MLRP TULE SUBBASIN | Multi-Benefit Land Repurposing Program

Groundwater Recharge

What is Groundwater Recharge?

Groundwater is an essential water source for California's communities and agricultural economy, especially during drought periods. Groundwater recharge is a practice that involves applying excess surface water flows across the landscape to replenish the underground aquifers faster than it would occur naturally. Converting active farmland to recharge opportunities could help meet the objectives of SGMA by enhancing recharge and by reducing groundwater demand, land subsidence, and risk from uncontrolled flooding.

Potential Water Benefit

Groundwater recharge will help restore groundwater levels and put the Tule subbasin water budget on a more sustainable path for future generations. This practice can also help California's farmers adapt to a future with more intense and frequent periods of drought and flooding.

Benefits to the Grower/Landowner

Financial Benefits: Fields that are part of an irrigation district may benefit from financial incentives offered through the district such as free or discounted surface water during flood flows or the ability to trade or sell recharged water in or out of the GSA. As the groundwater levels recover with recharge, the grower may benefit from reduced pumping costs. Funding opportunities are available through the Natural Resources Conservation Service (NRCS) Environmental Quality Initiative Program (EQIP), Multibenefit Land Repurposing Program (MLRP), the Department of Water Resources SGMA funding, and LandFlex.

Climate Resilience: Groundwater recharge offers landowners the advantage of a consistent and reliable water source, essential for agricultural, residential, and commercial needs. Replenishing aquifers, it also helps mitigate land subsidence, a problem that can lead to significant structural damage and reduced land value. Shaving off-peak flows to store underground can reduce damages from unmanaged flooding, which is costly and can have disastrous consequences in California.

Benefits to Other Stakeholders

Ecosystems: Many species benefit from the inundation of fields during the process of recharge. In areas where fields are stream adjacent, creating temporary floodplains can help provide habitat and food for fish. Raising groundwater levels through recharge can benefit groundwater-dependent ecosystems (GDEs), which serve as a refuge for birds and other species during droughts.

Community Drinking Water: Recharging in proximity to community wells can help raise groundwater levels and protect community access to drinking water. Depending on local conditions, recharge has the potential to benefit or impact community drinking water. If recharge is being done to benefit community drinking water, it should be managed with special consideration to water quality impacts (see Protecting Groundwater Quality While Replenishing Aquifers, Sustainable Conservation).

Water Rights Considerations: When a flood emergency is declared by local flood management agencies, water can be diverted for recharge outside of the water rights process. Growers within district boundaries can work with the district to divert surface water for recharge purposes, while growers in non-district areas might be able to work with nearby water districts or existing water rights holders to deliver water for recharge (On-Farm Recharge Methods Manual, Sustainable

Examples of Multi-Benefit Groundwater Recharge

In the context of MLRP, the examples presented here are intended to demonstrate multi-benefit recharge opportunities for land that will be repurposed. For recharge considerations on active cropland, see resources by the Almond Board of California and Sustainable Conservation.

Wildlife-Friendly Recharge Basin at Deer Creek

To achieve wildlife benefits, basin depth and food source are important considerations. Waterfowl thrive in deep water, but shorebirds need shallow areas that can be created with gently sloped sides, islands, and peninsulas. Vegetation such as safflower seeds may be planted to provide food for wildlife while also increasing infiltration of surface water into the groundwater. The wildlife-friendly basin at Deer Creek also provides benefits of reduced downstream flooding risk for the community of Alpaugh.

Tule Subbasin Wildlife-Friendly Recharge Basin at Deer Creek, Photo Credit: LTRID

Recharge for Migratory Birds and Community Recreation

Unlike recharge on active farmland, dedicated recharge basins provide more flexibility in the timing of when recharge can be applied because they do not have the same crop life cycle considerations as active farmland. This can enable landowners to ensure water is available in the basin during times of year that are critical for migratory waterfowl and shorebirds. Facilities that are originally constructed for dedicated recharge can later be converted to support habitat, as is the case for another wildlife-friendly basin on Deer Creek. In this example, the parcel is divided to provide flooded areas as well as upland habitat. Observation decks can also provide educational and recreational opportunities for the local community.

Deer Creek Tule River Authority Recharge Basin
Photo Credit: Gregory Liebau

Things to Know

Conveyance: During the drought many growers transitioned from conveyance suitable for flood irrigation to efficient drip irrigation systems. Even if these systems can take surface water, they are at risk of damage or clogging due to sediments that can be suspended in high flood flows. Growers might be able to seek financial assistance or could invest in permanent or temporary infrastructure to accommodate flood irrigation, which could be subsidized by local, state, or federal funding (On-Farm Recharge Methods Manual, Sustainable Conservation).

Site Suitability: Field suitability for recharge is dependent on the recharge objectives. If the objective is to recharge as intensely as possible, SAGBI, CVHM Soil Coarseness, and depth and thickness of Corcoran Clay will be potential hurdles. Heavier soils don't necessarily rule out a site for recharge given that infiltration can still occur, but the rate of recharge might be much slower. When inundating fields to provide habitat or temporary floodplains, heavier soils might be preferable for achieving ponding at certain depths.

Support and Technical Resources

Flood-MAR Hub, https://floodmar.org/, Flood-MAR Network
The Nature Conservancy: www.groundwaterresourcehub.org/where-we-work/california/multi-benefit-recharge/
"Building Multibenefit Recharge" Basins, EDF, Audubon, Point Blue, Sustainable Conservation
Sustainable Conservation: Recharge Methods Manual, Introduction to Groundwater Recharge Manual, Central Valley Groundwater Recharge Incentives and Strategies

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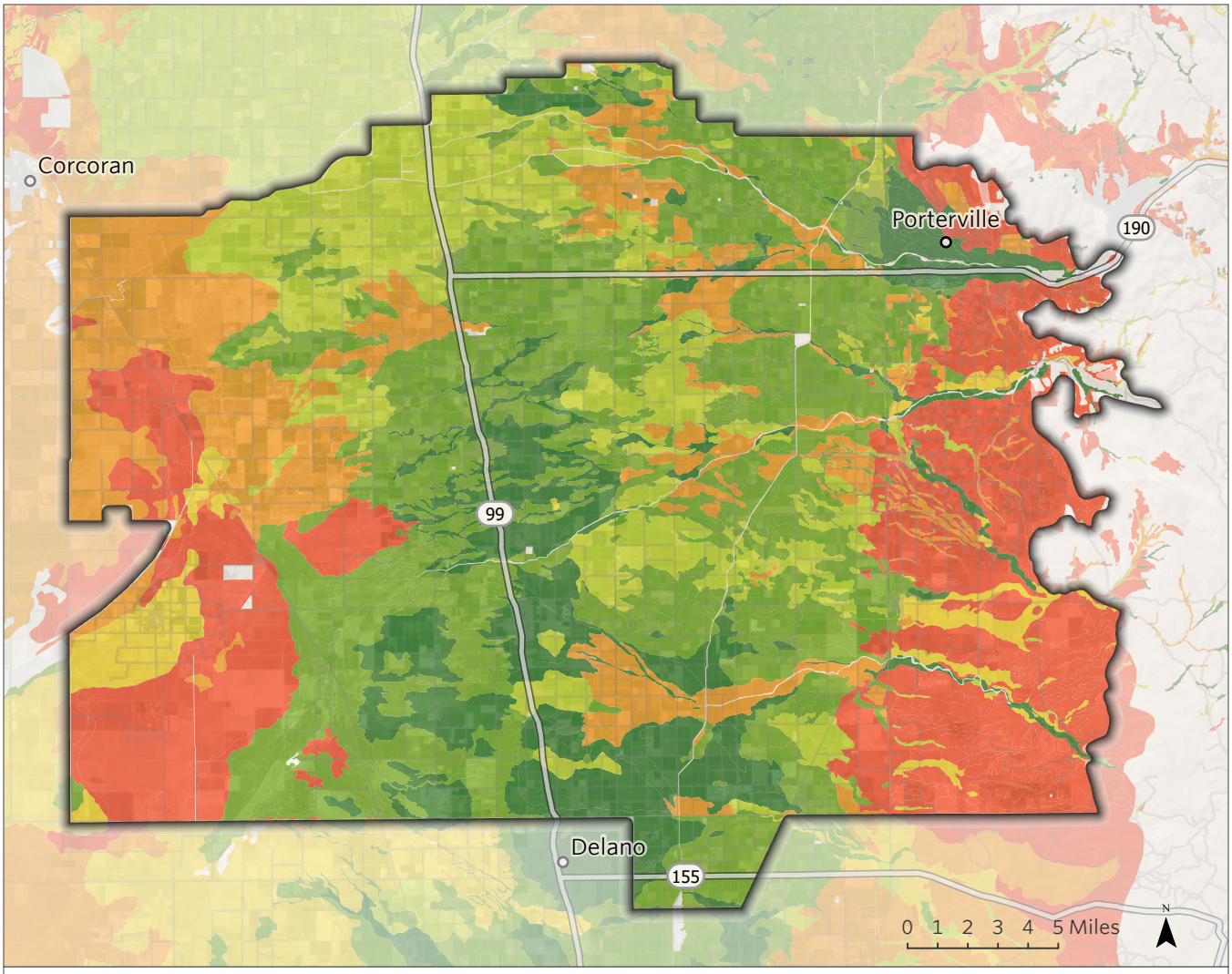

The Soil Agricultural Groundwater Banking Index (SAGBI) is a suitability index for groundwater recharge on agricultural land, based on deep percolation, root zone residence time, topography, chemical limitations, and soil surface condition.

Suitability of Soil for Traditional Groundwater Recharge

- Excellent
- Good
- Moderately Good
- Moderately Poor
- Poor
- Very Poor