POINT REYES LIGHT

Creek restorations sequester tons of bad gas, study finds

David Briggs

CREEK RESTORATION: Volunteers planted native habitat in 2010 as part of a restoration project of Redwood Creek in Muir Beach aimed at reducing bacteria and sediment. A new report from the University of California Cooperative Extension says that similar restorations on ranches can sequester large amounts of carbon.

By Beau Evans
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Restoring natural creek habitats over long periods of time could help eliminate the amount of greenhouse gases that tens of thousands of homes produce each year, according to a new study put out by the University of California

Cooperative Extension earlier this month.

Called “Creek Carbon: Mitigating Greenhouse Gas Emissions through Riparian Revegetation,” the cooperative’s study collected data from plants and soil from 42 waterways located on ranches in Napa, Sonoma and Marin Counties to show that the longer a habitat restoration project is in effect, the more carbon and nitrogen that revived environment traps—thereby offsetting greenhouse gases emitted by humans and cows alike. According to one of the study’s lead researchers, David Lewis, that knowledge—specifically as it pertains to California’s Mediterranean-type semi-temperate climates, such as those found in West Marin—has never been quantified.

“It has really added to a knowledge gap,” said Mr. Lewis, a watershed management and research specialist who is the director of the county’s U.C. Cooperative Extension. “I think it’s exciting, personally.”

From 2009 to 2011, Mr. Lewis and his colleagues sampled trees, shrubs, grasses and soils at the ranch creeks —including ones in Stemple Creek, Chileno Creek and a portion of the Lagunitas Creek watershed—to determine how much carbon and nitrogen those substances sequestered. They then applied a model developed from similar past studies to estimate the total amount of carbon and nitrogen, in metric tonnes, that is sequestered in the ground rather than released into the atmosphere.

The researchers selected 42 waterways from 102 ranch creeks studied in a 2011 report, also conducted by Mr. Lewis and others, that analyzed a variety of conditions on those creeks from 1959 to 2009. From that report, researchers determined the ages of restoration projects and devised a model to estimate how much carbon had been sequestered, even in creeks not evaluated in the new study.

It’s the first time this model has been applied to other research, Mr. Lewis said, which makes the new “Creek Carbon” study all the more unique.

“This is the first time we’ve been able to do that because we had done the programmatic review earlier,” he said. “It is the first time we’ve made this application of combining two different projects.”

In all, the researchers found that one kilometer of creek habitat that has been allowed to rejuvenate for 45 years—the longest restoration project that the study considered—can store as much as 4,419 tonnes of carbon and 16,217 tonnes of carbon dioxide and other greenhouse gases. For the 25 miles of ranch creeks previously studied in Marin, Mr. Lewis reasoned that just over 80,000 tonnes of carbon is sequestered—an amount equal to emissions from 61,959 cars or 26,853 homes in one year.

And that 80,000 tonnes figure is significant: according to Mr. Lewis, it’s roughly the same amount the county has pledged to reduce through its Climate Action Plan 2015 Update, which calls for reducing emissions in Marin by 30 percent by 2020 from levels in 1990.

“Every time you do a little over three and a half miles, the amount that can be stored over 45 years would equal one year’s worth of Marin’s Climate Action goal,” Mr. Lewis said. “So it’s no small amount.”

Going further, Mr. Lewis pitched the idea that real estate developers—who are required by the state to lessen the impacts their projects have on the atmosphere by developing other ways to mitigate carbon release—could be incentivized to invest in expensive creek restoration efforts.

“For the cost of doing these projects, we’re getting multiple benefits,” Mr. Lewis said. “When you do that, my guess would be that the return on investments would be more.”

And that’s important given the high cost of restoring creek habitats, according to Nancy Scolari, the executive director of the Marin Resource Conservation District. According to the district’s data, a restoration project can cost around $500,000 per mile for replanting, securing permits, redeveloping water and improving structures on a ranch. She added that the district receives funding from multiple sources for restoration projects, including the

Environmental Protection Agency, the State Water Resources Control Board, the Department of Fish and Wildlife, Measure A state funds, the Marin Agricultural Land Trust and a small percentage from ranch owners.

“Generally, a lot of folks out there see restoration as these feel-good projects, but it actually is quite pricey,” said Ms. Scolari, whose organization has engaged in numerous creek restoration projects over the years, many of which were studied by Mr. Lewis.

Despite such expensive work, Ms. Scolari said that Mr. Lewis’s study ought to encourage additional restoration projects due to the multiple ecological and environmental benefits that they produce.

“I think it’s really exciting to see that our ranchers aren’t just recognized for improving water quality and habitat,” she said. “Unbeknownst to all of us, they were helping reduce climate change as well.”