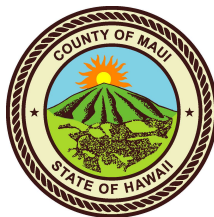


Utilization of R-1 water

Michael Reyes



Kēōkea Riparian Rehabilitation

This project is located approximately 0.5 miles mauka of Pi'ilani Highway and just north of the Bayer agricultural operation in Kihei, Maui County, HI.



Project Overview

A total of 7.4 acres of the riparian corridor along Kēōkea Gulch have been protected. The project area was fenced off with feral ungulate fencing, and 3,000 native plants were planted to lock in soils and provide habitat for native flora and fauna.



Irrigation with R-1 water

The plants receive 1 gallon of R-1 water daily, removing 21,000 gallons of R-1 water from underground injection wells weekly.

Before



After



Nutrients removed from injection wells annually:

Parameter	Average Concentration	Weekly removal in pounds based on 79,494 liters used per week	Pounds removed per year
BOD	4.2mg/L	0.74	38.48
TSS	1.5 mg/L	0.26	13.52
Ammonia-N	1.0 mg/L	0.18	9.36
Nitrate-N	6.2 mg/L	1.09	56.68
Total N	7.6 mg/L	1.33	69.16
Total P	2.8 mg/L	0.49	25.48

Employing the STEPL model, the BMP's associated with this project remove:

Parameter	Pounds removed per year
Sediment	19,400 (or 9.7 tons!)
Total N	75.5
Total P	15.3

Native Plants



Pōhinahina



ʻAʻaliʻi



Chaff Flower



ʻIlima



Maʻo



ʻĀwikiwiki



Wiliwili



Naio

Native Plants Continued...



Āweoweo



Koai'a



Maiapilo



'Ohe makai

Native plant species were selected based on their ability to survive in the hot, dry climate of this area.



MORE THAN 50 PARTICIPANTS FROM 10 ORGANIZATIONS HAVE VISITED THE SITE TO HELP PUT NATIVE PLANTS IN THE GROUND AND/OR TO LEARN ABOUT THE PROJECT

Project Success

FENCING
+
R-1 WATER
=
GROUNDCOVER



Future R-1 Application Projects

R-1 to Forage Pilot Project

22-acre pilot project to learn irrigation application techniques to be implemented at a larger scale.

Reservoirs

Install a 3 million gallon reservoir to distribute R-1 water at a landscape scale.

Riparian Protection

Expansion of Riparian Protection to Kūlanihākoī and Waipuʻilani Gulches.

R-1 to Forage Pilot Project

Step 1: Install fencing to secure the perimeter

Step 2: Assemble and install irrigation infrastructure

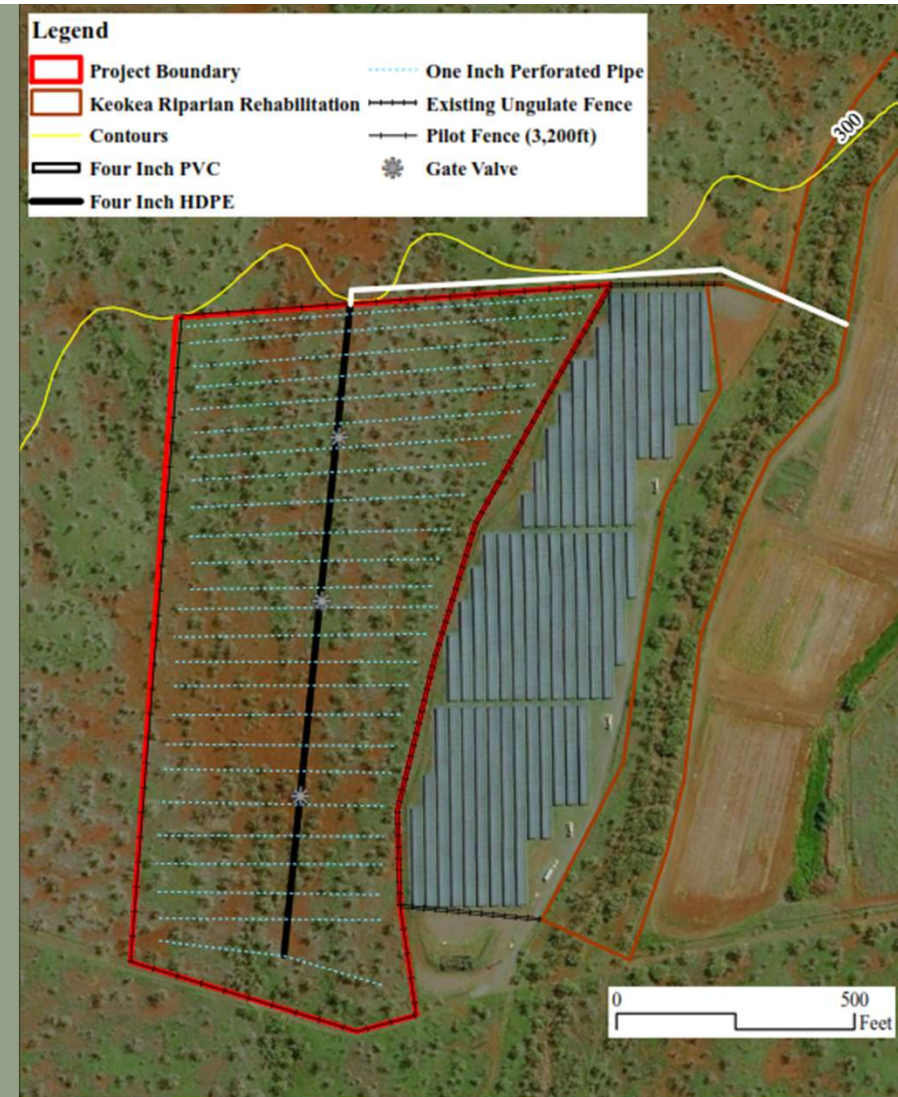
Step 3: Water the paddock

Step 4: Monitor vegetative growth and soil saturation

Step 5: Allow cattle to graze

Adjustments to water application will be made as needed.

Lessons learned from this pilot project will guide methodologies for landscape-wide R-1 water application.



Reservoirs

Step 1: Install infrastructure to pump R-1 Water mauka

Step 2: Construct a 3-million gallon reservoir

Step 3: Connect irrigation infrastructure for distribution

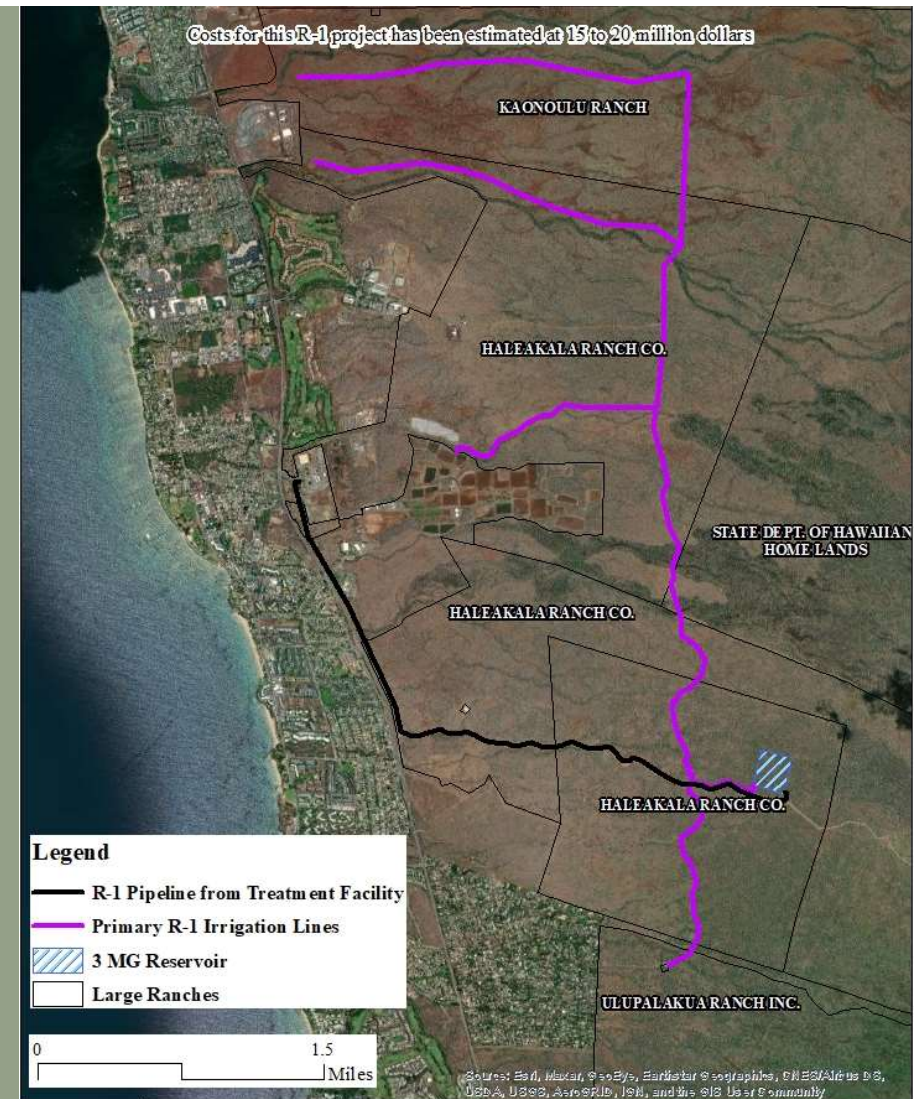
Step 4: Apply water to landscape

Step 5: Allow managed grazing to occur

Large tracts of denuded landscapes will become revegetated and erosion potential will decrease.

Re-establishing groundcover for managed grazing of livestock to occur will increase Maui's food security.

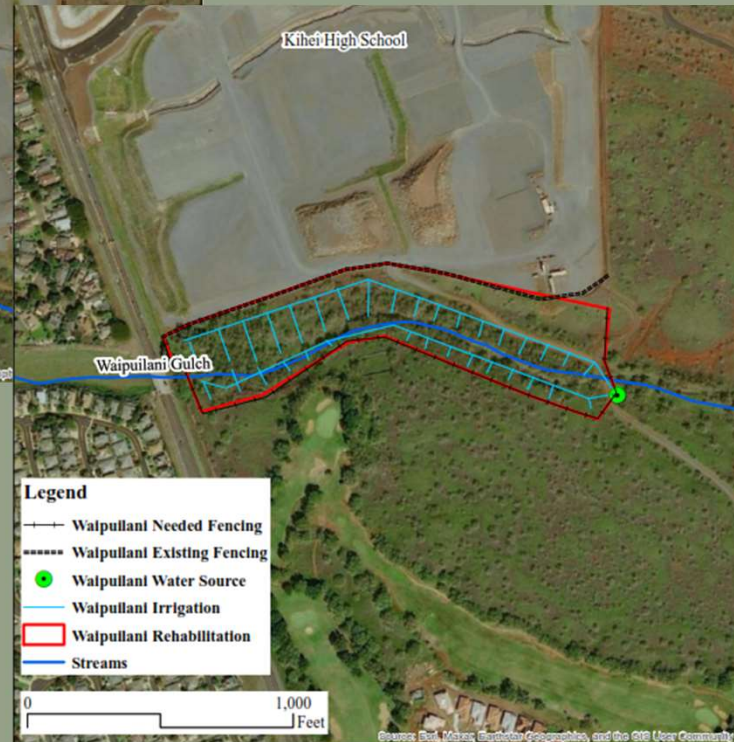
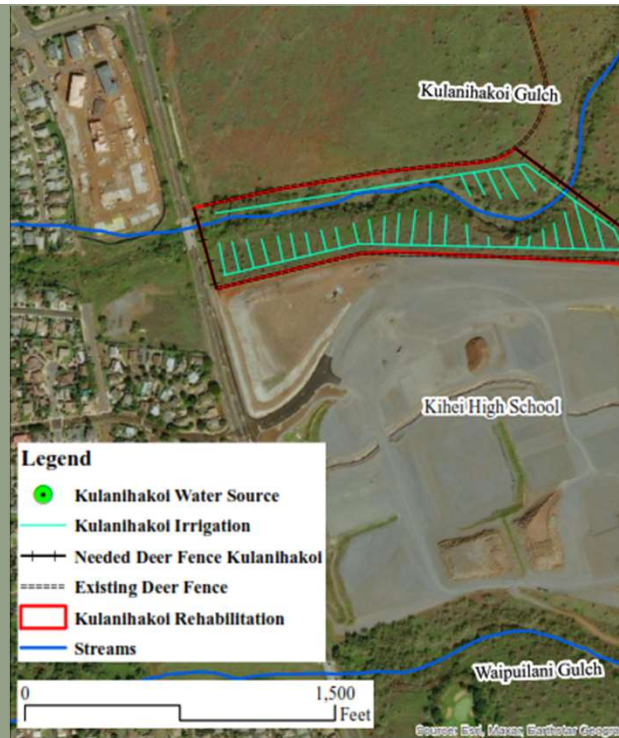
Managed grazing will also reduce fuel loads of dry grasses for fire mitigation.



Riparian Rehabilitation

In the FY 2024 Budget, Maui County has proposed expanding R-1 pipelines to the North.

Greater access to this R-1 resource means that this water could then be utilized for future riparian rehabilitation projects.



Benefits of R-1 Water Application to the Landscape



Reduce Erosion

Establishing vegetative cover will lock in soils and prevent erosion



Contribute to Groundwater Recharge

R-1 Water will percolate into the ground and replenish aquifers



Remove R-1 Water from Injection Wells

Nutrient-rich waters that enter the ocean are harmful to the marine environment



Increase Food Security

R-1 water can be used to grow forage for livestock



Fire Prevention and Mitigation

R-1 water can be used for green breaks, riparian protection, dip tanks, etc.

Thank you

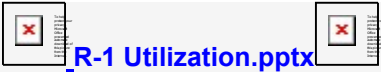
Questions?



ADEPT Committee

From: Michael Reyes <mreyes@mauienvironmentalconsulting.com>
Sent: Wednesday, October 18, 2023 12:50 PM
To: ADEPT Committee
Subject: R-1 Reuse Projects

You don't often get email from mreyes@mauienvironmentalconsulting.com. [Learn why this is important](#)



[R-1 Utilization.pptx](#)

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