



The Sierra Meadows Partnership

WORKPLAN 2018-2020

*A roadmap to implementing the
Sierra Meadows Strategy*

*Increasing the Pace, Scale and Efficacy of Mountain Meadow
Restoration in the Sierra Nevada and Cascade Mountain Ranges
of California*

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Background

The Sierra Meadows Partnership (Partnership) first began very informally with the development and implementation of the National Fish & Wildlife Foundation's Sierra Nevada Meadow Restoration Business Plan in 2010. Since then, the Partnership has grown with respect to increased and shared knowledge, common tools, and especially in engagement of a broad and increasingly coordinated array of partners involved in meadow restoration.

In February 2014, a Sierra meadows workshop was convened in Calistoga, California with the intent of further enhancing coordination and developing a coordinated vision for Sierra meadow restoration moving forward. An outcome of "Calistoga I" was the recognized need and development of an initial framework for a proposed "meadow strategy." Since the initial Calistoga gathering, there has been a focused effort on the part of many stakeholders to complete a Sierra Meadows Strategy, including three workshops convened at U.C. Davis and a second Calistoga workshop convened in February 2016 where more than 20 different entities actively participated in discussions that largely centered on developing the Strategy. It was during the "Calistoga II" workshop that participants decided to recognize the stakeholders involved as the Sierra Meadows Partnership (Partnership).

The Sierra Meadows Strategy (Strategy) was completed in the fall of 2016 and "Calistoga III" was convened in February 2017 with a focused intent of finalizing the Strategy through a signed but non-binding Memorandum of Understanding among members of the Partnership. Key element of this Strategy are the over-arching goal and a set of implementation priorities to guide the Sierra Meadows Partnership's collective work. The over-arching goal of the Strategy is the restoration and/or protection of 30,000 acres of meadow in the greater Sierra Nevada that includes the Cascade and Warner Mountains (Drew et al. 2016) by 2030. The outcomes of Calistoga III included identification and initial plans for three broad approaches to achieving this over-arching Strategy goal: (1) Restore and/or protect meadows to achieve desired conditions; (2) Enhance regulatory and institutional funding capacity and coordination; and (3) Increase and diversify institutional and partnership capacity. Within these broad approaches, four priority focal areas have been identified. They are:

1. Improve the science and monitoring of meadow restoration as part of **Approach 1. Restore and protect meadows.**
2. Develop a meadow restoration and investment prioritization framework as part of both **Approach 1, Restore and protect meadows and 2, Enhance institutional funding;**
3. Develop messaging and communicate the relevance of meadow restoration and management as part of **Approach 3. Increase and diversify capacity;** and

4. Simplify policy and permitting requirements as part of ***Approach 2. Enhance regulatory capacity and coordination.***

Leading up to Calistoga III, California Trout provided some of the necessary resources to advance drafting the Strategy on behalf of the Partnership. However, during Calistoga III there was also a recognized need to support Partnership members for their contributions which had, up to that time, primarily been based on volunteered time and resources. As a result, a further outcome of Calistoga III was the identified need to secure necessary funding to support implementation of the focal areas by willing Partnership members. With these outcomes, CalTrout and other Partnership members set out to advance work in the focal areas while pursuing funding to cover a small portion of the associated labor costs. In July 2017, CalTrout secured \$50,000 of initial seed funding from the USFS Region 5 Leadership to advance this work.

With secured funding from Region 5, in the summer and fall of 2017 CalTrout and lead members of the Partnership began work to implement the Strategy in the four focal areas. During the same period, a fifth focal area emerged. This fifth focal area grew out of recognition of the limited capacity of meadow restoration practitioners within the State and will work collaboratively to develop a Meadow Restoration Framework for Ecological Design (aka, MRFRED). This framework will provide a valuable resource for upcoming meadow restoration practitioners and will work to provide Sierra specific guidance to the restoration plan design process. MRFRED will include Sierra specific guidance to restoration plan design data collection, risk analyses and alternative approaches and will include criteria for identifying best meadow restoration management practices. Initial steps have begun on MRFRED including: assembling the group, identifying philosophical differences, drafting a work plan, and conducting an initial two day meadow site visit with the team in the Feather River watershed on USFS lands.

The planned host property for Calistoga IV, Mayacamus Ranch, was burned during the Santa Rosa fires in late 2017. Therefore, in place of the annual Partnership meeting, two workshops were convened in Auburn during February and March, 2018. Both workshops brought together many new stakeholder groups and provided a forum for Partnership members to “roll up their sleeves” and advance work on implementation of all five focal areas.

In March of 2018, Mark Drew of California Trout followed a new professional opportunity overseas, leaving behind the lead coordinator role of the Sierra Meadows Partnership. In advance of his departure, extensive transition planning efforts were initiated to assure continued momentum for the collaborative implementation of the Strategy. These planning efforts resulted in identification of an interim Steering Committee to oversee Partnership progress and to organize the traditional annual meadows gathering.

The annual meadows gathering was convened in May of 2018 at Granlibakken Tahoe and hosted some 80 participants. The goal of the meeting was to harness momentum and bring together leaders from resource management and regulatory agencies, academia, non-profits, tribal groups, restoration practitioners, and source funders involved in meadow restoration to:

- 1) Review progress on scientific efforts to quantify net greenhouse gas sequestration in meadows;
- 2) Advance the Sierra Meadows Strategy focal area workplans;
- 3) Identify how the Sierra Meadows Strategy can be incorporated in other regional goals;
- 4) Share information on current meadow protection, science, and restoration efforts.

The meeting concluded with a group field visit to Van Norden Meadow where restoration challenges and opportunities were discussed. Great progress was made in beginning implementation of the Strategy through the priority group workplans at this annual event.

However, challenges exist with respect to achieving the goals set out in the Strategy. These challenges include differences in the structure, timing, jurisdictional extent, and priority differences among institutions; philosophical differences among institutions and among individuals; and the ongoing need to fund partnership members in building and implementing the Strategy and associated focal areas. A key strength of the growing Partnership is the forthright honesty with which these challenges are being articulated and addressed among Partnership members, in spite of the difficulty. This continued and persistent honesty and openness will help the collective effort achieve its full potential and will work to ultimately strengthen the Partnership.

This report provides a summary of next steps for 2018-2020, a description of work of the collective Partnership to date, and more detailed descriptions of planned focal area actions in the form of five priority workplans. It also includes an update regarding how the funds provided by Region 5 have helped leverage additional financial support, and further articulates funding needs to implement the *Strategy* projected over the next three years.



Sierra Meadows Partnership Next Steps 2018-2020

Priority Area Workplan Summaries

The sections to follow provide summaries to the various priority workgroup workplans that were developed in direct response to the Region 5 funding award that was awarded to California Trout. The workplan summaries below identify goals and objectives and describe the direct linkage to the Sierra Meadows Strategy. For more workplan details, including specific tasks, associated timelines and budgets needed to further advance the work, can be found in the complete workplans located in the appendices of this report.

1) *Research/Monitoring (WRAMP)*

The proposed Sierra Meadow Wetland and Riparian Area Monitoring Plan (SM-WRAMP) is being developed by the Sierra Meadows Partnership WRAMP Advisory Committee (SM-WAC). Two over-arching goals of this effort are to track progress in meadow restoration and conservation and to provide critical information for adaptive management of the Sierra Meadow Strategy. These monitoring protocols will address a goal set out in the Sierra Meadow Strategy under Approach 1: “Restore and/or protect meadows to achieve desired conditions.” By developing a common set of protocols with instructions on field methods and reporting and with guidance on how to apply the methods for a particular meadow, a body of comparable data will be created from all restored and protected meadows in the greater Sierra Nevada. With this large body of comparable data, critical questions that span multiple meadows within a watershed, or across regional and program areas can be addressed.

The SM-WRAMP is designed to help answer programmatic or administrative questions such as (1) Is the Sierra Meadow Partnership (SMP) on track to achieve its goal of 30,000 acres of restored and/or protected meadows by 2030? (2) How do the restoration and/or protection activities differ geographically and across land tenure types? (3) How much is this costing initially and for on-going maintenance and repairs? A large fraction of the WRAMP data to be collected also will help address questions on restoration success, such as (4) Are the restoration projects achieving their stated goals for changes in conditions and/or function? Specific questions on targeted changes in condition and function (desired conditions) will trigger collection of appropriate, specific types of monitoring data so that the changes in a targeted condition are measured and reported consistently among meadows sharing the same type of targeted change. Another set of questions will address the efficacy of different restoration techniques to answer the broad question of what types of restoration techniques are demonstrated to be most effective, and under what conditions?

The SM-WRAMP structure is nested, with levels and tiers within those levels of monitoring specificity. At the first level and first tier (1A) all monitoring protocols are required since these protocols focus on programmatic attributes such as meadow size, action type (active restoration, conservation), location, action date, etc. At the second level and first tier (2A), key attributes as required for regulatory compliance for most active meadow restoration

activities are reported. And at the third level and first tier (3A), targeted changes in desired conditions determine which sets of protocols must be applied. The second tier of Level 3 (3B) is not required but offers a more in-depth set of protocols for targeted desired conditions. The required monitoring for Levels 1-3, Tier A could also be adopted for meadows identified for conservation and/or new land acquisitions.

An important task in development of the SM-WRAMP is gaining agreement from participants in the SMP to consistently apply these protocols on all meadow restoration and conservation projects. These guidelines and protocols will streamline monitoring for project managers by providing information to help budget and plan field and data management efforts, as well as to train field crew to consistently collect and report monitoring data before and after meadow restoration and/or protection. By having a collaborative partnership collect data across multiple project and meadow types, the power of more data, more experiences, and better understanding can be leveraged to rapidly build upon and improve the current art and science of meadow restoration.

Site assessment to inform restoration or conservation actions differs from implementation and effectiveness monitoring because the primary intent of site assessment is to evaluate where restoration actions are needed, not to evaluate effectiveness of a project. However, some overlap in on the ground data collection might occur and an important aspect of developing the SM-WRAMP is to clearly identify where and under what circumstances those overlaps might occur and to maximize the information gain from such overlap. Thus, communication and coordination with the Design Team is part of the process of developing the SM-WRAMP.

Like restoration techniques, this document is not intended to be static, but to be adaptively managed. The following document presents additional specifics on SM-WRAMP goals, structure, hypotheses-driven monitoring protocols, the timeline for completing monitoring planning and testing for Level 1A, 2A, 3A, and 3B (anticipated to be fully completed by fall of 2020), and associated costs (\$162,000) broken down by each task. The document does not include tasks associated with Level 3C focused research questions and long-term general monitoring.

Lastly the group has identified the need for long-term monitoring of both healthy and degraded meadows in a monitoring network across the SMP area (Level 3C) to better understand meadow functions and to track changes in meadow health and condition due to natural processes and climate change. This information is critical for evaluating meadow restoration success at a range of both temporal and spatial scales; however, the SM-WRAMP workplan and budget does not currently include the development of this monitoring.

2) *Prioritization*

The Sierra Meadows Partnership (SMP) identified a tool for helping prioritize meadow restoration as among its five highest priorities to achieve the goals of the Partnership. The

purpose of the Prioritization Committee is to develop a tool that will provide a strategic, flexible approach for prioritizing meadows for restoration and protection in order to maximize project benefits, reach desired meadow conditions as described in the Sierra Meadow Strategy, and increase the efficacy of the SMP.

Objectives

- Develop a scalable, flexible framework for prioritization that provides a suite of conservation targets, additional data inputs, and relevant scales from which the user can select to tailor decision-making.
- Provide a one-stop-shop for SMP members to access, leverage, and integrate existing tools and data sets used in meadow restoration, management planning, and decision-making.
- Generate a targeted list of meadows that meet the individual user's needs that can be used for on-the-ground site assessments and further prioritization efforts on a finer scale.
- Provide integration with the UC Davis Meadows Clearinghouse to facilitate project tracking and easy access to monitoring and meadow condition data relevant to ongoing prioritization and planning efforts.
- Contribute to transparent decision-making for the SMP and justify decisions to funders and others.
- Facilitate the identification of new critical research questions and data gaps necessary for informed decision-making and that can be used to update the tool as new information becomes available.

Importance to Sierra Meadow Strategy

Our work fits under Approach 1 of the Sierra Meadow Strategy, which is to restore and/or protect meadows to achieve desired conditions. The prioritization tool will help increase the pace, scale, and, most importantly, the efficacy of meadow restoration and protection by providing a flexible, strategic approach to decision-making that will ensure the projects we pursue achieve multiple benefits and are the best investment of our limited resources. The tool will also help clarify desired meadow conditions to inform restoration design, monitoring, and adaptive management.

3) Plan Design/Implementation

Background and link to Meadow Strategy

The overarching goal of the Sierra Meadows Strategy is to increase the pace, scale and efficacy of mountain meadow restoration across the Sierra Nevada and Cascade mountains of California. In December 2016, the Sierra Meadows Partnership formally adopted the Sierra Meadows Strategy to focus our efforts with the aim of restoring 30,000 acres of mountain meadows by 2030. In recognition of this ambitious goal, the Partnership went to work addressing critical needs to accomplish this task.

One critical need identified was to increase dialogue and build capacity specific to meadow restoration plan design and implementation throughout the State. The Plan Design Workgroup was formed with a primary goal of developing comprehensive standards and guides for meadow restoration design and implementation. An additional goal was to develop a meadow restoration apprenticeship among partner agencies and organizations to provide applied restoration experience under the guidance of seasoned practitioners.

These goals will be achieved through the development of a restoration plan design framework that presents a comprehensive list of design alternatives and appropriate applications of each alternative for use by upcoming designers and for setting the standard for process-based restoration plan design in the State. The work group will simultaneously provide apprentice-mentor working relationships where the framework can be applied thus building critical capacity deficits specific to restoration plan design within the Sierra and Cascade mountain meadows.

The Plan Design work group will create standards and rationale for data collection and analysis specific to restoration plan design. These data are meant to complement data collected in the WRAMP/Monitoring work group.

Goals & Objectives:

The work group's goal is to build capacity for implementing effective meadow restoration projects in support of the Sierra Meadows Partnership Strategy. We will do this by developing and educating others to develop ecologically sound process-based designs and implementing meadow restoration projects throughout the region based on the best available science. Objectives based on this goal include (1) to develop standards and guides to help practitioners develop restoration plans and help managers review them, and (2) to describe approaches and provide criteria for selecting appropriate approaches to meadow restoration while keeping in mind the diversity of stakeholder goals and practitioners' perspectives and approaches. To accomplish these objectives, the work group will (1) identify common assessment methods and measures of success, (2) review past projects and summarize outcomes including past reviews that have been completed, and (3) ground truth criteria and approaches by conducting a collaborative design with the project team. When implementing the design, we will include interested agency partners, students and tribal partners and incorporate several workshops to provide applied restoration experience.

Deliverables:

Products of this effort will include a peer-reviewed Sierra Nevada meadow restoration planning and implementation guide. The guide will include (1) a literature review that summarizes foundational papers and effective measurements of success (2) an addendum to the Guidance for Stream Restoration (Yochum 2018) and the Great Basin meadows document edited by Chambers and Miller (2011), among other relevant literature reviewed, that is specific to Sierra Nevada meadows and discusses processes, disturbances, assessments, and restoration techniques (3) a risk assessment method for weighing the risk of alternative

restoration approaches, (4) use the combined resources and expertise to compile a Meadow Restoration Framework for Ecological Design (MRFRED) that provides guidance for the design process and (5) completion and summary of a collaborative design and eventual implementation of a meadow restoration treatment from beginning to end that utilizes and tests the resources and processes compiled above including working with other Sierra Meadow Partnership Subgroups to collaboratively work through tasks and protocols developed such as site prioritization, monitoring plans, permitting, and outreach.

4) Permitting

Background and link to Meadow Strategy

Permitting and environmental compliance is currently an onerous, time consuming and costly component of meadow restoration projects and is recognized as a bottleneck for implementation on the ground. There is a need to improve the permitting processes for meadow restoration in order to increase the pace and scale of restoration to meet the targets of the Sierra Meadows Partnership as well as State and Federal agencies. The purpose of the Sierra Meadows Regulatory Work Group is to address this need. Our goal is to streamline permitting and environmental compliance for meadow restoration projects so that meadow restoration can occur at a pace and scale that allows for landscape level change. Our work directly supports the SMP Strategy Approach 2 “Enhance regulatory and institutional funding capacity and coordination” with the desired outcomes of improving permitting processes and obtaining support from key regulatory agencies. Direct support, coordination, and involvement of relevant regulatory agencies will be a critical component to accomplish the SMP Strategy goal of restoration of 30,000 acres of meadow within 15 years.

Streamline: to make (an organization or system) more efficient and effective by employing faster or simpler working methods.

The Permitting Work Group’s approach for addressing bottlenecks and improving permitting and compliance processes is threefold. We will: 1) provide improved guidance on existing permitting and environmental compliance pathways; 2) engage permitting agencies to foster support for meadow restoration and to provide technical support; and 3) work to identify and implement opportunities to streamline permitting and environmental compliance processes.

Deliverables for the Permitting Work Group will include a “Permitting and Compliance Guide Book” and summaries; SMP regulatory advisory group; a set of sample meadow restoration permit documents; a permitting resources document; a permitting challenges and potential solutions white paper; codified CEQA pathway for meadow restoration projects; pilot approach to streamlining NEPA.

5) *Communications*

Introduction

The Sierra Meadows Strategy Approach 3 describes desired outcomes, actions and milestones to help guide those working to implement the Strategy. Using this approach, the Strategy set forth to cultivate strong meadow restoration networks that would maintain and grow open communications among institutions and individuals with the SMP, including private landowners who own significant acreages of meadows across the Strategy Area. Further, the approach recognized the opportunity the Strategy has to integrate with Regional and State plans and more importantly how the Sierra Meadows Partners could work collaboratively to create a unified message about healthy meadow benefits. Finally, the Strategy recognizes the need for the development of SMP approved resources to aid practitioners and guide them through the restoration process, thereby increasing the pace, scale and efficacy of our work.

By the careful creation of a SMP communication plan moving forward, we can ensure the Partnership meadows message is clear, accurate, defensible and relevant to all interested parties in California.

Purpose & Goals:

1. To create a unified message that works to **increase and diversify support** for meadow restoration and clearly articulates benefits of meadow restoration using defensible data. The Communications Plan will work to send a unified message on why meadow restoration is a good investment that is persuasive to potential funders and works equally well to gain public support.
2. To facilitate ease of communications of information relevant to meadow restoration by development of a Sierra Meadows Partnership website.
3. To integrate the Sierra Meadows Strategy with State and Regional Planning through Policy efforts and strategic partnerships.

Priority Work Group Funding Needs Summary (3 year Time Horizon)

Sierra Meadows Partnership Budget (2018-2020)				
Budget by Federal Fiscal Year (Oct 1- Sept 31)	FY19	FY20	FY21	3 Year Budget
SMP Coordination				Totals
<i>Coordination Subtotal</i>	\$69,000.00	\$86,500.00	\$86,500.00	\$242,000.00
Priority Workgroup Budgets				
Monitoring (WRAMP)				
<i>Subtotal</i>	\$97,000.00	\$65,000.00		\$162,000.00
Prioritization Tool				
<i>Subtotal</i>	\$51,528.00			\$51,528.00
Plan Design/Implementation				
<i>Subtotal</i>	\$41,600.00	\$81,000.00		\$122,600.00
Permitting				
<i>Subtotal</i>	\$11,696.20	\$110,767.50		\$122,463.70
Communications				
<i>Subtotal</i>	\$22,000.00	\$38,000.00		\$60,000.00
NICRA 18.97%	<i>NICRA will be applied only to workgroup contracts, up to \$25,000/contract</i>			
SMP Strategy Implementation				
Annual Budget Subtotals	\$292,824.20	\$381,267.50	\$86,500.00	\$760,591.70

Background on Leveraged Funding from SMP Efforts

1. California Trout has partnered with Stillwater Sciences to submit two proposals to NFWF (\$97,946.81) and WCB (\$269,466.70) both for completion of the development and piloting of the Sierra Meadows WRAMP along with restoration plan designs for Horse Meadow on the Sequoia National Forest. If awarded, the SM WRAMP would be completed and applied in Summer 2019 in Horse Meadow. The project meadow is with the South Creek priority watershed for the SQF and a prime reintroduction watershed for native Kern River Rainbow Trout.
2. The Sierra Nevada Conservancy identified \$25,000 in funds to support the development of the Prioritization Framework. Point Blue Conservation Science raised additional funds and the project is now fully funded and on track for completion in 2019. Point Blue also submitted a proposal to NFWF for \$248,000 to pilot the tool, ground truth it, and develop restoration designs for 5 meadows in in the Feather River watershed by 2020.

3. Plumas Corporation submitted a funding proposal to the National Fish & Wildlife Foundation (NFWF) NorCal Forests and Watersheds 2018 Program to assist the Almanor District of the Lassen National Forest in designing, environmental review and permitting on a section of Yellow Creek and a section of an un-named tributary to Yellow Creek in upper Humbug Valley.

Members of the Sierra Meadows Design Committee (Todd Sloat, Sabra Purdy, Bill Christner, Betsy Harbert, Janet Hatfield, and Randy Westmoreland) will assist with the development of restoration design plans for the Riparian Corridor and the Tributary Meadow. The estimated cost for each team member assumes 3-4 8-hour days of work per person at \$65 per hour (\$2,080).

Expected mileage and per diem costs per person are \$1,420, for a total of \$3,500 per person, with the exception of Betsy Harbert, whose travel costs will be less due to her close proximity to the project.

Members of the Sierra Meadows Design Committee not needing funding support, but planning to participate, include: Laura McLean, CDFW, Damion Ciotti, FWS. Jared McKee, FWS, Jeff TenPas, USFS, Craig Oerhli, USFS, Karen Pope, USFS PSW, Carol Purchase, USFS.

Total grant line item for the full committee participation is \$20,500.00.

Challenges/Lessons Learned

- The SMP was formed with the goal and intent of creating a unified vision and approach to effectively change the paradigm regarding how we address meadow restoration and management.
- The SMP has intentionally focused on first building a “cultural foundation” based on understanding people, organizations, interests, priorities and opportunities-First and foremost are people!
- There is a great deal of expertise, passion and desire to advance meadow restoration and management.
- Significant challenges remain that need to be addressed and these require time and financial support.
- Preservation and expansion of the existing Partnership requires on-going efforts to reconcile differences and identify commonalities through focused efforts.
- Strengthening existing and building new relationships is important. This includes developing functional communications channels and mechanisms to facilitate building of relationships but doing so takes a considerable investment of time.
- Challenges include ensuring clear communication among those operating at the (1) political/policy level, (2) science/research level, (3) funding level and (4) partnership/relationship level.

- Often overlooked are the realities that the various partners and associated constituents have and how such realities can pose barriers to working together toward a common goal (these include government accountability).
- A Strategy and a Partnership have been established but both should be considered as living processes that need to adapt to changing situations

Next Steps/Immediate Opportunities (FY19)

- Completion of prioritization tool
- Development, piloting, and adoption of Sierra Meadows WRAMP
- Development of SMP Communications Plan
- Development & adoption of mountain meadow benefits fact sheets
- Fine tuning/continued development of SMP Website
- Initiate steps toward development of Sierra Specific Meadow Restoration Framework for Ecological Design (MRFRED)
- Development of Environmental compliance and permitting reference materials
- Develop and host meadow restoration permitting/compliance training workshop

Appendix A: Research/Monitoring Workplan

SM-WRAMP 3-year Work Plan Executive Summary



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The SM-WRAMP structure is nested, with levels and tiers within those levels of monitoring specificity. At the first level and first tier (1A) all monitoring protocols are required since these protocols focus on programmatic attributes such as meadow size, action type (active restoration, conservation), location, action date, etc. At the second level and first tier (2A), key attributes as required for regulatory compliance for most active meadow restoration activities are reported. And at the third level and first tier (3A), targeted changes in desired conditions determine which sets of protocols must be applied. The second tier of Level 3 (3B) is not required but offers a more in-depth set of protocols for targeted desired conditions. The required monitoring for Levels 1-3, Tier A could also be adopted for meadows identified for conservation and/or new land acquisitions.

An important task in development of the SM-WRAMP is gaining agreement from participants in the SMP to consistently apply these protocols on all meadow restoration and conservation projects. These guidelines and protocols will streamline monitoring for project managers by providing information to help budget and plan field and data management efforts, as well as to train field crew to consistently collect and report monitoring data before and after meadow restoration and/or protection. By having a collaborative partnership collect data across multiple project and meadow types, the power of more

data, more experiences, and better understanding can be leveraged to rapidly build upon and improve the current art and science of meadow restoration.

Site assessment to inform restoration or conservation actions differs from implementation and effectiveness monitoring because the primary intent of site assessment is to evaluate where restoration actions are needed, not to evaluate effectiveness of a project. However, some overlap in on the ground data collection might occur and an important aspect of developing the SM-WRAMP is to clearly identify where and under what circumstances those overlaps might occur and to maximize the information gain from such overlap. Thus, communication and coordination with the Design Team is part of the process of developing the SM-WRAMP.

Like restoration techniques, this document is not intended to be static, but to be adaptively managed. The following document presents additional specifics on SM-WRAMP goals, structure, hypotheses-driven monitoring protocols, the timeline for completing monitoring planning and testing for Level 1A, 2A, 3A, and 3B (anticipated to be fully completed by fall of 2020), and associated costs (\$162,000) broken down by each task. The document does not include tasks associated with Level 3C focused research questions and long-term general monitoring.

Lastly the group has identified the need for long-term monitoring of both healthy and degraded meadows in a monitoring network across the SMP area (Level 3C) to better understand meadow functions and to track changes in meadow health and condition due to natural processes and climate change. This information is critical for evaluating meadow restoration success at a range of both temporal and spatial scales; however, the SM-WRAMP workplan and budget does not currently include the development of this monitoring.

Introduction

The proposed Sierra Meadow Wetland and Riparian Area Monitoring Plan (SM-WRAMP) has been developed by the Sierra Meadows Partnership WRAMP Advisory Committee (SM-WAC) with the intent of creating a framework to assess pre- and post-restoration conditions specific to mountain meadows within the greater Sierra Nevada. The two primary objectives associated with development of the SM-WRAMP are to:

1. Serve as a robust, replicable and cost-efficient monitoring plan to track and understand the extent and effectiveness of meadow restoration and conservation actions by employing protocols pre- and post-restoration and/or conservation. Establishing a Sierra Meadows specific WRAMP provides the basis for determining the efficacy of meadow restoration at the project site-level and for improving our scientific understanding of cause and effect relationships among key meadow functions and restoration actions. This system of consistent monitoring protocols also will generate data on meadow restoration and conservation that can be compared with other management and regulatory programs at regional and statewide scales.
2. Serve as a short, medium and long-term approach to monitoring implementation of the Sierra Meadows Strategy (Strategy) completed in the fall of 2016. The intention of the Strategy is to guide all aspects of restoring and maintaining the health of meadows, including assessments, prioritization, project design, permitting, implementation and post-implementation monitoring. The overarching goal of the strategy is to increase the pace, scale and efficacy of meadow restoration, targeting 30,000 acres of restored and/or protected meadows by the year 2030. In addition to the SM-WRAMP providing site-level information, data derived from its implementation will serve as a framework for evaluating overall success of the Strategy through short, medium and long-term outcomes. More specifically, data derived from the application of the SM-WRAMP will provide the foundation necessary to determine advances in terms of: (a) the abundance, in number and acreage, of meadows protected and/or restored, (b) the diversity and distribution of meadows restored/ protected, (c) overall condition of meadows reported, and (d) information on important meadow attributes, such as water storage, soil carbon storage, biological abundance and diversity such as the distribution, abundance and diversity of plants, fish, birds, amphibians, and mammals.

The final deliverables of the SM-WRAMP work plan will include the materials, outreach and training, and integration of the SM-WRAMP generated data into an accessible database that can be used by multiple stakeholders and program administrators to manage and accelerate meadow protection and restoration with high quality and sufficient information. Through collaboration and coordination among participants, the SMP will provide a much larger, more coherent, and more consistent data set than would multiple entities working independently. Moreover, through the SMP, data collection methods and protocols will incorporate existing institutional knowledge which will foster broader acceptance and adoption. Familiarity, training, and adoption of data collection and reporting protocols will be made broadly available through in person trainings, databases, and the U.C. Davis Meadows Clearinghouse; dissemination also will be reinforced through word of mouth across the large network of SMP participants.

Direct ties to Sierra Nevada Meadow Strategy

The SM-WRAMP will inform the primary goal of the Sierra Meadow Strategy, to restore and protect 30,000 acres of meadow by 2030. Information reported through the SM-WRAMP will enable institutions and the public to track the progress of meadow restoration/ protection in the greater Sierra Nevada through time, and to gain insight on the distribution, success, and costs of restoration. This data will inform program level responses and corrections to ensure the Strategy stays on track to achieve the stated goal. Moreover, as a direct link to Approach 1, “Restore and/or protect meadows to achieve desired conditions”, the SM-WRAMP will provide feedback to project managers and program administrators on the degree to which specific projects or programs are achieving desired conditions. The need for consistent monitoring is illustrated in the Strategy flow chart for developing and using SMART objectives to achieve desired conditions (see Strategy, Figure 3 on page 24). Pre-restoration monitoring is performed to understand existing versus desired conditions. Post-restoration monitoring is employed to direct adaptive management to ensure that desired conditions are achieved. This process is applicable for a single meadow as well as for a set of meadows to achieve desired conditions. Employment of a consistent and effective set of monitoring protocols is critical for providing managers and program administrators with relevant and reliable information.

Task Summary Table

Table 1 provides a summary list of tasks to be completed to accomplish the Wetland and Riparian Area Monitoring Plan SM-WRAMP goals. An explanation of the SM-WRAMP structure, including Levels and Tiers, is provided in the next section.

Table 1. List of tasks required to complete development of the Sierra Meadows Wetland and Riparian Area Monitoring Plan (Dates assume full funding available for SM-WRAMP development in September 2018).

Task #	Sub#	Task Name/Short Description	Completion Date
1	Establish SM-WRAMP Advisory Committee (SM-WAC)		
	1.1	Enlist members with expertise covering range of SM-WRAMP topics	March 30, 2018
	1.2	Coordinate and participate in calls, meetings, and email exchanges	Fall 2020
2	Develop Protocols for office and field data collection and analysis		
	2.1	Outline overall structure of protocols and clarify goals	March 30, 2018
	2.2	Identify attributes to measure for Levels 1-3, Tiers A and B	June 30, 2018
	2.3	Draft Protocols for Levels 1 - 3, Tiers A and B	January 2019
	2.4	Integrate draft protocols with other SMP groups (e.g., prioritization and design groups)	February 2019
	2.5	Internal peer review of draft protocol documents	February 2019
	2.6	External peer review of draft protocol documents	May 2019
	2.7	Pilot field-ready protocols on existing project(s)	Summer 2019
	2.8	Revise protocols for wider roll-out	Fall 2019
3	Develop Guidance on Application of Protocol, Data Analysis and Interpretation		
	3.1	Draft guidance for setting up and applying protocols in the field	February 2019
	3.2	Draft guidance on data analysis and interpretation	February 2019

Task #	Sub#	Task Name/Short Description	Completion Date
	3.3	Peer review of guidance	May 2019
	3.4	Pilot application of guidance by practitioners in field	Summer 2019
	3.5	Revise guidance for wider roll-out	Fall 2019
4	Engage Agencies and other Users in Protocol Review and Application		
	4.1	Engage agency review of draft plan documents	May 2019
	4.2	Agency and Stakeholder review of draft final plan documents	Fall 2019
	4.3	Establish Memo of Understanding (MOU) for common use of protocols with state and federal agencies, practitioners, and other stakeholders	Spring 2020
5	Develop Guidance on Adaptive Management of Protocols		
	5.1	Draft Protocol Management Plan on protocol update and review process	February 2019
	5.2	Final Protocol Management Plan on protocol update and review process	Fall 2019
6	Develop Guidance on Training and Implement Training		
	6.1	Draft plan on training framework and materials	Fall 2019
	6.2	Perform one 'pilot' training session, including feedback questionnaires from participants	Spring 2020
	6.3	Revise training and materials	Fall 2020
	6.4	Perform second round of training: 2-3 sessions	Spring 2021
7	Establish and Coordinate Long-Term Data Management and Storage		
	7.1	Establish agreement among SMP members including agencies on database format and needs	Spring 2019
	7.2	Implement agreement such that all SM-WRAMP data can be entered and stored and accessible to users (as defined in agreement above)	Fall 2020

Budget Summary Table

Table 2. An estimated task level budget required to complete development of the Sierra Meadows Wetland and Riparian Area Monitoring Plan.

Task No.	Task Name	Task Budget Estimate
1	Establish and Coordinate the SM-WAC	\$5,000
2	Draft, Pilot, and Finalize Protocols	\$60,000
3	Develop Guidelines for Protocols	\$15,000
4	Engage Agencies	\$25,000
5	Develop Guidance on Protocol Management	\$1,500
6	Training	\$20,000
7	Database	\$30,000
	Expenses (Training, Piloting)	\$5,500
	TOTAL	\$162,000

Task Descriptions

Task 1. SM-WAC Formation and Coordination

An identified priority from the 2017 Sierra Meadows partnership workshop, attended by over 60 meadow restoration stakeholders and practitioners, was the need to establish a SM-WRAMP Advisory Committee (SM-WAC) which is responsible for standardizing data collection and assessment methodologies for meadow-related projects. Since then, the SM-WAC has been formed and is comprised of experts from diverse fields involving meadow research, planning and restoration. The SM-WAC will serve to guide the further development, implementation and revision of the proposed SM-WRAMP. Amy Merrill will provide overarching coordination that will serve to ensure the SM-WAC is operating smoothly, convene calls/meetings of the SM-WAC and oversee revisions to the SM-WRAMP document. Topical leads (fish & wildlife, soils, hydrology, and vegetation) will guide data collection methods, analysis and management with input from the general SM-WAC membership. All SM-WAC participants will collaborate to advance the science and implementation of the SM-WRAMP and future revisions as necessary.

The SM-WAC was assembled for the following purposes:

1. To guide the overall development, implementation and revision (as needed) to the SM-WRAMP.
2. To develop topically focused groups within the SM-WAC based on SM-WAC members fields of expertise. These groups currently include, fish and wildlife, soils, hydrology, geomorphology, and vegetation. Each of the topical groups will have a designated lead responsible for ensuring all data collected based on the application of the SM-WRAMP is complete, of sufficient quality and that is uploaded and managed in the SM-WRAMP database. The designee also will lead the coordination of uploading appropriate data to relevant regional datasets.
3. Designated leads, working with the coordinator will spearhead potential revisions to the SM-WRAMP once applied, based on review of data.
4. Assure integration with other groups in the SMP, particularly the Restoration Design Group and the Prioritization Group.

Table 3. The Sierra Meadows WRAMP advisory committee (SM-WAC) includes the listed members; topical leads are indicated by blue highlight.

Name	Institution	Role and/or Area of Expertise
Amy Merrill	Stillwater	SM-WAC Lead, Soils Topical Lead, Veg
Christian Braudrick	Stillwater	Geomorphology – Topical Lead
Brent Campos	Point Blue	Wildlife-Topical Lead
Janet Hatfield	Caltrout	SM-WAC liaison, Project Design Group
Nina Hemphill	USFS	Aquatic ecology – Topical Lead
Carrie Monahan	Sierra Fund	Hydrology- Topical Lead
Shana Gross	USFS	Vegetation – Topical Lead
Beth Christman	Truckee River Watershed Council	Restoration and Permitting
Judy Drexler	USGS	Soils and Hydrology
Rachel Hutchinson	SYRCL	Vegetation
Karen Pope	USFS Research	Wildlife
Mona Robinson	CALIPC	Vegetation
Terri Rust	Plumas Corporation	Hydrology

Natalie Stauffer-Olson	Trout Unlimited	Fish/Wildlife
Sheli Wingo	USFWS	Vegetation
Evan Wolfe	Private Consultant	Soils, Vegetation
Sarah Yarnell	U.C. Davis	Fish/Wildlife, Hydrology

Contact person: Amy Merrill (amy@stillwatersci.com)

Task 2. Develop SM-WRAMP Protocols

Initial Draft of SM-WRAMP Protocols

While several aspects of the SM-WRAMP have yet to be finalized, the SM-WAC members have agreed upon several guiding principles:

- Monitoring is critical for (1) adaptive management of a site, (2) program tracking and planning, (3) effective communication with partners, funding institutions, land owners, and the public, (4) improved management and protection of meadow function, (5) improved understanding of benefits healthy meadows provide;
- Monitoring needs to occur both before and after restoration to demonstrate potential effects of restoration on meadow conditions and processes;
- Both structural and process attributes are important to monitor to gage meadow 'health';
- Required or strongly advised monitoring protocols need to be effective but inexpensive to implement; and
- Monitoring and data reporting need to be structured to answer specific questions.

SM-WAC members will develop the protocols for the SM-WRAMP based upon a common structure, as agreed upon by the SM-WAC in Spring 2018. The proposed SM-WRAMP structure has been developed based on the identification of information considered essential to effectively assess and monitor meadows pre and post-restoration in a robust, replicable and cost-efficient manner. It has also been developed with the intent of meeting requirements of funding programs requiring assessments and monitoring activities.

The sections below outline three levels of monitoring: program and landscape assessment (Level 1), rapid assessment (Level 2), and more intensive site assessment data (Level 3). In addition, as part of the SM-WRAMP, all participating meadows would be required to report project goals and desired conditions, types of degradation to be addressed through the project, and hypothesized sources of degradation (such as undersized culvert, recent or legacy intensive grazing, channel re-alignment, etc.). How the project proponent reports on these important linkages between project goals and desired conditions, types and hypothesized source(s) of degradation, intended actions to address those sources, and degree of success in removing or alleviating those sources of degradation, will be further developed in the SM-WRAMP during coming year, once funding becomes available.

The proposed SM-WRAMP reflects the EPA National Wetlands Monitoring Workgroup structure by having three levels of data: program and landscape assessment (Level 1), rapid assessment (Level 2), and more intensive site assessment data (Level 3) (see Table 4). Further, the SM-WAC determined that using tiers nested within these levels was also important for guiding data collection: data to be required

for all funded projects, depending on targeted desired conditions (Tier A), data necessary to meet specific project objectives such as species level information (Tier B), and data relevant for scientific research that would likely be pursued and applied at “sentinel” or long-term research meadows (Tier C). Levels 1 and 2 of the SM-WRAMP contain only Tier A data. Level 3 includes Tiers A, B and C data.

Table 4. SM-WRAMP Levels and Tiers

Level	Description	Tier A	Tier B	Tier C
Level 1.	Landscape Assessment			
Level 2.	Rapid Assessment			
Level 3.	Intensive Site Assessment			

As a next step, the SM-WAC will finalize attributes to be measured for Levels 1A and 2A for programmatic tracking and for Level 3A by linking each attribute to specific desired conditions for tracking restoration or conservation outcomes. The exact field protocols and metrics for measuring, analyzing and reporting on these attributes also will be drafted under this Task. We further assume, that with pilot applications and external peer review, additional refinements in these data collection and management methods will occur. The attributes and metrics listed in Tables 5 through 8 below are based upon current best estimates of attributes and associated field data collection methods.

Pilot Draft Protocol and Solicit Expert Review

Once applied to a first set of pilot meadows (one control and one treatment meadow, pre-restoration), the SM-WAC will review and analyze the data collected with the goal of applying these types of data to additional meadows in the future. These data will be intended to help determine trends in meadow conditions across varied geographical settings and subject to varied restoration techniques. The initial piloting of the SM-WRAMP will include questions for field crews to solicit critical feedback on the structure and content of the protocols and clarity of the field guidance documents. At the same time, outside experts will review the draft protocols and will provide feedback to the SM-WAC by the end of the field season.

Refine Draft Protocols and Produce Final Version

The SM-WAC will collate, review, and integrate field crew and expert reviewer comments and suggestions on the first draft of the protocol in the final draft. The final protocols will include written brief background information on each set of attributes and measurement methods, and instructions for preparing materials for data collection. This set of documents will be paired with the Protocol Guidelines described under Task 3.

The SM-WRAMP will be applied as a tool to compare pre-restoration conditions of hydrologic, physical and biological attributes of target meadows. Additionally, the intent is to apply the SM-WRAMP post-restoration (post-restoration time frame might vary by metric) to enable quantification of changes in meadow conditions as a function of restoration activities. It might be critical to monitor metrics at a longer time scale than funding cycles allow to adequately address if the project was effective at different temporal scales.

Task 3. Guidance on Protocol Application and Data Analysis

Written protocols will include a “Guidance” document with an explanation of how the protocols can be applied at a site or set of sites. Thus, this document will provide overall guidance on control site selection, setting up data collection locations within a meadow (e.g., spatial distribution and density), and data collection timing and frequency. Other guidance on co-location of different data collection types, potential pitfalls and/or technical advice will also be provided. Because methods for statistical analysis should be part of the initial data collection plans, guidance on potential methods for data analysis to address the hypothesis driving each Level 3A attribute will also be part of this Guidance document. Finally, this document will include information on field equipment and recommendations on equipment construction or purchasing, as appropriate.

A much briefer field instructions document will be developed to accompany the Guidance document. These detailed instructions on how to collect and report field measurements will ensure that all data are collected the same and can be directly compared to one another across projects.

Task 4. Engage Agencies and Other Users

Multiple institutions will need to adopt the SM-WRAMP protocols to ensure wide use and population of a truly representative database for restoration and management of Sierra Meadows. An incomplete list of these institutions includes the public land management agencies such as the US Forest Service, the National Park Service, the Bureau of Land Management, California Tahoe Conservancy, and California State Parks. Other stakeholders and practitioners include Water Boards, Environmental Protection Agency, Plumas Corporation, Sierra Nevada Conservancy, American Rivers, CalTrout, The Nature Conservancy, the Foothill Conservancy and other Land Trusts and Conservancies. Agencies involved in regulatory compliance as well as private and public funding agencies and organizations will also have a strong interest in ensuring that the SM-WRAMP protocols are well constructed and broadly applied. Monitoring will be clearly articulated to current organization requirements and needs. The tasks associated with this step include:

- Identify key organizations and to engage associated representatives in the review of draft Protocol documents. This task is expected to require up to five meetings with agencies and other entities to describe and discuss the proposed SM-WRAM format in relation to institutional needs and limitations. Several SM-WAC members are part of these target institutions and will support these communications.
- Identify key representatives in upper management from each agency to provide review and feedback on what the agency would adopt.
- Send the draft background document to agency representative for review with explanations and monitoring metrics being proposed, estimates for people-hours and training level per protocol if known, as well as required/recommended timeline and responsibility assignment(s) for monitoring (e.g., 1 to 5 years prior, 1 to 5 or more years post restoration).
- Send final document, including final metrics and protocols to agency representatives along with MOU (see below) for adoption.
- Develop one to multiple Memo(s) of Understanding (MOUs) regarding the common use of the SM-WRAMP protocols, including posting and sharing data collected. As part of the MOU, meadows could be Sierra Nevada Meadow Partnership Certified, indicating that by participating in the monitoring the meadow is contributing to healthy meadows across the SMP project area.

Task 5. Develop Guidance on Protocol Management

As a future step, the SM-WAC will evaluate the efficacy of the proposed SM-WRAMP and potentially revise it based on analysis of its implementation, and its ability to be scaled back for time and cost-efficiency - while ensuring data collected provides robust and necessary information to evaluate efficacy of restoration activities over time at site-specific and programmatic scales.

Task 6. Training Materials and Training Sessions

The protocols themselves will be communicated in several formats, including written and video. A pilot training session will be held in spring 2019 and materials and methods used during the pilot training will be refined and improved based on trainee feedback. These updated materials and methods will be applied during up to three training sessions located in different locations in the Sierra Nevada during spring of 2020. A video will be developed and revised as part of this training to increase access of the training materials to a broader audience.

Task 7. Data management, analysis and adaptive approach to proposed SM-WRAMP

In addition to the SM-WRAMP development, the SM-WAC intends to provide guidance on management and analysis of data derived from the implementation of the SM-WRAMP. This will include guidance on QA/QC of SM-WRAMP specific data and ultimately ensuring data is structured in a manner appropriate for submittals to the Sierra Meadows Clearinghouse. During this phase of SM-WRAMP development, the SM-WAC will investigate opportunities to integrate and or link SM-WRAMP data with other current data from the UC Davis Meadows clearinghouse, to ensure longevity, accessibility and a user-friendly platform. In this scenario, for all database submittals, all meadow data will be tagged with a unique Meadow ID, to enable queries across multiple databases that include or are outside of the Meadow data clearing house (e.g., CEDEN, eCRAM, etc.).

Proposed SM-WRAMP Attributes, Levels 1-3

Level 1: Maps and Spatial Information

Level 1 data are required for all participating meadows. This Level 1 information is primarily directed towards tracking the number and distribution of planning vs. implementation meadow restoration projects in the Program Area. Other basic information on land ownership and project partners is also reported at this level (Table 5). Level 1 includes landscape context variables that could be used to stratify meadows within the program area, such as underlying parent material (granitic, volcanic, etc.), elevation, county, start and end date, target desired conditions (proposed drop-down list), and restoration method (proposed drop-down list). Thus, Level 1 data can be used to facilitate analysis of distribution and diversity of meadow restoration and conservation projects, and to explore relationships between meadow restoration projects and landscape scale characteristics, such as land use and tenure, climate change patterns, as well as fundamental differences in geology, growing season length, fire frequency, etc.

Table 5. Proposed Level 1 data for SM-WRAMP

Data Attribute	Tier
Project name	A
UCD Unique Meadow ID	A
Project partners	A
Meadow name	A
Meadow site characteristics: Meadow HGM type(s), size (ac), past land use practices	A
Restoration Project Characteristics: project goals and objectives, restoration methods (select from list), target desired conditions (select from list), expected impact area (ac)	A
Meadow landscape context: underlying parent material, elevation, site location (lat/long)	A
County	A
HUC 12	A
National Forest Land (Y/N)	A
If Yes, Specific Ranger District	A
If No, Specify Land Ownership	A
Project activity type (assessment, planning, restoration-implementation etc.)	A
Project schedule: Implementation start and expected end dates	A

Level 2: Information Collected for Regulatory Compliance

Level 2 data are data that are reported for SM-WRAMP only if collection is required for regulatory compliance. These reporting protocols are a means of ‘harvesting’ this data for use in assessing changes in wetland extent and distribution and plant species composition. Project specific information is reported here from the California Rapid Assessment Method CRAM report on meadow vegetation, hydrologic regime, water source, presence of peat soils, extent of section 404 wetland delineated area (Table 6).

Table 6. Proposed Level 2 data for SM-WRAMP

Methodology	Tier
CRAM	A*
Wetland delineation	A*

*Wetland delineation and CRAM may be required prior to restoration implementation, regardless of project type. However, it is not considered required for every project. For example, if a proposed project is to install plantings with no earthwork, a wetland delineation might not be required and so the information reporting is not required as part of the SM-WRAMP protocol. The information for Tier3A vegetation monitoring was identified so that it can pair with or serve in lieu of wetland delineation information if necessary.

Level 3: Specific condition information

Within the Level 3 data, we propose having three Tiers of information. Level 3, Tier A (3A) would be required of all participating meadow restoration projects, with monitoring of some attributes only required if triggered by potential effects of proposed actions. Level 3, Tier B (3B) data would not be required; but would support more thorough monitoring for targeted desired conditions or other potential outcomes. Level 3, Tier C (3C) data would support greater understanding of underlying processes that support healthy and resilient meadows in the face of climate change and in response to restoration actions and would be implemented in a subset of meadows selected to represent the diversity of meadows in the program area. These 3C protocols would require the greatest level of scientific rigor. Level 3C is recognized as needed; however, is not being developed at this time as part of this request.

Level 3, Tier A

The intent of these Level 3A data are to provide more detailed landscape and site-specific information on meadow conditions and processes. While some of these attributes will be required for all participating meadows, such as photo-monitoring and response to climatic stress, others are only required if restoration or conservation is intended to address a relevant class of problems, based on a decision tree (to be developed). Such a decision tree for Level 3 Tier A would be structured around project goals and types of degradation. For example, types of degradation could include an incised channel, conifer encroachment, or loss of native plant cover to invasive species. Actions to address incised channels trigger monitoring for channel structure and ground and surface water. Actions to address conifer encroachment can also trigger monitoring for groundwater response but would not require monitoring and reporting on channel structure or surface water. Additional monitoring would be welcome but not required unless 'triggered' by the protocol. Thus, information from 3A could be used to track condition or target population changes in individual meadows as well as changes in overall site conditions for meadows at a programmatic scale. All these data types are screened to provide 'cheap, easy, and effective' information. As part of this data set, all participating meadows would be required to establish permanent photo-points from which photographs are taken during July prior to restoration and for years 1, 3, and 5 post-restoration (specific photo-monitoring and reporting protocol will be included). Each attribute is intended to address a particular hypothesis, as indicated in Table 7.

Table 7. Proposed Level 3, Tier A variables for SM-WRAMP

When Required	Hypotheses	Quantifiable Attribute	Methodology	Rationale
Required for all	Restoration and protection of meadows will occur at a steady pace and with even spatial and land tenure type distribution across the greater Sierra Nevada between now and 2030 to achieve a total of 30,000 acres of restored and/or protected meadows.	Measure of restoration success based on stated goals (specifics tbd); maintenance required (including restoration amendments or corrections), year, cost	Photos and simple data questions	This provides an opportunity to track efficacy of the design and tie the results to ecological outcomes being investigated. If project is continually maintained, then it may not be achieving desired conditions as far as returning meadow to disturbance adapted system.
	Some restoration methods are more costly and less effective than others.	Cost per acre to implement, cost per acre and year for maintenance. [need to combine with effectiveness or success attribute]	Reporting	This provides an opportunity to track efficacy of the design and tie the results to ecological outcomes being investigated. If project is continually maintained, then it may not be achieving desired conditions as far as returning meadow to disturbance adapted system.
	Compared to unrestored degraded meadows, restored degraded meadows will have more resistance/ resilience to climatic perturbations. On a shorter time-scale and per meadow, climate will affect near-term restoration response. Response variables tbd from this table.	Climatic conditions as explanatory variables: Total precipitation over water year; growing season temperature – average, maximum, minimum.	<u>Climate Engine:</u> http://app.climateengine.org/	Climate influences meadows directly through the timing and amount of precipitation and evapotranspiration, which modifies the position of the water table. Therefore, restoration response is influenced by climate.
Where channel structure is altered to address incision,	Channel planform and sediment transport properties will change: higher sinuosity, increased bed patchiness, decreased channel incision, increased bar-pool morphology	Sinuosity, migration rate, sediment transport and deposition, Upstream and downstream hydrologic effects	Geomorphic Mapping and Grain Size Analysis	Geomorphic maps and grain size analysis can be used to assess meadow condition before and after restoration; experienced geomorphologists required.
	Channel form will change with restoration: decreased channel slope, decreased grain size, increased width-	Channel morphology	Cross sections and Long profile	Channels can adjust to changes in sediment supply via adjustments in channel dimensions, slope, and surface

When Required	Hypotheses	Quantifiable Attribute	Methodology	Rationale
	depth ratio, channel width and slope will become quasi stable once the channel adjusts			grain size. This protocol will provide data to quantify these changes in functionally relevant ways.
	A more extensive area will become inundated at lower discharge events following restoration compared to before restoration.	Floodplain connectivity	Relevant indicators from USFS Stream Condition Inventory and/or other scientifically accepted protocols	Fundamental expected restoration effect that supports multiple other changes in site conditions, including aquatic habitat
Where losses from shallow groundwater are reduced or inputs increased	Following restoration, depth to shallow groundwater decreases during the growing season overall, and/or depth is less for greater portion of growing season. Change in depth to groundwater brings groundwater to or higher within the plant rooting zone.	Depth to shallow groundwater table	Shallow groundwater well transects established and monitored at least monthly during the growing season; where relevant, linked to elevation transects established during design phase	Fundamental expected restoration effect that supports multiple other changes in site conditions for terrestrial habitat. Linkage to Design Group to use design data for pre-restoration monitoring. Minimum of 3 wells per meadow (further detail to come).
	Following restoration, shallow groundwater inputs to surface water will increase	Specific conductance	Growing season measures using YSI meter or field titration kit	Reflects dissolved solids such as salts, minerals, and can be used indicator of pollution and/or source water
	With greater plant production and longer periods of soil saturation at or near the surface, soil carbon content will increase, more within the first 15 cm than in deeper soils	Surface soil carbon content	Soil cores, to 45 cm depth; See SMRRP protocol	Core samples for C bulk density in 15 cm depth intervals, C and N content
Where losses from shallow groundwater are reduced or inputs	With restoration that reduces depth to groundwater during the growing season, net soil carbon loss will decrease	Soil carbon loss rate	TBD	Net soil carbon loss rate should decrease rapidly with hydrologic restoration as more carbon is added from increased production and less old soil C is lost via aerobic decomposition
	Longer spring flows, higher baseflows, reduced annual peak flow, greater lateral and more frequent inundation	Surface Water Hydrology	Hydrograph analysis: base flow duration, slope of rising limb, peak flow entering and existing	Hydrograph data for summer base flow (duration), rising limb slope (connectivity/ wet up), and peak flow

When Required	Hypotheses	Quantifiable Attribute	Methodology	Rationale
	extent per flow level will occur with restoration.			entering and existing meadow (attenuation)
	Stream water temperatures are cooler for a longer period of the growing season with restoration	Water temperature	Deploy and manage data from temperature loggers within meadow	Reflects multiple interactions: ground/surface water contributions, channel shade, duration of snow melt
	Vegetation production and growth increases with greater access to surface or groundwater with restoration.	Change in vegetation vigor	Normalized Difference Vegetation Index (NDVI)	Indicator of vegetation vigor. This is a good, simple monitoring tool for restoration effectiveness which can visually display if after restoration vegetation vigor increases despite drought conditions.
	Restoration increases plant access to water and decreases plant water stress at the beginning, middle, and end of the growing season. The degree of change in water stress with restoration varies with changes in vegetation type and extent.	Change in water stress	Normalized Difference Water Index	Indicator of plant water content and a good proxy for plant water stress.
	Restoration increases extent of water dependent plant community types	Acres by vegetation community type	Acres by community type as mapped by a rapid assessment method per CNPS - CalVeg mapping to alliance level.	Changes in vegetation community type expected to be a fundamental response to most restoration actions. This can be complimentary to data reported under Level 2.
Where invasives removed	Reduced competition with invasive plant species supports increased native plant diversity	Plant species composition and cover	Cover or rooted density (tbd) by species in quadrats along transects	Removal of invasive species, including conifers, changes availability of light, water, and nutrients and will favor a different set of species. If all invasives are addressed, natives will increase in cover

Level 3, Tier B

Level 3B attributes are not required for all meadows but will be standardized so that meadow restoration proponents choosing to track more in-depth and/or more specific meadow condition responses to restoration actions can report changes using the same method protocols. This will support tracking and adaptive management on a meadow-specific basis, as well as meta-analysis of meadow response and restoration ‘success’ at broader spatial scales, or within stratified sets of meadows (e.g., classified by parent material, elevation, ownership, or restoration methods) (Table 8).

Table 8. Proposed Level 3, Tier B variables for SM-WRAMP

Where suggested	Hypothesis	Quantifiable Attribute (<i>performance outcomes</i>)	Methodology	Rationale
Manage to affect depth to groundwater	Impact on change in depth to groundwater due to restoration varies across full meadow area	Acres by depth to shallow groundwater; depth bins will be included in protocol	Use transect groundwater and surface topography data to develop spatial data of depth to groundwater; create depth bins and report acreage per bin	Reporting change by area will increase resolution of data on efficacy of restoration action(s).
Changes in surface water hydrology	Changes in stream flow hydrograph varies from top to mid to bottom of meadow channel due to restoration	Stream channel discharge above and below meadow	Establish and collect data from multiple field gages, perform hydrologic modeling	Track change in amount and duration of summer baseflow, a potential benefit of meadow restoration
Changes in groundwater inputs and/or losses	Restoration results in an overall increase in alluvial groundwater storage that can be quantified	Alluvium storage capacity	Measure alluvium surface area, depth, porosity, and 'shape factor' per Cornwell and Brown 2008	Track change in total volume of groundwater storage in meadow
		Depth to water table	Establish and monitor groundwater wells (see above)	
Changes in ground and surface water inputs and	With restoration, expected improvements in water quality will be reflected in benthic invertebrate community characteristics	Benthic invertebrates	Direct surveys: community structure: diversity, richness, tolerance	Reflects spatial and temporal integration of water quality conditions (DO, temperature, etc.); also characterizes base of aquatic food web

Where suggested	Hypothesis	Quantifiable Attribute (performance outcomes)	Methodology	Rationale
	Bank erosion will decrease with restoration	Bank stability pre- and post-restoration	Multiple Indicator Monitoring of Stream Channels and Streamside Vegetation	Reflects aquatic and streamside habitat condition
	Turbidity will decrease with restoration	Turbidity	Turbidity meter during range of conditions, with focus on peak storm events; timing, spatial density and frequency of measurement tbd	Turbidity reflects water transparency, due to suspended solids and dissolved organic matter; it affects aquatic habitat quality
	Suspended sediment concentration will decrease with restoration	Suspended sediment concentration	<2mm filtered, dried and weighted water samples; timing, spatial density and frequency of measurement tbd	Increased filtration is an expected benefit of many meadow restoration efforts. Suspended solid concentration reflects part of sediment transport load as well as water quality condition
	Dissolved oxygen will increase with restoration	Dissolved oxygen	DO meter, timing, spatial density and frequency of measurement tbd	Direct measurement of important water quality attribute that directly affects aquatic plants and animals
Changes in habitat conditions for plant species	The species and populations of rare plant species will change, depending on the species needs in relation to effects of restoration on habitat conditions, such as water and shade availability	Rare plant survey	CNDDDB protocol; using databases from CDFW (CNDDDB) and CNPS (rare plants database)	Likely already required for NEPA or CEQA compliance and monitored to reflect progress towards restoration goal(s).
	The species and populations of invasive species will change, depending on species needs in relation to effects of restoration on	Invasive Species	Mapped level of data for invasive species	If invasive species are found then this would be an indicator to track how restoration project influenced invasion

Where suggested	Hypothesis	Quantifiable Attribute (<i>performance outcomes</i>)	Methodology	Rationale
	habitat conditions and eradication actions			
	Plant community composition, diversity, and distribution of functional groups will change with restoration	Plant rooted frequency, root depth, groundcover, plant species richness and diversity	R5 Rangeland monitoring protocol	Valuable because data would align with existing long-term monitoring database; include call-out for invasive species
	Conifer encroachment will decrease with treatment	Conifer encroachment	USFS R5 protocols for conifer encroachment	Conifer encroachment is an issue in many meadows so this would provide direct measure of intended benefit
Changes in Soil Conditions	Increased flood frequency and extent will increase delivery of mineral soils, with grain size decreasing with water energy in deposition area	Soil texture distribution	Sand/silt/clay analysis, SOM content (sampling distribution and density tbd)	Provides information fundamental to interpreting C sequestration, surface erosion, plant community composition, water holding capacity
	Soil carbon content will increase with restoration to 1 m depth (greater increase in shallow than deep soils)	Soil carbon content to 1 m: Core samples for bulk density, C and N content in 15 cm depth intervals	Measure to 100 cm depth	Changes in carbon content to 1 m vs. 45 cm depth provide more information on long term soil C storage – although small changes likely to occur over 1 to 5 years in deeper soils
	Rate of net soil carbon loss will decrease with restoration	Grams of C per acre per year	tbd	Changes in rates of soil carbon loss = shorter time-scale information on meadow response to restoration

Where suggested	Hypothesis	Quantifiable Attribute (<i>performance outcomes</i>)	Methodology	Rationale
Aquatic, terrestrial species richness, habitat diversity	Aquatic and terrestrial species that are appropriate to the site (as determined by wildlife and/or fisheries biologists and past monitoring information) will increase in abundance and diversity in restored meadows	Abundance, species richness, diversity, community structure/age class, recruitment, presence/absence, expansion of spawning area (change in substrate type and temperature), habitat connectivity	Fish, bird, amphibian, and mammal surveys, habitat surveys	Direct measure of expected benefit of restoration to determine changes in aquatic and terrestrial species richness and habitat diversity

Appendix B: Prioritization Workplan

Prioritization Committee 3 Year Work Plan

Introduction and Purpose

The Sierra Meadows Partnership (SMP) identified a tool for helping prioritize meadow restoration as among its five highest priorities to achieve the goals of the partnership. The purpose of the Prioritization Committee is to develop a tool that will provide a strategic, flexible approach for prioritizing meadows for restoration and protection in order to maximize project benefits, reach desired meadow conditions as described in the Sierra Meadow Strategy, and increase the efficacy of the SMP.

Objectives

- Develop a scalable, flexible framework for prioritization that provides a suite of conservation targets, additional data inputs, and relevant scales from which the user can select to tailor decision-making.
- Provide a one-stop-shop for SMP members to access, leverage, and integrate existing tools and data sets used in meadow restoration, management planning, and decision-making.
- Generate a targeted list of meadows that meet the individual user's needs that can be used for on-the-ground site assessments and further prioritization efforts on a finer scale.
- Provide integration with the UC Davis Meadows Clearinghouse to facilitate project tracking and easy access to monitoring and meadow condition data relevant to ongoing prioritization and planning efforts.
- Contribute to transparent decision-making for the SMP and justify decisions to funders and others.
- Facilitate the identification of new critical research questions and data gaps necessary for informed decision-making and that can be used to update the tool as new information becomes available.
-

Importance to Sierra Meadow Strategy

Our work fits under Approach 1 of the Sierra Meadow Strategy, which is to restore and/or protect meadows to achieve desired conditions. The prioritization tool will help increase the pace, scale, and, most importantly, the efficacy of meadow restoration and protection by providing a flexible, strategic approach to decision-making that will ensure the projects we pursue achieve multiple benefits and are the best investment of our limited resources. The tool will also help clarify desired meadow conditions to inform restoration design, monitoring, and adaptive management.

Task List with Completion Dates

Task		Completion Date
1	Review existing prioritization and decision support tools.	
1.1	Compile list of existing prioritization tools	April 2018
1.2	Develop brief summaries of each identified tool	April 2018
1.3	Identify a subset of tools for which we want to gather more information	April 2018
1.4	Identify gaps and unmet needs in existing tools	April 2018
2	Refine conservation targets, indicators, scales, and additional data inputs.	
2.1	Reach out to tribal contacts to identify additional items to be captured in prioritization tool	April 2018
2.2	Align on refined list of conservation targets and rationale for inclusion	April 2018
2.3	Identify spatially explicit indicators of conservation targets for use in mapping tool	May 2018
2.4	Revise TNC's 2015 Methods document for prioritization based on refined targets and indicators	May 2018
2.5	Develop and align on refined list of scales for inclusion in the tool	May 2018
2.6	Develop and align on list of additional data inputs/filters	May 2018
3	Integrate workgroup efforts with other committees	
3.1	Develop task list and key questions for integration with WRAMP committee	April 2018
3.2	Meet with WRAMP committee	April 2018
3.3	Develop task list and key questions for integration with design committee	May 2018
3.4	Meet with design committee	May 2018
3.5	Develop task list and key questions for integration with permitting committee	May 2018
3.6	Meet with permitting committee	May 2018
4	Develop a conceptual model of the prioritization tool and identify data layers	
4.1	Refine and align on prioritization tool purpose, objectives, and tool output/s	May 2018
4.2	Develop flow chart for overall meadow restoration/protection cycle that integrates deliverables of other work groups.	June 2018
4.3	Compile data layers for conservation target indicators, scales, and additional data inputs/filters	August 2018
4.4	Develop relational model linking targets, indicators, scales, and data inputs/filters to data layers and tool output/s	August 2018
5	Build prioritization tool	
5.1	Identify location for tool to live	October 2018
5.2	Explore integration with UC Davis Meadows Clearinghouse	October 2018
5.3	Develop budget and secure funding	October 2018
5.4	Identify contractor for building tool	October 2018
5.5	Identify tool host and long-term tool maintenance	October 2018
5.6	Generate flexible weighting scheme for tool inputs	October 2018
5.7	Alpha testing of tool	January 2019
6	Pilot and finalize tool	
6.1	Pilot tool in different prioritization processes to test efficacy	March 2019
6.2	Generate first cut list of meadows to serve as representative snapshot of priorities	March 2019
6.3	Develop user guide	March 2019
6.4	Develop report with case studies/examples	March 2019
6.5	Tool goes live	March 2019

Task Descriptions and Deliverables

Task 1: Review existing prioritization and decision support tools.

Under this task, we will identify, review, and summarize existing meadow prioritization and decision support tools in order to identify gaps and unmet needs that could be met by our tool as well as tools that should be integrated into our prioritization tool. We will also identify conservation planning/prioritization tools that we could use to model our tool after.

Deliverables		Completion Date
1	List of meadow-specific tools with summaries about utility	April 2018
2	List of a subset of meadow-specific tools for further research and integration into our tool	April 2018
3	Summary of findings about data gaps and unmet needs	April 2018
4	List of conservation planning/prioritization tools that we could model our tool after	April 2018

Task 2: Refine conservation targets, indicators, scales, and additional data inputs.

Under this task, we will identify and refine the conservation targets (e.g., species, water quality) and associated spatially explicit indicators (e.g., critical habitat units, listed watersheds), scales (e.g., county, national forest, watershed), and additional data inputs (e.g., climate vulnerability) that will form the basis for our prioritization tool.

Deliverables		Completion Date
1	List of conservation targets with rationale/criteria for inclusion	April 2018
2	Revised Methods document for prioritization with conservation targets and spatially explicit indicators	May 2018
3	List of scales and additional data inputs for inclusion in tool	May 2018

Task 3: Integrate workgroup efforts with other committees.

This task will be ongoing throughout the life of our work plan. In order to be efficient and streamline integration, we will arrange for the heads and/or key members of each group to meet to discuss key questions and tasks that require integration, with the option for other work group members to join. The heads of each work group should develop a structured agenda with a meeting target prior to the meeting to streamline integration efforts.

Deliverables		Completion Date
1	List of considerations for integration into our tool from each work group	May 2018

Task 4: Develop a conceptual model of the prioritization tool and identify data layers.

Under this task, we will develop a conceptual model of the prioritization tool that will describe how we want the tool to function as well as how our conservation targets and indicators, scales, and additional data inputs will be integrated into the tool in the form of GIS layers. This will build off of the work done in tasks 1 and 2. We will also develop a flow chart that demonstrates how our prioritization tool can be

integrated into the life cycle of meadow restoration and protection projects, with links to the deliverables of other work groups.

Deliverables		Completion Date
1	Flow chart for overall meadow restoration and protection cycle	August 2018
2	Spreadsheet linking Task 2 deliverables to GIS data layers	August 2018
3	Conceptual model of prioritization tool	August 2018

Task 5: Build prioritization tool.

Under this task, we will identify a location for the tool to live, build the prioritization tool, and identify how the tool will be maintained over time.

Deliverables		Completion Date
1	Tool developed and alpha testing	January 2019

Task 6: Pilot and finalize tool.

Under this task, we will pilot the prioritization tool to test efficacy in preparation for the tool to go live. We will also develop a user guide and report with case studies/examples that can be shared with the SMP members. The report will contain an example list of meadow priorities generated by the prioritization work group as an example of potential project priorities that will achieve multiple benefits.

Deliverables		Completion Date
1	Prioritization tool user guide	March 2019
2	Prioritization tool report	March 2019

Budget

Task	Hours	Hourly Rate	Cost
Review existing prioritization and decision support tools	24	\$69.50	\$1,668.00
Refine conservation targets, indicators, scales, and additional data inputs	40	\$69.50	\$2,780.00
Integrate workgroup efforts with other committees	24	\$69.50	\$1,668.00

Develop conceptual model of prioritization tool and identify data layers	120	\$69.50	\$8,340.00
Build prioritization tool	80	\$69.50	\$5,560.00
Pilot and finalize tool	216	\$69.50	\$15,012.00
Develop Web interface/IT Support	220	\$75.00	\$16,500.00
Total Project Cost			\$51,528.00
Matching Funds			
CalTrout Funding SMP – In hand			\$4000
NFWF Funding for Pilot - Pending			\$15000
Point Blue Match – In hand			\$4500
Funding Needed			\$28,028.00

Appendix C: Plan Design/Implementation Workplan

3-year Work Plan- Restoration Plan Design

I. Introduction:

Background and link to Meadow Strategy.

The overarching goal of the Sierra Meadows Strategy is to increase the pace, scale and efficacy of mountain meadow restoration across the Sierra Nevada and Cascade mountains of California. In December 2016, the Sierra Meadows Partnership formally adopted the Sierra Meadows Strategy to focus our efforts with the aim of restoring 30,000 acres of mountain meadows by 2030. In recognition of this ambitious goal, the Partnership went to work addressing critical needs to accomplish this task.

One critical need identified was to increase dialogue and build capacity specific to meadow restoration plan design and implementation throughout the state. The Plan Design Workgroup was formed with a primary goal of developing comprehensive standards and guides for meadow restoration design and implementation. An additional goal was to develop a meadow restoration apprenticeship among partner agencies and organizations to provide applied restoration experience under the guidance of seasoned practitioners.

These goals will be achieved through the development of a restoration plan design toolbox that presents a comprehensive list of design alternatives and appropriate applications of each alternative for use by upcoming designers and for setting the standard for process-based restoration plan design in the State. The work group will simultaneously provide apprentice-mentor working relationships where the toolbox can be applied thus build critical capacity deficits specific to restoration plan design within the Sierra Meadows Partnership.

The Plan Design work group will create standards and rationale for data collection and analysis specific to restoration plan design. These data are meant to complement data collected in the WRAMP/Monitoring work group.

Goals & Objectives:

The work group's goal is to build capacity for implementing effective meadow restoration projects in support of the Sierra Meadows Partnership Strategy. We will do this by developing, and educating others to develop ecologically sound process-based designs and implementing meadow restoration projects throughout the region based on the best available science. Objectives based on this goal include (1) to develop standards and guides to help practitioners develop restoration plans and help managers review them, and (2) to describe approaches and provide criteria for selecting appropriate approaches to meadow restoration while keeping in mind the diversity of stakeholder goals and practitioners' perspectives and approaches. To accomplish these objectives, the work group will (1) identify common assessment methods and measures of success, (2) review past projects and summarize outcomes including past reviews that have been completed, and (3) field truth criteria and approaches by conducting a collaborative design. When implementing the design, we will include interested agency partners, students and tribal partners and incorporate several workshops to provide applied restoration experience.

Deliverables:

Products of this effort will include a peer-reviewed Sierra Nevada meadow restoration planning and implementation guide. The guide will include (1) a literature review that summarizes foundational papers and effective measurements of success (2) an addendum to the Guidance for Stream Restoration (Yochem

2018) and the Great Basin meadows document edited by Chambers and Miller (2011), among other relevant literature reviewed, that is specific to Sierra Nevada meadows and discusses processes, disturbances, assessments, and restoration techniques (3) a risk assessment method for weighing the risk of alternative restoration approaches, (4) use the combined resources and expertise to compile a Meadow Restoration Framework for Ecological Design (MRFRED) that provides guidance for the design process and (5) completion and summary of a collaborative design and eventual implementation of a meadow restoration treatment from beginning to end that utilizes and tests the resources and processes compiled above including working with other Sierra Meadow Partnership Subgroups to collaboratively work through tasks and protocols developed such as site prioritization, monitoring plans, permitting, and outreach.

II. Task list:

Task		Completion Date
1	Define Workgroup Purpose and Process	
1.1	Identify workgroup leads and process for progress	November 2018
1.2	Define Goals and Objectives	June 2018
2	Identify Sierra Meadow Partnership Meadow Restoration Plan Design Site Assessment Information	
2.1	Develop Meadow Restoration Literature Review from identified foundational papers and build a Resource Library	July 2018
2.1a	Library of meadow condition assessment techniques.	
2.2	Discuss and decide upon accepted terminology (design principles vs. standards as an example) for the mzf. fred toolbox/framework based on literature review and group experience. List of problematic terms by end of June.	October 2018
2.2a	List of problematic terms that require definition	June 2018
2.2b	Review and finalize definitions	October 2018
2.4	Consult/work with other SMP breakout groups to identify redundancy or gaps in data needed and identify further collaborative efforts.	Ongoing
2.5	Identify assessment data required by benefit type claimed in collaboration with WRAMP group	Ongoing
3	Review relevant literature and resources to provide update to meadow restoration design that is specific to Sierra Nevada Meadows	
3.1	Define design principles and criteria for process-based design based on relevant literature. Identify and incorporate processes that form and maintain meadows that are Sierra Nevada specific	September 2019
3.2	Identify and incorporate historic and continued anthropogenic disturbances to meadows that are Sierra Nevada specific	September 2019
3.3	Identify and incorporate common assessment methods, analysis of assessment, and measures of success in meadows that are Sierra Nevada specific and summarize. This includes identifying essential and ancillary Plan Design Assessment Data.	September 2019
3.4	Identify and incorporate restoration implementation tools/techniques specific to Sierra meadows	September 2019
3.5	Incorporate any additional information from previous reviews of meadow restoration success	September 2019
3.6	Complete draft addendum if necessary	October 2019
3.7	Determine if follow up science-based publication—a review paper that incorporates more recent science within the sierra Nevada—is necessary	Ongoing
4	Define Risk/Develop Meadow Restoration Specific Risk Matrix	
4.0	Communicate with permitting group to identify overlap of topic	December 2018
4.1	Identify and compile relevant risk matrices	April 2018
4.2	Identify different types of risk while addressing various audiences	April 2018
4.3	Reconstruct Risk Matrix specific to meadow restoration work	December 2019
5	Assemble completed tasks 1-4 above into a <u>draft</u> comprehensive meadow restoration design mrfred framework that defines basic site assessment needs, tools and techniques, principles and criteria, and risk.	

	5.1	Coordinate sub-group efforts and compile first draft of toolbox: Meadow Restoration Framework for Ecological Design (MRFRED)	December 2019
	5.2	Incorporate lessons from testing toolbox through in- field collaborative design process and initial group site visits of previously restored meadows	March 2020
	5.3	Draft Meadow Restoration Framework for Ecological Design (MRFRED)	December 2020
6	Test the framework/toolbox by working collaboratively on a range of meadows		
	6.1	Identify sites and work with landowners, managers, stakeholders site visit dates (includes informal and potentially grant funded visits)	July –December 2018
	6.2	Create budget/Scope/Workplan specific to project planning	January - April 2019
	6.1a	Coordinate with all other SMP work groups to bring into collaboration	January - March 2019
	6.3	Identify project specific roles and responsibilities	May - July 2019
	6.4	Apply for project funding	Ongoing
	6.5	Assemble project Stakeholder Group	January - March 2019
	6.6	Define Goals/Objectives/Concerns of Stakeholders/Landowner(s)	March - June 2019
	6.7	Convene necessary site visits and apply framework/toolbox	June - October 2019
	6.8	Develop Conceptual Plan Design Alternatives	October 2019- January 2020
	6.9	Document lessons learned, revise toolbox based on application	January - March 2020
	6.10	Work with landowner and permitting group to complete NEPA/CEQA and all necessary permitting	March - December 2020
7	Implement Project		
	7.1	Create budget/Scope/Workplan specific to project implementation	October 2020- December 2020
	7.2	Identify lead agency and apply for funding	October 2020 - January 2021
	7.3	Implement Design	August 2021
	7.4	Revise MRFRED based on applications	October 2021
	7.5	Monitor Performance	August 2022
	7.6	Document Lessons Learned through process	Oct 2022- Dec 2022
	7.7	Grant Administration and Reporting	January 2023
8	Publish the revised comprehensive meadow restoration design toolbox/framework (MRFRED) that defines basic site assessment needs, tools and techniques, principles and criteria, and risk.		
	8.1	Draft comprehensive meadow restoration design document (MRFRED) based on lessons learned from Tasks 6 and 7.	October 2021
	8.2	Solicit comments from workgroup, incorporate and finalize.	October 2021
	8.3	Publish and print SMP approved MRFRED, a restoration plan design toolbox.	December 2021

III. Task Descriptions:

Task 1: Define Workgroup Purpose/Goals and Process

This task includes the following: define mutually agreed upon group goals and objectives, develop a detailed workplan, identify workgroup leads, organize individual workgroup activities, set up meeting protocols, and track group progress. The design group will work collaboratively to outline mutually agreed upon group goals and objectives. The goals and objectives will be used to provide focus for the overall design workplan and guide development of individual tasks and subtask. Work group leads will be identified to organize and track workplan deliverables. Meeting protocols will be agreed upon and incorporated into subsequent meetings to facilitate successful completion of agreed upon tasks. Target dates for each task will be identified and tracked by project lead and individual workgroup leaders.

Deliverables		Date
1	Group Goals and Objectives	June 2018
2	Workplan Tasks/Subtasks	June 2018
3	Identify Workgroup & Task Leads	November 2018
4	Workplan Schedule	June 2018
3	Meeting Protocols	June 2018

Task 2: Identify Sierra Meadow Partnership Meadow Restoration Plan Design Site Assessment Information

There is a wealth of existing information on restoration design, assessment, and implementation for rivers and streams available in the form of primary peer-reviewed literature, agency reports, and technical memoranda. However, this information is not necessarily easily accessible and new information and research is being generated on an ongoing basis from many sources. Creating and maintaining a stream and meadow restoration reference library with core foundational literature, tools, and resources is a critical component of meadow design. This literature will contain key texts that will be used as the framework for assessment, design, and implementation approaches. In addition to the references provided, the meadow restoration design technical team will compile a standard list of essential data and information needs that provide the basis of design for a meadow restoration. This data will provide the critical information required in order to create a sound and well thought out restoration taking into account all potential factors that influence the site that should be taken under consideration when creating a design for a given site.

Deliverables		Date
1	Restoration Plan Design Resource Library	June 2018
2	List of essential and ancillary Plan Design Assessment Data	June 2018

Task 3. Review relevant literature and resources to provide update to meadow restoration design that is specific to Sierra Nevada Meadows -

Based on the literature review in Task 2 we will identify processes, disturbance, assessment methods, and restoration techniques that may be unique to Sierra Nevada meadow ecosystems. Suggesting process-based restoration and particularly what that means within the context of Sierra Nevada meadow ecosystems will hopefully lead to more successful meadow restoration projects. There are numerous methods for collecting effective data for restoration design purposes at the basin and reach scales. Most entail some level of direct field measurements. Practitioner consistency in assessments, data collection and analysis are important in determining project design effectiveness over time. The intent is to provide a suite of customarily used assessment/analysis tools and restoration techniques for the restoration community's reference and use.

Deliverables		Date
1	Establish process based design principles and criteria based on relevant literature	October 2019
2	Establish appropriate assessment and interpretation methods based on design principles and criteria	October 2019
3	Addendum to current literature detailing meadow restoration design considerations that are specific to Sierra Nevada meadows	November 2019

Task 4: Define Risk/Develop Meadow Restoration Specific Risk Matrix

The Meadow Restoration Framework for Ecological Design (MRFED, Task 5) will include a risk assessment or screening approach for projects. Various collaborators and stakeholders including regulatory agencies, funding agencies, Tribes, and private organizations have a diverse view on project risks. These risk attributes should be factored early into the design when restoration projects are publicly funded. The matrix or assessment process would attempt to incorporate the various risk attributes from the input of the various stakeholders. This will ensure a broader consistent analysis of project risks and allows for making agreed upon adjustments on what constitutes risk level. General categories may include potential risks to endangered species and habitat, level of habitat or cultural resource disturbance, public cost, and adaptability of the action. The intent would be to accelerate the implementation of actions that are considered to be on the lower end of the risk spectrum. Foundational to ecological process-based restoration is implementation of actions that relax human constraints and have an adaptive learning component. A risk screening process should have the effect of streamlining regulatory and funding review processes and therefore increasing the pace and scale for the implementation of lower risk actions.

Deliverables		Date
1	Meadow Restoration Risk Matrix	December 2019

Task 5: Assemble completed tasks 1-4 above into a draft comprehensive meadow restoration design framework that defines basic site assessment needs, tools and techniques, principles and criteria, and risk.

The Meadow Restoration Framework for Ecological Design (MRFRED) will discuss the principles of process-based restoration as they pertain to Sierra Nevada meadow ecosystems, address assessment needs to understand impaired processes within the meadow, describe restoration techniques available to address impacts to meadow processes, and offer a risk matrix to best decide on meadow restoration approaches based on tasks 1-4 above. The framework will be informed by initial collaborative site visits to meadows to discuss assessment methods for determining meadow restoration needs and identifying impaired processes.

Deliverables		Date
1	Draft of MRFRED (Meadow Restoration Framework for Ecological Design) based on Tasks 1-4 and in field site visits.	December 2020

Task 6: Test the framework/toolbox by working collaboratively on a meadow restoration design(s)

The design group would identify a site, after visiting several meadows, to test and refine the framework. After selecting the site, the group would invite the other groups and stakeholders to collaborate on the project. The framework would be tested on the site to develop one or more plan designs through this collaboration. Lessons learned through this process would be documented and the framework revised. Once a design is chosen, the group would embark on collaborating with the landowner and other stakeholders in pursuing funding, and permitting to implement the project.

Deliverables		Date
1	Site visits to several meadows	September 2018
2	Secure funds to apply toolbox through conceptual plan design (30%).	June 2019
3	Developed Conceptual Plan Design and Alternatives	January 2020
4	Revise Framework based on lessons learned	March 2020

Task 7: Implement project piloting designs based on MRFRED

Based on collaborative design approach and following guidelines of MRFRED, the final restoration plan, and the securing of necessary permits, the design group will apply for implementation funds to restore the selected meadow. This will require identifying the appropriate agency funder and securing funds in time for a summer implementation. We expect restoration implementation to occur during the summer of

2021. Documentation of the lessons learned through this process will be shared with the restoration community and used to update MRFRED if appropriate.

Deliverables		Date
1	Secure Implementation funds to apply MRFRED through 100% plan design.	October - December 2020
2	Completed Meadow Restoration	October 2021

Task 8: Publish the revised comprehensive meadow restoration design /framework that defines basic site assessment needs, tools and techniques, principles and criteria, and risk.

The Meadow Restoration Framework for Ecological Design (MRFRED) will utilize the combined expertise of the Meadow Design Technical Advisory Team to assemble guidelines for meadow restoration design beginning with site assessment, data collection needs and analysis, assessing and managing risk in design, criteria for success, and essential components and considerations for designing ecologically sound, dynamic, and self-sustaining restoration designs in order to support the goals of increasing the pace, scale, and efficacy of restoration in Sierra Nevada Meadow ecosystems. The final product will be available online with active links to reference materials as appropriate.

Deliverables		Date
1	Updated and SMP Approved Restoration Plan Design Toolbox/MRFRED	December 2021

IV: Budget

Task #	Hours/Units	Avg. Billing Rate/Hr	Task Total Cost	Task Lead
1	40	65	\$2,600	
2	100	\$65	\$6,500	
3	100	\$65	\$6,500	
4	100	\$65	\$6,500	
5	300	\$65	\$19,500	
SubTotal 2018 Budget Request			\$41,600	2018
6	600	\$65	\$39,000	All
7	400	\$65	\$26,000	
8a	200	\$65	\$13,000	
8b	200	\$15/Copy	\$3,000	
Budget through 2020 (Funded by Project)			\$81,000	2018-2020+

V. Plan Design Work Group Participants

Name	Organization	Email Address
Betsy Harbert	South Yuba River Citizens League	Betsy@yubariver.org
Bill Christner	KTC Environmental Consulting	jugmtn@gmail.com
Carol Purchase	USFS	cpurchase@fs.fed.us
Craig Oehrli	USFS	coehrli@fs.fed.us
Damion Ciotti	USFWS	damion_ciotti@fws.gov
Janet Hatfield	California Trout	jhatfield@caltrout.org
Jared McKee	USFWS	jared_mckee@fws.gov
Jeff TenPas	USFS	jtenpas@fs.fed.us
Jim Wilcox	Plumas Corporation	jim@plumascorporation.org
Karen Pope	USFS	kpope@fs.fed.us
Laura McLean	CDFW	Laura.McLean@wildlife.ca.gov
Randy Westmoreland	USFS	rwestmoreland@fs.fed.us
Sabra Purdy	Independent	sabrapurdy@gmail.com
Todd Sloat	Forest Creek Restoration, Inc.	trsloat8@gmail.com

Appendix D: Regulatory workgroup/Permitting Workplan



The Sierra
Meadows
Partnership

Collaborative meadow
restoration and protection

3-year Work Plan Regulatory Group

Introduction:

Background and link to Meadow Strategy

Permitting and environmental compliance is currently an onerous, time consuming and costly component of meadow restoration projects and is recognized as a bottleneck for implementation on the ground. There is a need to improve the permitting processes for meadow restoration in order to increase the pace and scale of restoration to meet the targets of the Sierra Meadows Partnership as well as state and federal agencies. The purpose of the Sierra Meadows Regulatory Work Group is to address this need. Our goal is to streamline permitting and environmental compliance for meadow restoration projects so that meadow restoration can occur at a pace and scale that allows for landscape level change. Our work directly supports the SMP Strategy Approach 2 “Enhance regulatory and institutional funding capacity and coordination” with the desired outcomes of improving permitting processes and obtaining support from key regulatory agencies. Direct support, coordination, and involvement of relevant regulatory agencies will be a critical component to accomplish the SMP Strategy goal of restoration of 30,000 acres of meadow within 15 years.

The Permitting Work Group’s approach for addressing bottlenecks and improving permitting and compliance processes is threefold. We will: 1) provide improved guidance on existing permitting and environmental compliance pathways; 2) engage permitting agencies to foster support for meadow restoration and to provide technical support; and 3) work to identify and implement opportunities to streamline permitting and environmental compliance processes.

Streamline: to make (an organization or system) more efficient and effective by employing faster or simpler working methods.

Deliverables for the Permitting Work Group will include a “Permitting and Compliance Guide Book” and summaries; SMP regulatory advisory group; a set of sample meadow restoration permit documents; a permitting resources document; a permitting challenges and potential solutions white paper; codified CEQA pathway for meadow restoration projects; pilot approach to streamlining NEPA.

Task list:

Task			Completion Date
1	Finalize permitting and compliance guidebook		
	1.1	Engage staff from outstanding agencies to review (USFS –NEPA, CDFW - regulatory, Central Valley RWQCB)	July 2018
	1.2	Incorporate feedback and finalize	Sept 2018
	1.3	Develop summary/schedule documents based on guidance document	Oct 2018
2	Establish agency contacts and regulatory advisory group		
	2.1	Engage staff from outstanding agencies to participate in/with work group (USFS-NEPA, CDFW Regulatory and CEQA/Prop 1, Central Valley RWQCB)	May 2018
	2.2	Establish appropriate structure of the working group, given constraints of agencies	May 2018
3	Develop permitting and environmental compliance reference materials		
	3.1	Identify appropriate format/information outlet for materials (eg. Sierra Meadows Clearinghouse, webpage)	May 2018
	3.2	Collect example permit documents	July 2018
	3.3	Solicit agency review of examples and make available	Sept 2018
	3.4	Solicit agency tips and important links	July 2018
	3.5	Compile into regulatory tips and resources document and make available	Aug 2018
4	Organize meadow restoration permitting and environmental compliance training		
	4.1	Engage agency staff to participate	Sept 2018
	4.2	Develop/collect materials	Sept 2018
	4.3	Organize and host event	Nov 2018
	4.4	Make training materials available	Dec 2018
5	Develop regulatory challenges and solutions white paper		
	5.1	Collect information about permitting challenges from SMP (and agencies?)	July 2018
	5.2	Collect information about opportunities and solutions from other examples and agencies	Sept 2018
	5.3	Synthesize information into draft white paper	Nov 2018
	5.4	Solicit feedback and incorporate edits	Jan 2019
	5.5	Use white paper to evaluate viability of solutions (benefits, feasibility)	April 2019
	5.6	Develop information needed to make solutions viable (eg. suite of restoration techniques)	April 2019
6	Establish CEQA pathway for meadow restoration projects		
	6.1	Engage CDFW and RWQCB at appropriate level to discuss options for clear CEQA path	Sept 2018
	6.2	Investigate examples from other agencies/programs	Sept 2018
	6.3	Synthesize outcomes and circulate to SMP	Feb 2019
7	Evaluate options to streamline NEPA with US Forest Service		
	7.1	Engage Forest Service at appropriate level to discuss options for/benefits of programmatic/batched approaches	July 2018
	7.2	Research existing examples and examples from other programs	Oct 2018
	7.3	Identify options for partners to provide capacity	Oct 2018
	7.4	Synthesize outcomes and circulate to SMP	Feb 2019
8	Implement novel regulatory approaches and pilot project		

	8.1	Work with agencies to implement regulatory solutions and novel approaches	Nov 2019
	8.2	Test solutions and approaches on a project	Aug 2020
	8.3	Incorporate new approaches and lessons learned in updated version of the guidance document	Nov 2020

Task Descriptions:

Task 1: Finalize permitting and compliance guidebook

Under this task the Regulatory Workgroup will facilitate additional agency review of the permitting and compliance guidance document. This will include identifying and engaging staff from agencies that have not yet provided review including the USFS, CDFW and the Central Valley Waterboard. The workgroup will incorporate new edits from this review, as well as feedback from the recent SMP meetings, including drafting a section related to tribal consultation. We will finalize Version 2 of the guidance document and make it available to the SMP and the public. We will also develop a set of brief documents summarizing the regulatory pathways and schedule for projects on public and private land.

Deliverables		Date
1	Permitting and Compliance Guidance Document Version 2	July-18
2	Summary Documents	Oct-18

Task 2: Establish agency contacts and regulatory advisory group

Under this task we will engage additional agency staff to ensure appropriate representation from each agency with a central role in permitting and environmental compliance for meadow restoration. Recognizing that agency staff have differing capacity to engage with the group, we will work with agency staff to develop levels of engagement that are compatible with their constraints. We envision developing a tiered structure for the group, with a more directly engaged core workgroup and a regulatory advisory group that the workgroup will engage at strategic points to advance our work.

Deliverables-examples		Date
1	Agency Contacts Established	May-18
2	Regulatory Advisory Group Structure	May-18

Task 3: Develop permitting and environmental compliance reference materials

Under this task we will develop a set of example permit applications and environmental compliance documents, and a regulatory resources reference document. We will work with SMP member and agency staff to compile a set of example permit applications and environmental compliance documents for projects under a variety of scenarios. We will work with agency staff to ensure examples meet their needs to help to streamline their review processes. We will also compile a set tips for completing permitting and links to important guidance resources provided by the agencies. We will determine the best format for this information to ensure that remains current. We will work with the SMP communications group to determine the best means of making these documents available to SMP members and the public.

<i>Deliverables-examples</i>		<i>Date</i>
1	<i>Example Permit Documents</i>	<i>Sept-18</i>
2	<i>Regulatory Tips and Resources Document</i>	<i>Aug-18</i>

Task 4: Organize meadow restoration permitting and environmental compliance training

Under this task we plan to organize at least one meadow restoration and environmental compliance training. We will identify target audiences and gauge interest to determine topics, format, duration and number of trainings. We will engage agency staff to develop materials and to participate as presenters. We will recruit participants, organize and host the training event. We will make training materials available to the SMP and public.

<i>Deliverables</i>		<i>Date</i>
1	<i>Permitting and Environmental Compliance Training Event</i>	<i>Nov-18</i>
2	<i>Training Materials Available</i>	<i>Dec-18</i>

Task 5: Develop regulatory challenges and solutions white paper

Under this task we will develop a white paper that identifies significant regulatory challenges and evaluates the benefits and feasibility of potential solutions. To ensure we capture a variety of experiences, we plan to survey SMP members about their most significant permitting challenges. We will also discuss permitting challenges with agency staff to ensure we address agency to agency challenges as well. We will use this set of challenges as the basis for discussions with agency staff about potential solutions. We will research existing examples and work with agency staff to identify potential solutions, given regulatory constraints. Once we have identified a suite of potential solutions, we will evaluate potential benefits and feasibility. We will compile the results of this effort into a white paper that can we use in discussions with decision makers and to inform next steps. We will identify and develop information needed to make solutions viable, as applicable and implement approaches with each respective agency.

<i>Deliverables</i>		<i>Date</i>
1	<i>Regulatory Challenges Survey</i>	<i>July-18</i>
2	<i>Draft White Paper</i>	<i>Nov-18</i>
3	<i>Final White Paper</i>	<i>April-19</i>

Task 6: Establish CEQA pathway for meadow restoration projects

Under this task we will engage funders and regulators to determine a clear and repeatable CEQA path under common scenarios for meadow restoration projects (eg. state funded projects on federal land). We will engage key agencies such as CDFW, who has become a key funder of meadow restoration in addition to their regulatory role, and the regional water quality control boards, who have regulatory authority. We will participate in opportunities to engage on this topic as they arise, such as submitting comment

letters. We will also research options for batched or programmatic approaches to CEQA that might afford an economy of scale. We will synthesize outcomes and share with the SMP.

<i>Deliverables</i>		<i>Date</i>
1	<i>CEQA Pathway Memo</i>	<i>Jan-19</i>

Task 7: Evaluate options to streamline NEPA with US Forest Service

Under this task we will explore options to streamline NEPA for meadow restoration projects with the US Forest Service. This may include programmatic or batched approaches, or means of increasing forest service capacity to complete NEPA through partnership. We will research examples from other project types and programs and discuss options with US Forest Service Regional NEPA staff. We will synthesize outcomes and share with the SMP.

<i>Deliverables</i>		<i>Date</i>
1	<i>NEPA Opportunities Memo</i>	<i>Feb-19</i>

Task 8: Implement novel regulatory approaches and pilot project

Under this task we will work with agencies to implement the solutions and novel regulatory approaches identified under Tasks 5-7 and pilot these approaches with an on-the-ground project. Specific activities will be dependent on the outcomes of the previous tasks, but may include workshops with agency staff and working with the other SMP groups to provide the information needed to develop programmatic approaches. Depending on timing, we are hoping to coordinate with the SMP design workgroup to utilize the same pilot project to test our new approaches. We will then incorporate lessons learned to inform our approaches and produce an updated version of the permitting and environmental compliance guidance document.

<i>Deliverables</i>		<i>Date</i>
1	<i>Solutions Implementation Workshops</i>	<i>Nov-19</i>
2	<i>Pilot Project</i>	<i>Nov-20</i>

Budget- Costs per task(s)

Item	Unit Cost	Quantity	Total
Task 1			\$2,250.00
Personnel - Julie Fair	\$45.00	50	\$2,250.00
Task 2			\$1,715.40
Personnel - Julie Fair	\$45.00	30	\$1,350.00
Travel - mileage	\$0.55	120	\$65.40
Conference expenses	\$300.00	1	\$300.00
Task 3			\$1,800.00
Personnel - Julie Fair	\$45.00	40	\$1,800.00
Task 4			\$5,930.80
Personnel - Julie Fair	\$45.00	80	\$3,600.00
Personnel - Jess Strickland	\$50.00	20	\$1,000.00
Travel - mileage	\$0.55	240	\$130.80
Meeting expenses	\$700.00	1	\$700.00
Agency participation	\$500.00	1	\$500.00
Task 5			\$11,318.00
Personnel - Julie Fair	\$45.00	180	\$8,100.00
Personnel - Jess Strickland	\$50.00	40	\$2,000.00
TBD additional workgroup participant	\$50.00	20	\$1,000.00
Travel - mileage	\$0.55	400	\$218.00
Task 6			\$5,209.00
Personnel - Julie Fair	\$45.00	80	\$3,600.00
Personnel - Jess Strickland	\$50.00	30	\$1,500.00
Travel - mileage	\$0.55	200	\$109.00
Task 7			\$6,368.00
Personnel - Julie Fair	\$45.00	70	\$3,150.00
Personnel - Jess Strickland	\$50.00	40	\$2,000.00
USFS Participation	\$1,000.00	1	\$1,000.00
Travel - mileage	\$0.55	400	\$218.00
Task 8			\$87,872.50
Personnel - Julie Fair	\$45.00	280	\$12,600.00
Personnel - Jess Strickland	\$50.00	80	\$4,000.00
Travel - mileage	\$0.55	500	\$272.50
Supplies	\$1,000.00	1	\$1,000.00
Permit Fees	\$5,000.00	1	\$5,000.00
Field Surveys	\$25,000.00	1	\$25,000.00
USFS - NEPA	\$40,000.00	1	\$40,000.00
Totals			
Total 2018 (Tasks 1-4)			\$11,696.20
Total 2018-2020 (Tasks 5-8)			\$110,767.50
Total 2020 (all Tasks)			\$122,463.70

Costs through 2018

\$11,696.20

Costs through 2020

\$122,463.70

Participants and Contacts

Workgroup Lead: Julie Fair (530 478 0206 x 206)

Secondary Lead: Sheli Wingo

Participants

Name	Affiliation	Contact
Julie Fair	American Rivers	jfair@americanrivers.org
Sheli Wingo	USFWS - Partners Program	Sheli_wingo@fws.gov
Jessica Strickland	Trout Unlimited	Jessica.Strickland@tu.org
James Croft	CDFW - Watershed Restoration Grants	james.croft@wildlife.ca.gov
Lisa Fong	USFS - Region 5	lfong@fs.fed.us
Rick Kuyper	USFWS - Sierra Cascades Division	richard_kuyper@fws.gov
Jesse Stovall	USACE - CA South Section	Jesse.T.Stovall@usace.army.mil
Mary Fiore-Wagner	Lahontan Regional Water Quality Control Board	mary.fiore-wagner@waterboards.ca.gov

Appendix E: Communications Workplan

3-year Work Plan- Communications

Work Group Introduction:

The Sierra Meadows Strategy Approach 3 sets forth desired outcomes, actions and milestones to help guide those working to implement the strategy. Using this approach, the Strategy set forth to cultivate strong meadow restoration networks that would maintain and grow open communications among institutions and individuals with the Sierra Meadows Partnership (SMP), including private landowners. Further, the approach recognized the opportunity the Strategy has to integrate with Regional and State plans and more importantly how the Sierra Meadows Partners could work collaboratively to create a unified message about healthy meadow benefits to both policy makers and the public. Finally, the Strategy recognizes the need for the development of SMP approved resources to aid practitioners and guide them through the restoration planning process. The new SMP website will create a central location to host these resources developed through this collaborative effort.

By the careful development of a communication plan moving forward, we can ensure the Sierra Meadows Partnership meadows message is clear, accurate, defensible and relevant to all interested parties in California.

Purpose & Goals:

4. To create a unified message that works to ***increase and diversify support*** for meadow restoration and clearly articulates benefits of meadow restoration using defensible data. The Communications Plan will work to send a unified message on why meadow restoration is a good investment that is persuasive to potential funders and works equally well to gain political and public support.
5. To facilitate ease of communications of information relevant to meadow restoration planning and implementation by development of a Sierra Meadows Partnership website.
6. To integrate the Sierra Meadows Strategy with State and Regional Planning through Policy efforts and strategic partnerships.

Task list:

Task		Completion Date
1	Draft and Develop a Sierra Meadows Partnership website	
	1.1	Contract web developer
	1.2	Supply content to web developer from partners
	1.3	Communicate/Guide web design with Communications Group collective knowledge/vision
	1.4	Initial draft of website out for partner review
	1.5	Finalize web architecture
	1.6	Host website update training for select SMP members responsible for updating workgroup content
	1.7	Improve, revise, expand content as completed and made available
2	Develop Topical Communications Fact Sheets	
	2.1	Identify Target Audiences/Stakeholder Groups
	2.2	Assign Fact Sheet Working Pairs/Groups
	2.3	Fill Data Gaps/Gather Relevant Data
	2.4	Customize SMP Fact Sheet Template using Sierra Fund example as starting point
	2.5	Draft Fact Sheets & send them to SMP for peer review
	2.6	Finalize Fact Sheets and push to SMP website
	2.7	Announce Fact Sheet Completion via the SMP website, social media campaigns and partner websites
	2.8	Adaptively revise fact sheets based on WRAMP data learning opportunities
3	Development of Marketing and Communications Plan	
	3.1	Obtain Comm Plan Template from USFS and revise to fit SMP needs
	3.2	Incorporate fact sheet outreach as focused component of Plan
	3.3	Decide on the appropriate messenger of various fact sheets
	3.3	Identify Opportunities to revise web content
	3.4	Collaboratively decide upon appropriate hashtags and their use
	3.5	Create, vet and decide upon SMP logo
	3.6	Identify and Implement web mapping opportunities
	3.7	Work collaboratively at SMP Annual Meeting to Finalize Comm Plan
	3.8	Engage Marketing experts to help guide meadows marketing campaign
4	Produce Video (Optional)	
	4.1	Contract Videographer
	4.2	Draft Script
	4.3	Obtain video footage of meadows, SMP, SMRRP work
	4.4	Initial Draft of Video out for review by Communications Committee
	4.5	Revise Draft
	4.6	Second Draft out for review by SMP
	4.7	Incorporate final edits
	4.8	Finalize Video

	4.9	Promote Video	TBD
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Task Descriptions:

Task 1: Draft and Develop a Sierra Meadows Partnership website

Under this task the communications workgroup will work together to guide web content development and design for release in July to SMP. This includes, specific pages to each of the workgroup efforts as well as overarching SMP messages, memberships, and currently available resources. Acknowledgement that the website will be a living site, with much maturation over the next three years as the Partnership works to implement the Strategy.

Deliverables		Date
1	Launch Sierra Meadows Partnership Website	June 2018

Task 2: Develop Topical Communications Fact Sheets

The need for topical fact sheets stems from the recognition that each user group may have unique facts they are interested relevant to meadow restoration. As such the following topics are currently identified as key stakeholder groups to address. 1) Water (supply, quantity, quality); 2) Tribal; 3) Policy; 4) Wildlife/ T&E Species; 5) Carbon; 6) Beaver; 7) Grazing.

Deliverables		Date
1	Final Topical Fact Sheets to website	March 2019
2	Published/Print Fact Sheets	May 2019

Task 3: Development of Marketing and Communications Plan

The Marketing and Communications Plan will serve as a guide to communicating meadows message to a variety of audiences. The plan will work to focus meadows messaging within the SMP utilizing a unified message that is collaboratively agreed upon and is supported by defensible data. Through the development of the plan, the SMP will have the opportunity to decide upon social media presence, hashtag use, and a new logo to represent the organization.

Deliverables		Date
1	Sierra Meadows Partnership Communications Plan	December 2019

Task 4: Video Production

Once post restoration data is made final, and fact sheets are completed, the data will be used to support production of a public meadows campaign video

Deliverables		Date
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1	Sierra Meadows Partnership Meadows Video	May 2020
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Budget Outline

Costs per task(s)

Task 1: Draft Web Development \$2,000. Annual Maintenance \$2,000 x 3= \$8,000

Task 2: Fact Sheet Development, Publishing Hardcopies \$3,000

Task 3: Communications & Marketing Plan Development \$20,000

Task 4: Video Production \$10,000

Task 5: Communications Working Group Leadership \$14,000

Costs through 2018 - \$8,000

- Initial web design and maintenance = \$4,000
- Communications Group Leadership = \$4,000

Costs through 2020- \$47,000

- Communications Workgroup Lead Funding Support = \$10,000
- Web Maintenance \$2,000 annually (years 2 & 3) = \$4,000
- Hardcopy Printing of Fact Sheets = \$3,000 (Optional)
- Communications Plan Development, contracting Marketing Expertise = \$20,000
- Video Production = \$10,000

Budget Total = \$55,000.00

Participants

- Garret Costello- Symbiotic Restoration
- Brock Dolman- OAEC
- Kate Lundquist- OAEC
- Rodd Kelsey- The Nature Conservancy
- Alex Keeble Toll- Sierra Fund
- Shelly Covert- Rancheria
- Janet Hatfield- California Trout
- Redgie Collins- California Trout
- Jason Ko- USFS
- Sherry Reckler- USFS
- Luke Hunt- American Rivers