TAHOE REGIONAL PLANNING AGENCY

# TRPA Regional Planning Committee

*April 24, 2024*

## AGENDA ITEMS 4,5,6

# Threshold Standards Update

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775-589-5233, dsegan@trpa.gov

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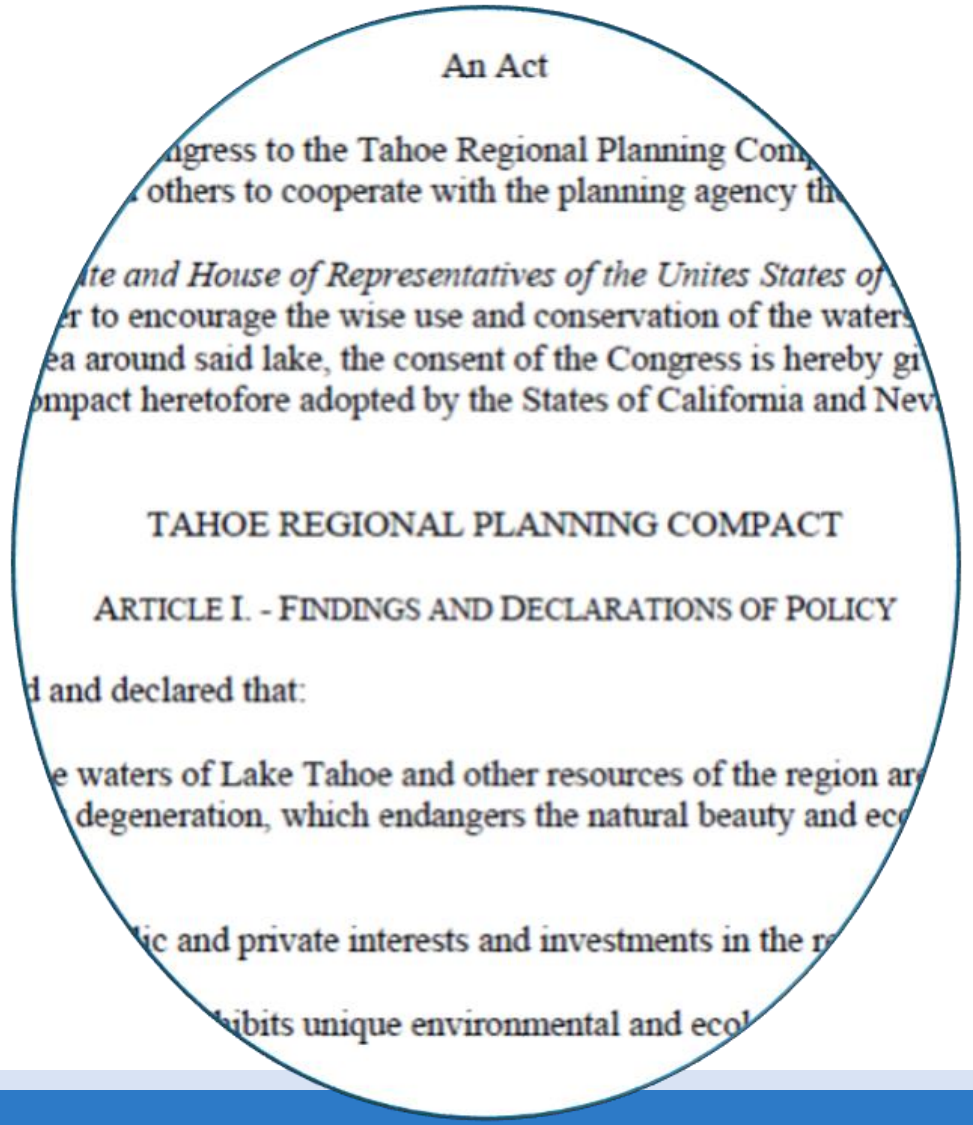
# Threshold Standards



An Act

ngress to the Tahoe Regional Planning Com
others to cooperate with the planning agency th

te and House of Representatives of the Unites States of
r to encourage the wise use and conservation of the water
ea around said lake, the consent of the Congress is hereby gi
mpact heretofore adopted by the States of California and Nev

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ARTICLE I. - FINDINGS AND DECLARATIONS OF POLICY

d and declared that:

e waters of Lake Tahoe and other resources of the region ar
degeneration, which endangers the natural beauty and ec

ic and private interests and investments in the r

ibits unique environmental and ecol

Article (II) (i) "***Environmental threshold carrying capacity***" *means an environmental standard necessary to maintain a significant scenic, recreational, educational, scientific or natural value of the region or to maintain public health and safety within the region. Such standards shall include but not be limited to standards for air quality, water quality, soil conservation, vegetation preservation and noise.*

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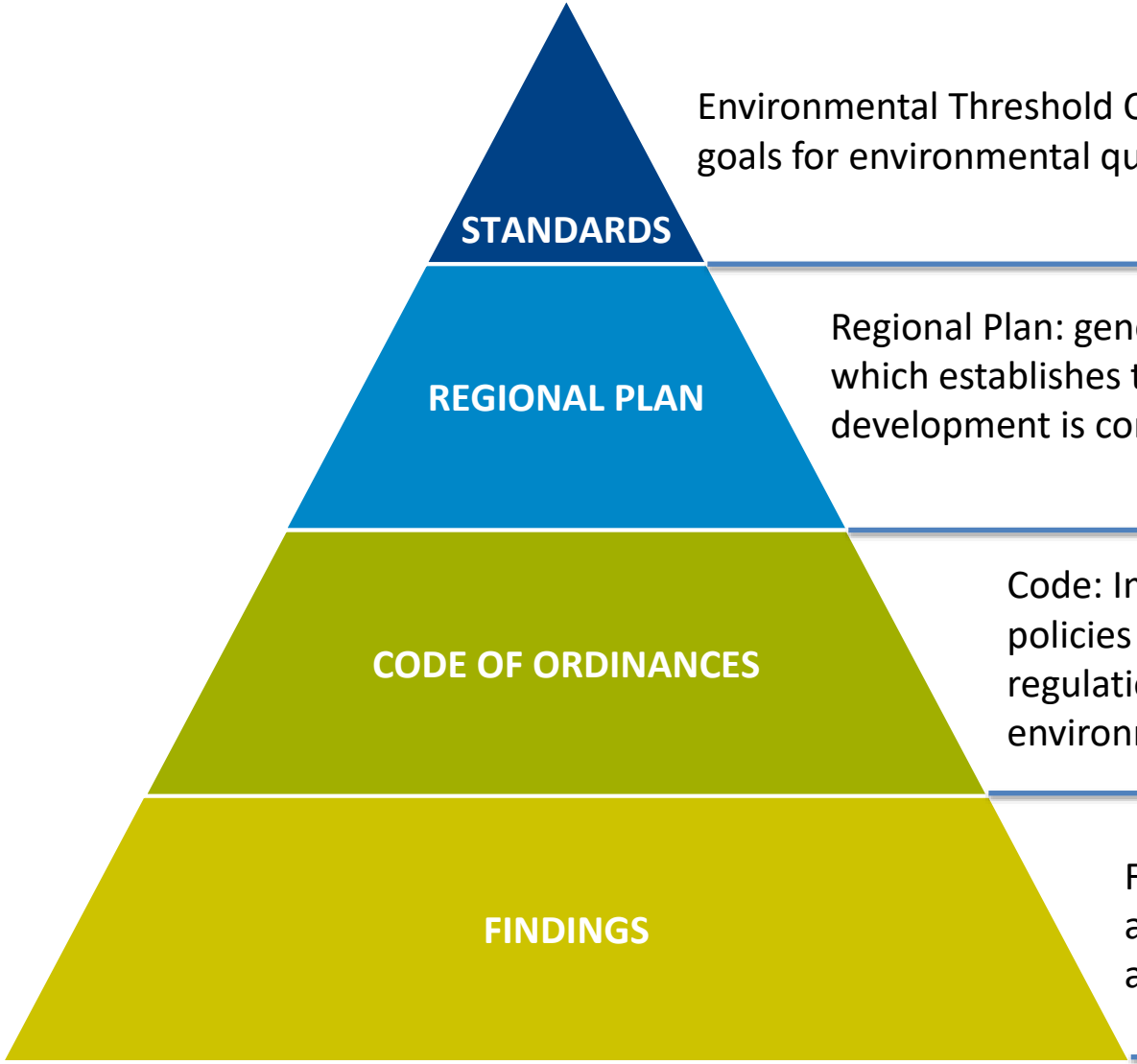
# Threshold Standards




Environmental Threshold Carrying Capacities (Standards): Establish the goals for environmental quality and restoration in the Lake Tahoe basin.

Regional Plan: general plan for development of the region, which establishes the guides for orderly growth and ensures development is consistent with the standards.

Code: Implements the regional plan and goals and policies and ensure the ordinances, rules, and regulations, achieve and maintain the adopted environmental threshold carrying capacities.

Findings: Ensures that development does not adversely impact implementation of the regional plan and will not cause the standards to be exceeded.

# Lake Tahoe Restoration Act

VII of the Compact, and State law, as applicable.

"(b) PRIORITY LIST.—

"(1) DEADLINE.—Not later than March 15 of the year after the date of enactment of the Water Resources Development Act of 2016, the Chair, in consultation with the Secretary, the Administrator, the Directors, the Planning Agency, the States of California and Nevada, the Federal Partnership, the Washoe Tribe, the Lake Tahoe Federal Advisory Committee, and the Tahoe successor organization) sh prioritized Environmental I for the Lake Tahoe Basi egories described in subsect

"(2) CRITERIA.—The List shall be based on the the following criteria:

"(A) The 4-year ity evaluation.

"(B) The ability to measure progress or success of the program.

"(C) The potential to significantly contribute to the achievement and maintenance of the environmental threshold carrying capacities identified in Article II of the Compact.

"(D) The ability of a program to provide multiple benefits.

"(E) The ability of a program to leverage non-Federal contributions.

"(F) Stakeholder support for the program.

"(C) The potential to significantly contribute to the achievement and maintenance of the environmental threshold carrying capacities identified in Article II of the Compact.

on the Priority List.

"(c) RESTRICTION.—The Administrator shall use not more than 3 percent of the funds provided under subMAN-

made

0,000

shall be made available to the Secretary to carry out, including by making grants, the following programs:

"(i) Programs identified as part of the Lake Tahoe Basin Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy 10-Year Plan.

"(ii) Competitive grants for fuels work to be awarded by the Secretary to commu- adopted national wildland lement the applicable por- ar plan described in clause

ass programs, including nents.

a Fire Restoration under f the Secretary.

Tribe programs on tribal Lake Tahoe Basin.

(vi) Development of an updated Lake Tahoe Basin multijurisdictional fuel

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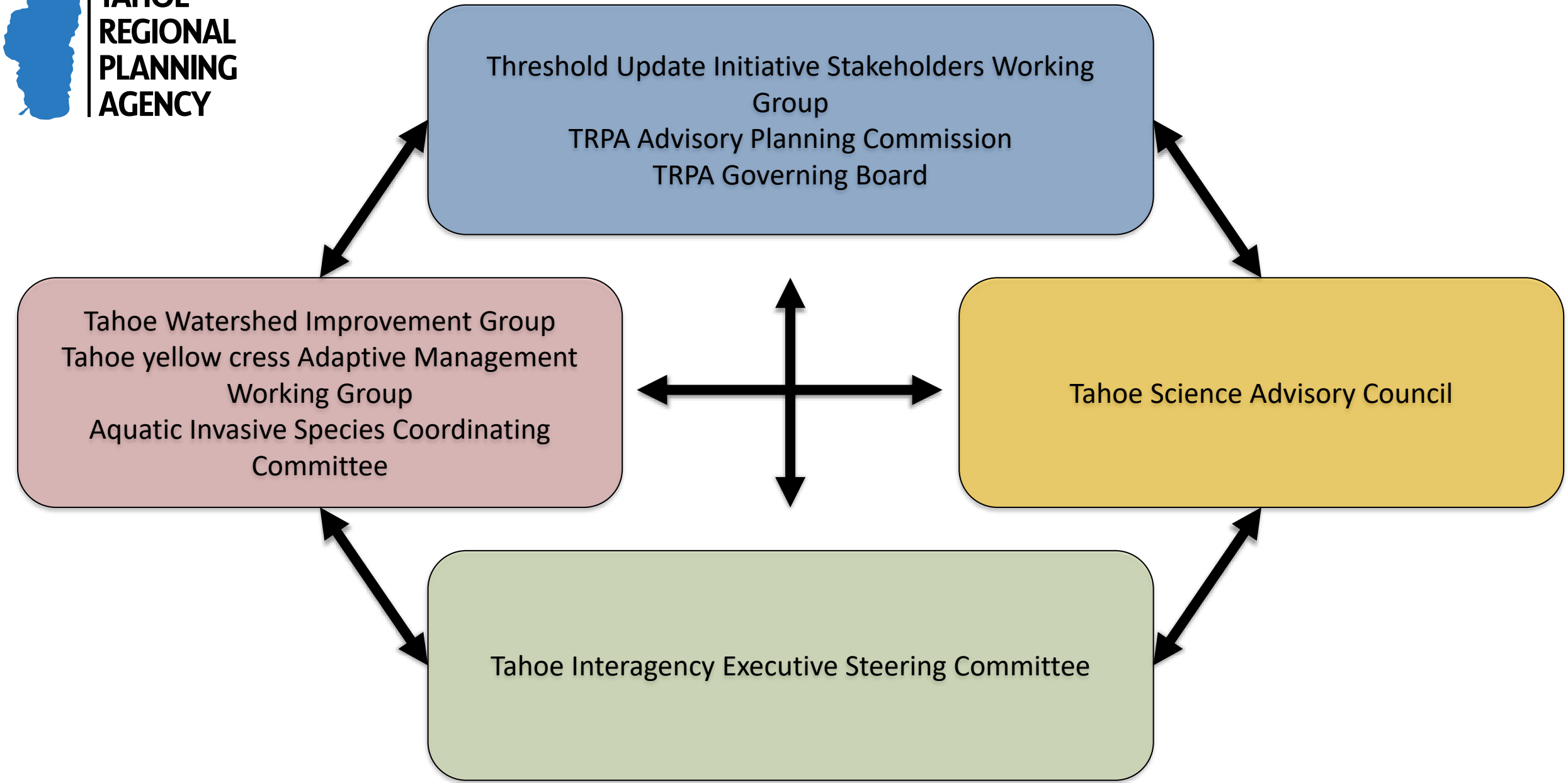

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# Natural Resource Evaluation Systems: Assessment of Best Practices for the Tahoe Regional Planning Agency

**Tahoe Science Advisory Council Technical Report | October 2017**


**A product of the Tahoe Science Advisory Council prepared by:**

Alan Heyvaert – *Desert Research Institute; TSAC co-chair*

Christopher Knopp – *Desert Research Institute consultant*

Ed Parvin – *U.S. Geological Survey*

Casey Schmidt – *Desert Research Institute*


TSAC

TSAC WO-004, ver. 8-d

**Structuring Data to Facilitate Management of Threshold Standards**

**Executive Summary**


In a previous study the Tahoe Science Advisory Council (TSAC) reviewed natural resource management systems from around the country and documented their findings in terms of best practices for establishing environmental management goals and for evaluating progress towards those goals (TSAC, 2017). The Council identified four core principles and eight programmatic characteristics that were considered essential for effective natural resource evaluation and management. This document builds on that earlier work by providing guidance on three essential elements needed for structuring information to inform threshold standard development and outcome tracking. These essential elements include 1) the development of a conceptual framework to communicate broad-scale socio-ecological system goals and interactions across threshold categories, 2) elucidation of system functions and causal linkages through conceptual models, and 3) tracking progress toward specified outcomes through indicators selected from causal networks or result chains.

The conceptual framework recommended for Tahoe Basin thresholds management is derived from decades of environmental resource management research based on Pressure-State-Response (PSR) relationships. This has been expanded over time to better represent complex social-ecological systems, where the driving forces from social, demographic and economic developments produce activities that create pressures on environmental states and yield changes or impacts on ecosystem services that ultimately require management responses (DAPSIR: Driver-Activity-Pressure-State-Impact-Response). This basic conceptualization has been used extensively for different types of problems around the world. It has proven to be a flexible and useful framework that can be tailored to the specific requirements of each system. It serves as the foundation for communicating and deliberating on complex environmental issues and for collaborative consideration of potential management responses.

The conceptual model represents our understanding of system function, based on those factors represented within the conceptual framework. It condenses a universe of potentially relevant environmental factors and interactions into a set of diagrams and associated narratives that identify and organize the key attributes of these complex systems into a simplified representation of system structure and dynamics. It shows where management responses can provide benefits by maintaining or restoring desired features or ecosystem services (as benefits humans obtain from properly functioning ecosystems). The conceptual model also indicates where assumptions or uncertainties are present that may require additional investigation, often conducted within an adaptive management system to inform future decisions.

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# Framework

| INPUTS | OUTPUTS | OUTCOMES |
| --- | --- | --- |
| Resources and actions used to implement program. | Quantifiable products/ services showing progress implementing actions/ strategies. | Quantifiable goals that are publicly valued and accepted as the end-result of achieving a plan. |
| Example: Miles of street sweeping | Example: Fine sediment load reduction achieved | Example: Secchi depth |

EIP Performance Measures

Threshold Standards

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# Best Practice

| | |
|---|---|
| Specific | The standard establishes a specific numeric target, and benchmark/baseline values are documented where necessary. |
| Measurable | The standard has clearly defined indicator(s) that link to the standard, and there are practical ways to objectively and accurately measure progress towards attainment. |
| Outcome-based | Standards establish a desired condition for an environmental end state. Standards do not establish a means to achieve the desire outcome. |

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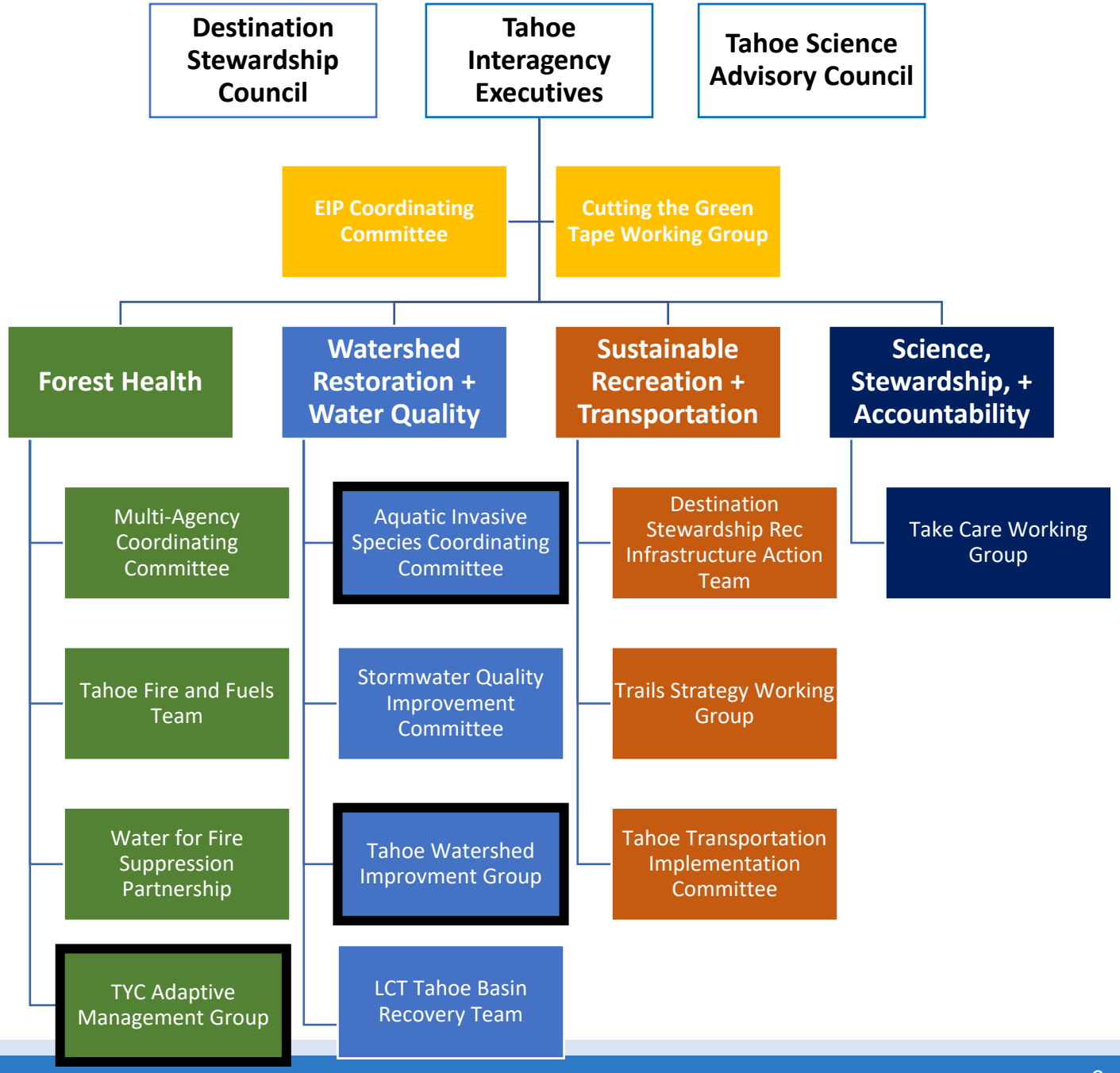
# Proposal development

- Stream Environment Zone
- Tahoe Yellow Cress
- Aquatic Invasive Species



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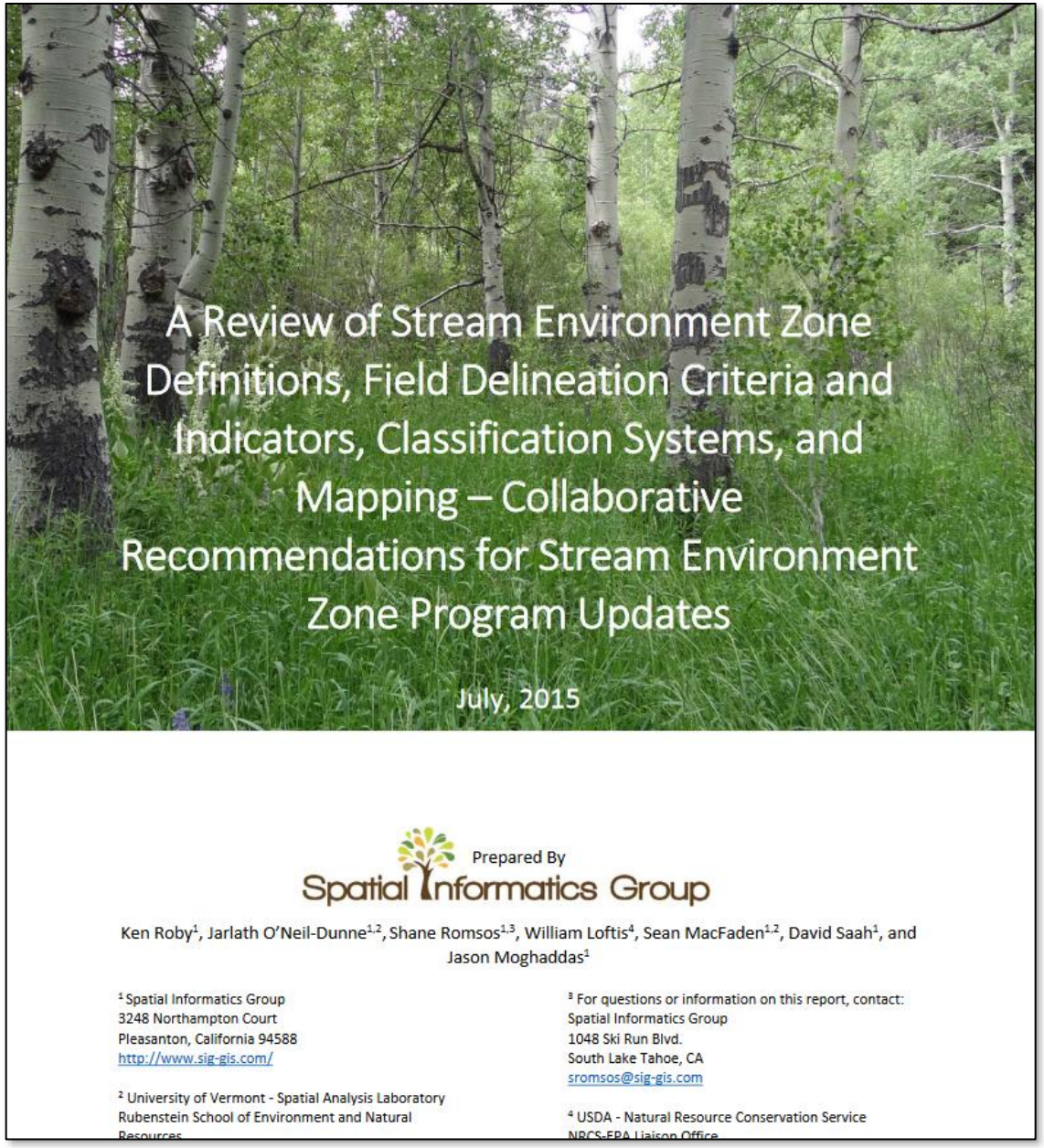
# Stream Environment Zone (SEZ)

# What is an SEZ?

## TRPA Code

### Stream Environment Zone

- Generally an area that owes its biological and physical characteristics to the presence of surface or ground water.



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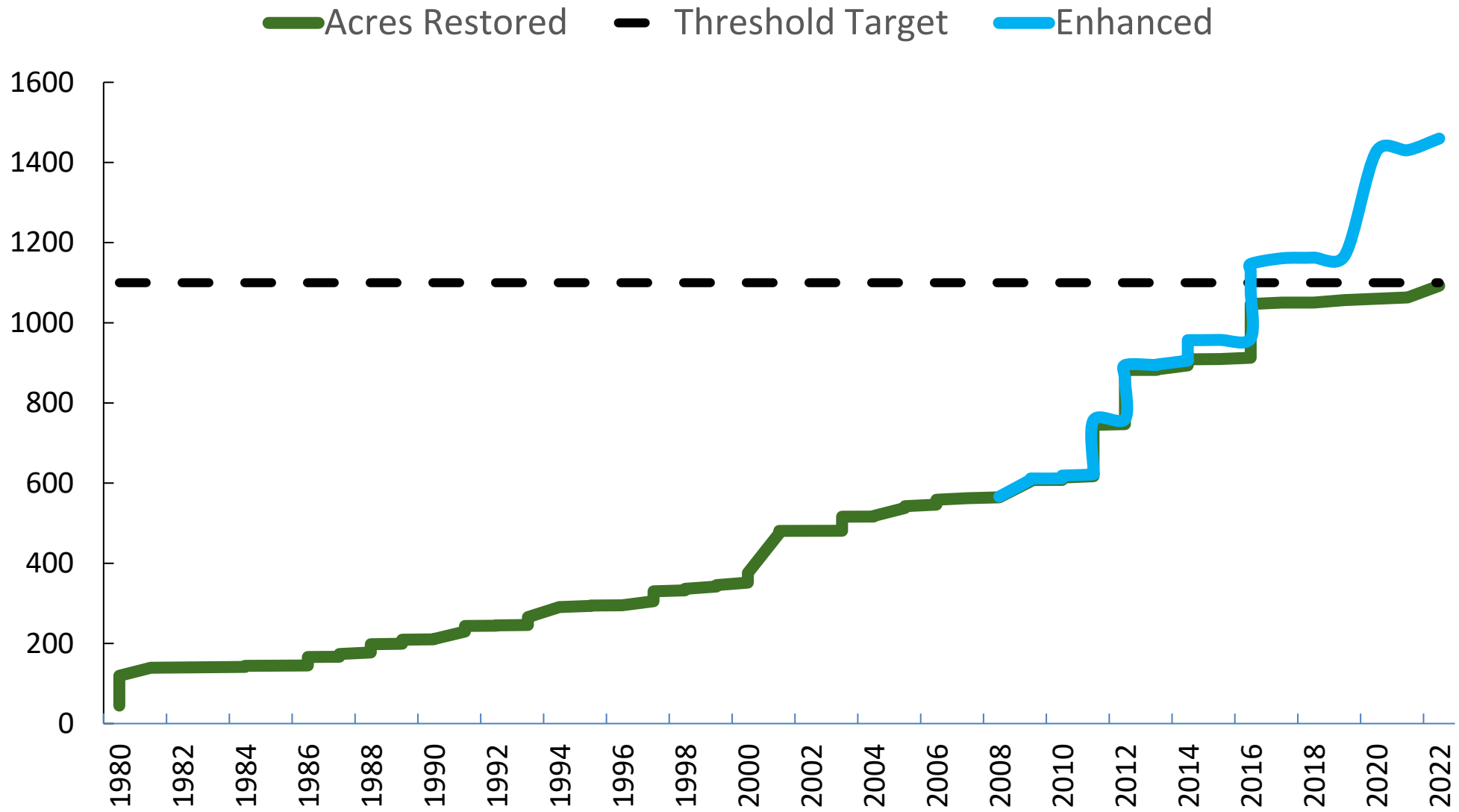
# SEZ Restoration

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CALIFORNIA STATE PARKS
SINCE 1864
TAHOE TRUCKEE COMMUNITY FOUNDATION
TAHOE RESOURCE CONSERVATION DISTRICT
NEVADA STATE PARKS
Nevada Tahoe Conservation District
NEVADA DIVISION OF FORESTRY
RANGE FOREST WATERSHED PROTECTION
Tahoe City Public Utility District
Nevada Division of STATE LANDS
EDGEWOOD COMPANIES
COUNTY OF Placer
CALIFORNIA TAHOE CONSERVANCY
USGS science for a changing world
TROUT UNLIMITED
U.S. DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION
EL DORADO COUNTY CALIFORNIA
TAHOE DOUGLAS FIRE
INCLINE VILLAGE GENERAL IMPROVEMENT DISTRICT
CALIFORNIA Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS
CITY OF SOUTH LAKE TAHOE
SOUTH TAHOE PUBLIC UTILITY DISTRICT
CELEBRATING 75 YEARS OF SERVICE
est. 1948
north tahoe PUBLIC UTILITY DISTRICT
WASHOE COUNTY, NEVADA 1861
CALIFORNIA DEPARTMENT OF FISH & WILDLIFE
FOREST SERVICE US DEPARTMENT OF AGRICULTURE
DOUGLAS COUNTY NEVADA EST. 1861 GREAT PEOPLE GREAT PLACES
CCC CALIFORNIA CONSERVATION CORPS EST. 1976
KEEP TAHOE BLUE League to Save Lake Tahoe
KBM, Inc.
TAHOE REGIONAL PLANNING AGENCY
WCB California Wildlife Conservation Board
foriver TRUCKEE RIVER WATERSHED COUNCIL
Caltrans

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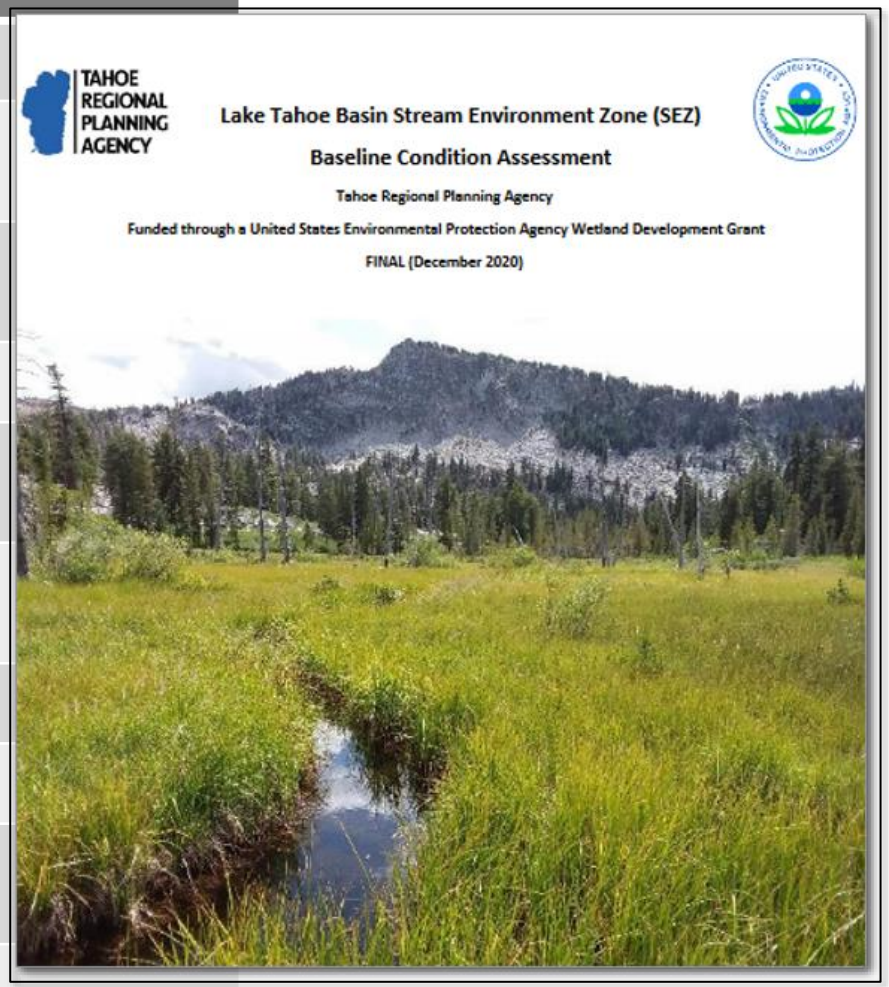
# Peer Review

*"In summary, the present approach to evaluating the condition and the improvement in SEZ's is an overly blunt instrument with no apparent scientific basis beyond "more is better." The science has truly advanced in the last 40+ years"*

– 2015 Peer Reviewer

# Condition Index

| Indicator | Description | Value | Score |
|---|---|---|---|
| Headcuts | Number of headcuts | 0 | 12 |
| Vegetation Vigor | Vegetation “greenness” | Trending drier | 3 |
| Conifer Encroachment | Percent of pixels encroached | 98 | 3 |
| Channel Incision | Bank height ratio | 2.23 | 3 |
| Ditches and Gullies | Percent ditches / gullies | 37 | 6 |
| Channel Stability | Percent unstable banks | 23 | 6 |
| Habitat Fragmentation | Percent developed | 86 | 3 |
| Biotic Integrity | CSCI score | 0.85 | 9 |
| Invasive Plants | Number of invasive plants | 1 | 9 |
| Fish passage | Number of barriers | 2 | 3 |
| Total | | | 57 / 120 = 47.5% (D) |



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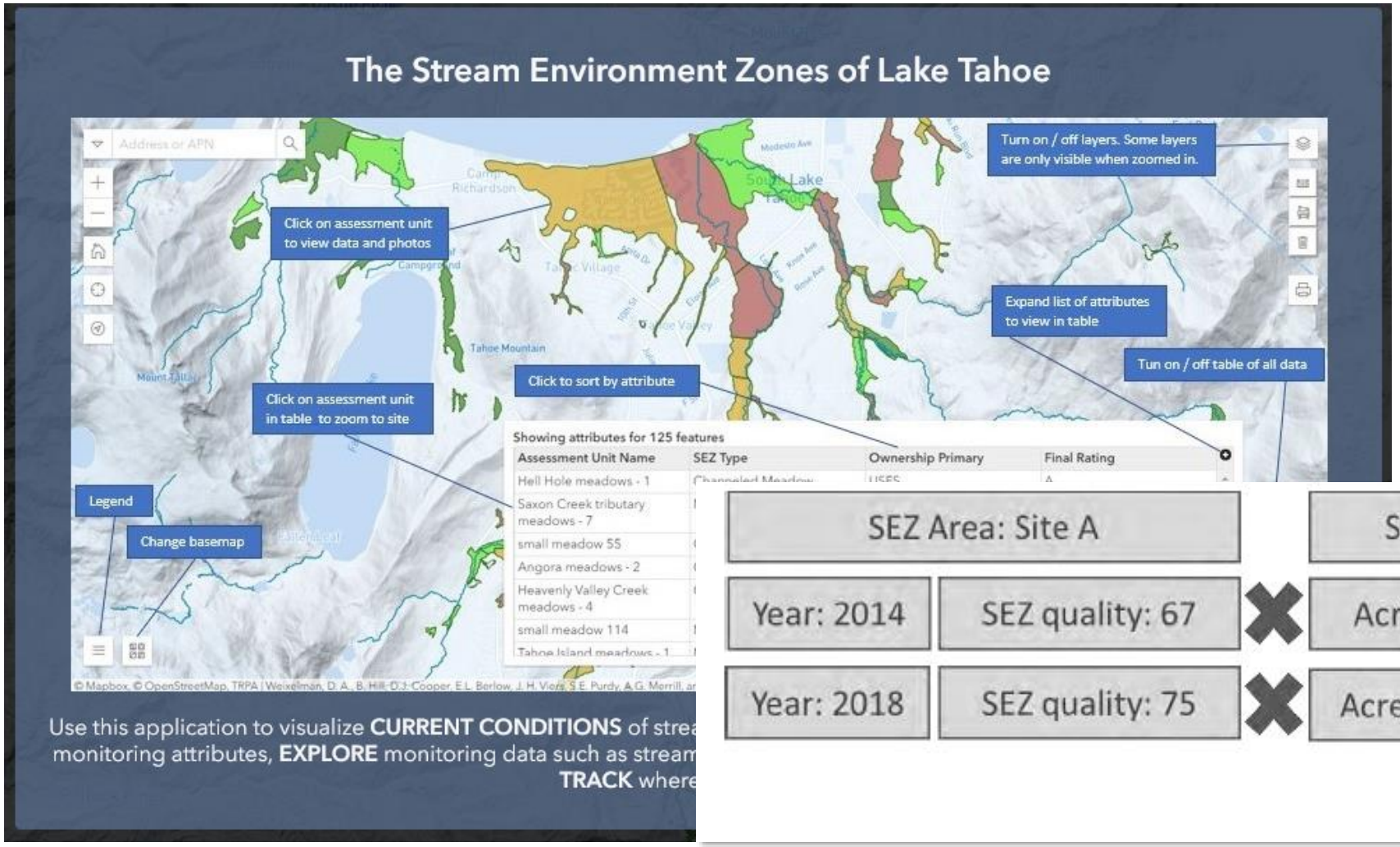
# SEZ Baseline




| | | | | |
|---|---|---|---|---|
| SEZ Area: Site A | | | SEZ Type: Meadow, Non-Channeled | |
| Year: 2014 | SEZ quality: 67 | × | Acres: 10 | = SEZ condition index: 670 |
| Year: 2018 | SEZ quality: 75 | × | Acres: 10.5 | = SEZ condition index: 788 |
| | | | | **SEZ index change: 118** |

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# Target setting

| Partner 1 | | Post Restoration Score | | |
|---|---|---|---|---|
| | | 100% | 91% | 88% |
| # Projects | 103 | | | |
| Acres Treated | 2,748 | | | |
| Regional Score | | | | |
| Regiona | | | | |
| Regiona | | | | |
| Regiona | | | | |
| Score im | | | | |
| Total gap | | | | |
| Gap clos | | | | |

| Partner 2 | | Post Restoration Score | | |
|---|---|---|---|---|
| | | 100% | 91% | 88% |
| # Projects | 269 | | | |
| Acres Treated | 6,238 | | | |
| Regional Score | | | | |
| Regior | | | | |
| Regior | | | | |
| Regior | | | | |
| Score | | | | |
| Total g | | | | |
| Gap cl | | | | |

| Partner 3 | | Post Restoration Score | | |
|---|---|---|---|---|
| | | 100% | 91% | 88% |
| # Projects | 309 | | | |
| Acres Treated | 6,206 | | | |
| Regior | | | | |
| Regior | | | | |
| Regior | | | | |
| Regior | | | | |
| Score i | | | | |
| Total g | | | | |
| Gap cl | | | | |

| Partner 4 | | Post Restoration Score | | |
|---|---|---|---|---|
| | | 100% | 91% | 88% |
| # Projects | 349 | | | |
| Acres Treated | 7,252 | | | |
| Regional Score | | 1,112,517 | 1,065,378 | 1,025,492 |
| Regional % of Possible Score | | 93% | 89% | 86% |
| Regional % of Possible Score (no SEZ re-establishment) | | 104% | 99% | 96% |
| Regional % increase | | 18% | 13% | 9% |
| Score improvement | | 173,480 | 126,341 | 86,455 |
| Total gap closed | | 68% | 50% | 34% |
| Gap closed (no SEZ re-establishment) | | 129% | 94% | 64% |

Restoration Vision:
EIP Watersheds Working Group

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# Proposed Standard

- Enhance the quality and function of meadows and wetlands from 79% to a minimum of 88% of the regional possible SEZ condition index score.

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# Tahoe Yellow Cress (Rorippa subumbellata)

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# Tahoe Yellow Cress

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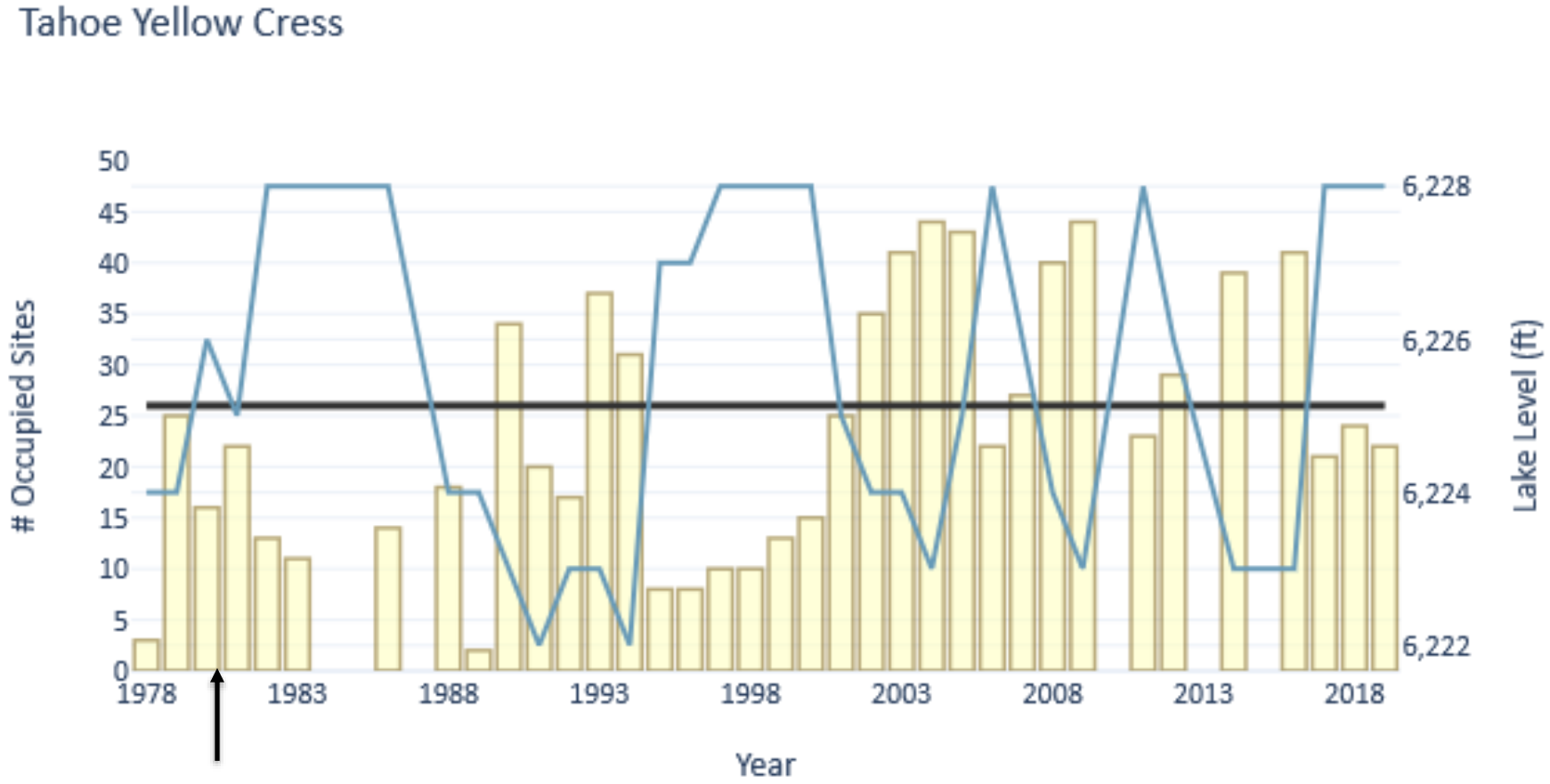
# Influence of Lake Level




26 site goal was first three years of survey data from approximately 34 sites during 1979-1981

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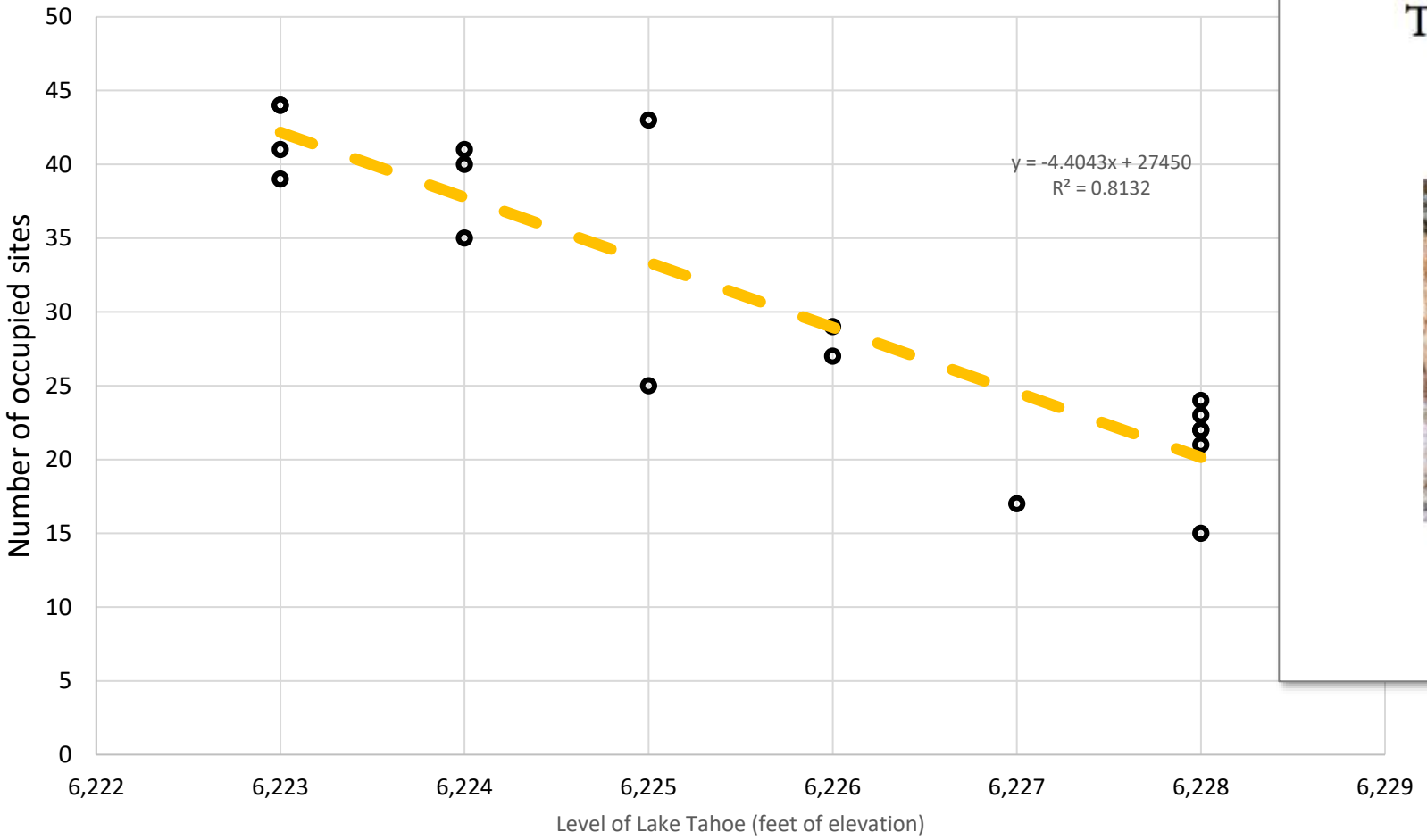
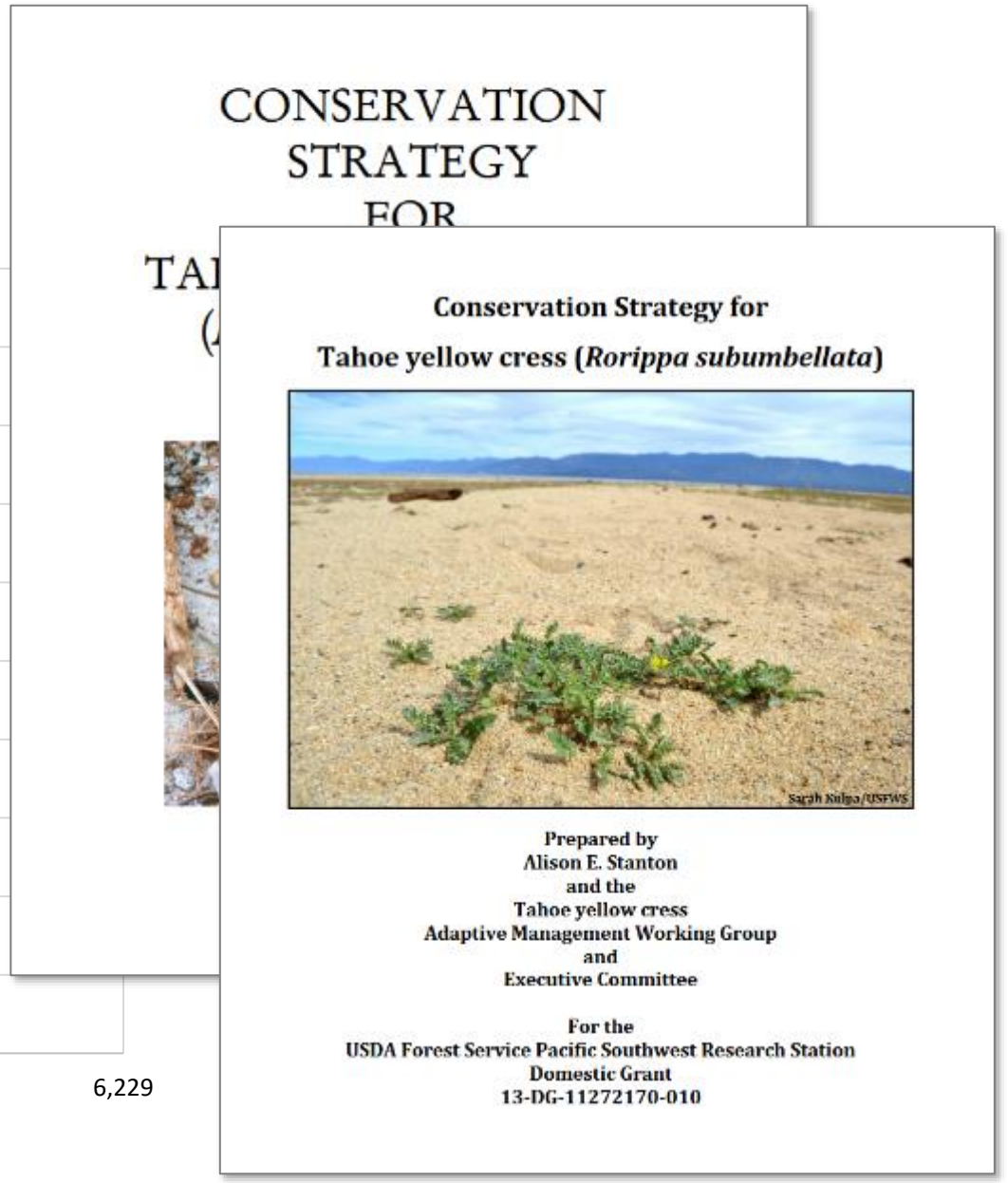
# Lake Level



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# Tahoe Yellow Cress

Proposed: Maintain at least the number of occupied Rorippa subumbellata survey sites for each lake level as established in the Table below:

| Lake Level (feet of elevation) | Occupied survey sites |
|---|---|
| Low (<6,225) | 35 |
| Transition (6,225- 6,227) | 26 |
| High (>6,227) | 20 |

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# Aquatic Invasive Species

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# AIS Program

## Prevention


## Control

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# AIS Control Standards

WQ9) Reduce the abundance of known aquatic invasive species.

WQ10) Reduce the distribution of known aquatic invasive species.

WQ11) Abate harmful ecological impacts resulting from aquatic invasive species.

WQ12) Abate harmful economic impacts resulting from aquatic invasive species.

WQ13) Abate harmful social impacts resulting from aquatic invasive species.

WQ14) Abate harmful public health impacts resulting from aquatic invasive species.

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# Water Quality Review

TSAC WO-012 report; June 2020

**Implementation of a System Structuring Approach for Water Quality Threshold Standards**

**From:** Tahoe Science Advisory Council (TSAC)
TSAC subcommittee authors: Dr. Alan Heyvaert and Dr. Ramon Naranjo
TRPA collaboration co-author: Dan Segan

**Executive Summary**

The Tahoe Science Advisory Council (Council) has been working with the Tahoe Regional Planning Agency (TRPA) to develop specific recommendations for threshold standards and associated performance measures to ensure they formally link to appropriate metrics for the Environmental Improvement Program (EIP) and for thresholds progress reporting. This report summarizes progress toward that goal through diverse efforts over the last few years, including an updated set of recommendations for implementation of a system structuring approach, focused here on water quality threshold standards to serve as a model for similar reviews in other threshold categories. System structure in this context represents general organization of threshold standards and the reporting framework that supports decision-making on actions to promote standards attainment and maintenance.

Recommendations for structuring the threshold standards system comprise three key elements: first, to articulate program goals in clear language that communicates a collective purpose to a general audience; second, each goal statement should be supported by one or more specific objectives that explicitly define success, which are the threshold standards; third, objectives should be supported by result chains that link management actions (strategies and individual tactics) to objectives and clearly identify how implementation will be tracked and how the effectiveness of management actions will be evaluated.

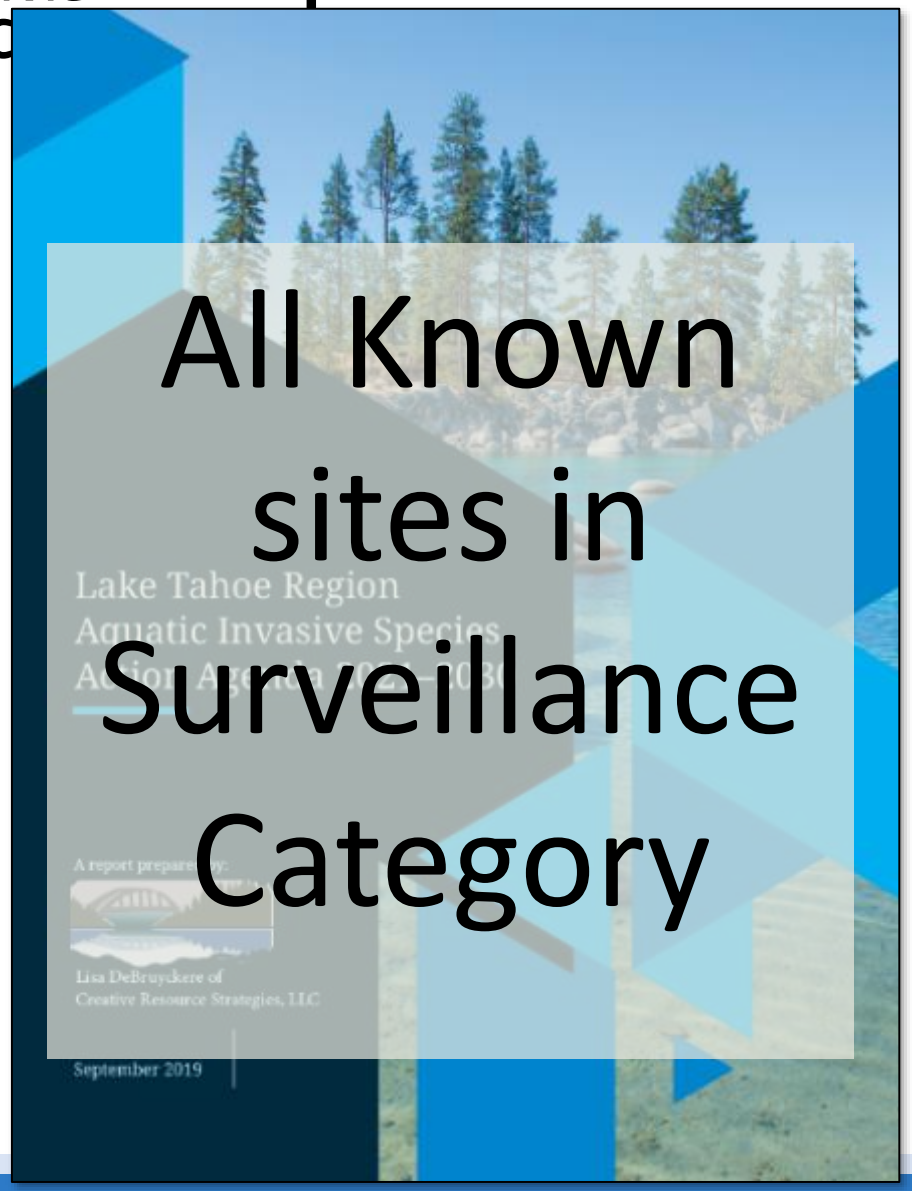
Expanding on these key features, recommendations for structuring threshold standards include:

1) Ensuring that each threshold standard fits under a broad aspirational goal statement for its threshold category;
2) Clarifying that threshold standards are framed as objectives, and that each objective conforms to SMART criteria (specific, measurable, attainable, relevant and time-framed);
3) Where current threshold standards articulate a goal instead of an objective, a specific objective should be defined as the threshold standard for that goal;
4) Continue to reduce or eliminate sources of overlap between standards;

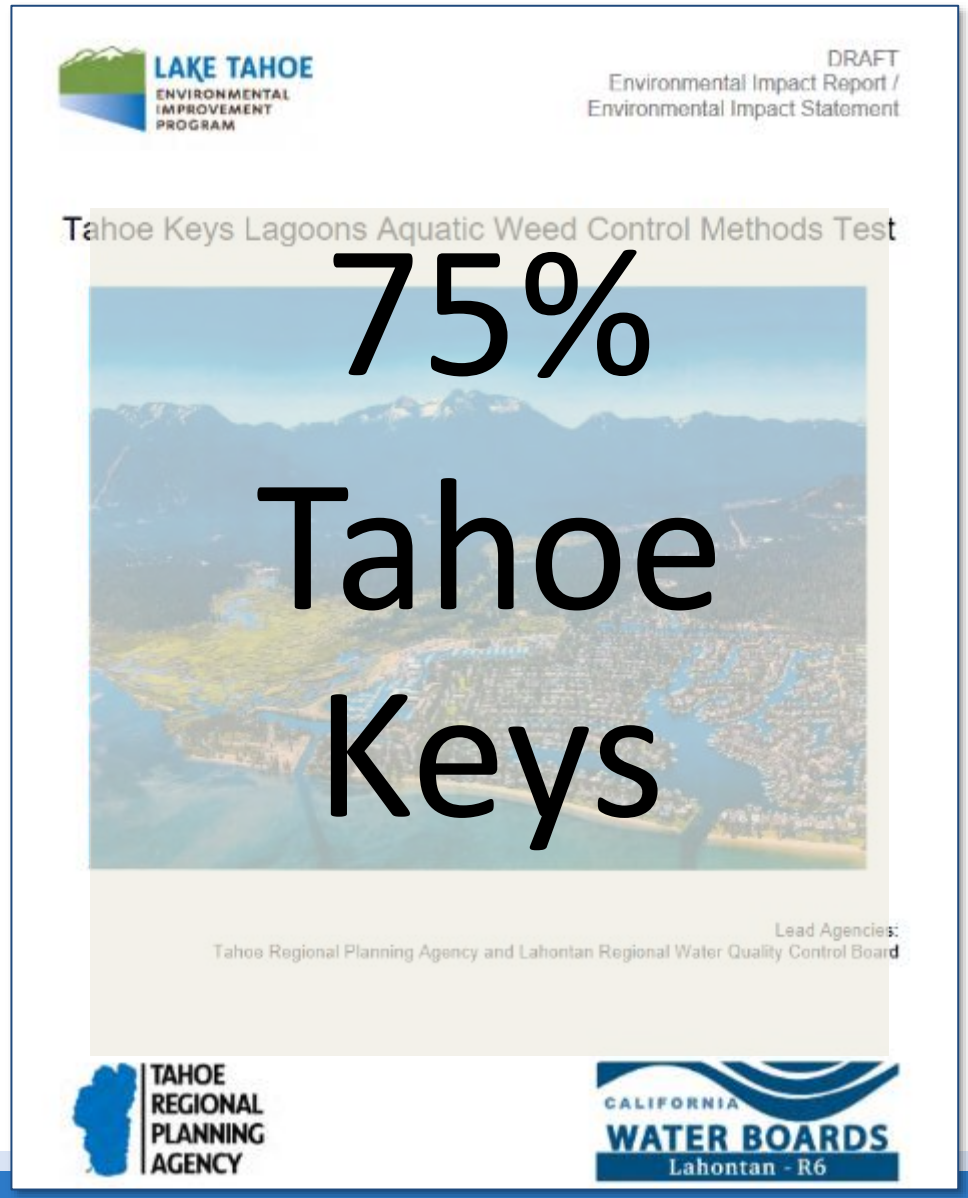
*Table 2. Role identification for WQ threshold standards. All are TRPA threshold standards at present, with VEC added as an existing state standard. N/A indicates a role was not identified within the system structure. See Appendix A for narrative definitions associated with each threshold standard.*

| ID No. | Reporting Category | Name of Standard | Role |
|---|---|---|---|
| State Standard | Deep Water (Pelagic) Lake Tahoe | Vertical Extinction Coefficient (VEC) | Objective |
| WQ-01 | Deep Water (Pelagic) Lake Tahoe | Secchi Disk | Objective |
| WQ-02 | Deep Water (Pelagic) Lake Tahoe | Phytoplankton Primary Productivity | Objective |
| WQ-03 | Nearshore (Littoral) Lake Tahoe | Nearshore Turbidity (Stream Influence) | Objective |
| WQ-04 | Nearshore (Littoral) Lake Tahoe | Nearshore Turbidity (No Stream Influence) | Objective |
| WQ-05 | Nearshore (Littoral) Lake Tahoe | Nearshore Phytoplankton Primary Productivity | Objective |
| WQ-06 | Nearshore (Littoral) Lake Tahoe | Nearshore Periphyton Biomass | Objective |
| WQ-07 | Nearshore (Littoral) Lake Tahoe | Nearshore Attached Algae | Goal |
| WQ-08 | Aquatic Invasive Species (AIS) | Aquatic Invasive Species Prevention | Goal |
| WQ-09 | Aquatic Invasive Species (AIS) | Aquatic Invasive Species Abundance | Goal |
| WQ-10 | Aquatic Invasive Species (AIS) | Aquatic Invasive Species Distribution | Goal |
| WQ-11 | Aquatic Invasive Species (AIS) | Aquatic Invasive Species Ecological Impacts | Goal |
| WQ-12 | Aquatic Invasive Species (AIS) | Aquatic Invasive Species Social Impacts | Goal |
| WQ-13 | Aquatic Invasive Species (AIS) | Aquatic Invasive Species Economic Impacts | Goal |
| WQ-14 | Aquatic Invasive Species (AIS) | Aquatic Invasive Species Public Health Impacts | Goal |
| WQ-15 | Tributaries | Nitrogen Concentration (Tributaries) | Strategy |
| WQ-16 | Tributaries | Phosphorus Concentration (Tributaries) | Strategy |
| WQ-17 | Tributaries | Iron Concentration (Tributaries) | Strategy |
| WQ-18 | Tributaries | Suspended Sediment Concentration (Tributaries) | Strategy |
| WQ-19 | Surface Runoff | Nitrogen Concentration (Surface Runoff) | Strategy |
| WQ-20 | Surface Runoff | Phosphorus Concentration (Surface Runoff) | Strategy |
| WQ-21 | Surface Runoff | Iron Concentration (Surface Runoff) | Strategy |
| WQ-22 | Surface Runoff | Suspended Sediment Concentration (Surface Runoff) | Strategy |
| WQ-23 | Groundwater | Surface Discharge – Total Nitrogen | N/A |

# Proposed Threshold Standards




All Known sites in Surveillance Category




75% Tahoe Keys

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# AIS proposed standards

1. No active aquatic invasive plant infestations in Lake Tahoe, adjacent wetlands, and tributaries, not including the Tahoe Keys.

2. Reduce average aquatic invasive plant abundance in the Tahoe Keys by a minimum of 75% from the 2021 baseline year

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# Required Motions

1. A motion to recommend approval of the required findings (Attachment B) including a finding of no significant effect.
2. A motion to recommend adoption of Ordinance 2024-__, amending Ordinance 2019-02 (Attachment A), updates to the threshold standards for 1) Stream Environment Zone (SEZ) restoration, 2) Aquatic Invasive Species control, and 3) Tahoe Yellow Cress conservation.