Draft Biological Water Quality Objectives

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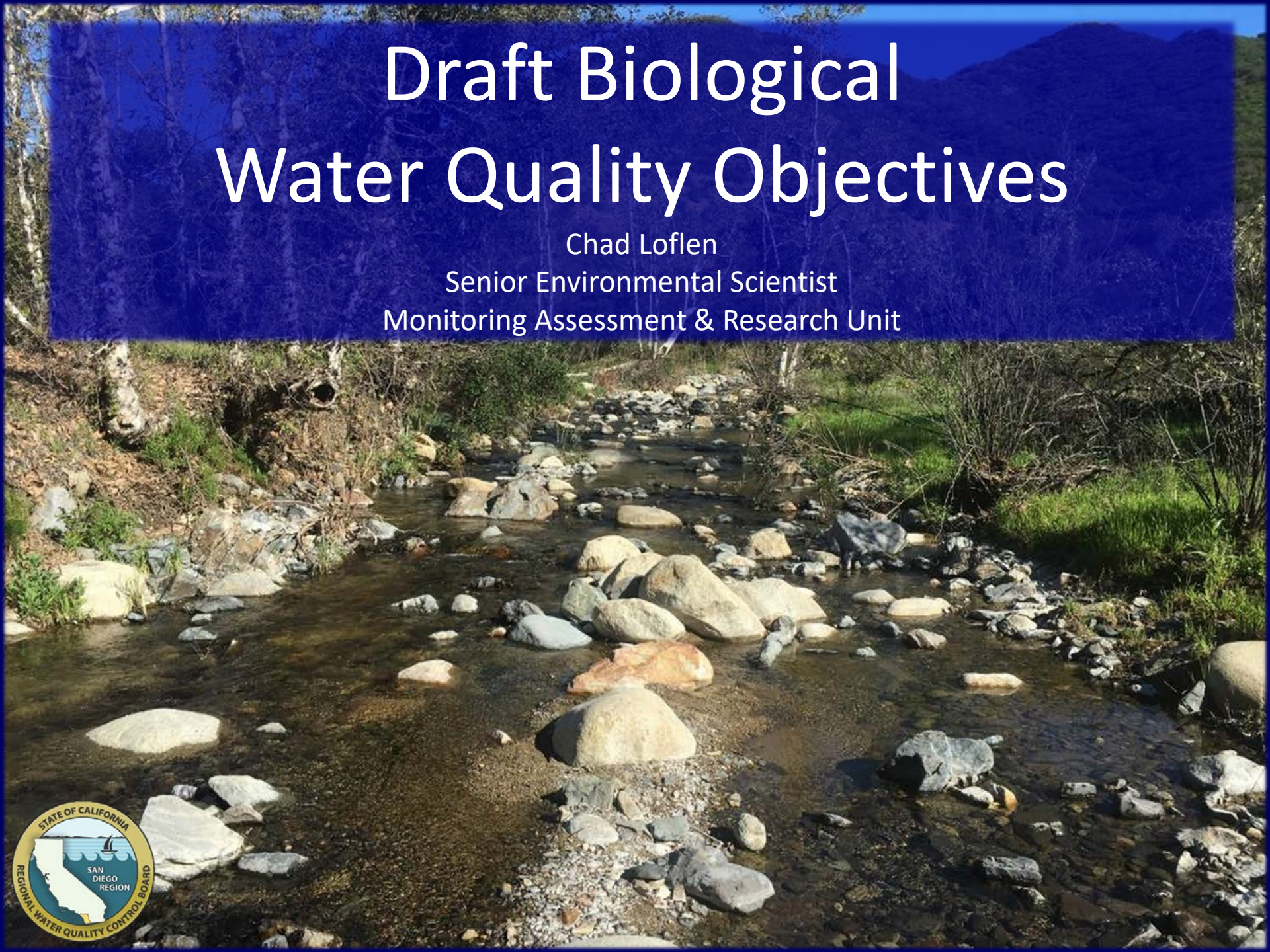


Project Goals:

- Protect High Quality Waters
- Guide Meaningful Restoration

Clean Water Act Objective

Protect and Restore the Physical, Chemical, and **Biological Integrity** of the Nation's Waters

Clean Water Act Objective

Beneficial Uses San Diego Streams:

"Includes uses of water that support warm/cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, **including invertebrates**."

Biological Beneficial Uses Need Biological Water Quality Objectives

Today:

- Water Quality Objective
- Program for Implementation

Today:

- Water Quality Objective = Protects Beneficial Use
- Program for Implementation = How the Objective is Applied

Biological Objective:
Reference Approach

- *Overall Narrative Objective*
- *Numeric Objective "Translators"*

Narrative Objective:

Surface waters within the San Diego Region shall support an ecologically balanced and resilient community of organisms having a native species composition, diversity, abundance, and functional organization commensurate with that of unaltered analogous waters.

Biological Objective:
Numeric Translators for Streams

California Stream Condition Index (CSCI)

2016. *Freshwater Science* 35(1): 237-248

Evaluating the adequacy of a reference-site pool for ecological assessments in environmentally complex regions

Peter R. Ode[1,7], Andrew C. Rehn[1,8], Raphael D. Mazor[1,2,9], Kenneth C. Schiff[2,10], Eric D. Stein[2,11], Jason T. May[3,12], Larry R. Brown[3,13], David B. Herbst[4,14], David Gillett[2,15], Kevin Lunde[5,16], and Charles P. Hawkins[6,17]

2016. *Freshwater Science* 35(1): 249-271

Bioassessment in complex environments: designing an index for consistent meaning in different settings

Raphael D. Mazor[1,2,5], Andrew C. Rehn[2,6], Peter R. Ode[2,7], Mark Engeln[1,8], Kenneth C. Schiff[1,9], Eric D. Stein[1,10], David J. Gillett[1,11], David B. Herbst[3,12], and Charles P. Hawkins[4,13]

CSCI

EXPECTED

LOCATION

CLIMATE

GEOLOGY

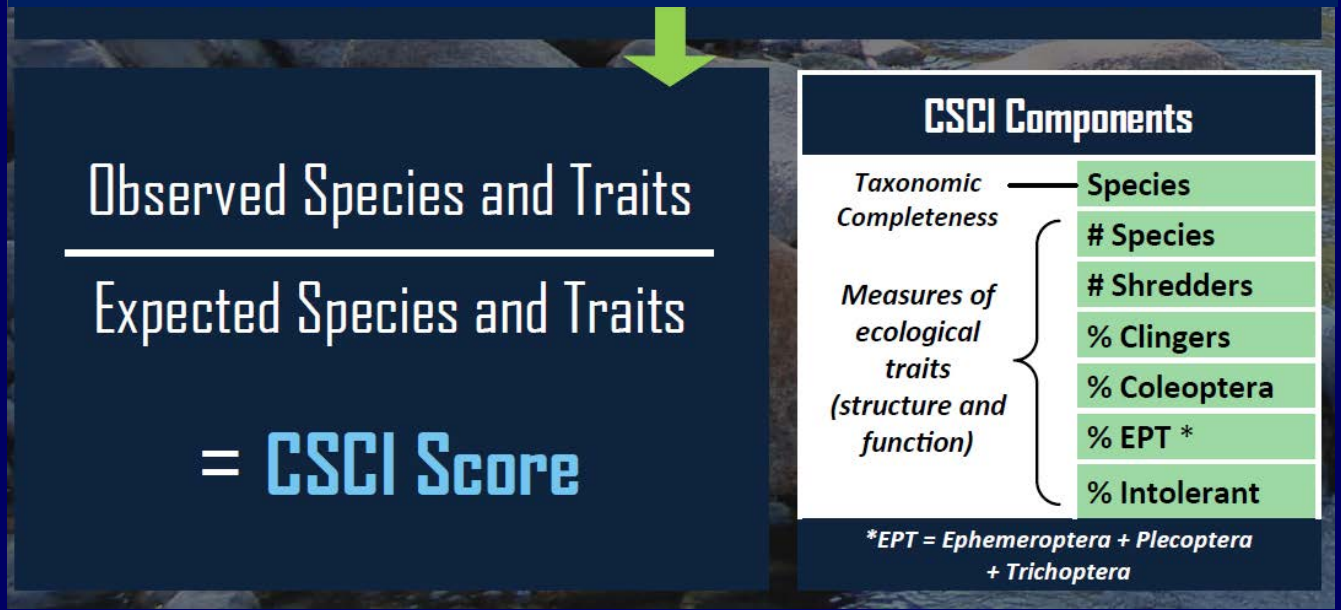
WATERSHED SIZE

CSCI

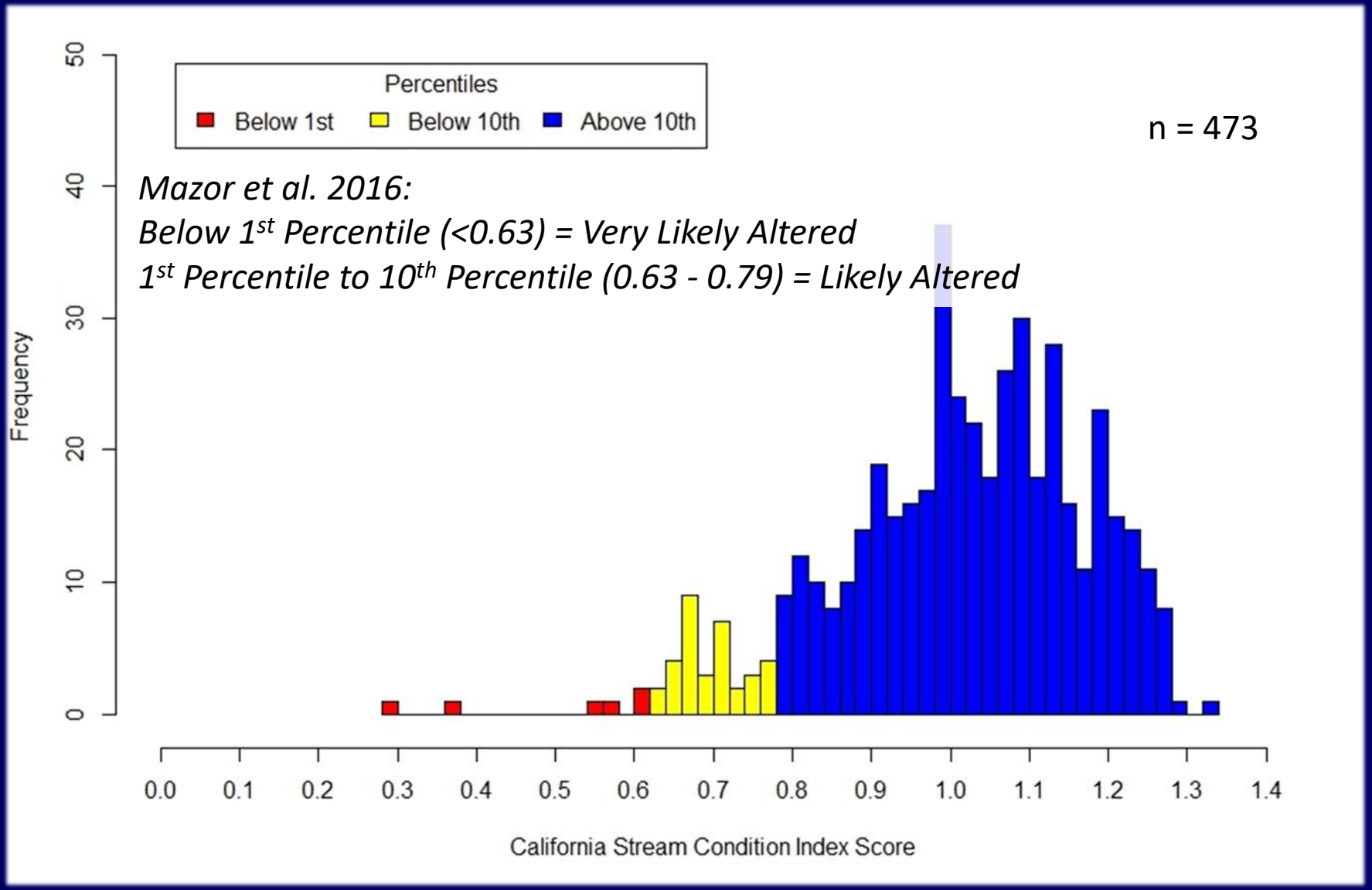
OBSERVED

The site is sampled and species are identified in the lab.

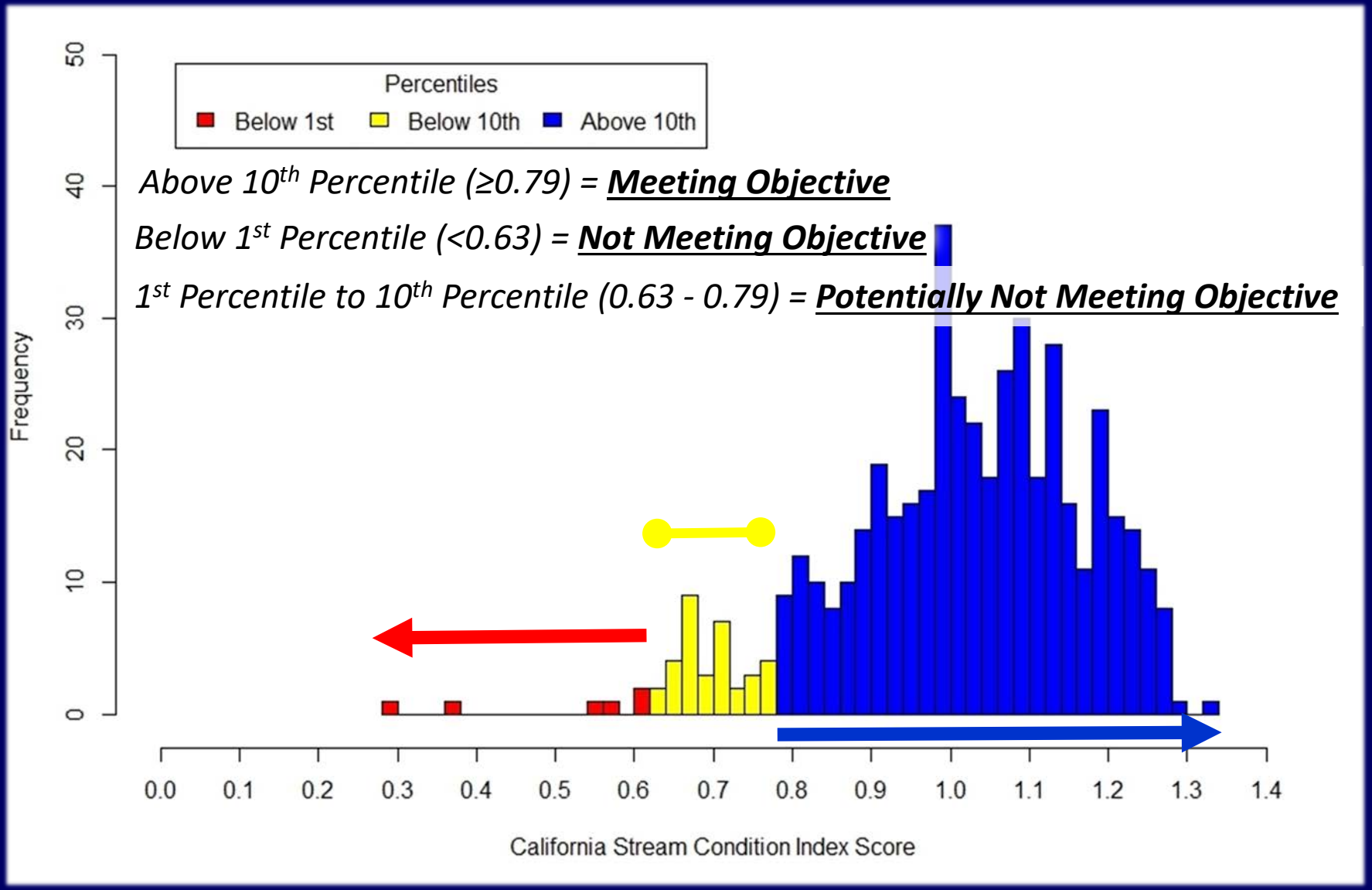
CSCI


Observed Species and Traits
Expected Species and Traits
= CSCI Score
CSCI Components
Taxonomic Completeness
Species
Measures of ecological traits (structure and function)
Species
Shredders
% Clingers
% Coleoptera
% EPT *
% Intolerant
*EPT = Ephemeroptera + Plecoptera + Trichoptera

CSCI Score: Percentile of Reference



CSCI Score: Biological Objective



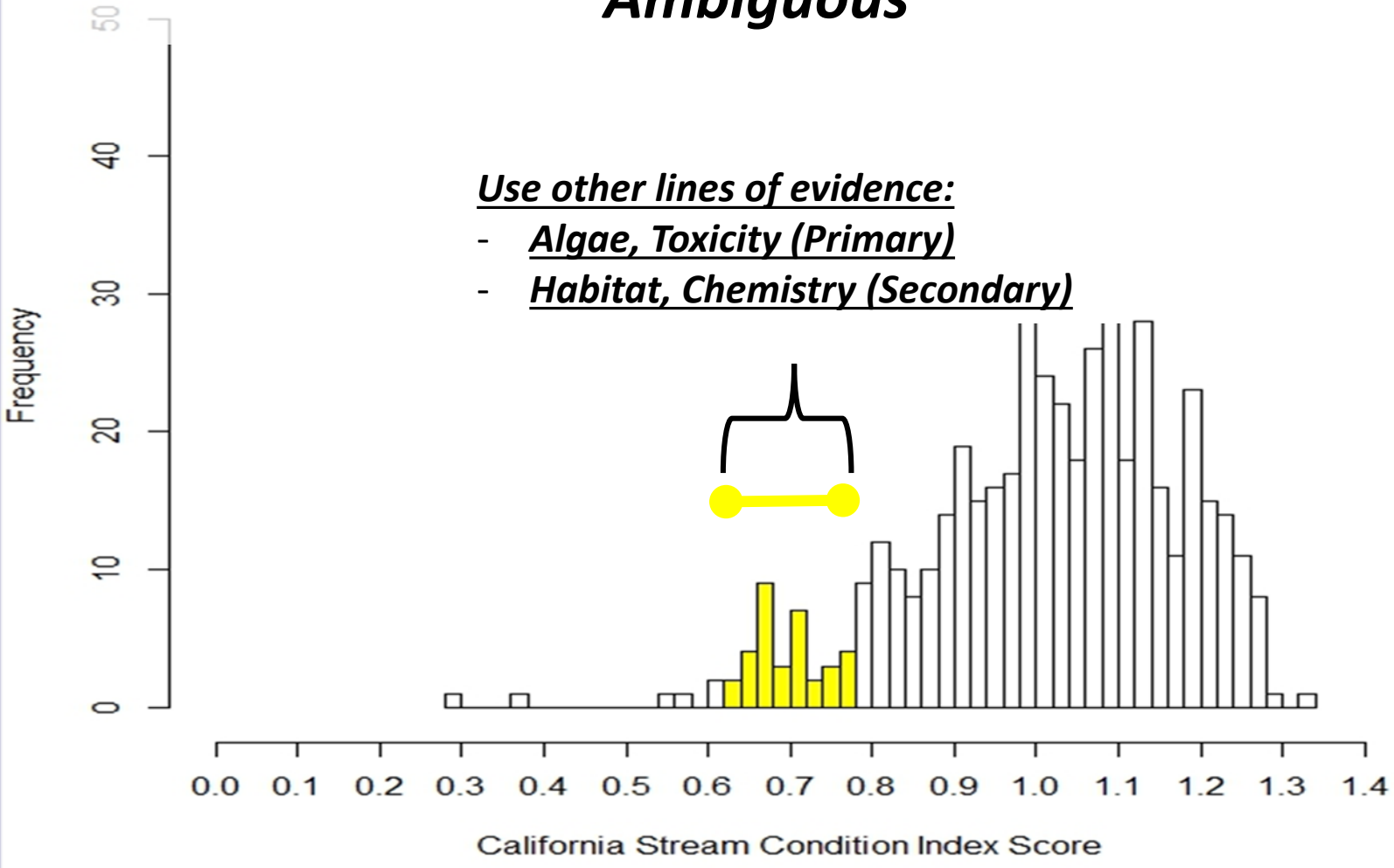
CSCI Score: Biological Objective

1st Percentile to 10th Percentile (0.63 - 0.79) = ***Potentially Not Meeting Objective***

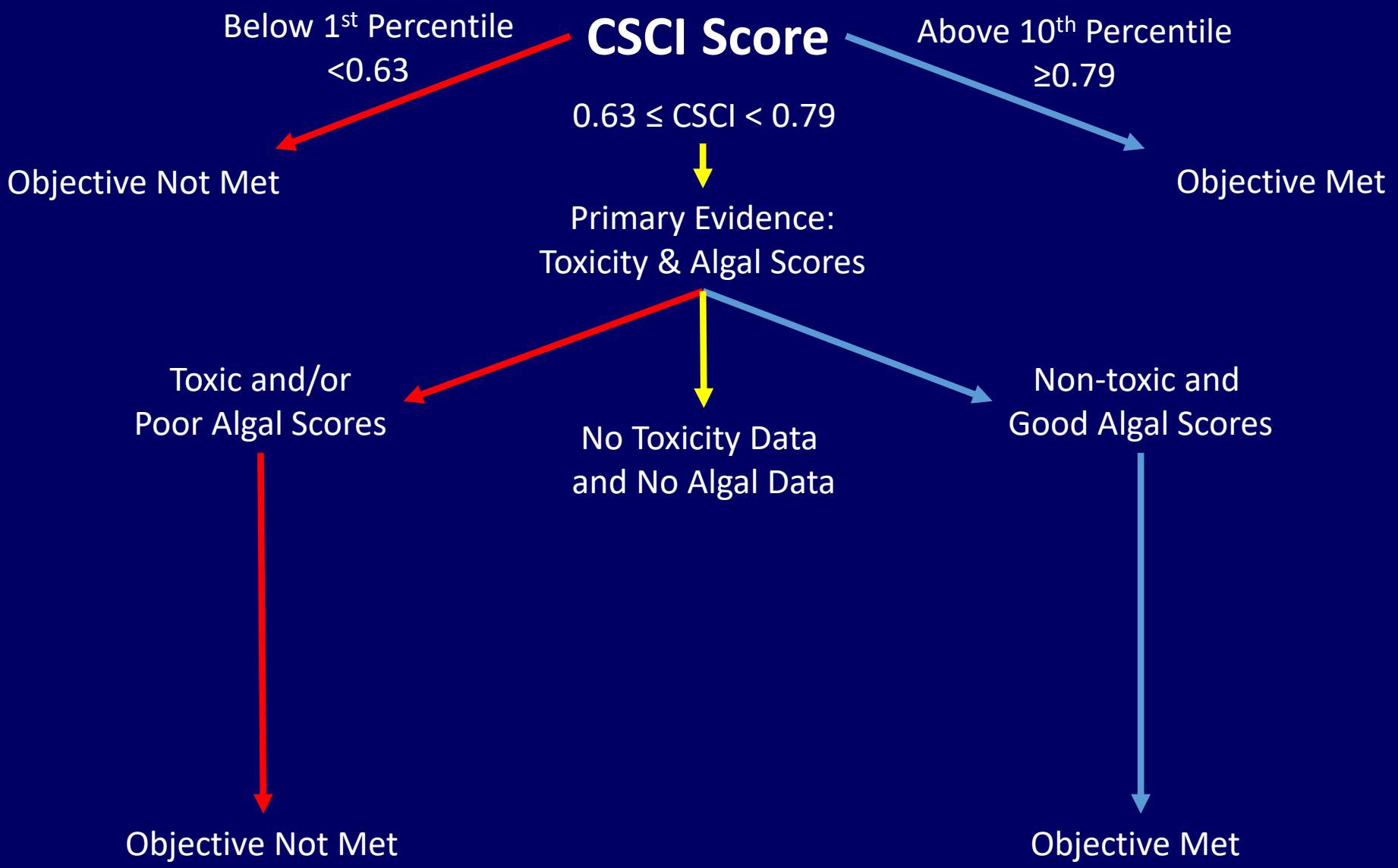
"Ambiguous"

Use other lines of evidence:

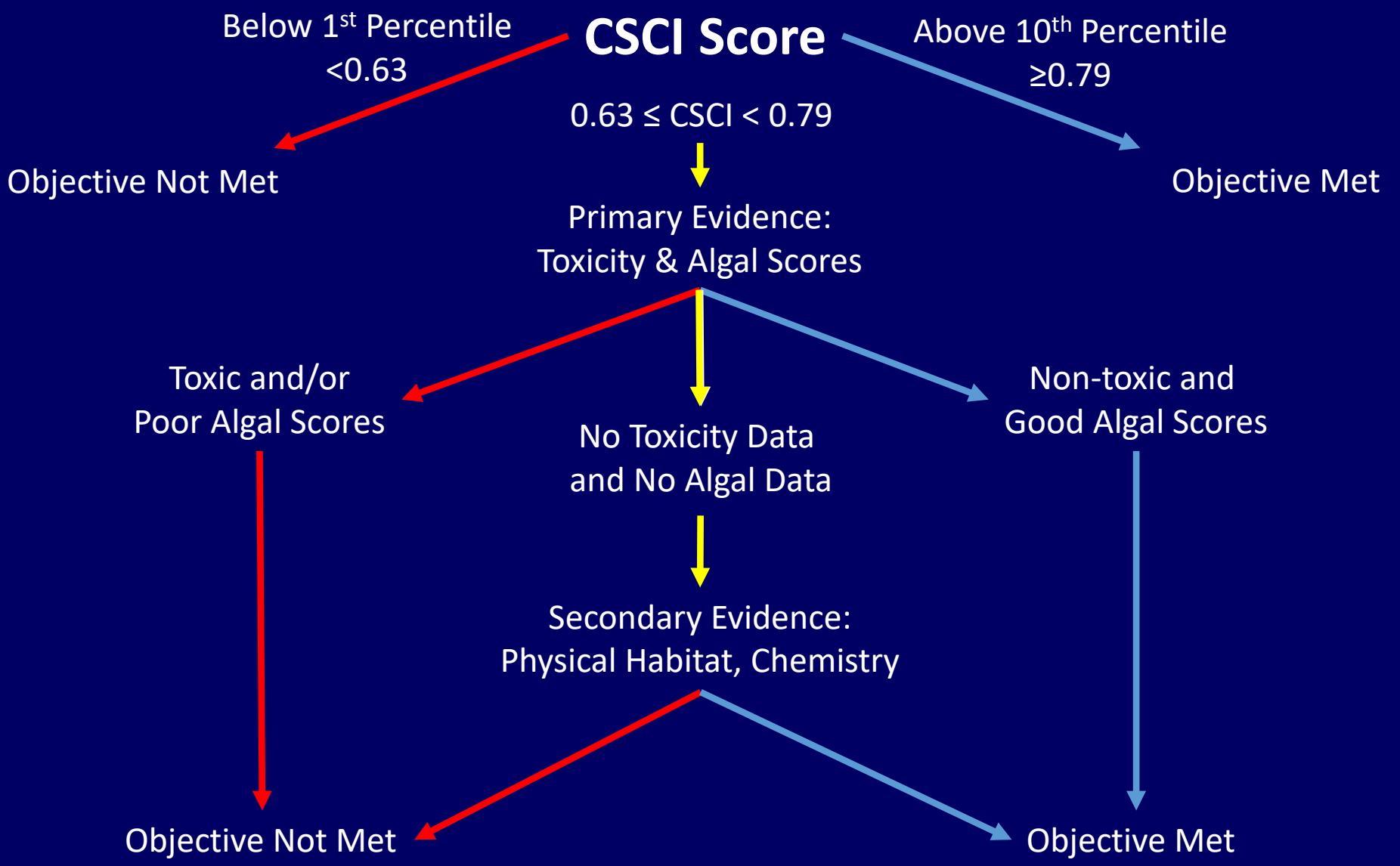
- ***Algae, Toxicity (Primary)***
- ***Habitat, Chemistry (Secondary)***



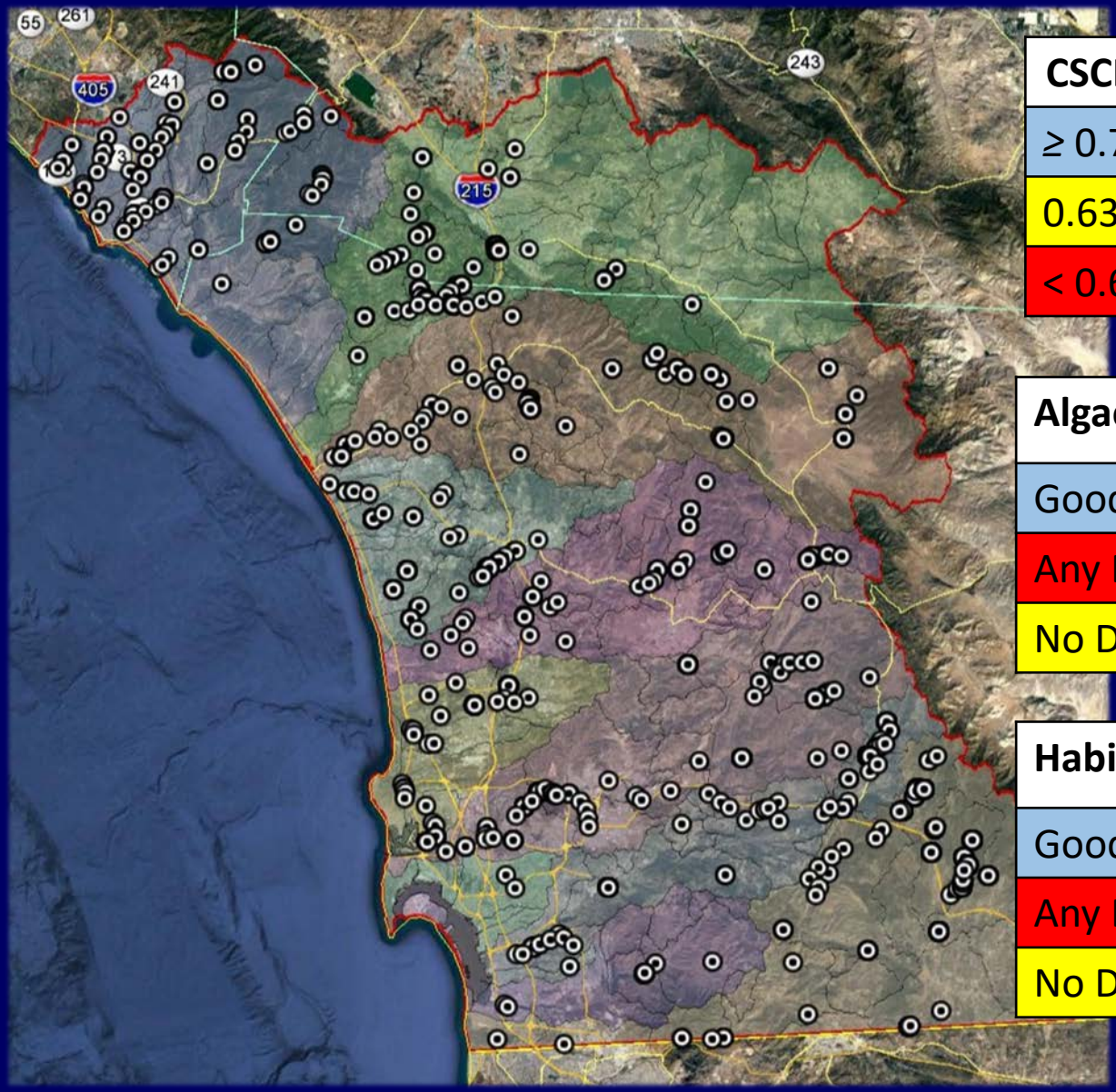
Biological Objectives: Walkthrough



Biological Objectives: Walkthrough



Bioassessment: 1,300+ samples at 400+ sites



CSCI Score	Objective Met?
≥ 0.79	Yes
0.63-0.79	Ambiguous: Next Table
< 0.63	No

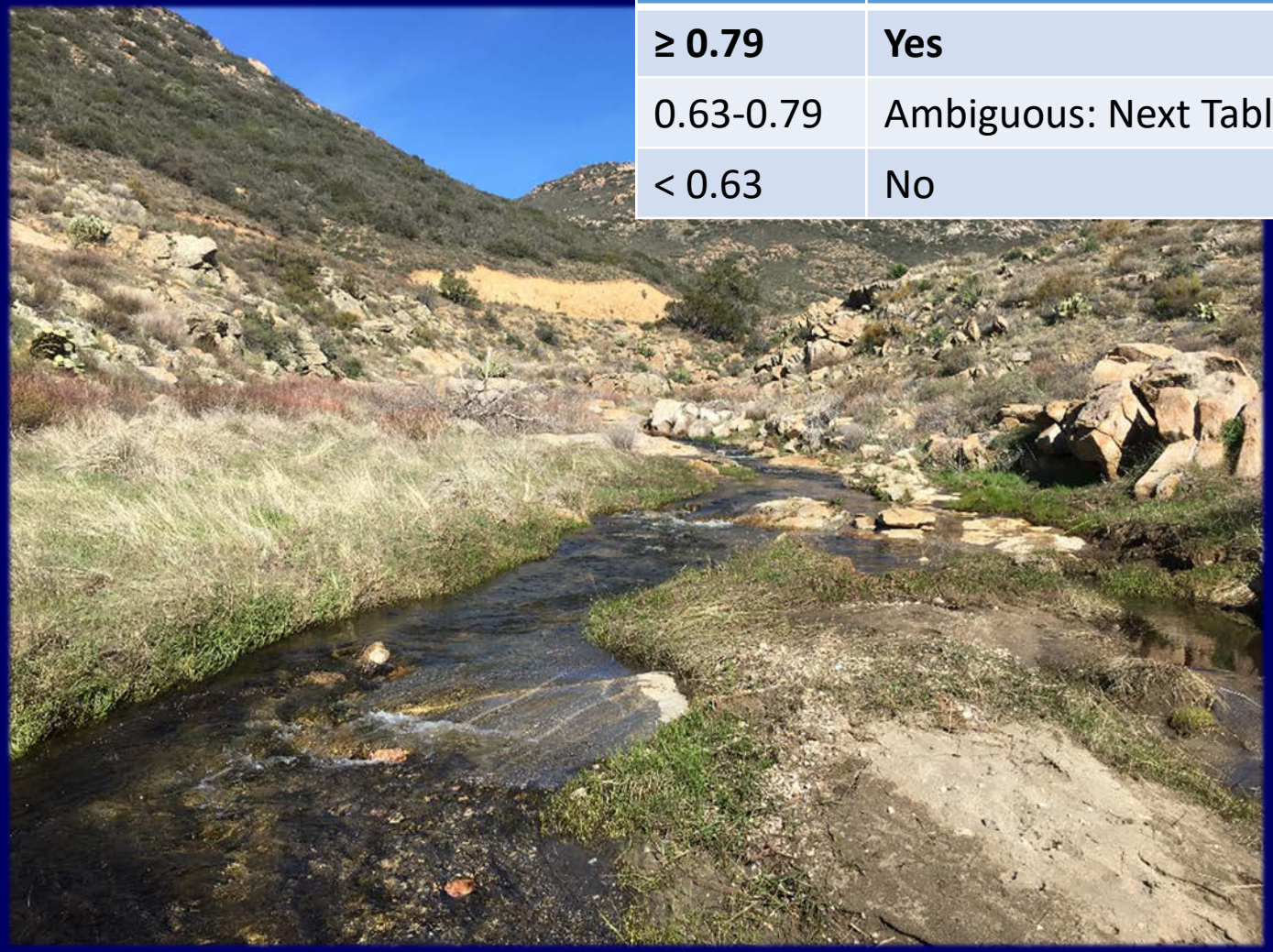
Algae/Toxicity	Objective
Good	Yes
Any Bad	No
No Data	Next Table

Habitat/Chemistry	Objective Met?
Good	Yes
Any Bad	No
No Data	Inconclusive

CSCI Score: Objective Met?

CSCI Scores:
0.95
0.96
0.98
0.96

CSCI Score	Objective Met?
≥ 0.79	**Yes**
0.63-0.79	Ambiguous: Next Table
< 0.63	No



CSCI Score: Objective Met?

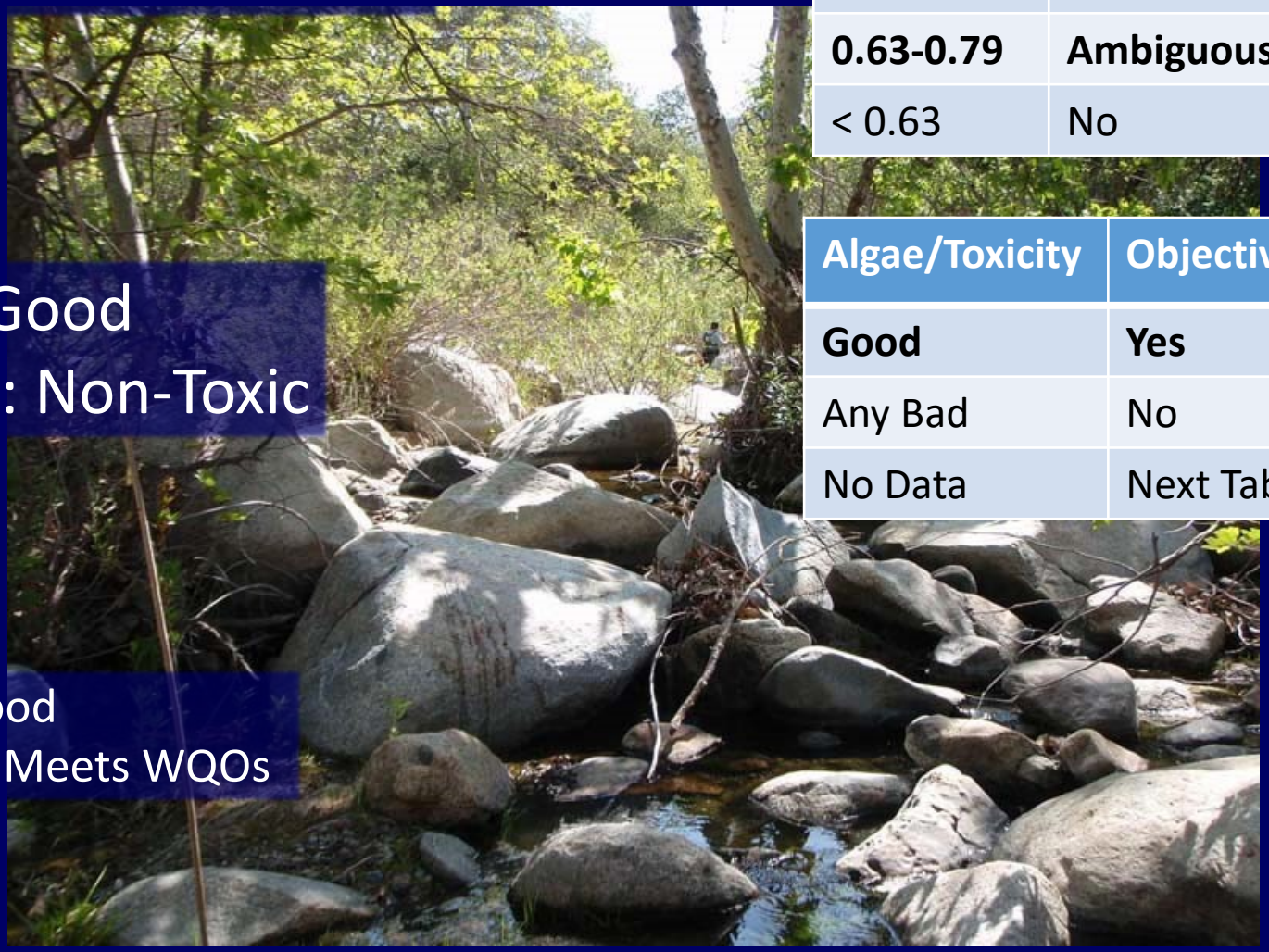
CSCI Score	Objective Met?
≥ 0.79	Yes
0.63-0.79	Ambiguous: Next Table
< 0.63	**No**

CSCI Scores:

0.33	0.21
0.27	0.20
0.22	0.34

CSCI Score: Objective Met?

CSCI Score: 0.69



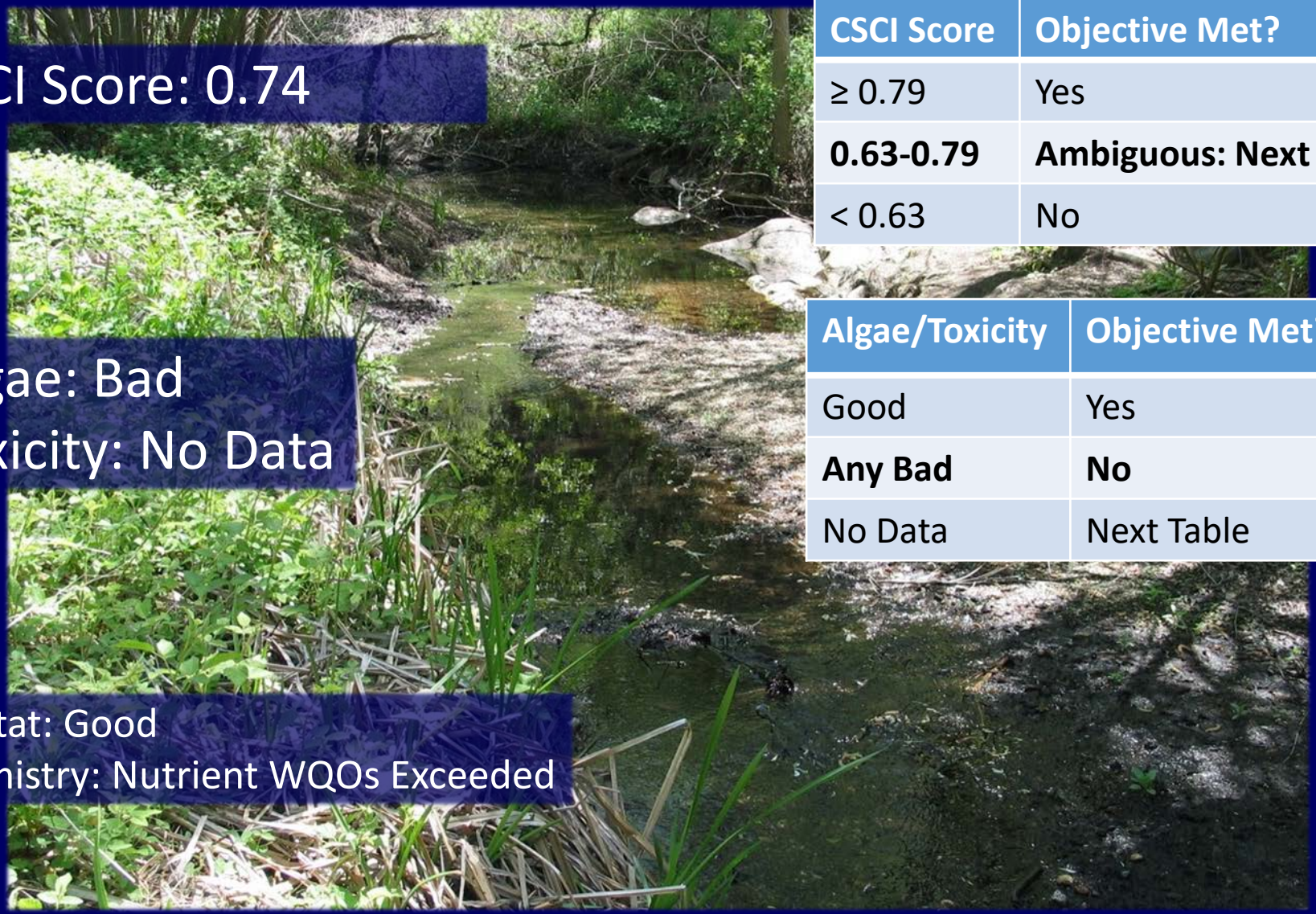
Algae: Good
Toxicity: Non-Toxic

Habitat: Good
Chemistry: Meets WQOs

CSCI Score	Objective Met?
≥ 0.79	Yes
0.63-0.79	**Ambiguous: Next Table**
< 0.63	No

Algae/Toxicity	Objective Met?
Good	**Yes**
Any Bad	No
No Data	Next Table

CSCI Score: Objective Met?



CSCI Score: 0.74

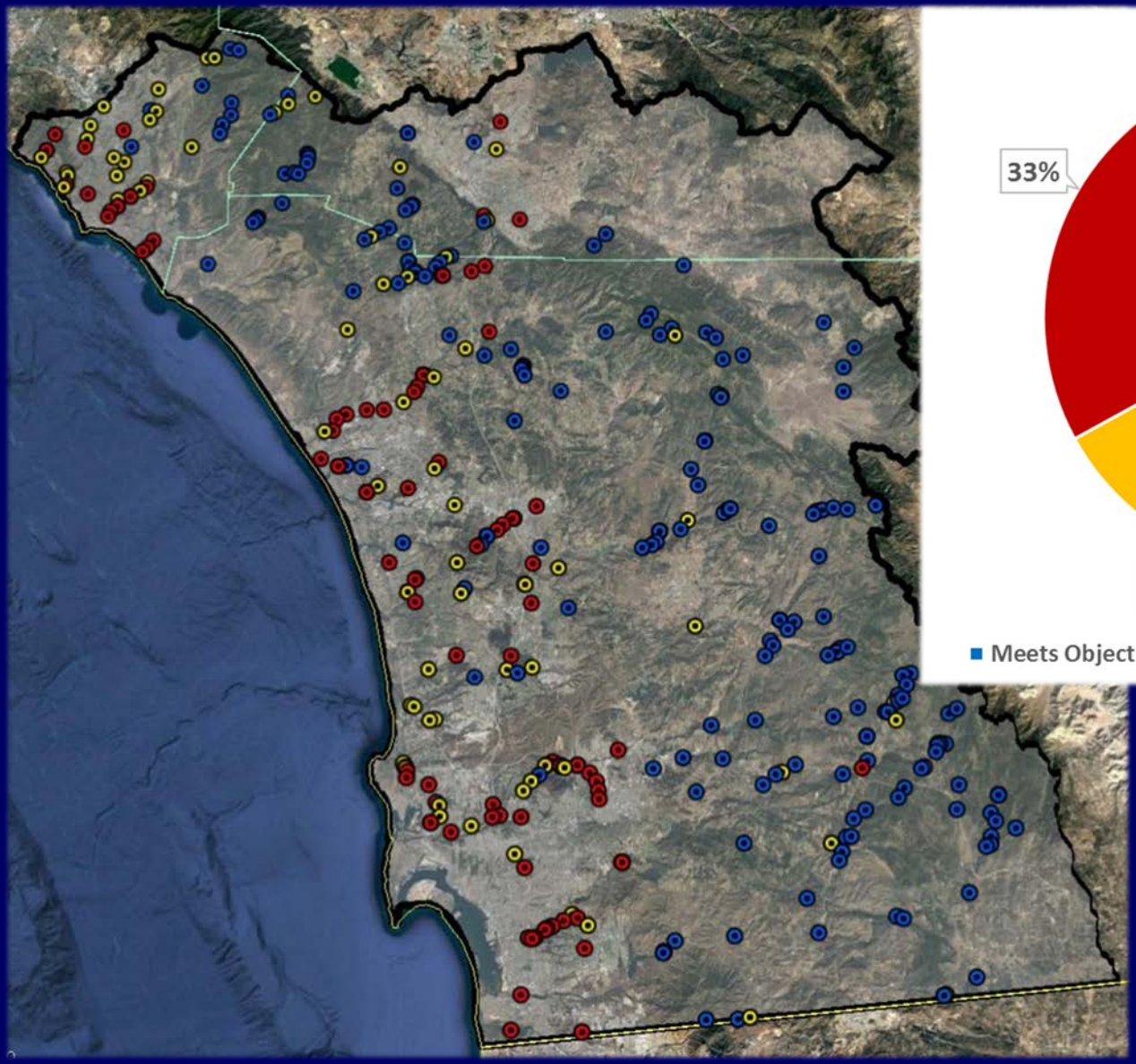
Algae: Bad
Toxicity: No Data

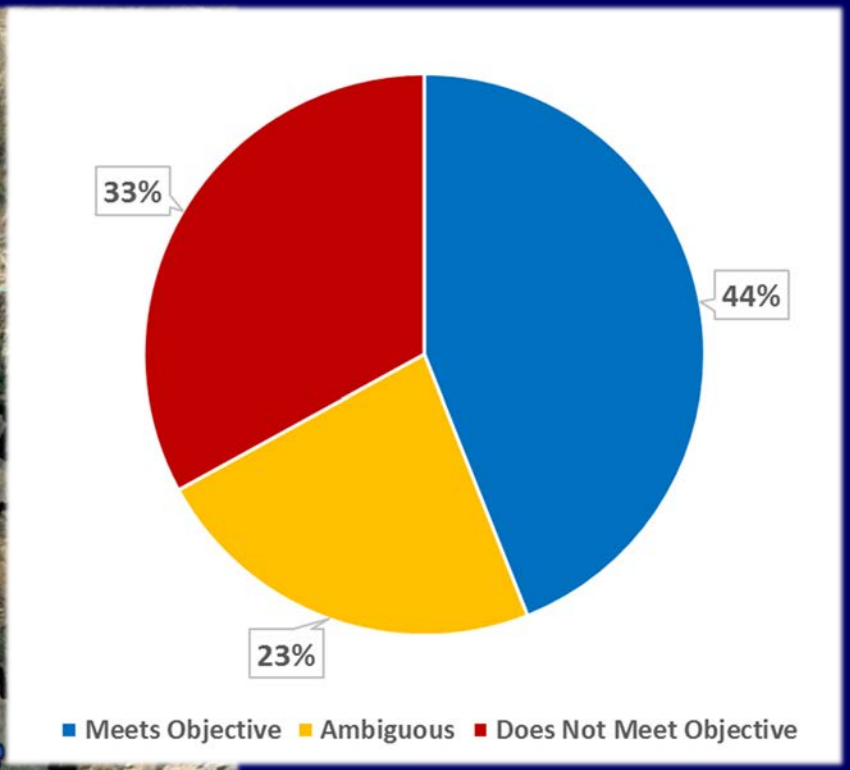
Habitat: Good
Chemistry: Nutrient WQOs Exceeded

CSCI Score	Objective Met?
≥ 0.79	Yes
0.63-0.79	**Ambiguous: Next Table**
< 0.63	No

Algae/Toxicity	Objective Met?
Good	Yes
Any Bad	**No**
No Data	Next Table

CSCI Scores: What does the Region look like?





Today:

- Water Quality Objective
- Program for Implementation

Short Break!

- Water Quality Objective
- Program for Implementation

Today:

- Water Quality Objective = Protects Beneficial Use
- Program for Implementation = How the Objective is Applied

Program of Implementation

What does a Basin Plan Amendment Require?

A Description of a Program for Implementation

CWC 13242

"(a) A description of the nature of actions which are necessary to achieve the objectives, including recommendations for appropriate action by any entity, public or private.

(b) A time schedule for the actions to be taken.

(c) A description of surveillance to be undertaken to determine compliance with objectives."

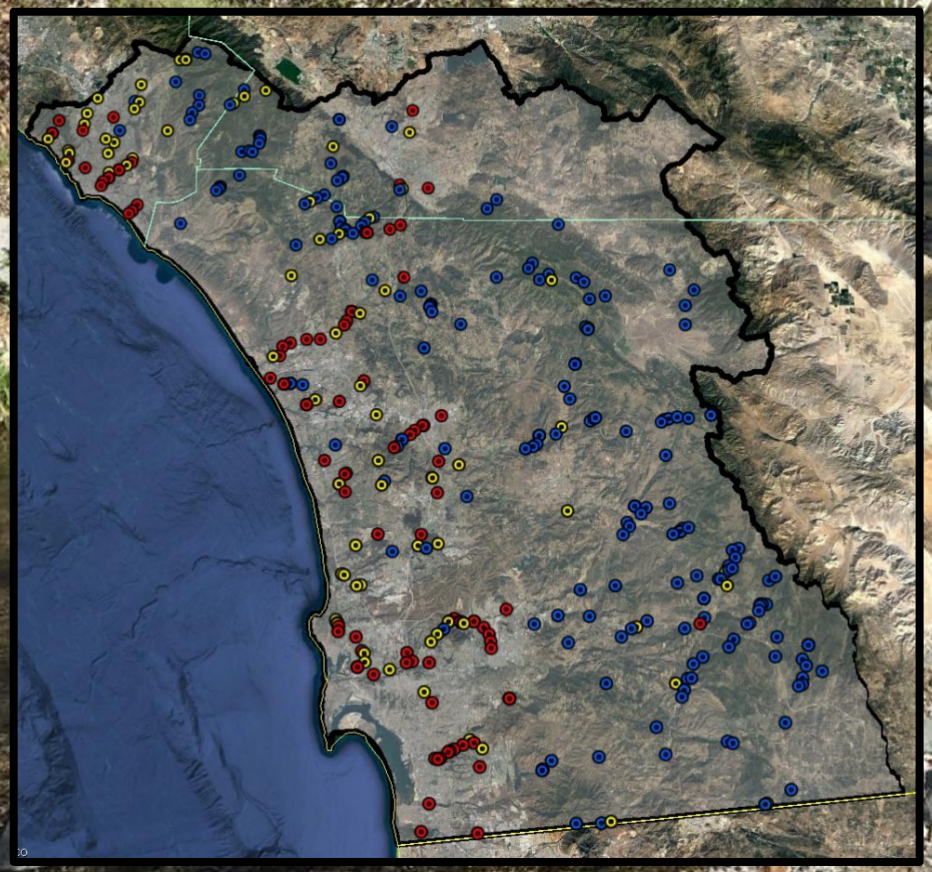
Chapter 4 of the Basin Plan: *A Framework for Implementation of Biological Objectives*

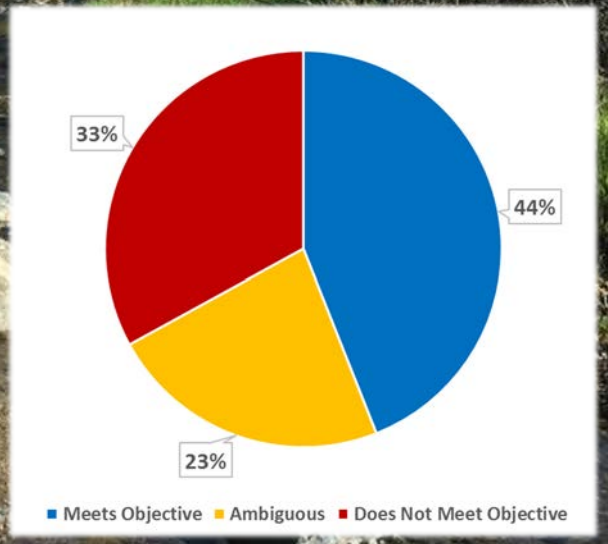
DOES: Overview of how SD Water Board will implement by program

DOES NOT: Specify how implemented on a permit-by-permit or project-by-project basis

Project Goals:

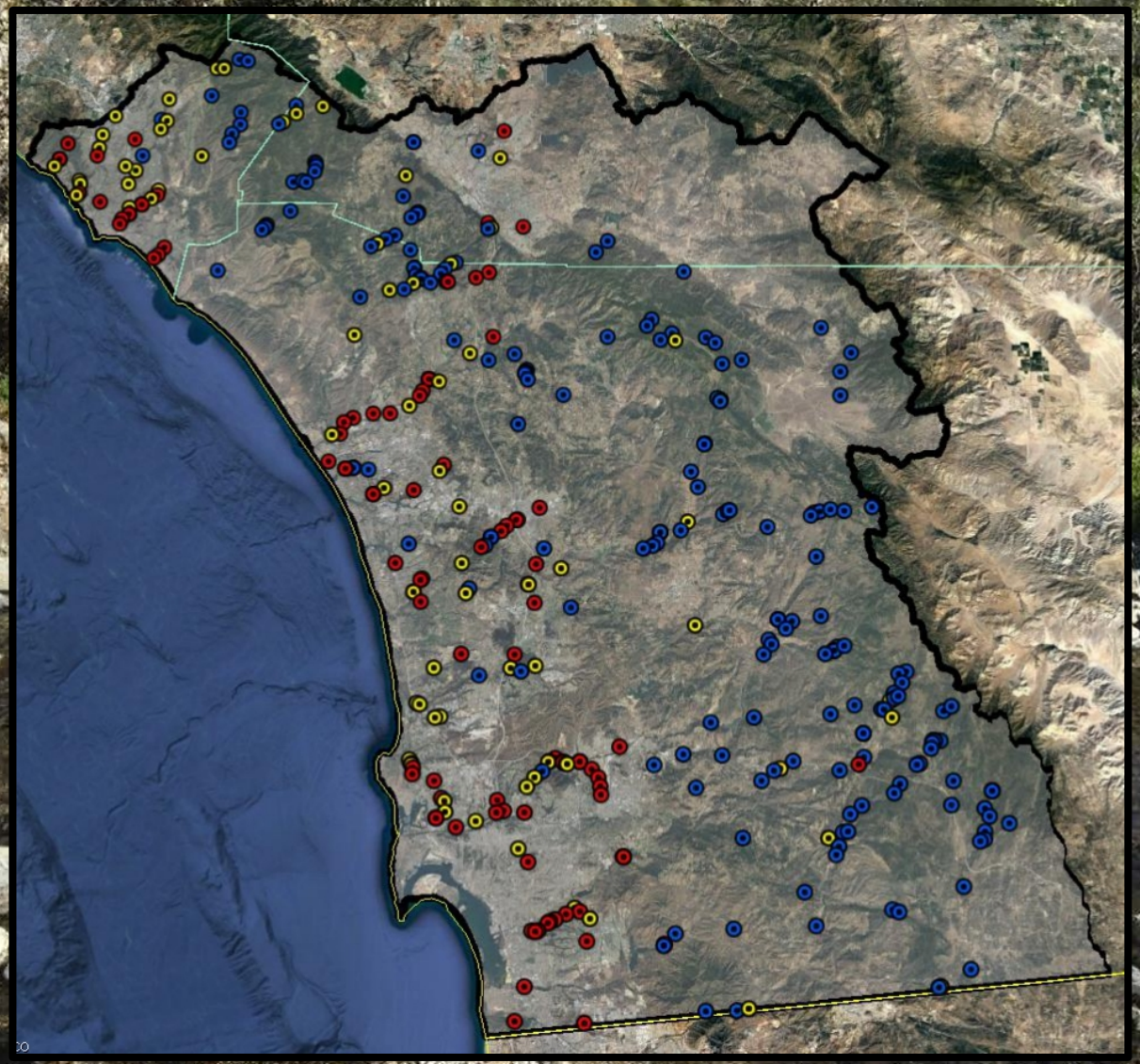
- Protect High Quality Waters
- Guide Meaningful Restoration





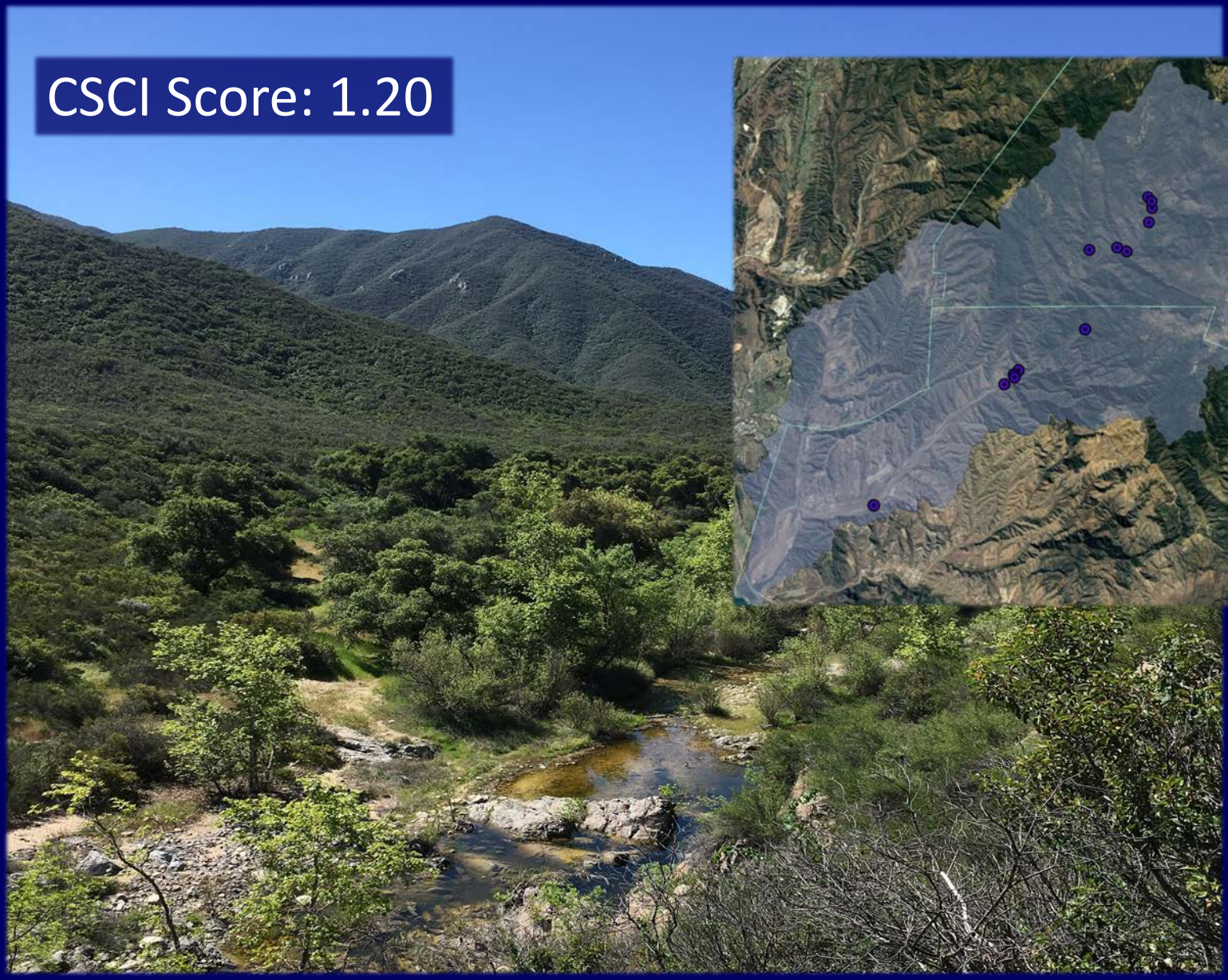
To Protect Your Rivers, Protect Your Mountains

Emperor Yu(China)

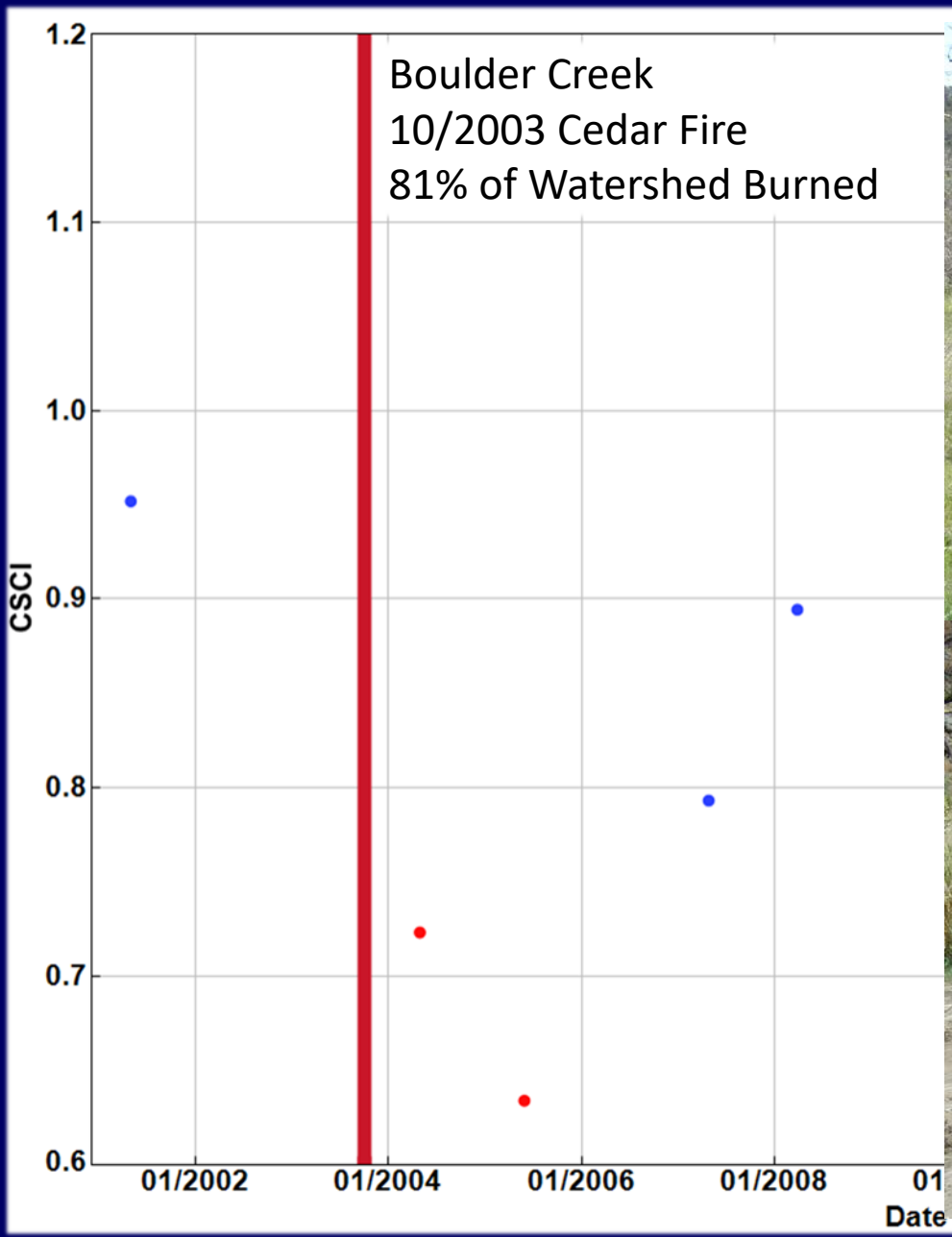


Protect High Quality Waters:
- Clean Water Act 401 Certifications
- Assessing Environmental Harm
- Grants & Environmental Projects
Education and Outreach!

CSCI Score: Protect High Quality



CSCI Score: Protect High Quality



Guide Meaningful Restoration
- Restore Impaired Waters
- Assessing and Prioritizing BMPs/Effluent Limits in Permits
- Grants & Environmental Projects
Education and Outreach!

Biological Objectives: Guide Program Activities

CSCI Score: 0.74

CSCI Score	Objective Met?
≥ 0.79	Yes
0.63-0.79	**Ambiguous: Next Table**
< 0.63	No

Biological Objectives: Guide Program Activities

CSCI Score: 0.74

Algae: Bad
Toxicity: No Data

Habitat: Good
Chemistry: Nutrient WQOs Exceeded

Biological Objectives: Prioritize Efforts

CSCI Score: 0.58

CSCI Score	Objective Met?
≥ 0.79	Yes
0.63-0.79	Ambiguous: Next Table
< 0.63	**No**

Biological Objectives: Prioritize Efforts

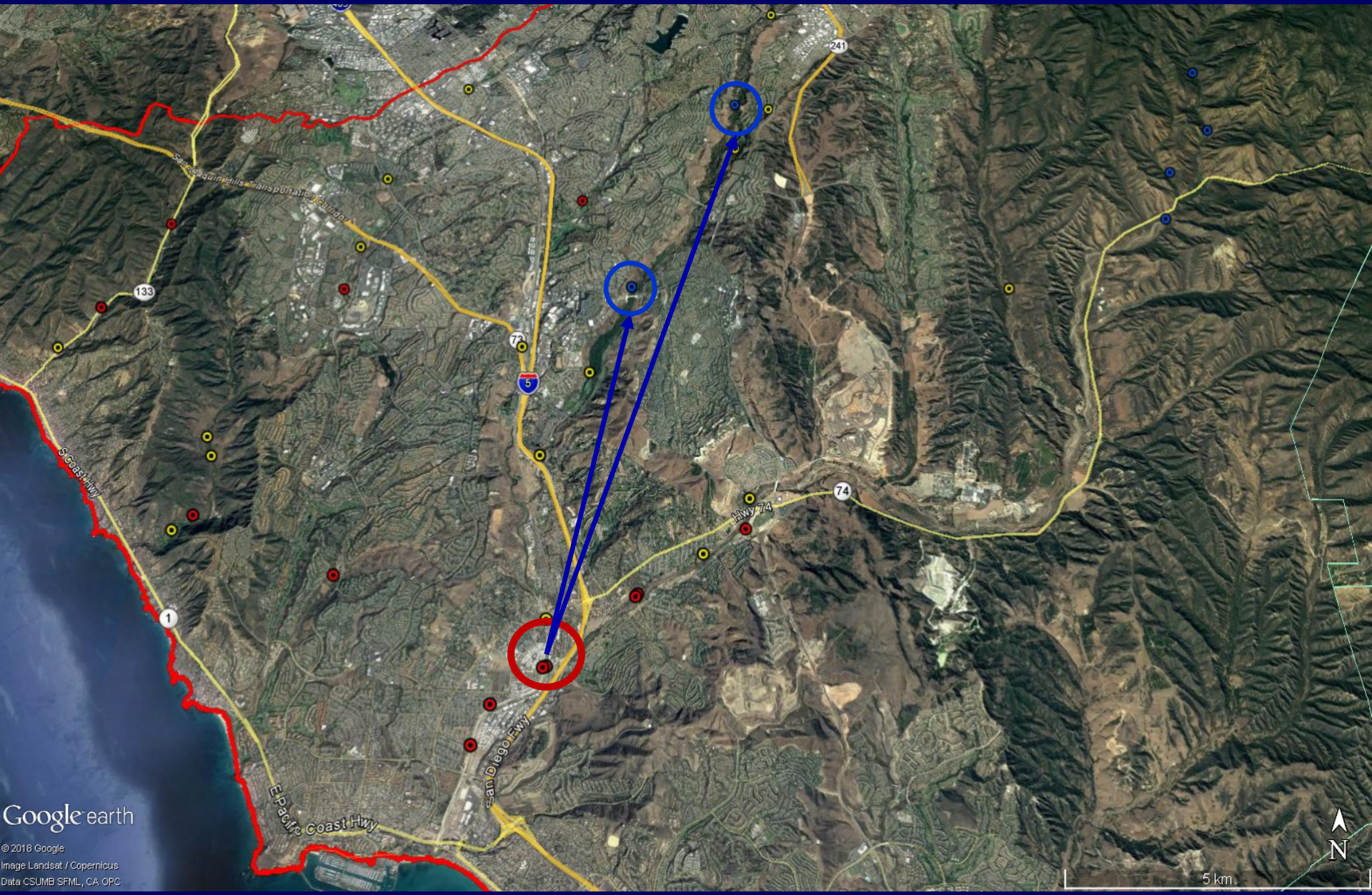
CSCI Score: 0.58

Algae: Bad
Toxicity: Toxic

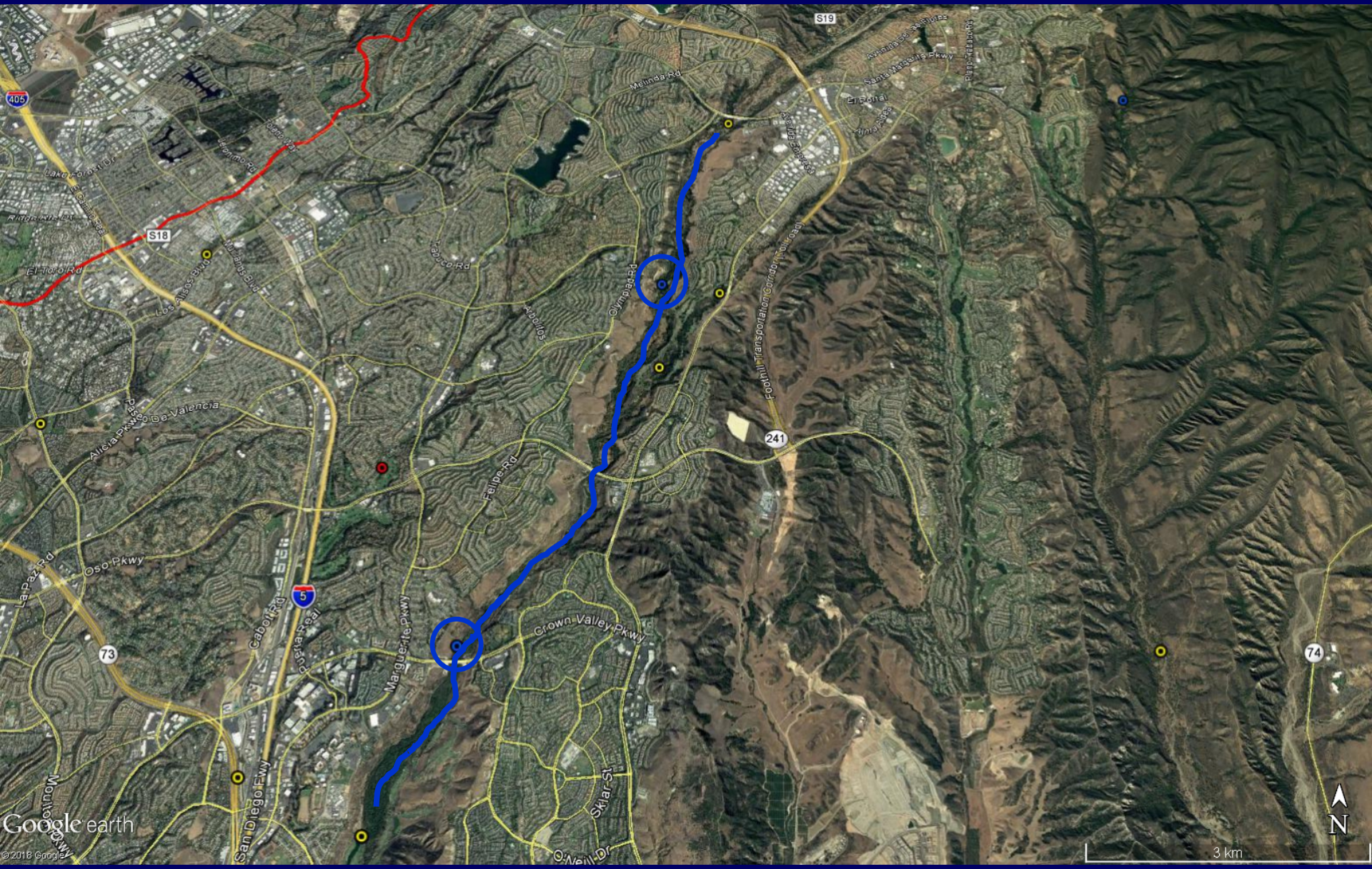
Habitat: Bad
Chemistry: Nutrients
Selenium
Bacteria
DDE

Biological Objectives:
Not a Mandate to Remove Concrete

Biological Objectives: Prioritize Efforts



Biological Objectives: Prioritize Efforts



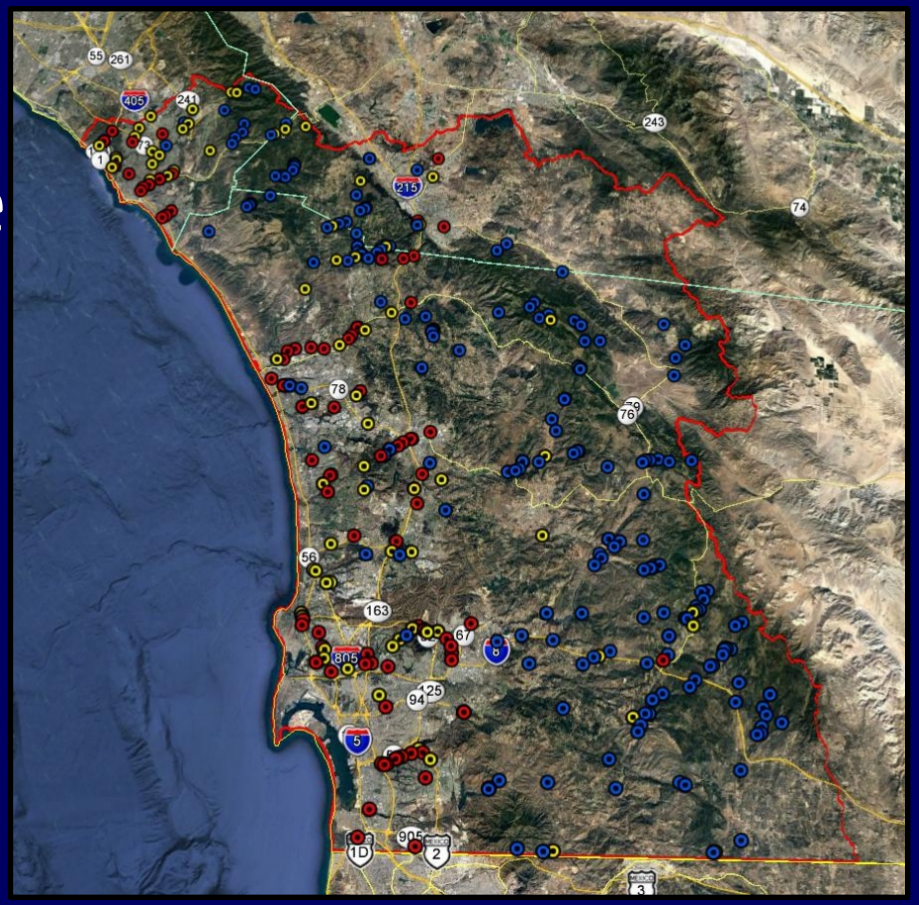
Biological Objectives:

Next Steps

- Consider Comments
- Revise Documents
- Public/Peer Review Release
- Summer Workshop
- Fall Hearing

Biological Objectives:

- Biological Beneficial Uses Need Objectives
  - Protect High Quality
  - Better Resolution = Better Restoration
- The Science is Sound
- The Data are Available



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https://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/bio_objectives/