

Evaluating Restoration Effectiveness: a Tidal Wetland Monitoring Framework for California's Sacramento-San Joaquin Delta



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Stacy Sherman

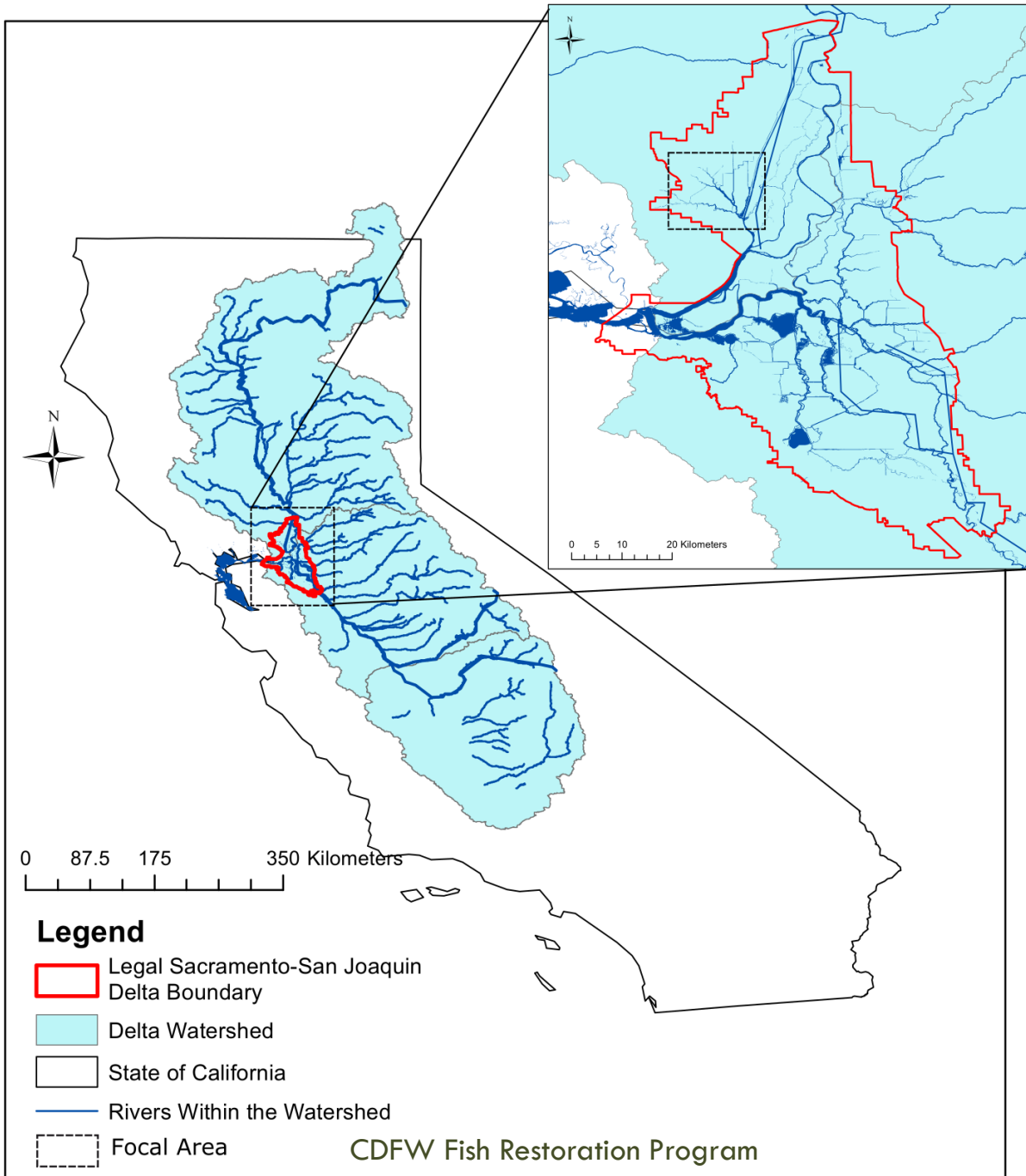
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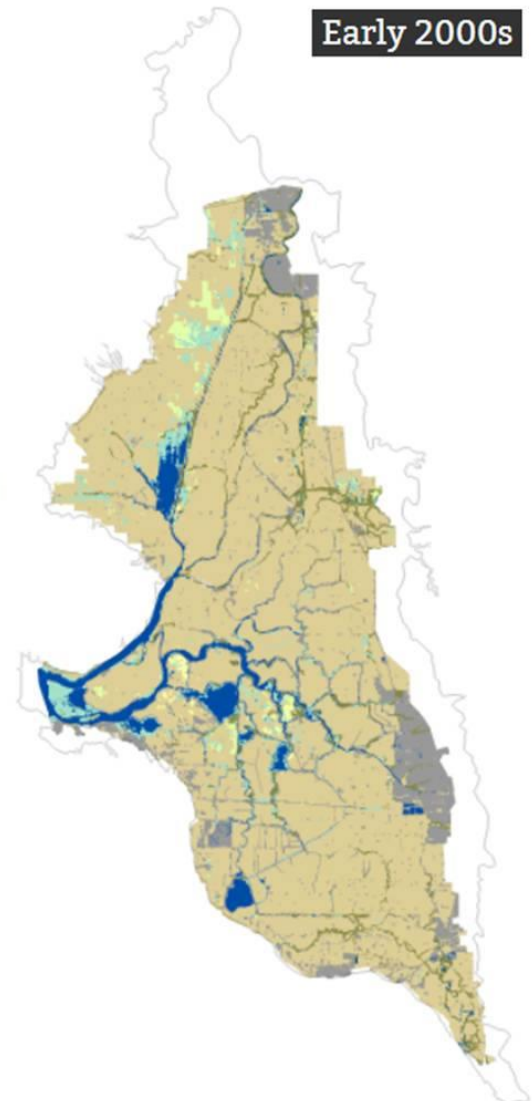
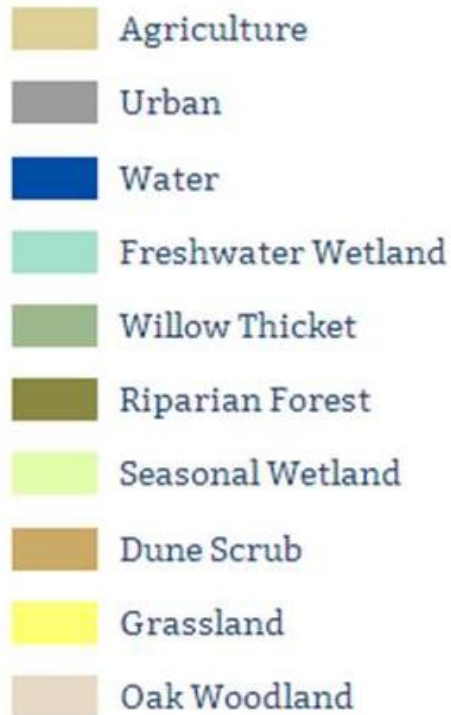
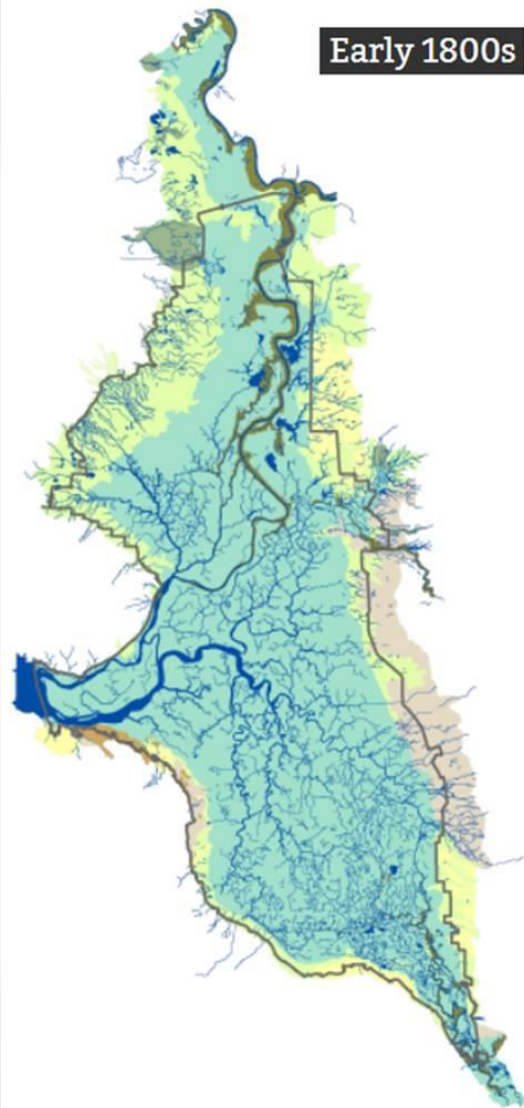
Fish Restoration Program Monitoring Team,
California Department of Fish and Wildlife

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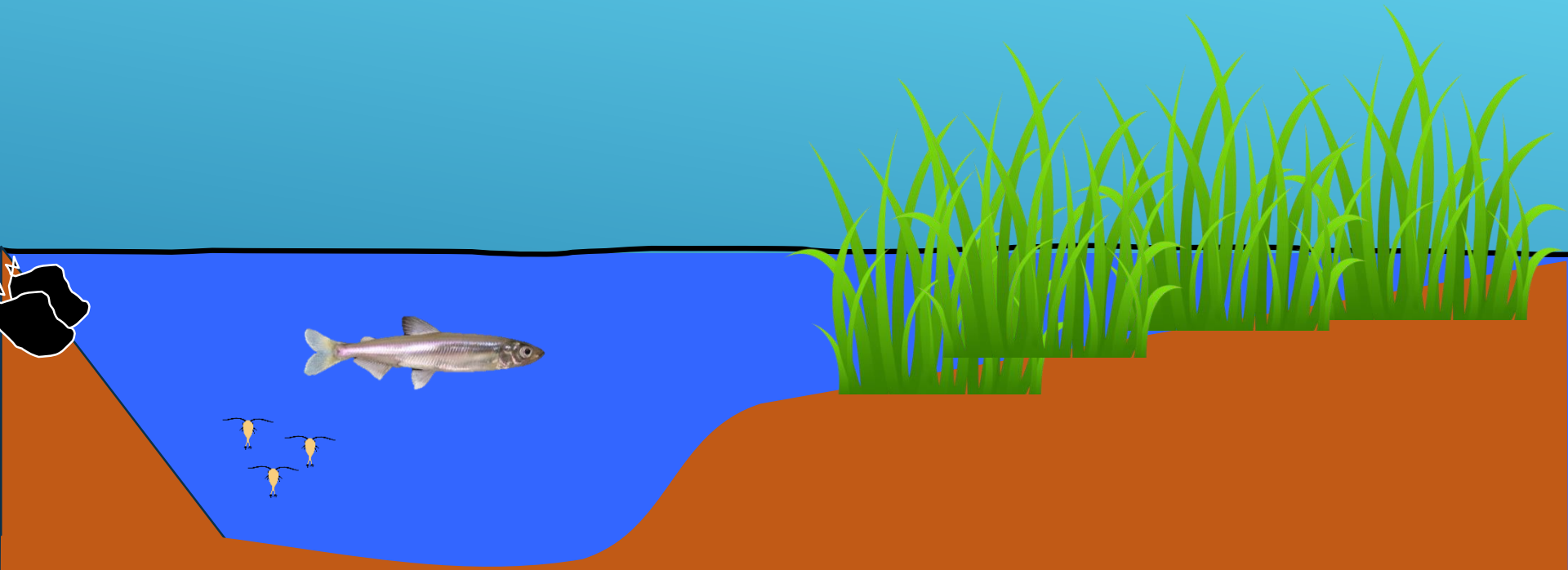
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THE DELTA SMELT



THE DELTA SMELT



Climate Change

Contaminants

Water Diversion

Habitat loss



Predation

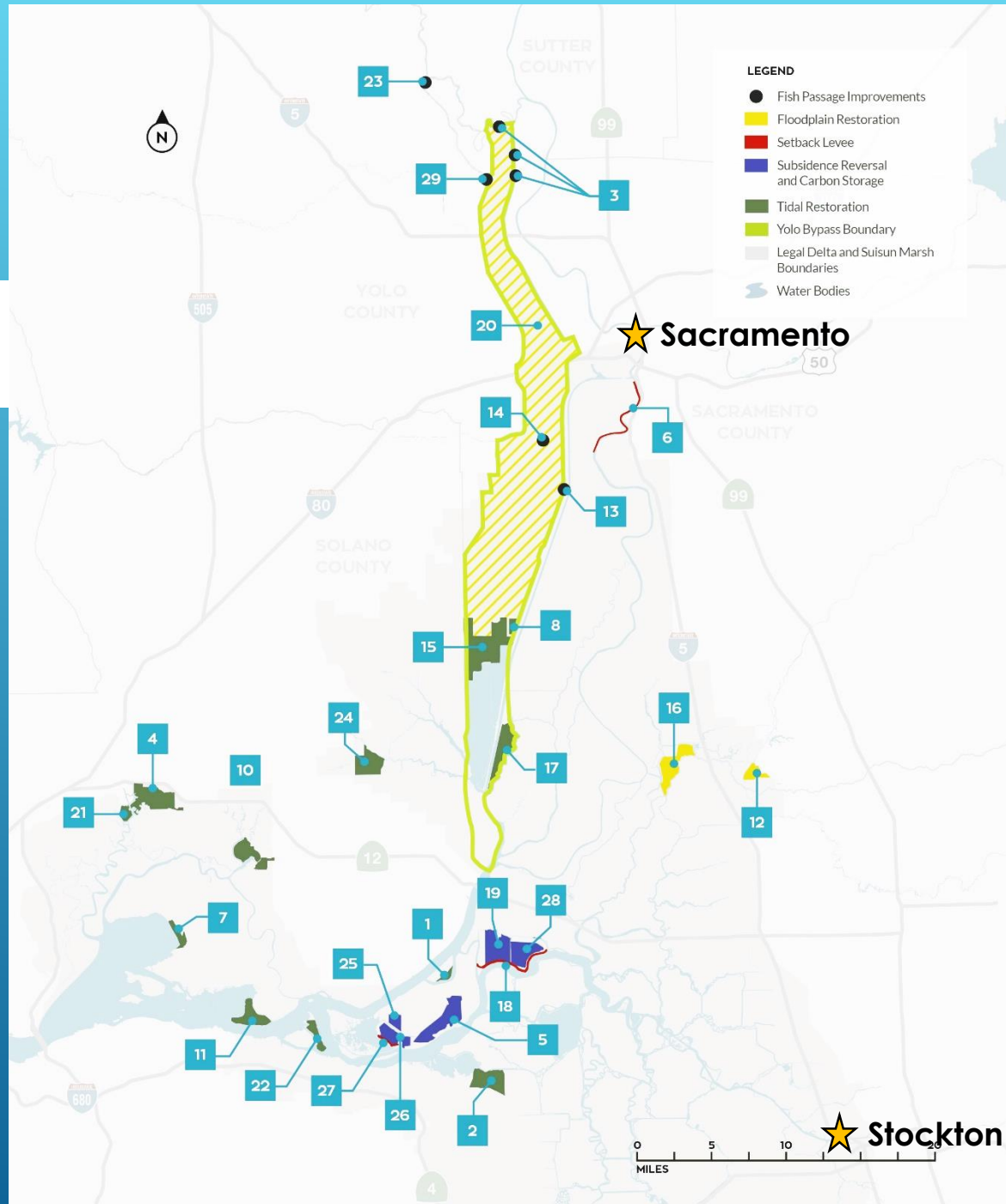
Food limitation

Invasive weeds

THE HOPE OF RESTORATION



CALIFORNIA
ECO RESTORE
A STRONGER DELTA ECOSYSTEM.



CDFW Fish Restoration Program

map from: <http://resources.ca.gov/ecorestore/>

TIDAL WETLAND BENEFITS

HYPOTHESES

Nutrients
Production

MHHW

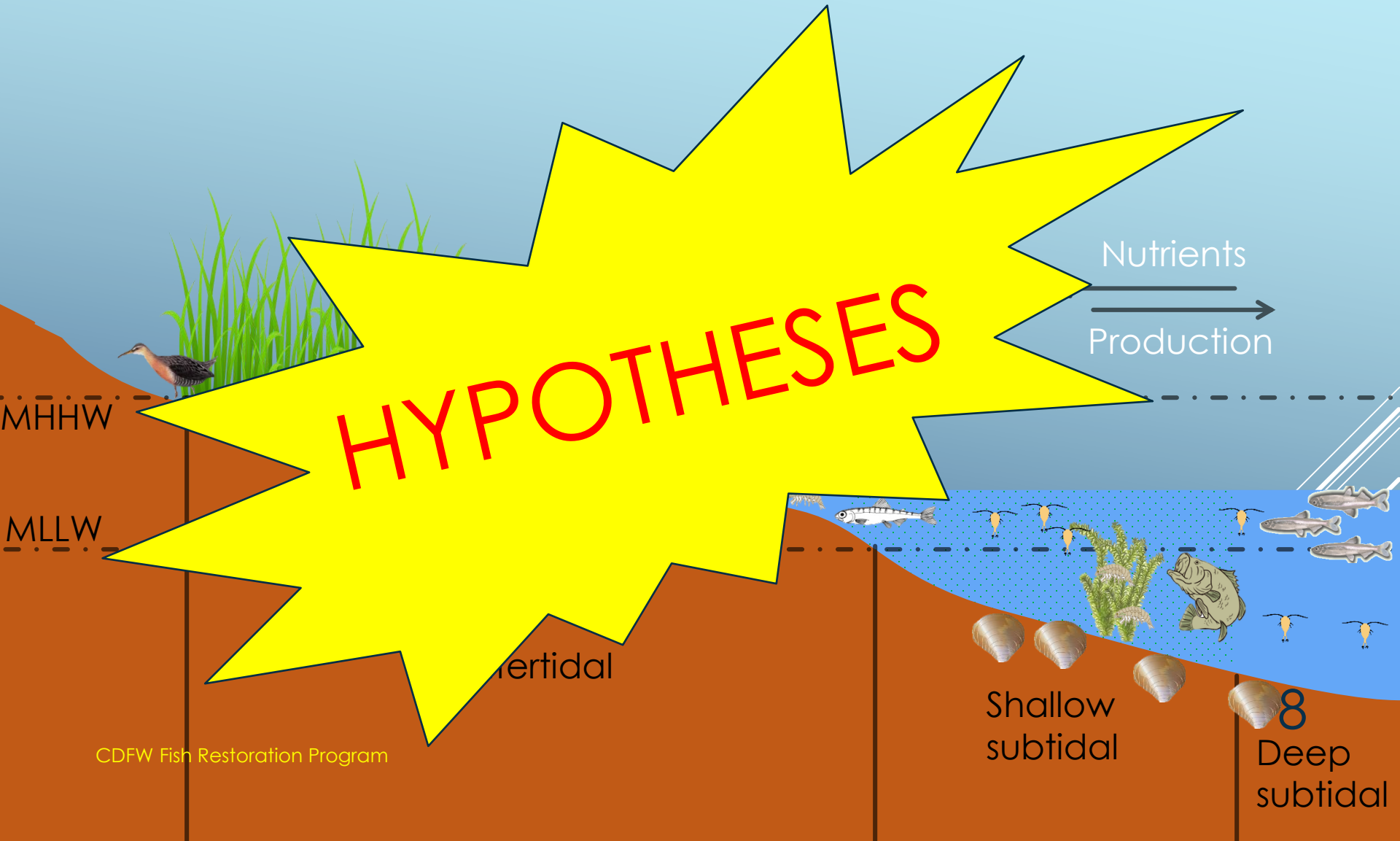
MLLW

Intertidal

Shallow
subtidal

8
Deep
subtidal

CDFW Fish Restoration Program



INTERAGENCY ECOLOGICAL PROGRAM





PROJECT WORK TEAM



Prospect Island
Restoration Project



Hill Slough
Restoration Project



Tule Red
Restoration Project

MONITORING FRAMEWORK

- ▶ Effectiveness
- ▶ Large scale
- ▶ Long term
- ▶ Comparable
- ▶ Fish centric

Monitoring plan guidance:

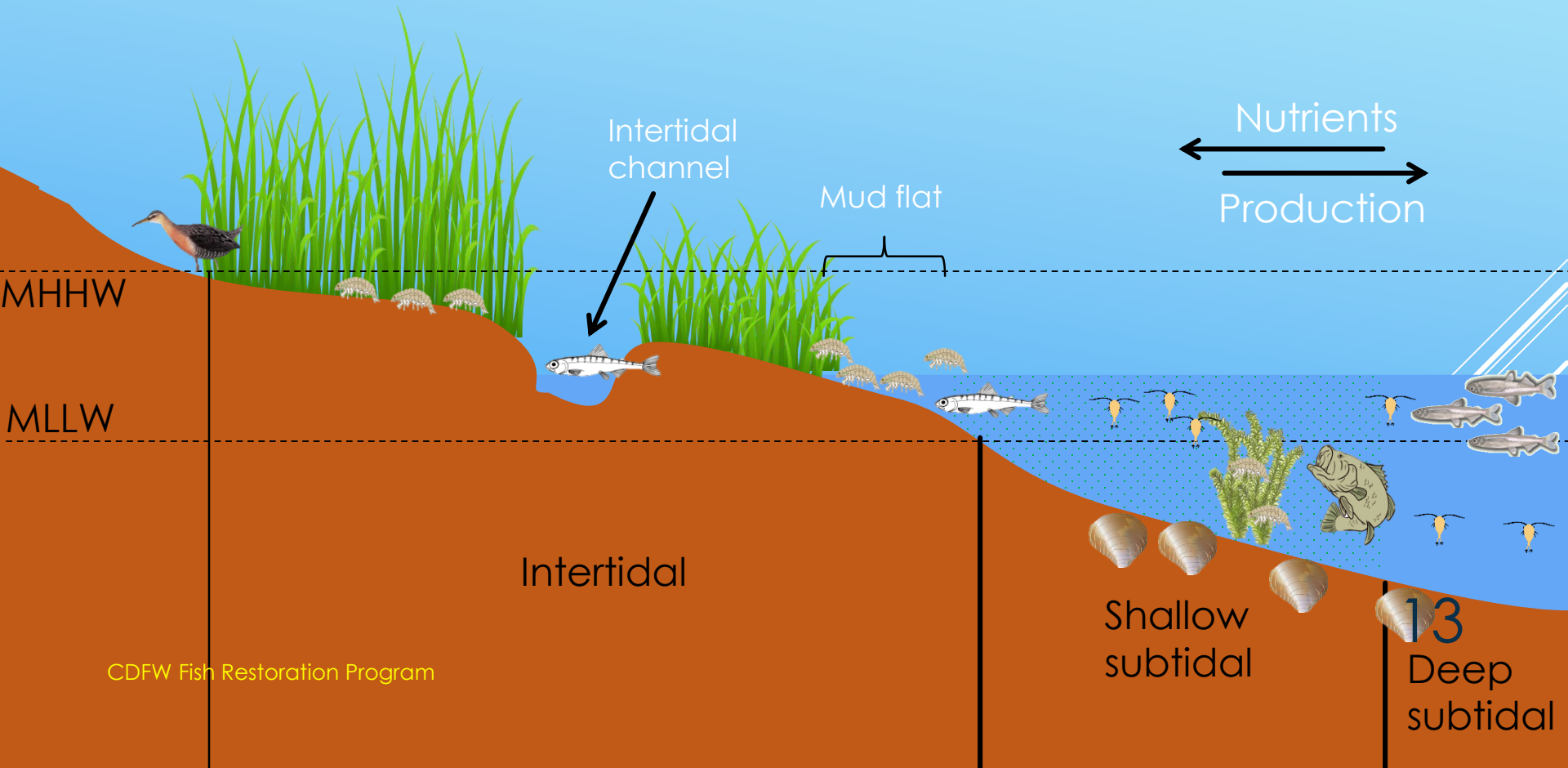
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SOPs

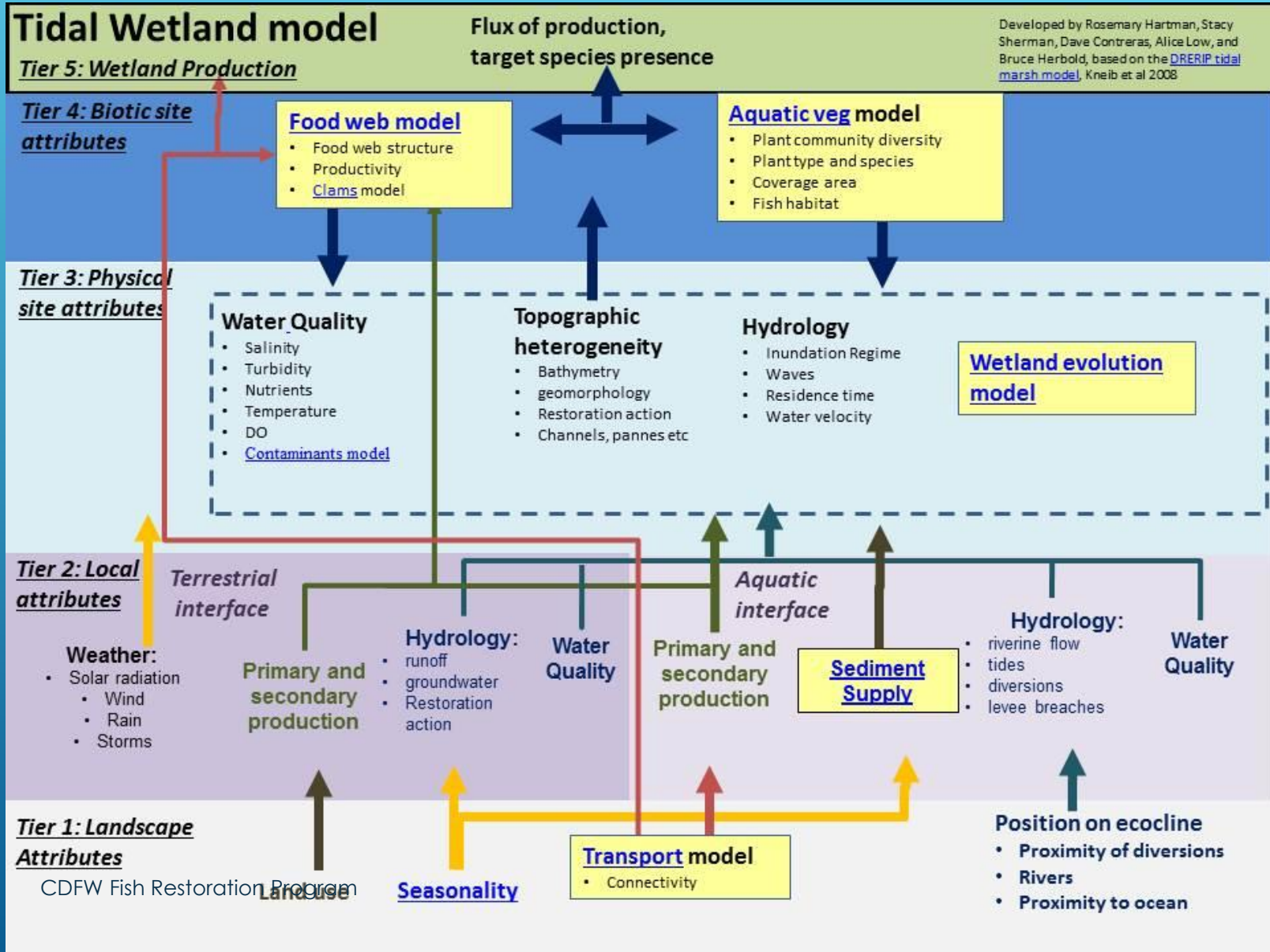
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CONCEPTUAL MODELS



CONCEPTUAL MODELS



DEFINED QUESTIONS AND HYPOTHESES

- ▶ Tidal wetlands are good for fish.
- ▶ The increase in amphipods caused by tidal wetland restoration will lead to increased body condition in juvenile salmonids.
- ▶ Tidal wetland restoration may increase contribution of wetland-associated invertebrates to the pelagic food web.

Too Big

Too Small

Just Right

MONITORING METRICS

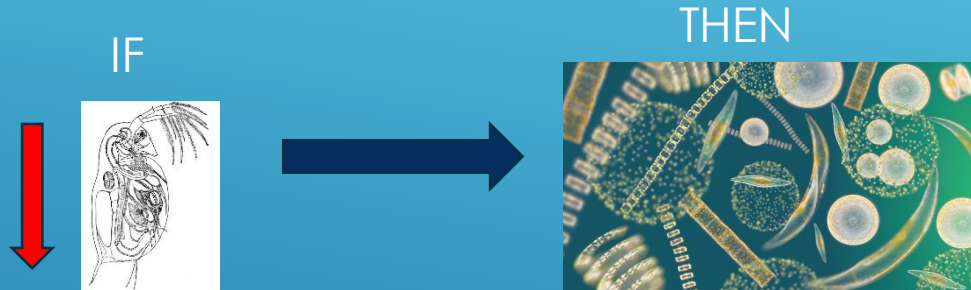


MONITORING METRICS

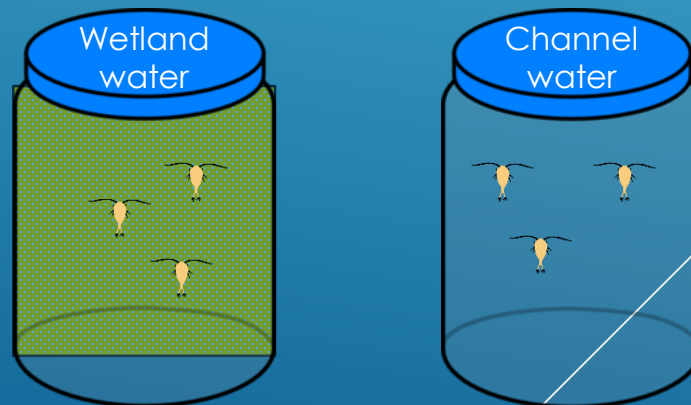
- Primary



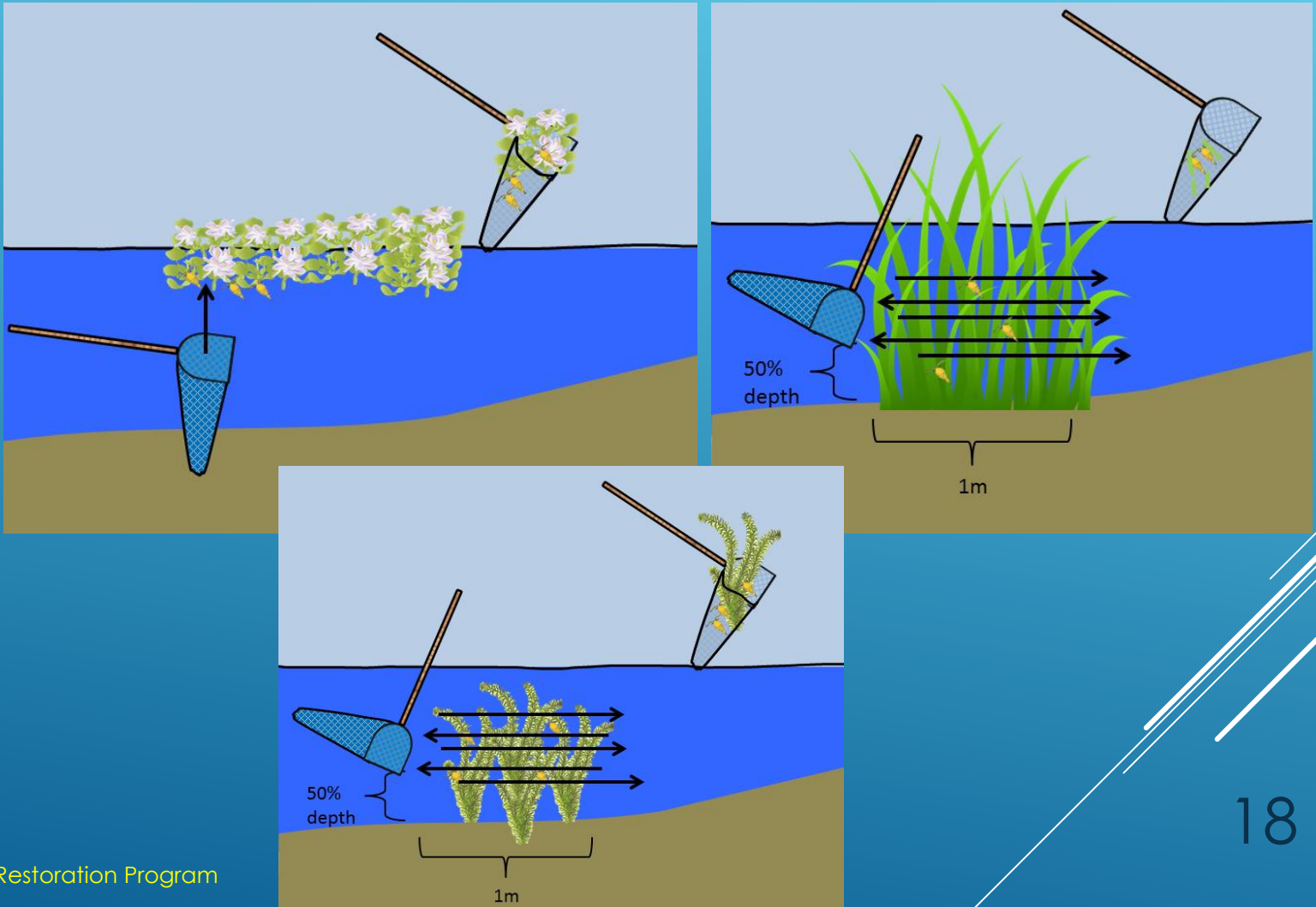
- Triggered



- Higher function/
special study



STANDARD METHODS

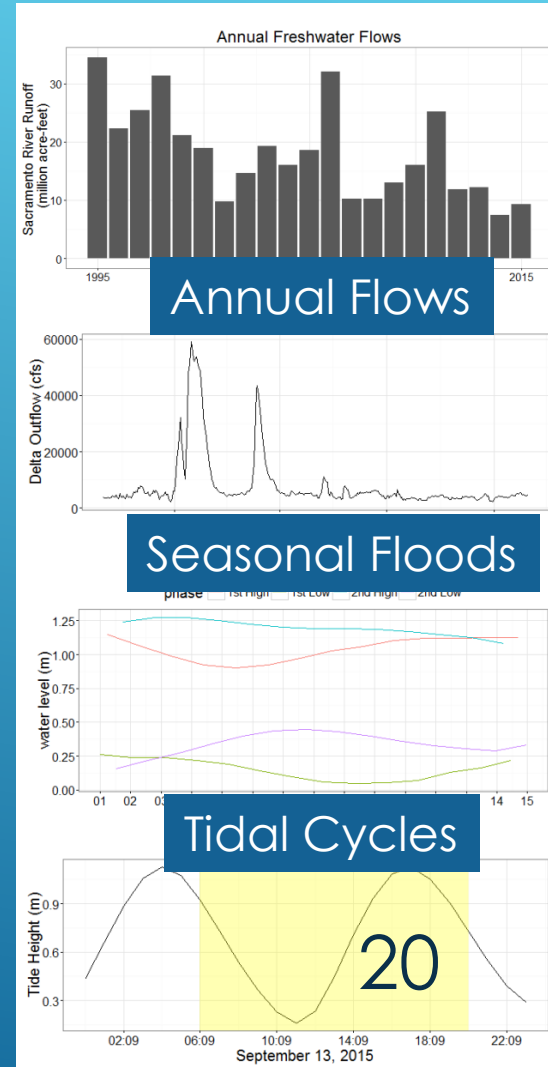
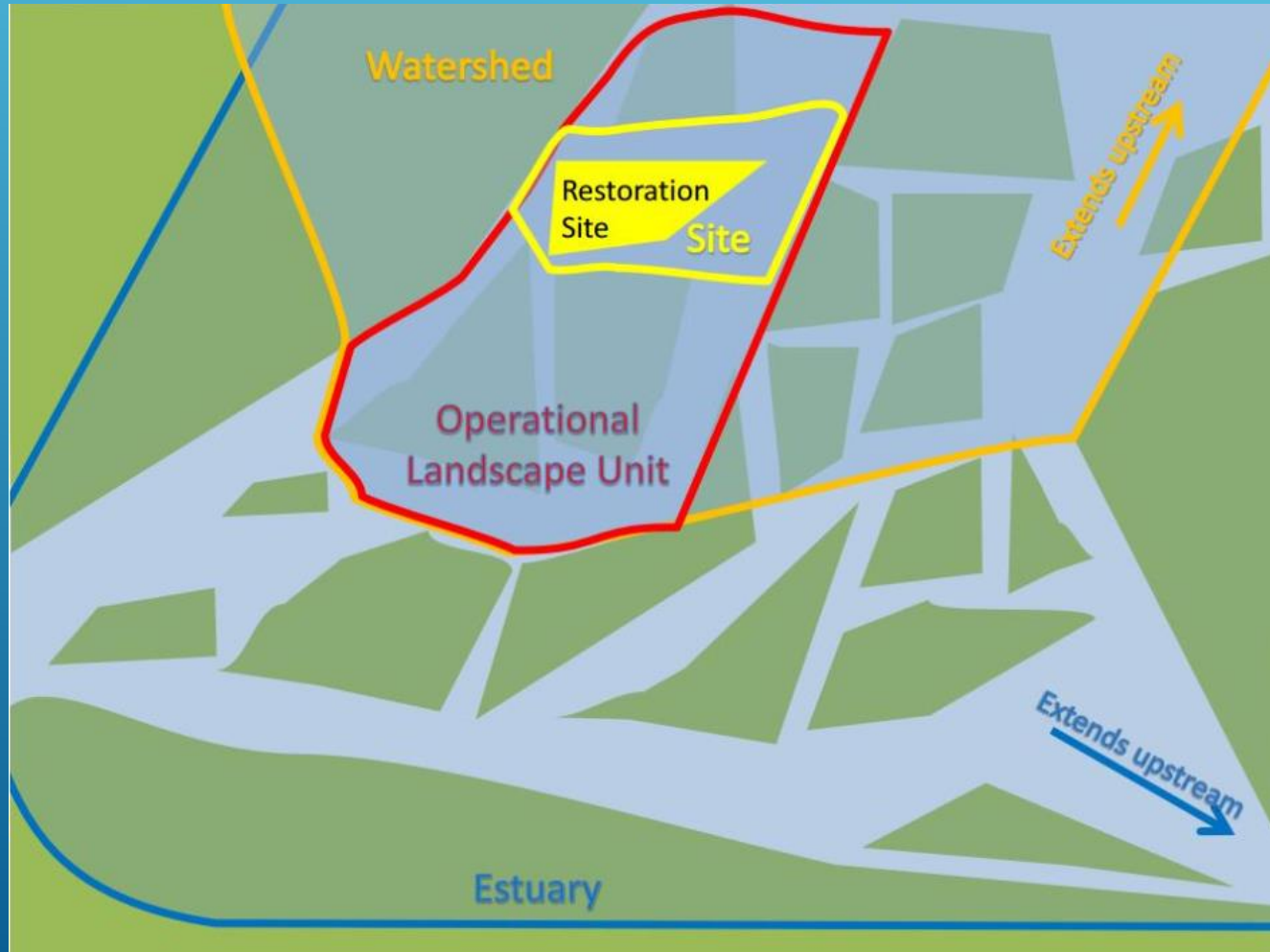


METHOD TRIALS

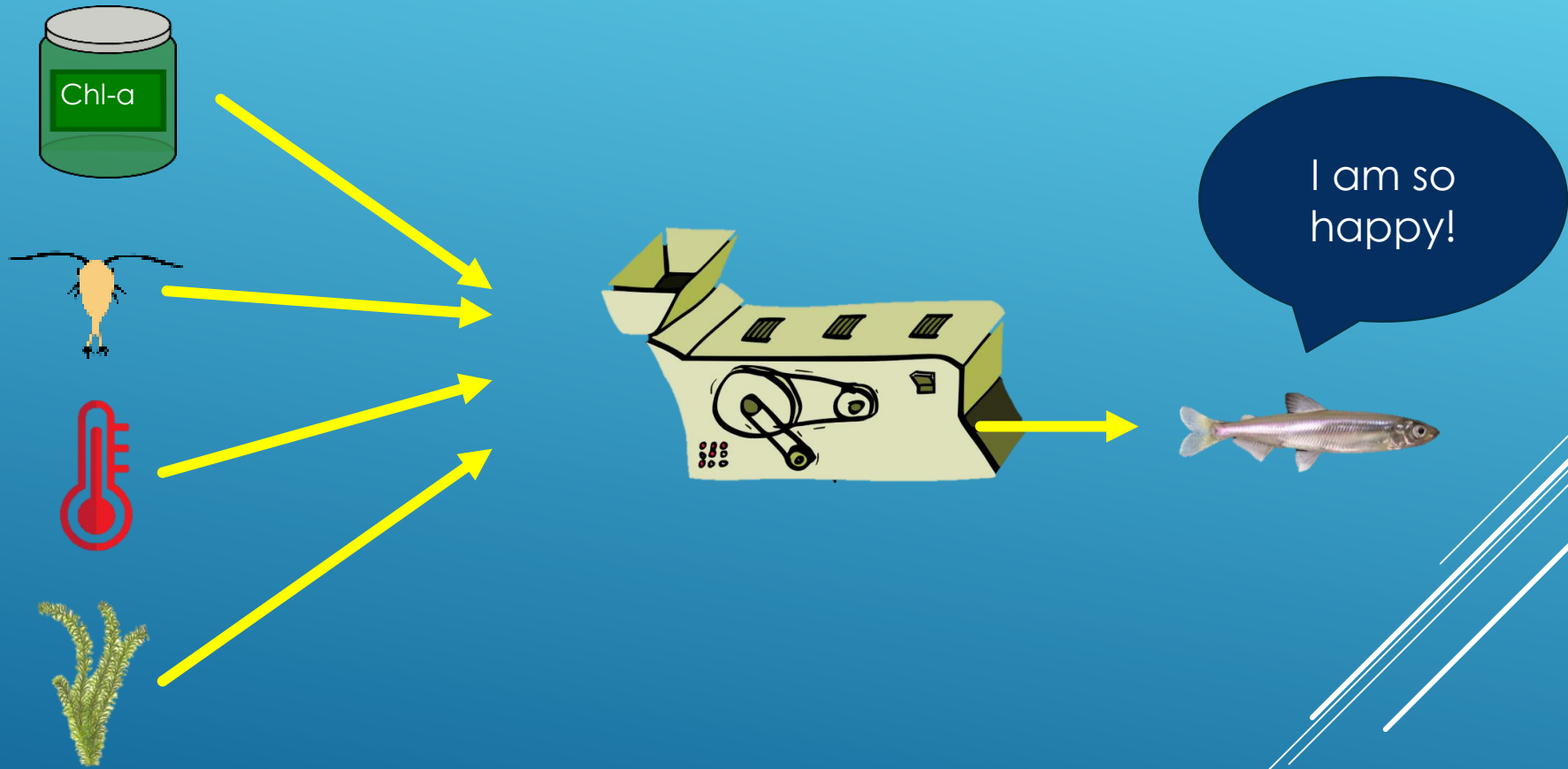


CONTEXT

Landscape

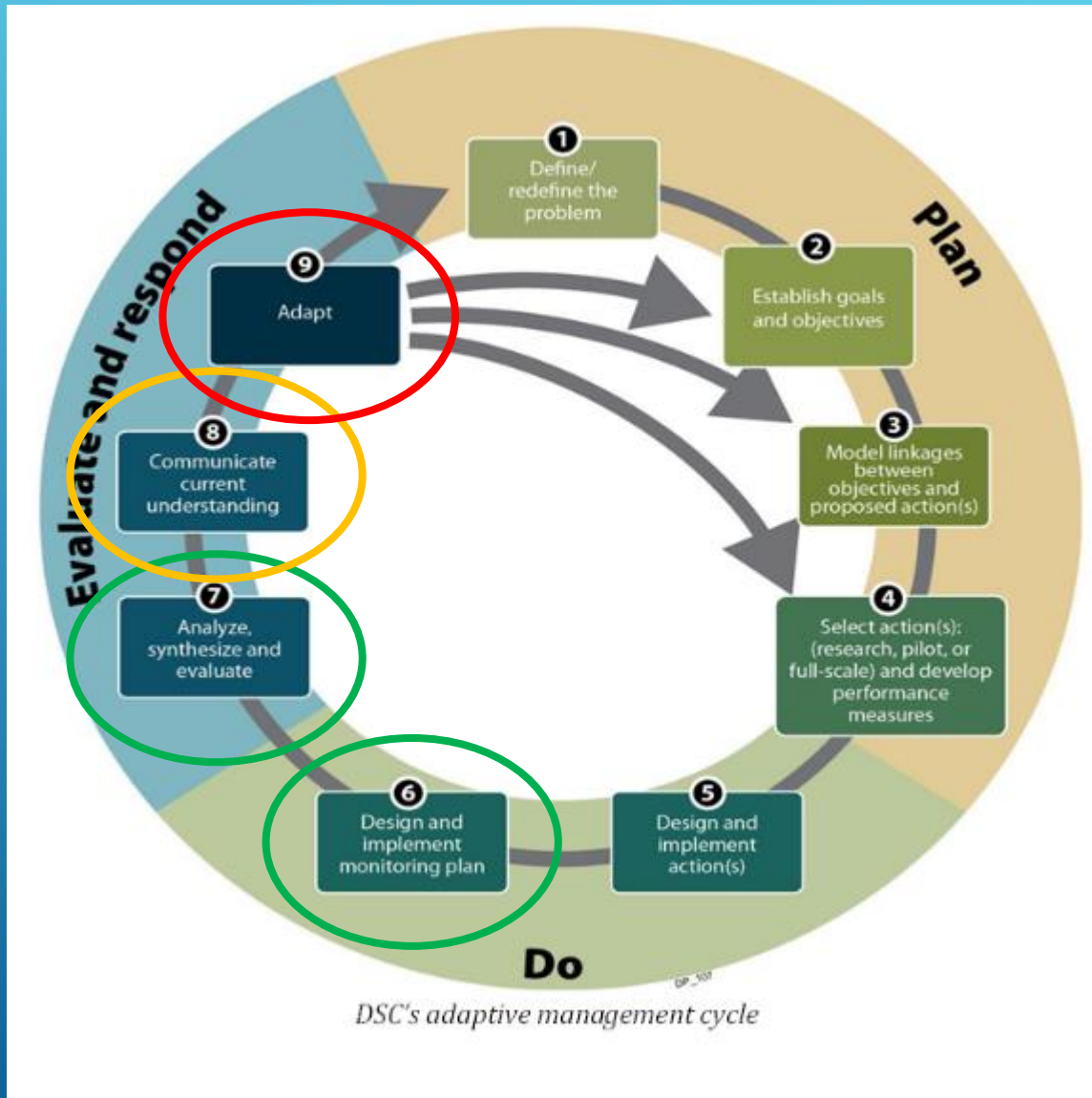


DATA ANALYSIS

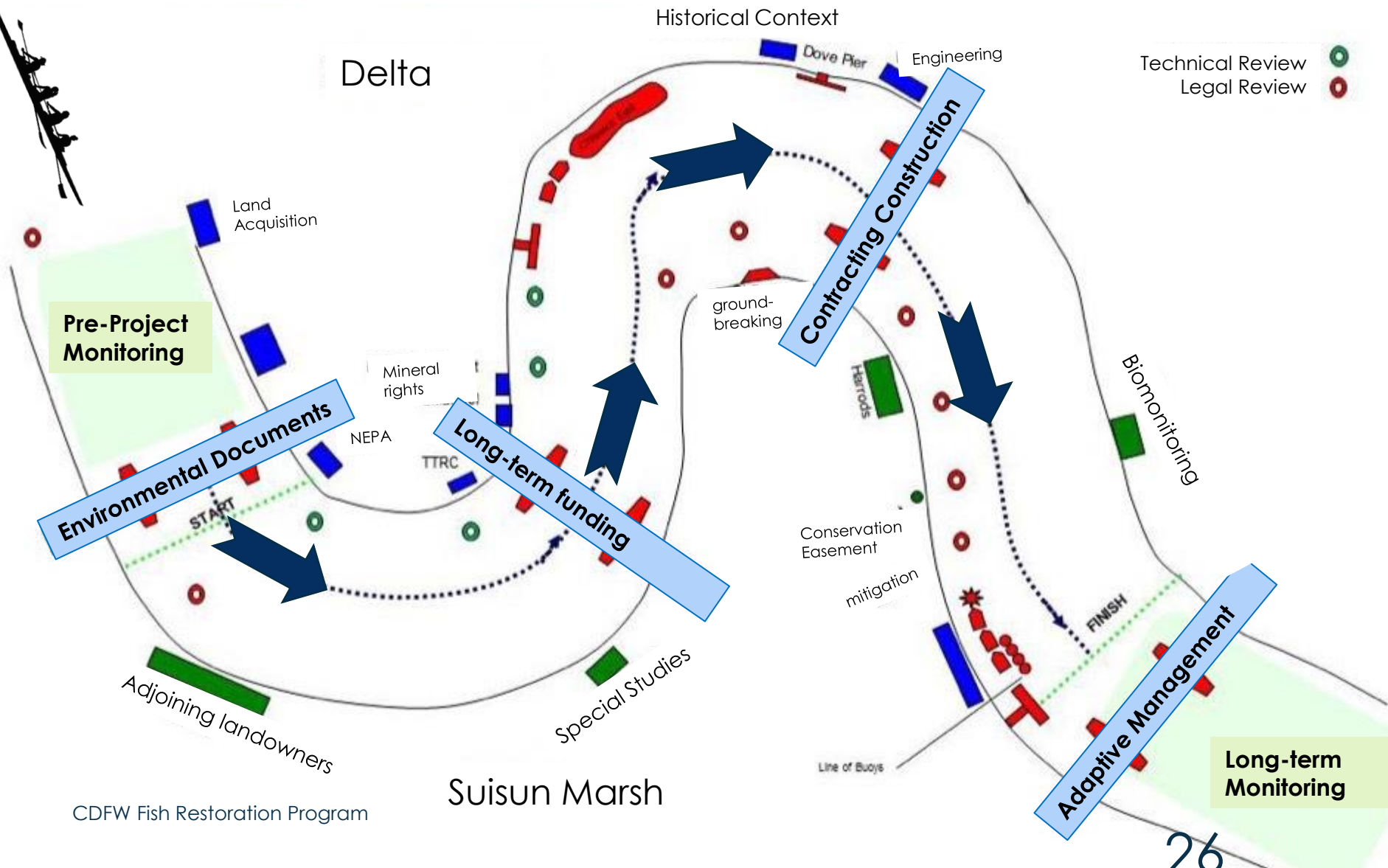


REACHING THE FINISH?

ADAPTIVE MANAGEMENT



Restoration Regatta – Can all of us make it to the finish?



- ▶ We would like to thank all the participants in the Interagency Ecological Program Tidal Wetlands Monitoring Project Work Team
- ▶ Funding for Fish Restoration Program provided by the CA Department of Water Resources State Water Project funds.
- ▶ Fish Restoration Program field and lab staff
- ▶ Stacy Sherman and Greg Erikson for assisting with out-of-state travel

ACKNOWLEDGEMENTS