

Integrated Scenarios and Outreach for Assessing Threats to Ecosystem Services on California Rangelands: Science Delivery

Project Lead: Kristin Byrd, Ph.D., U.S. Geological Survey Western Geographic Science Center
345 Middlefield Road, MS-531, Menlo Park, CA 94025; 650-329-4279; kbyrd@usgs.gov

Ecoregion: Central Valley and surrounding foothills, which include portions of the North and Central Coast, Bay-Delta, and Sierra Nevada ecoregions

Relevant Partners and Their Participation: In this phase of the project we will partner with the California Association of Resource Conservation Districts (<http://www.carcd.org>). Resource Conservation Districts (RCDs) are locally-led conservation organizations that play an essential role in watershed protection, restoration and other conservation activities. RCD staff will be recipients of training on project results and the web-based data visualization tool so that science products can be applied in local decision-making. Trainings will be accompanied by a peer-reviewed USGS Fact Sheet and additional online content.

RCDs serve as a hub between State and regional resource goals and local implementation of conservation plans. RCDs are an ideal user of project results because of their role in natural resource management at the local level. Science products will help RCDs identify and prioritize conservation efforts in areas that would provide maximum conservation benefits and provision of ecosystem services. The RCDs are well positioned to use information from this project to guide land use decisions at the local level and to provide outreach and to raise awareness of the importance of rangeland conservation in the face of climate change.

Management Need Being Addressed: RCDs need climate-related science products to integrate climate-smart conservation into the practical, hands-on conservation projects they accomplish every year. RCD training will supply information on watershed vulnerability to extreme events from climate change and how land use planning may mitigate against climate-related impacts. Product information most useful to the RCDs include: 1) where critical habitat is vulnerable to conversion to intensive agriculture or development, 2) potential loss of carbon sequestration capacity due to grassland and woodland conversion, and social costs associated with these losses, 3) locations of potential bioclimatic refugia for iconic oak species based on scenarios of increasing climatic water deficit, and 4) how zoning decisions may influence future water availability and water storage in a highly variable future climate.

Implementation of the CA LCC Strategic Plan: With 99 RCDs state-wide, staff training for multiple districts will serve to coordinate information exchange among scientists and managers to advance decision-making and climate-smart conservation on the ground, across the CA LCC landscape. The proposed work will implement the following strategies of Objective 1 of the Strategic Plan.

Strategy 1: Identify key science needs and improve delivery of useable scientific information: We will offer in-person training, additional online content, and a peer-reviewed USGS Fact Sheet. *Strategy 3: Identify and facilitate efficient ways to engage partner collaboration:* We will collaborate with the RCDs to address high-priority conservation needs, and we will present project results at the California Association of Resource Conservation Districts Annual Conference. *Strategy 4: Develop and deliver relevant training and information products:* Training topics will specifically focus on strategies for climate smart conservation and land use planning. Trainings will focus on the implications of climate change for resource management and conservation. We will also enhance the content of our website to deliver relevant information to managers.

In addition, the proposed work will implement *Objective 2, Strategy 1: Support and promote place-based projects:* We are partnering with the RCDs, willing partners who can take action on the ground, and demonstrate and/or advance climate smart conservation at a landscape scale.

Status of Existing Product Deliverables and Outreach: We have successfully completed all modeling tasks and multiple outreach activities. We have selected 6 key watersheds distributed across the California Rangeland Coalition focus area where substantial changes are expected to occur for a detailed analysis of ecosystem services changes. *Summary of research activities:* To date we have 1) Completed FORE-SCE land use/land cover (LULC) change model runs for 6 integrated scenarios; 2) Completed Basin Characterization Model (BCM) runs for 6 scenarios to investigate the influence of increasing urbanization and changing climate on watershed runoff and recharge, and for 6 key watersheds, streamflow; 3) Quantified LULC change impacts on high priority conservation areas across 6 scenarios; 4) Quantified LULC change and climate change impacts on potential future conservation areas for the A1B and B1 scenarios; and 5) Quantified potential change in carbon sequestration capacity due to grassland conversion for 6 key watersheds across 3 emission scenarios. We are currently developing methods for quantifying water-wildlife hotspots, where water availability and wildlife habitat are threatened across 6 scenarios, and we are calculating change in bioclimatic distribution of oaks, grassland and shrubland due to change in climatic water deficit. *Summary of outreach activities:* We have conducted 2 workshops with multiple stakeholders including ranchers, conservation non-profits and federal and state agency personnel, 1 focus group with ranchers and 6 oral presentations at scientific meetings and to other stakeholders. In addition one webinar was given targeting the LCC network. A factsheet prepared by Defenders of Wildlife summarizing results from the project, a poster and several Powerpoint presentations have been produced. The web-based visualization tool has been developed, and we are currently generating maps to be displayed on the website. Preparation of a journal article will begin in summer 2013.

Proposed Additional Work and Value Added: Focusing on the RCDs located in the 6 case-study watersheds, we will conduct 3 trainings that summarize findings from the project and provide instruction on the use of the online tool. A project presentation and demonstration of the online tool will also be provided at the 2013 California Association of RCDs Annual Conference. We will also complete a peer-reviewed USGS Fact Sheet on project highlights, accompanied by a USGS press release, and additional online content that summarizes the value of rangeland ecosystem services.

Through past workshops and conference presentations, the RCDs have been identified as an organization with interest in our project results that could directly make use of science products on a local level, consistently across the CA LCC landscape. Whereas past workshops were useful for scoping the project and receiving initial input from a range of stakeholders, additional funding will allow us to focus our outreach on the RCDs, a local non-regulatory organization with a mission to promote responsible natural resource management through voluntary community stewardship and technical assistance.

Staff Involvement and Capabilities: **Dr. Kristin Byrd** – Preparation of USGS Fact Sheet, online content and training materials, present at trainings. Expertise: spatial analysis, remote sensing, modeling urban and exurban growth, land use planning/land conservation. **Dr. Lorraine Flint** – Provide Fact Sheet content, present at trainings. Expertise: downscaling climate data for application to regional water balance models to calculate the hydrologic response of watersheds and landscapes to current and future climates at very fine spatial scales. **Dr. Pelayo Alvarez** – Present at trainings, coordinate with the RCDs. Expertise: oversees research and outreach activities for the California Rangeland Conservation Coalition. He coordinates stakeholder meetings, field trips, conferences on a variety of topics including conservation, ecology, ecosystems services. **Dr. Frank Casey** – Present at trainings. Expertise: Ecosystems Services Theme Lead at the USGS Science and Decisions Center, experience in the market and non-market valuation of ecosystem services.

Timeline for Deliverables: USGS Fact Sheet – November 1, 2013; Presentation at the 2013 California Association of Resource Conservation Districts Annual Conference – November 13-16, 2013; Trainings for local RCDs: March, April 2014; Completion of additional online content: March 2014.



May 10, 2013

Rebecca Fris, Research Coordinator
California Landscape Conservation Cooperative
Suite 2007, Modoc Hall
3020 State University Drive East
Sacramento, CA 95819

Dear Ms. Fris:

The California Association of Resource Conservation Districts fully supports the proposal, “Integrated Scenarios and Outreach for Assessing Threats to Ecosystem Services on California Rangelands: Science Delivery,” submitted to the California Landscape Conservation Cooperative by the U.S. Geological Survey and Defenders of Wildlife. Resource Conservation Districts (RCDs) are locally-led conservation organizations that play an essential role in watershed protection, restoration and other conservation activities. We are the local link to conservation and agriculture and serve as a hub between State and regional resource goals and local implementation. RCDs are an ideal user of the results from this project because of their role in natural resource management at the local level. Project results most useful to the RCDs include: information on watershed vulnerability to extreme events from climate change and information on how land use planning may mitigate against climate-related impacts such as loss of water availability, loss of areas suitable for oaks, and provision of other ecosystem services including streamflow, carbon and wildlife habitat.

Data from this project will help RCDs identify and prioritize conservation efforts in areas that would provide maximum conservation benefit (i.e. provision of ecosystem services). Without the RCDs, this data will not be translated into local action. The RCDs are well positioned to use data from this project to guide land use decisions at the local level and provide outreach and raise awareness of the importance of rangeland conservation in the face of climate change. RCDs have already expressed interest in receiving more training on the project at the presentation given at the California Association of Resource Conservation Districts annual conference held in San

CALIFORNIA ASSOCIATION OF RESOURCE CONSERVATION DISTRICTS

801 K Street, 18th Floor Sacramento, CA 95814

Phone: (916) 457-7904 **Fax:** (916)457-7934

email: staff@carcd.org

Diego in November of 2012. RCDs in the project's six target watersheds will benefit from workshops for stakeholders, individual training of RCD staff on the project's web-based data visualization tool, as well as training at the 2013 conference of the California Association of RCDs.

Thanks,

A handwritten signature in cursive script that reads "Karen Buhr". The signature is written in black ink and is positioned to the right of the word "Karen".

Karen Buhr

**Project Title: Integrated Scenarios and Outreach for Habitat Threat Assessments on California Rangelands:
Metrics and Economic Analysis for Decision Support**

Contact: Kristin Byrd, USGS Western Geographic Science Center, kbyrd@usgs.gov, 650-329-4279

California Landscape Conservation Cooperative 2013 Budget

USGS Western Geographic Science Center

Budget Categories	CA LCC Request	Partner(s) Contribution(s) (monetary)	Partner(s) Contribution(s) (non-monetary value/in-kind)	Total
Salaries	\$ 22,000.00	\$ -	\$ -	\$ 22,000.00
Supplies	\$ -	\$ -	\$ -	\$ -
Overhead	\$ 7,670.00	\$ -		\$ 7,670.00
Equipment	\$ -	\$ -	\$ -	\$ -
Other (specify)	\$ 7,500.00	\$ -	\$ -	\$ 7,500.00
Sub-Total	\$ 37,170.00	\$ -	\$ -	\$ 37,170.00

Defenders of Wildlife /California Association of RCDs

Budget Categories	CA LCC Request	Partner(s) Contribution(s) (monetary)	Partner(s) Contribution(s) (non-monetary value/in-kind)	Total
Salaries	\$ 10,100.00	\$ -		\$ 10,100.00
Supplies		\$ -	\$ -	\$ -
Overhead	\$ 1,126.00	\$ -	\$ -	\$ 1,126.00
Equipment	\$ -	\$ -	\$ -	\$ -
Other (specify)	\$ 1,500.00	\$ -	\$ -	\$ 1,500.00

Sub-Total	\$ 12,726.00	\$ -	\$ -	\$ 12,726.00
------------------	--------------	------	------	--------------

Total Budget

Budget Categories	CA LCC Request	Partner(s) Contribution(s) (monetary)	Partner(s) Contribution(s) (non-monetary value/in-kind)	Total
Salaries	\$ 32,100.00	\$ -	\$ -	\$ 32,100.00
Supplies	\$ -	\$ -	\$ -	\$ -
Overhead	\$ 8,796.00	\$ -	\$ -	\$ 8,796.00
Equipment	\$ -	\$ -	\$ -	\$ -
Other (specify)	\$ 9,000.00	\$ -	\$ -	\$ 9,000.00

Total	\$ 49,896.00	\$ -	\$ -	\$ 49,896.00
--------------	--------------	------	------	--------------

Other:

<p>USGS Western Geographic Science Center: Other: \$7500 \$3500 - publication costs for USGS Fact Sheet \$4000 - travel costs to attend trainings, RCD annual conference</p> <p>Defenders of Wildlife: Other: \$1500 travel costs to attend trainings, RCD annual conference</p>
--