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UVRGA GSP Implementation

Aquatic GDE Monitoring Three Year Summary (2023-2025)

UVRGA Board Meeting February 2026

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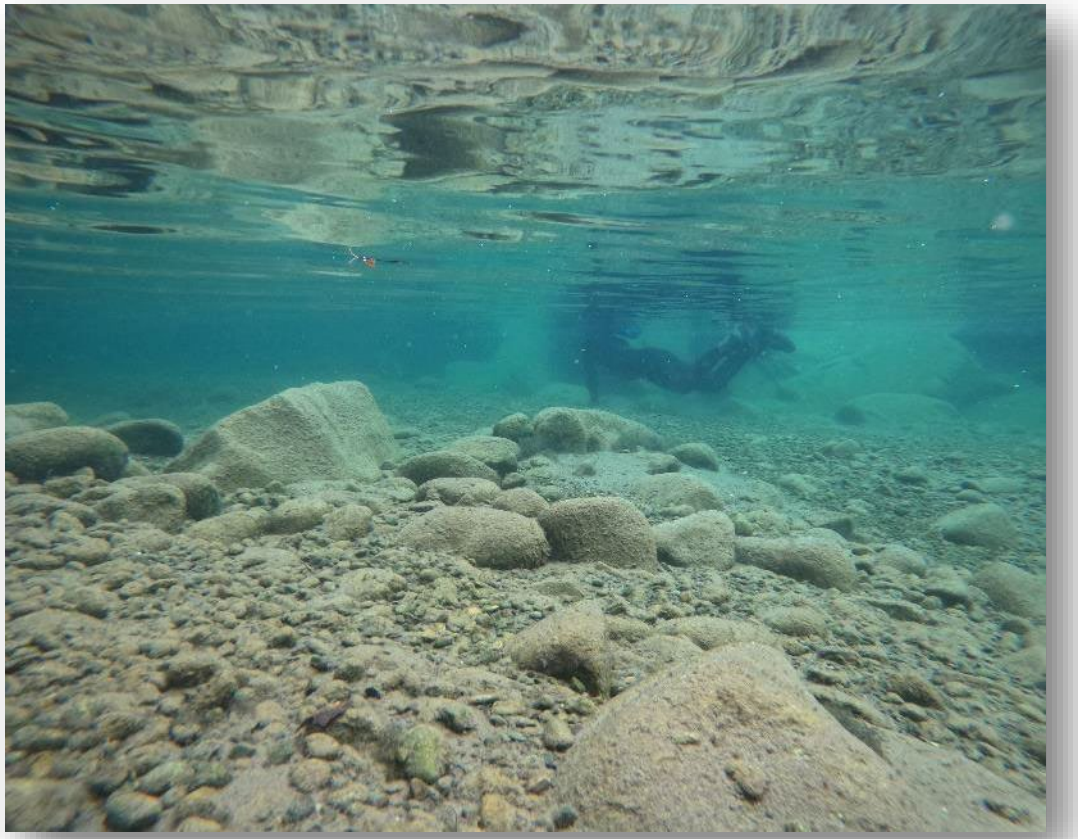
Three-Year Summary: Aquatic Groundwater Dependent Ecosystem Monitoring Program

- Aquatic GDEs: what and where
- Purpose of monitoring program
- Questions we are seeking to answer
- Monitoring components
- Key findings and recommendations
- Next steps for the program and goals

Available on UVRGA website at https://uvrgroundwater.org/library/



Biologists snorkeling in confluence
September 11, 2025

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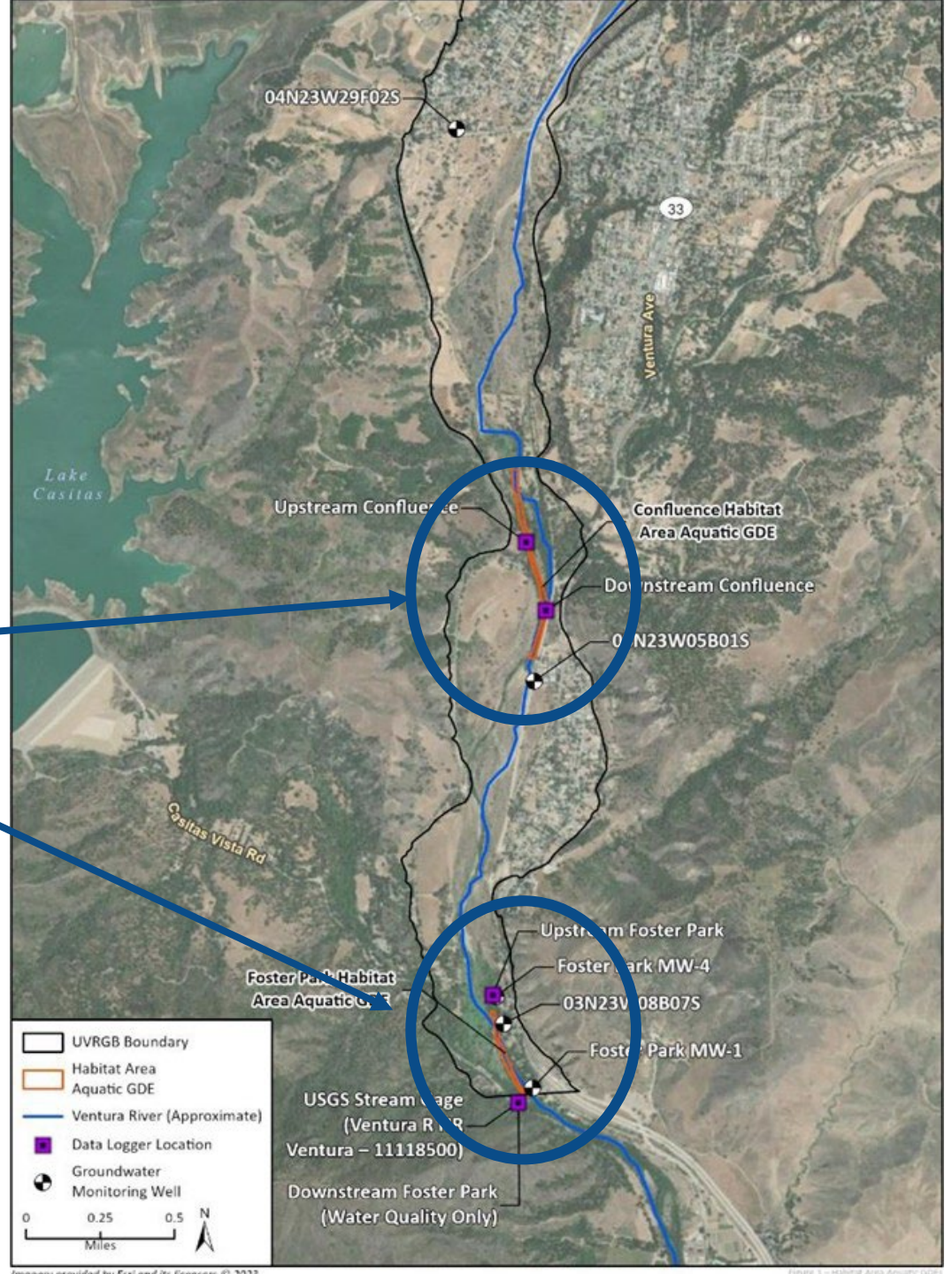
Aquatic GDEs: what and where

- Two aquatic habitat areas identified as aquatic GDEs in the GSP:
  - Confluence of the Ventura River and San Antonio Creek
  - Foster Park at southernmost portion of Basin at Foster Park



Purpose of monitoring programs

- Confluence Aquatic Habitat Area GDE
  - Evaluate if ISW depletion is causing significant and unreasonable effects
  - Assess whether SMC are needed
  - If SMC deemed necessary, inform long-term monitoring plan
- Foster Park Aquatic Habitat Area GDE
  - Assess performance of the ISW depletion SMC
  - Inform long-term monitoring needs

Biologist investigating ISW in Confluence pool
June 19, 2024

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Core Questions:

Are or could impacts occur?
How are aquatic species using the GDEs?

Aquatic GDE Monitoring Plan Components

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Data Gap	Aquatic GDE Monitoring Component(s) to Address Data Gaps			
What is the distribution of aquatic mesohabitats in both GDEs?	**Habitat Suitability and Snorkel Surveys** Collect survey parameters (i.e., sediment type, riparian vegetation, water depth, morphology, and species) within pools, riffles, and glides to determine distribution of existing mesohabitats.			
What are the aquatic habitat suitability conditions within both GDEs?	**Habitat Suitability and Snorkel Surveys** Provide data on existing conditions habitat suitability for target species. Provide an understanding of habitat conditions within the GDEs and compare to water quality under varying flows.	**Water Quality and Flow Monitoring** Provides continuous flow and water quality (WQ) data to determine timing of Habitat Suitability and Snorkel Surveys. Also, provides data to compare water quality parameters under varying flows to habitat conditions.		
How do aquatic habitat suitability conditions within both GDEs change in response to seasonal variation?	**Habitat Suitability and Snorkel Surveys** Provide habitat suitability data for target species to compare with streamflow,climatic data, modeled ISW depletion. Surveys conducted throughout different seasons to understand seasonal variability of habitat suitability.	**Aerial Photography** Provides a visual time series of conditions within the GDEs and compare conditions during different hydrologic and climatic conditions to capture seasonal variability.	**Water Quality and Flow Monitoring** Provides continuous flow and WQ data that improves understanding of instream conditions throughout the seasons.	**Fish Stranding and Mortality Surveys (Confluence only)** Provide data on steelhead migration habitat within the GDEs, as well how flow recedes within GDEs for varying climatic conditions and modeled ISW depletion estimates.
How and when might ISW depletion affect habitat suitability conditions within both GDEs?	**Habitat Suitability and Snorkel Surveys** Surveys to target a range of flows to understand at when instream flow recession results in habitat degradation; combine with ISW depletion modeling estimates to inform whether SMCs are warranted.	**Water Quality and Flow Monitoring** Provides continuous flow and WQ data to determine timing of Habitat Suitability and Snorkel Surveys.	**Fish Stranding and Mortality Surveys (Confluence only)** Provide important information on hydrologic conditions as flows recede naturally and data on how and when streamflow recedes within GDEs following varying climatic conditions and modeled ISW depletion.	**Refuge Water Quality Monitoring** Provides continuous water quality data to characterize ISW dynamics and associated habitat conditions within the designated mesohabitat units of the Aquatic GDEs. *Optional eDNA Sampling* informs the presence and absence of target aquatic species within the Aquatic GDEs and/or isolated mesohabitats.
Completed Under Separate Programs				
How might groundwater pumping in the Basin affect habitat suitability conditions within both GDEs?	**Groundwater Level Monitoring** Rincon collects groundwater level data semi-annually to support ISW depletion modeling, completed by UVRGA, and can be correlated to instream monitoring data from the Aquatic GDE Monitoring program.	**ISW Depletion Modeling** UVRGA conducts ISW depletion modeling to quantify instream conditions as a result of natural base flow recession and compare to base flow recession exacerbated by groundwater pumping to assess whether significant and unreasonable effects occur as a result from pumping.		

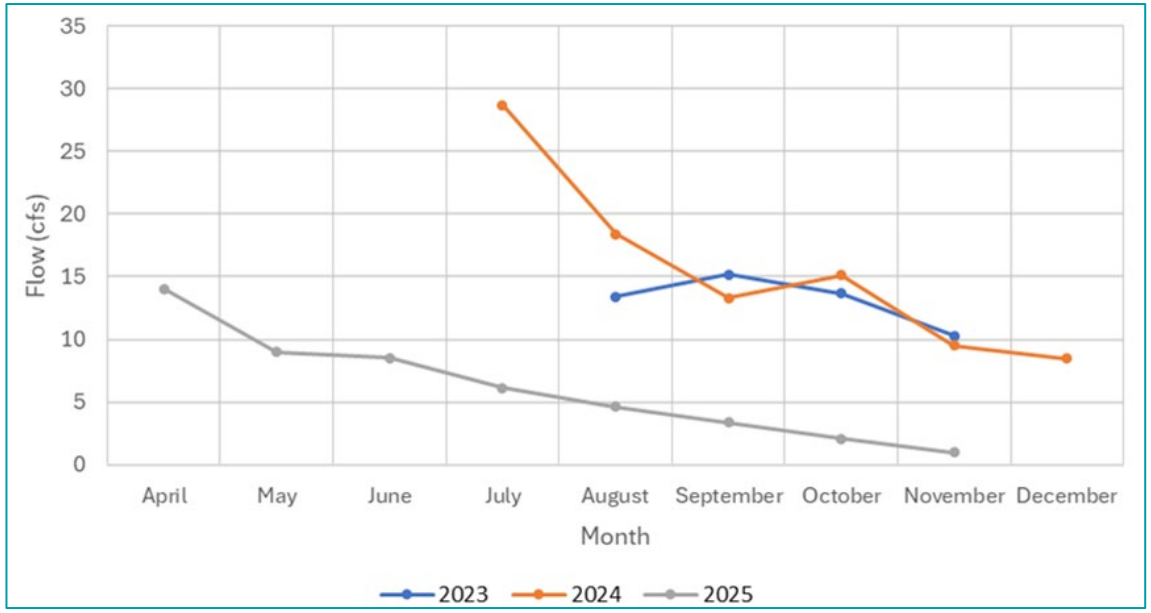
Flow Monitoring

Flow Monitoring at Lower Foster Park
April 14, 2025

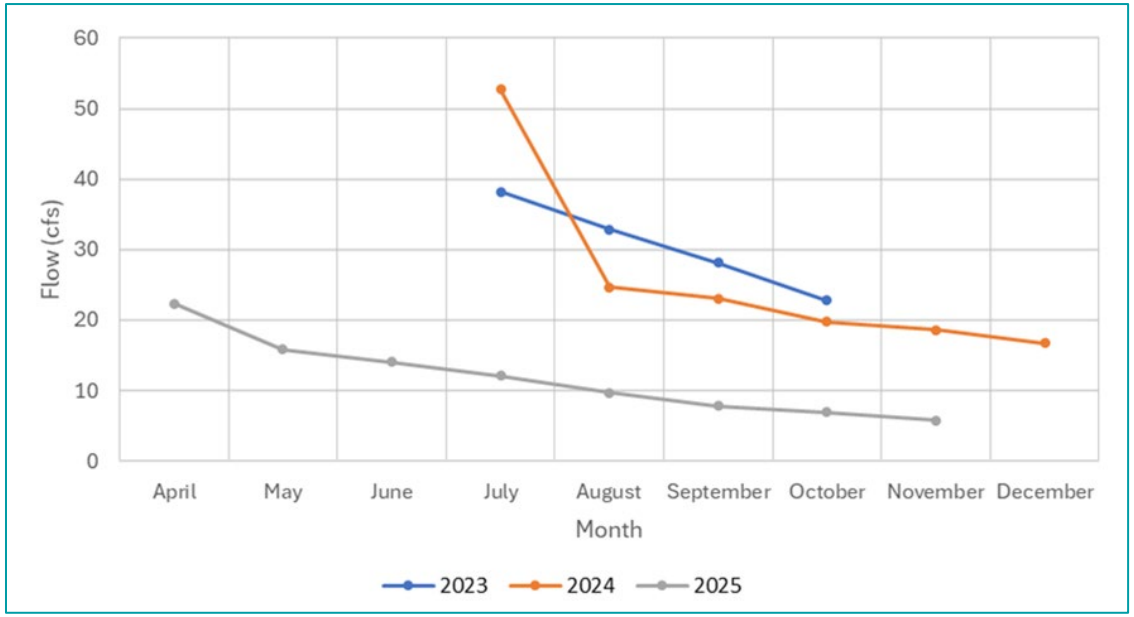
Sonde deployed at Lower Foster Park
April 14, 2025

Aquatic GDE Monitoring Flow Data

Upstream Confluence

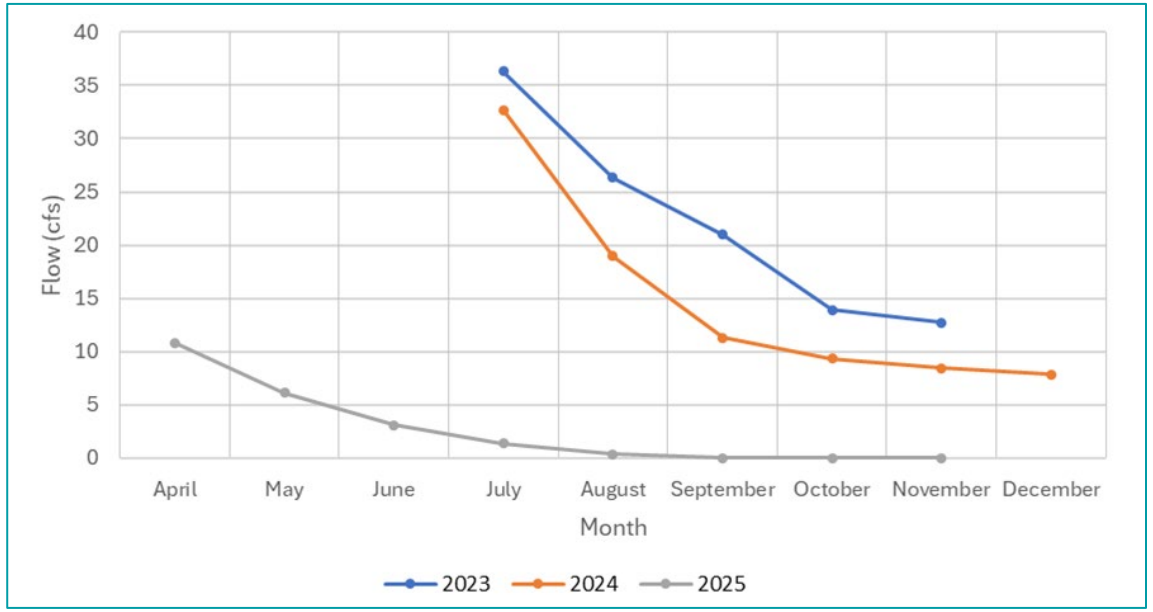


Downstream Confluence

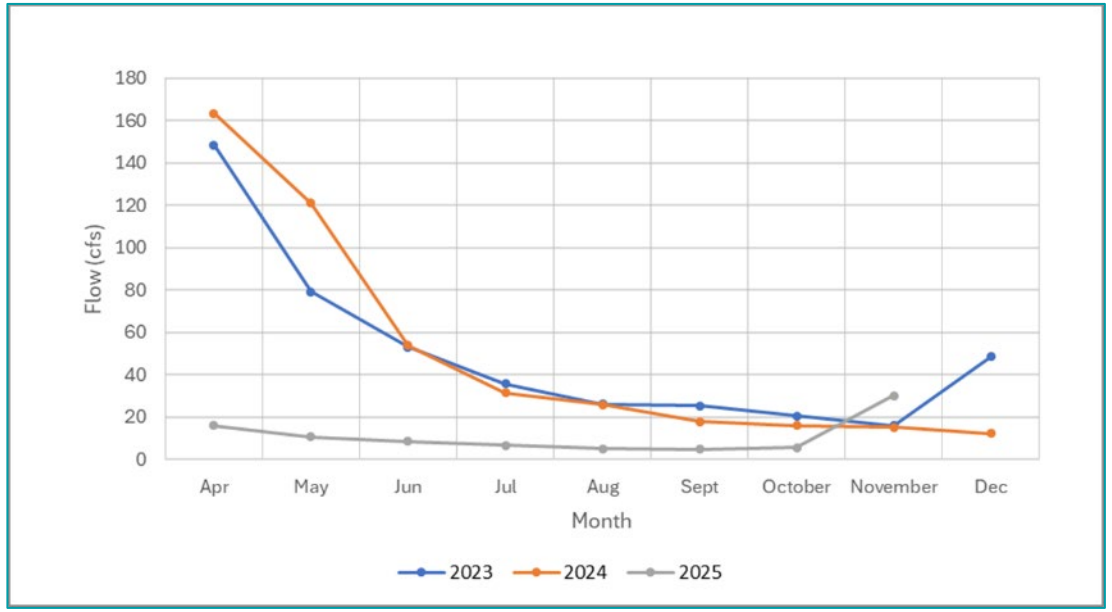


Aquatic GDE Monitoring Flow Data

Upstream Foster Park



Downstream Foster Park (USGS)



Snorkel and Habitat Surveys

Photo: Surface glare and reflections, distortion, etc.

Video: underwater habitat structure and conditions, fish populations, etc.

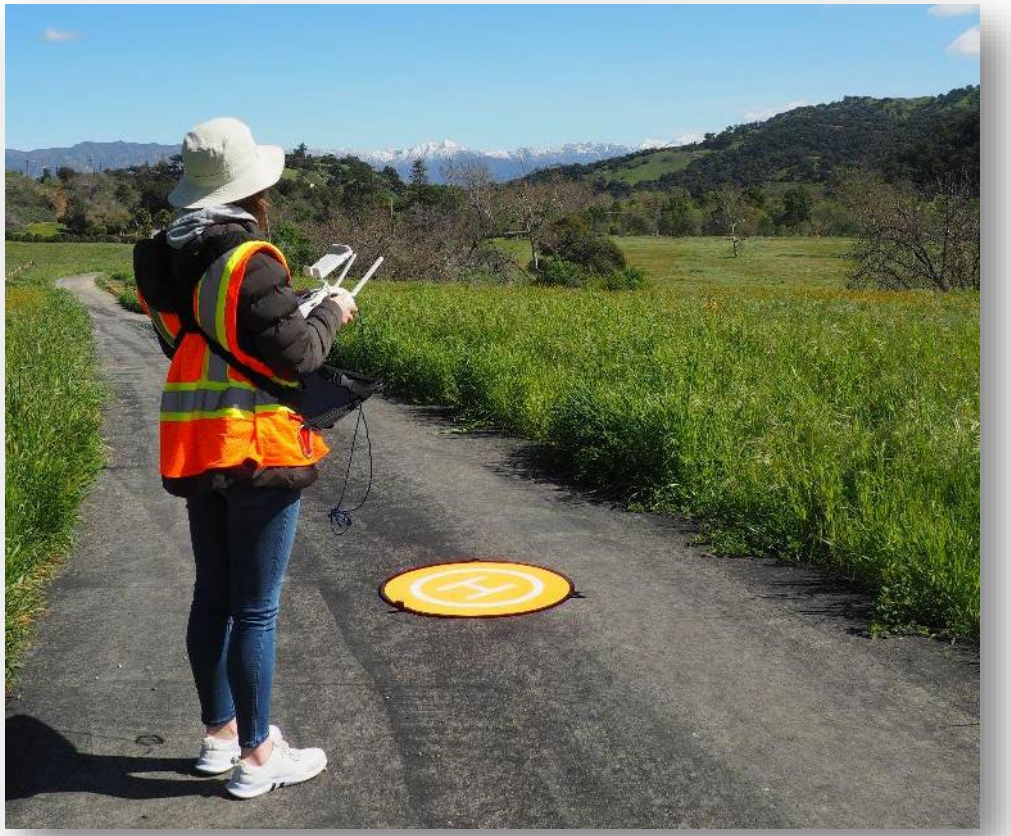
Sensitive Species Observed

Southwestern pond turtle at Confluence
February 3, 2025

Pacific lamprey ammocete at Foster Park
September 23, 2025

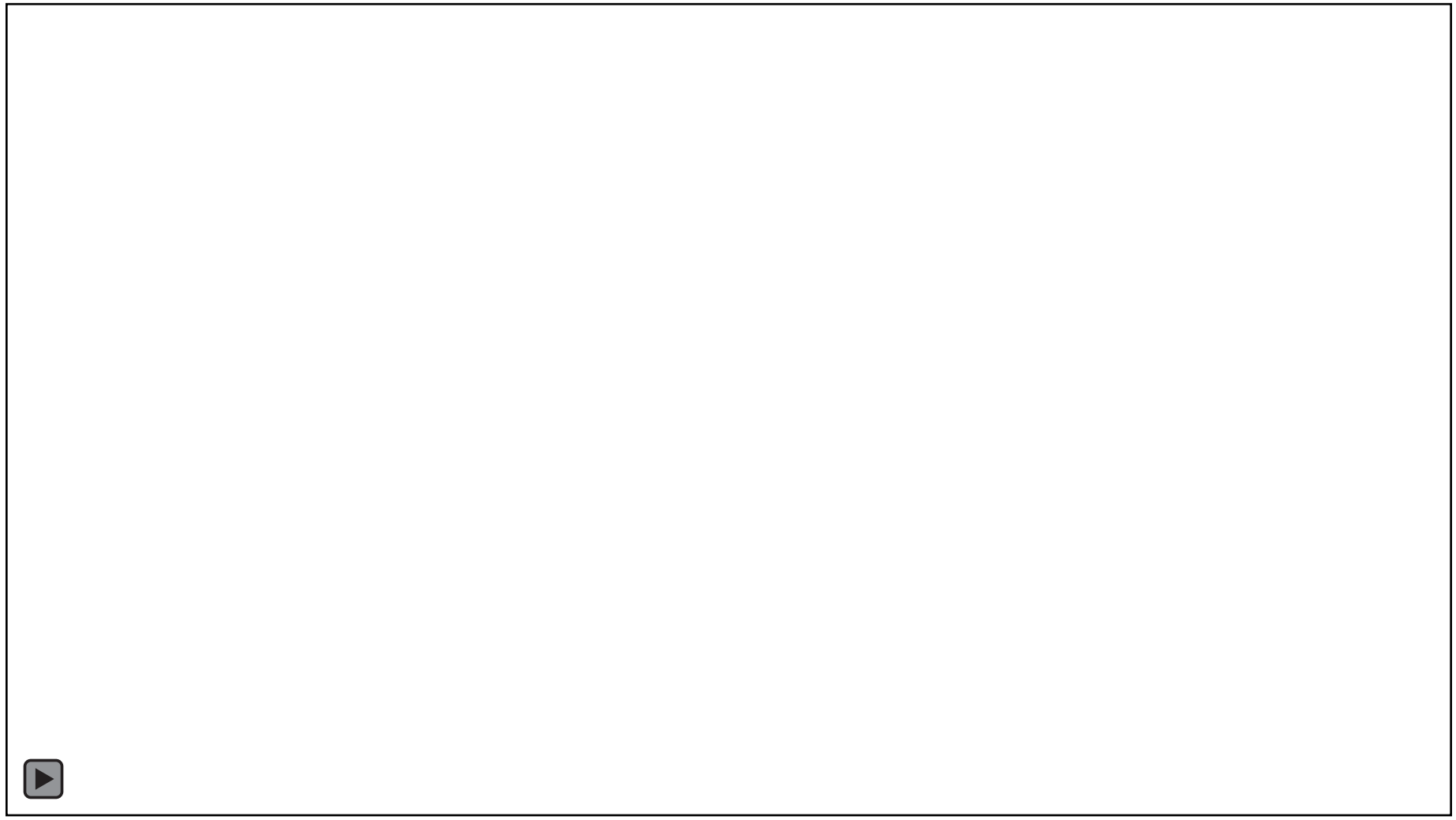
Drone Surveys

View of drone collecting aerial orthoimagery
March 24, 2023



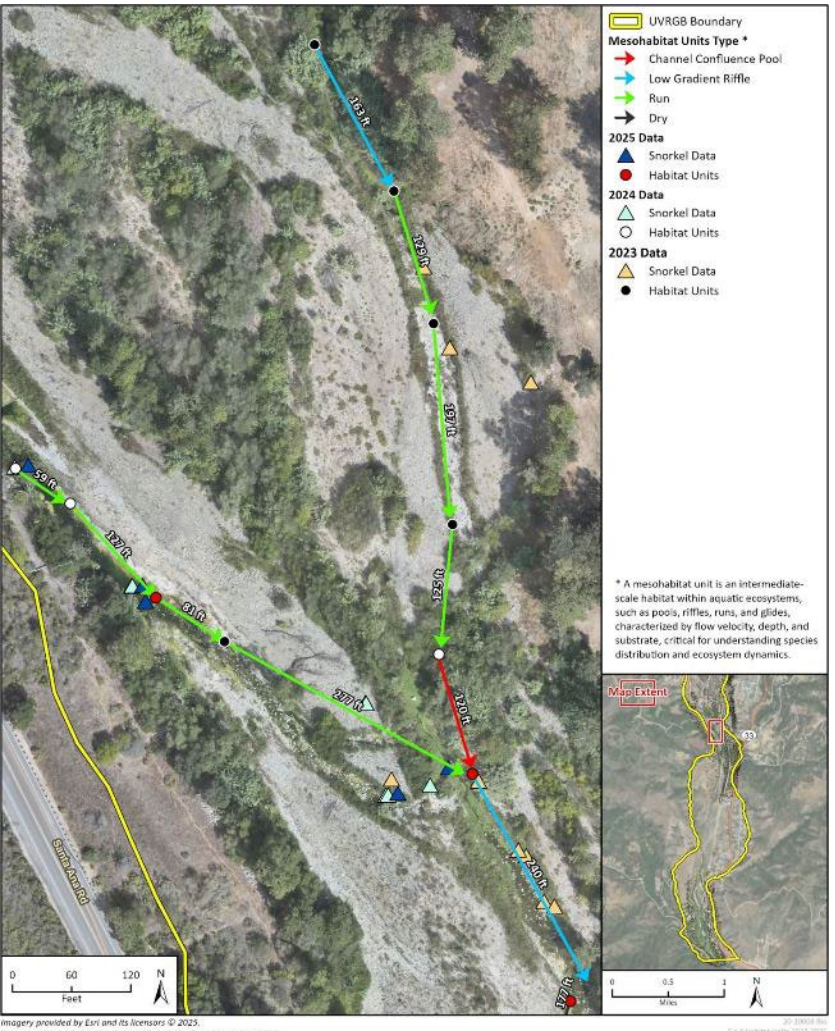
Drone being operated by Rincon's drone team
March 24, 2023

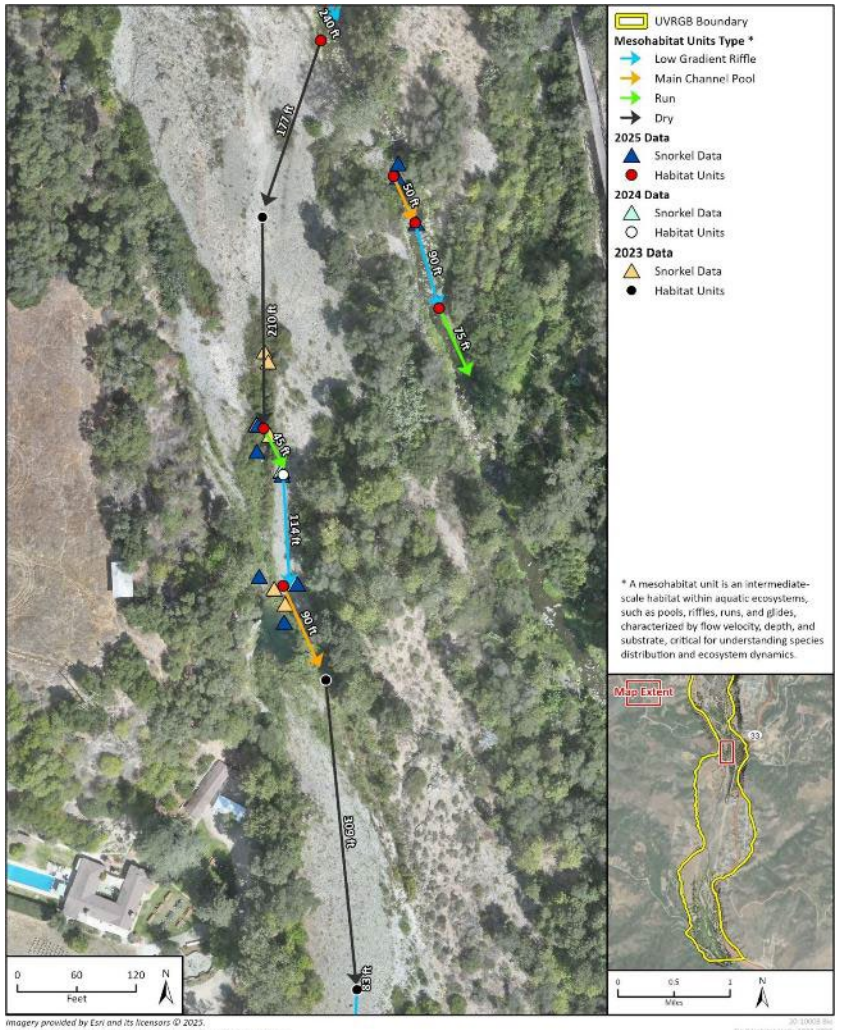
Geomorphic and Mesohabitat Reset of 2023



Confluence Aquatic GDE Monitoring Habitat and Snorkel Survey Data

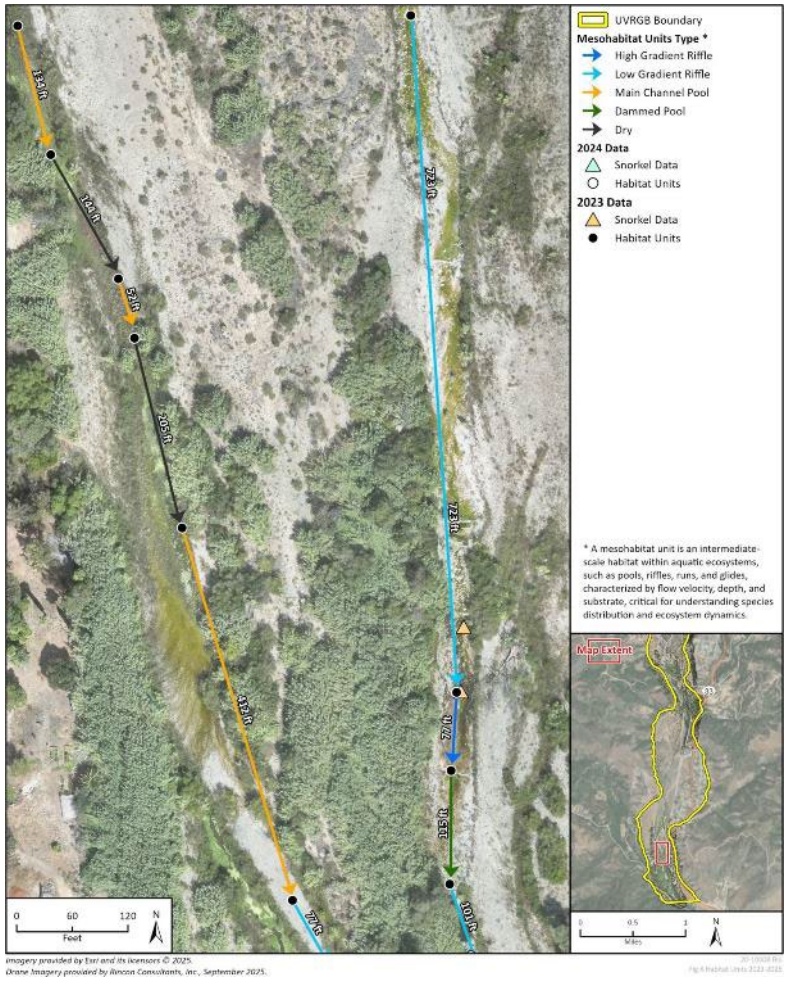
Upstream → Downstream

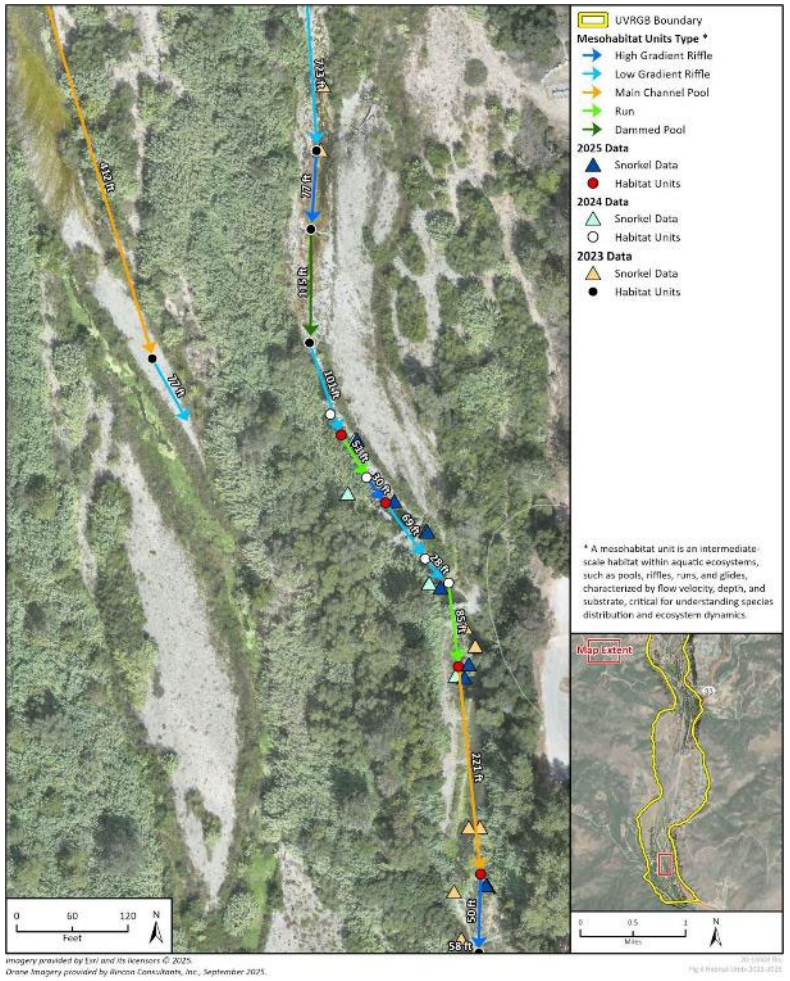




Foster Park Aquatic GDE Monitoring Habitat and Snorkel Survey Data

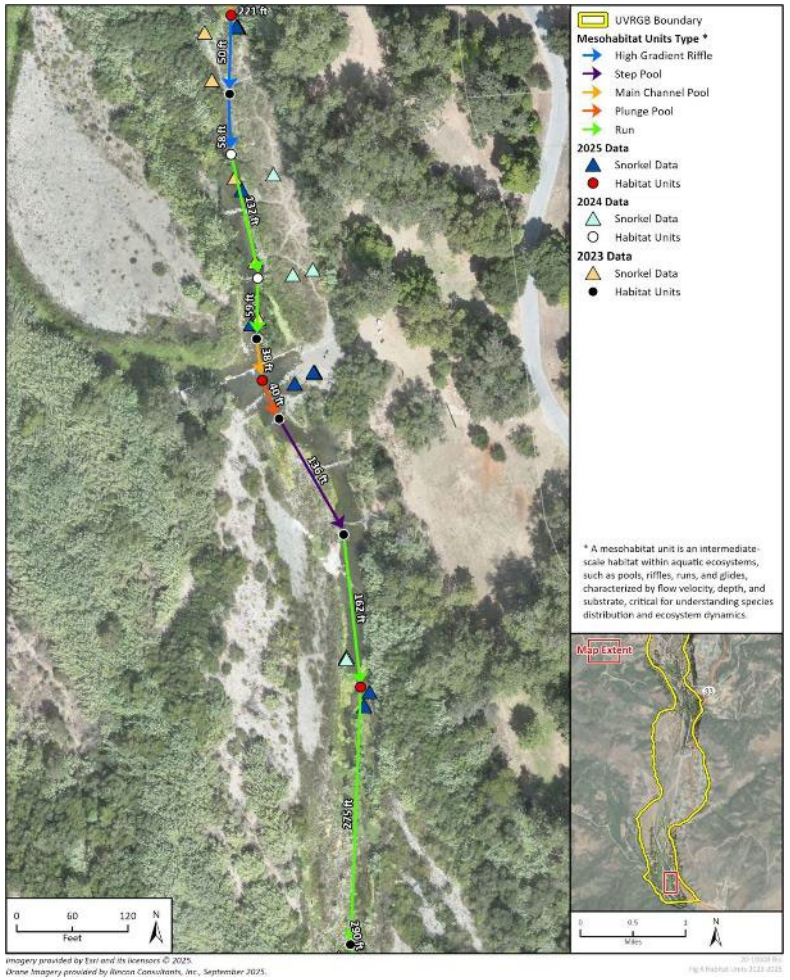
Upstream → Downstream

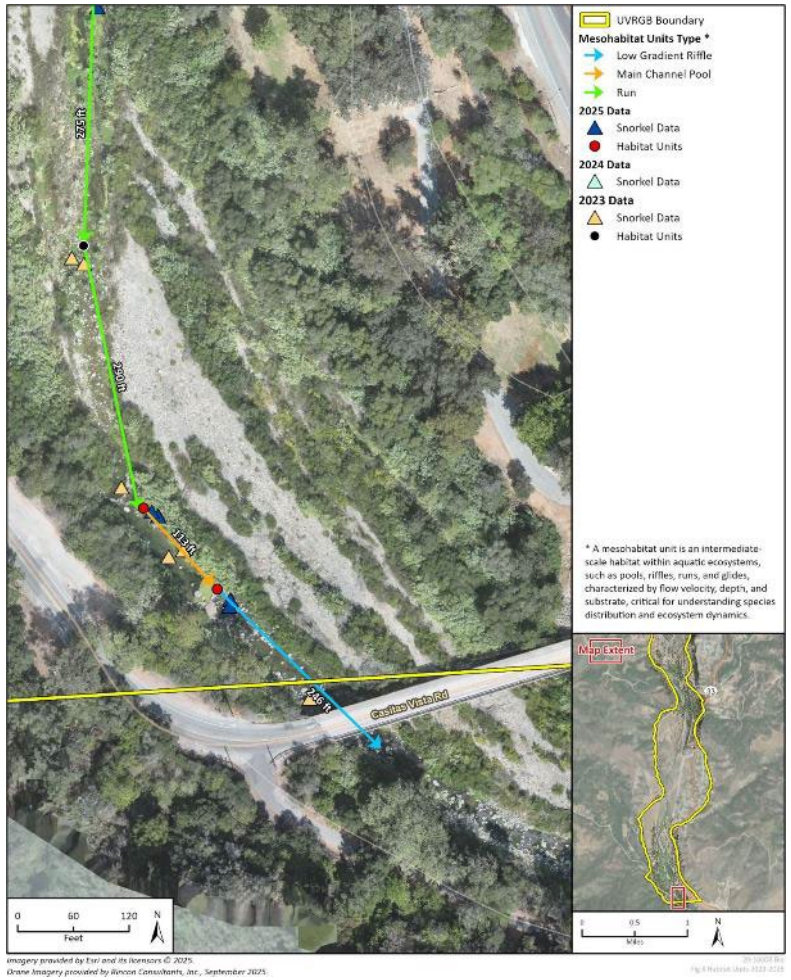




Foster Park Aquatic GDE Monitoring Habitat and Snorkel Survey Data

Upstream → Downstream

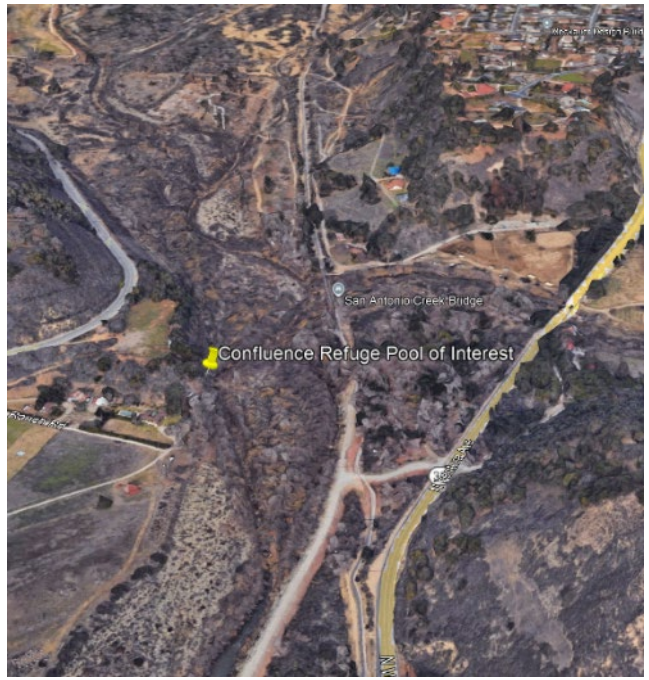


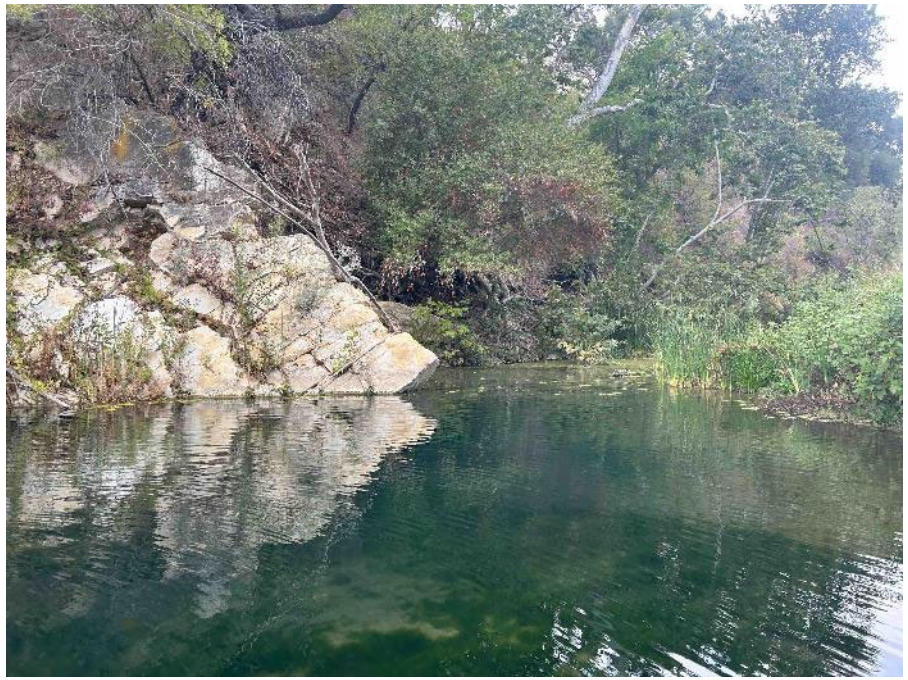


Groundwater Interaction

Upper Foster Park (34.357261, -119.310202)

Refuge Pool of Interest for Focused Water Quality Monitoring





Conclusions

- Range of flow across water years offers good data comparisons
- In WY 2025, three isolated pools with stranded fish were documented - apparent groundwater influence has been observed
- Isolated pools may offer refuge habitat conditions during low flows, even as flows become discontinuous, mesohabitat units are isolated, and surrounding ambient conditions deteriorate
- Changing morphology and habitat structure in the GDEs has strong influence on habitat suitability (not surface flow alone)

Biologists discussing fish count during snorkel survey September 10, 2025

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Next Steps for the Monitoring Program

- Refine and continue monitoring:
  - Establish flow- and condition-based monitoring triggers for snorkel and habitat surveys
  - Targeted continuous water quality monitoring in areas of habitat refuge (e.g., pools) of the Aquatic GDEs during low flow conditions
- Use findings to answer:
  - Are suitable habitat conditions in refuge areas sustained through low flow conditions, and for how long?
  - How do stream flows and groundwater levels correlate to habitat suitability and potential significant and unreasonable impacts?
  - Does this substantially change in the GDE as mesohabitat structures shift and reset (e.g., through geomorphologic changes)?
  - Can additional flow and/or groundwater triggers be set to reduce monitoring needs?
  - Can groundwater levels be used to update (Foster Park) or establish (Confluence) groundwater management thresholds?

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