

Meeting Agenda
Tahoe Science Advisory Council

Thursday July 20, 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), Sudeep Chandra (UNR), Scott Tyler (UNR), Alan Heyvaert (DRI), Geoff Schladow (UCD), Steve Sadro (UCD), John Melack (UCSB), Max Moritz (UCB), Pat Manley (PSW), Ramon Naranjo (USGS), Ed Parvin (USGS), Todd Ferrara (CNRA), Zach Hymanson (CNRA), My-linh Nguyen (NDEP), Alison Toy (UCD), Patrick Wright (CTC). Julie Regan (TRPA), Devin Middlebrook (TRPA), and Joe Flowers (LTBMU)

Draft Agenda

1. Welcome, agenda review, introductions (Geoff) 5 minutes
2. Council operations: contracting update, set 2017 meeting schedule, review draft web site content (Zach/Alison) 20 minutes
 - a. TRPA has established technical service agreements with USGS, UNR, DRI, and UCD. The agreement with UCD is the model for agreements with UC Cooperative Extension (UCCE) and UCSB. Zach explains that if TRPA is unable to set up contracts with UCCE and UCSB directly, the fall back will be subcontracting through UC Davis. The contract with PSW is still a hold up. Pat explains that they cannot do a blanket contract, one needs to be prepared for a specific task. Once an agreement is established it can be amended. A template is in place and should be useful when the time comes. Ed mentioned that a second contract with USGS CA Water Science Center will be needed for his services. He is hopeful that there will be progress by next week. He is ok currently volunteering time.
 - b. Reimbursement expenses for travel, and meal and meeting per diem: No one has submitted a claim yet. Christine at TRPA can help. Still working on the time limits for how far back we can go. Todd thinks that as long as it's within the appropriation we should be able to process it. Process directly thru TRPA – Zach.
 - c. Meeting schedule for remainder of 2017. Those present agreed to continue meeting the 3rd Thursday of the month every other month. Plan for a January video conference meeting due to weather. Geoff interjects and add that the meetings are likely to be changing mode of operation: more substantive work group meetings, and fewer full Council meetings. All agreed to schedule meetings now, and cancel later. Next meeting dates are 9/21/17, 11/16/17, 1/18/18, 3/15/18, 5/17/18, and 7/19/18.

- d. Web update from Alison: two different renditions were briefly reviewed with Council members. Sudeep wants TRPA Threshold update project removed from website and just have projects coming soon. Big differences between two website, one page has news link that has documents like agenda, memo, etc. allowing for comments on the webpage. Unsure if this is information being shared with the public. Geoff concerned about people making comments that are inappropriate to share with the public. Is there a need for a presence for social media? Zach thinks it would be worthwhile to post notes from previous meetings. Present financials on the website is necessary, part of the commitment to the legislature; need to share with the public how monies are being used. Geoff says to link to the resource website. Zach suggests it would be more straightforward to publish the Council's work plan. Documents that will need to be published out by a third party. But it is something that can be revisited 6 months from now. Geoff does not like the news heading, suggests renaming to meeting notes, agendas, etc. Alison suggests documents which everyone agrees would be adequate. It is important to track people who are visiting the site; Alison will make sure that Google Analytics is active on the website. My-Linh likes the colorful design of the first website (blues and greens). Sudeep wants Tahoe Science Advisory Council in big letters. Zach likes drop down menus. Steve and Sudeep like the second website better. Direction to Alison: take input received today and work with Zach if needed to complete the web site.
- e. Cover page for written products. Products are numbered. Citation is the Science Council or is it the authors. We produced them or commissioned them. Consistency with the website. List of contributors. Use a numbering scheme so that products can be tracked and tallied, e.g., 17-01 is the first document produced by the Council in 2017. Two digits is fine.

3. 2017 Exec. Comm. meeting agenda (Geoff) 20 minutes

- a. The meeting will be held in TCES 141 1-4pm. Everyone is welcome to attend but not required. Please let everyone know ahead of time if you do plan on attending. Zoom will be made available.
- b. Zach will provide an update on council operations and wants to include time to have Alison present information on the website as a product.
- c. Time is allotted for Alan to discuss the Council's work on the TRPA threshold update, especially the evaluation report. Alan is also presenting this to TRPA governing board around that time. A pretty polished presentation should be ready by then.
- d. Important discussion: Emerging issues for science and technology, which is more or less what the Council thinks it should be doing. Taken care of website, stationary, contracts, etc. convincing executive committee about what we think is important and why.

- i. Sudeep is wondering if we will have one pager available to hand out, something to reflect on, or is it here's the issues here's how we would go about working on the issue, here's uncertainty and here's what we need, are we including needs? Is something written down? Or is it a PowerPoint?
- ii. Something should be written? Sudeep and Geoff say yes.
- iii. Sudeep's 2nd question: Can any of this be related to the activities of the LTRA? We think this is important but connect the dots for them. For example, AIS in Sand Harbor is a hot topic, and AIS is a topic in the LTRA.
- iv. Geoff explains that it's not coming up with list of hot issues. We are looking at answering a broader need. Create a framework for something for science to work within.
- v. Todd thinks this item on the agenda is a good use of their time and there will be interest. But wonders if 30 minutes is the appropriate amount of time? He thinks it's requires a larger amount of time. Like to flag for more time. Maybe move contracting and stuff to the back end.
- vi. Geoff explains that Item 5 emerging issues for science and item 6 is council review and work plan approval. That's where they are responding and reacting to what they just heard. Those items together are over an hour. Maybe the wording and break is wrong and that they should be combined. Thru item 5 we are wondering what is the requested work?
- vii. Item 7 asks is this council meeting its goals and expectations? If we do a good job and provide a good work plan then we should be setting ourselves for an affirmative answer.
- viii. Last item is Public Comment.
- ix. Zach says that Scott Tyler has expressed concern with asking directly, are we doing a good job? Sudeep said that he also talked to Steve about it and discuss with bosses ahead of time. Geoff says that this would provide the opportunity for someone to voice... I wish you were addressing social issues, asking a question that we don't know what the answer will be.
- x. Patrick wants to know, what happens if you ask a question like that? On public record. Is it relevant? Is it useful? I think it's a fair question and you should expect that. Zach thinks it's premature to ask that question.
- xi. Steve wants to know what is the goal for asking that question? We are still a new council.

- xii. Geoff says the goal is affirmation and we shouldn't anticipate anything going awry. But we're new and just hearing about us might be good enough.
- xiii. Pat think that item #6 accomplishes that. We haven't done a whole lot as a council, but have actualized what we expect of the council. Here's our frame of work, is that the type of contribution you would hope and expect it to make. So #7 seems redundant. This does seem like something premature and the committee would not be able to answer that.
- xiv. Geoff suggests maybe as an alternative open the discussion to general comments. Interesting approach especially after item 6, they would build on each other. Allows for extra time in case we go over.
- xv. Geoff asks if Zach wants to revise the agenda and recirculate, Zach says yes. Says that there is a person listed with each agenda item to lead the discussion, Geoff emphasizes that it is just to start and anyone who is there is allowed to chime in or take over. PowerPoint or presentation is the responsibility of the lead person. Date to have an agenda finalized? Zach wants it sent out at the beginning of August and reconfirm participation. He would like to send out the work plan with the agenda, as that is the action item. If there is other content it should be sent out ten days before the meeting.
- xvi. Item #5 Ramon asks, are these things that they already know? The way it's worded, Challenges or issues... it's vague. Sounds like there are issues about science. Can we clarify that item? Geoff intended it to indicate there is a whole universe of things that we could do, what has emerged as the more important one or two items? Because we don't have the ability to work on more than that. It's not an emerging issue it's the priority issues.
- xvii. Zach will revise the agenda and resend for one last review. He will be annotating it for the two co-chairs, but not until after we have the final form.

4. Discussion of draft Council work plan (Zach) 30 minutes

- a. Text did not change substantially from last year. Big change is in the budget detail. Show what was previously allocated, what was encumbered this year, and new proposed additional allocation (\$150k). The final two rows show the total funding each activity has received and the remaining available funding. The work plan goes thru June 2018, that's when the contract between the Natural Resources Agency and TRPA goes until. After that everything will be adjusted with the new contract. Overall no additional monies needed for administrative functions. Did not have to make funding adjustments this year. We have not been spending money as quickly as we thought we would. The work plan proposes to put the bulk of new monies (\$130k) towards substantial projects, which includes

the TRPA threshold assessment and a new priority issue that will hopefully be determined today. Intent to be finalized by August for the next meeting.

- b. Sudeep no concerns or issues. Intended to be general and vague for flexibility, specifics come out when there are task orders.
 - c. Zach makes sure all council members are ok with text and details. No questions or concerns from everyone.
5. TRPA threshold assessment: update from work-group examination of existing evaluation programs (Zach) 10 minutes
- a. Zach is reporting out for Alan. Last couple of months Alan and his colleagues completed an assessment of other environmental evaluation programs around the country. All original programs have been contacted with exception of the Great Barrier Reef. Intended audience is staff at TRPA, advisory committee, and governing board. A complete draft of the report was sent around on the 14th of July. Alan is looking for substantial comments by August 1st, rewrites, additions, and edits. Look for other items that could be pulled out and highlighted. The front end is what the audience will really be looking at, the first 12 pages. Chris and Casey (report co-authors) will be revising them in addition to Alan. Revisions will occur over the next 10 days or so. The document needs to go to the TRPA by August 7th so that it can be sent as a draft to the TRPA advisory planning council. A ppt will also be created. Governing board meeting is the third week in August. Dan Segan will present the threshold assessment results. Also going to be talking about recommendations going forward. Presentation by Alan is content with what we have learned from other organizations and how that can be applied to a future Threshold evaluation program. One of the comments that have come up in several forms is to think about overall organization of thresholds. Overall timeline and what is needed from everyone. This is a council document. Make it the best it can be or if there are serious concerns please let everyone know. – Ed and Zach.
 - b. Julie notes that the board is looking forward to hearing about this. Eager to see that things are moving forward.
 - c. Parallel to document itself but directly related to the Council work on threshold updates, what are the next steps? Some communication between Geoff, Dan, and Alan. What do you see the council doing after the governing board meeting in August? Need guidance from the governing board. Staff is discussing four areas of priority to pursue that will connect with next phase of the threshold updates as determined by the TRPA. One is native vegetation and forestry connects with Tahoe West Project. Transportation, have been working on a white paper document, whatever comes out of that might need some outside review, so the Council could help with that review. Third area is sustainable recreation and the Council heard more about that from Devin Middlebrook during the May meeting. The fourth area is stream environment zones (SEZ), wetlands plus, which is probably the most hot topic issue. TRPA and Lahontan successfully

applied for EPA grant to continue with SEZ roadmap this year, so new money coming to those agencies, so there will be some work done on monitoring and mitigation. One suggestion is that the organizations do more work and then bring council in, but will be discussed further. This was recently discussed at TIE meeting. After governing board meeting we'll know more about the focus of the council's role with the threshold assessment. This relates back to the work plan and why it is vague.

- d. Geoff wants to know, working on this for over a year, in the TRPA mind this threshold review assessment what is the TRPA's thinking about? Julie says breaking the more detailed assessment into increments, to get the ball rolling. Recognize that some will be easier to amend than others, and it is a multi-year process. Some measure of success and update and some admin clean up. Demonstrate some progress in 2018, and then it will continue. In 2019 some change in dynamics on governing board, highly functioning board right now that we want to capitalize on. Not enough info to determine a more concrete time line.
 - e. Pat wonders if after the first write up, took a look at the criteria, and curious after review. Have a detailed discussion with TRPA, based on these comments how would you change your approach? Then that feedback would be incorporated, but what's the plan to do that? Problematic for the first step to be some subset of the thresholds unless big picture approach was discussed how to take that first step. Wondering if there is value in getting a discussion with TRPA, the flush out what the next steps would look like.
 - f. Julie says that TRPA is very open to that, and eager for that kind of work session. Don't get locked into the 9 silos, as we have been for 20 years. Recognizing a more systems approach, more indices, balancing that without throwing everything on the table and getting paralyzed. Some focus time is a great idea. Encourages Zach to share this with Alan and Dan.
 - g. Zach explains that where Dan and Alan are in their thinking, they have some initial products to share with governing board, including a better understanding of the lay of the land and the changes you could make. Dan wants discussion with governing board. At the September meeting of the council get more materially into those kinds of issues. How do you want to tinker with the system? What's on the table for making changes? Not perfect, but with the timing this is how it worked out.
 - h. Julie says some focus time is a great idea.
6. Council member updates on relevant science topics (All) 10 minutes
- a. Julie wants to make a note, the threshold evaluation report that the board adopted and approved in 2016, labeled 2015. Deep water plants was flagged as a concern. More work is needed on this issue, and it would be appropriate to bring more data to the conversation. We need to understand what's happening with these special species. Under the TRPA rubric of vegetation threshold, deep

water plants are a special species of concern. It's on the radar. Where is the best point to engage the science council?

- b. Patrick has been discussing SNPLMA funding for climate change. It's being done on an ad hoc basis. Climate adaptation, particularly an update of the 3-year CA plan. How are agencies incorporating climate change? He is reaching out to TRPA and this group to do a synthesis. Dozens of studies about climate change in the basin, and half a dozen agency efforts underway. It would be great to pull that all together, so we can say here's how climate is impacting the lake, the forest, economy etc. We need a synthesis to educate the public and government about what's happening, and describe what agencies are doing to incorporate the available information. All this work is done, but now must be synthesized and integrated. So we can say here is the impact on the environment and the economy to better educate policy makers and the public. Here's how we are adjusting our programs to accommodate this change. All this work is done, but no one has the time to synthesize it and integrate it across programs. It's an area where the Council could be of great assistance. Perhaps the Council could be a venue to get updates, maybe every quarterly. Does it make sense for the Lake Tahoe West effort, the transportation effort, the shorezone effort etc. to be using a common set of scenarios regarding potential climate change. My guess is they are all using different scenarios. Just an idea right now. This has been discussed with Geoff, Sudeep, etc. Devin would like to be part of the conversation well.
- c. Max suggest the whole idea of climate change should be integrated into the threshold update effort. This is something that is missing. Need to put forth a conceptual framework for how you merge those.
- d. Ramon thinks that it's a great idea for a comprehensive evaluation and monitoring program that tells a story of what changes have occurred in the basin. Relating it to long-term patterns, natural variability, and extending that on to predictions. This can tell a story about the importance of long term data and the impacts of climate change. Would be nice if there's a report that pulls it all together.
- e. Geoff suggests that the first step might be to have an intern collect all reports to see what all agencies are doing? Get all that stuff in one place. No synthesis but have all the material in one place.
- f. Pat thinks it's important to integrate. This will happen whether we plan for it or not. Great to have synthesis, analysis and a potential adaptation strategy. Think about new ways to track conditions through the Tahoe West Project and others. And how we think about what resilience looks like in the basin and what's desirable. Lake Tahoe West project through efforts of design team has come up with a draft set of indicators of resilience. Output monitors and how those match with the design teams. Existing threshold standards a third set. Engaged Keith Reynolds from PNW research station to help build a decision support tool to match these things up and determine what these dynamics really look like. Invest in research to improve our understanding. Indicator products, or decision support

tool, or some combo of the two will be of interest to the Council. Here is one emerging issue: Is the spectrum of tree mortality, a response to climate change. Episodes have occurred in the past but we have another wave coming, in fact it's probably started. People are aware of where these pockets of tree mortality are, and dealing with the magnitude and rate of impact of this mortality. Will impact many things we have discussed.

Working lunch; 20 minute lunch break around 11:30 a.m.

7. Identification of emerging science issue(s) and substantive project (Co-chairs) 135 minutes

a. Sustainable recreation:

- i. This is the newest working group under the Tahoe Interagency executive steering committee. Started in February. Recreation in the Tahoe basin is a long-standing issue of concern. How will we include increasing recreation and visitation? Looking to bridge the gap between increasing visitors and declining budgets, while maintaining a quality experience. The working group is a coalition of federal, state, and local partners including non-profits and private recreation providers. The overarching aim is to provide quality recreational opportunities, while protecting natural and cultural resources. Framed around three issues: ecological (recreation impact, unmanaged access, intensity of use), social (transportation, social science, social justice, i.e., equitable distribution of recreational resources), and then funding and staffing to provide recreation to locals and visitors.
- ii. Currently following visitor use management framework that has a four step process planning for recreation, recreation capacity, and management strategies. Process is working on: (1) identifying current conditions for recreation in the Tahoe Basin, (2) identifying current issues land managers and recreation providers are dealing with, (3) current and planned recreation projects, (4) data aggregation and an examination of the current plans and how those impact recreation. Finding desired conditions, defining decisions around those conditions, and strategize.
- iii. Reaching out to TSAC for greater Social Science expertise. Also seeking advice on the visitor use framework. Understanding of user behavior, visitor demographics, more information about visitor and local values. Building capacity for social science.
- iv. Looking at four focus areas: transportation, recreation management, stewardship, and then measures and science.
- v. Joe explains that he, Devin, and Dan Sagan have discussed where TSAC could assist with this effort.

1. Questions about current conditions assessment

- a. Aggregating and exploration of existing data; visitor demographics, visitor satisfaction, visitation, traffic, congestions, and how those all interplay.
- b. Taking a step back, 2015 National Visitor Use Monitoring report gives us a set of metrics and data at a forest level, like visitation estimates, demographics, visit descriptions, what people are doing in terms of activities, economic info, and visitor satisfaction. However, we have no comprehensive picture at the basin-wide scale.

2. Visitor expectations and value statements

- a. Why folks are visiting, what people are doing, what visitor satisfaction looks like, desired experiences by location, why are people going to this particular site and what are they looking for by site?
- vi. Two things: current conditions assessment and then acquisition of new information through design and implementation of visitor surveys. The second piece is kind of a hybrid between the two, a Gap assessment contrasting those current conditions captured in the current conditions assessment against the visitor expectation value statements/the new info.
- vii. How do we manage for visitor capacity? What does it mean on a per site basis? How do we manage for an exceedance of capacity at sites?
- viii. The Council also could help to come up with monitoring and evaluating framework, or resource evaluation framework. These are the areas where we feel TSAC could plug in with the new initiative.
- ix. Review: Current conditions, visitor expectations and values, a gap assessment of those two, and then monitoring and evaluating framework.
- x. Zach wants to know if there is funding? Currently they do not have secure funding. Devin and Joe's time is covered as co-lead of the working group. Some funding for a workshop around visioning and those desired conditions. They are seeking more funding.
- xi. Just put in for National park service river trails and conservation grant. If application is approved then we will have 300 hours of service time.
- xii. Geoff says real possibility on the order of \$100-150k of science involvement in this area, although there is nothing specific about what that has to be. If the council wants to carve out something of interest.

- xiii. Pat thinks this working group needs to identify the needs, the importance pieces and how they fit together. For this particular project, the surveys are something that can be done. It would take a year to 2 years, craft them carefully to get representative and unbiased information. Other info to get as well; might be some additional economic values to consider weaving into surveys, nearly every visitor visits for recreation. Why are people visiting the basin? That covers the economic basis. Think about how to ask questions in a way that answer a suite of questions. Other thing to throw out: this is something of a biocomplexity grant. Maybe there is seed funding thru SNPLMA overflow, or some resources thru working group could get us in the position where we can put together a biocomplexity grant. All issues looking at lake health, water variability, etc. all intertwined to leverage it as a whole and determine how social fabric woven into it. Could be \$100K just to do the survey.
- xiv. Geoff says there is metadata that exists from smart phones. What data do you have?
- xv. Devin answer that there is data based on the transportation monitoring pings of cell phones off towers. Includes info such as origin-destination, data for winter and summer. Look at that data and prioritize where you want to get the critical issues areas and test recreation management strategies. Areas we are looking at: Tourism levels crowding, visitor-resident survey, hotel occupancy, transit-tour bus volume, guest satisfaction, traffic volume, parking lot access, residential and hospitality growth plans, etc. Started gathering that data from multiple sources. A lot of data surrounding traffic, but still a lot of data about current conditions that are missing. Depending on the parameter, it is time limited. Traffic volumes and transit ridership goes back to the 60s, 70s, 80s. Cell phone data just for one summer and winter.
- xvi. Do you want the science council to advise on that? We could hire expertise or know of it. But is there another expertise or park service does this all the time asks Sudeep. Is it a better of use and resources to go thru park service? Just a suggestion.
- xvii. They are exploring all possibilities, and Devin thought that the Science Advisory Council could have expertise that would be valuable because the guidance in relation to thresholds, monitoring etc. would be very useful.
- xviii. Pat says we could function to find the appropriate expertise. Could provide bringing in correct expertise and then see how we can connect the dots with all the other pieces and environmental quality questions and relate things that we are looking at.
- xix. Geoff says most problems arise out of the forest. Tourism is unregulated. Not sure what the science questions are. Other expertise only goes so

far. What are the science questions that we would want to consider? The other expertise only goes so far. Access and private ownership.

- xx. Pat says that it's tough to have any credible contingent evaluation because with visitor-based recreation, values generated outside of the basin are brought into the basin. A talented economist would be a valuable addition to your working group. Tough to import work from other places and apply here because we are a unique location.
- xxi. What is the outcome you're aiming at with these different products and analyses?
 - 1. Define current and desired conditions.
 - 2. What does sustainable recreation looks like?
 - 3. Ultimate, strategy to get from current conditions to desired conditions
 - 4. A plan that highlights management decisions, visitor movement, transportation, and stewardship and suggests how to implement and get those right conditions.
 - 5. Manage resources without detracting from the visitor experience, as well as maintaining cultural and environmental resources.
- xxii. Recreation in the Tahoe basin is on the path of loving it to death. Living up here and seeing it, there has been a change. The resources to manage recreation have declined, while recreation use has gone up. You can see it at all hot spots in Tahoe. Where we are now is not sustainable.
- xxiii. What do you do about it? Is there the political will to make the tough choices of limitations of visitors? Adding a gate? –Geoff and Zach.
- xxiv. Zach fears you bring the science community in to get good data for making good decisions. However, the work hasn't be done to deal with the political outfall, so it all gets dumped on the science community.
- xxv. There is a tie-in from the steering committee. From the agencies there is buy-in, which is something that needs to be maintained.
- xxvi. Are there connections between this and the TRPA thresholds? Steve asks. Yes, the TRPA recreation threshold has two categories: (1) to preserve and enhance high quality recreational experiences, and provide access to the shoreline and other areas for dispersed recreational uses. And (2) establish a fair share capacity in the basin for the general public. Basically ensuring high quality recreation experience and making sure that there is equal distribution of those resources available to public.

There could be a lot more development of those thresholds and measurements that look to see if they are being achieved.

- xxvii. Julie want to speak about the political will. The Tahoe Interagency executive steering committee is really committed to looking at this. They recognize that this is a very challenging topic. There is work being done just between agencies; recreation providers, USFS, State parks, various state agencies, and other private sector operators. There's a lot of work to be done. Based on the peer review, the policy statements on recreation in the thresholds are not enough. One key point, if the members of the council can look within their own agencies/universities and if there are some leading scholars or some experts within, the TRPA would like to know that and can be communicated back to Zach, Devin, or Joe. That would help the TRPA move thru this and develop a work plan.
- xxviii. Joe wants to add that when Jeff Marsolais came in as the forest supervisor of the basin, he identified two priorities: landscape restoration and sustainable recreation. So from USFS perspective there is definitely a will/interest that collaborates with the shrinking budget as a result of monies being spent on fire.
- xxix. How do you define sustainable recreation? Ramon asks. Conservation v. sustainable. Which usually means limiting visitors. Sustainable is making sure the recreation does not cause degradation, etc.
- xxx. Two things to consider: outdoor recreation on public lands, the sustainable part, has been framed around the ecological, social, and economic issues of being able to provide those recreational activities without degrading cultural and environmental resources. Make sure that the recreation isn't degrading the environment.
- xxxi. At the last meeting Amy Berry made a plea for needing help from social science experts. Zach says one thing that came out was the need for a workshop. Hear from the environmental community as well as business community and engage the public and bring experts back in, get a chance to meet each other, and garner interest.
 - 1. Paul Sebatiau, Prof. of Environmental Science and Policy at Davis did initial surveys of people's thoughts of the economics of recreation in Tahoe. The power of these surveys is that he went back to the same people years later. Paul has passed away. But Sudeep asks is there anyone at Davis involved in this area of study? Geoff says he has tried to reach other experts at Davis but everyone is busy. There is a need and yes there is money, but we want you to stick with us, and people don't participate because it's a pain in the ass, and no guaranteed way of setting a future course. Sudeep will send Devin a list of names.

2. Matthew Potts from UC Berkeley would be a good possibility says Pat. What hangs in the balance has shifted from decades ago. We do have some perspective and a pressing need that wasn't there before. There is a risk in looking at the economics but there is a need for people to take more of a risk than they used to. There's a lot of opportunity.
3. **ACTION.** Geoff assigns the homework for everyone to think of colleagues at your institution, feel free to contact Zach and then Zach can produce one list for Devin and Joe.

xxxii. What's TRPA general experience with visitors, are they finding Tahoe enjoyable? Do they find it stressful? Visitor satisfaction?

1. The TRPA does not actually track this information. Anecdotally people still seem to be enjoying themselves.

xxxiii. Any comments about the use of drones? Ramon

1. USFS does not allow drone use on its land says Devin. Might be an enforcement issue.

xxxiv. Devin to send a link out about this working group.

xxxv. Is there only a set amount of money? Would it be for transportation? Recreation management and Science will be the two primary ones as far as interfacing with different groups.

xxxvi. Patrick asks, how do we deal with people management? That will encompass recreation, transportation, etc.

b. A Proposal for a substantive Task for TSAC (Geoff)

- i. Trying to be responsive to the needs of agencies, which is good because that's a large part of the reason why we are all here. Another part of why we're here is because we are independent agencies/scientists, and maybe we see the world differently. Rather than waiting for the agencies to see that they need more help. Let's flip it and say here is what we think is a good idea. See how it works.
- ii. Potential topics I raised was the question of monitoring. Scientists do it, agencies are required to do it. Is there a monitoring framework that we could contribute to?
- iii. This idea of a decision making support framework or a conceptual model or a set of them. A lot of decisions are being made based on funding and the assumptions that they are good because they've been thought about for a while. But we don't really know. We have passed them thru tests

that show the validity. Data gaps are rarely described. If we had a framework for testing and checking the validity then the research needed would flow out of that. The other motivation that despite the perceived complexity, the Tahoe Basin ecosystem is pretty simple in comparison to the San Francisco Estuary or Chesapeake Bay.

- iv. We need to change the historical approach to picking our own projects and working our way down the list. And then prove that it's a good project. What are the linkages in a system and what are the outcomes? Is there something interesting here? And is there an important issue that we would want to start with. Here are three examples (see ppt presentation). Once you know what the linkages are, one can work through to potential action(s). In the evaluation we can identify some results we are certain about, and other things we don't know. Work through the certainty the project will deliver, you can quantify what the benefits are, and maybe it's a really certain project but the benefits are very small. And you can understand what the critical knowledge gaps are. Huge gains in that sense. Highly uncertain until we fill in this piece of knowledge. This sort of thing is being done in many systems. The really interesting part is, what is the test case? What are the emerging issues? Three potential topic areas initially suggested:
 - 1. Upper Truckee River Watershed.
 - 2. Landscape scale change, upland forest into Lake Tahoe. Lake Tahoe West ties into other nearshore projects, but specifically looks at change in the natural landscape.
 - 3. Atmosphere watershed interaction, looking at atmospheric deposition, but that was a while ago. California is looking for a largely electric car force. This will change emissions, so whatever we knew before is subject to change. Further, understanding of the atmosphere has definitely evolved.
- v. Zach says if you pursue this, start with test case. We want to think about who is on the agency side to take this study and engage with the science community. To understand what is being done and comment on it. Maybe think about things like Upper Truckee River and what working group could tie in. Which group will be most receptive.
- vi. Pat comments that a lot of the agencies are already working together to envision a multi-institutional/agency monitoring approach. Development of indicators, like state parks, etc. can broaden the suite. Another approach, rather than being place-based (like Upper Truckee River) is to think about it in terms of how to develop a monitoring system, whether its data collection or interpretation of data by making it a topic area. Basin-wide scale perspective would be better. Lake Tahoe West could be another case study potentially.

- vii. Geoff's vision of number two is that there is a linkage between Tahoe West and the lake or nearshore. It may fit nicely in that effort. Upper Truckee River may seem place based, but that's where everything is happening. In a way if you can successfully build a conceptual model for the Upper Truckee you can do it anywhere.
- viii. Putting the Lake Tahoe West under item two helpful. Sees combustion and fire under atmospheric conditions. Changes in carbon budget, we should be thinking of that in terms of understanding what is happening in the basin or in the central sierra region. Forest fire combustion can be a major influence. Wants to add things like this under Atmospheric Watershed Interaction. Sudeep says
- ix. 2 -4 people say I want to work on this topic (if we coalesced on a topic) says Geoff. Then people will report back during the meeting.
- x. Max comments on climate change projections. How much of the basin will support mixed conifer forest in the future? How is warmer and dryer affecting lake conditions? We think that we know the way the system works under baseline conditions. Wants to know the potentially interesting project of historical range of variation that the system bounced around. Can the desired future conditions be worked into this?
- xi. Geoff says this is driving the system. Linkages between issues, linkages that have uncertainty. This will occupy us for a while.
- xii. How do we function as a council? Pat wants to know. The research plan was done ages ago. Best five investments in the basin that would further our understanding of the system and forming management, how do those get done? Maybe that's the broader question. Helping to facilitate bringing the correct expertise into the basin.
- xiii. Patrick says every program is required to complete programmatic evaluations. Great opportunity for this group to help figure this out. Test cases go to us and the forest service. You should be funding this, but we need to partner with you to see how to get it done. Sustainable recreation, major agencies initiatives, involvement of science community, largely should be coming from the implementation agency.
- xiv. We need to think in terms of a 12 month time frame for this project. The products need to demonstrate utility to the agencies and stakeholders. That's what we take to funding groups to show it works. And we have so many other years of works at the basin to do.
- xv. Patrick says you have this window with the LTRA funding.
- xvi. Marc says it occurs to him could develop mini proposals and market with potential sponsors within the basin. Whether the development of

proposals are done ad hoc or more systematic. If we use the funding we have to put together a proposal. That's something to discuss and decide. We can't do much based on titles. We need to lay out the issues we need to address, the cost, the methods, etc. We could put together in a 5 page letter proposal.

- xvii. Geoff says this could be for our executive committee, one or two pages of considered topic areas so they can say whether this sounds like a worthwhile project, or a waste of resource.
- xviii. Pat wonders if this is about a science council accomplishment, or are we discussing how we can divest ourselves. This is strictly about the funding available and how it can be put to good use? What are the good questions we are pursuing?
- xix. Geoff says it's one of the big questions to look at, some aspect of threshold activity will continue. Waiting for TRPA governing board to give their staff some direction. One, two, or three separate projects that the different members of the council could be working on. Patrick's point is that if we do this, do it well and demonstrate its utility. Then this opens this percentage of funding from LTRA that can go towards monitoring and understanding. Available to scientists not just the science council.
- xx. Pat suggests another topic for consideration as a substantial project: Meadows in the basin. This is a topic that has come up a lot in Tahoe West certainly relatable to the upper Truckee. Many locations around the basin. They can impact water quality, and it's something facing the Sierra Nevada as a whole. Meadow restoration is an area with growth and has a lot of momentum. There's also opportunity for outside funding. Relevant but it is a barrier as the meadow models are lagging. Sudeep seconds this idea.
- xxi. Exemplary habitat in the basin, but also meadow processes. Sudeep thinks meadows will be important for managers. Carbon flux.
- xxii. Not sure if this is a monitoring category as it is more of a research question. Any research project will benefit from a conceptual model. says Pat.
- xxiii. Can you create a conceptual model for meadows if you don't have one for what's upstream and downstream, etc? Geoff asks. There are meadow conceptual models, the question is, do we prioritize it? Sudeep. Add some relevance to the rest of the sierra. Nearshore linkages or upper Truckee. Could just be including a meadow component?
- xxiv. Pat thinks that it is separate because it's a research gap not a monitoring issue. Proposing where gaps and needs are identified. LTRA does not have money for science but for monitoring.

- xxv. Scope: work plans has ~\$400k but the threshold has a ~\$200k range project. 12 month project – Zach recaps – Master agreement up June 2018, and having substantive work completed at the conclusion of the agreement is important. Showing progress with the money we have.
- xxvi. Anyone have a problem with the work plan being vague? Over the next week if you have further ideas or suggestions send them via email, we can refine the work plan. Framework for the model that we will present and these are the four areas we could narrow down from here without describing precise details.
- xxvii. Sudeep is concerned about the diversity of thinking. New diverse thought to come into the basin. Post docs in the lab, try to seek funding for a post doc to start attending the meeting. Diverse color and gender.
- xxviii. Pat says if we don't have the expertise we could still get it.
- xxix. Post doc assigned to the working group, someone moving the whole program forward – says Max.
- xxx. Sudeep has a post doc shared with Steve.
- xxxi.