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.: 3

Reporting Period: 2020

Date of Post-Performance Report: 5/7/2021

Project Specific Output Signatures				
	Yes	**No**		**Comments**
Was a stream restoration plan implemented for the project area?	☒	☐		
Was a supplemental agricultural well installed?	☒	☐		
Were off-stream water sources for cattle developed?	☒	☐		
Project Specific Outcome Indicators				
	Yes	**No**		**Comments**
Was there a measureable increase in flows in Indian Creek as a result of project management activities?	☒	☐		
Was there a measureable improvement in irrigation efficiencies as a result of project management activities?	☒	☐		
Were stream and grazing conditions improved as a result of the project?	☒	☐		
How many feet/miles of wildlife friendly fencing was installed/repaired along riparian areas?	☒	☐		6,600' of additional wildlife friendly fencing was installed in 2020 along Indian Creek
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.	☒	☐		Each year we are making progress towards our goals on the property. Last year we made improvements to the riparian fence systems as well as the livestock water facilities. Each of these steps allows us to better manage the property for multiple benefits.
	☐	☐		
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**		**Comments**
	☐	☐		

	☐	☐		
What Upper Feather River IRWM Plan Objectives did your project address to support implementation of the Plan?				
	Yes	**No**		**Comments**
Restore natural hydrologic functions	☒	☐		
Reduce potential for catastrophic wildland fires in the Region	☒	☐		
Balance the needs of forest health, habitat preservation, fuels reduction, forest fire prevention, and economic activity in the Upper Feather River Region	☒	☐		
Build communications and collaboration among water resources stakeholders in the Region	☒	☐		
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	☐	☒		
Encourage municipal service providers to participate in regional water management actions that improve water supply and water quality	☐	☒		
Continue to actively engage in FERC relicensing of hydroelectric facilities in the Region	☐	☒		
Address economic challenges of municipal service providers to serve customers	☐	☒		
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	☒	☐		
Address water resources and wastewater needs of Disadvantaged Communities (DACs) and Native Americans	☐	☒		
Coordinate management of recharge areas and protect groundwater resources	☒	☐		
Improve coordination of land use and water resources planning	☐	☒		
Maximize agricultural, environmental and municipal water use efficiency	☒	☐		

Effectively address climate change adaptation and/or mitigation in water resource management	☒	☐		
Improve efficiency and reliability of water supply and other water-related infrastructure	☒	☐		New storage tank installed at existing livestock water trough, new trough installed at other location, new water gap installed
Enhance public awareness and understanding of water management issues and needs	☒	☐		
Address economic challenges of agricultural producers	☐	☒		
Work with counties, communities, and groups to make sure staff capacity exists for actual administration and implementation of grant funding	☐	☒		

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, the FRLT 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 online & 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 by installing both 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, which provides wet meadow habitat for birds such as Sandhill Cranes. In addition, the groundwater irrigation system provides FRLT the flexibility to reduce its usage of surface water from Indian Creek and depend more on groundwater 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 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 gpm 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 the 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 pounds per square inch (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 (PG&E) requirements, electrical code requirements and County building code requirements.

The Project Assessment and Evaluation Plan (PAEP) was completed and submitted with the grant proposal and the mechanisms for continued project performance monitoring are outlined in the PAEP. The FRLT 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. The FRLT contacted the Natural Resources Conservation Service (NRCS) to develop & further improve long term grazing plans. The 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 allowed us to move forward with a number of projects that were previously stalled. This includes the transfer of the Taylor Lake property (owned by the The Nature Conservancy (TNC)) to the United States Forest Service (USFS). 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 was completed in 2020 to restore natural drainage patterns to the areas that were disturbed during the creation of the ditch in the late 1800s/early 1900s. These projects have had a direct effect on water quality and the environment by eliminating the unintended capture and transportation of surface water by the historic ditch.

We completed a grazing management plan and are entering into the last year of our 5-year lease with the livestock operators. In 2019, we completed a full upgrade to the Heart K Ranch Land Management Plan and will be assessing how our ranch management techniques are impacting the environment.

The 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. In 2020, we constructed an additional 6,600 feet of riparian fence and removed almost as much of the old fence. These improvements allow us 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 received a grant from the Resources Legacy Fund to develop a meadow restoration plan for the Ranch and worked with a variety of professionals in 2020 to move this project along. This work included the establishment of 10 short-term and 3 long-term soil monitoring transects. Established protocols were followed that will allow the data that was collected to act as a baseline that will help us to quantify how land management actions are impacting the soil health of the Ranch.

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, FRLT 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 TNC to complete the land swap that has delivered Taylor Lake and its associated water infrastructure to the USFS. This process was quite complicated and required the repair of the dam and the removal of infrastructure associated with the historic water delivery system that provided irrigation water from Indian Creek to the Heart K Ranch.

We are working with neighbors who own property adjacent to the historic ditch to complete remediation efforts to ensure that the ditch will not cause damage to their properties during heavy runoff events. We continue to network with partners to identify and implement projects to improve the condition of the property.

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. Moving away from the historic water delivery system will ultimately lead to a more efficient system that uses less water to supply our Ranch. Additionally, there will be a reduction in staff time needed to monitor and maintain the ditch. A major benefit from the project is the increase in water that flows down Indian Creek. However, FRLT is now budgeting for utility costs associated with running the groundwater wells. We are unable to run the pumps as much as we would like due to the high costs of doing so. We are looking into funding to install large solar arrays to offset high utility costs. We are also looking into funding to upgrade the water delivery system to target specific areas on the property; this will require additional funds that we currently do not have. The next phase of this project is to develop a budget for completing the water conveyance infrastructure on the property and seeking funds to implement that phase. Until we do that, the system is not able to irrigate the entire area that we would like to irrigate.

The riparian corridor is recovering from years of overgrazing and livestock impacts. We are working with local partners to locate historic cross sections and to revisit them to assess how the stream channel had changed over time.

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; a lot has been accomplished to date, but there is a lot more work to do. The riparian fencing has been performing as designed and we are seeing great vegetation responses from improved livestock management in the riparian corridor. In April of 2020 we hired contractors to install an additional 6,600 feet of wildlife friendly riparian fence; this project will be funded by the US Fish and Wildlife Service and Partners for Fish and Wildlife Program.

We have learned a lot from the livestock water infrastructure projects 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 management practices that we are applying to this property and to other properties that we own in the region. We are recognizing that we need a lot more water troughs, without them we are not able to get the grazing impacts that we want. In 2021 we will be working with numerous partners to develop a Carbon Farm Plan for the property. We are grateful for the opportunities that were afforded to FRLT through this funding from the state.