



Groundwater Dependent Ecosystems Monitoring 2025

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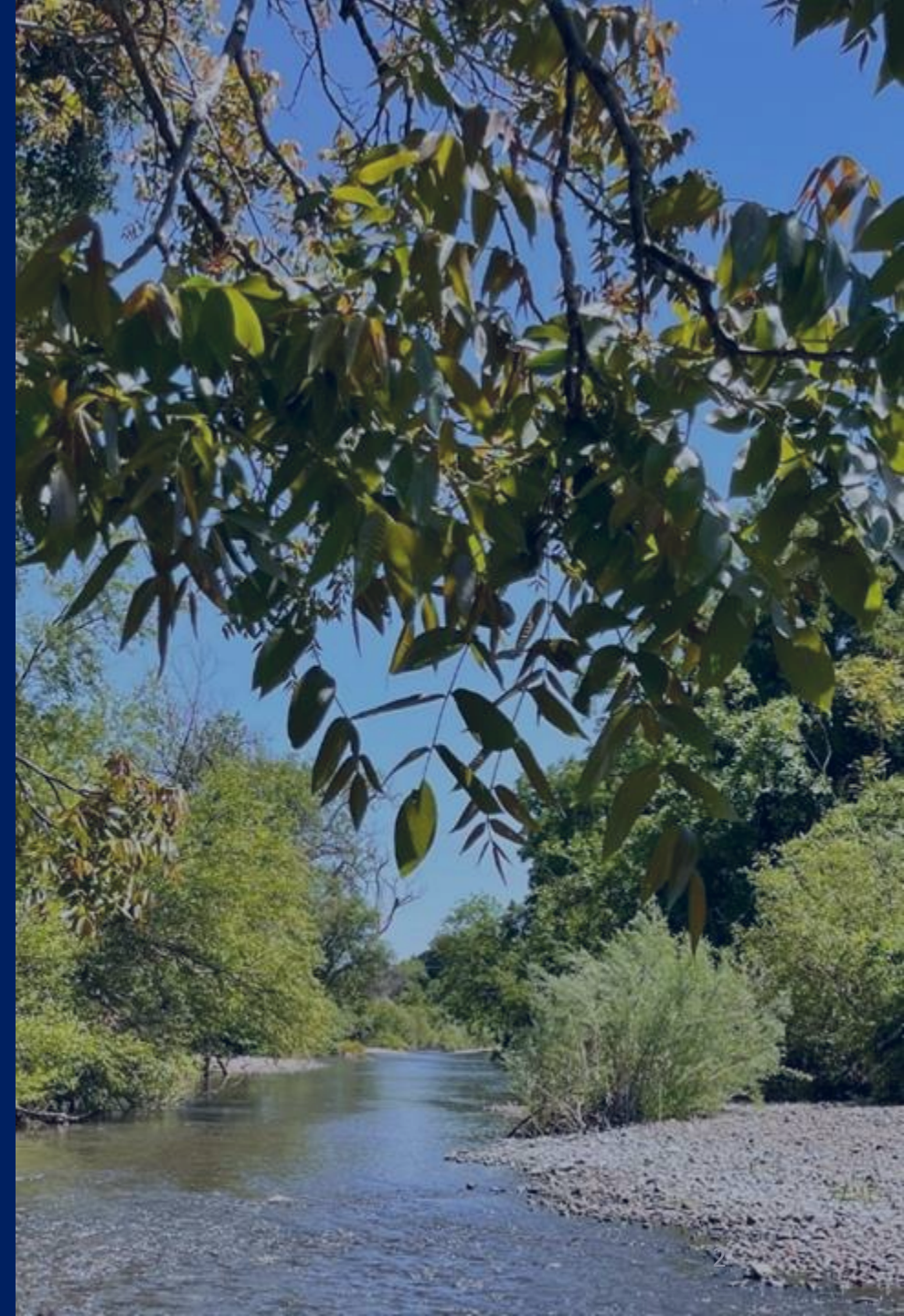
Workplan Objectives

Monitoring





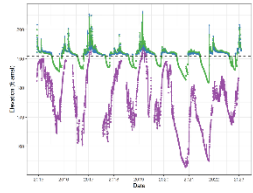







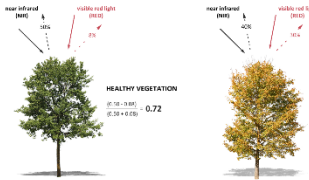
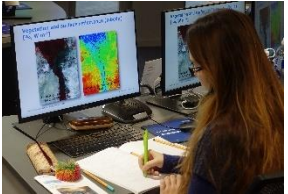
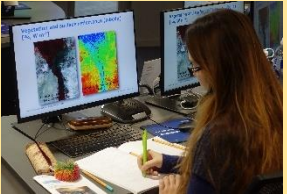
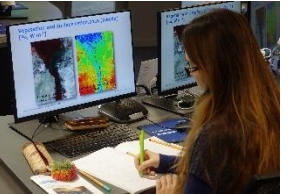
- What ecosystem components are at intensive monitoring sites (what species are present)?
- What are the groundwater elevation and surface water dynamics?

Analysis














- What are the biological flow and groundwater needs for each ecosystem component?
- Use California Environmental Flows Framework (CEFF) to assess ecological flow needs.
- Periodic Evaluation will focus on analysis, to be discussed next meeting.



Ongoing Monitoring Schedule

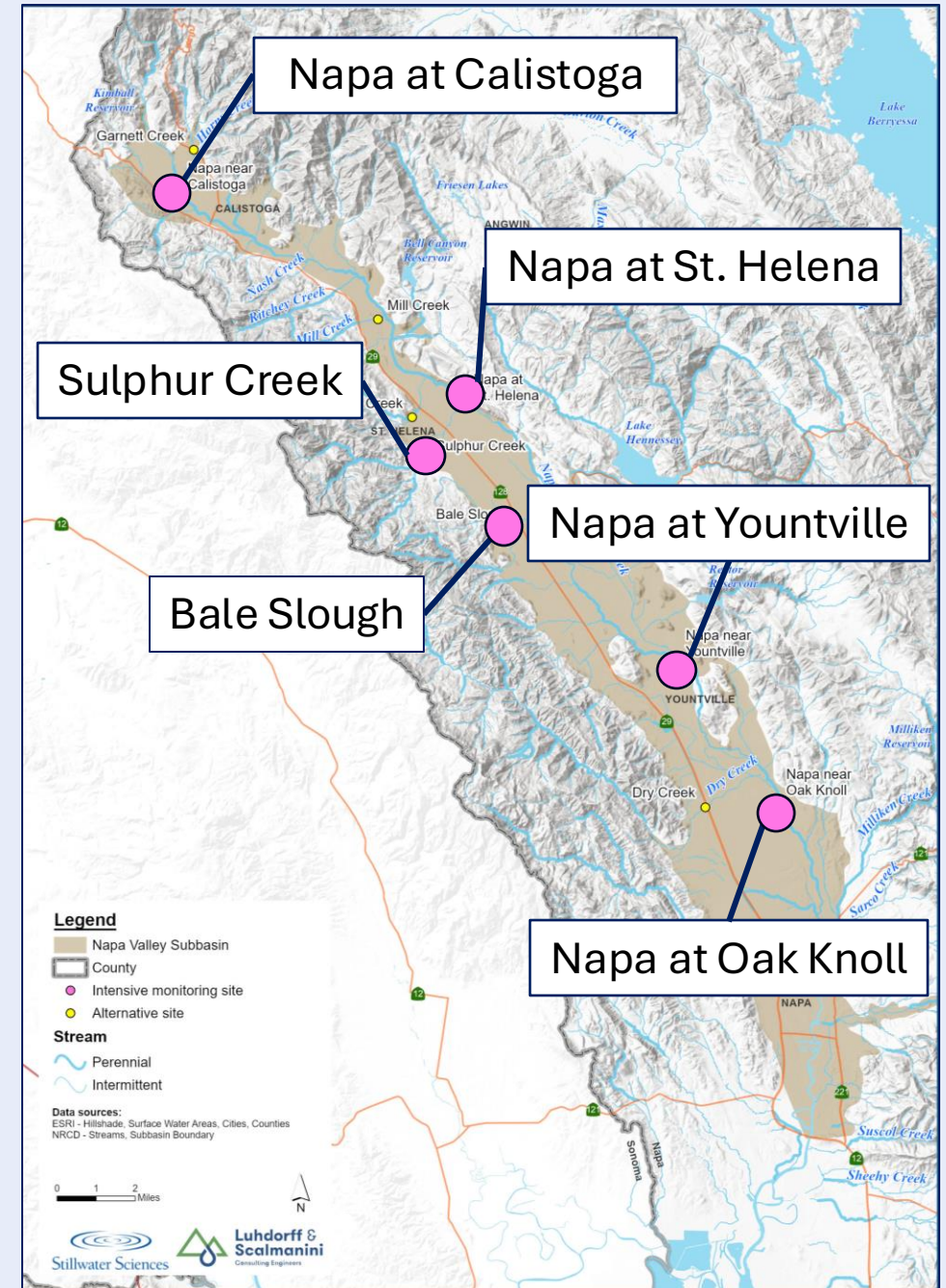
	2024	2025	2026	2027
 <p>Stream Watch</p>				Periodic Evaluation (January)
 <p>Shallow Groundwater Monitoring</p>				Periodic Evaluation (January)
 <p>Napa RCD fish surveys</p>				Periodic Evaluation (January)
 <p>Remote Sensing of GDEs</p>				Periodic Evaluation (January)

Ongoing Monitoring Schedule (continued)

		2024	2025	2026	2027
	Fish Habitat and Usage				Periodic Evaluation (January)
	Aquatic Wildlife			Optional (Flood, Drought)	Periodic Evaluation (January)
	Vegetation Health and Rare Plants			Optional (Flood, Drought)	Periodic Evaluation (January)
	Terrestrial Wildlife (Birds)				Periodic Evaluation (January)

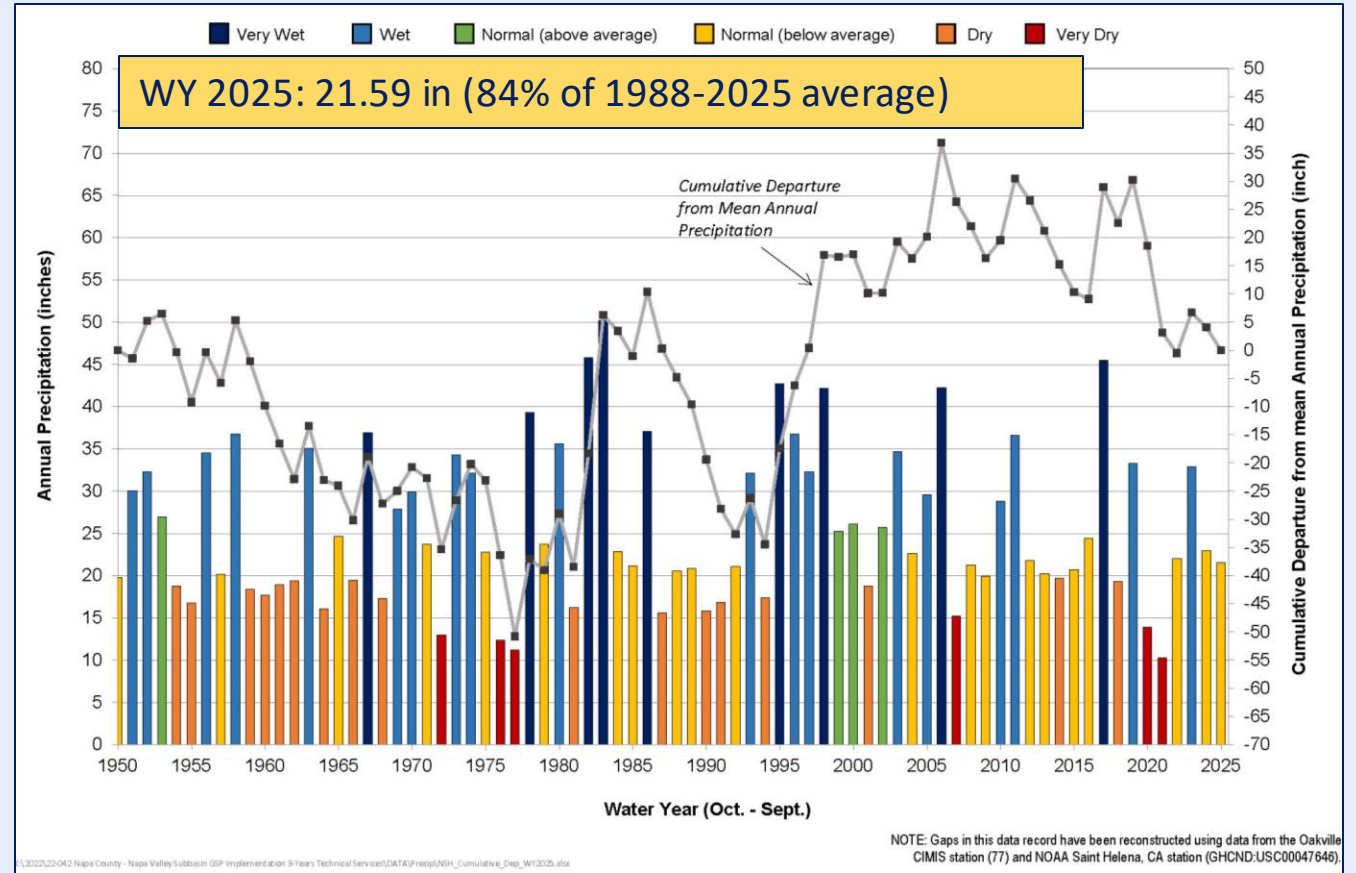
ISW and GDEs Workplan Implementation

- Six intensive survey sites identified in the Workplan.
- Surveys conducted at all 6 sites in 2025.
- Stillwater led three field trips, which included members of the TAG and NCGSA.



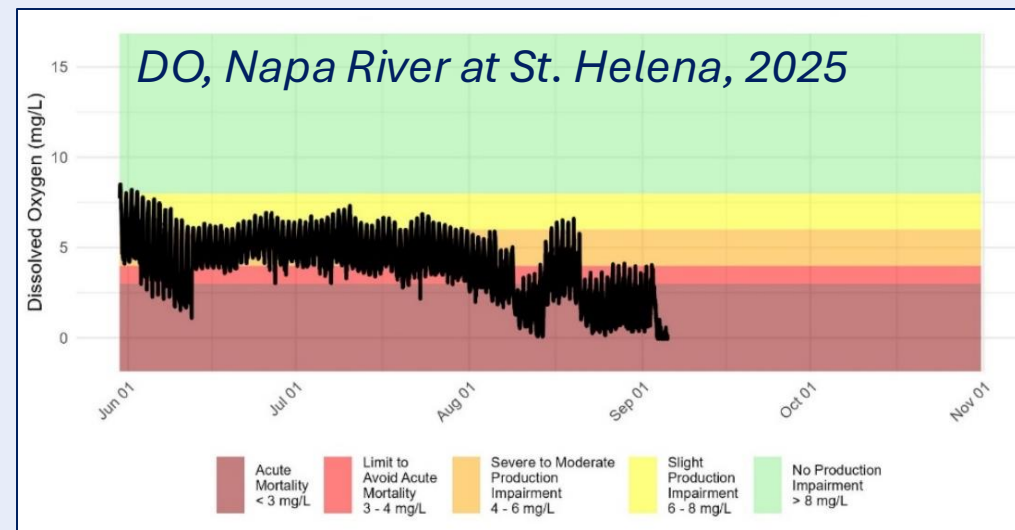
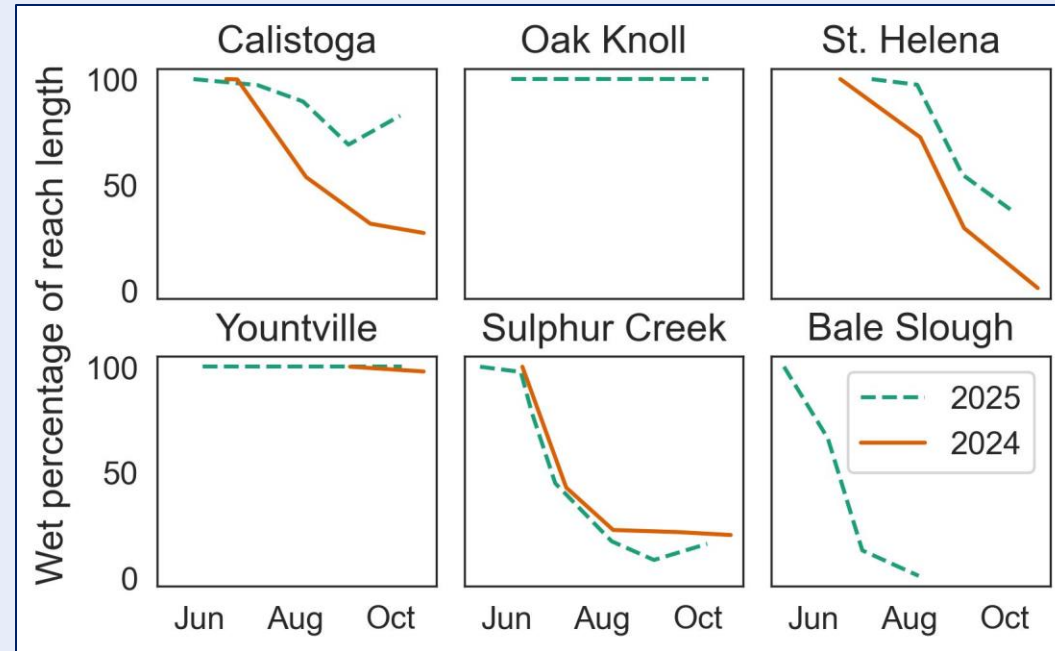
Climate

- 2025 had normal (below average) precipitation in the southern portion of the basin.
- 2025 was much wetter relative to the historical record in the northern portion of the basin.
- July and August 2025 were relatively cool compared with the historical record.



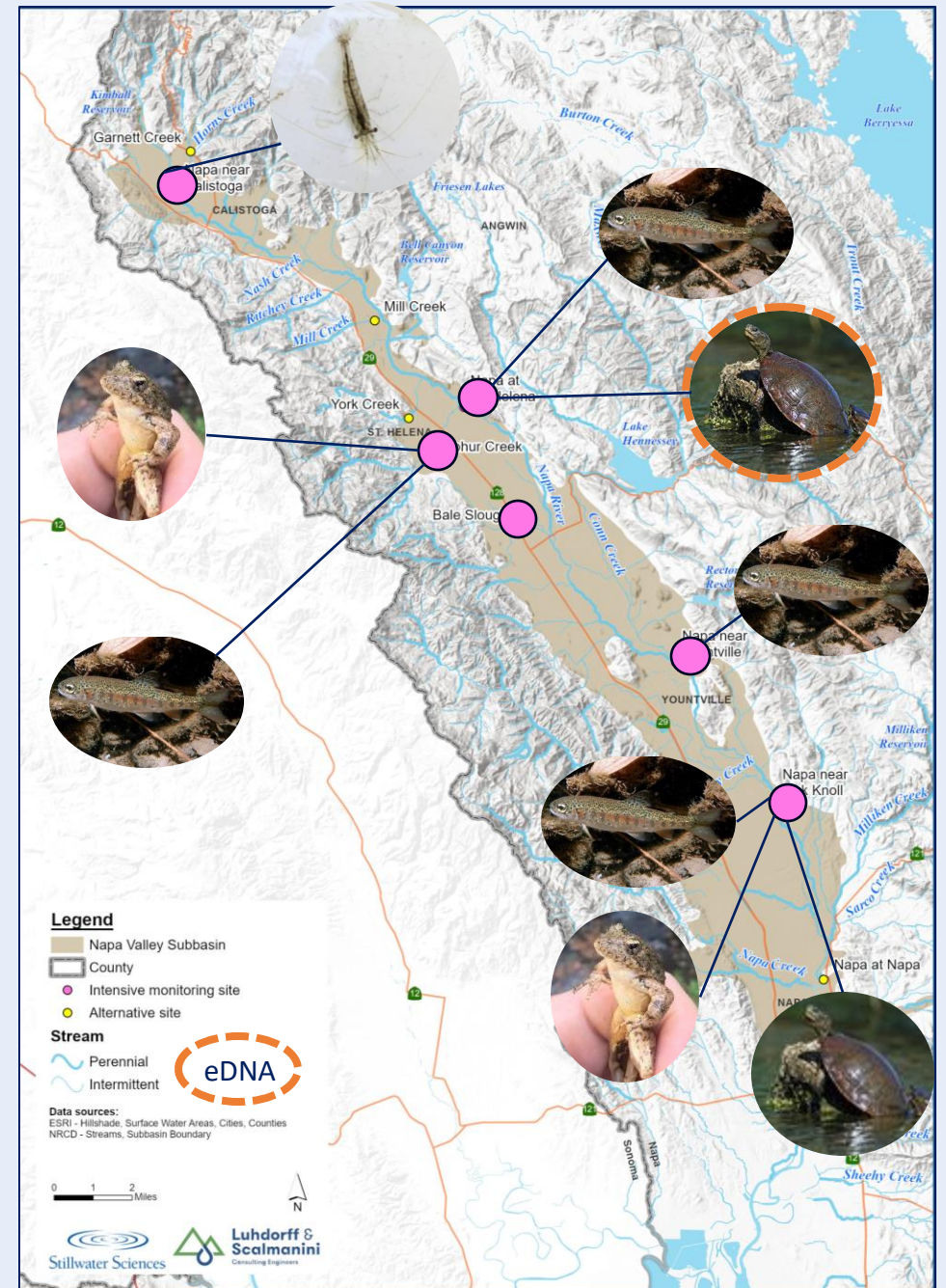
Flow Connectivity and Water Quality Summary

- USGS gage at Oak Knoll did not go dry in 2025
- USGS gage at St. Helena went dry on August 28, 2025
- Sulphur Creek and St. Helena stayed wetter than in 2024
- Temperature and dissolved oxygen generally stressful for steelhead



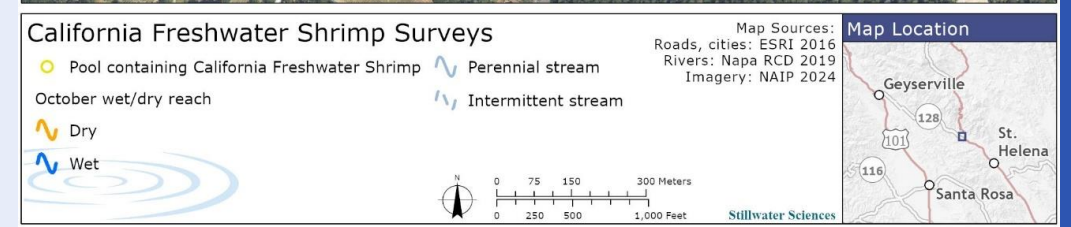
2025 Biological Survey Summary

- **Juvenile steelhead** observed at St. Helena, Sulphur Creek.
- **Adult steelhead** observed at Yountville.
- **Juvenile Chinook salmon** observed at all sites.
- **Foothill yellow-legged frogs** observed in tributaries only (Sulphur Creek and Dry Creek).
- **Northwestern pond turtle** observed at Oak Knoll and detected from eDNA sampling at St. Helena.
- **59 unique bird species** identified using sound recordings. One special-status species at the Napa River at St. Helena.
- **Minor vegetation stress** in mature trees on mainstem.



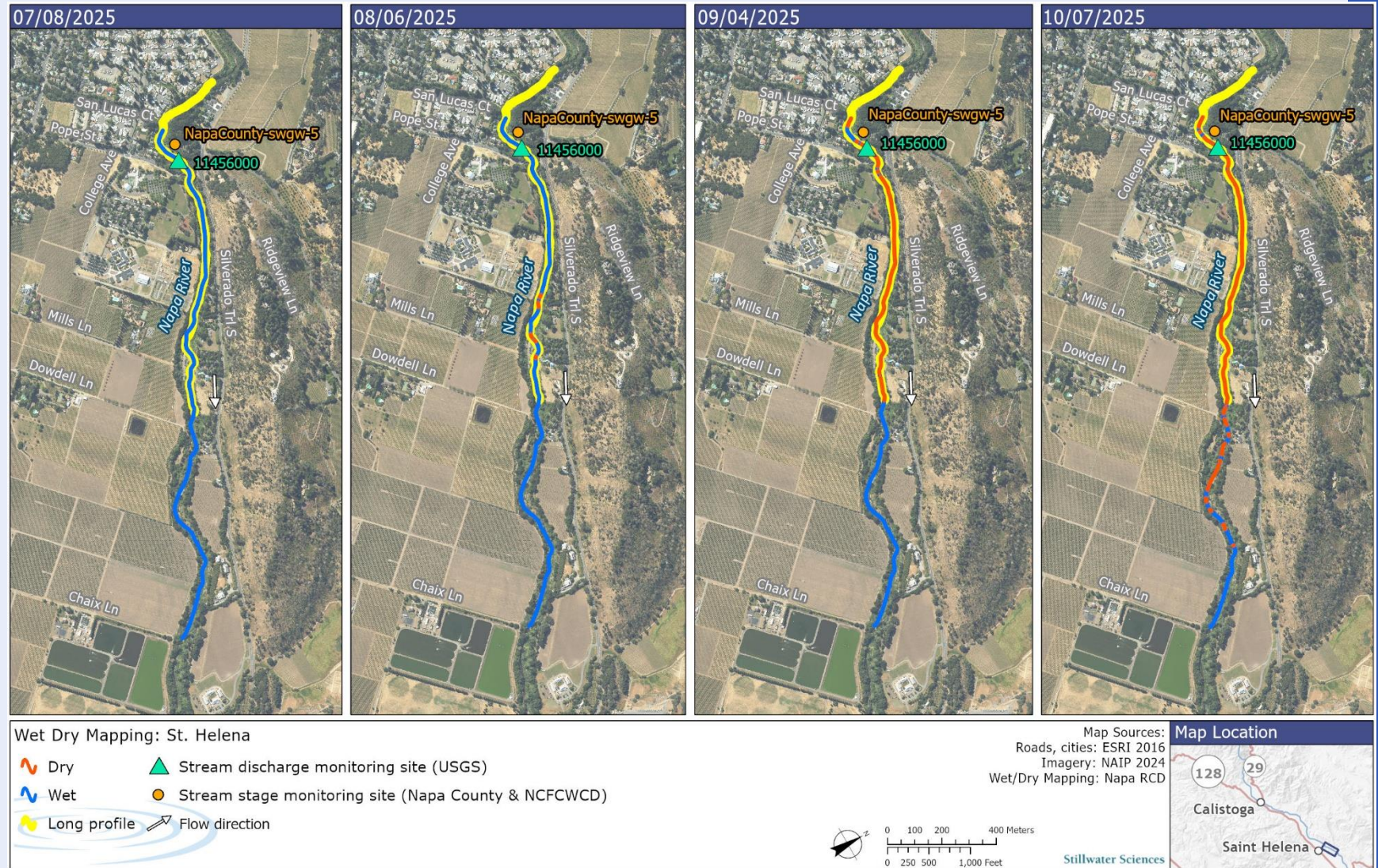
Napa River at Calistoga: Biological Surveys

- California Freshwater Shrimp
 - 123 shrimp observed in isolated pools
 - 33 males, 32 females, 58 juveniles
 - Found throughout the reach and in Garnett Creek
- Fish
 - Juvenile chinook throughout
 - Abundant bluegill (non-native)
- Herps
 - Bullfrog tadpoles



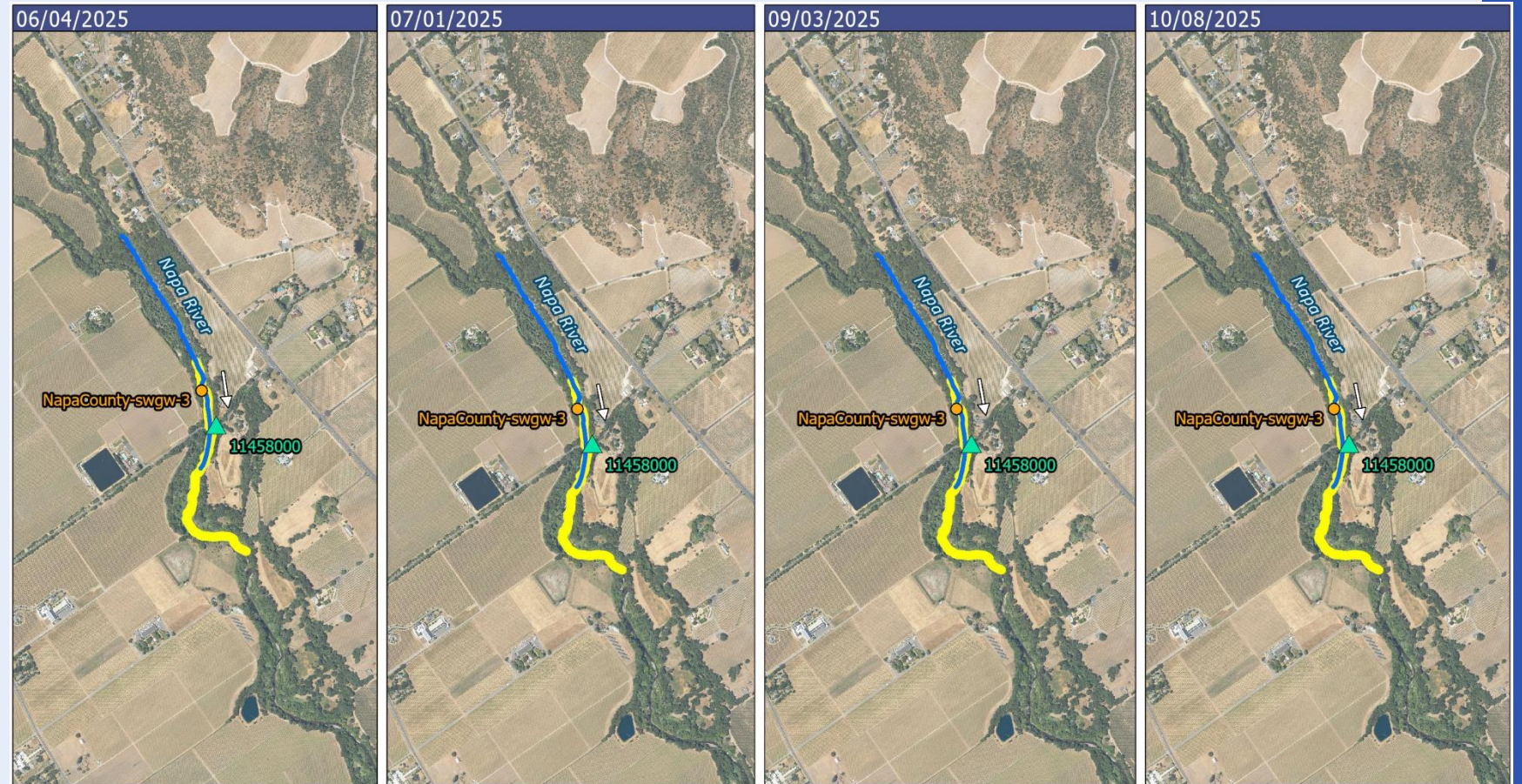
Napa River at St. Helena: Wet/Dry Mapping

- Upstream section of channel stayed wet through early August
- Surface flow observed at Pope Street on 8/28, isolated pools by 9/4
- Middle section started drying in early August, dry by September

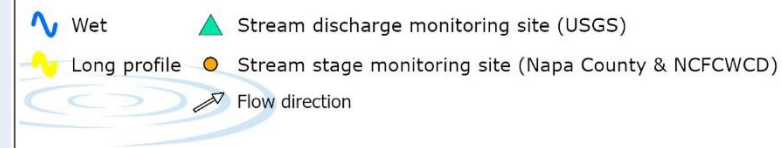


Napa River at Oak Knoll: Wet/Dry Mapping

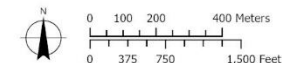
- Flowing year-round
- Beaver dams!



Wet Dry Mapping: Oak Knoll

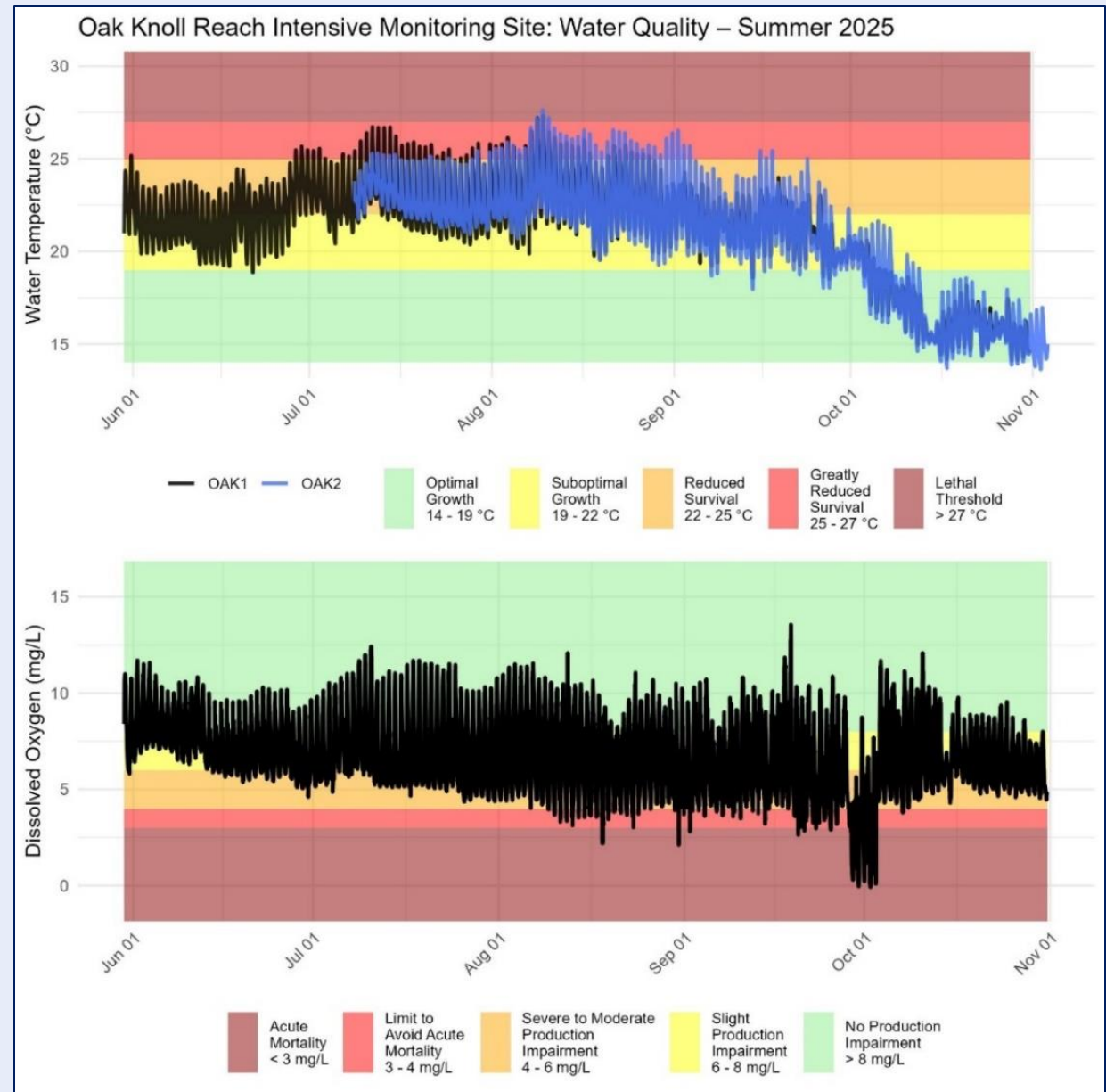


Map Sources:
Roads, cities: ESRI 2016
Imagery: NAIP 2024
Wet/Dry Mapping: Napa RCD



Napa River at Oak Knoll: Temperature and Dissolved Oxygen

- Temperature and DO somewhat suitable for steelhead in June
- Stressful water quality for juveniles
- Similar conditions at the Napa River near Yountville



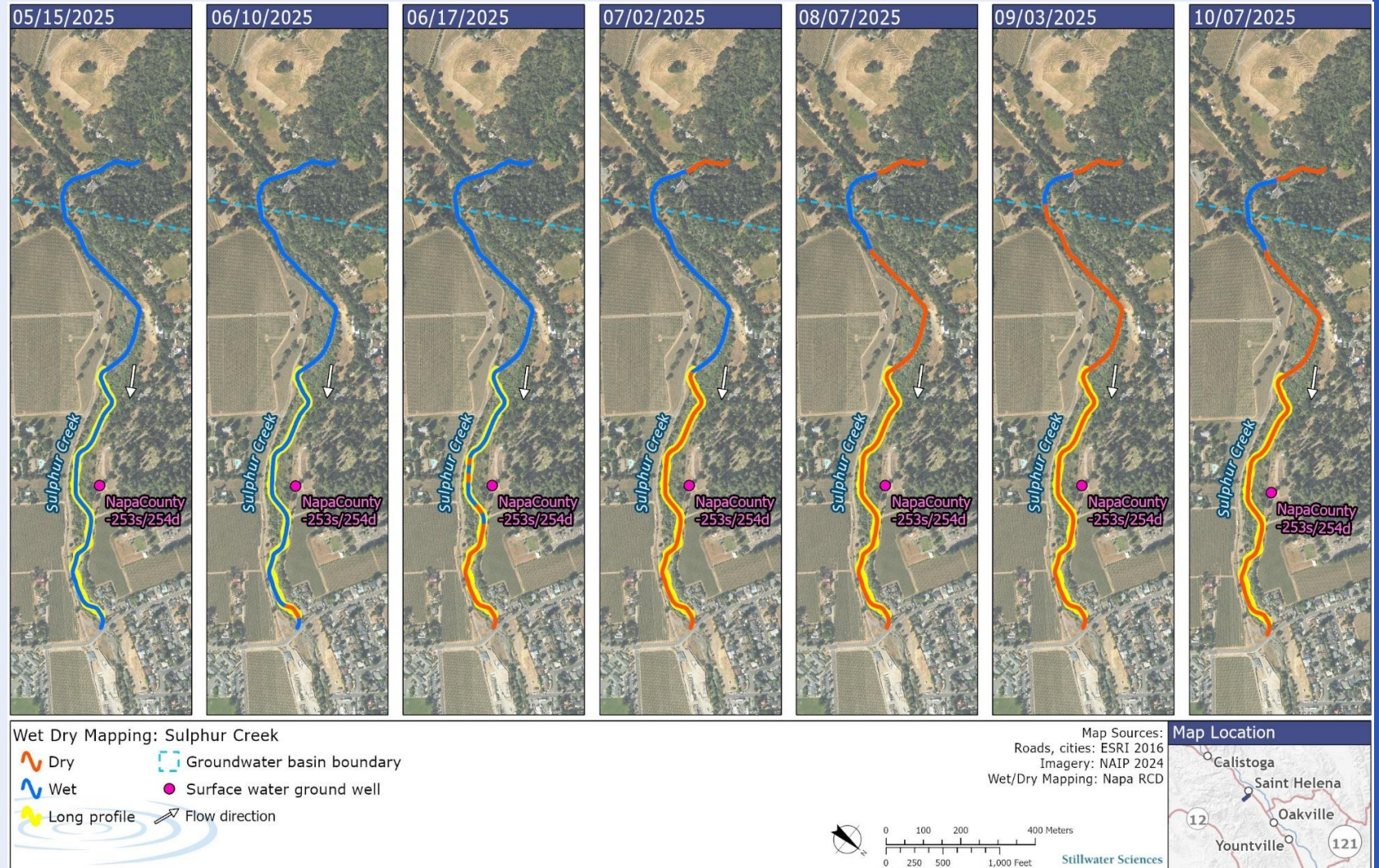
Napa River at Oak Knoll: Biological Surveys

- Fish
 - 2 adult *O.mykiss*
 - 1 juvenile Chinook
- Herps
 - Northwestern pond turtles observed in June
 - Foothill yellow-legged frog detected in eDNA in June, observed at Dry Creek in July (habitat is poor at Oak Knoll)



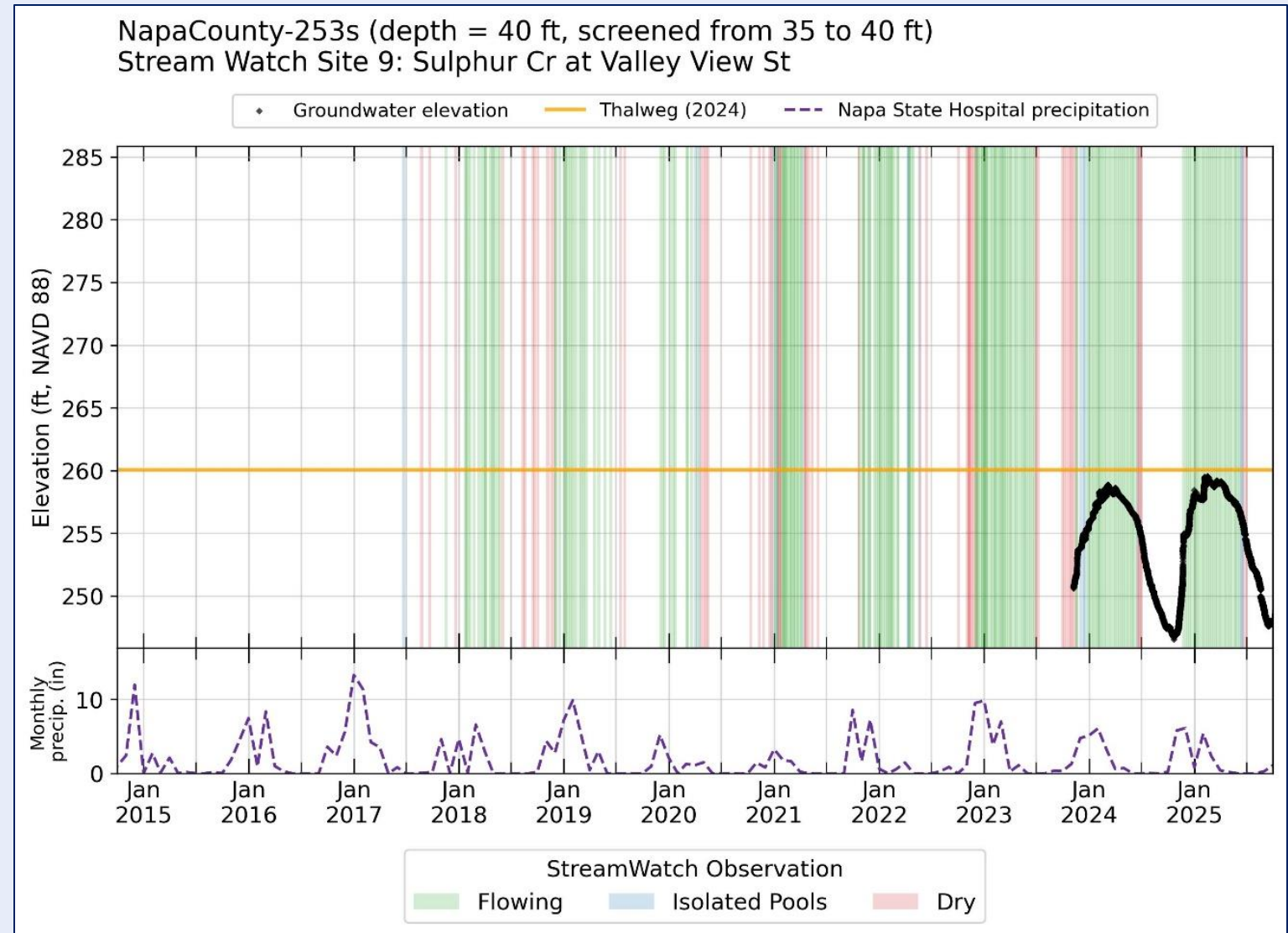
Sulphur Creek: Wet/Dry Mapping

- Reach within basin began to dry by June
- Wet at Heath Canyon confluence year-round



Sulphur Creek: Groundwater and Stream Watch

- Water table below channel thalweg throughout monitoring period
- Vegetation primarily upland and riparian herbaceous species unlikely to be GDEs



Sulphur Creek: Biological Surveys

- Fish
 - 700+ juvenile steelhead in May, 200+ in June
 - Juvenile chinook
- Herps
 - Foothill yellow-legged frog egg masses (April) and tadpoles (April-June)
 - 1,471 foothill yellow-legged frogs relocated upstream during fish passage restoration project



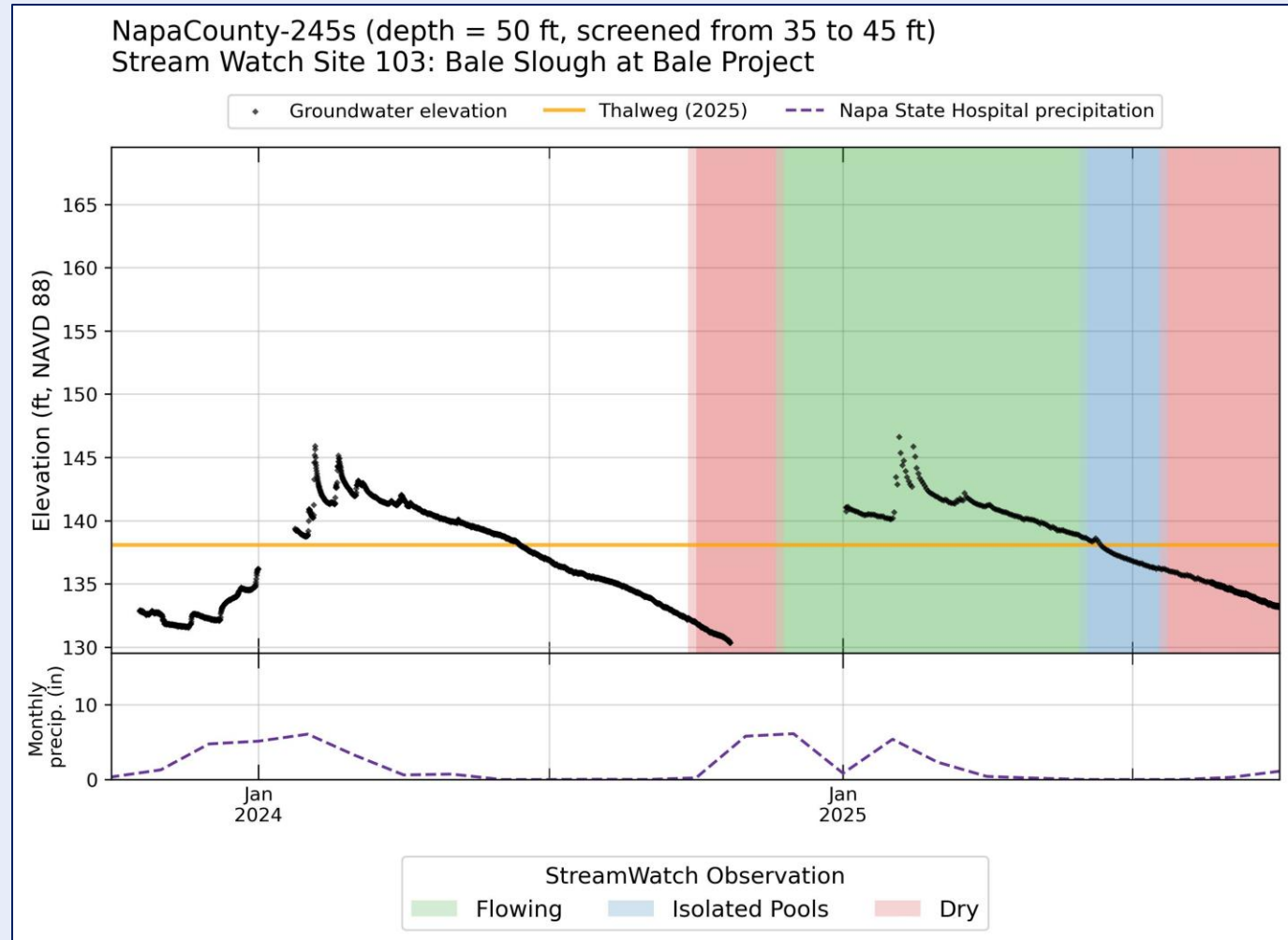
Bale Slough: Wet/Dry Mapping

- Dries from downstream to upstream
- Isolated pools in early June
- Mostly dry by July
- Restoration completed in 2023



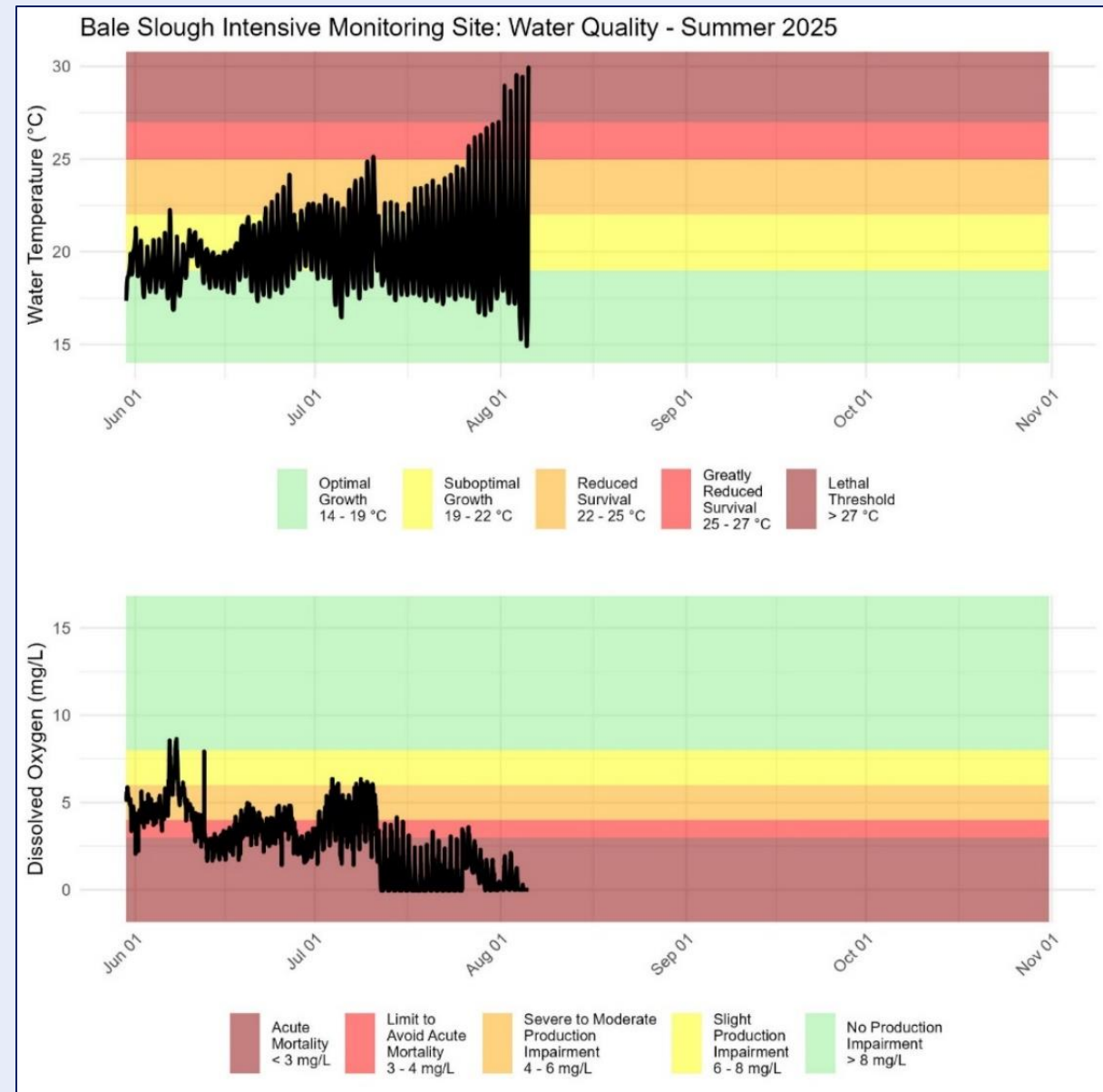
Bale Slough: Groundwater and Stream Watch

- Dried as water table fell below channel thalweg
- Likely groundwater dependent
- Only a few fish observations (likely migration reach)
- No special-status herps
- Beaver pond!



Bale Slough: Temperature and Dissolved Oxygen

- Temperature and DO somewhat suitable for steelhead in early June (several juvenile Chinook observed)
- Stressful temperature and DO otherwise
- Generally unsuitable habitat for salmonids



2026 Planned Surveys

RCD

- Dissolved oxygen and temperature sensors redeployed in April
- Habitat connectivity surveys (wet/dry mapping)
- Fish population surveys

Stillwater

- Birds (audio recorders deployed in March)
- Oak Knoll: herps; Bale Slough: herps, veg



ISW and GDE Workplan Goal: ...better understand the conditions required to protect and enhance healthy terrestrial and aquatic GDEs

Current Conditions:

- Juvenile steelhead abundant on Sulphur Creek
- Water temperature and dissolved oxygen stressful but slightly better in early summer
- 2024-2025 variability
 - More Chinook observed in 2025
 - June water quality slightly better in 2025: higher flows and cooler air temperature



ISW and GDE Workplan Goal: ...better understand the conditions required to protect and enhance healthy terrestrial and aquatic GDEs

In 2026:

- Periodic Evaluation will summarize 2024 and 2025 monitoring
- CEFF analysis will explore habitat requirements and flow-ecology relationships





Questions and Discussion
