

The Value of Protecting Riparian Corridors

THE HEALTHY LANDS AND HEALTHY ECONOMIES INITIATIVE

CASE STUDY



**AG +
OPEN
SPACE**
SONOMA COUNTY

CONTEXT

Stream ecosystems are areas of incredibly high biological diversity – home to myriad plant communities and critically important habitat for aquatic, terrestrial, and avian wildlife. Over three-quarters of the amphibians and half of the reptiles in California rely upon these systems for a substantial part of their life cycle, and these areas are foundationally important for threatened and endangered aquatic species including freshwater shrimp, steelhead trout, coho, and Chinook salmon. Resident and migratory bird species are dependent on riparian areas – some traveling from Central and South America to overwinter in California streamside forests. Salmonid species use these connected habitats to move up and downstream during spawning and outmigration, while a wide variety of terrestrial species – including bears, mountain lions, bobcats, foxes, and coyotes – use stream corridors for shelter, food, and movement through increasingly developed landscapes.

Intact riparian corridors are also important for human well-being – helping to ensure clean and abundant supplies of drinking water, minimizing downstream flood impacts, supporting the commercial and recreational fishery, sequestering carbon, enhancing climate resiliency, maintaining cultural and spiritual values for a community, and contributing to scenic beauty and recreational enjoyment.

Because floodplains are often ideally suited for high value human land uses such as roads, residential and commercial development, or agriculture, over **95%** of the floodplain riparian habitat in California has been removed. Preliminary studies in

Sonoma County point to trends similar to the rest of the state, with increasing impacts to floodplain riparian areas.

Ag + Open Space is tasked with protecting natural lands (including riparian corridors), agricultural lands, scenic areas, and greenbelts. One strategy that Ag + Open Space uses to accomplish this goal is to work with private landowners through a voluntary, incentive based approach to protect stream systems, such as a riparian easement. Riparian easements can protect existing riparian habitat as well as degraded habitat in the floodplain that can be restored to a fully functional state.

Based upon this analysis, the estimated value provided by current riparian areas is **\$61.3 million to \$85.0 million** annually. If fully restored to their functional potential, riparian corridors could provide up to **\$116.3 million** per year. Since numerous services were not included in this study (including natural beauty, water supply, pollination, and pest control services, among others), this value is likely an underestimate of the true value of Sonoma County riparian corridors.

METHODS

This analysis is based on a review of published studies evaluating the effects of riparian corridor protection, and building on a multi-year technical collaboration with Tukman Geospatial, Dr. Joan Florsheim, and O'Connor Environmental, among others, to identify the most important riparian corridors in Sonoma County to prioritize for protection.



FINDINGS

Value: WATER QUALITY

Toxic algae blooms, polluted runoff, high water temperatures, and altered sediment levels negatively impact Sonoma County's water quality. Highly functioning riparian ecosystems can assimilate pollutants, reduce stream temperature, and decrease erosion thereby improving water quality throughout the watershed and avoiding costly water treatment infrastructure. Previous studies have shown that households are willing to pay on average \$45 per year to improve water quality through riparian restoration. In Sonoma County, this is equivalent to **\$8.5 million** per year for the benefits provided by riparian corridors in their current state, and **\$17 million** per year if all riparian corridors in Sonoma County were restored to a fully functional state.

Value: MODERATION OF EXTREME EVENTS

Floods are the most frequent natural hazard in Sonoma County. Naturally vegetated riparian areas can reduce the force, height, and volume of floodwaters by slowing waters and allowing water to spread out across the floodplain. Natural riparian areas thus help save lives, prevent costly property damage, and reduce the need for flood control infrastructure. By analyzing the value of buildings and infrastructure at risk from large flood events, the researchers estimated that current riparian areas contribute up to **\$59.5 million** annually in flood protection benefits. Increasing the area of riparian corridors would provide more room for floodwaters to spread out, and would likely decrease the amount of damage caused by flooding in Sonoma County.

Value: HABITAT AND NURSERY

In a recent survey, 78% of respondents in Sonoma County indicated that preserving a diversity of habitat for wildlife is extremely important or very important. Riparian areas are relied on by many species – 11 of the county's 28 threatened and endangered species rely on riparian zones as their primary habitat. By approximating that Sonoma County households would be willing to pay \$35 per year for habitat and nursery benefits, the researchers estimated that riparian areas in their current state would provide at least **\$6.6 million** annually.

Value: CARBON SEQUESTRATION

Carbon is stored in riparian vegetation and in riparian soils in the form of organic matter. In Sonoma County, current riparian areas are estimated to sequester above ground approximately 1.84 million tonnes carbon dioxide equivalent (tCO₂e), and, with additional restoration, could increase to 3.1 million tonnes aboveground CO₂e. Using the most conservative estimate of the social cost of carbon at \$15 per tCO₂e, the value of aboveground carbon storage in Sonoma County's riparian areas is **\$27.6 million**, and the potential value of a fully functional system would be **\$46.5 million**. The range in values for the social cost of carbon is very wide; using the least conservative estimates, the value of aboveground carbon storage in Sonoma County riparian areas is **\$489 million**, and the carbon values associated with fully restored riparian corridors exceeds **\$820 million**.

Value: RECREATION

Nearly 75% of our nation's outdoor recreation – including fishing, hiking, and viewing wildlife – takes place within one-quarter mile of streams or other bodies of water. Sonoma County residents make approximately 907,000 trips a year to fish or view wildlife that are supported by riparian corridors. This benefit can be valued at approximately **\$45.3 million to \$54.4 million** annually. Enhancing our current riparian areas or allowing riparian areas to expand over time would likely provide for a greater recreational value to Sonoma County residents.



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Sonoma County Ag + Open Space permanently protects the diverse agricultural, natural resource and scenic open space lands of Sonoma County for future generations. We are responsible for the perpetual protection of over 116,000 acres of land throughout our region. These agricultural and open space lands are protected through a quarter-cent sales tax approved by voters in 1990 and reauthorized in 2006. For more information, please visit www.sonomaopenspace.org.



THE HEALTHY LANDS AND HEALTHY ECONOMIES INITIATIVE

The Healthy Lands and Healthy Economies Initiative documents the economic value and community benefits of natural and working landscapes. This research helps to show that Sonoma County's investments in land conservation pay real dividends, now and into the future. This Initiative would not have been possible without contributions from the Gordon and Betty Moore Foundation, the S. D. Bechtel, Jr. Foundation, and the California State Coastal Conservancy.

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FULL REPORT: Sonoma County Ag + Open Space and Highland Economics. 2018. The Multiple Benefits and Values of Sonoma County Riparian Corridors. Report prepared for Sonoma County Ag + Open Space.

AVAILABLE AT: www.sonomaopenspace.org/HLHE

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