Flood-MAR Snapshot Story



Scott Valley Irrigation District Groundwater Recharge Project

This project is an example of how flood-managed aquifer recharge (Flood-MAR) along the Scott River can enhance streamflow. During periods of high flows, water is diverted from Scott River and applied to nearby fields where it infiltrates and recharges the aquifer. In turn, the increased groundwater storage later returns to the Scott River as baseflow. Leveraging the existing Scott Valley Irrigation District Ditch, this project works with existing systems to make water available when it is needed the most.

Project Overview

Located in Scott Valley, an alluvial basin, designated as medium-priority by the State of California



Scott River is a tributary of the Klamath River and is important for habitat and migration of anadromous fish including coho and Chinook salmon.

Project Benefits

Groundwater and surface water flows here are interconnected. Higher flows are available in winter and spring, whereas there are low flow concerns in summer and fall.

Low flows coincide with migration periods for anadromous fish including Chinook and coho salmon. During these lower flow periods, baseflow from the aquifer is critical for instream flows.

Scott Valley has existing, unlined irrigation ditches. When high stream flows are diverted to these unlined ditches, some of the water recharges the aquifer. This increased groundwater storage can then contribute to Scott River's baseflow during lower flow periods.

Project History

2016 University of California, Davis pilot project: **675 acre-feet (AF)** diverted for recharge

2022 Flow conditions were not met for diversion

2023 Recharge conducted only at the end of March: **52 AF** diverted for recharge

2024 Recharge from January 15 through March 31st, 2024: **2,539 AF** diverted for recharge

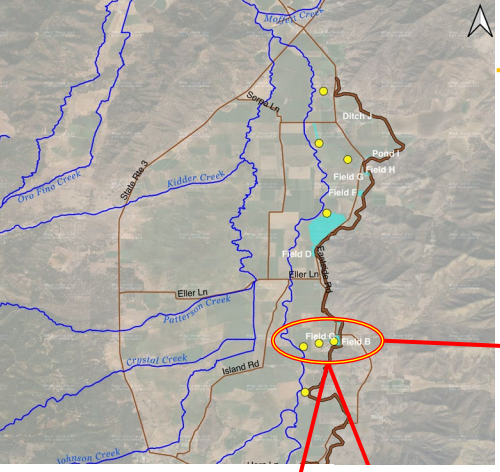
2025 Wet conditions, however ditch maintenance interrupted recharge: **868 AF** diverted for recharge

Looking Forward An application for a five-year temporary diversion permit was submitted for subsequent years of recharge

Challenges in Meeting Recharge Goals

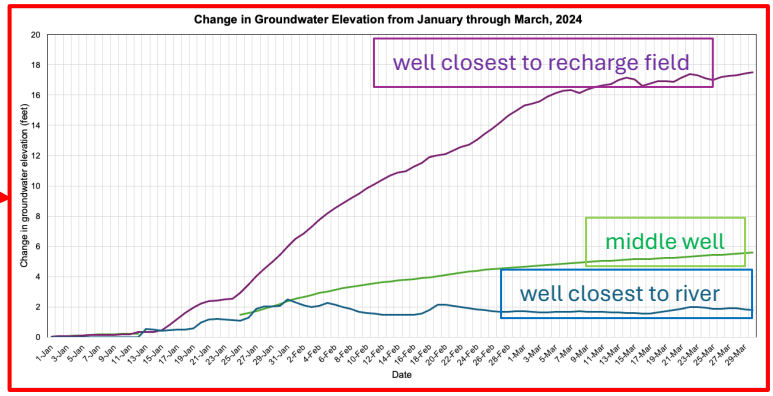
- Cost and complexity of obtaining diversion permits.
- Uncertainty around streamflow ability to conduct recharge in any given year due to unknown precipitation and flow conditions.

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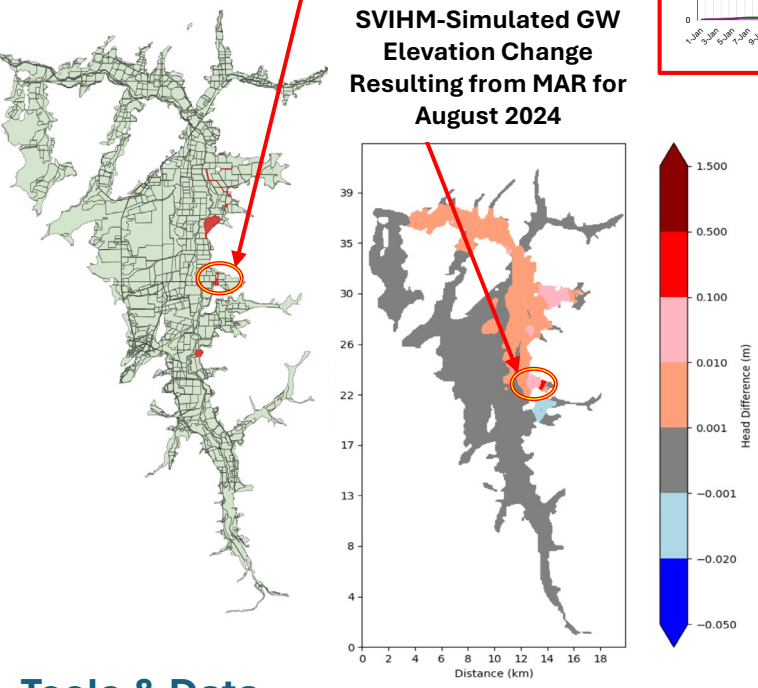


Results of 2024 Recharge

A total of **2,539 AF was** diverted for recharge in Winter 2024. The water infiltrated through unlined irrigation canal and applied to 10 locations (160 acres).



SVIHM-Simulated GW Elevation Change Resulting from MAR for August 2024



MAR Contributions to Late Summer Baseflows

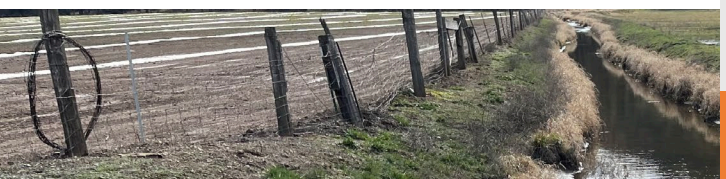
The Scott Valley Integrated Hydrological Model (SVIHM) was used to simulate the effects of MAR at the identified fields on groundwater elevations throughout Scott Valley Basin. The scenarios (left) illustrate higher water table elevations in late summer. More analysis is needed to better quantify the positive contribution of MAR to late summer streamflows.

Recent & Next Steps

- Three transects across the river have been added.
- Additional wells outside of the recharge area have been added to compare responses to recharge and control for precipitation impacts.
- Multi-year geochemical data collection conducted to improve localized understanding of groundwater contributions and seasonal changes.
- SVIHM has been undergoing updates to include a HEC-RAS-based streamflow routing (SFR) package that uses LiDAR data to allow better characterization of instream flow benefits.

Tools & Data

1. **Flow measurements** – to track diverted water, ditch losses, and water applied to fields.
2. **Groundwater level and temperature** – to monitor groundwater response to recharge.
3. **Geochemical monitoring** – isotopes are used to help distinguish water sources, identify mixed water sources, and identify stream reaches. Radon is used to identify localized groundwater contribution to instream flows.
4. **Biological monitoring** – to ensure no harm comes to fish during the diversion period.
5. **Water quality** – to monitor for any water quality impacts from recharge implementation.
6. **Scott Valley Integrated Hydrologic Model (SVIHM)** – used to simulate benefits to instream flows from recharge activities.



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