



featherriver.org

UPPER FEATHER RIVER IRWM PROJECT INFORMATION FORM

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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	Plumas County Department of Public Works – Engineering
Name of Primary Contact	Robert A. Perreault , Jr., Director of Public works
Name of Secondary Contact	Robert Thorman, Engineering Technician II
Mailing Address	1834 East Main Street, Quincy, CA 95971
E-mail	bobperreault@countyofplumas.com
Phone	(530) 283-6222
Other Cooperating Agencies / Organizations / Stakeholders	NA
Is your agency/organization committed to the project through completion? If not, please explain	Yes

II. GENERAL PROJECT INFORMATION

Project Title	FMW-8: Spanish Creek Restoration
Project Category	<input type="checkbox"/> Agricultural Land Stewardship <input checked="" type="checkbox"/> Floodplains/Meadows/Waterbodies <input type="checkbox"/> Municipal Services <input type="checkbox"/> Tribal Advisory Committee <input type="checkbox"/> Uplands/Forest
Project Description (Briefly describe the project, in 300 words or less)	<p>An assessment of the Spanish Creek watershed, funded by Proposition 13, was completed in 2006 and includes a comprehensive, community-based rehabilitation strategy for Spanish Creek, primarily in American Valley.</p> <p>Spanish Creek, located in the upper Feather River watershed, has been subjected to intensive use for over 150 years. Resource use and extraction directly affecting Spanish Creek include all the usual suspects, but its hydraulic-placer mining and stream channelization that have resulted in the most extensive changes to the system.</p> <p>American Valley is the naturally evolved floodplain of Spanish Creek. Extensive large-scale hydraulic mining in the mid to late 1800's led to the deposit of millions of cubic yards of coarse</p>

	<p>gravel and cobble in Spanish Creek and its tributaries upstream of the valley. A large streamflow diversion trench was constructed through American Valley in the late 1800's to alleviate flooding in the valley. The episodic release of the coarse sediment has resulted in excessive deposition of this material throughout the American Valley reach of Spanish Creek, resulting in accelerated bank erosion and enhanced flooding.</p> <p>Gravel material had been mined for years at the upstream end of American Valley. The operation was established to take full advantage of the natural tendency for gravel to deposit in this area. Initially, just enough gravel was harvested to prevent further aggradation of the channel. However, as community needs expanded, the operation began to overdraft the supply, contributing to bank erosion, expansion of the entrenchment and diminished channel maintenance. During the past several years, the amount of gravel extracted has been curtailed due to permitting requirements by the California Department of Fish and Game. As a result, an increasing amount of gravel has deposited in American Valley, resulting in a re-initiation of bank erosion and land loss. As a result, the Spanish Creek landowners have approached Plumas County for assistance. The community and landowners recognize the need for a holistic and long-term approach to managing the problems.</p>
<p>Project Location Description (e.g., along the south bank of stream/river between river miles or miles from Towns/intersection and/or address):</p>	<p>Six miles along Spanish Creek</p>
<p>Latitude:</p>	<p>From 39 degrees 56' N to 39 degrees 57' N</p>
<p>Longitude:</p>	<p>From 121 degrees 3' W to 120 degrees 55' W</p>

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.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> N/A	Improvements in stream and riparian conditions would use hydraulic structures to divert streamflow energy away from entrenchment banks and would establish energy dissipating vegetation along the highest stressed banks.	<ul style="list-style-type: none"> • Improvement of six miles of aquatic and riparian habitat. • One gravel management zone at head of valley. • Construction of 22 bank erosion control structures (boulder vanes). • 15 riffle enhancements (boulder cross vanes).
Reduce potential for catastrophic wildland fires in the Region.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A		
Build communication and collaboration among water resources stakeholders in the Region.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A		
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	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A		

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)
Region.			
Encourage municipal service providers to participate in regional water management actions that improve water supply and water quality.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A		
Continue to actively engage in FERC relicensing of hydroelectric facilities in the Region.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A		
Address economic challenges of municipal service providers to serve customers.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A		
Protect, restore, and enhance the quality of surface and groundwater resources for all beneficial uses, consistent with the RWQC Basin Plan.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A		
Address water resources and wastewater needs of DACs and Native Americans.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A		
Coordinate management of recharge areas and protect groundwater resources.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A		
Improve coordination of land use and water resources planning.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> N/A	By working with the community and landowners to come up with a long-term management plan, the coordination between land use and water resources is improved.	
Maximize agricultural, environmental and municipal water use efficiency.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A		
Effectively address climate change adaptation and/or mitigation in water resources management.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A		
Improve efficiency and reliability of water supply and other water-related infrastructure.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A		
Enhance public awareness	<input type="checkbox"/> Yes		

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)
and understanding of water management issues and needs.	<input checked="" type="checkbox"/> N/A		
Address economic challenges of agricultural producers.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A		
Work with counties/communities/groups to make sure staff capacity exists for actual administration and implementation of grant funding.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A		

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

Project goals include (1) a stable, healthy channelway that is neither aggrading nor degrading, (2) a community with the capacity to collaborate and implement sound stream rehabilitation and watershed management practices, and (3) a gravel management program that promotes a properly functioning stream and riparian system.

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 not 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	<input checked="" type="checkbox"/> N/A	
b. Disadvantaged Communities¹	<input checked="" type="checkbox"/> N/A	
c. Environmental Justice²	<input checked="" type="checkbox"/> N/A	
d. Drought Preparedness	<input checked="" type="checkbox"/> N/A	
e. Assist the region in adapting to effects of climate change³	<input checked="" type="checkbox"/> N/A	

f. Generation or reduction of greenhouse gas emissions (e.g. green technology)	<input checked="" type="checkbox"/> N/A	
g. Other expected impacts or benefits that are not already mentioned elsewhere	<input type="checkbox"/> N/A	To improve the aquatic and riparian ecosystem of Spanish Creek and reduce erosion of its banks, reduce the amount of gravel entering American Valley by identifying the primary bedload source areas in the upper watershed, treating those source areas to reduce their output, identifying where gravels naturally deposit in American Valley and periodically remove the excess gravels without disturbing natural fluvial geomorphic development and processes.

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	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A	g. Drinking water treatment and distribution	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A
b. Stormwater capture, storage, clean-up, treatment, management	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A	h. Watershed protection and management	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> N/A
c. Removal of invasive non-native species, creation/enhancement of wetlands, acquisition/protection/restoration of open space and watershed lands	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A	i. Contaminant and salt removal through reclamation/desalting, other treatment technologies and conveyance of recycled water for distribution to users	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A
d. Non-point source pollution reduction, management and monitoring	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A	j. Planning and implementation of multipurpose flood management programs	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A
e. Groundwater recharge and management projects	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A	k. Ecosystem and fisheries restoration and protection	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A
f. Water banking, exchange, reclamation, and improvement of water quality	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Urban water use efficiency	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Improve Flood Management		
Flood management	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p><u>Excess Gravel Removal at the Head of American Valley</u>: Remove excess bedload gravels by developing and maintaining:</p> <ul style="list-style-type: none"> • Sediment trapping ponds. <ul style="list-style-type: none"> ◦ Floodplain ponds with bedload shunt(s) (aka, vortex bedload sampler). ◦ Floodplain ponds without bedload shunts (not connected to stream). • Floodplain areas within the gravel management section maintained at bankfull ($Q_{1.5}$) elevation by periodic removal of excess gravels. • Monitor the effects of removing the gravels and treating banks and adjust the strategy to meet desired conditions. <ul style="list-style-type: none"> ◦ Rate of bedload replenishment within the gravel management section. ◦ Changes to stream channel elevation, geometry (width, depth, gradient) and pattern within the gravel management section and downstream. ◦ Changes in bedload size classes (surface and subsurface) in a downstream direction.

Resource Management Strategy	Will the Project incorporate RMS?	Description of how RMS to be employed, if applicable
		<ul style="list-style-type: none"> ◦ Continued or new bank erosion sites along the entire American Valley reach.
Improve Operational Efficiency and Transfers		
Conveyance – regional/local	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
System reoperation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Water transfers	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Increase Water Supply		
Conjunctive management	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Precipitation Enhancement	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Municipal recycled water	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Surface storage – regional/local	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Improve Water Quality		
Drinking water treatment and distribution	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Groundwater remediation/aquifer remediation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Matching water quality to water use	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Pollution prevention	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Prevention of non-point source pollution issue of sediment and protection of riparian habitats.
Salt and salinity management	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Urban storm water runoff management	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Practice Resource Stewardship		
Agricultural land stewardship	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Ecosystem restoration	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Forest management	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Land use planning and management	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Recharge area protection	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Sediment management	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The gravel management program would remove excess gravel along the stream channel at designated locations and at appropriate rates. Gravel bars and other accumulations would be lowered to floodplain elevation and maintained at this elevation by monitoring several permanent channel cross-section locations. Monitoring these cross-sections would help determine periodic gravel removal.
Watershed management	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<u>Minimize Bank Erosion and Improve Stream</u>

Resource Management Strategy	Will the Project incorporate RMS?	Description of how RMS to be employed, if applicable
		<p><u>Channel Conditions</u>: Treat eroding banks to establish dense vegetation protection and improve channel streamflow conditions using various techniques, including:</p> <ul style="list-style-type: none"> • Boulder guide-vanes. • Bankfull floodplain elevation development and maintenance. • Channel constrictions constructed using naturally occurring material. • Riparian vegetation plantings. • Biotechnical Erosion Control.
People and Water		
Economic incentives	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Outreach and engagement	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Water and culture	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Water-dependent recreation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Wastewater/NPDES	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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?: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
Funding Match Waiver request?: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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	\$150,000			\$150,000
b.	Land Purchase/Easement				
c.	Planning/Design/Engineering / Environmental	\$79,000	\$19,000		\$98,000
d.	Construction/Implementation	\$850,000	\$27,000		\$877,000
e.	Environmental Compliance/ Mitigation/Enhancement	\$10,000			\$10,000
f.	Construction Administration	\$61,000			\$61,000
g.	Other Costs				
h.	Construction/Implementation Contingency	\$100,000			\$100,000
i.	Grand Total (Sum rows (a) through (h) for each column)	\$1,250,000	\$46,000		\$1,296,000
j.	Can the Project be phased? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes , provide cost breakdown by phases				
		Project Cost	O&M Cost	Description of Phase	
	Phase 1	\$648,000		22 bank treatments and gravel removal	
	Phase 2	\$648,000		15 constriction treatments and gravel removal	
	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).		NA		
l.	Has a Cost/Benefit analysis been completed?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
m.	Describe what impact there may be if the project is not funded (300 words or less)		Loss of riparian habitat, bank erosion and loss of agricultural land, increased risk to infrastructure		

*List all sources of funding.

Cost Share Non-State Funding Match: (All amounts are estimated; proposed match amounts and commitments have not yet been confirmed, but have been discussed with the contributing entities.)

Planning/Design/Engineering/Env: \$19,000

Pre-project monitoring/surveys	FRC Watershed Class	\$2,000 (completed)
Surveys/design support	Plumas Co. Public Works	\$15,000 (completed)
Post-project monitoring	FRC Watershed Class	\$2,000 (proposed)

Construction/Implementation: \$27,000

Construction support	FRC Heavy Equip Class	\$20,000 (proposed)
Re-vegetation	FRC Watershed Class	\$2,000 (proposed)
2015 Stream Enhancement	QCSD	\$5,000 (ongoing/proposed)

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	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Pre-project monitoring/Surveys and design support completed	TBD	TBD
b. Final Design	<input type="checkbox"/>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		TBD	TBD
c. Environmental Documentation (CEQA / NEPA)	<input type="checkbox"/>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	CEQA	1 year	TBD
d. Permitting	<input type="checkbox"/>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		TBD	TBD
e. Construction Contracting	<input type="checkbox"/>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		TBD	TBD
f. Construction Implementation	<input type="checkbox"/>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		August (2 years)	October
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.

<p>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.).</p>	<p>Upper Feather River IRWM Plan 2005</p>
<p>b. List technical reports and studies supporting the feasibility of this project.</p>	<p>Feather River Coordinated Resource Management, 2006. Spanish Creek Assessment Rehabilitation and Gravel Management Strategy.</p> <p>Duan et al, Desert Research Institute, 2006. Two-Dimensional Simulation of Flow Hydraulics and Bed-Load Transport in a Mountain Gravel-Bed Stream: the Upper Spanish Creek (Appendix C of Spanish Creek Assessment).</p>
<p>c. Concisely describe the scientific basis (e.g. how much research has been conducted) of the proposed project in 300 words or less.</p>	<p>Feather River Coordinated Resource Management (FR-CRM) has been doing research and collecting data on Spanish Creek Restoration since 1999 when numerous landowners approached them for assistance in addressing their concerns. FR-CRM collaborated with Dr. Jennifer Duan of the Desert Research Institute in Las Vegas as noted in the technical report in b. above.</p>
<p>d. Does the project implement green technology (e.g. alternate forms of energy, recycled materials, LID techniques, etc.).</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A If yes, please describe.</p>
<p>e. Are you an Urban Water Supplier¹?</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A</p>
<p>f. Are you are an Agricultural Water Supplier²?</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A</p>
<p>g. Is the project related to groundwater?</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A If yes, please indicate which groundwater basin.</p>

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: FMW-8 Spanish Creek Restoration

Project applicant: Plumas County Department of Public Works- Engineering

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

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

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.)

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

By reducing erosion and sedimentation, the creek will be capable of carrying increased flood waters. The project will also add floodplain ponds.

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

The project when completed will reduce the erosion and sedimentation in Spanish Creek.

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

FMW-8 Spanish Creek Restoration

GHG Emissions Analysis

Project Construction Emissions

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 ₂ e
Excavators	5	20	44
Off-Highway Trucks	2	20	50
Tractors/Loaders/Backhoes	5	20	27
Off-Highway Tractors	3	20	48
Dumpers/Tenders	5	20	3
			0
			0
			0
			0
			0
Total Emissions			171

The project requires materials to be transported to the project site. If yes:

Total Number of Round Trips	Average Trip Distance (Miles)	Total MTCO ₂ e
40	30	2

The project requires workers to commute to the project site. If yes:

Average Number of Workers	Total Number of Workdays	Average Round Trip Distance Traveled (Miles)	Total MTCO ₂ e
20	20	60	8

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.

FMW-8 Spanish Creek Restoration

Project Operating Emissions

The project requires energy to operate. If yes:

Annual Energy Needed	Unit	Total MTCO ₂ e
	kWh (Electricity)	0
	Therm (Natural Gas)	0

The project will generate electricity. If yes:

Annual kWh Generated	Total MTCO ₂ e
	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 ₂ e
	0

*A negative value indicates GHG reductions

The project will affect wetland acreage. If yes:

Acres of Protected Wetlands	Total MTCO ₂ e
	0

*A negative value indicates GHG reductions

The project will include new trees. If yes:

Acres of Trees Planted	Total MTCO ₂ e
0	0

*A negative value indicates GHG reductions

Project operations are expected to generate or reduce GHG emissions for other reasons. If yes, explain:

GHG Emissions Summary

Construction and development will generate approximately:	181 MTCO ₂ e
In a given year, operation of the project will result in:	0 MTCO ₂ e