featherriver.org

UPPER FEATHER RIVER IRWM

PROJECT INFORMATION FORM

Please submit by 5:00 p.m. on August 3, 2015, to UFR.contact@gmail.com

Please provide information in the tables below:

I. PROJECT PROPONENT INFORMATION

Agency / Organization	Cal Poly - SLO
Name of Primary Contact	Christopher Surfleet
Name of Secondary Contact	Jay Francis
Mailing Address	NRES Dept., One Grand Ave., Cal Poly, San Luis Obispo, CA 93407
E-mail	csurflee@calpoly.edu
Phone	62743
Other Cooperating Agencies / Organizations / Stakeholders	Collins Almanor Forest
Is your agency/organization committed to the project through completion? If not, please explain	yes

II. GENERAL PROJECT INFORMATION

Project Title	UF-1: Marian Meadow
Project Category	☐ **Agricultural Land Stewardship** ☐ **Floodplains/Meadows/Waterbodies** ☐ **Municipal Services** ☐ **Tribal Advisory Committee** ■ **Uplands/Forest**
Project Description (Briefly describe the project, in 300 words or less)	To date there are few studies which quantify the hydrologic response of meadow restoration due to vegetation or conifer removal. Quantifying the response of meadow restoration assists forest, range, and agricultural land managers determine the effect of their investment in meadow restoration. This study is using a before after control intervention (BACI) study design to study the hydrologic change conifer removal from a historic meadow (Marian Meadow). We hypothesize that the conifer removal will create soil hydric characteristics which will promote a wet meadow system. We have instrumented two sites 1) a restored meadow and 2) our historic meadow with soil moisture sensors, shallow groundwater wells, and a surface

	water level recorder. We have been measuring soil moisture, groundwater levels, and soil hydric characteristics for two years prior to meadow restoration and currently have funding for study one year following meadow restoration. This application is requesting funding to increase the length of study by two years. A longer duration will provide greater certainty in before and after and control and treatment site comparisons of the hydrologic response of the conifer removal. The longer duration ensures that if we get 1 bad winter post restoration our study design will not be lost, we will have additional years to ensure completion and appropriate comparisons.
Project Location Description (e.g., along the south bank of stream/river between river miles or miles from Towns/intersection and/or address):	Marian Meadow is located within the Upper Feather River Watershed (UFRW). Marian Meadow is approximately 5 miles west on highway 36 from Chester, CA. The control meadow used for study purposes is located approximately 4 miles directly west from Marian Meadow.
Latitude:	40.262406
Longitude:	-121.313083

III. APPLICABLE IRWM PLAN OBJECTIVES ADDRESSED

For each of the objectives addressed by the project, provide a one to two sentence description of how the project contributes to attaining the objective and how the project outcomes will be quantified. If the project does not address *any* of the IRWM plan objectives, provide a one to two sentence description of how the project relates to a challenge or opportunity of the Region.

Upper Feather River IRWM Objectives:	**Will the project address the objective?**	**Brief explanation of project linkage to selected Objective**	**Quantification** (e.g. acres of streams/wetlands restored or enhanced)
Restore natural hydrologic functions.	■ Yes ☐ N/A	The removal of conifers encroached on historic meadows is hypothesized to restore hydrologic conditions conducive to maintaining meadow habitat.	45 acres of historic meadow has been restored in this study.
Reduce potential for catastrophic wildland fires in the Region.	■ Yes ☐ N/A	The interruption of continuous conifers will help to create a fuel break.	
Build communication and collaboration among water	■ Yes	The results of the research on meadow restoration will be	

Upper Feather River IRWM Objectives:	**Will the project address the objective?**	**Brief explanation of project linkage to selected Objective**	**Quantification** (e.g. acres of streams/wetlands restored or enhanced)
resources stakeholders in the Region.	☐ N/A	shared by presentations with local watershed groups, The Upper Feather River IRWM, and the monitoring study group of the Ca. Dept. of Forestry. We anticipate 3-4 scientific journal articles will be published from the study.	
Work with DWR to develop strategies and actions for the management, operation, and control of SWP facilities in the Upper Feather River Watershed in order to increase water supply, recreational, and environmental benefits to the Region.	☐ Yes ■ N/A		
Encourage municipal service providers to participate in regional water management actions that improve water supply and water quality.	☐ Yes ■ N/A		
Continue to actively engage in FERC relicensing of hydroelectric facilities in the Region.	☐ Yes ■ N/A		
Address economic challenges of municipal service providers to serve customers.	☐ Yes ■ N/A		
Protect, restore, and enhance the quality of surface and groundwater resources for all beneficial uses, consistent with the RWQC Basin Plan.	■ Yes ☐ N/A	This project will quantify the effect restoring a historic meadow and thinning the upland forest around the meadow has on the ground and surface water in the restored meadow.	
Address water resources and wastewater needs of DACs and Native Americans.	☐ Yes ■ N/A		
Coordinate management of recharge areas and protect groundwater resources.	■ Yes ☐ N/A	Meadows are identified as important storage areas of Sierra Nevada precipitation and water. This study is attempting to	

Upper Feather River IRWM Objectives:	**Will the project address the objective?**	**Brief explanation of project linkage to selected Objective**	**Quantification** (e.g. acres of streams/wetlands restored or enhanced)
		quantify this change in hydrology due to restoring the meadow and thinning the upslope forest.	
Improve coordination of land use and water resources planning.	☐ Yes ■ N/A		
Maximize agricultural, environmental and municipal water use efficiency.	☐ Yes ■ N/A		
Effectively address climate change adaptation and/or mitigation in water resources management.	■ Yes ☐ N/A	We hypothesize that restoration of meadows encroached by conifers and thinning of the forest surrounding the meadows will create greater resiliency in maintenance of meadow habitat in a changing climate. Actively managing forests for increased water yield to maintain meadow habitat in the Sierra Nevada might be required with changing precipitation predicted due to climate change.	
Improve efficiency and reliability of water supply and other water-related infrastructure.	☐ Yes ■ N/A		
Enhance public awareness and understanding of water management issues and needs.	■ Yes ☐ N/A	Results from the study will be shared in public forums through presentations and published scientific articles.	
Address economic challenges of agricultural producers.	☐ Yes ■ N/A		
Work with counties/ communities/groups to make sure staff capacity exists for actual administration and implementation of grant funding.	☐ Yes ■ N/A		

If no objectives are addressed, describe how the project relates to a challenge or opportunity for the Region:

IV. PROJECT IMPACTS AND BENEFITS

Please provide a summary of the expected project benefits and impacts in the table below or check N/A if not applicable; **do no leave a blank cell.** Note that DWR encourages multi-benefit projects.

If applicable, describe benefits or impacts of the project with respect to:		
a. Native American Tribal Communities	■ N/A	
b. Disadvantaged Communities[1]	☐ N/A	The people who conduct the work on these types of projects typically live in the communities of Chester, Westwood or Greenville. All three of these towns have been designated as Disadvantaged Communities.
c. Environmental Justice[2]	■ N/A	
d. Drought Preparedness	■ N/A	
e. Assist the region in adapting to effects of climate change[3]	☐	Restoring hydrologic functions of meadows will create greater resiliency in maintenance of meadow habitat in a changing climate. We hypothesize that the result will demonstrate improved hydrologic conditions conducive to maintaining meadow habitat. This type of active management will likely be required in a changing climate.
f. Generation or reduction of greenhouse gas emissions (e.g. green technology)	☐ N/A	These multiproduct harvests have been calculated to have net reduction in greenhouse gasses by sequestering carbon in long-term form of solid wood products and using the sub-merchantable material to generate electricity thereby reducing the need for fossil fuels.
g. Other expected impacts or benefits that are not already mentioned elsewhere		Scientific evidence of benefits of removing encroached conifers and thinning upland forests toward maintaining meadow ecosystems and hydrologic functions.

[1] A Disadvantaged Community is defined as a community with an annual median household (MHI) income that is less than 80 percent of the Statewide annual MHI. DWR's DAC mapping is available on the UFR website (http://featherriver.org/maps/) .
[2] Environmental Justice is defined as the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation and enforcement of environmental laws, regulations and policies. An example of environmental justice benefit would be to improve conditions (e.g. water supply, flooding, sanitation) in an area of racial minorities.
[3] Climate change effects are likely to include increased flooding, extended drought, and associated secondary effects such as increased wildfire risk, erosion, and sedimentation.

DWR encourages multiple benefit projects which address one or more of the following elements (PRC §75026(a). Indicate which elements are addressed by your project.

a. Water supply reliability, water conservation, water use efficiency	☐ Yes ■ N/A	g. Drinking water treatment and distribution	☐ Yes ■ N/A
b. Stormwater capture, storage, clean-up, treatment, management	☐ Yes ■ N/A	h. Watershed protection and management	■ Yes ☐ N/A
c. Removal of invasive non-native species, creation/enhancement of wetlands, acquisition/protection/restoration of open space and watershed lands	■ Yes ☐ N/A	i. Contaminant and salt removal through reclamation/desalting, other treatment technologies and conveyance of recycled water for distribution to users	☐ Yes ■ N/A
d. Non-point source pollution reduction, management and monitoring	■ Yes ☐ N/A	j. Planning and implementation of multipurpose flood management programs	☐ Yes ■ N/A
e. Groundwater recharge and management projects	■ Yes ☐ N/A	k. Ecosystem and fisheries restoration and protection	■ Yes ☐ N/A
f. Water banking, exchange, reclamation, and improvement of water quality	☐ Yes ■ N/A		

V. RESOURCE MANAGEMENT STRATEGIES

For each resource management strategy (RMS) employed by the project, provide a one to two sentence description in the table below of how the project incorporates the strategy. A description of the RMS can be found in Volume 2 of the 2013 California Water Plan (http://featherriver.org/2013-california-water-plan-update/).

Resource Management Strategy	Will the Project incorporate RMS?	Description of how RMS to be employed, if applicable
Reduce Water Demand		
Agricultural Water Use Efficiency	☐ Yes ■ No	
Urban water use efficiency	☐ Yes ■ No	
Improve Flood Management		
Flood management	☐ Yes ■ No	
Improve Operational Efficiency and Transfers		
Conveyance – regional/local	☐ Yes ■ No	

Resource Management Strategy	Will the Project incorporate RMS?	Description of how RMS to be employed, if applicable
System reoperation	☐ Yes ■ No	
Water transfers	☐ Yes ■ No	
Increase Water Supply		
Conjunctive management	☐ Yes ■ No	
Precipitation Enhancement	☐ Yes ■ No	
Municipal recycled water	☐ Yes ■ No	
Surface storage – regional/local	■ Yes ☐ No	Restoring meadow hydrology slows the timing of water delivery dissipating surface water peakflows (downstream flooding). It further increases the volume of sub-surface/groundwater decreasing sediment and naturally filtering water for improved water quality.
Improve Water Quality		
Drinking water treatment and distribution	☐ Yes ■ No	
Groundwater remediation/aquifer remediation	■ Yes ☐ No	Restoring meadow conditions and hydrology allows more precipitation to enter the ground water supply and less evapotranspiration of this water.
Matching water quality to water use	☐ Yes ■ No	
Pollution prevention	☐ Yes ■ No	
Salt and salinity management	☐ Yes ■ No	
Urban storm water runoff management	☐ Yes ■ No	
Practice Resource Stewardship		
Agricultural land stewardship	☐ Yes ■ No	
Ecosystem restoration	■ Yes ☐ No	Meadow habitat has decreased in the Sierra Nevada over the last century. Climate change, fire suppression, and minimal forest management of Federal forest lands make managing meadow ecosystems in the Sierra Nevada imperative to ensure this ecosystem does not disappear.
Forest management	■ Yes ☐ No	Managing forests for improvements in water yield has been a focus of research for many decades. With predicted changes in hydrology due to climate change managing forests to improve hydrologic processes will become extremely important. Managing forests to improve meadow hydrology is one aspect of managing forests for future ecosystem values.
Land use planning and management	■ Yes ☐ No	
Recharge area protection	☐ Yes ■ No	
Sediment management	☐ Yes ■ No	

Resource Management Strategy	Will the Project incorporate RMS?	Description of how RMS to be employed, if applicable
Watershed management	■ Yes ☐ No	Meadows and wetlands are important features within watersheds. They store water altering timing of runoff, create areas of low flow surface water, and seasonal ponding useful for wildlife habitat. Understanding how the interactions of land/forest management can improve meadow habitat will be useful information to assist in decisions of how to best reconcile human interactions with their watersheds.
People and Water		
Economic incentives	☐ Yes ■ No	
Outreach and engagement	☐ Yes ■ No	
Water and culture	■ Yes ☐ No	The dissemination of the research on forest management improvements to meadow habitat hopefully will help to demonstrate to people the importance of managing Sierra Nevada forest toward not only economic but also environmental goals.
Water-dependent recreation	■ Yes ☐ No	This project area drains to Butt Lake, an important water-dependent recreation site in the Feather River watershed. Increased water yields will help promote & sustain recreation.
Wastewater/NPDES	☐ Yes ■ No	

Other RMS addressed and explanation:

VI. PROJECT COST AND FINANCING

Please provide any estimates of project cost, sources of funding, and operation and maintenance costs, as well as the source of the project cost in the table below.

PROJECT BUDGET

Project serves a need of a DAC?: ☐ Yes ■ No
Funding Match Waiver request?: ☐ Yes ■ No

	Category	Requested Grant Amount	Cost Share: Non-State Fund Source* (Funding Match)	Cost Share: Other State Fund Source*	Total Cost
a.	**Direct Project Administration**				
b.	**Land Purchase/Easement**				
c.	**Planning/Design/Engineering / Environmental**				
d.	**Construction/Implementation**				
e.	**Environmental Compliance/ Mitigation/Enhancement**				
f.	**Construction Administration**				
g.	**Other Costs (labor and supplies for restach)**	55,000	45,000	45,000	145,000
h.	**Construction/Implementation Contingency**				
i.	**Grand Total (Sum rows (a) through (h) for each column)**	***55,000***	***45,000***	***45,000***	***145,000***

j.	**Can the Project be phased? ☐ Yes ■ No** If **yes**, provide cost breakdown by phases			
		Project Cost	**O&M Cost**	**Description of Phase**
	Phase 1			
	Phase 2			
	Phase 3			
	Phase 4			

k.	**Explain how operation and maintenance costs will be financed for the 20-year planning period for project implementation (not grant funded).**	
l.	**Has a Cost/Benefit analysis been completed?**	☐ **Yes** ■ **No**
m.	**Describe what impact there may be if the project is not funded (300 words or less)**	Currently the research has funding to study 1 year following meadow restoration and 1 additional year following the meadow restoration with upland forest thinning included. We are seeking funds to increase the study for 2 additional years to ensure that we are getting a longer and accurate result on the restoration effects. Without the additional funds the

		uncertainty in our current study results will be large. One very wet or very dry winter could reduce our ability to interpret the meadow restoration results. For the research to be effective a longer study duration is needed, the current funding for the study only funds projects for set durations requiring additional support to complete the restoration study.

*List all sources of funding.
Note: See Project Development Manual, Exhibit B, for assistance in completing this table (http://featherriver.org/documents/).

VIII. PROJECT STATUS AND SCHEDULE

Please provide a status of the project, level of completion as well as a description of the activities planned for each project stage. If unknown, enter **TBD**.

Project Stage	Check the Current Project Stage	Completed?	Description of Activities in Each Project Stage	Planned/ Actual Start Date (mm/yr)	Planned/ Actual Completion Date (mm/yr)
a. Assessment and Evaluation	☐	☐ Yes ■ No ☐ N/A	We have been evaluating research results as we collect them, but final evaluation will completed once all field measurements are completed.	06/16	06/18
b. Final Design	☐	☐ Yes ☐ No ■ N/A			
c. Environmental Documentation (CEQA / NEPA)	☐	☐ Yes ☐ No ■ N/A			
d. Permitting	☐	☐ Yes ☐ No ■ N/A			
e. Construction Contracting	☐	☐ Yes ☐ No ■ N/A			
f. Construction Implementation	☐	☐ Yes ☐ No ■ N/A			
Provide explanation if more than one project stage is checked as current status					

IX. PROJECT TECHNICAL FEASIBILITY

Please provide any related documents (date, title, author, and page numbers) that describe and confirm the technical feasibility of the project. See www.featherriver.org/catalog/index.php for documents gathered on the UFR Region.

a. List the adopted planning documents the proposed project is consistent with or supported by (e.g. General Plans, UWMPs, GWMPs, Water Master Plan, Habitat Conservation Plans, TMDLs, Basin Plans, etc.).	The improvement of meadow habitat is important for a variety of regulatory concerns. Meadow habitat assists in maintenance of water quality, regulated by the Clean Water Act and, in California, the Porter Cologne Act. Meadows are habitat for many endangered and threatened species, regulated by the Endangered Species Act. Timing of peak flows and water storage within watersheds fall under the jurisdiction of many state and federal agencies, including Army Corp of Engineers, California Dept. of Water Resources, and Bureau of Reclamation.
b. List technical reports and studies supporting the feasibility of this project.	There are many studies documenting the decline of meadow habitat in the Sierra Nevada and research methods that support this work. The list below is just a couple of resources, more can be provided. Aylward, B. and A. Merrill. 2012. An economical analysis of Sierra meadow restoration. A report for Environmental Defense Fund under the National Fish and Wildlife Foundations Sierra Meadows Initiative. Access online December 16, 2013 at: http://www.fs.fed.us/r5/hfqlg/monitoring/resource_reports/socioeconomics/Economic%20Analysis%20of%20Meadow%20Restoration%202012.pdf California Department of Fish and Game (CDFG). 2012. Aspen restoration. Accessed on internet Dec. 2012 at: https://r1.dfg.ca.gov/portal/ConservationPermitting/Timber/Wildlife/WildlifeHabitats/AspenRestoration/tabid/924/Default.aspx Ratliff, Raymond D. 1985. Meadows in the Sierra Nevada of California: state of knowledge. Pacific Southwest Forest and Range Experiment Station, U.S. Department of Agriculture Forest Service, Berkeley, CA. Gen. Tech. Rep. PSW-84. 52 p. University of California at Davis (UC Davis), Natural Heritage Institute, US Forest Service, and Department of Fish and Game. 2007. Final Report Sierra Meadows: Historical Impact, Current Status and Trends, and Data Gaps. Final Report of USEPA Contract CD96911501 June 19, 2007. Accessed on internet Dec. 2012 at: http://watershed.ucdavis.edu/pdf/SierraMeadows-2007.pdf
c. Concisely describe the scientific basis (e.g. how much research has	Meadows create a number of important hydrologic functions in watersheds. Meadows can: 1) dissipate stream energy from high flows, reducing erosion and improving water quality; 2) filter sediment and capture bedload, aiding floodplain development; 3) enhance floodwater retention and groundwater recharge; and 4) support root masses that stabilize streambanks against cutting action (UC Davis et

been conducted) **of the proposed project in 300 words or less.**	al, 2007). Stable, well vegetated streams with functioning meadows, aquifers and uplands are critical to reducing erosion and modifying potentially destructive runoff patterns (UC Davis et al., 2007). The recognition of the importance of meadows in the ecology of the Sierra Nevada Mountains and the deterioration of meadow distribution, size, and quality has prompted restoration efforts and changes to land management policies. Restoration efforts have focused on restoring degraded stream channels by altering the grade of the watercourse and on removing encroaching forest vegetation and restoring the hydrologic processes which promote and maintain meadow habitat. There has been quantification of the hydrologic benefits of meadow restoration by grading stream channels, but little quantification on removal of conifer encroachment. The funds requested in this proposal are to characterize and measure the hydrologic response of shallow groundwater and soil water due to meadow restoration by encroaching conifer removal. Both private forest and agricultural landowners have spent considerable resources to restore meadow habitat on their lands. Providing better understanding of the hydrologic response to meadow restoration will attempt to quantify the benefits the meadow restoration and mitigation efforts have produced. University of California at Davis (UC Davis), Natural Heritage Institute, US Forest Service, and Department of Fish and Game. 2007. Final Report Sierra Meadows: Historical Impact, Current Status and Trends, and Data Gaps. Final Report of USEPA Contract CD96911501 June 19, 2007. Accessed on internet Dec. 2012 at: http://watershed.ucdavis.edu/pdf/SierraMeadows-2007.pdf
d. Does the project implement green technology (e.g. alternate forms of energy, recycled materials, LID techniques, etc.).	☐ Yes ☐ No ■ N/A If yes, please describe.
e. Are you an Urban Water Supplier[1]?	☐ Yes ■ No ☐ N/A
f. Are you are an Agricultural Water Supplier[2]?	☐ Yes ■ No ☐ N/A
g. Is the project related to groundwater?	■ Yes ☐ No ☐ N/A If yes, please indicate which groundwater basin. Upper Feather River Watershed

[1] Urban Water Supplier is defined as a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually.

[2] Agricultural Water Supplier is defined as a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding the acreage that receives recycled water.

Climate Change – Project Assessment Checklist

This climate change project assessment tool allows project applicants and the planning team to assess project consistency with Proposition 84 plan standards and RWMG plan assessment standards. The tool is a written checklist that asks GHG emissions and adaptation/resiliency questions.

Name of project: UF-1: Marian Meadow

Project applicant: Collins Pine Company

GHG Emissions Assessment

Project Construction Emissions

(If you check any of the boxes, please see the attached worksheet)

☒ The project requires nonroad or off-road engines, equipment, or vehicles to complete.

☐ The project requires materials to be transported to the project site.

☒ The project requires workers to commute to the project site.

☐ The project is expected to generate GHG emissions for other reasons.

☐ The project does not have a construction phase and/or is not expected to generate GHG emissions during the construction phase.

Operating Emissions

(If you check any of the boxes, please see the attached worksheet)

☒ The project requires energy to operate.

☐ The project will generate electricity.

☒ The project will proactively manage forests to reduce wildfire risk.

☒ The project will affect wetland acreage.

☐ The project will include new trees.

☒ Project operations are expected to generate or reduce GHG emissions for other reasons.

Adaptation & Resiliency Assessment

Water Supply

Describe how the project makes the watershed (more/less) resilient to one or more of the following high priority water supply vulnerability issues:

- ☐ Not applicable
- ☒ Reduced snowmelt
- ☒ Unmet local water needs (drought)
- ☐ Increased invasive species

More resilient by improving available soil moisture for surrounding trees, and by enhancing recharge to groundwater aquifers.

Water Demand

Describe how the project makes the watershed (more/less) resilient to one or more of the following high priority water demand vulnerability issues:

- ☐ Not applicable
- ☐ Increasing seasonal water use variability
- ☒ Unmet in-stream flow requirements
- ☐ Climate-sensitive crops
- ☒ Groundwater drought resiliency
- ☐ Water curtailment effectiveness

More resilient by creating more availability of groundwater to feed nearby streams and by reducing water stress for water dependent vegetation.

Water Quality

Describe how the project makes the watershed (more/less) resilient to one or more of the following high priority water quality vulnerability issues:

☐ Not applicable
☒ Increasing catastrophic wildfires
☐ Eutrophication (excessive nutrient pollution in a waterbody, often followed by algae blooms and other related water quality issues)
☒ Seasonal low flows and limited abilities for waterbodies to assimilate pollution
☐ Water treatment facility operations
☒ Unmet beneficial uses (municipal and domestic water supply, water contact recreation, cold freshwater habitat, spawning habitat, wildlife habitat, etc.)

More resilient by reductions in catastrophic wildfires and associated reductions in severely burned soils and erosion related impairments to water quality. And more resilient through Increased seasonal low flows to nearby streams and aquifers from reducing fire-prone conifer densities. Reduced forest densities in turn, reduce evapotranspiration competition and water stress levels for retained mature vegetation, including streamside vegetation, during the growing season. And more resilient by making more water available for beneficial uses through enhanced stormwater infiltration and groundwater recharge to forest soils and aquifers during the dormant season. Cold freshwater spawning habitat and wildlife habitat is enhanced by stream cooling in the summer that results from higher inputs of shallow groundwater to nearby streams and through enhanced shading and temperature moderation by well-watered streamside vegetation.

Flooding

Describe how the project makes the watershed (more/less) resilient to one or more of the following high priority flooding vulnerability issues:

☐ Not applicable
☐ Aging critical flood protection
☒ Wildfires
☐ Critical infrastructure in a floodplain

☐ Insufficient flood control facilities

More resilient through less risk of "fire, flood, and mud" effects to downslope water bodies from large areas of severely burned forest stands and soils.

Ecosystem and Habitat

Describe how the project makes the watershed (more/less) resilient to one or more of the following high priority ecosystem and habitat vulnerability issues:

☐ Not applicable
☐ Climate-sensitive fauna or flora
☐ Recreation and economic activity
☐ Quantified environmental flow requirements
☒ Erosion and sedimentation
☐ Endangered or threatened species
☒ Fragmented habitat

More resilient from less erosion and sedimentation caused by severe wildfires. More resilient to habitat fragmentation by wildfire that is so severe and extensive that large acreages of mature forest habitats are converted into non-forest conditions, thereby reducing habitat availability and habitat connectivity for the iconic fish and wildlife species that are dependent on connected mosaics of mature forest habitats.

Hydropower

Describe how the project makes the watershed (more/less) resilient to one or more of the following high priority hydropower vulnerability issues:

☒ Not applicable
☐ Reduced hydropower output

May be applicable where fuels reduction projects at a landscape scale are effective in enhancing measureable summer flows in hydropower source watersheds (e.g. the North Fork Feather River that drains to Pulga, or in the watersheds draining to Lake Oroville on the Middle Fork of the Feather River below Sierra Valley.

Upper Feather River IRWMP

Project Assessment - GHG Emissions Analysis

UF-1: Marian Meadow

GHG Emissions Analysis

Project Construction Emissions

[X] The project requires non-road or off-road engines, equipment, or vehicles to complete. If yes:

Type of Equipment	Maximum Number Per Day	Total 8-Hour Days in Operation	Total $MTCO_2e$
Excavators	2	10	9
Rubber Tired Dozers	1	10	10
Excavators	1	10	4
Other Construction Equipment	1	10	1
			0
			0
			0
			0
			0
			0
		Total Emissions	**24**

[ ] The project requires biomass materials to be transported outside of the UFR watershed. If yes:

Total Number of Round Trips	Average Trip Distance (Miles)	Total $MTCO_2e$
		0

[ ] The project requires workers from outside of the UFR watershed. If yes:

Average Number of Workers	Total Number of Workdays	Average Round Trip Distance Traveled (Miles)	Total $MTCO_2e$
			0

[ ] The project is expected to generate GHG emissions for other reasons. If yes, explain:

[ ] The project does not have a construction phase and/or is not expected to generate GHG emissions during the construction phase.

UF-1: Marian Meadow

Project Operating Emissions

☐ The project requires energy to operate. If yes:

Annual Energy Needed	Unit	Total $MTCO_2e$
	kWh (Electricity)	**0**
	Therm (Natural Gas)	**0**

☐ The project will generate electricity. If yes:

Annual kWh Generated	Total $MTCO_2e$
	0

*A negative value indicates GHG reductions

☒ The project will proactively manage forests to reduce wildfire risk. If yes:

Acres Protected from Wildfire	Total $MTCO_2e$
45	**-284**

*A negative value indicates GHG reductions

☒ The project will affect wetland acreage. If yes:

Acres of Protected Wetlands	Total $MTCO_2e$
45	**-195**

*A negative value indicates GHG reductions

☐ The project will include new trees. If yes:

Acres of Trees Planted	Total $MTCO_2e$
	0

*A negative value indicates GHG reductions

GHG Emissions Summary

Construction and development will generate approximately:	24 $MTCO_2e$
In a given year, operation of the project will result in:	-478 $MTCO_2e$