

Upper Feather River Integrated Regional Water Management Plan Proposition 50 Grant Agreement No. 4600007650

Project Performance & Monitoring Report

Project No./Name: Genesee Valley IRWM Project

Project Proponent: Feather River Land Trust, County of Plumas

Progress Report No.: 1

Reporting Period: 2016-2018

Date of Post-Performance Report: 3/25/2019

Project Specific Output Signatures			
	Yes	No	
Was a stream restoration plan implemented for the project area?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See narrative below.
Was a supplemental agricultural well installed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See narrative below.
Were off-stream water sources for cattle developed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See narrative below.
Project Specific Outcome Indicators			
	Yes	No	
Was there a measurable increase in flows in Indian Creek as a result of project management activities?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See narrative below.
Was there a measurable improvement in irrigation efficiencies as a result of project management activities?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See narrative below.
Were stream and grazing conditions improved as a result of the project?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See narrative below.
How many feet/miles of wildlife friendly fencing was installed/repared along riparian areas?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See narrative below.
Did you meet the goal of your project? If yes, please provide a brief description stating how you achieved this goal. If no, please comment as to why the goal was not achieved.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See narrative below.
	<input type="checkbox"/>	<input type="checkbox"/>	
Other Standard Reporting Requirements: Please indicate other monitoring/reporting requirements you may already be required to do independent from DWR contractual obligations. For example: CDPH Title 22 Ch. 15 "Domestic Water Quality AND Monitoring Regulations," NPDES, GAMA, CASGEM, or other internal reporting requirements that may yield valuable data.			
	Yes	No	
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	

What Upper Feather River IRWM Plan Objectives did your project address to support implementation of the Plan?			
	Yes	No	Comments
Restore natural hydrologic functions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See narrative below.
Reduce potential for catastrophic wildland fires in the Region	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Accomplished with other funds
Balance the needs of forest health, habitat preservation, fuels reduction, forest fire prevention, and economic activity in the Upper Feather River Region	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Accomplished with other funds
Build communications and collaboration among water resources stakeholders in the Region	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See narrative below.
Work with Department of Water Resources to develop strategies and actions for the management, operation, and control of the State Water Project facilities in the Upper Feather River Watershed in order to increase water supply, recreational and environmental benefits to the Region	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Encourage municipal service providers to participate in regional water management actions that improve water supply and water quality	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Continue to actively engage in FERC relicensing of hydroelectric facilities in the Region	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Address economic challenges of municipal service providers to serve customers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Protect, restore, and enhance the quality of surface and groundwater resources for all beneficial uses, consistent with the Central Valley Regional Water Control Board Basin Plan	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Address water resources and wastewater needs of Disadvantaged Communities (DACs) and Native Americans	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Coordinate management of recharge areas and protect groundwater resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Improve coordination of land use and water resources planning	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See narrative below.
Maximize agricultural, environmental and municipal water use efficiency	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No municipal. The Project's new agricultural wells allow integrated surface and groundwater management for enhanced efficiency in all water years and for ensuring that more water is

			available for the environment especially in dry and critically dry years.
Effectively address climate change adaptation and/or mitigation in water resource management	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Conservation of riparian forest and meadow ecosystems sequesters carbon in soils, vegetation, and trees. Healthy meadows and soils also absorb and hold water for delayed runoff and enhanced groundwater recharge, benefiting multiple species during the dry summer season.
Improve efficiency and reliability of water supply and other water-related infrastructure	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Efficiency and reliability of agricultural and environmental water supplies is improved with the ability to integrate surface to groundwater supplies- especially during multiple dry years.
Enhance public awareness and understanding of water management issues and needs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The FRLT's mission includes outdoor education for all ages and the award-winning "Learning Landscapes" program for elementary and high school students. The FRLT hosted an inter-tribal gathering with inter-agency and other resource management professionals which included exploring "all lands" conservation of waters and upland springs in the Genesee Valley. The FRLT continues to host Maidu Traditional Ecological Knowledge (TEK) tours on the ranch including some of the Project treatment areas.
Address economic challenges of agricultural producers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Work with counties, communities, and groups to make sure staff capacity exists for actual administration and implementation of grant funding	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

1. Summary of the operations of the project.

For the landowner, the Feather River Land Trust (FRLT), the goals of the Project were to: (1) increase in-stream flows in Indian Creek (tributary to the North Fork of the Feather River); (2) improve irrigation efficiency at the Heart K Ranch; and (3) improve stream habitat and conditions. The project eliminated irrigation surface water discharge into Indian Creek; enhanced pool/riffle development and cold water refugia; removed non-native plants, stabilized and re-vegetated stream bank and riparian area; created a 0.33-mile wide, 2.5-mile long riparian buffer strip between irrigated pasture and Indian Creek; improved wet

meadow/irrigated pasture management; and implemented a progressive rotational grazing program. Wildlife friendly fencing was installed along the riparian areas.

The enhanced groundwater irrigation water supply minimizes the need for surface water usage, thereby increasing in-stream flow in Indian Creek. Through the installation of new pipe and a groundwater well pump to improve irrigation on the property, enhanced wet meadow habitat for native and forage plants and domestic livestock and wildlife has been ensured during prolonged drought periods so that the project could initiate the non-use of a portion of the surface water rights to in-stream flow augmentation in Indian Creek during summer low flow season.

During 2008 Feather River Land Trust worked with a local rancher to develop a rotational grazing strategy and to plan locations of off-site water locations. Also during 2008, temporary repairs to existing dilapidated fences were completed to test a rotational grazing system during the summers of 2009 and 2010, a temporary off-stream watering facility was constructed so livestock could be excluded from riparian area during most of the 2009 grazing season. During 2010-2014 FRLT repaired and installed nearly 25,000 feet of fencing to exclude livestock from floodplain. Additionally, eight 700-gallon troughs, and a storage tank for off-stream water supplies for livestock were installed.

Extensive irrigation work began in 2014 and continued through 2016 to upgrade the irrigation system. Through the assessment phase, FRLT was able to bring an existing and outdated well back on line & drill two other wells, the test /monitoring well and the new agricultural well. The FRLT was able to link the two wells by an irrigation system run by both underground and above ground piping by installing the needed underground and above ground pipe to more efficiently irrigate and manage the irrigated pastures.

This system allows FRLT to convey water to specific pasture areas, this provides wet meadow habitat for birds such as Sandhill Cranes. In addition, the ground water irrigation system provides FRLT the flexibility to reduce its usage of surface water from Indian creek and depend more on ground water during times of dry or below average water years.

The existing agricultural well was upgraded in August, 2016, and after a relatively short period of time it was determined that the new well capacity far-exceeded the 350 gpm that was previously hoped for. The upgraded pump is likely capable of sustainably discharging at 800 to 1,200 gpm (or more). At 385 gpm, approximately 7.35 feet of drawdown was measured (relative to static groundwater level) resulting in a specific capacity of approximately 52 gallons per minute per foot of drawdown (gpm/ft). After the test, total groundwater level recovery to the original static groundwater level occurred in less than five minutes. After the construction and evaluation of the agricultural well production potential was complete, the installation of the pump and associated infrastructure was initiated.

A new irrigation pump was installed consisting of a Xylem GWT DWT IICHC (2-stage) line shaft vertical turbine pump. The inlet of the pump was set at 120 feet below the top of the well

casing, and pump was rated to variably produce 1,000 gallons per minute at 118 feet of total dynamic head, to 800 gpm at 108 feet of total dynamic head and 1,600 rpm. The new well pump controller was designed and constructed in accordance with the same electrical requirements described above. The controller included a programmable 50 horsepower Yaskawa VFD Model P1000 pump drive. The controller allows FRLT to operate the pump in either a manual or an automatic operation. In either manual or automatic operation, if downstream pressure is outside of a set range of approximately 2 psi to 35 psi for more than 20 seconds, the motor will stop and the controller will indicate the reason for stopping. Water derived from the previously existing agricultural well is delivered for irrigation via 12-inch aluminum pipe (inclusive of 3,060 feet of gated pipe) to irrigate pasture on the western half of the Heart K Ranch.

Irrigation pipe installed in the eastern half of the Heart K Ranch is connected to the new agricultural well and used to deliver water to the on-site ditch system for flood irrigation as needed. Additionally, the systems are interconnected to allow for water to be moved to different areas as needed. During September 2016, a new electrical service and breaker system was designed and constructed in accordance with Pacific Gas & Electric (PGE) requirements, electrical code requirements and County building code requirements.

The PAEP was completed and submitted with the grant proposal and the mechanisms for continued project performance monitoring are outlined in the PAEP. Feather River Land Trust has continued to implement the Conservation, Stewardship and grazing plans completed during this project and will continue to use this project to demonstrate co-existing sustainable grazing and preservation of conservation values for regional landowners. FRLT contacted the Natural Resources Conservation Service (NRCS) to develop & further improve long term grazing plans. FRLT completed a noxious weed plan and management/stewardship plan and began implementation as funding and staffing has permitted.

2. Discuss project benefits to water quality, water supply, and the environment.

The project has allowed FRLT to move forward with a number of projects that are directly tied to water quality, water supply and the environment:

The establishment of the groundwater wells and irrigation infrastructure on the Heart K Ranch has enabled the FRLT to advance and conclude projects that were delayed pending the development of an alternate irrigation system for the Heart K Ranch. This includes the transfer of the Taylor Lake property owned by the Nature Conservancy (TNC) to the United States Forest Service. Prior to the transfer to the USFS, TNC worked with FRLT to oversee the removal of 1,400 feet of 24" diameter steel water pipe that supplied the ditch with water. This work was completed in November of 2018.

FRLT is working to formally abandon our easement on properties that are adjacent to the ditch. These efforts are being done with landowners on a one on one basis. Work will be done in the next year to restore natural drainage patterns to the areas that were disturbed during the

creation of the ditch in the 1800s. These projects will have a direct effect on water quality and the environment by eliminating the unintended capture and transportation of surface water by the historic ditch.

FRLT continues to work on the pastures of the Heart K Ranch in order to combat invasive plants. New livestock fencing and water systems are in the works to improve our ability to use livestock as a tool to better manage the pastures and the invasive plants. Infrastructure such as the offsite water troughs and riparian fences are functioning as designed. We are able to better control livestock access to Indian Creek, as a result the banks are more stable than before the project and the riparian vegetation is more robust, this leads to improved water quality for downstream users (reduced sediment, water temperatures and nutrients).

We are using the groundwater wells to experiment with meadow restoration and revegetation efforts on the ranch.

We completed a grazing management plan and have entered into a 5 year lease with the livestock operators since the project was completed. We have established permanent monitoring points in pastures and in the riparian corridor and are visiting those sites annually to document how conditions are changing over time.

This year we will be making updates to the Heart K Ranch Land Management Plan and will be assessing how our ranch management techniques are impacting the environment.

3. Comparison and explanation of any differences between expected versus actual project success in meeting IRWM priorities as stated in the original IRWM Implementation Grant application.

The historic water delivery system for the Heart K Ranch was antiquated and in poor condition. In the proposal, FRL T was planning on improving 16,000 feet of the ditch system. After extensive research and investigations, it was determined that the development of a new Ag well would be a better solution to providing water to the ranch.

Generally, the project has allowed FRLT to move forward with creating a new water delivery system that is more efficient than the previous system. Since the project was completed we have partnered with the Nature Conservancy to complete the land swap that has delivered Taylor Lake and its associated water infrastructure to the United States Forest Service. This process was quite complicated and required the repair of the dam and the removal of infrastructure associated with the historic water delivery system such as open water ditches, with dilapidated pipe sections and culverts, crossing multiple private properties that provided irrigation water from Taylor Lake, down Indian Creek and to the Heart K Ranch. Water losses were significant with the old ditch system as well as ditch bank erosion and other maintenance problems on neighboring properties.

We are continuing to work with neighbors who own property adjacent to the historic ditch system to complete remediation efforts to ensure that the now-abandoned ditches will not cause damage to their properties during heavy runoff events.

4. Summary of any additional costs and/or benefits deriving from the project.

The project provided us with the opportunity to move toward permanent solutions to the water delivery system for the ranch that in turn enhances the FRLT's ability to sustain and balance agricultural, environmental, and outdoor recreation uses in all water year types, and for years to come. Moving away from the historic and inefficient water delivery system will ultimately lead to an even more efficient system beyond just eliminating miles of ditch water losses to a longer term vision for conserving water on the ranch as we update our Genesee Valley Heart K Ranch Management Plan. Additionally, with the reduction in staff time needed to monitor and maintain the ditch, more staff resources are being dedicated to environmental enhancement projects and priority repairs for the historic houses and barns on the ranch. A major benefit from the project is the increase in water that flows down Indian Creek. However, in providing those increased instream flows, FRLT is anticipating higher PG&E utility bills, especially now after the PG&E bankruptcy filing. The FRLT is budgeting for rising utility costs associated with operating the groundwater wells as well as exploring alternative energy options for the powering the wells. PG&E has also notified customers to expect power outages in windy "red flag" fire danger days which are becoming more frequent in the summer and fall of most years. Water reliability is being increasingly tied to energy reliability after the Camp Fire.

5. Additional information relevant to or generated by the continued operation of the project.

We have been pleased with how the project has impacted our operations at the Heart K Ranch. The riparian fencing has been performing as designed and we are seeing great vegetation responses from improved livestock management in the riparian corridor. Additionally we have learned a lot from the livestock water infrastructure project and we are planning on installing additional solar panels and troughs to supply livestock water to newly fenced fields. The project gave us opportunities to learn new best water management practices that we are applying to this property and to other properties that we own in the region for sustaining and integrating historic water uses with enhancing environmental conservation and stewardship. We are grateful for the opportunities that were afforded to FRLT through this funding from the state.