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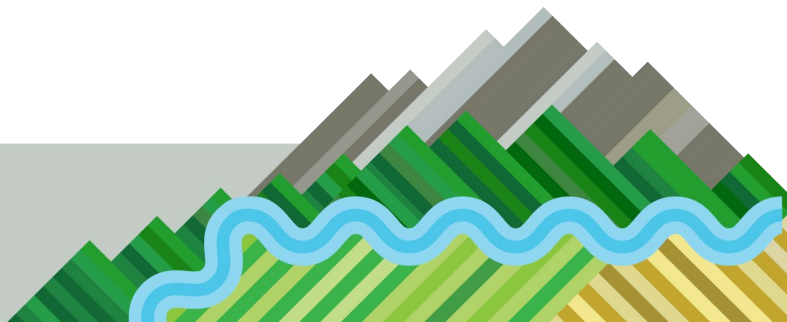
Carbon Cycle Institute – Soil Health Program

Final Report

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Introduction

The Carbon Cycle Institute (CCI) and the Placer Resource Conservation District (Placer RCD, District) entered into an agreement to develop the framework and strategic plan for a Soil Health Program that serves the greater portion of Placer County.

Placer RCD serves the region stretching from the Sacramento Valley, through the Sierra Foothills, to the rim of the Tahoe Basin. It ranges in elevation from 200 feet to 9,000 feet and supports various agricultural operations ranging from small-diversified farms to large agricultural enterprises. Over the decades, crops have come and gone in production and currently rice, cattle, walnuts, timber, and almonds are among the top 5 crops (revenue) in the county. As one of the most rapidly growing counties in California, there has been a continual decline in agricultural acres since 1950. In response, the average farm size has decreased, with most producers operating on fewer than 50 acres.

For the last 74 years, Placer RCD has provided technical assistance to private landowners, collaborated with state and local agencies, and implemented projects that promote sustainable land management. With a rapidly developing landscape, the need for conservation entities to provide education on ecologically sound practices has elevated. Cohesive action among partnering agencies is needed to identify farming practices that improve soil and potential barriers to help producers implement these practices.

Placer RCD has the distinct opportunity to serve as a liaison for private land managers and institutions providing scientific information and best management practices (BMPs) for soil health. By nature, farmers are conservationists, and due to the county's dry climate and steep topography, many producers inherently integrate soil health practices into their operations. However, many producers cite a lack of basic tools like education, equipment, and funding needed to integrate BMPs into their operations. By partnering with CCI the District will:

- Better understand current land management practices
- Determine the on-the-ground potential for carbon farming practices
- Identify barriers to implementing those practices.

Placer RCD and CCI can help establish the groundwork necessary for carbon farming activities to be more successful in the foothill region.

Current Status of Objectives:

Develop a framework and strategic plan for initiating and sustaining a Healthy Soils Management Program within Placer County. Components of this framework will include the following:

I. Identify the scale of potential involvement by landowners (short-term as well as longer-term given additional funding opportunities), as well as areas of the highest priority.

In Placer County, 175,000 acres of farmland are in production and producers offer a breath of commodities and operate within various sizes. Local survey participants and program stakeholders identified two areas of primary concern for producers in Placer County. Ranchers are the largest stewards of land in Placer County when considering acreage. The 146,000 acres of grazing lands have the potential to be a net carbon sink for the county. In the short term, ranchers can incorporate practices like conservation grazing, resting periods, and targeted residual dry matter. Practices like perennial pastures, pollinator hedgerows, and shelterbelts are long-term investments that capture more carbon, increase biodiversity, and improve soil health. Small farming operations are another major concern identified within the county. Of the 1,200 producers, more than three-quarters are operating on fewer than 50 acres. Operations employ a diversity of cropping systems and management practices. Short-term participation of producers can fluctuate, but practices including compost application, cover crops, and mulching can be easily implemented and provide instant on-farm benefits. Longer-term practices like crop rotation, reduced or no-tillage, and wooded habitat strips may be cost-prohibitive. Other identified areas of importance are rice farms and moderate to large producers who would still benefit from assistance implementing soil health practices. However, they can be involved in the short and long term with access to education, equipment, and funding.

II. Identify and to the extent possible quantify opportunities to enhance carbon capture in terrestrial plant biomass and soil organic matter on natural and working landscapes within the district including a list of potential practices, acreage, and environmental co-benefits (ecosystem services) and multiple beneficiaries both locally and downstream communities.

The Placer RCD distributed a survey to producers from November 1st, 2021, through December 1st, 2021. Thirty-one producers were surveyed, with an even distribution of Annual, Perennial, and Grazing Operations. Carbon farming practices can be broken down into three identifying groups:

<u>Cropland/Perennial Practices</u>	<u>Ranching Practices</u>	<u>Habitat Improvement Practices</u>
<ul style="list-style-type: none">• Compost Application (CA)• Cover Cropping (CC)• Crop Rotation (CR)• Mulching (M)• Reduced Till (RT)• No-Till (NT)	<ul style="list-style-type: none">• Conservation Grazing (CG)• Perennial Pasture (PP)• Resting Periods (RP)• Targeted Dry Matter (TDM)	<ul style="list-style-type: none">• Pollinator Hedgerow (PH)• Riparian Filter Strips (RFS)• Windbreaks/Shelterbelt (WS)

Carbon Farming practices listed in the survey were determined by stakeholders and have been proven to increase soil health, improve water conservation, and sequester soil carbon.

The top Cropland/Perennial practices implemented by growers surveyed were CA and M. Nearly half of the producers surveyed use CC, CR, RT, and NT. Over 70% of producers believe CA, CC, M, RT should be more widely adopted. The top needs/barriers identified for Cropland/Perennial practices were financial assistance, technical assistance, and equipment.

The most widely used practice by ranchers surveyed is the implementation of RP. Fewer than 50% of ranchers are utilizing other carbon farming practices like CG, PP, and TDM. Despite these low numbers, most ranchers believe CG, PP, and RP should be more widely adopted. Ranchers identified financial assistance, technical assistance, equipment, and practice maintenance as their leading needs or barriers to practice implementation.

Habit improvement practices like PH, RFS, and WS have been implemented by fewer than one-quarter of survey participants. Regardless, nearly 60% of all producers felt that PH and RFS should be more widely used in Placer County. Financial assistance, technical assistance, and assistance maintaining the practice were the primary needs expressed by producers. A full list of practices and a summary of survey results can be found in the appendix of this report.

III. Recognize and describe possible limiting factors and foreseeable challenges relating to economics, cultural beliefs, regulations, outreach, education, and commitment involving Placer RCD, partner organizations, and landowners.

A Soil Program can only be successful if it provides the proper tools to land managers. The survey established that producers in Placer County need more economic, operational, and educational assistance. Traditional funding sources (cost-share-based) require producers to pay the residual costs of practice implementation. Small-scale producers are also at a disadvantage for these funding pools because pay-out rates can typically based on acreage. In addition, many producers lack the staff and/or appropriate equipment to execute carbon farming practices. Over 70% of producers in the survey expressed interest in an equipment rental program. Orchard chippers, no-till drills, and manure spreaders were the most frequently requested equipment. Furthermore, amid the COVID-19 pandemic, in-person workshops and technical assistance were put on hold. Producers frequently rated technical assistance as one of the top two needs or barriers to adopting practices. Without access to additional funding, equipment, and education, producers are not well equipped to successfully implement carbon farming practices.

Placer RCD and partnering agencies must overcome challenges to provide adequate support to farmers and ranchers. The District and partnering agencies must overcome challenges associated with financial support, educational material, and targeted outreach. Acquiring sources of funding for staff is crucial to continue the support and services provided to local land managers. Organizations like the California Department of Food and Agriculture (CDFA), Natural Resource Conservation Service (NRCS), California Association of Resource Conservation District (CARCD), and other agencies have begun to allocate more monies to technical service providers. With adequate funding, the District can provide more robust assistance to farmers and ranchers, host more workshops, and create educational material. Placer RCD can provide tailored educational support from the information provided by survey participants. The District and partnering agencies need to broaden outreach efforts to best deliver goods and services. Producers are scattered amongst a diverse agricultural landscape, creating a challenge for outreach efforts. Targeted outreach and establishing relationships with individual grower groups will allow the District to distribute information more

effectively to producers. Placer RCD needs to increase funding, expand education, and improve outreach efforts to implement a successful Soils Program.

IV. Strategize incorporation of RCD technical knowledge and staff assistance, as well as possible cost-share funding such as EQIP, in the implementation of planned best management practices

Placer RCD has served producers and landowners since 1946. As agriculture has evolved in the county, so too has the District's programs. To help producers adopt soil health practices, the District will:

- Discover additional funding sources for producers
- Establish an agriculture learning hub
- Facilitate ways for producers to obtain farming equipment.

In 2021, Placer RCD received the Climate Smart Agriculture Technical Assistance grant from CDFA. This grant allows District staff to help producers apply for CDFA Healthy Soil Program Incentive Grants. The District is also working with CARCD to apply for a Wildlife Conservation Board grant that will provide funding to create pollinator habitat. Habitat improvement practices like hedgerows, windbreaks, and riparian filter strips can be implemented at no cost to producers. In addition, the Placer RCD Board has identified establishing an agricultural learning hub as a long-term objective. The District and partnering local agencies can provide producers with regionally relevant data and BMPs for soil health practices. Placer RCD staff is collaborating with the Lincoln High School Student Farm to create a demonstration farm. This site will provide a space for Placer County farmers, ranchers, and youth to learn about sustainable agriculture practices. Lastly, producers expressed the need for equipment for carbon farming. Placer RCD is actively searching for funding sources that producers can utilize to update and purchase carbon farming equipment. Additionally, the District is working with CARCD and partnering organizations to establish an equipment rental program including a no-till drill, orchard chipper, and manure spreaders at a subsidized cost. Farmers and ranchers by nature are conservationists, and with the appropriate tools including funding, education, and equipment they will be successful carbon farmers.

V. Specify additional technical and financial needs which cannot reasonably be accommodated by RCD resources.

Establishing a healthy soil program in Placer County will require unilateral support from partnering agencies. The district will ask partnering organizations to assist with:

- The establishment of a learning hub.
 - The successful creation of a demonstration farm will require the involvement of many different agencies including, but not limited to, UC Cooperative Extension, NRCS, Placer County, City officials, Lincoln Unified School District, and grower organizations.
- Access to agricultural specialists.
 - The District does not have staff biologists, soil scientists, or crop specialists. Access to these individuals from partnering organizations may assist the District in providing more sound technical support to producers.
- The production of Placer County relevant research & data.

- The district does not currently have the staff capacity to conduct research and data collection. It will require the support and collaboration with the UC Cooperative Extension, USDA-NRCS partners to develop science-based information to be distributed to producers.

VI. Conceive possible additional mutual-benefitting partners to aid in the planning and implementation of a Healthy Soils Management Program within the county.

- USDA-NRCS, UC Cooperative Extension, Placer Land Trust, Placer County Agricultural Commissioner, Placer County Community Development Resource Agency, Placer County Farm Bureau, Placer Grown, Point Blue Conservation Science, Placer County Air Pollution Control District, Placer County Water District, Nevada Irrigation District, United Auburn Indian Community, The California Wildlife Foundation, Carbon Cycle Institute, Patagonia, Cattlemen's Association, Fibershed and more.

Appendix

Carbon Farming Stakeholders

Name	Entity
Pelayo Alvarez	Carbon Cycle Institute
Jennifer Wood	JTW Soil Consulting
Chris Robbins	Natural Resource Conservation Service
Tony Rafles	Natural Resource Conservation Service
Neysa King	Nevada Irrigation District
Josh Huntsinger	Placer County Agricultural Commissioner
Yushuo Chang	Placer County Air Pollution Control District
Angel Green	Placer County Community Development Resource Agency
Elias Grant	Placer Land Trust
Sarah Jones	Placer Resource Conservation District
Maddison Easley	Point Blue Conservation Science
Cindy Fake	University of California, Cooperative Extension
Dan Macon	University of California, Cooperative Extension

List of Carbon Farming Practices





Survey Information

Cropland/Perennial practices:

Compost Application

- 76% of producers surveyed currently use this practice
- 86% of producers surveyed rated this practice to be well suited for Placer County
- Top 3 needs expressed by producers who took our survey:
 - Financial assistance
 - Access to supplies
 - Equipment

Cover Crops

- 72% of producers surveyed currently use this practice
- 81% of producers surveyed rated this practice to be well suited for Placer County
- Top 3 needs expressed by producers who took our survey:
 - Financial assistance
 - Technical Assistance
 - Assistance maintaining the practice

Crop Rotation

- 43% of producers surveyed currently use this practice
- 67% of producers surveyed rated this practice to be well suited for Placer County

- Top 2 needs expressed by producers who took our survey:
 - Technical Assistance
 - Financial assistance

Mulch

- 71% of producers surveyed currently use this practice
- 81% of producers surveyed rated this practice to be well suited for Placer County
- Top 3 needs expressed by producers who took our survey:
 - Financial assistance
 - Access to supplies
 - Equipment

Reduced Tillage

- 52% of producers surveyed currently use this practice
- 71% of producers surveyed rated this practice to be well suited for Placer County
- Top 3 needs expressed by producers who took our survey:
 - Technical assistance
 - Financial assistance
 - Equipment

No-Tillage

- 52% of producers surveyed currently use this practice
- 57% of producers surveyed rated this practice to be well suited for Placer County
- Top 3 needs expressed by producers who took our survey:
 - Technical assistance
 - Financial assistance
 - Equipment

Ranching Practices:

Conservation Grazing

- 50% of producers surveyed currently use this practice
- 60% of producers surveyed rated this practice to be well suited for Placer County
- Top 3 needs expressed by producers who took our survey:
 - Financial assistance
 - Technical assistance
 - Equipment

Perennial Pasture

- 50% of producers surveyed currently use this practice
- 50% of producers surveyed rated this practice to be well suited for Placer County
- Top 3 needs expressed by producers who took our survey:
 - Financial assistance
 - Technical assistance
 - Equipment

Resting Period

- 60% of producers surveyed currently use this practice
- 60% of producers surveyed rated this practice to be well suited for Placer County
- Top 3 needs expressed by producers who took our survey:
 - Financial assistance

- Access to supplies
- Equipment

Targeted Grazing

- 20% of producers surveyed currently use this practice
- 40% of producers surveyed rated this practice to be well suited for Placer County
- Top 3 needs expressed by producers who took our survey:
 - Technical Assistance
 - Financial assistance
 - Assistance maintaining the practice

Habitat Practice:

Hedgerows

- 29% of producers surveyed currently use this practice
- 58% of producers surveyed rated this practice to be well suited for Placer County
- Top 3 needs expressed by producers who took our survey:
 - Financial assistance
 - Technical assistance
 - Assistance maintaining the practice

Riparian Filter Strips

- 23% of producers surveyed currently use this practice
- 58% of producers surveyed rated this practice to be well suited for Placer County
- Top 3 needs expressed by producers who took our survey:
 - Technical assistance
 - Financial assistance
 - Assistance maintaining the practice

Windbreak

- 13% of producers surveyed currently use this practice
- 29% of producers surveyed rated this practice to be well suited for Placer County
- Top 3 needs expressed by producers who took our survey:
 - Technical assistance
 - Financial assistance
 - Assistance maintaining the practice