

2016 Sierra Meadows Workshop



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The Goal: Bring together leaders from land management agencies, academia, non-profits, and source funders involved in meadow restoration to (1) learn and advance efforts pertaining to enhancing resiliency to climate change via greenhouse gases sequestration and the development of carbon credits for Sierra meadow systems and (2) develop a Greater Sierra Meadow Strategy and Prioritization Framework. Expected outcomes for day one of the workshop include preliminary understanding of greenhouse dynamics in Sierra meadow systems and the development of a “carbon certification roadmap”. Expected outcomes for Days 2 & 3 include development of a proposed Greater Sierra Meadow Strategy and Prioritization Framework (Day 2) and implementation plan for the Strategy (Day 3). This workshop will include a series of discussions led by experts in their respective field. Workshop participants are expected to be actively engaged in these discussions and be solution-oriented in their participation.

Where: Mayacamas Ranch, Calistoga, CA. Mayacamas is an inspiring locale located on 80 acres of oak woodlands 10 minutes north of Calistoga, CA. The venue is all inclusive, providing lodging, meals, and meeting facilities. For more information on the venue, please visit: <http://www.mayacamasranch.com/>

When: Arriving: February 9, 4:00 pm and **Departing:** February 12, 1:00 pm.

Registration: Online registration is available at: Caltrout.org/Meadows2016

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Proposed Agenda

Tuesday Evening, February 9th

6:00-8:00 Dinner & Roundtable Introductions, Goals for Workshop Discussion

There will be an informal welcome and roundtable discussion regarding goals and desired outcomes for the Workshop.

All partners introduced themselves and their involvement in Sierra meadows. Goals of the workshop were outlined; namely answering the following questions: What is the current status of research and restoration in Sierra meadows? What is the purpose/utility of the Strategy document? What is the status of the document? What is needed to continue work/finish the strategy document? What is the future path of this partnership and the meadow Strategy? The overall theme of the workshop was “convergence” of knowledge, goals, metrics and momentum to accelerate the pace and scale of meadow restoration in the Greater Sierra.

Wednesday, February 10th

Wednesday Morning: Introductions/ CA DFW Cap & Trade Projects and Synthesis of Research Findings

8:30 AM-9:00 AM: Welcome, Introductions, and Workshop Overview

Session Leads: Mark Drew

This short block allowed for re-introductions and outlining of the day's presentations and discussions.

9:00-10:15: Synthesis Of Research Completed To Date

Session Leads: Amy Merrill, Steve Hart, Cody Reed, Ben Sullivan

The objective of this session is to present research designs, sampling protocols and preliminary results of the research being implemented to quantify greenhouse dynamics within the suite of projects funded by the Wetlands Restoration for Greenhouse Gas Reduction Grant Program. Additionally, this session will allow for discussions regarding challenges and next steps for research and restoration. Desired outcomes include better understanding of scientific methodologies and research designs being employed, preliminary results and clarity regarding next steps in the research and restoration processes.

See Powerpoint.

This session presented the scientific framework behind the greenhouse gas research being conducted by the partnership as well as preliminary results. In order to fill the current knowledge gap, we are measuring changes in GHG dynamics in restored meadows using a before-after-control impact design as well as measurable covariates. The hypothesis is that hydrologic restoration of meadows will result in a

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net carbon equivalent increase due to decreased decomposition and oxidation rates. Preliminary results reveal high temporal and geographic variability in methane, nitrous oxide and carbon dioxide but do support the potential for a net carbon equivalent accumulation in restored meadows. This study is complicated by variation in management practices, weather trends and hydrologic degradation among the 18 study meadows. There was particular concern raised over the potential impacts of grazing (both pre and post-restoration) on the outcomes of this study, though the scientific method appears to be well-founded.

10:15-10:30: Break

10:30-12:15: Prop. 1 DFW funded Cap & Trade Projects: Where We Started, Where We Are And Where We Are Headed.

Session Leads: Evan Wolf, Levi Keszey, Cody Reed, Lauren Hubert, Kristen Podalak, Rachel Hutchinson, Leslie Mink, Gia Marten.

The objective of this session is to present and discuss the various Cap & Trade funded projects being implemented as well as providing a preliminary synthesis of research and restoration completed since June, 2015. Desired outcomes from this session include an improved understanding of the research being implemented to quantify greenhouse gas dynamics in restored and unrestored meadow systems as well as the types of meadow restoration that will be implemented. An overview of the collective projects will be provided that will be followed by brief presentations of each project funded via the Wetlands Restoration for Greenhouse Gas Reduction Grant Program (DFW). Project presentations will include the following:

- Sierra Foothills Conservancy Project (Bean Meadow complex)
- South Yuba River Citizens League (Loney Meadow complex)
- Truckee River Watershed Council (Martis Meadow complex)
- Truckee River Watershed Council (Truckee Meadow complex)
- Plumas Corporation (Mountain Meadow complex)
- California Trout (Osa Meadow complex)
- Yosemite National Park (Yosemite Meadow complex)
- UC Davis (Childs Meadow complex)

See Powerpoints from each of the above partners.

This session updated the partnership on the progress of research and restoration of the 9 meadow complexes funded through the DFW Cap and Trade Grant. Unifying themes among the presenters included a shared methodology, historical degradation from intensive grazing practices and permitting as a major bottleneck. The variety of projects within the partnership was evident, but much common ground was found in hydrologic functionality, protection of threatened and endangered species and the potential for carbon sequestration in meadows.

12:00-1:00: Lunch

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Wednesday Afternoon: Carbon Markets, Protocols and Developing a Carbon Credit Roadmap for Sierra Meadows

1:00-2:30: Cap & Trade: What Is It, How Does It Work And What Are The Opportunities/Challenges Pertaining To Sierra Meadows And Establishing A Carbon Protocol.

Session Leads: Mark Nechodom, Robert Hrubes, TBD

The objective of this session is to provide an overview of the Cap & Trade Program, Protocol development and significant issues and challenges involved with establishing carbon credits/units. A particular focus of this session will involve discussions regarding opportunities & considerations for carbon credit/units on federal & state lands. Desired outcomes include an informed understanding about the Cap & Trade Program, carbon credits/units, opportunities and challenges associated with developing a Meadow Protocol.

See Powerpoint from Robert Hrubes.

This session introduced the workshop participants to the carbon market, both practically and conceptually. Robert Hrubes of SCS Global presented on the basic concept and application of carbon markets and Cap and Trade Programs. Participants were offered instruction on key terms and an overview of the verification process. Mark Nechodom focused on the carbon market's place in the larger climate of the ecosystem services economy, environmental politics and the social "Jetstream". Meadows have charisma on their side to draw public appeal and perhaps a higher price. Concern was raised that carbon accreditation could marginalize other benefits to restoration. The balance of opportunity versus challenge was clearly articulated for future consideration and actions. Applying a carbon market on public lands is a barrier, though not insurmountable.

2:30-3:00 Break

3:00-5:00 Establishing A Carbon Accreditation Roadmap: What Are The Necessary Steps And Requirements For Establishing A Meadows Carbon Protocol?

Session Leads: SCS Global

The objective of this session is to identify a proposed roadmap that will direct those involved with meadow restoration for greenhouse gas sequestration. Specific conversations will focus on identification of necessary steps/milestones to establish a protocol and key decisions that will need to be made along the path from initial research/data collection to achieving an approved protocol allowing for carbon credits to be transacted and/or carbon units traded/banked. Desired outcomes include confirming a roadmap that will set direction moving forward during the next three years of Cap & Trade funded projects.

See Powerpoint from SCS Global

SCS Global presented a proposed "Roadmap" to carbon accreditation from "define the project" to "sell carbon credits and invest revenue". Much of the session focused on choosing the suitable registry for our

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project. This decision is based on registry variation in 1) Ability to work on public lands; 2) Cost of development of methodology; 3) Carbon price per ton; 4) Timeline and 5) Other Payment for Ecosystem Services (PES). Partnership interest was greatest in the Climate, Community and Biodiversity standards registry (CCB) which offers broader payment for ecosystem services outside of Carbon. Further benefits of CCB include the ability to work on federal lands and no cost to develop methodology as the peer-review process serves that purpose. It is also possible to combine carbon credits from other registries with PES from CCB.

5:00 Break

6:30-7:30 Dinner

7:30- Roundtable Discussion: Meadow Project(s) update, Current Status of NFWF Meadow Business Plan, and The Status Of Beavers In Sierra Meadow Restoration.

Session Leads: Claire Thorp, Kate Lundquist, Brock Dolman, Group

There will be an informal roundtable discussion about meadow projects participants are involved with, status of NFWF's Meadow Business Plan as well as a discussion on the topic of beavers and meadow restoration. Desired outcomes include increasing awareness of the scope of meadow projects (including beaver projects), particular challenges limiting restoration as well simply providing an opportunity for networking.

NFWF, having funded 48 meadow projects and granted \$7.2 million, is proud of fostering the broader meadows partnership and momentum for meadow conservation/restoration across the country. NFWF recognizes the bottleneck in permitting and planning and will aim to invest in future efforts to address this bottleneck as well as projects focusing on adaptive management. From a higher-level forest service perspective, a structured prioritization scheme and efforts to address permitting bottleneck and data gaps are most important. A structured strategy should help reduce resistance from the forest service on a regional level.

Next a short presentation on the status of beaver in the Sierra was given. Major takeaways include that beaver are native to the Greater Sierra, despite widespread skepticism and lack of conservation support and the potential for beavers to help achieve our three higher-level objectives. Beavers are cheap and have been shown to help accelerate the pace of restoration. More analysis and data is necessary to assess the potential for the large-scale use of beaver restoration projects and to make a case to reduce legal barriers to using this technique.

ACTION ITEM: Contact Kate and Brock regarding current/historic presence of beaver on restoration sites and their impact(s).

**Thursday, February 11th
Developing a Greater Sierra Meadow Strategy and
Prioritization Framework**

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Thursday Morning: Developing a Greater Sierra Meadow Strategy

8:00-8:30 Welcome, Recap of Day 1 & Overview of Day 2

8:30-9:30 Plenary Review Of Structural Elements Of Proposed Greater Sierra Meadow Strategy Based On Work Completed To-Date

Session Leads: Amy Merrill, Rene Henery, Mark Drew

The objective of this session is to provide an overview of work completed to date with emphasis on (a) over-arching goal statement, (b) target audience, (c) proposed “Sierra Meadows Partnership”, and (d) proposed High Level Objectives: Hydrology, Biodiversity & Soil/Carbon. This brief review will be followed by a review of the methods we propose applying to develop specific sub-objectives and metrics. Desired outcomes include gaining clarity and agreement on structure, components and process for completing proposed Strategy

See Powerpoint from Rene-

Rene provided an overview of what took place during the Calistoga 1 workshop with an emphasis on the decision to develop a “conservation strategy” that had hierarchical elements. Discussions also centered on the use of structured decision-making signifies a transition in conservation. Designing this structure is our task. One document to guide practitioners is ideal, though difficult to produce due to the range of objectives of practitioners. Objections should be based on desired conditions for the ecoregion and meadow type. Metrics should evaluate the success of the sub-objectives within Hydrology, Soils/Carbon and Biodiversity for 1) partners to measure all meadows and 2) to assess specific to meadow sites and agency’s purpose. The partnership and workshops have created momentum, but we need a guiding document to direct the momentum.

See Powerpoint from Amy-

Amy gave an overview of proposed structure of meadows strategy document components. Input on proposed outline included concerns over isolating biodiversity and soils from the hydrology objective and lack of orientation towards business/industry interests. This document should attempt to align with language from USFS planning documents as well as CWAP, WIP and other water resource and biodiversity planning documents.

9:30-9:45 Break

9:45– 10:30 Group Breakouts To Develop Each Of the Three Proposed High Level Objectives Using The Approach Described During Plenary.

Session Leads: TBD during workshop-One per breakout group

The objective of this session is to develop proposed associated Desired Future Conditions, Geographic or other sub-sets, and Sub-Objectives for each of the High Level Objectives with the intent of fleshing out a template comprising of key Strategy components with emphasis on Desired Future Conditions. Desired outcomes include refined elements of Strategy for each of the High Level Objectives and associated Desired Future Conditions ideally in both narrative and tabular form.

10:30-10:45 Break

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10:45-11:30 Group Breakouts To Articulate Stressors, Actions, Metrics And Priorities Associated With Sub-Objectives and Future Desired Conditions

The objective of this session is to continue refining proposed Strategy, building on work completed during the prior morning session. More specifically, continuing in breakout groups, participants are asked to develop and articulate Stressors (biophysical, ecological, institutional etc), Actions, Metrics and Priorities associated with Sub-Objectives. Desired outcomes include refined elements of the Strategy, notably Stressor, Actions, Metrics and Priorities linked to each Sub-Objectives.

See below regarding discussion/outcomes from the breakout discussions.

11:30-12:15 Breakout group Reports And Synthesis of Strategy

Session Leads: TBD during workshop-One per breakout group

The objective of this session is to for each breakout group to report on progress per High Level Objective and identify critical gaps, next steps and key challenges. Desired outcomes include synthesis of work completed thus far, as well as identification of next steps and associated rolls and responsibilities- strategy moving forward.

The overall structure of the strategy document was approved by the partnership and breakouts occurred based on the 3 over-arching objectives. A document was provided to direct conversation. All groups approached the breakout differently

See documents of notes from each group.

Overview of breakouts:

Soils- Desired conditions for soil are sustainability and functionality. This group populated the "Actions" within the 3 overarching strategies of support, implementation and capacity.

Hydrology- Consensus on the draft objective was reached. Dynamic stability is a desired condition that incorporated fluxes/erosion/climate change. Hydrology goals/strategies should be approached from a watershed scale. Reconnection and protection of connected meadows, filling of data gaps and increased knowledge transfer are sub-objectives.

Biodiversity- Landscape dynamics → landscape structure → Habitat structure → Multi-species dynamics → Individual species. We must have sub-objectives at each of these levels to foster biodiversity. A possible future approach would be to list categories of function and indicator species of functionality.

12:15-1:00 Lunch

Thursday Afternoon: Developing a Meadow Prioritization Framework

1:00-2:00 Proposed Greater Sierra Prioritization Framework(s)

Session Leads: Kristen Podalak, Rene Henery

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The objective of this session is to provide an overview of prioritization efforts and geospatial information available to support future prioritization frameworks and to frame the afternoon's work pertaining specifically to the proposed High Level Objectives. Desired outcomes include gaining a better understanding of prioritization frameworks, available data/geospatial information and clarity on developing a prioritization framework relative to the proposed Strategy.

See Powerpoints from Kristen and Rene

Kristen presented a pilot spatial prioritization framework based on available GIS layers to map hydrology, carbon and biodiversity. Concerns were raised over calling this "prioritization" rather than a decision-making tool. Biodiversity layers do not include potential range and are based on surveys done in areas of active management. Better classification of meadows' position within the watershed would aid in analysis of spatial data with regards to fish and hydrology. There are gaps in data that need to be filled to produce a comprehensive spatial prioritization framework.

2:00-3:00 Group Breakout session-Prioritization Within The Context Of Proposed High Level Objectives: Biodiversity, Hydrology & Soil/Carbon

Session Leads: TBD during workshop-One per breakout group

The objective of this session is for breakout groups to develop proposed prioritization approaches for each objective, identify, data/information gaps

3:00-3:30 Break

3:30-4:00 Breakout Group Reports And Synthesis of Prioritization Framework(s)

Session Leads: TBD during workshop-One per breakout group

The objective of this session is to share conceptual approaches for prioritization relative to each of the proposed High Level Objectives. Additionally, this session will help identify what tools (data/geospatial information, etc.) are available, gaps in relevant information/data. Desired outcomes include confirming prioritization approaches for each of the High Level Objectives.

See documents produced by breakout groups.

4:00-4:30 Integration Of Hydrology, Biodiversity and Soil/Carbon Prioritization Approaches

Session Leads: Kristen Podalak, Rene Henery

The objective of this session is to work towards integrating the three proposed Prioritization approaches and to identify outstanding issues/tasks moving forward. Desired outcomes include, to the extent possible, having an integrated Prioritization Framework that can then be merged with the proposed Strategy.

See documents produced by breakout groups.

Overview:

Groups brainstormed other possible layers/datasets or metrics to use in prioritization. There was much overlap, producing "priority" layers to produce/acquire.

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Hydrology: (Broadly) Connectivity, inputs and outputs, timing of water release, elevation, downstream benefits, land-use history and current, channel features.

Biodiversity: (Broadly) Current and potential ranges, meadow condition and abiotic features, Vulnerability to CC, invasive species and disease, Ecozone

Soils: (Broadly) Geology, land-use, physical characteristics, water, GHGs, stressors, vulnerability.

4:30-5:30 Data/Geospatial Information Management And Expanding UC Davis Meadow Clearinghouse
Session Leads: Ryan Peek, Mark Waetjen

The objective of this session is to update workshop participants on the status of the UC Davis Meadow Clearinghouse and discussing ways to enhance the Clearinghouse's usefulness and value. Desired outcomes include understanding of how the Clearinghouse functions, what data are (will be) available and what is proposed in terms of expanding the scope of the Clearinghouse moving forward.

See Powerpoint by Ryan

The purpose of the clearinghouse is to provide a central location for all things meadows, to increase/improve communications and overlap in research, restoration and management efforts/efficiency. Challenges include complexity/difficulty to practitioners of making additions to the clearinghouse, lack of meadow names and difficulty linking people to data. Updates include new and improved polygons, search functions and revised FAQ page.

Action Item: Partnership will help update the clearinghouse project maps and photos.

5:30 Break

6:30-7:30 Dinner

7:30-8:30 Roundtable Discussion: Sierra Meadow Partnership
Session Leads: All

The objective of this informal evening session is to discuss opportunities for the evolving Sierra Meadow Partnership and to chart a course moving forward. Desired outcomes include identifying opportunities for the Sierra Meadow Partnership, potential structure and potential for developing a Charter in 2016.

The evening's conversation centered primarily on the potential of developing a more formal "partnership". The benefit of moving forward as a more formal partnership is many-fold. It could: provide a home for shared products; carry more weight in positions on future legislation/decisions; provide scientific expertise to all partners; signify a commitment to the cause; provide a point-group for industry funders to approach; and engage in advocacy and science; help partners fill capacity gaps. Group consensus on moving forward as a partnership and in a more formal manner, but need to investigate models of similar organizations MOUs.

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Action Item: All will search for partnership models as well as their MOUs and send them to Levi for distribution to the partnership for assessment.

8:30-TBD (sub group work on synthesizing & integrating day's work to be reported out Friday am)

Friday, February, 12th

Integration and Implementation of Proposed Greater Sierra Meadow Strategy and Prioritization Framework

8:30-9:00 Welcome, Recap of Day 2 & Overview of Day 3

9:00-10:00 Roll Out of Integrated Meadow Strategy and Prioritization Framework
Session Leads: Kristen Podalak, Rene Henery, Mark Drew, Amy Merrill, Rita Kelly

The objective of this session is to present proposed Strategy and Prioritization Framework (Strategy) based on work completed during Thursday's workshop and to identify informational gaps, next steps necessary to complete the proposed Strategy, and associated roles and responsibilities. Desired outcomes include consensus regarding structure and content of proposed Strategy, clarity on what is required to complete the Strategy and by when.

Synthesis of the previous day's work was presented with the take home messages of functionality and sustainability of ecosystem services as well as dynamism opposed to stasis as desired end conditions. The group agreed to synthesize state of science to direct future paths grounded in science, but with the ability to perform advocacy as well. Emphasis was placed on the role of science in developing our strategy and prioritization framework.

10:00-10:15 Break

10:30-12:00 Meadow Strategy & Prioritization Framework Implementation. What Needs to Be Done By Whom, When and How?
Session Leads: Nina Hemphill, Luke Hunt

The objective of the final session is to discuss and identify opportunities for implementing the proposed Strategy. Key considerations include identifying key forums/Agencies, stakeholders etc. to engage with, potential funding opportunities to support implementation of the Strategy, potential role of the Sierra Meadow Partnership etc. Desired outcome include establishing, at a minimum, an outline of a proposed implementation plan.

Given the draft form of the strategy document, attention during this session was given to bigger-picture direction and next steps for the partnership. The Partnership will continue moving forward and simultaneously bydeveloping and testing our strategy/prioritization and keeping science enmeshed in all

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stages of monitoring, design and implementation to fill existent data gaps. Small working groups will be the first step in developing guiding principles for the partnership.

In addition to the conversation above, short presentations from representative partners outlined the uses of the partnership and strategy for the diversity of agencies involved. Common themes included 1) the importance of neat desired conditions and objectives; 2) The abundance of other structured conservation plans that could glean from and align with the strategy (convergence of opportunity) ; 3) the need for streamlined permitting; 4) The importance of communication and relationships in success; and 5) the necessity to continue and strengthen momentum post-workshop. Other opportunities for research and implementation include the National Park Service and the USFS South West research station.

Action Item: Mark and Levi will re-distribute material from the first Calistoga Workshop, possibly via the UC Davis Meadows Clearinghouse.

Action Item: Luke will assemble a technical group to synthesize state of science in meadows, develop a partnership-wide monitoring plan and a path for future science.

Action Item: Reach out to Mark Drew if you want to be involved in formal comments to WIP.

Action Item: If you have input for USFWS on restoration on private lands, contact Sheli Wingo.

Action Item: Partners who presented in this session will draft a short statement summarizing suggestions for next steps from their agency's perspective.

Action Item: Levi will create a survey monkey for voting on the Partnership name.

12:00-1:00 Lunch/Workshop Adjourned.

Thank you all!