Marin Carbon Project – Design, Implementation, Funding

I. INTRODUCTION

Drawdown: Marin is a community-driven campaign to dramatically reduce greenhouse gas emissions and prepare for climate change impacts. Working towards a vision in which Marin reverses its own impacts on climate change with local solutions, the program aims to achieve a 60% reduction in county-wide GHG emissions by 2030, and a draw down to below zero by 2045. To accomplish this, Drawdown is working with public/private stakeholder collaboratives to develop and prioritize solutions in six focus areas:

- Renewable Energy
- Transportation, Buildings + Infrastructure
- Carbon Sequestration
- Local Food + Food Waste
- Climate Resilient Communities

Whereas most collaboratives are focused on solutions for reducing future emissions, the Carbon Sequestration collaborative plays a unique and essential role in achieving the vision of a below zero emission rate. The solutions developed in this focus area aim to actually remove existing carbon from the air, and safely store it in other land and water resources, where carbon does not present a climate threat.

This paper explores one such solution proposed by the group: scaling up the Marin Carbon Project, an existing program that works with local farmers, ranchers, and dairies to design and implement on-farm practices that build soil health and sequester atmospheric carbon. It proceeds as follows: Section II will provide an overview of the carbon farming proposal, including a general project description, plans for scaling the program, expected results, and cost projections. Section III will identify potential barriers to implementation, focusing in particular on securing necessary funding and addressing labor shortfalls. It will also put forward possible solutions to overcome these implementation barriers and guide future efforts to implement and scale carbon farming projects in Marin and across the State.
II. MARIN CARBON PROJECT PROPOSAL

A. Marin Carbon Project Description

The Marin Carbon Project was established in 2007 in response to the rapid pace of global climate change, and seeks to enhance carbon sequestration in rangeland, agricultural, and forest soils through applied research, demonstration, and implementation in Marin County.¹ The project works to increase the rate of carbon capture on working landscapes through the design and implementation of “carbon farming” practices. Unlike common agricultural practices like tilling soil, over-grazing, and using fossil fuel based fertilizers and pesticides, which result in significant carbon dioxide releases, carbon farming involves implementing practices that are known to improve the rate at which carbon is removed from the atmosphere, and converted to plant material and soil organic matter.² A modest 1% increase in soil organic matter across Marin County’s roughly 154,000 acres of grassland would represent removal of 2.56 MMTCO2e from the atmosphere, which could be safely stored in soils for up to 100 years.³ Such practices can be as simple as compost application and no-till planting regimes, to more technically advanced projects, including anaerobic digester installation and wetlands restoration.⁴ Not only can these practices lead to substantial carbon capture over time, but they also result in a host of co-benefits, including increased soil fertility and crop yields, as well as improved water quality, biodiversity, and overall climate resilience.⁵ To date, and with the help of a $2 million NRCS Regional Conservation Partnership Planning Grant, the Marin Carbon Project has created 20 individualized carbon farm plans, each tailored to the unique soil and ecosystem conditions of the site.

Spearheaded by the Marin Resource Conservation District (Marin RCD), in collaboration with the Marin Agricultural Land Trust and the Carbon Cycle Institute, the carbon farm process has three basic phases: planning, design, and implementation. First, Marin RCD staff perform a whole-farm assessment, taking inventory of the site’s natural resources, surveying soil quality

¹ https://www.marincarbonproject.org/about
⁴ See https://www.marincarbonproject.org/document.doc?id=110 for a preliminary carbon farm practice list, adapted from the USDA-NRCS GHG ranking tool and COMET-Planner.
⁵ California Climate & Agriculture Network (CALCAN), Abundant Solutions: Climate Change and Agriculture Recommendations to the New California Governor, 17 (Sep. 2018).
and composition, understanding the land managers’ priorities and limitations, and evaluating the on-farm sequestration potential of a suite of NRCS approved practices using the COMET-Planner tool. The resulting carbon farm plan identifies which practices the land manager should strive to implement, and quantifies annual and long term sequestration benefits. With one full time staff member and additional part time support, RCD currently has capacity to complete five plans per year, at an average cost of $5,000 to $15,000 per plan.

Next, RCD staff work to design out the projects. For instance, if a carbon farm plan recommends applying compost over 20 acres, planting a riparian buffer zone, and putting in hedgerows, staff must then determine what plant species to use, what if any permits are needed, where water and compost will be sourced from, and what implementation will cost. Depending on project complexity, outside contractors and engineers are hired to develop the technical design specifications. The design process can take anywhere from one day to three weeks, and costs on average $5,000 to $12,000 in staff resource time.

At this point, the projects are “shovel ready” and implementation can begin, but the cost and ease of implementation vary widely based on the particular practice. Compost application can cost as little as $1,000 per site, whereas environmentally sensitive riparian projects and dairy infrastructure can cost up to $500,000. When projects create significant wildlife ecosystem benefits, Marin RCD considers covering all implementation costs. Otherwise, it follows a 75/25 cost sharing policy. RCD secures 75 percent of necessary funding, and the farmer or rancher is responsible for the rest. RCD requires 10 percent of the farmers’ share to be cash or in-kind contributions, and the remaining 15 percent can be sourced from outside grants or government conservation subsidies.

B. Plan to Scale

The Carbon Sequestration collaborative has proposed significant investment in and expansion of the Marin Carbon Project in order to achieve Drawdown: Marin’s climate mitigation goals.

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6 https://www.marincarbonproject.org/carbon-farming/carbon-farm-plans
7 Interview, Nancy Scolari, Marin RCD Executive Director (Oct 1, 2019).
8 Interview, Nancy Scolari, Marin RCD Executive Director (Oct 1, 2019).
9 For instance, a mile-long riparian project involves fencing installation, stream crossings, water troughs, stream bank stabilization, planting, and permit fees, the materials and labor for which can quickly add up in light of state prevailing wage requirements. Interview, Nancy Scolari, Marin RCD Executive Director (Oct 1, 2019).
10 Interview, Nancy Scolari, Marin RCD Executive Director (Oct 1, 2019).
Ultimately, the goal is to engage 180 farms spanning 90,000 acres, or 57 percent of Marin County’s agricultural lands.\(^\text{11}\) The collaborative estimates that, when fully scaled, the project will sequester 526,000 metric tons of CO2e by year 20. To put that figure into perspective, as of 2017, Marin County emitted an estimated 1,441,640 metric tons of greenhouse gases across all economic sectors, and projects by 2045 that yearly emissions will be reduced to 192,000 metric tons.\(^\text{12}\) In order to achieve the target sequestration outcome, a professional support team of at least five full time employees will be needed for planning and design, along with another 12 full time employees for on the ground implementation.

C. Timeline and Cost Projections

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<tr>
<td>2025</td>
<td><strong>Goal:</strong> Implement 1st phase practices on existing Marin Carbon Farms &lt;br&gt; <strong>Scale:</strong> 20 farms (10,000 acres) &lt;br&gt; <strong>Sequestration Potential:</strong> &lt;br&gt; ♦ 9,400 MT CO2e/year  &lt;br&gt; ♦ 188,000 MT CO2e by 2045</td>
<td>$10M</td>
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<td>2030</td>
<td><strong>Goal:</strong> Complete 40 new carbon farm plans and start 1st phase practices on these additional 40 Marin operations &lt;br&gt; <strong>Scale:</strong> 60 farms (30,000 acres) &lt;br&gt; <strong>Sequestration Potential:</strong> &lt;br&gt; ♦ 47,000 MT CO2e on first 20 farms  &lt;br&gt; ♦ 18,800 MT CO2e/year on 40 new farms  &lt;br&gt; ♦ 65,800 MT CO2e total</td>
<td>$20.6M</td>
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<td>2045</td>
<td><strong>Goal:</strong> Complete 120 new carbon farm plans and start 1st &amp; 2nd phase practices on all 180 carbon farms &lt;br&gt; <strong>Scale:</strong> 180 farms (90,000 acres) &lt;br&gt; <strong>Sequestration Potential:</strong> &lt;br&gt; ♦ 470,000 MT CO2e on first 60 farms  &lt;br&gt; ♦ 56,400 MT CO2e/year on 120 new farms  &lt;br&gt; ♦ 526,000 MT CO2e total</td>
<td>$62.5M</td>
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\(^\text{11}\) Drawdown: Marin, Carbon Sequestration Collaborative Executive Steering Committee Meeting (Oct 31, 2019). <br>\(^\text{12}\) Id.
III. IDENTIFYING AND OVERCOMING BARRIERS TO IMPLEMENTATION

A. Funding

One of the largest barriers to scaling the carbon farming proposal is securing the necessary funding. Because the County does not currently have any dedicated funding streams that can be used for building out the program, it is actively exploring its options, looking to state and federal grant programs, local tax and offset measures, and potential public/private investment partnerships to create the necessary capital for project implementation. This section identifies promising funding streams to be pursued, as well as less feasible options not worth pursuing.

Feasible Funding Streams:

1. Federal and State Grant Programs

Securing state and federal conservation grants is an obvious avenue to pursue, but alone will likely not be sufficient to support full scale ramp of the carbon farming proposal. In addition, grant dollars are not necessarily a guaranteed and continuing source of funding, as awards are dependent on program capacity and cyclical budget allocations. Moreover, many of the grants available are limited to funding implementation of shovel ready initiatives and would not cover the cost of the full time RCD staff necessary for the planning and design phases. With these caveats in mind, below is a list of grant programs to pursue:

♦ Regional Conservation Partnership Planning Grant (Federal)
  - Administered by: Natural Resource Conservation Service, USDA
  - Description: Funds “effective and compelling solutions that address one or more natural resource priorities to help solve natural resource challenges, an in particular seeks projects that “integrate multiple conservation approaches, implement innovative conservation approaches or technologies, build new partnerships, and effectively take advantage of program flexibilities to deliver conservation solutions.”
  - Available Funds: Awards $300 million in grant funding annually
  - Proven Interest in Carbon Farming: Marin Carbon Project received a $2 Million grant award in 2015, which financed the development of the 20 existing carbon farm plans.

♦ Conservation Stewardship Program (Federal)
- **Administered by:** Natural Resource Conservation Service, USDA
- **Description:** Helps agricultural producers “maintain and improve their existing conservation systems and adopt additional conservation activities to address priority resource concerns.” Producers are paid for “conservation performance,” thus the “higher the performance, the higher the payment.”
- **Best For:** Reimbursing the up-front cost of implementation

**Environmental Quality Incentives Program (Federal)**
- **Administered by:** Natural Resource Conservation Service, USDA
- **Description:** Provides “financial and technical assistance to agricultural producers to address natural resource concerns and deliver environmental benefits such as improved water and air quality, conserved ground and surface water, increased soil health and reduced soil erosion and sedimentation, improved or created wildlife habitat, and mitigation against increasing weather volatility.”
- **Available Funds:** In FY 2019, EQIP disbursed $116.7 million in technical and financial assistance grants to California producers alone.

**Conservation Innovation Grants (Federal)**
- **Administered by:** Natural Resource Conservation Service, USDA
- **Description:** Supports public and private grantees with a one to one matching investment to develop “tools, technologies, and strategies to support next-generation conservation efforts on working lands and develop market-based solutions to resource challenges.” Funds “on-farm trials,” including “Soil Health Demo Trials” focused exclusively on implementation of conservation practices and systems that improve soil health. Commits NRCS staff to help evaluate impact.
- **Available Funds:** Awards up to $25 million annually for On Farm Trials.

**Healthy Soils Program (State)**
- **Administered by:** California Department of Food and Agriculture
- **Description:** Supports conservation projects that enhance climate mitigation and adaptation efforts by building the carbon sequestration capacity of California soils.

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The program provides financial assistance for incentivizing and demonstrating the implementation of soil-building practices that increase on-farm carbon sequestration and reduce on-farm GHG emissions.

- **Available Funds:** The [2020 Grant Cycle](#) opened February 27, 2020, funding on a first come first serve basis [316 projects](#) requesting $22,062,449. The maximum award is $100,000. In addition, the program has an additional $3 million to fund demonstration projects, and will be announcing final grant decisions by August 2020.

**Technical Assistance Grants (State)**

- **Administered by:** California Department of Food and Agriculture
- **Description:** Provides hands-on application assistance to farmers and ranchers seeking Healthy Soils Program funding and other CDFA incentive grants, which could be used to fund the carbon farming planning activities of RCDs, Cooperative Extensions, and other non-profits with demonstrated technical expertise in designing and implementing agricultural management practices.

- **Available Funds:** Awarded $2.3 million in Technical Assistance grants in 2019. Awards up to $20,000 per organization for each CDFA program for which the organization will provide technical assistance, capping the maximum award at $60,000.

2. **Local Offset Programs**

An alternative funding stream the County should explore is developing a local offset program, which either relies—in full or in part—on government contributions. Such programs can avoid the cost prohibitive expense of verifying offset credits, while still encouraging

**Restore California**

Administered by the non-profit Perennial Farming Initiative, Restore California is a voluntary offset program that encourages California restaurants to add a one percent surcharge to customer bills in order to fund carbon farming practices. The proceeds generated from the surcharge can either be directed to specific farms and ranches within a restaurant’s own supply.

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15 California Climate & Agriculture Network (CALCAN), *Abundant Solutions: Climate Change and Agriculture Recommendations to the New California Governor*, 17 (Sep. 2018).
16 In total, CDFA received 578 applications requesting $37,870,190.
chain, or into a general fund from which grants are disbursed to a pool of applicants. The program is not a true “offset” because it does not require annual credit verification but Restore California does rely on the COMET planner tool to gage carbon sequestration benefits of proposed projects, and prioritizes funding for projects that will have the highest projected carbon removal for the least cost. The initiative is completely voluntary; not only do restaurants decide whether to participate in the offset scheme, but customers also decide whether to opt in or out of paying the surcharge on their bills. 95 percent of all proceeds directly support the upfront costs of carbon farming implementation.\(^{18}\) Launched in partnership with CDFA, CalEPA, and CARB, Restore California is meant to serve as a “private sector complement” to the Healthy Soils program, funding the same 35 NRCS approved practices, and working in concert with local RCDs to support on the ground implementation.

The program is in its infancy, having just launched its first grant cycle this January, but already has some promising buy in from the restaurant community. Over fifty California restaurants have, or are in the process of implementing the program, including corporate cafeterias of tech companies like Salesforce and Square Inc.\(^ {19}\) The program is also flexible enough to accommodate short term promotions. For instance, this past January, Restore California enlisted over one hundred restaurants to participate during San Francisco Restaurant Week. All told, program success has yet to be evaluated. However, if just one percent of California restaurants participated, Restore California estimates it could generate $10 million a year for carbon farming.\(^ {20}\)

For counties that are interested in supporting local carbon farming efforts, this program model has potential, but it will be important to continue tracking Restore California through its first grant cycle\(^ {21}\) and beyond to determine how sustainable a revenue source it is. At minimum, it seems worth it to promote the program to county restaurants and farmers, especially since there is no overhead for the County. One of the shortfalls of this initiative, however, is that it only provides implementation funding, and does not appear to cover any technical assistance costs borne by the RCD in the carbon farming planning and design phases. Additionally, since it is a statewide program, it is unclear how many Marin restaurant dollars will ultimately be allocated

\(^{18}\) Five percent of proceeds supports the non-profit’s overhead costs.

\(^{19}\) [https://www.zerofoodprint.org/home-dig-deeper.](https://www.zerofoodprint.org/home-dig-deeper)


\(^{21}\) The first round of funding is expected to be disbursed beginning in July 2020.
to Marin farmers and ranchers. Thus, Marin restaurant participation may not necessarily lead to carbon sequestration benefits within the county. This may not necessarily be a bad thing, since it also means that Marin landscapes could potentially access revenue streams from other urban districts with dense restaurant sectors, like San Francisco.

♦ Publicly Funded Offset Programs

Another option would be for the County to administer its own local offset program so that it has more control over where and how to allocate funds. The County could adapt the Restore California model to its specific needs, which for Marin, may include more funding assistance going to Marin RCD to support the additional full-time staff necessary to scale up carbon farm planning. Most programs administered by the County, however, are at least in part, supported by mandatory government contributions into the offset fund, and local governments have found it difficult to effectively market the program to attract voluntary private sector participation.

For instance, the city of San Francisco launched a carbon offset program in 2009 with the goal of funding only local carbon reduction projects. The program is primarily funded through local legislation, which contributes the equivalent of thirteen percent of the cost of municipal employee air travel22 to the fund, generating approximately $170,000 per year.23 Although the original vision for the carbon fund was to stimulate private residential and business investment, over a decade has passed and the program is still almost entirely funded by the compulsory city contribution. The city quickly found that residential outreach was infeasible and has instead focused on marketing the program to event and conference organizers as a means offsetting event related GHG emissions. They have found the biggest selling points for private investment to be the fact that the city itself is contributing to the fund, that the program bypasses the arduous and expensive credit verification process, and that businesses and event organizers can choose specific projects to support.24 Blending the Restore California model into a county program, so

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22 For Counties that don’t have significant levels of employee air travel, the offset contribution could be tied to other GHG-emitting activities, like municipal fuel or energy costs.
that the restaurant industry captures residential contributions, could resolve the obstacle met by with marketing to individuals.

3. **Tax Measures**

   ♦ **Marin County Measure A**

   Passed in 2012, Marin County Measure A is a quarter cent sales tax that supports the preservation of parks, open spaces, and farmland. In total, the tax raises approximately $14 million in annual revenue, 20 percent of which—or approximately $3 million—is allocated for farmland preservation. The lion’s share of these preservation dollars is earmarked for Marin Agricultural Land Trust, which uses the funds to acquire agricultural conservation easements. Only 5% of farmland preservation funds, or approximately $140,000, is allocated to the Marin RCD to match funding for conservation projects on easement-protected agricultural lands.

   If Marin were to re-allocate Measure A funding such that more dollars were pushed toward Marin RCD and carbon farming staff, it could help to close the funding gap. Alternatively, the County could propose a new quarter cent sales tax measure, dedicated to funding the Drawdown: Marin carbon mitigation and sequestration projects. Based on historical Measure A revenue, this would bring in an additional $15 million annually.

   The County estimates that upfront costs of assessing the potential ballot measure, including consultant fees, polling, feasibility studies, ballot fees, and staff support, would cost approximately $250,000. In addition, the County anticipates an additional $250,000 in non-public funds would be necessary to launch and run a successful ballot campaign.

4. **Local Green Bank**

   Another option for leveraging limited public dollars is creating a local green bank in order to attract private investment. Generally established in the context of supporting renewable energy and other green infrastructure projects, green banks are finance entities that blend commercial,

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26 Id.
27 Drawdown: Marin, Carbon Sequestration Collaborative Executive Steering Committee Meeting (Oct 31, 2019).
public, and philanthropic capital to deliver “catalytic finance solutions” capable of supporting the implementation of projects that otherwise could not be built. In other words, green banks mobilize private investment into under-served markets in combination with public dollars.

These institutions can be either be public, quasi-public, or private, and use financial tools to address perceived barriers that prevent private capital providers from fully investing in a target market. In the context of carbon farming investment, green banks could be utilized to overcome the following financing gaps:

- **Large Upfront Costs:** When carbon farming projects are capital intensive and require a large investment upfront;
- **Limited understanding of the value proposition:** Many do not understand the long-term value of carbon farming projects, or the expected return on investment;
- **Conflicting time horizons:** When the payback period for a conventional loan often exceeds the consumer’s short-term needs;
- **Risk aversion of lenders:** There is a limited track record of performance and payment history for carbon farming financing;
- **Undeveloped secondary market:** Non-standardized financial products and low volume of loans make it challenging to securitize loans.

Green banks can offer credit enhancements, such as loan loss reserves or loan guarantees, that help de-risk investments for private investors, or can bundle small and geographically dispersed projects to make them more cost-effective to underwrite. attracting private investors who might otherwise perceive carbon farming as an unproven, unfamiliar practice. By

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employing such methods, green banks have on average generated a 3.4:1 ratio of private to public investment. 32

**Infeasible Funding Streams:**

1. **Cap and Trade / Credit Verification**

   The Marin Carbon Project has thoroughly explored the possibility of financing carbon plans through cap and trade carbon credits, but has found the credit verification process to be burdensome and prohibitively expensive. Agricultural carbon credits generally trade for between $3-15 / ton, which according to Marin RCD, is not enough to finance the necessary work on the ground. 33 Additionally, the process through which credits are verified so that they can be eligible for trade requires hiring costly consultants, who alone extract much of the profit potential from participating in the market in the first place.

2. **Social Investment Financing**

   There are a number of social investment firms, including RSF Social Finance, that present seemingly attracting funding solutions for regenerative agriculture programs. However, ultimately this private funding option is illusory. Based in San Francisco, RSF Social Finance makes investing decisions that have social impact, and prioritizes projects that provide measurable benefits for the food system, climate, and environment. 34 By drawing upon a large base of small-scale investors, the firm provides integrated capital packages to lendees, which can include low interest loans, loan guarantees and matches, as well as grants. RSF even has a social health initiative, which specifically fund projects aimed at regenerating agricultural soils.

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33 Drawdown: Marin, Carbon Sequestration Collaborative Executive Steering Committee Meeting (Oct 31, 2019).
34 See e.g., RSF Social Finance “Our Areas of Lending Expertise” https://rsfsocialfinance.org/get-funding/loans/ (“RSF is dedicated to the development of healthy food systems as a foundation for more vibrant and resilient regional economies. With a commitment to biodynamic and high integrity organic farming, we also see agriculture as critical to restoring the earth and environment and supporting human health . . . we support organizations and initiatives committed to regenerating and preserving the earth’s ecosystems”).
However, the eligibility criteria for receiving such capital will likely bar Marin RCD, and other state and non-profit organizations working in the regenerative agriculture space. For instance, in order to be eligible for an RSF social finance loan or investment package, applicants must generate annual revenue at or exceeding $1 million dollars, provide strong collateral such as pledges or guarantees, and demonstrate a path to profitability within 12 months. While the firm does lend to non-profit entities, such organizations are required to fundraise a portion of their revenue through earned income, including contracts or sales. Neither Marin RCD, nor the other non-profit entities involved in the Marin Carbon Project, would be able to meet the revenue-related criteria. In addition, it would be difficult to demonstrate profitability on such a short time horizon. While soil health improvements have been shown to increase on-farm revenue, such profits take years, if not decades to fully realize.

B. Labor Requirements

As mentioned above, in order to fully scale and implement the Marin Carbon Farming Proposal requires 5 FTE for planning and design, and an additional 12 FTE for on the ground implementation. Currently, Marin RCD is operating with only one staff member qualified to engage in planning and design activity. Marin RCD is in particular need of staff who possess the qualifications and engineering expertise to effectively design and estimate projects. While CDFA offers a technical assistance grant of up to $20,000 which could be put towards funding staff salary, the award is not enough to cover a full-time position.

Until the County is able to access more substantial and reliable funding streams, one potential solution is to pool resources with neighboring County RCDs so that the salary of one full time staff member could be funded using multiple technical assistance awards. This county share plan would be especially useful to harness technical expertise for the more complex carbon farming practices, like installation of dairy infrastructure, which requires engineering input.

35 RSF Social Finance “Get Funding” https://rsfsocialfinance.org/get-funding/loans/.
36 National Association of Conservation Districts, Case studies show big economic benefits of soil health practices (Aug. 29, 2017), https://www.nacdnet.org/newsroom/case-studies-show-big-economic-benefits-soil-health-practices/ (During a three-year study period, corn-soybean farmers who adopted regenerative agriculture practices increased net farm income by up to $110 per acre as a result).
37 Interview, Nancy Scolari, Marin RCD Executive Director (Oct. 1, 2019).
RCD could look to conservation corps programs to help staff the 12 person implementation team. For instance, Project Climate at UC Berkeley’s Center for Law, Energy, and Environment is developing BearCorp, an AmeriCorps program which will send recent graduates and students to work in farming and forest communities promoting regenerative agriculture and forest resilience, particularly in disadvantaged communities. BearCorps could place staff with Marin RCD as soon as August 2020. However, the district would need to contribute $20,000 to fund the corps members’ stipend. The California Conservation Corps also provides crews to support carbon reduction projects. However, currently corps members are prevented from working on private lands, which makes it difficult to support the carbon farming practices of private farmers and ranchers.

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39 Drawdown: Marin, Carbon Sequestration Collaborative Executive Steering Committee Meeting (Oct 31, 2019).