

Meeting Notes
Tahoe Science Advisory Council

Thursday September 21, 2017
10:00 AM – 2:00 PM

Tahoe Center for Environmental Sciences, first floor Rm 119
291 Country Club Drive
Incline Village, NV 89451

Participants: Mark Pitchford (DRI), Scott Tyler (UNR), Geoff Schladow (UCD), Steve Sadro (UCD), Max Moritz (UCB), Pat Manley (PSW), Ramon Naranjo (USGS), Ed Parvin (USGS), Zach Hymanson (CNRA), My-linh Nguyen (NDEP), Alison Toy (UCD), Dan Segal (TRPA)

1. Welcome, agenda review:

Geoff welcomed all meeting participants and briefly reviewed the agenda. No changes were made to the agenda.

2. Council operations update:

TRPA is working with the CA Natural Resources Agency to extend the master agreement from 6/2018 to 06/2019. The amendment will also augment the agreement budget to include the \$150,000 authorized for the Science Council in the most recent State budget.

TRPA has sub-agreements with USGS (NV side only), UCD, DRI, UNR, Agreements still possible with UCSB, UCCE. John and Max (respectively) were sent the UCD agreement as a model for use by their institutions, but we have not heard back. PSW can't work with a generic agreement, it needs a specific task or project to work with. Pat thinks they are ready, just waiting for the need. They have a vehicle ready to go. The specificity needed is something like the task orders used for other Council work on the Threshold initiative.

Zach noted the all Council positions are filled. Let Alan, Geoff, and Zach know if there are changes with representatives from any entity. Pat says that Matt Busse will be subbed out. He should be taken off the mailing list. Pat will update when she knows more.

Website – Alison asked all members to take a look at the Council web site. Send any comments on the web site to her **ACTION**. Alison will post the most recently approved Council work plan to the web site **ACTION**.

Geoff noted that Alison is the Go-to person for Council logistics and calendaring. Council members should also contact Alison, if they have problems getting ahold of Geoff and Alan.

Video conferencing system – everything looks and sounds good.

Zach noted that the Council is fully operational. Future operations updates should be very short.

Geoff has question for Todd: is there any anticipation of increased SB630 funding for the Science Council as the total pot of money increases? CTC to Lahontan Reg. is there

anticipation of funding growth? Zach to pose question to Todd for discussion at a subsequent meeting **ACTION**. Zach noted that a Budget Change Proposal is the mechanism for changing the funding amount. This would start as a concept proposal in the spring.

3. 2017 Executive Committee meeting recap:

Overall, Geoff thought it was a nice two-hour meeting, briefly interrupted by Bruce Babbitt (former interior secretary), John Garamendi (congressman), and Gary May (UC Davis' new Chancellor). Committee members were pleased with what they heard. Two main things discussed: 1) presentation by Alan about TSAC's contributions to the TRPA threshold update initiative (well-received). Zach chimes in that this is what the committee considers the Council's primary task, an important item for both states. 2) Discussion/Presentation about a second substantive task to undertake. Looking at development of conceptual models and a decision support framework. Getting a more holistic view of the Tahoe basin at how we monitor and assess change. NV committee members had concerns about the unknown, worries about scientists running amuck, but John Laird did a good job addressing that.

We do have a go ahead to begin work on a decision support framework. Geoff's presentation was very general, and non-committal of specifics. Zach agrees they did provide approval. The Committee want to make sure there is communication along the way.

Pat observed the lack of detail raised concerns. She felt that there were some contributions of what the committee thought was important to focus on and potential pitfalls. It's good that Geoff got the ball rolling and put some ideas out there. As a council we need to spend some time to figure out what we are actually going to focus on. Maybe this afternoon we can give it additional form and make it a fruitful approach. There were concerns and a lot of ideas, so maybe some queries to committee members would be needed to shape what would be most well-received?

Geoff explains it was intentionally vague. He didn't see much value in going into details about things that not everyone is familiar with. Also the council members need more time to discuss.

Zach observed that the discussion of the decision support framework pointed out the need to start earlier in shaping the Committee agenda, and framing agenda items. He will start prepping for next committee meeting in January. Could be very different thing next year as people come and go, and the CA and NV administration wind down.

Geoff thinks there will be more substance to discuss next year. These past meetings were mostly administration. A lot of reps are not super familiar with Tahoe, so bringing them up to speed and getting meaningful response is a challenge. Thinking of ways to do this would be helpful.

Zach thinks it would be beneficial for Alan and Geoff to spend more time with the NV Director of the Department of Conservation of Natural Resources. My-linh should attend, if possible. My-linh and Jennifer Carr had a meeting with the Director, and give him briefing. They try to brief him before the Committee meets, but this is not always possible. His wants the Council to consider the practical aspects of managing Tahoe. They said "yes, that is the point." Moving forward, he knows that we are taking this into account. My-linh does agree there is value in Alan, Geoff, Sudeep, and Steve getting to know the Director. The Director is the co-chair of the

Executive Committee. The CA Natural Resources Secretary is the other co-chair. Todd and Jim Lawrence are also members of the Committee.

4. TRPA threshold Update Initiative: update and next steps

All Council members have received the final draft of the existing environmental program evaluation authored by Alan and others. Geoff asked the members present if are any comments or substantive issues with the final draft. Are there comments? Or did you have any substantive issues with it? Generally all present offered positive comments about the document. Specific comments and discussion points regarding the TRPA threshold update initiative follow.

- i. Ed has minor comments he will send to Alan. He noted that Alan put a lot of effort in and so thanks for that.
- ii. Ramon will provide comments directly to Alan.
- iii. Dan is happy with the product. Alan will provide a 15-minute product presentation to TRPA governing board on Wednesday the 27th. He thinks the guiding principles for where to go from here are good. Copies of the report and executive summary have been provided to the Governing board. At the board meeting, staff also will recommend moving forward to update the threshold standards in four areas: 1) Air Quality (specifically vehicle miles traveled), 2) forest health, 3) sustainable recreation, and 4) stream environment zones (SEZ). These areas have agency efforts currently underway, but TRPA also is looking for assistance from the Council as well. In addition, staff will pursue an assessment of overlap among the existing standards. Council assistance also is requested for this effort.
- iv. Geoff asks if TRPA has a document that identifies the areas of overlap among the existing standards. Dan says yes, it is available on the TRPA web site.
- v. Dan thinks the program reviews document lays out core principles, essential elements, and recommendations for some best practices. However, the document is fairly general. He thinks information from the document can be used to identify criteria that new or modified standards should adhere to. However, some issues warrant further discussion. For example, the 'best' standards seem to be outcome based indicators that are measurable and time bound. Is it the council's recommendation that Standards which are not outcome based should no longer be considered threshold standards?
- vi. Geoff – is there another existing evaluation system that TRPA could adopt? The review report finds all of the evaluation systems have issues. The Tahoe system is as good or bad as all of them. There is no quick fix.

- vii. Dan – This larger question of threshold system organization is something that is asked routinely. Right now there are nine threshold categories: air, water quality, wildlife, soil, conservation, vegetation, recreation, scenic, and noise. Past reviewers have noted that this silo approach to organizing and evaluating the threshold standards is not in line with current thinking. How the threshold system is organized is another topic where Council assistance is needed.
- viii. Pat has thoughts to suggest for next steps, bringing a systems approach to it. A decision support system could be applied to the threshold system. The Tahoe West project efforts could be applicable. The aim is to turn a static representation of conditions of individual measures into a more integrated and interactive interpretations of those conditions relative to identified values. We need something like this applied to existing threshold standards, and then bring evaluations into that system to update/upgrade. The value of an integrated evaluation system, some indicators can be used for multiple interpretations, multiple indicators can speak to one category or certain indicators speak to multiple categories. The Ecosystem Management Support Tool is being used in multiple organizations, it's not THE tool, but a really useful one that could be applicable here in terms of how to update to be effective for your current need. Would require a dedicated amount of time for TSAC to understand what this system would do.
- ix. Geoff thinks there are a number of stakeholder groups weighing in on thresholds. Would be helpful to precisely say what TSAC should engage in. There are aspects that TSAC is not equipped to deal with. We need to figure out what we are exactly in charge of. The science part is just one element of standards. Dan says the list of potential topics identify the Council's role. Geoff suggests it's not just a specification of what the Council is doing, but also knowing who is in charge of what. So we know...
- x. Dan says the approach that Pat proposed is good. We are on a tight timeline, with changes expected in Governing Board membership as a result of the 2018 NV and CA gubernatorial elections. He is hoping the overlap and technical clean-up will happen over the next three months. Ideally, March 1st for what system of the future looks like. There is a broad mandate to bring recommended changes, but beyond that it's open. How much can we get done by then?
- xi. Pat thinks that doing a trial run of a decision support tool with certain standards, and evaluation of utility could be done in a three month period. She suggests developing a framework now, and then use that to upgrade standards. There are existing software packages that can be used for this kind of effort.

- xii. Geoff thinks our conceptual understanding is not good enough. Even with a decision support system, there may be suggestions... but with some areas there may be assumptions, and important interactions may not have been examined. We need to understand these limitations.
- xiii. Pat thinks that the tool allows you to represent the certainty and uncertainty and have it reflected in how it is represented in the value.
- xiv. Zach wonders if the Council can work on conceptual models and decision framework at the same time? Pat says while not an expert, building both at same time makes the most sense.
- xv. Marc doesn't see harm in trying to fit the info we have into a decision support tool. It will show us if our info is so uncertain that decisions can't be made. We can determine the highest priority unknowns and from there figure out what we do. Decision support tool might be the mechanism to impart that type of judgement. Air quality we know things better than some other disciplines, wouldn't see a problem being displayed in a decision support tool.
- xvi. Dan turns the Council's attention to the questions TRPA has about VMT. The original VMT standard was to help reduce mobile sources of atmospheric nitrogen, but many stakeholders think VMT has other roles. There are questions about the role of VMT in road degradation and fine sediment production. What is the current role and future role of VMT as a nitrogen contributor? Conflicting studies coming out of SNPLMA and TMDL. Geoff asks if TRPA is expecting new research, or do you want someone to look at all the available information? Some of these questions really require new research. Dan acknowledges both may be required, but the timeline is a constraint. If there's new research that requires 10 years of work, it's flagged.
- xvii. Dan says recreation threshold is another standard to look at. Currently the standards are to make sure everyone has a high quality fun experience, and make sure recreation it is equally distributed. However, evaluating this gives you no useful information. There is quality of recreational experience; however, we haven't done a good job measuring impact of rec activities on water and air quality, and wildlife. How can we quantify this? What are the recreational activities of concern? TRPA also is looking for recommendations on a monitoring framework. Testing framework in emerald bay summer 2018, for measuring recreational experience.
- xviii. Pat notes TRPA is looking to the council for ecological advice, but not for social science advice. Dan says that's specifically for recreation so as not to have redundant efforts. Pat is confused because if we are primarily advisory, how is TSAC not advisory for social science? Dan notes the EIP coordinating committee (Joe Flower and Devin Middlebrook) is taking

the lead on social aspects. Dan says that he heard reticence initially. Recreation is a prime example of increasing environmental impacts, but don't have information about it, it is all very abstract. Are there impacts? From what types of recreation? Impacts on what?

- xix. Pat says that while the Council doesn't have an expert among our members, our role also is to reach out to people we know and get them engaged. Interface between social and ecological. Ways to think of these problems, we could bring resources to have input for ways to think about problems and ways to develop tools or consultative role. It is important for us to grow into that role. Zach noted that he asked previously about providing contact information for others that could help with sustainable recreation issues. If Pat knows anyone send contact information to Zach so it can be sent to Devin and Joe.
- xx. Dan knows that Devin and Joe will definitely take on any assistance from TSAC.
- xxi. Ramon notes that cell phone info could be used to quantify impact to specific areas. What is defined as sustainable? Are we talking about limiting people? Geoff notes that UCD has this initiative dealing with big data problem. Develop a proposal, then use Computer scientists to work on this problem. He thought examining a year of cell phone data would fit within this initiative. He has reached out to Tahoe transportation representatives (Steve and Carl), but has received no response. May not actually want science input. Disappointing lack of response. Ramon had the same experience. Dan is wondering if the offer is still on the table, but Geoff has to see if the due date is still available. Fishing expedition that might provide new insight. Dan will follow up with head of TTD **ACTION**. Is the data available for sharing? Geoff uncertain about the desire for science input.
- xxii. Zach suggests a workshop focusing on Tahoe sustainable recreation issues for some opportunity to engage with the relevant scientific community. Can invite people to participate with agency and stakeholder representatives. Focus in on the questions and viable approaches. Opportunity to meet with scientists. Geoff agrees says it could assist Joe and Devin solidify approach. Dan asks if the Council is offering to assist, e.g., help organize the workshop? Geoff says yes, the Council can help.
- xxiii. Geoff asks Steve if he can research people in his dept. that may be appropriate. Steve has had general discussions but will get more specific with people. Geoff wonders if UC Cooperative Extension (UCCE) has any expertise with this. Max says yes, but extension role is to communicate science like this. What is the science we are communicating and who? He isn't aware of any specific expertise for sustainable recreation, but will look around.

- xxiv. Ed wonders when to have a workshop? Zach says Council members could assist on an organizing committee. This group would deal with details of timing, location, agenda, etc. Ed says April seems doable, rather than trying to cram it in winter?
- xxv. Last area is SEZ's. Dan says in Tahoe the term SEZ (stream environment zone) is a broad amalgamation of habitats influenced by water: beaches, riparian, meadows, wetlands, etc. Currently regulated as one entity. Standard is 1,100 acres of SEZ restoration. Current accounting suggests they are nearing that goal. What is the next target? Or are we done? Is the SEZ construct still valuable in the basin? Or do we recognize the different habitats within SEZ individually? TRPA is hoping the Council can provide expertise to address specific questions and critically evaluate the existing standards.
- xxvi. Process for next steps: Dan to email Zach and Co-chairs with task descriptions and suggested timelines. Geoff suggests from there he and Alan will approach Council members to see who is interested in what, and break down into individual committees.
- xxvii. By November 1st task orders written and agreed to, asks Zach? Geoff wants by Oct. 1st to have a path forward. Have something to go out to the rest of the Council, and get commitments for engagement for different parts. Tasks orders are always slow.

5. Identification of emerging science issue(s) and substantive project(s)

A major portion of the Council's working budget is reserved for substantive projects. The Council's work on the TRPA Threshold Update Initiative is the Council's current substantive project. Geoff put this item on the agenda to discuss other ideas Council members may have for additional substantive projects.

- i. Geoff suggests development of a decision framework (like Pat was talking about earlier) for some aspect of the Tahoe ecosystem could be another substantial project. The Council would need to decide where to apply this. He is thinking of a decision framework that utilizes one or more conceptual models.
- ii. Steve asks if this framework is independent of the Threshold work. Geoff says yes and no. There could definitely be connections, especially on the issue of monitoring. TRPA has to monitor in order to determine if thresholds are being met or maintained. A decision framework would be a way to rationalize monitoring. This is an important from a science point of view. The LTRA passed in congress, but there is no appropriation. If there is an appropriation, the only entry point for science is through monitoring and programmatic assessment.

- iii. Pat says it would be good to pair with a decision support tool. There are lots of commonalities, but differences as well. Maybe there is a need or an opportunity for Tahoe West?
- iv. Alan says there is interest in trying to link what is happening in the watershed to what is happening in the lake. Tahoe West is one of the first to bring a lot of the upland information together; however, it is still landscape dominated. Pat says this is a logical next step.
- v. Alan has been hearing from TRPA, that whatever the Council does with a substantive project it should have relevance to current agency initiatives. We need to make sure that there's something for them to report back to the states. Geoff and Dan concur.
- vi. Zach says if the council chooses to pursue conceptual models... then the timelines may not match up with near-term Threshold Update products. From the Executive Committee meeting, Dan thought there is interest from both states for something that can assist with upcoming decisions. While he may not understand what the drivers may look like. There is a concern about how long it will take to develop this. Geoff says the medium term strategy is to have substantial progress in one year, with the full project taking up to two years. Dan asks what can be completed in one year? Priorities might change. Executive committee might change or roll over and so priorities might change or be adjusted.
- vii. Pat notes that the Tahoe Science Plan contains conceptual models. They are generally bigger, inclusive models. Additional effort could focus on higher resolution, or smaller scale models representing system dynamics. Fine scale models take a longer. It would be good to fit the timeframe, highlighting a direction TRPA can head maybe 18 months from now.
- viii. Alan suggests a decision framework could make a substantial near-term contribution if it can integrate with the threshold initiative by identifying indicators and selection of standards to focus on. Dan agrees. But doesn't think every conversation needs to address the threshold. He suggests development in conjunction with agency partners.
- ix. Getting down to specifics: Geoff asks if the initial decision framework could focus on the Upper Truckee watershed? This would be the overall focus of a conceptual model. There could be a general watershed model and component models that are more focused: urban development, SEZs, wildlife, etc.
- x. Ramon says the conceptual modeling approach depends on the question. If its restorations work, then there should be a focus on a model that will help with that. They need to be specific, otherwise you won't get anywhere. Geoff suggests we should to build a conceptual model (or

models) that covers everything. This will help understand connections and relationships.

- xi. Pat says that a conceptual model for watershed restoration should build in the concept of resilience. What does a resilient system look like in terms of wildfire, biodiversity, etc.?
- xii. Zach says for the Delta conceptual models we looked at how things work. Then we used a decision support tool (routing system) to understand how restoration projects might affect different parts of the system. So looking at the Upper Truckee, what are the applicable restoration projects? How does this system work? And make sure we are addressing project goals or objectives. No success in compartmentalization.
- xiii. Geoff suggests the Council have an initial workshop to better define the conceptual model work, and begin their development. Do all contracts need to be in place initially before substantive work can begin? Zach says we need a project description, timeline, costs, and deliverables. And then we can work from that. It would be good to get these details down in writing as part of the workshop.
- xiv. Pat says it seems like it would make sense to focus on the four topic areas that the TRPA called out (i.e., VMT, sustainable recreation, forest health, and SEZ).
- xv. What specifically are we working on? Landscapes? Species? Geoff says the Delta was focused on endangered species but not necessarily the driving force in the Tahoe Basin. Is anyone adverse to participating in a 2-day workshop?
- xvi. Alan says we should start on paper via email in anticipation of having a weekend meeting. At least then we have a starting point that we have all thought about and contributed to.
- xvii. Steve says there is a lot of ambiguity, but once we have a lens then there is the good opportunity to float things around and get feedback from people. Always likes the initial meeting to see how cohesive the idea is. Geoff agrees, there is ambiguity now. Once we get past that then it becomes a lot clearer what expertise is needed, where there are gaps, etc. Would like to get to that point quickly, and then put the time into getting work done.
- xviii. Zach brings the group's attention back to the idea of a one-day meeting. Ramon says he likes the one day, to put it all out there followed by a second day to get back to it. Scott thinks doing a day and a half, with a product out by noon on the second day. Steve also thinks the second day would be helpful. Opportunity to have dinner and drinks together. It's

good to do it on a weekend to minimize other work conflicts. Zach says there are travel monies available.

- xix. Winter is coming, the meeting could be held in Reno or Placerville. Challenge is that someone may have to drive through bad weather. Ed thinks that it's easier to get out of Tahoe. Truckee is a possibility, but then difficult for people coming from Sacramento.
- xx. Alan thinks a day and a half on the weekend would be great, and he doesn't care where it is at. Zoom could be useful. Setting up ahead of time, would be nice to have examples ahead of time to inform the process before we get together. Zach will look for the guidance document on conceptual models they developed for the Delta effort. He will send to Alison to share with everyone (ACTION).
- xxi. Pat will round up half a dozen papers about the decision support tool and how it has been used to facilitate efforts like this (ACTION). Keith Reynolds or Paul Hesberg could be consulted on how it's been dealt with in other systems.
- xxii. Alison will send out a Doodle poll for dates between now and Thanksgiving (ACTION). Dates will be for all-day Saturday and half day Sunday. Reno is the selected location. Steve will find a meeting room on the UNR campus (ACTION).
- xxiii. Alison will set up a Dropbox to place papers (ACTION).
- xxiv. Geoff asks if an independent facilitator is needed. Alan thinks no, but wonders if we want someone like Stuart Roll at the meeting. Everyone thinks it's a good idea. Alan or Geoff will invite Stuart to attend (ACTION). Geoff recommends keeping the workshop focused on one geographical region, and suggests the Upper Truckee River watershed.
- xxv. Zach suggests again that project details should come out of the workshop, so that task orders can be prepared and funding can be allocated. Geoff notes the timeline for initial product should be April/May, so there are substantive products to share at the 2018 bi-state executive committee meeting.

6. Council member updates on relevant science topics:

- a. Alan updated the group on SNPLMA funding process for additional science projects. Results should be available soon. They expect to have actual allocation within a few weeks and will check in when he gets back.
- b. Ramon wants everyone's take on the *Microcystis* algae bloom in the Tahoe Keys. What do they expect the outcome to be? Finds it interesting that it comes out of a big water year. Zach says most agencies are not very interested. Part of

the issue is that agencies don't consider the Keys to be part of Tahoe. Lahontan Water Board is the lead State agency. Monitoring is occurring, and Lahontan staff say toxicity levels are on the decline. *Microcystis* is the harmful organism. Scott asks is if this was introduced or if it is a result of run off. Geoff thinks that they all exist and is a result of high nutrients and warm water. Ramon says it's not temperature dependent according to the literature.

- c. Pat says that prior to summit there was an agreement to increase restoration across national forest lands. Similar to approach taken in the basin and includes the basin. Science team has been formed to frame resilience.
- d. Geoff says the network Pat has would be good for indicators for forest change. Steve says he has been in touch with many people for networking forest systems and broadly reaches out to people. Definitely continuing on this effort.
- e. In the lead-up to the federal summit, Geoff has been telling people that Tahoe is getting warmer. Feinstein was engaged and concerned about what we can do to stop the warming of Tahoe. What can we do to reduce the impacts of the inevitable climate change? She is asking for a proposal to come up with a climate vulnerability plan in two months. TSAC would be the designated reviewer. Currently where it stands, it is still in the formative stages. TRPA has viewed this very negatively. TRPA has an award-winning climate adaptation plan – nice glossy list of 200 things you can do against climate change, but no prioritizations. There is no description of what is happening. Hopefully this climate vulnerability plan will be more quantitative. Initial funding from CTC with an expectation for \$200-300k still needed to complete, but not sure where that will come from.
- f. Steve notes that the work Geoff is describing could lend itself to a conceptual model. Yes, climate is just another overarching driver. Eventually the hope is that this will all coalesce. Scott thinks climate change should be included in the Upper Truckee watershed conceptual model. All agree. There is virtually no control over climate change, but it is likely to influence the restoration response.

7. Next meeting:

The next regular Council meeting is November 16th. The co-chairs will determine if this meeting is needed. An email will be sent to all Council members in early November.