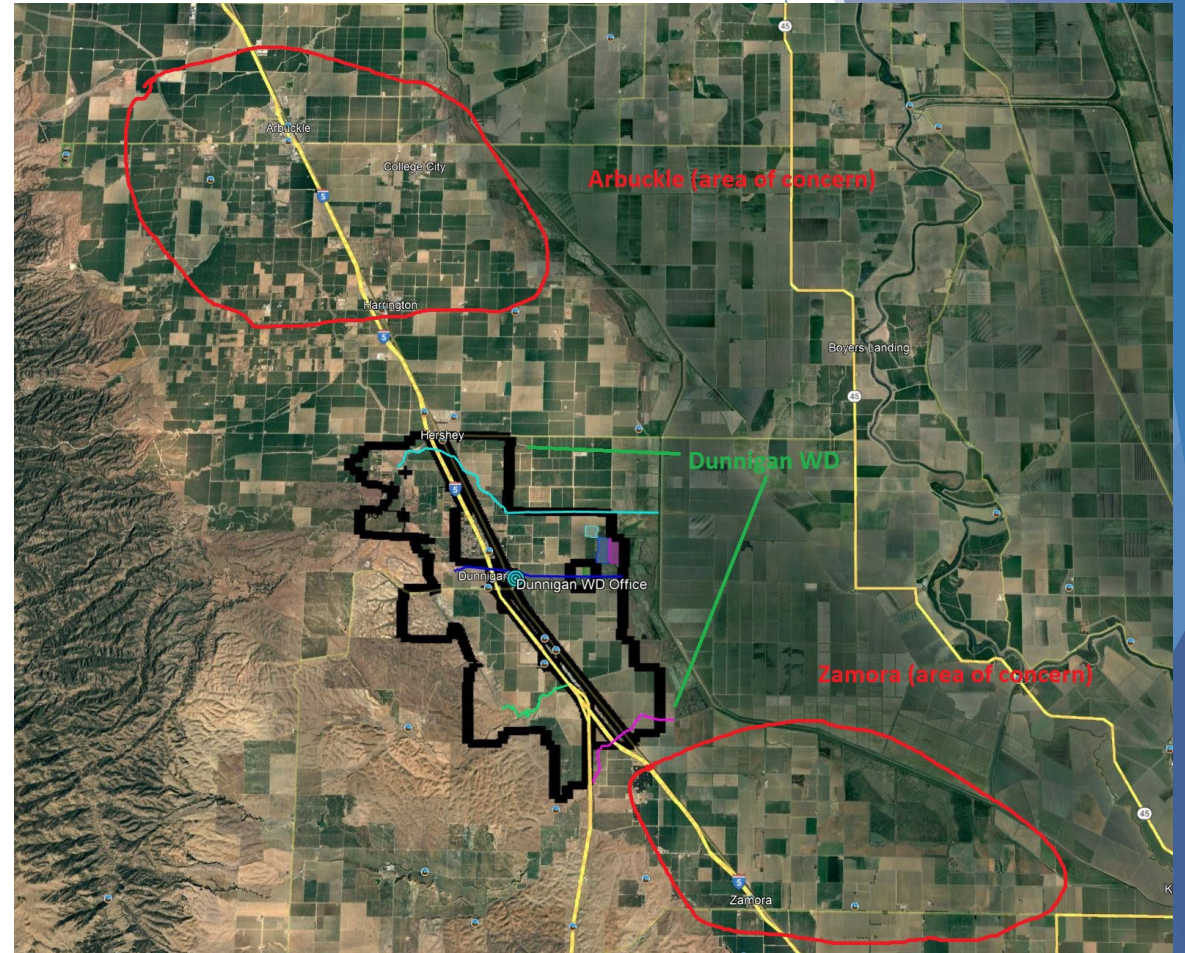


Dunnigan Area Recharge Program (DARP)

May 2023 North Sacramento Valley IRWM

Dunnigan Water District

- ▶ 11,500 acres
- ▶ Located between two areas of significant subsidence and GW related issues
- ▶ USBR Service Contract - served by Tehama-Colusa Canal
- ▶ 19,000 AF contract : received **ZERO** allocation previous 3 years, 100% this year
- ▶ Strong partnership with RD-108
 - ▶ Management and Administration by RD-108 staff
 - ▶ Long standing transfer agreements with RD-108
 - ▶ Shared landowners (~40% of DWD is shared landownership)



DARP Overview

► Goals

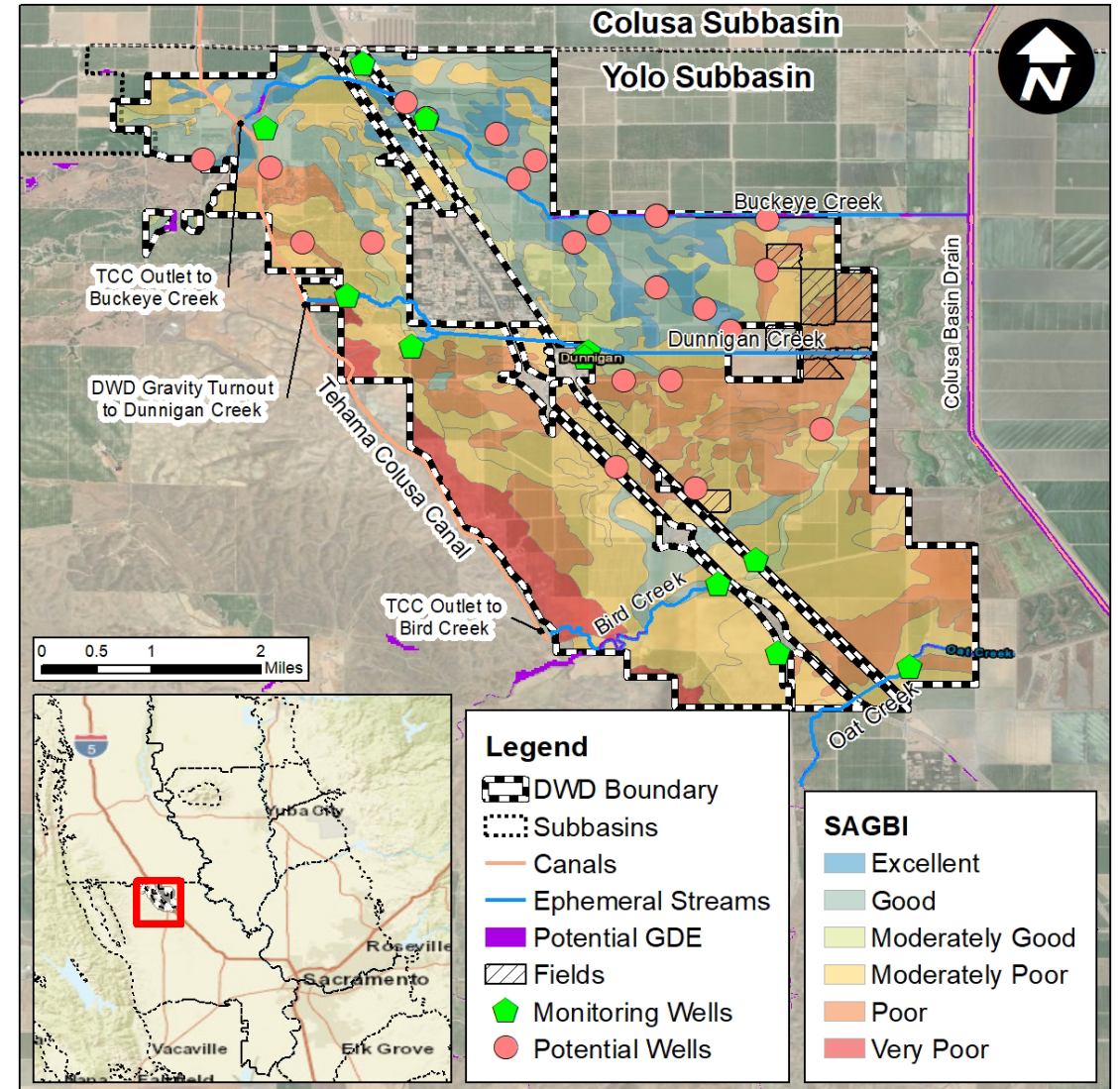
- Recharge up to 5000 AF each year
 - DWD is 11% land area of the North Yolo Management Area (NYMA)
 - 5000 AF is 16% of the GW depletion in the NYMA (31,000 AF annual average depletion)
 - Domestic use is all groundwater and approximately 130 AF per year (population of 1400)

► Habitat

- Shorebird habitat of 500-600 acres each year

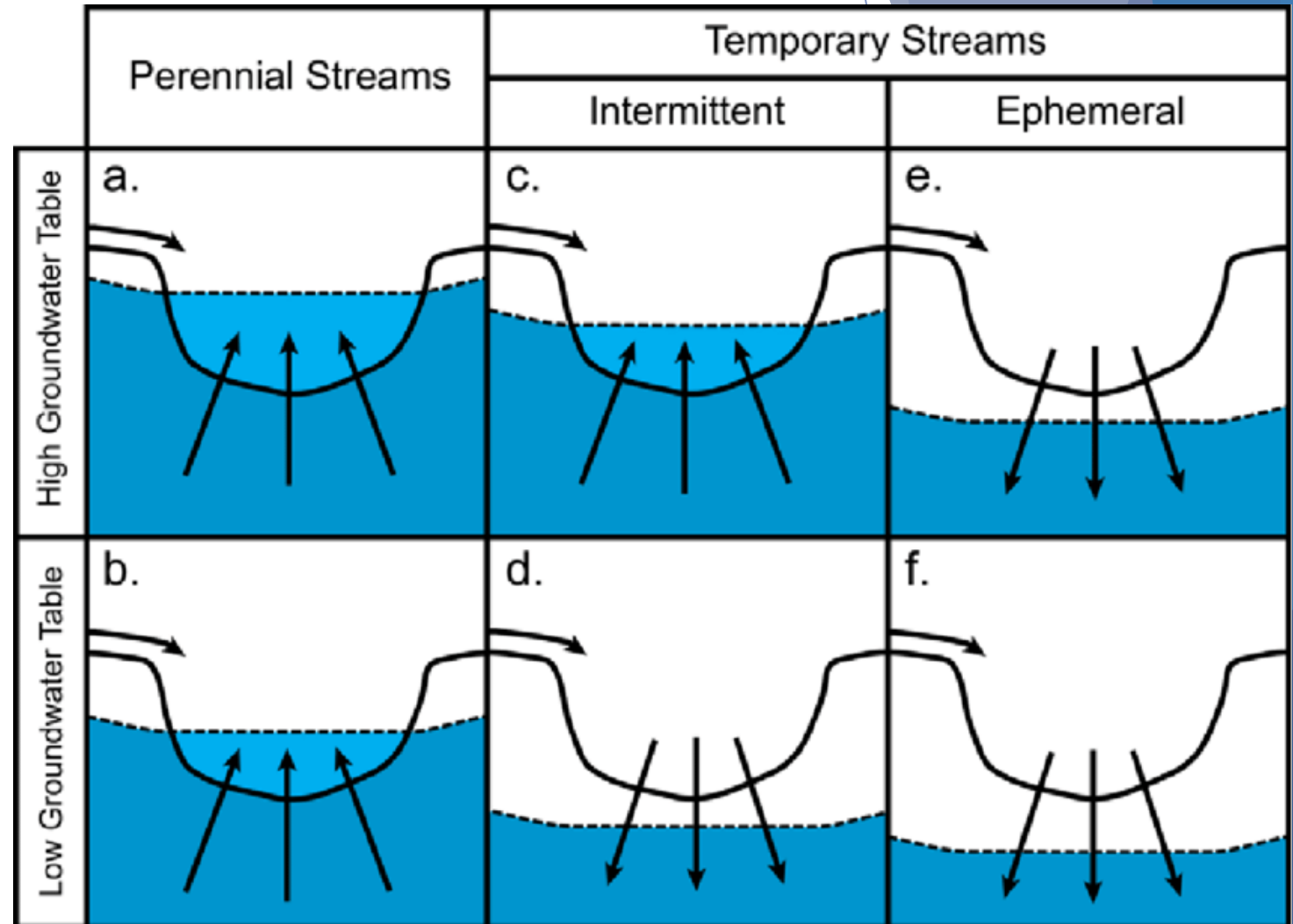
► Funding to bridge the gap between SGMA enactment and self reliance

► Winter Water Rights



Ephemeral Streams

- ▶ Concept is to mimic nature and trickle flow water into ephemeral streams.
- ▶ Four (4) streams that bracket the Dunnigan area: Buckeye, Dunnigan, Bird, Azevedo Drain and Oat Creek.
 - ▶ 14.02 miles of ephemeral streams
- ▶ Previous tests done on Stony Creek in Glenn County



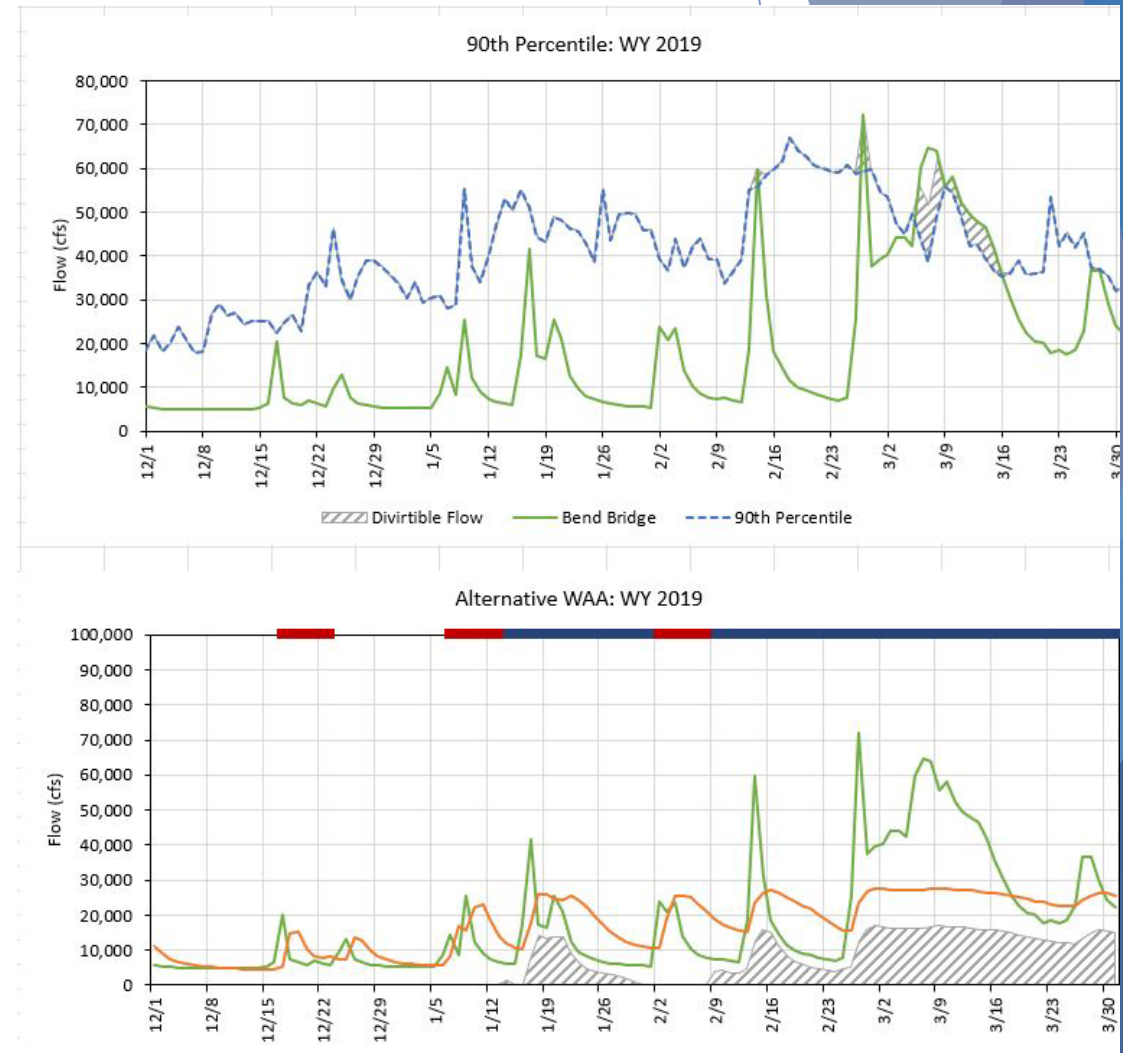
Shorebird Habitat/Recharge & FloodMAR

- ▶ Shallow flooding of fields to provide habitat for migrating shorebirds.
- ▶ Demonstrated by Davis Ranch/The Nature Conservancy
- ▶ FloodMAR similar without the shorebird component emphasized.
- ▶ Goal of 500-600 acres of habitat and recharge in any given year.
- ▶ Exercise the aquifer if needed to support the habitat



Funding & Water Rights

- ▶ SGMA Implementation is providing funds for now
- ▶ Eventually, landowners/water users will have to self sustain recharge
- ▶ Underground drip irrigation dilemma
- ▶ Funding needs:
 - ▶ Monitoring & Infrastructure - currently lots of funding
 - ▶ Water! - very little of it, and very little funding currently
- ▶ Winter Water Rights
 - ▶ Diversion of Sacramento River water in winter, high flows
 - ▶ Harnessing ephemeral streams natural flow



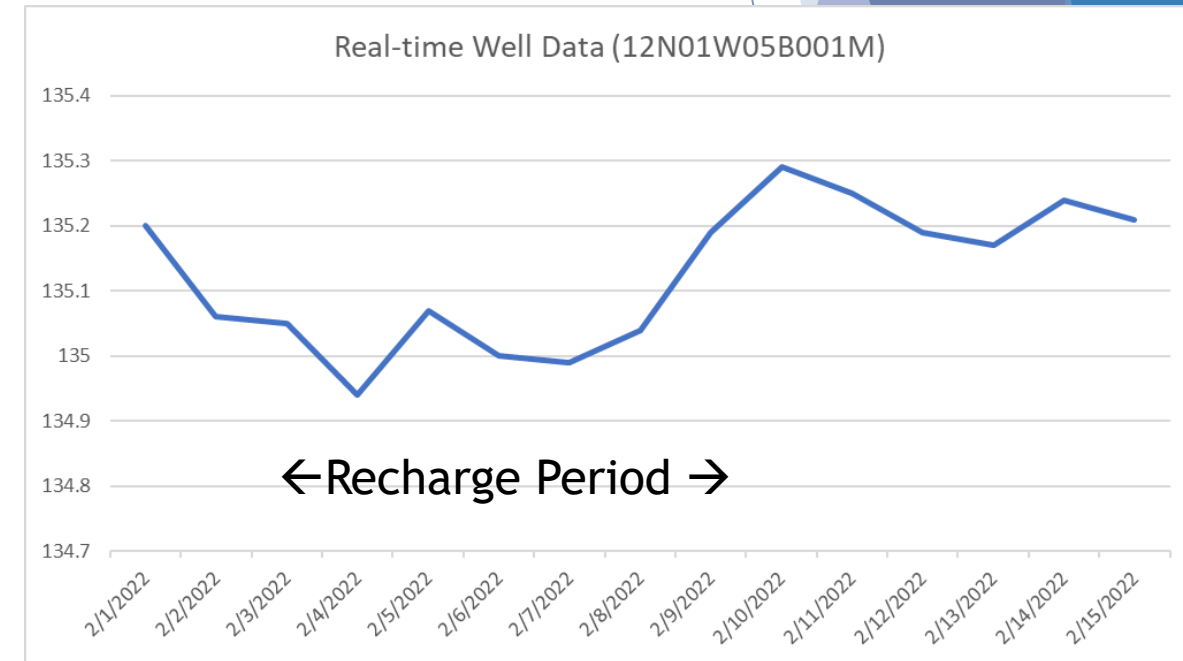
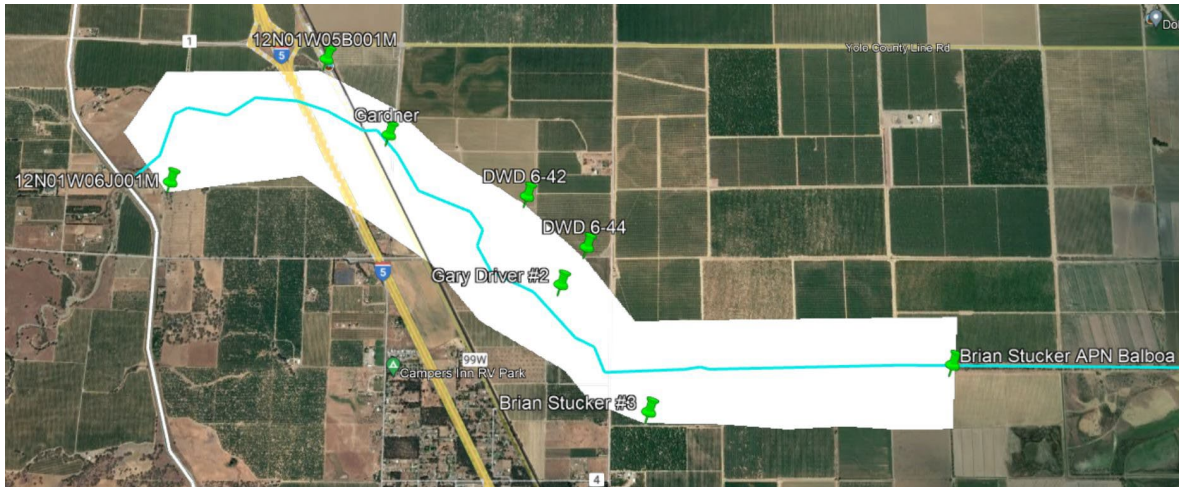
Pilot Projects

- ▶ 2022 - one of the worst water years on record in Sacramento Valley
- ▶ DARP - 425 to 510 AF recharged in this year
 - ▶ 125-210 AF in Buckeye Creek test run
 - ▶ 300 AF in TNC-DWD Shorebird Habitat/Recharge
- ▶ Received \$800k grant funds via Sierra Institute and Westside Sac Valley IRWM Program
- ▶ TNC contribution of ~\$127,000 for water and farmers work on shorebird/recharge pilot. (From General Mills grant)



Buckeye Creek Test Recap

- ▶ February 2022 TCCA needed repairs
- ▶ Dewatered canal primarily through Buckeye Creek (500 AF +/- over Thursday pm to Sunday pm)
- ▶ 125-210 AF of recharge measured (6 inches to 9 inches average rise in wells)



Buckeye Creek Photos



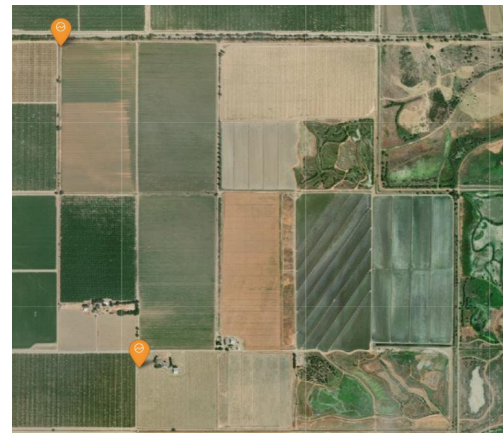
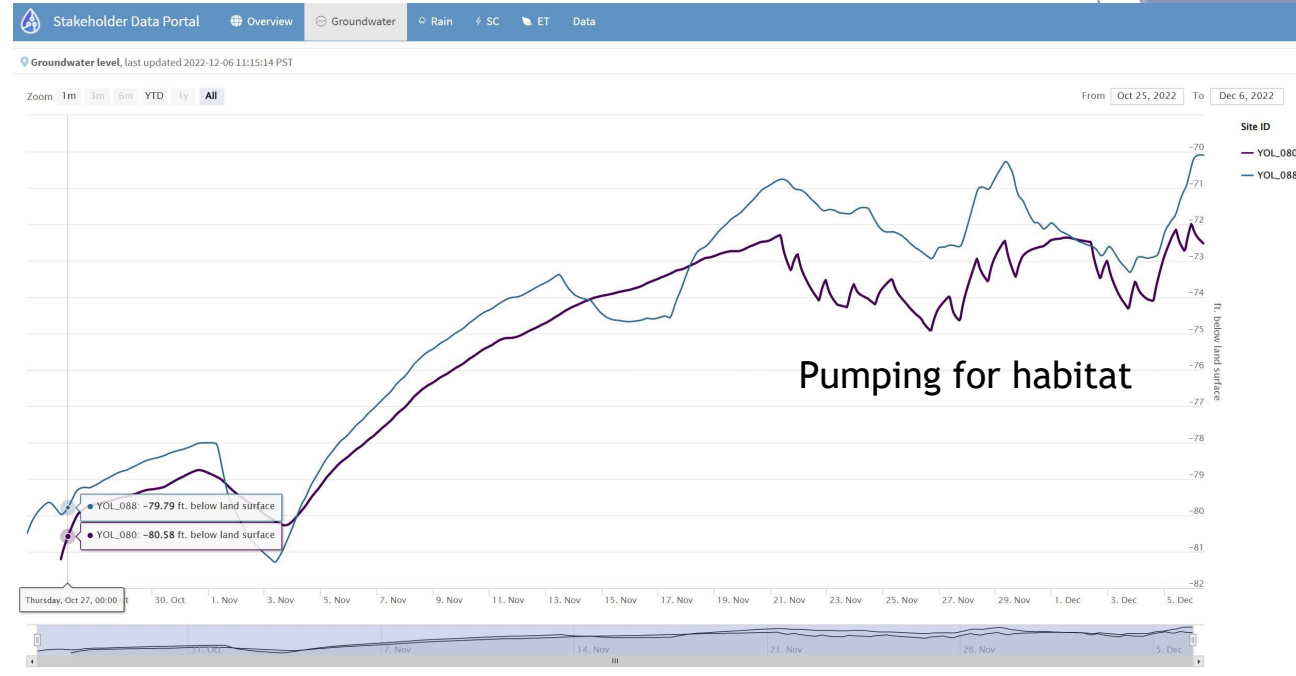
Near Gary Driver's property



County Road 88 Crossing

TNC Shorebird Habitat/Recharge Pilot

- ▶ 200 acres of fields
- ▶ 300 AF applied
- ▶ \$731 per AF
 - ▶ \$400 by TNC plus farmers cost (~\$127,000)
 - ▶ \$331 by SI/WSVIRWM grant
- ▶ Draft report shows 91%-92% deep percolation, so 276 AF effective recharge
- ▶ Exercised aquifer for habitat because of fast infiltration



TNC Shorebird Habitat/Recharge photos



Big White Birds (Egrets) feasting

Video
courtesy of
Brian
Stucker



February to April 2023

- ▶ Reclamation made Section 215 water available
- ▶ Between Thursday, Feb 9th and Friday, April 28th, 691 AF of recharge was been done in Buckeye Creek and 685 AF on C & H 3 Farm fields for a total 1,376 AF
- ▶ Wells in the area have come up about 40 ft overall.
- ▶ This is funded by the grant.
- ▶ Nitrogen levels appear lower post recharge (empirical observation)



Funding Sources

- ▶ Disadvantaged Community Grant via the Sierra Institute and West Sac Valley IRWM
 - ▶ Includes funding to purchase recharge water
 - ▶ Providing funding to install monitoring network (both water level and water quality)
- ▶ Being included in GSA grant application
- ▶ Urban Drought Grant with CCWD
- ▶ Private investment
 - ▶ Landowners - tracking for future “credit”
 - ▶ NGO’s

Questions?

- ▶ Project Partners
 - ▶ DWR
 - ▶ Sierra Institute
 - ▶ West Sac IRWM
 - ▶ Yolo GSA
 - ▶ Yolo County Flood Control & Water Conservation District
 - ▶ The Nature Conservancy
 - ▶ CalAM Water Company
 - ▶ Dunnigan Water District
 - ▶ RD-108
 - ▶ Schaad Family Farms
 - ▶ C & H 3 Farms
 - ▶ The TCCA