

February 1, 2017

To: Tahoe Regional Planning Agency (TRPA) Staff and Governing Board

From: Tahoe Science Advisory Council (TSAC)

RE: Comments and Recommendations on Threshold Assessment Process

The Tahoe Science Advisory Council was tasked (August 2016) by its executive committee to review assessment materials related to the 2015 Threshold Evaluation (TVAL) Report and to contribute subsequently to a technical review of the TRPA's existing threshold standards. The initial step of Council engagement in this process is to provide guidance on the proposed assessment process that will be used by the TRPA as a starting point in their Threshold Update Initiative. The mechanics of this assessment process are detailed in pages 14–21 of Chapter 13 in the TVAL Report, and this memo is focused on the methodology described in that section of the report.

The Threshold Update Initiative is intended to provide a comprehensive review of existing thresholds and their relationship to long-term resource management goals. Our understanding is that the Threshold Standards Assessment process is the first step in this comprehensive review. It is designed as a simple systematic approach for initial review of all existing 178 threshold standards in a consistent manner, which will help to inform and focus subsequent stakeholder discussions and evaluations that could lead to adjustments in the overall threshold system.

TRPA staff attended TSAC meetings in July and November 2016 to present an overview of the assessment process and to answer Council member questions. The Council reviewed materials provided by the TRPA pertaining to this process, which included the Draft 2015 TVAL Report as well as independent peer-review comments received on that document (Conservation Science Partners, 2016).

The following describes collective comments and recommendations from the Council on the assessment methodology described in Chapter 13 of the TVAL Report. We have attempted to prioritize Council member suggestions and peer-review comments related to assessment methodology so that TRPA staff can implement important recommendations efficiently and start the assessment as soon as possible, while still considering additional recommendations over time.

The Threshold Standards Assessment is a critical first step, but it is also important to acknowledge that Chapter 13 identifies the desire to move toward “managing systems not symptoms”. Thus, in the long run it will be important to develop a more systems-based approach that considers important interactions among physical, biological and socio-cultural factors, along with the outcomes of interest (goals), the factors contributing to those outcomes, and the interactive elements within those systems (such as interdependent outcomes, system stressors, etc.). Although this

may not be practical in advance of Threshold Standards Assessment, moving thresholds evaluation toward a systems framework of this type would help provide guidance for the interpretation of changes across multiple metrics both within and across thresholds and standards over various spatiotemporal scales.

TSAC Review of TRPA Threshold Assessment Methodology

Priority Recommendations

The Council is supportive of an initial Threshold Standards Assessment based on “SMART” criteria: standing for Specific, Measurable, Achievable, Relevant, and Time-bound, as described in the TVAL Report along with its application through Assessment Frameworks shown in Tables 13.1 and 13.2. However, there are several specific recommendations related to this approach that should be addressed, as follows.

- The R-criterion in SMART assessment is variously represented as realistic, reliable, or relevant. Of these we consider relevant to be the most important for initial assessment. Relevant to whom and toward what purpose should be documented during the assessment process.
- Categorization questions listed in the Assessment Framework (Table 13.2) were generally found to be somewhat confusing by peer-reviewers and Council members alike. They serve an important purpose, but we believe that purpose would be enhanced if they were considered prior to or as part of the SMART assessment process, rather than after evaluation by SMART-based criteria.
- Threshold standards are a mixture of environmental standards, restoration goals, specific directives, broad guidance and narrative statements. The “focus” categorization of these various types of standards should be addressed first. Then the SMART-based criteria could be applied to standards with interpretation informed by whether the standard is a specific activity, an outcome, or some intermediate result.
- The remaining four categorization questions could readily be considered as aspects of the defined SMART criteria, and either integrated into them (for example, cost would be a component of achievability) or added to them to expand the list of criteria (for example, reliable and credible categorization is a subset of the science-based category, which could both be could additional representation of the letter R in addition to “relevant”, akin to the addition of “attributable” as another letter A in SMAART criteria). Any categorization questions that are retained as part of the first stage of assessment should include clarification as to why they are considered separately from the SMART criteria.
- The TRPA proposed assessment methodology does not include time as a criterion, but the Council recommends that time should be considered as part of the SMART assessment. While not all threshold standards are amenable to

specific time statements, we believe this attribute should be included in the assessment to document whether a time component exists or should be considered as part of the threshold standard. Expected response times, for example, can be important when evaluating the appropriateness of specific threshold standards. The assessment can recognize that some categories of thresholds (for example those that provide broad narrative guidance) may not require a time element.

- The measureable (M) criterion in SMART should be expanded to address several important characteristics of measurements (similar to some of the original categorization questions).
 - Is the threshold standard represented by a direct or an indirect measurement of outcome or condition?
 - Is the metric sensitive to measurable change?
 - In terms of credible and reliable, how accurately and precisely can the threshold standard or associated metric(s) be measured?
 - Is the threshold standard response curve expected to be linear or non-linear and how is this evaluated?
- The yes/no response to questions seems unnecessarily restrictive. Instead we recommend a rating (for example, 1-5) where applicable for criteria questions and sub-questions that can represent the strength of the response with respect to the attribute (i.e., 1 = weak, 5 = very strong). A scaled rating for these questions would contribute toward quantitative prioritization of individual standards and suites of standards. Regardless of the ranking system developed, it will be critical to articulate decision-making guidelines for these scores. Not all the rating definitions in the current assessment questions are adequately explained.
- There is no description of who is going to work through the Assessment Frameworks to populate the results matrix. Therefore, the Council recommends an expanded description in the methods section that shows engagement of specific stakeholders and agency representatives during discrete steps in the process.
- Assuming one of the main goals of the threshold standards assessment is to prioritize among the 178 existing threshold standards for subsequent in-depth evaluation and potential changes as part of the Threshold Update Initiative, it will be important to engage the broader community in the assessment to build public confidence and support. Differing opinions are likely to be presented, which should be considered valuable information on areas of interest, technical understanding, and support for specific threshold standards. Retaining the granularity of this information, rather than lumping results, may provide important information on identifying the perspectives and addressing the concerns of specific stakeholder communities. We

recommend a broad representation of stakeholders participate in or ultimately review and comment on the assessment of threshold standards.

- The assessment methods section should include a description of how the results from this assessment will be used to make recommendations for next steps so all stakeholders understand the process and know when and where they can contribute. Clearly, communicating the overall approach will encourage greater support.

Additional Comments on Assessment Process

- It is suggested that the TRPA choose one set of threshold standards to test out the assessment process initially and then adjust the process as issues and ambiguities in approach are resolved. The TRPA should be strategic and could probably start with standards that are most clearly defined and best understood.
- Peer-reviewers and Council members recommend development and documentation of consistent terminology to be used during the assessment process. There can be a lot of confusion when stakeholders with expertise in diverse fields talk from different vocabularies or conflicted understanding of terms used during the process. A glossary of definitions developed during assessment would provide a common basis of understanding and improve communication.
- Initial assessment should include clear articulation of the goals and objectives relevant to each threshold area. This will help link threshold standards to the regional plan and the Environmental Improvement Program.
- It would be useful to include a description of the approach that will be used to prioritize standards (or theme areas) for subsequent in-depth review as part of the Threshold Update Initiative, based on results from the Threshold Standards Assessment. Include a discussion on how anticipated weightings and rankings of responses to Framework questions would be used for prioritization. Will other data and information be used to make determinations of priority? Who will interpret the data and information to generate prioritization of the standards? With regard to weighting of responses, the TSAC strongly recommends a judicious and transparent approach. Arbitrary weighting of particular responses could result in very subjective outcomes and undermine stakeholder confidence.

Supplemental Observations on Threshold Update Initiative and Threshold Evaluation Reporting

During the Council's discussion of Assessment Methodology a number of issues were raised that are not directly germane to the assessment process itself, but which are important to consider as part of the larger Threshold Update Initiative.

We highlight some of these below to help inform the longer-term vision for subsequent engagement on threshold updates.

- Funding priorities are becoming more interdisciplinary. Periodic evaluations of threshold standards under a systems approach could provide useful information in determining future funding priorities and enhance access to multidisciplinary funding opportunities.
- Evaluation of threshold standards should be predicated on conceptual models that communicate how different parts of the system interact. This facilitates communication and discussion of relevance and relative value. Simple conceptual models may currently exist or could be in development. Over the longer-term these should be updated periodically to reflect new public questions about system behavior, along with advances in scientific understanding and management options. Ultimately these should follow the Driver-Linkage-Outcome approach, as done for other complex ecosystem restoration projects (e.g., DiGennaro et al, 2012).
- To the extent that conceptual models already exist for system components of the Tahoe Basin, they should be assembled as supporting material for the assessment process. We are not recommending the development of new conceptual models before assessment can proceed, but believe that when available they contribute to a common basis of understanding among stakeholders during assessment, showing linkages and interactions among different standards and thresholds. Some conceptual models were developed, for example, during production of the “Integrated Science Plan for the Lake Tahoe Basin: Conceptual Framework and Research Strategies” (Hymanson and Collopy, 2010).
- The standard categorization question “reliable and credible” is a useful approach by which to group standards. It would be interesting to consider the possibility of quantifying uncertainty rather than simply ascribing a yes or no answer to this question. How does the uncertainty in our measurements compare to our target, based on the model for that standard? This would inform assessment of sampling frequency, for example, which has important implications on cost feasibility (categorization question five).
- Distinguish between theory-based versus evidence-based standards (this is where conceptual models or results chains are useful). Also, it will be important to distinguish between goal-based standards and metric-based standards, perhaps during the categorization process.
- The standard categorization and SMART criteria questions might benefit from having someone or a group designated to evaluate whether or not the correct metrics are still being measured, or if alternative metrics that were not measured in the past might be more useful.

References

- Conservation Science Partners. 2016. Peer Review of the Tahoe Regional Planning Agency's 2015 Threshold Evaluation Report: Individual Reviews of "Recommendations for Review and Modification of Threshold Standards". Submitted to the Tahoe Regional Planning Agency, September 23, 2016. 15 p.
- DiGennaro, B., D. Reed, C Swanson, L. Hastings, Z. Hymanson, M. Healey, S. Siegel, S. Contrell, and B. Herbold. 2012. Using conceptual models in ecosystem restoration decision making: An example from the Sacramento-San Joaquin River Delta, California. *San Francisco Estuary and Watershed Science*, 10(3): 1-15.
- Hymanson, Z.P. and M.W. Collopy, eds. 2010. An Integrated Science Plan for the Lake Tahoe Basin: Conceptual Framework and Research Strategies. General Technical Report PSW-GTR-226. U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 368 p.

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