



# TRPA Advisory Planning Commission

*October 11, 2023*

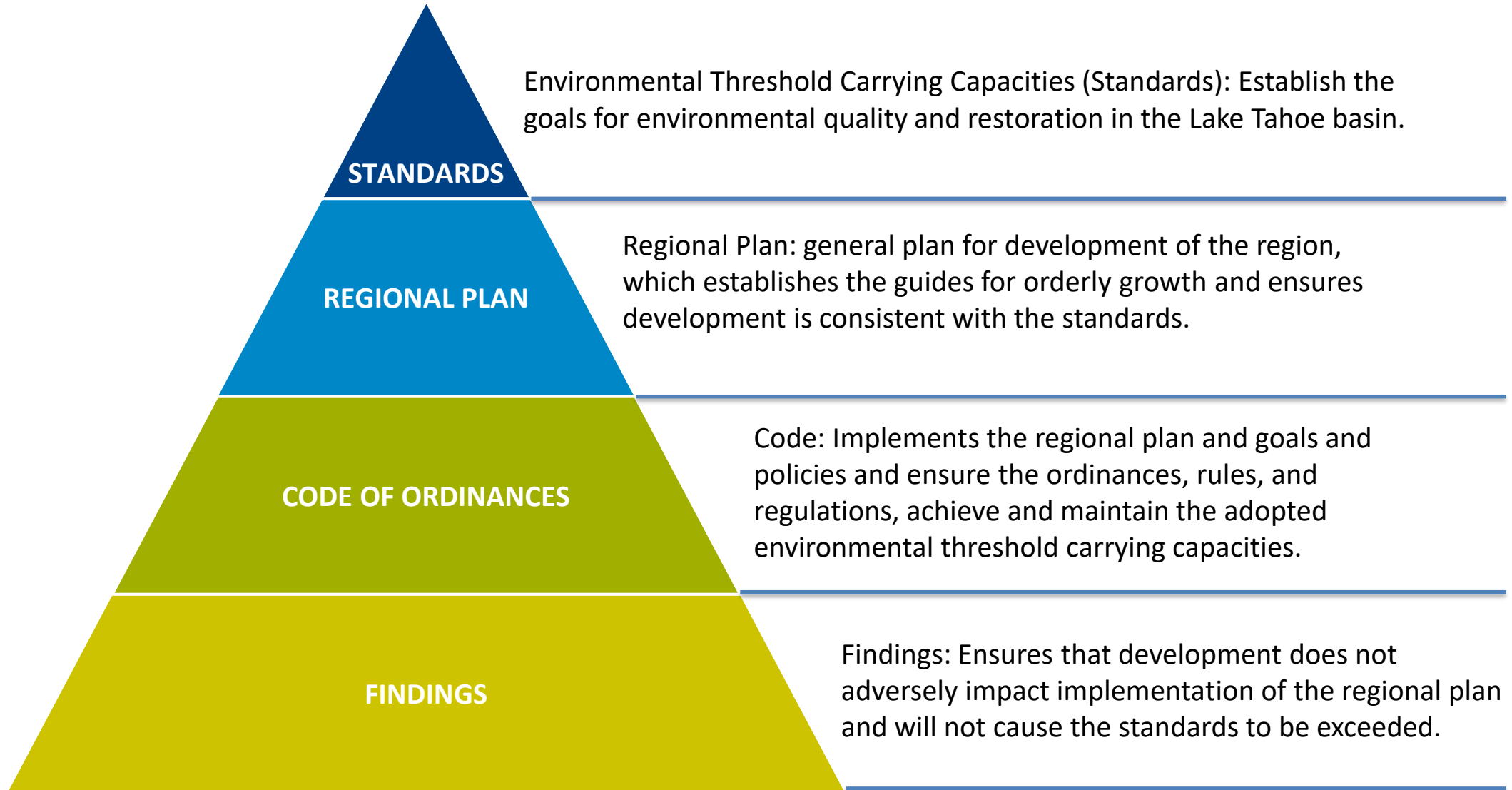
## **AGENDA ITEM V**

# Threshold Standards Update

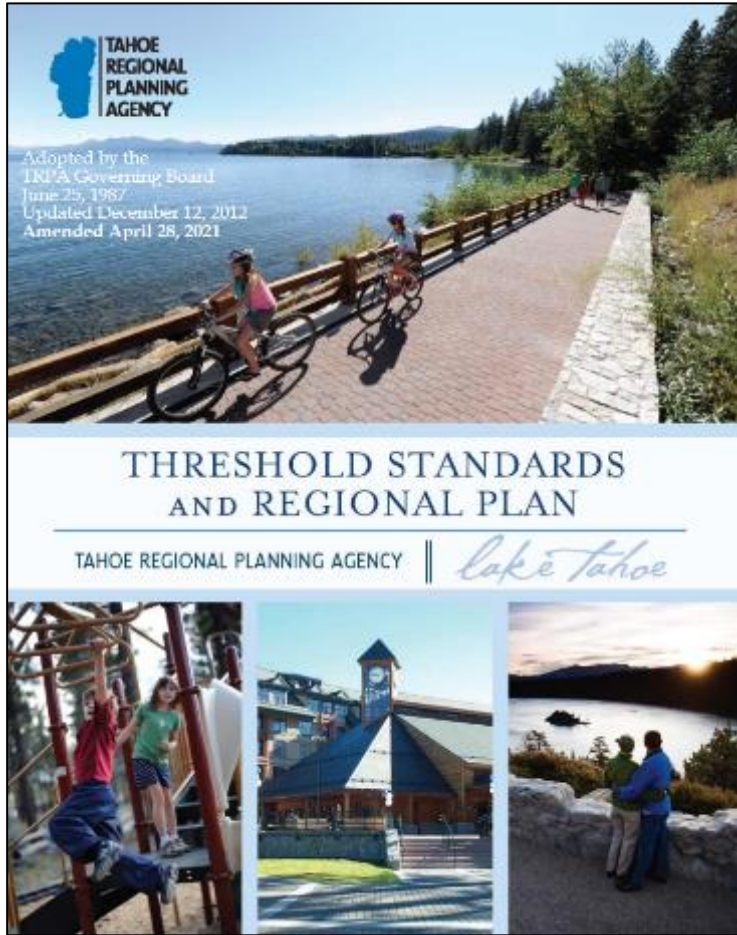
**Dan Segan**

Chief Science and Policy Advisor  
775-589-5233, [dsegan@trpa.gov](mailto:dsegan@trpa.gov)

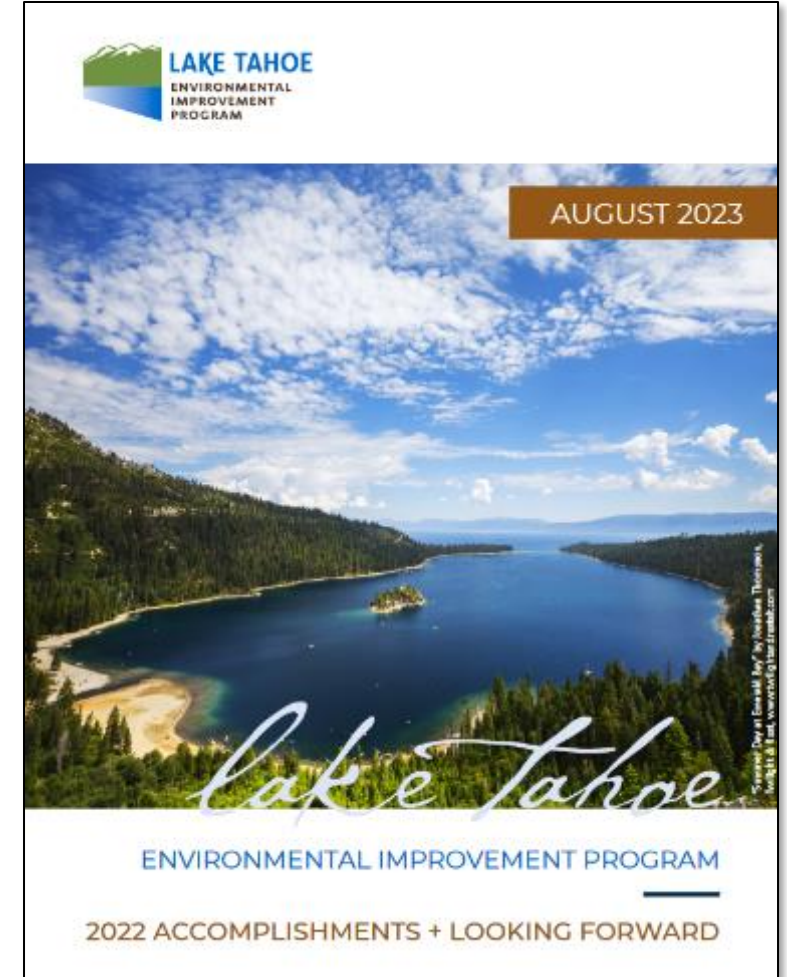
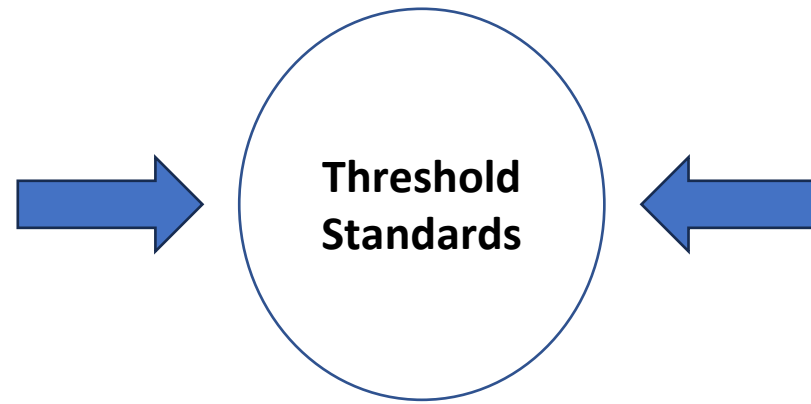
# Threshold Standards



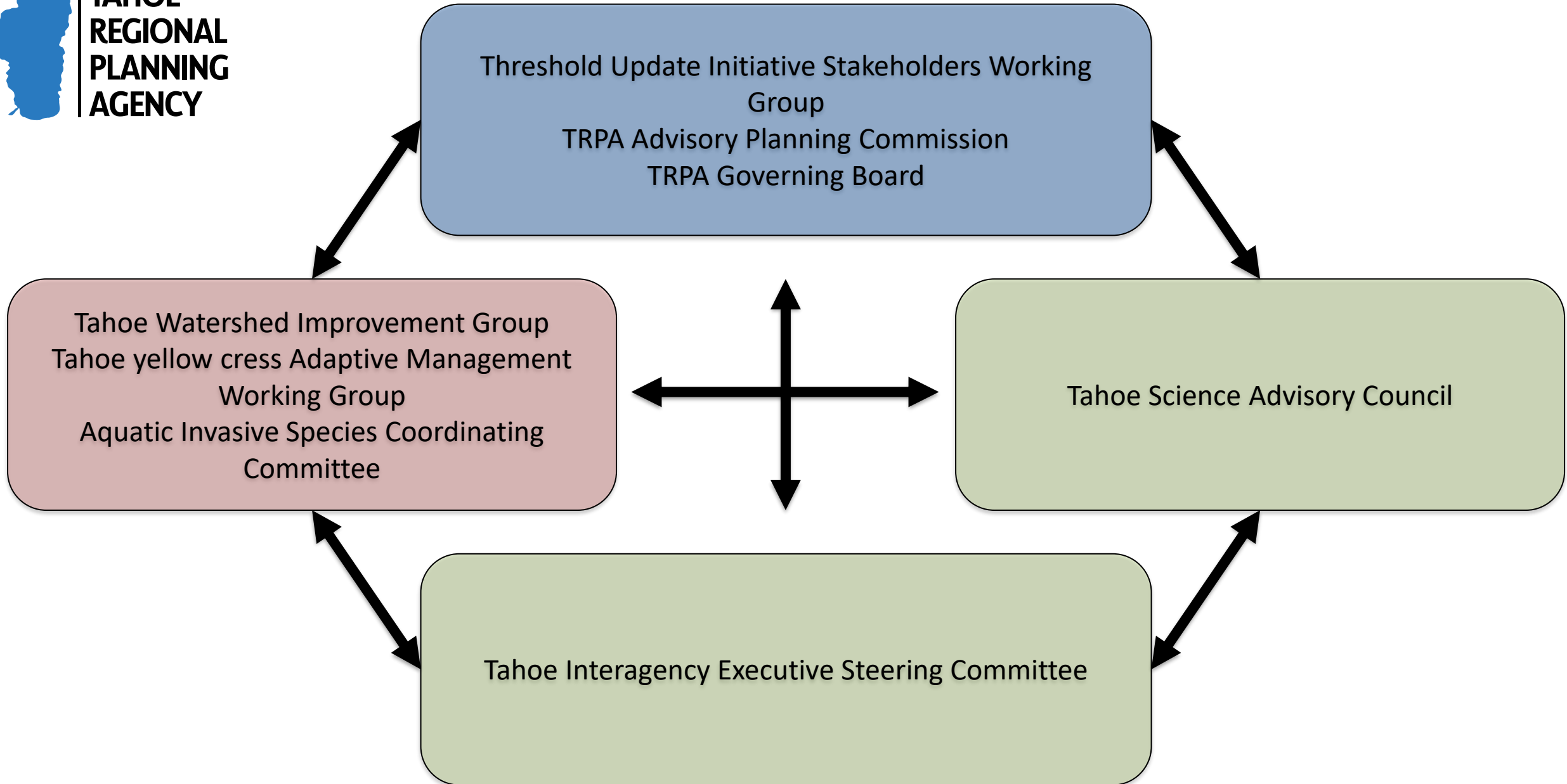
# Implementing the Compact



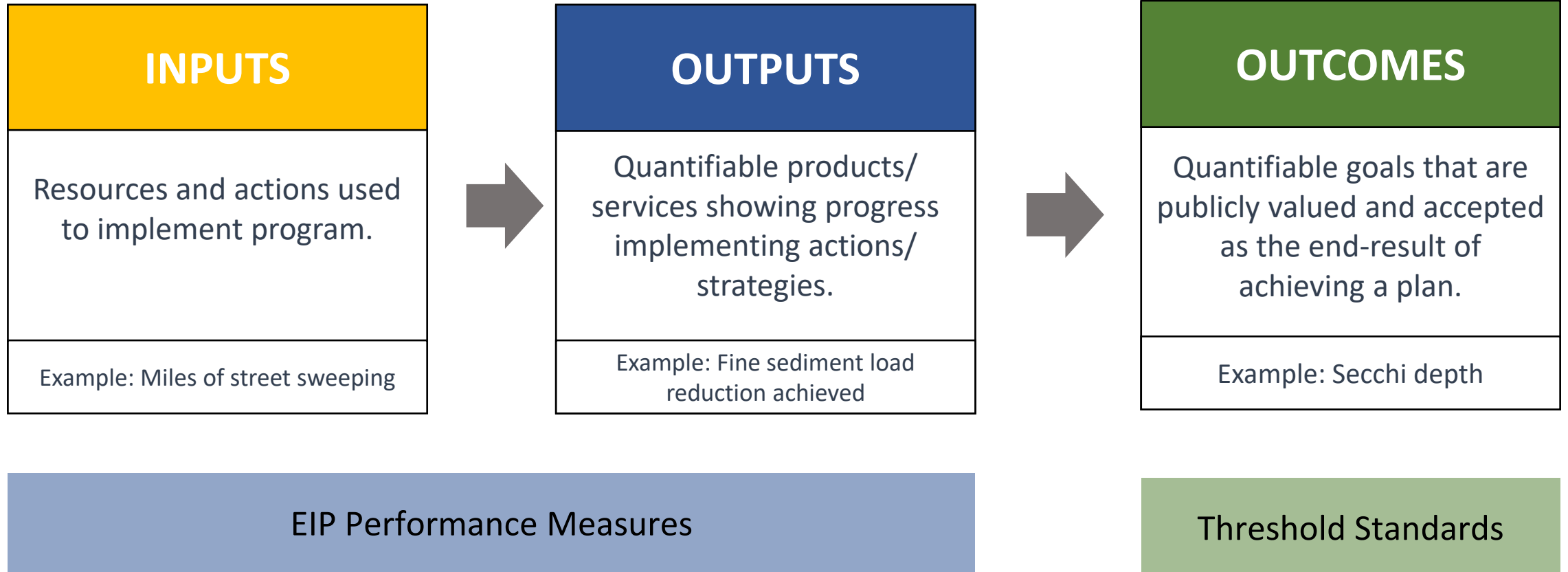
**Regional Plan**



**EIP**



# Framework



# 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 desired outcome.

# **Aquatic Invasive Species**

# AIS 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.



# AIS Program

## Prevention



## Control



# 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 authors: Dan Segan

### Executive Summary

The Tahoe Science Planning Agency associated performance Environmental Improvement summarizes progress an updated set of focused here on water threshold categories standards and the standards attainment

Recommendations first, to articulate general audience; objectives that exist should be supported tactics) to objective effectiveness of measures

Expanding on the

- 1) Ensuring the threshold
- 2) Clarifying conforms
- 3) Where current objective
- 4) Continued



April 25, 2018

To: Dan Segan, Tahoe Regional Planning Agency (TRPA)

From: Tahoe Science Advisory Council (TSAC)

**RE: Work Order #007  
Guidance on Technical Clean Up of Existing Threshold Standards**

The Tahoe Science Advisory Council (TSAC) was tasked (March 2018) with attending a stakeholder meeting organized by TRPA to present the guidance document, answer questions about it, and collect feedback. Based on TSAC member comments and stakeholder feedback, the TSAC was then tasked with revising the document *Guidance Document on the Administrative/Technical Clean Up of Existing Threshold Standards* (developed under Work Order #003, November 2017).

This document is the deliverable revised Guidance Document for that work order.

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Table 1. Functional relationships between goals, objectives, strategies and tactics. Note the difference in detail levels and whether they address “what” is desired or “how” the desired outcomes will be achieved.

Role	Description	Purpose	Water Quality Example	Link to EIP Program
Goal	High-level “what”	Broad, high-level ultimate outcome that supports a collective vision.	Restore the historic clarity and exceptional water quality of Lake Tahoe.	EIP focus area goals
Objective	Detailed “what”	Specific (SMART) result representing desired conditions for a goal or an intermediate outcome.	Restore lake clarity to a depth of 97.4 feet by 2076 (Lake Tahoe Clarity Commitment).	Threshold standard
Strategy	High-level “how”	An overall approach or actionable plan taken to achieve the objectives linked to primary goals.	Reduce urban fine sediment particle loading. The TMDL jurisdictional pollutant load reduction plan.	EIP Action Priority (output performance measure, FSP load reduced)
Tactic	Detailed “how”	A discrete set of actions taken to execute the strategy.	Street sweeping.	EIP action performance measure (miles of street swept)



# 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.

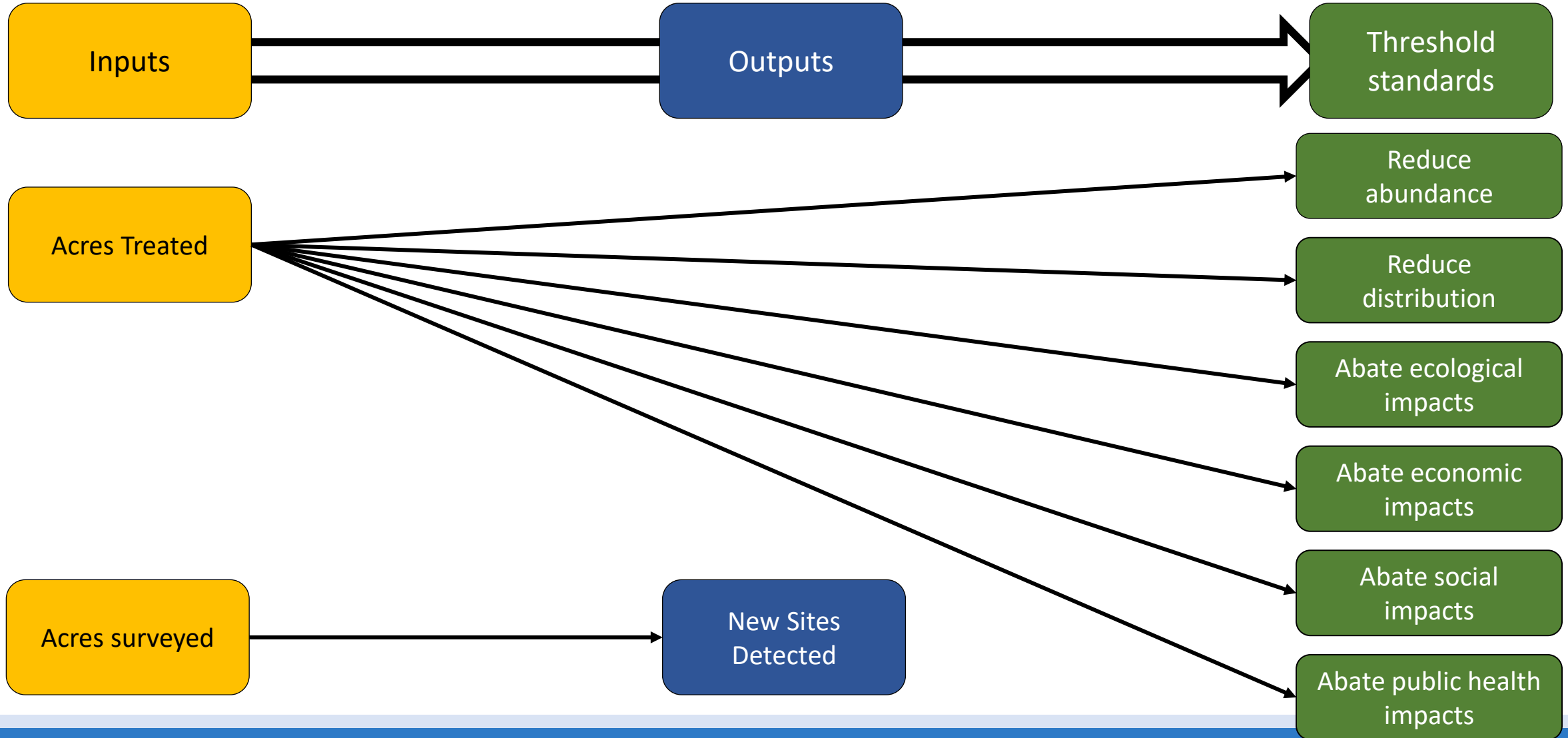
Expanding on these key features, recommendations for structuring threshold standards include:

- 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;

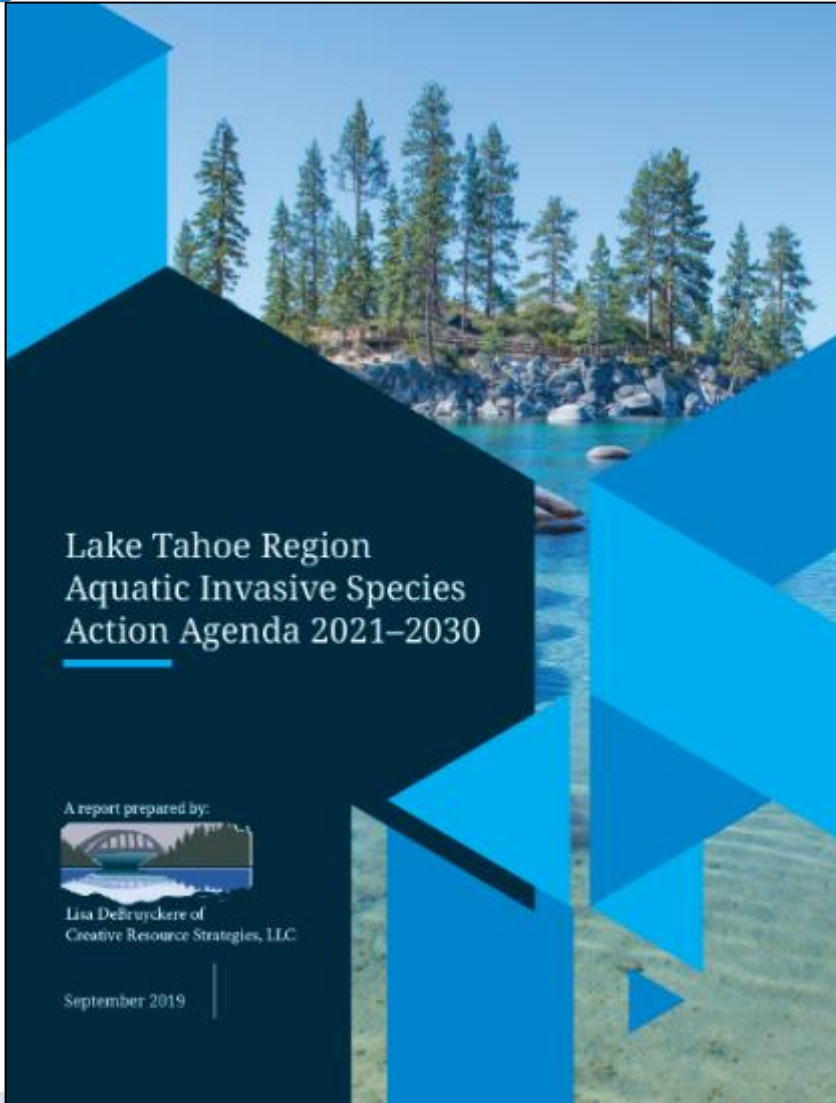
Table 2. Role identification for WQ threshold standards. All are TRPA threshold standards at present, with VEC added as an existing state standard. N/A indicates a role was not identified within the system structure. See Appendix A for narrative definitions associated with each threshold standard.

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 Distribution	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

# Control - Current



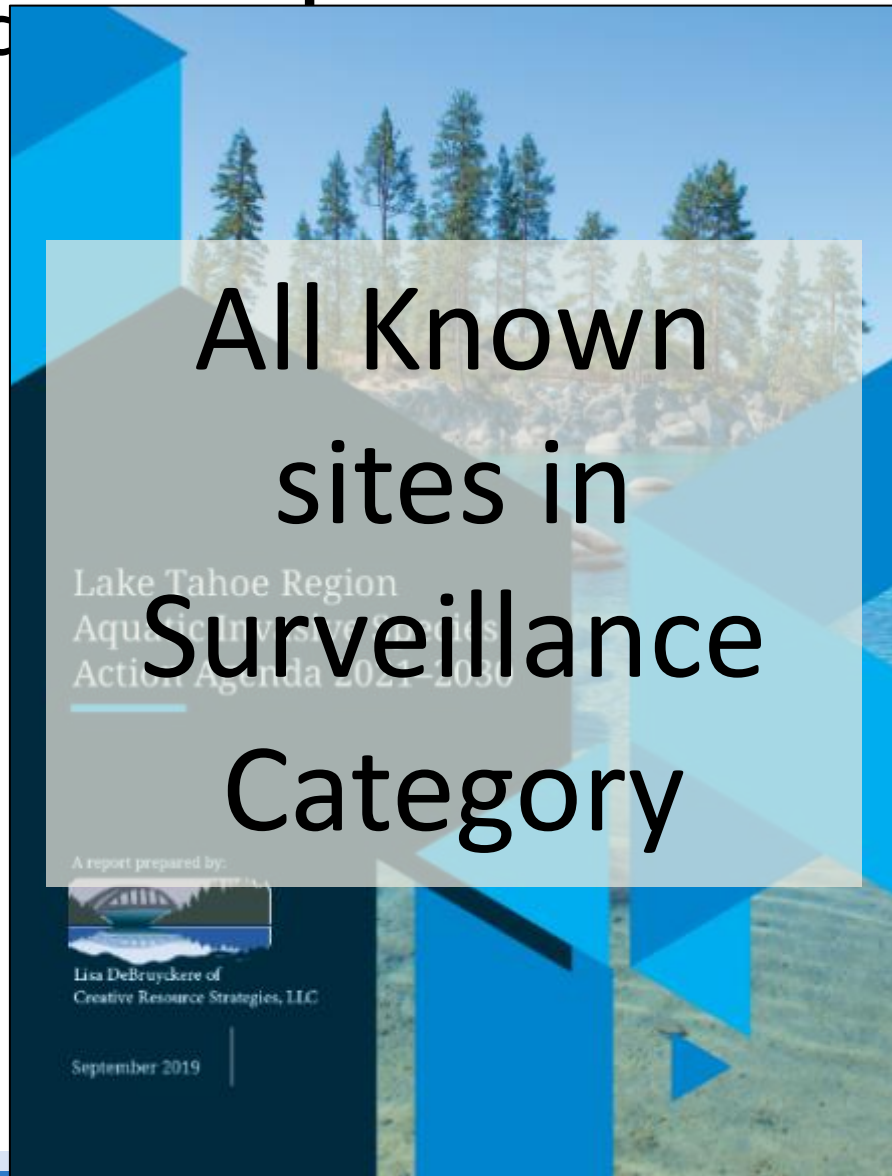
# AIS – Action Agenda



► Table 1. Aquatic invasive plant strategies, performance metrics, desired outcomes, lead, budget, and timeline, 2021–2030.

Strategies	Performance Metrics	Desired Outcomes	Lead	Phase I Costs (2021–2025)	Phase II Costs (2026–2030)
<p><b>Non-Tahoe Keys locations:</b></p> <p>1A. Establish the baseline for AI plant infestations in upstream portions of the lake.</p> <p>1B. Implement a full suite of control actions, using an integrated management approach, to reduce the abundance and distribution of AIS in regional waters.</p>	<p>% increase or decrease in infested area (acres) per species</p> <p># of AIS-infested acres</p>	By 2030, reduce by 90%, the acreage of AI plant populations in priority areas (and their upstream components) identified in the Implementation Plan as well as any additional areas that have been identified since plan creation (excluding Tahoe Keys).	TRPA	\$2.5 million annually = <b>\$12.5 million total</b>	Maintenance of an estimated 25 acres annually x \$50,000/acre = \$1.25 million annually x 5 years = <b>\$6.25 million total</b>
<p>1C. Implement a full suite of control actions, using an integrated management approach, to reduce the abundance and</p>	<p>% increase or decrease in infested area (acres) per species</p>	<p><u>Tahoe Keys*</u></p> <p>By 2030, reduce from 90% to full eradication, AI plant populations</p>		\$1 million annually (2021–2023), then \$4 million*** for	Estimated \$100,000/acre x 172 acres =

# Proposed Threshold Standards

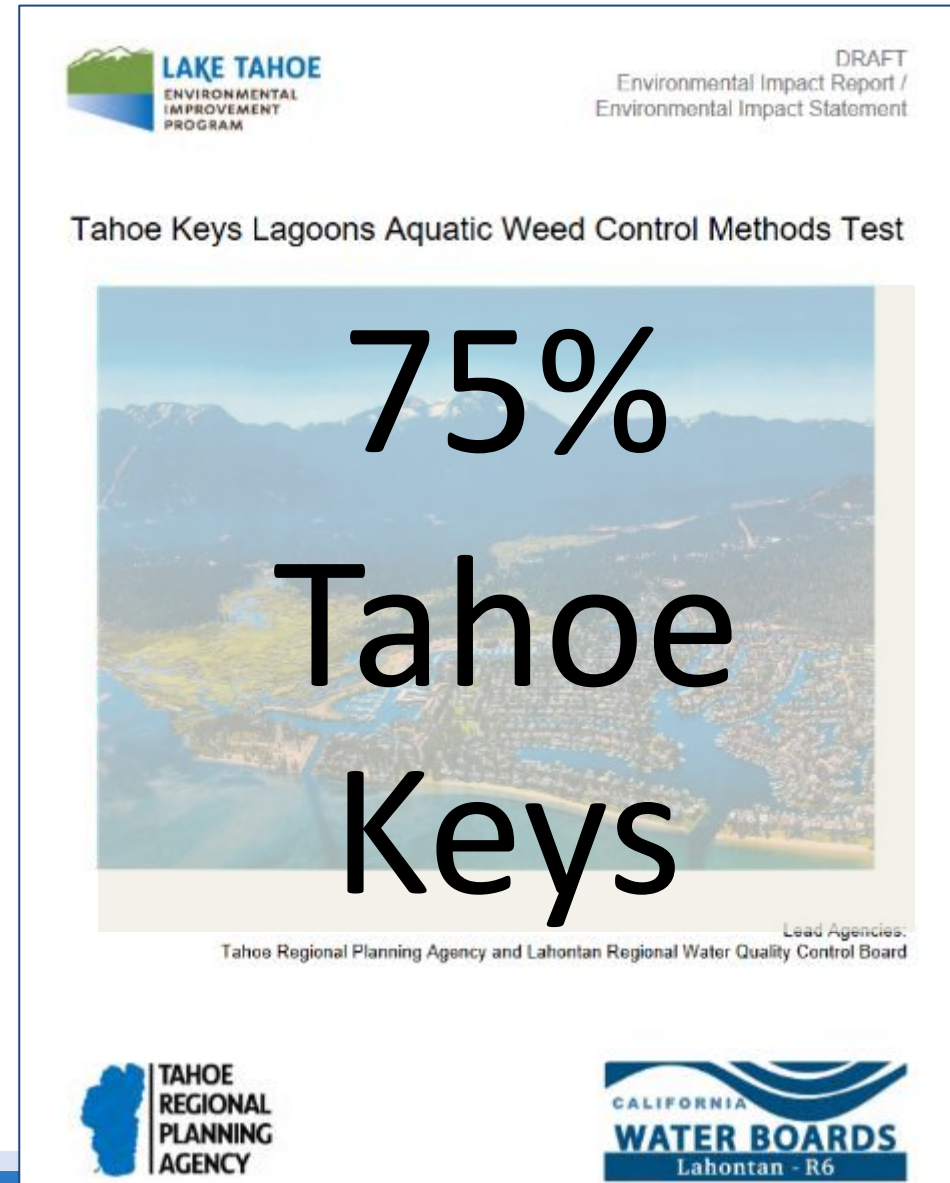


All Known sites in Surveillance Category

Lake Tahoe Region  
Aquatic Invasives Management  
Action Agenda 2021-2030

A report prepared by:  
Lisa DeBruyckere of  
Creative Resource Strategies, LLC

September 2019



LAKE TAHOE  
ENVIRONMENTAL  
IMPROVEMENT  
PROGRAM

DRAFT  
Environmental Impact Report /  
Environmental Impact Statement

Tahoe Keys Lagoons Aquatic Weed Control Methods Test

75%  
Tahoe  
Keys

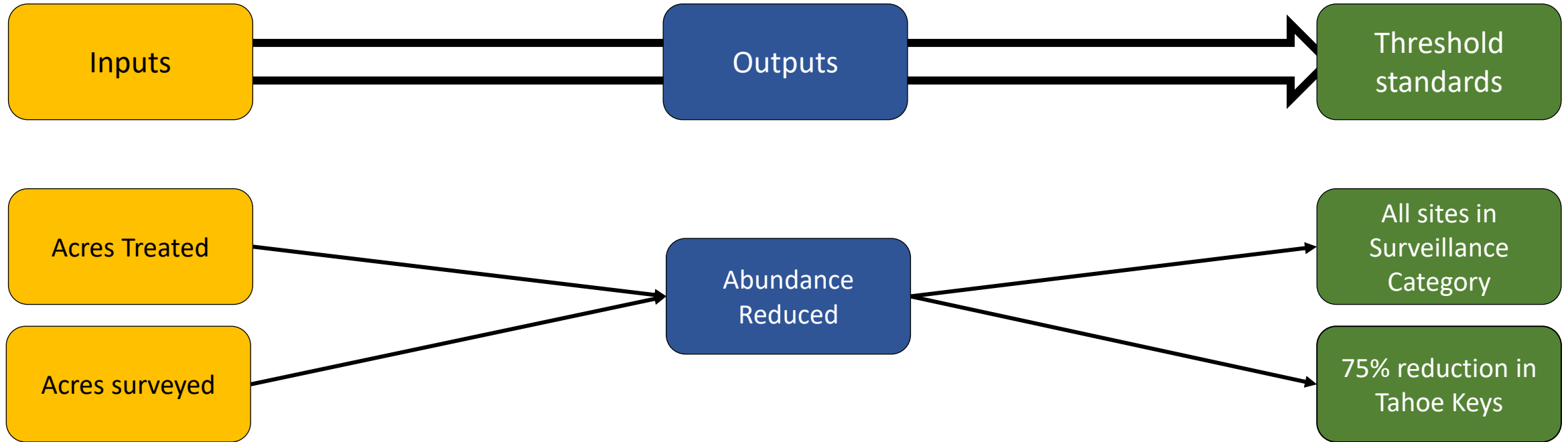
Lead Agencies:  
Tahoe Regional Planning Agency and Lahontan Regional Water Quality Control Board

TAHOE  
REGIONAL  
PLANNING  
AGENCY

CALIFORNIA  
WATER BOARDS  
Lahontan - R6



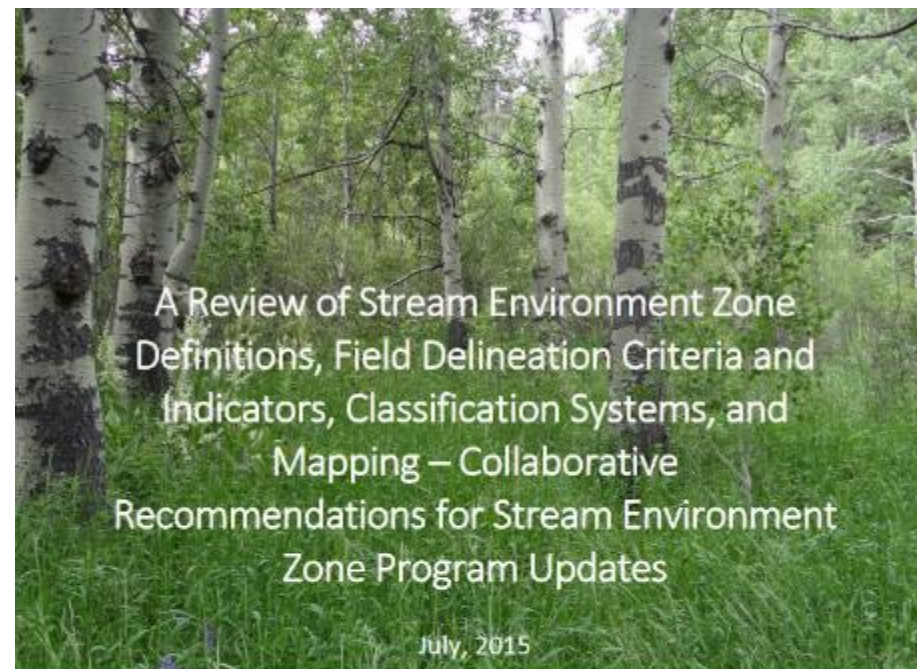
# Control - Proposed



# **Stream Environment Zone (SEZ)**



# What are Stream Environment Zone (SEZ)?



Prepared By  
**Spatial Informatics Group**

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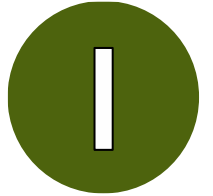
<sup>3</sup> For questions or information on this report, contact:  
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<sup>4</sup> USDA - Natural Resource Conservation Service  
NRCIS-EPA Liaison Office  
75 Hawthorne Street  
San Francisco, CA 94105

# Current thresholds

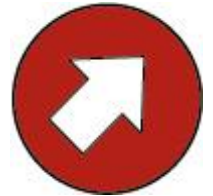
1. *Preserve existing naturally functioning SEZ lands in their natural hydrologic condition*

- Regulatory controls and permitting
- Compliance



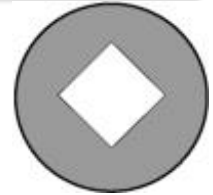
2. *Restore 25% of the SEZ lands that have been identified as disturbed, developed or subdivided*

- Target: 1,100 acres
- 924 acres of SEZ have been restored
- Upper Truckee Marsh will restore 592 acres



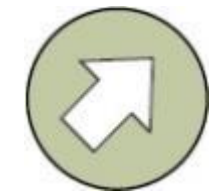
3. *Restore all disturbed SEZ lands in undeveloped, un-subdivided lands*

- No status determination possible



4. *Attain a 5% total increase in the area of naturally functioning SEZ lands*

- Target: 877 acres
- 924 acres of SEZ have been restored




# 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



# Roadmap steps and status



**TAHOE  
REGIONAL  
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AGENCY**

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Stateline, NV 89449-5310

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128 Market Street  
Stateline, NV 89449


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Phone: 775-588-4547  
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www.trpa.org

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**Memorandum**

**TO:** Tahoe Interagency Executive Steering Committee

**FROM:** Shane Romsos (TRPA), Paul Nielsen (TRPA), Hannah Schembri (Lahontan), Sue Norman (USFS-LTBMU), Woody Loftus (NRCS), Jacques Landy (EPA), and Tricia York (CTC)

**DATE:** March 21, 2010 

**SUBJECT:** Summary of Proposed Steps to Update Program Elements and Policies for Stream Environment Zones in the Lake Tahoe Basin ("SEZ Roadmap")

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Around July 2010, the Tahoe Interagency Executive Steering Committee directed agency staff to prepare a briefing paper that outlined steps necessary to update policies and program elements related to the conservation of stream environment zones at Lake Tahoe. Multiple agencies worked together to develop the following narrative included individuals listed in the memo heading with input provided by Josh Collins (San Francisco Estuarine Institute), Zach Hymanson (Tahoe Science Consortium) and Jonathan Long (USFS – Pacific Southwest Research Station).

**Purpose and Need**

Multiple Tahoe Basin agencies have goals and policies related to the conservation and restoration of stream environment zones (SEZs). Broadest among these are the Tahoe Regional Planning Agency's (TRPA), whose Regional Plan requires achievement of several threshold standards related to stream zones. The TRPA and other agencies have adopted and/or implemented various conservation measures, management guidelines, restoration programs and ordinances designed to achieve desired conditions, and regulatory standards related to SEZs. Although land management agencies have made significant strides in protecting and conserving SEZs in the Tahoe Basin, new science-based information, State initiatives, Federal guidance and identified issues with existing SEZ conservation program elements is prompting a comprehensive review and update of Regional SEZ policies and conservation program elements. Consequently, the TRPA has obtained Governing Board and other agencies' endorsement to review and update its SEZ conservation policies and program to encompass the four program elements recommended by EPA for an effective wetlands program.

**The four EPA Wetland Program elements and associated Regional needs are:**

1. **Monitoring and Assessment** (Standardize methodologies to document and track changes in acreage and SEZ condition)
2. **Establish Water Quality Standards for SEZ** (Set benchmarks for wetland conditions)
3. **Voluntary Restoration and Protection** (Improve the functional characteristics of SEZ and increase the acreage of SEZ)
4. **Regulation and Permitting** (Avoid/minimize the loss of SEZ and set guidelines for mitigation)







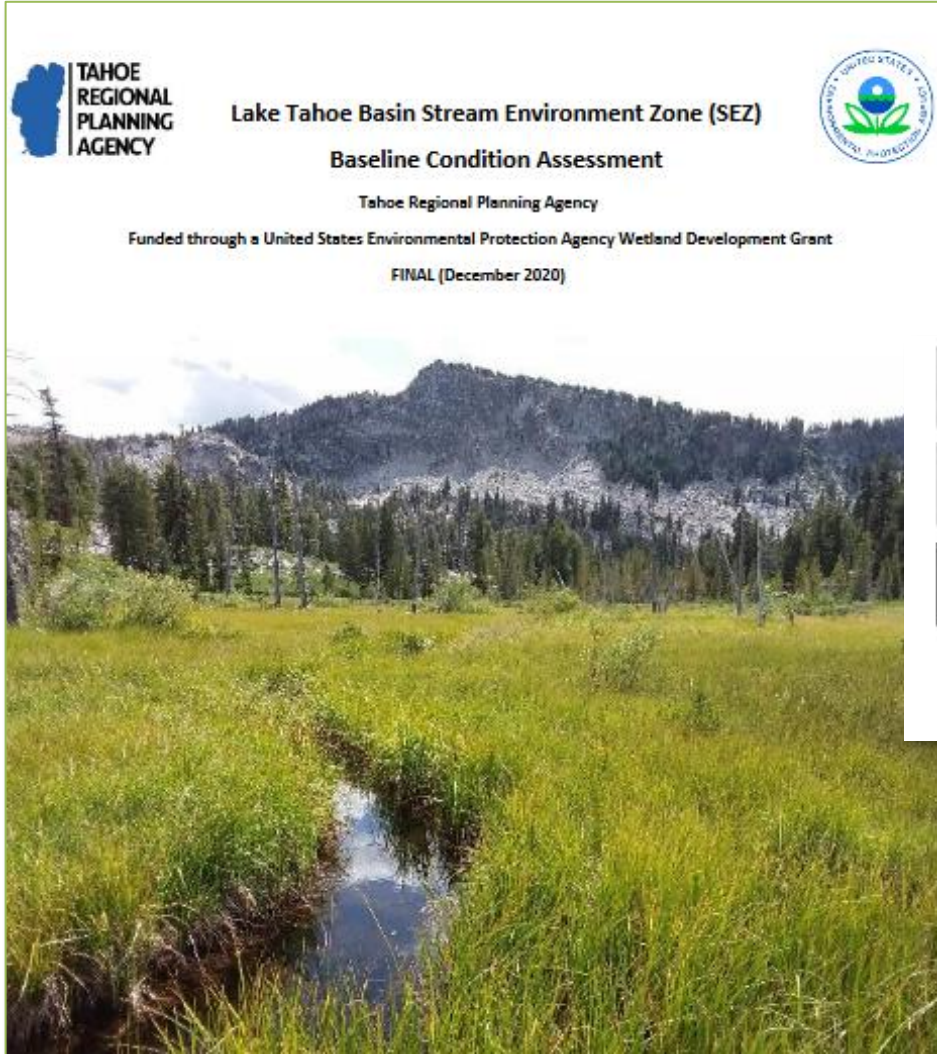
# Background

- EPA awarded a Healthy Watersheds grant in 2017.
- Initiated SEZ Technical Advisory Committee to help develop SEZ monitoring and assessment program.
- TRPA staff spent Summers 2019 and 2020 on intensive SEZ data collection from field and existing partner data.



# Current Condition

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



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
<b>SEZ index change: 118</b>			



## The Stream Environment Zones of Lake Tahoe



Use this application to visualize **CURRENT CONDITIONS** of stream environment zones, **SEARCH** for a meadow or stream, **FILTER** monitoring attributes, **EXPLORE** monitoring data such as streambank erosion and channel incision, **LOCATE** where you are, and **TRACK** where you've been.



# Target Setting

OBJECTID	Included	Assessment	Acres	SEZ_Type	Feature_Ty	Ownership_	Ownersh_1	Ownersh_2	Ownersh_3	EIP Project Number
1		Saxon Creek meadows - below Fountain Place	16.66	Channeled Meadow	Meadow	USFS				0
2	YES	Saxon Creek meadows - above Fountain Place 1	12.81	Channeled Meadow	Meadow	USFS				01.02.01.0084
3		Burke Creek meadows - 2	4.92	Non-Channeled Meadow	Meadow	USFS	private			0
4		Washoe State Parks meadow - 1	35.72	Non-Channeled Meadow	Meadow	State of California				0
5		Spooner Meadows - 4	18.76	Non-Channeled Meadow	Meadow	State of Nevada				0
6	YES	Slaughterhouse Meadows - 1	21.17	Non-Channeled Meadow	Meadow	private				01.02.01.0092
7	YES	Upper Truckee River - Tahoe Paradise	86.99	Channeled Meadow	Meadow	State of California	USFS	local		01.02.01.0063
8		Hell Hole Meadows - 2	3.47	Channeled Meadow	Meadow	USFS				0
9		Trout Creek headwaters meadows - 2	68.27	Channeled Meadow	Meadow	USFS	private			0
10		small meadow 2	2.56	Non-Channeled Meadow	Meadow	USFS				0
11		small meadow 1	5.04	Channeled Meadow	Meadow	USFS				0
12		North Logan House meadows	1.26	Non-Channeled Meadow	Meadow	USFS				0
13		Logan House meadow	1.30	Non-Channeled Meadow	Meadow	USFS				0



Your Portfolio		Post Restoration Score		
		100%	91%	88%
# Projects	103			
Acres Treated	2,748			
Regional Score		1,004,256	986,393	971,279
Regional % of Possible Score		84%	83%	81%
Regional % of Possible Score (no SEZ re-establishment)		94%	92%	90%
Regional % increase		7%	5%	3%
Score improvement		65,219	47,356	32,242
Total gap closed		26%	19%	13%
Gap closed (no SEZ re-establishment)		48%	35%	24%

# Target setting

Partner 1		Post Restoration Score		
		100%	91%	88%
# Projects	103			
Acres Treated	2,748			
Regional Score		1,004,355	885,283	871,270

Partner 2		Post Restoration Score		
		100%	91%	88%
# Projects	269			
Acres Treated	6,238			
Regional Score		1,105,375	1,065,837	1,031,517

Partner 3		Post Restoration Score		
		100%	91%	88%
# Projects	309			
Acres Treated	6,206			




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  
Increase SEZ condition Index score from  
79% to 88%

# **Tahoe Yellow Cress (*Rorippa subumbellata*)**

# Current Standard

- Maintain a minimum of 26 *Rorippa subumbellata* population sites.

— Vegetation Preservation	2011	2015	2019
— Sensitive Plants			
— Tahoe Yellow Cress ( <i>Rorippa Subumbellata</i> )			

# Conservation Success?

## Conservation Efforts Protecting Tahoe Yellow Cress

OCT 7, 2015

Lake Tahoe, Stateline, NV – Collaborative conservation efforts are successfully pro... determine that the plant does not require additional protections under the federal E...



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PRESS RELEASE

## Successful Conservation Effort Keeps Tahoe Yellow Cress Off Endangered Species List

Oct 7, 2015

**R**ENO –Successful conservation actions from a collaborative Lake Tahoe partnership spanning the past 15 years have helped the U.S. Fish and Wildlife Service (Service) decide today that Tahoe yellow cress (*Rorippa subumbellata*), a flowering perennial plant in the mustard family found only along the

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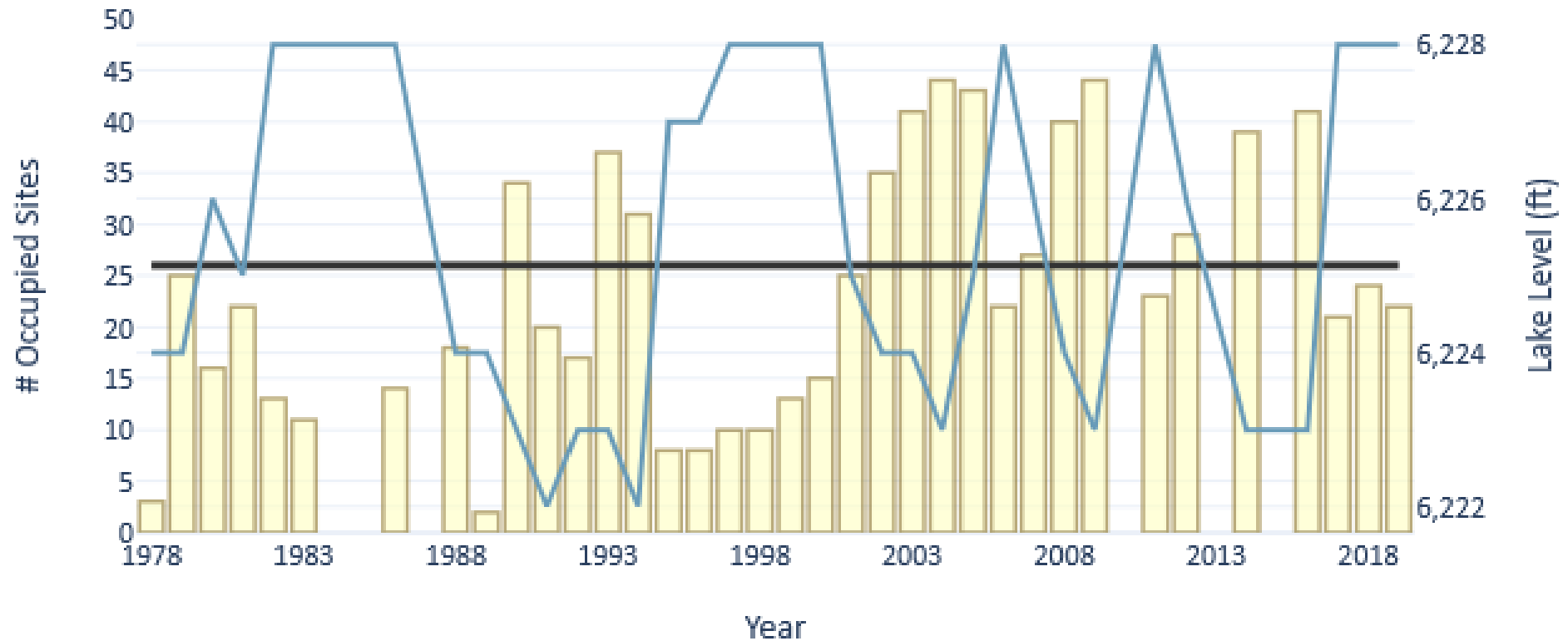
## Rare Plant Conservation Success Stories

### Pacific Southwest Region

- [Seed Banking Tracy's beardtongue \(\*Penstemon tracyi\*\), Meeting Target 8 of the Global Strategy for Plant Conservation](#)
- [Tahoe yellow cress \(\*Rorippa subumbellata\* Roll.\) Recovery on the Lake Tahoe Basin Management Unit](#)

# Influence of Lake Level

Tahoe Yellow Cress



# Current Standard

CONSERVATION  
STRAT  
FO  
TAHOE YEL  
(*Rorippa su*



August

Conservation Strategy for  
Tahoe yellow cress (*Rorippa subumbellata*)



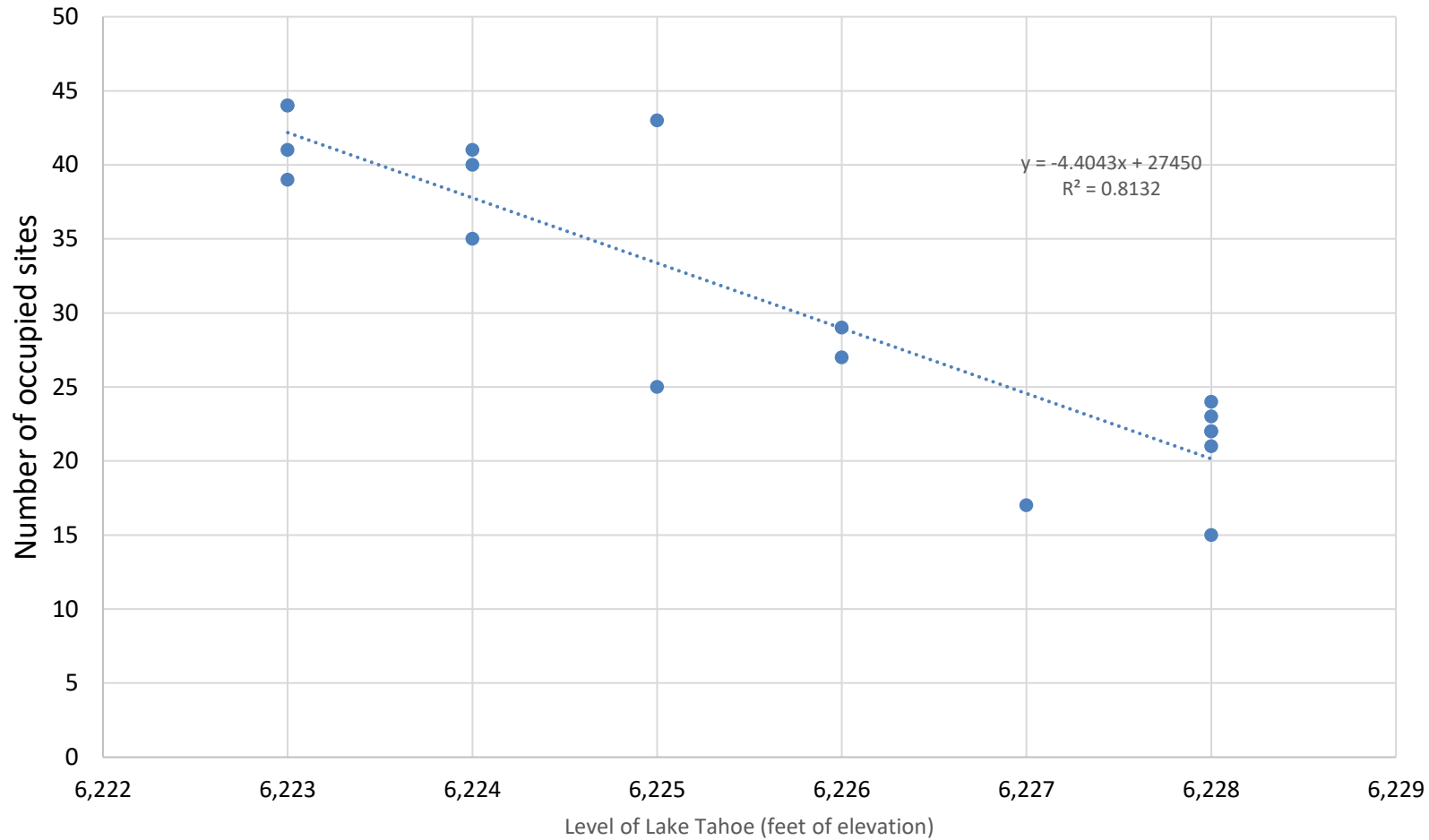
Sarah Kilga/USFWS

Prepared by  
Alison E. Stanton  
and the  
Tahoe yellow cress  
Adaptive Management Working Group  
and  
Executive Committee

For the  
USDA Forest Service Pacific Southwest Research Station  
Domestic Grant  
13-DG-11272170-010

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

# Lake Level





# Proposed Standard

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