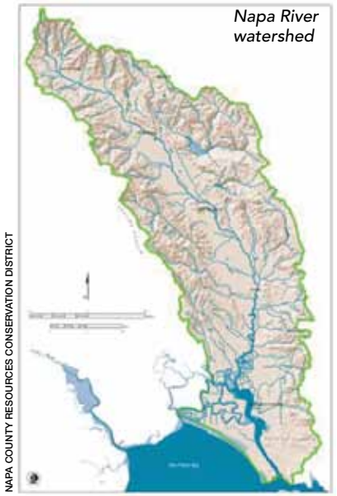


NAPA COUNTY RESOURCES CONSERVATION DISTRICT

Waterways in Wine Country

After decades of declining health, the Napa River is being resuscitated by neighbors.

GEORGE GMELCH AND GRETCHEN E. HAYES

Visionary landowners in the 1960s had a radical idea: turn the Napa Valley into an agricultural preserve, with minimum lot sizes of 40 acres (160 acres on the hillsides) and restricted commercial activities. The proposal to create the Agricultural Preserve was met with vigorous opposition from both developers and residents who wanted the freedom to subdivide their land. Fortunately, the visionaries joined forces with local governments and prevailed, saving Napa from the urban development that paved over other fertile California valleys, such as the Santa Clara.

Although the Ag Preserve—as it's commonly known—saved the rural landscape, it did not prevent the degradation of the Napa River, nor lessen the destructiveness of its floods. Rising from springs and seeps on the slopes of Mount St. Helena (elevation 4,343 feet), the Napa River flows fifty-five miles south down the valley through the winery towns of Calistoga, St. Helena, Rutherford, Oakville, and Yountville before reaching the city of Napa and emptying into San Pablo Bay north of San Francisco. Today, the river and its thirty tributaries drain the most expensive farmland in the United States.

The Port of Napa

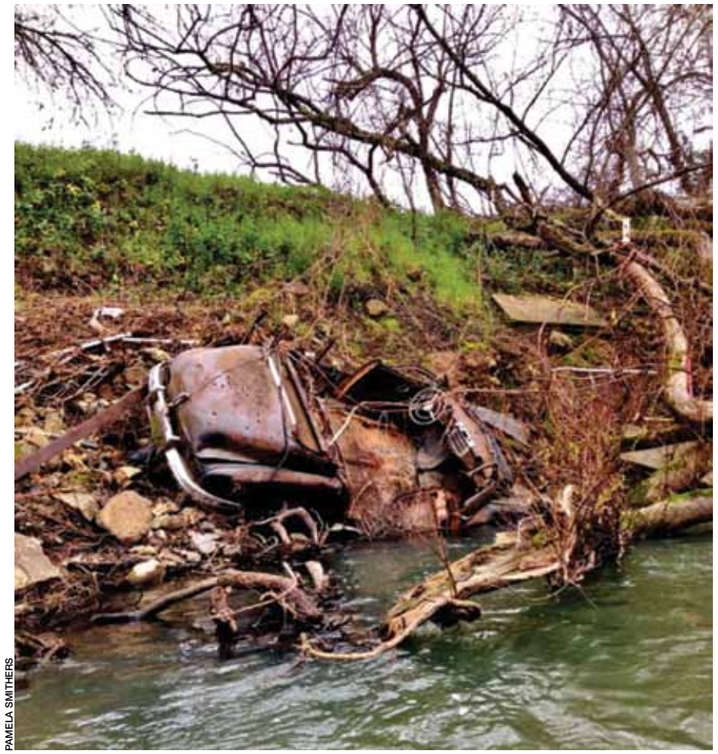
J.L. SOUSA/REGISTER

As Napa's wine country began its post-Prohibition rise to fame with a resurgence of vineyards in the 1960s, the decline of fisheries and habitat in the Napa River went largely unnoticed. The river channel narrowed and dug deep into the valley floor, becoming increasingly disconnected from its floodplain and its residents. Now, decades after the passage of the Ag Preserve, another visionary private-public partnership—the Napa River Restoration Project in Rutherford and Oakville—has begun to reestablish an ecological and economic balance in the agricultural heart of the Napa Valley.

More than 4,000 years ago, the Napa River and its floodplain were central to the livelihood of the first peoples—mainly the Wappo—to settle the valley. Archaeological surveys carried out in the 1940s by archaeologist Robert Fleming Heizer at the University of California, Berkeley, discovered middens (refuse mounds) eight feet deep, indicating long-standing village sites roughly ten miles, or one day's travel, apart. "It's not surprising that the Wappo lived along the river," notes archaeologist Christopher Kimsey. "All the staples in their diet—deer, fish, and acorns—were tied to the riparian environment." The remains of Wappo settlements can be found all along its banks, and after winter rains, local residents still find obsidian shards, arrowheads, and grinding stones in the river bed.

Although the Wappo were foragers, which in most settings requires a degree of nomadism, Napa's environment was rich enough to enable them to stay put most of the year, with seasonal forays to the coast to gather shellfish, seaweed, and salt. Men hunted and fished; women gathered berries, acorns, and bulbs from the tule (bulrushes) that grew in wetlands along the river.

In the early 1800s, when people of European origin began arriving in Napa Valley—first via Mexico and then from the Midwest—they brought great change both to the Wappo and to the watershed. By 1900, the Wappo and other aboriginal people had been so decimated by disease and conflict that scarcely any remained in the valley. Foraging gave way to cattle grazing, and, later, agriculture. Commercial traders shipped coveted "Napa leather"—cow hides tanned with oak bark—by riverboat steamers from the nascent port of Napa through the estuary to markets in San Francisco.



PAMELA SMITHERS

Car body used to manage bank erosion in Calistoga, CA

As the 1849 Gold Rush increased the demand for food to feed hungry prospectors, cattle ranching gave way to wheat production. When wheat prices slumped in the 1870s, farmers planted vineyards and orchards of apples, prunes, walnuts, and olives. Using horse-drawn, mold-board plows, they carved furrows and dug ditches to route rainwater from the fields. Stream channels changed in response to the new land uses. Nineteenth century sources describe a complex Napa River with multiple branches and sloughs spread across the valley floor interspersed with wetlands, providing rich habitat for wildlife, including ducks, yellow-billed cuckoos, beavers, deer, steelhead trout, and salmon. A few of these former waterways linger today as ghost images in the vineyards—faint, dark pathways that indicate their richer soils.

The incision of the Napa River, resulting from the practices of early farmers, accelerated dramatically after the 1970s as Napa's wine industry took off and vineyards expanded across the valley floor and hillsides, displacing native vegetation. Rainwater pulsed into the river, scouring the channel, undermining trees, and creating vertical banks susceptible to erosion and collapse. Trapped in a single deep, narrow channel, the Napa River could no longer distribute its flow over the floodplain each year and replenish the soil with deposits of sand, silt, and clay. These fine sediments instead deposited in the channel bed, clogging up the shrinking number of gravel bars that provide critical habitat for spawning salmon and the threatened steelhead.

As the river was becoming disconnected from its floodplain, so too were Napa's inhabitants losing their ties to the river, once a popular site for recreation. Yountville resident Andy Jaeger recalls, "We'd often be down there all day… When the moon was bright, we'd go exploring at night." Folks of all ages scanned gravel bars for obsidian arrowheads. Above all, the river was a place to swim. One 84-year-old resident, Louie Pommetta, remembers that "just about everything we did as kids for fun was in the river. It was a magical place."

The river was also a convenient place to dump trash—everything from car tires and batteries to old appliances. "When the river would come up in the wintertime," remembers vineyard manager Davie Piña, a fifth-generation Napan, "people would take all the garbage accumulated over the year and throw it into the rushing water to get it out of here. Pesticides, motor oil, any sort of thing. It wasn't that people didn't care about the river, they just didn't know better." Rivers all across America were suffering similar abuse.

By the early 1980s, most Napans had turned their backs on the river. It was no longer a desirable place to play

Newly constructed alcove refuge and restored fish passage awaiting revegetation

GRETCHEN E. HAYES, TESSERA SCIENCES

or swim. Channel incision had eroded and steepened the banks. Environmentally reckless road building, logging, and vineyard planting on the valley's steep hillsides had turned loose massive amounts of silt that muddied the river and its tributary streams and degraded spawning beds. New vineyard acreage on the valley floor led to more pumping for irrigation from the river, reducing its volume and flow. For the first time in human memory, some up-valley reaches went dry in summer. And what water remained became increasingly polluted by slaughterhouses and effluent from a few up-valley towns that resisted treating their sewage.

Demographic changes also reduced interaction with the river. Fences and "No Trespassing" signs sprung up with the influx of new landowners, who came mostly from urban areas and were unfamiliar with the local custom of letting people walk across their property. Worried about vandalism, theft, loss of privacy, and liability, many blocked public access to the river across their land. Lifestyle changes also caused Napans to turn away from the river. With computers, electronic games, and schedules filled with sports and extracurricular activities, children had less time and inclination to explore outdoors.

Further distancing residents from the river was the growing scrutiny by county and state agencies tasked with protecting water, air quality and wildlife. Landowners' prior practice of managing their land without oversight—shoring up their river banks with riprap, bulldozing and removing trees from the channel, dumping into the river—could now result in hefty fines. Many landowners and vineyard managers became wary of doing anything involving the river. Tension also grew between landowners primarily concerned with protecting their property rights and those more environmentally conscious. All of these threatening conditions were exacerbated by general confusion over agencies' differing jurisdictions, river management policies, and a lack of information about how watersheds function.

The growing consumption of and demand for fine wine in the United States also threatened the river. As grape prices increased and land became scarce, vineyards pushed ever closer to the river, hastening the removal of the riparian forest that once buffered the banks from erosion, filtered fine sediments from storm water runoff, and provided vital habitat. Willows, oaks, white alder, and California bay laurel once bordered the river channel to a width of 500 feet. But today, notes Robin Grossinger in his seminal *Napa Valley: Historical Ecology Atlas,* all that remains of this primordial forest are a few strands 50 to 100 feet in width. Some idea of Napa's historic riparian forest can still be seen at the Yountville Ecological Reserve. This 73-acre remnant surrounded by vineyard is home to more than 150 bird and 230 plant species.

JONATHAN KOEHLER, NAPA COUNTY RESOURCE CONSERVATION DISTRICT

Salmon smolts in the Napa River, an anchor watershed for salmonid restoration

Some of the most serious effects of development in the Napa watershed have been experienced in downtown Napa, the valley's urban center and historic port. Napa suffered severe floods in 1955, 1986, 1995, and 1997. The worst, in 1986, caused widespread devastation, forced the evacuation of 7,000 people, and did $100 million in damage, finally prompting the Napa community to come together to support a large flood protection project. The U.S. Army Corps of Engineers initially proposed building higher levees and adding more concrete—"gray infrastructure"—to contain the river within its banks. Fortunately, the voters rejected this traditional approach. They were persuaded by environmentalists that the solution lay not in further channelizing the Napa River, making it harder, deeper and straighter, but rather adopting a design that adhered to "living river" principles. Instead of a concrete infrastructure, which is subject to deterioration, "green infrastructure" increases the connection of the river to its natural floodplain, attenuating flood damage while improving habitat, aesthetics, and access. Dikes were removed to restore Napa's tidal marshlands. Bridges that obstructed flood flows were replaced, and the river was widened and terraced to provide more room for large volumes of water.

JEREMY SARROW, NAPA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Beavers return to the Napa River.

For downtown residents, accustomed to lugging sandbags to ward off high water each winter, the flood control project has been a huge relief. They no longer make every decision about home, garden, and yard with the worry of flooding in the back of their minds.

Flooding also caused destruction in the rural valley upstream. In 1997, John Williams, owner and winemaker of Frog's Leap Winery, waded into the river near his recently purchased vineyard in Rutherford to check on a breach in the earthen berm that protected the property from flooding. He was shocked by the damage he found. "As I walked along the river, I saw my neighbors had similar damage. I saw, too, that they were trying to protect themselves by building higher and higher berms, using riprap, car bodies,

GRETCHEN E. HAYES, TESSERA SCIENCES

Willow baffle at inlet to a newly restored secondary channel

just about anything, piled up high along the bank to keep the water out." For years, people had been waging a losing "berm war" against the river, and with each other. Confining flood flows with longer and higher berms, thereby further pinching the flow of water and increasing the river's erosive force, only exacerbated the problems caused by the already incising river. Adults who, as children, had clambered down five-foot banks to roam the river's gravel beds now peered down 25-foot vertical drops and lamented the unchecked erosion and disappearance of their farmland.

"But it wasn't just the eroding banks and breached berms that landowners were dealing with," recalled Williams. "They had a host of other bellyaches—arundo (*Arundo donax,* a tough, invasive giant cane), blue-green sharpshooters (insect vectors for Pierce's disease that attacks grape vines), erosion and bank collapse, and excessive pumping of water from the river for irrigation and frost control. It occurred to me that if we tackled these different problems together we might have a better chance [of success]." Williams invited local landowners to a meeting in his barn to discuss their collective problems. "Besides an airing of the issues, we discovered that a lot of people didn't really know their neighbors, as many were newcomers to the valley. So we organized some lunches, visits to one another's vineyards and wineries, and did a group walk to survey the river." Meetings were soon convened under the auspices of the newly-organized Rutherford Dust Society (RDS), whose mission is to promote wines from the Rutherford sub-appellation and to serve the local community. "At these meetings people brought their own wines… and we drank a lot of Zinfandel," recalled Williams. "I can't emphasize enough the importance that drinking wine together had in creating a community."

As they educated themselves about the river, the landowners decided that rather than seek the help of local government (which some feared would result in undesired scrutiny of their agricultural practices and more regulations), they would fund a river restoration study themselves. Each landowner contributed to the fund based on the length of river frontage they owned. Collecting about $100,000, they hired Philip Williams & Associates, now part of Environmental Science Associates, a San Francisco environmental hydrology firm, to conduct an assessment of the Rutherford Reach of the Napa River. When the engineering report came in, the RDS formed a formal private-public partnership with Napa County and the local Resource Conservation District, which they christened the "Rutherford Dust Restoration Team" (RDRT or "our dirt") to initiate a plan to restore and manage the river. One of the biggest challenges RDRT faced, said former RDS president Rue Ziegler, "was getting all thirty-one landowners on board. Some were strong property rights people—folks who were used to doing things their own way and didn't want anyone, and especially government agencies, telling them what to do."

In large measure, the success of the project came down to personality, to having the right leader. That person was local vineyardist Davie Piña, who chaired the RDRT landowner committee. "Davie knew that he could never get everybody on board simply by touting the project's environmental benefits," explained John Williams. "Davie's approach to the landowners was pragmatic… Davie understood that landowners needed to know that they would always be in control of their land and were not being forced to do something. Davie knew how to work the back channels."

Once united, RDRT began to seek assistance from agencies including the California Department of Fish and Wildlife and the Regional Water Quality Control Board. "These regulators were surprised," said Ziegler, "that a group of such diverse local landowners had gotten together and were putting up their own money to try to fix their river." In the end, all thirty-one riverside land and vineyard owners voluntarily came on board, including several who had spent significant personal funds to defeat previous ballot measures that would have mandated channel setbacks on their land to restore the riparian buffer zone. "That in itself was a remarkable achievement," said one observer.

The RDRT therapy for the river involved a suite of approaches, including relocating earthen berms from the riverbank. All told, landowners along the five-mile stretch of the river from Rutherford to Oakville converted eighteen acres of vineyard floodplain back to native riparian forest. Invasive plants (e.g. Himalayan blackberry, periwinkle, arundo) were replaced by native species to create a complex vegetated buffer between the river and the adjacent vineyards. Floodplain benches were excavated and planted. Structures made of wood and stone were installed in the streambed to help reestablish resilient habitat conditions including gravel bars, riffle-pool sequences, and cover for fish. Landowners continue to fund and help manage a long-term river channel maintenance program with the Napa County Flood Control District, which also removes debris and log jams, manages and removes non-native vegetation, and monitors the instream habitat structures. As Andy Beckstoffer, the valley's largest landowner and a champion of the restoration, said, "Our goal is a living river."

"The big challenges to making this a successful collaboration," said an environmental scientist on the restoration team, "were ignorance of how watersheds function, concern over individual property rights, and distrust of government." The costs were ultimately spread equitably between landowners and state and local agencies, with help from a county sales tax. Where the Napa River had become a long, narrow ditch carrying fast-flowing floodwaters, there is once again a complex system of pools and gravel bars with many new acres of slow-water habitat in which fish can take refuge during high storm flows.

Sitting on the veranda of his Frog's Leap Winery, which uses sustainable principles including dry farming (no irrigation) to grow grapes, John Williams mused in June 2015 about the completion of the restoration project. "Looking back now, it is all a bit unbelievable. None of us could have ever imagined what has been achieved. I was just down at the river this morning. It's such a beautiful sight with new terraced banks, and with beaver, salmon, and steelhead coming back. It just goes to show that in this age of great skepticism about our political institutions and polarized views about the environment, a group of diverse individuals can find common ground and work constructively with government to build a sustainable river for our future."

The restoration project has inspired other endeavors, such as saving the valley's ancestral walnut trees. Not many years ago, none of these projects would have seemed possible to many of the participating landowners. And their example is now spreading downstream, with another nine river miles slated for restoration. Those working to restore the Napa River today are continuing what an enlightened group of residents achieved nearly fifty years earlier when they created the Agricultural Preserve—the protection of their beautiful valley from urbanization, and the creation of a sustainable community.

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