife populations have also risen, including natural predators such as foxes and birds of prey. Groundwater flow and downstream creek flow have increased, sediment runoff has decreased, overall water quality has improved, and the use of pesticides has declined.

Phill Blake, believes this case truly set a precedent for agriculture in California. According to Mr. Blake, there wasn't anything driving interest in land stewardship in California, until "some fiercely independent growers who didn't want the government telling them what to do and who valued the beauty of the land around them discovered a new path for navigating the fairly uncharted waters of the Endangered Species Act." As a result, there has emerged a "hopefulness that farming in an environmentally sustainable, socially responsible way is actually good for the industry." Though the Huichica Creek Stewardship Council no longer meets, its successor, the Napa Sustainable Winegrowers Group, has received a variety of environmental accolades (<http://www.nswg.org>), and eight other creek projects similar to Huichica's are up and running as a result of the success of this project. The success of this project has overflowed the beds of Huichica Creek.

For more information, please see:

<http://www.nswg.org/infoonnswg.htm>

http://www.smartcommunities.ncat.org/success/huichica_creek.shtml

<http://www.naparcd.org/huichicacreekstewardship.htm>

<http://www.naparcd.org/huichicavineyard.htm>

http://www.ceres.ca.gov/biodiversity/newsletter/v2n4/huichica_creek_vineyard.html

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