DRAFT - SUMMARY
STAKEHOLDER SCIENCE COMMITTEE MEETING
LAKE TAHOE WEST RESTORATION PARTNERSHIP

Tuesday, October 3, 1:00 pm to 4:30 pm
The Mountain Lab, 3079 Harrison Ave, South Lake Tahoe, CA 96150

All meeting materials are publicly available on the Lake Tahoe West website http://nationalforests.org/laketahoewest. For questions please contact the program manager/facilitator Sarah Di Vittorio at sdivittorio@nationalforests.org or (530) 902-8281.

Meeting Synopsis

The Lake Tahoe West Restoration Partnership (Lake Tahoe West) Stakeholder Science Committee (SSC) met on October 3, 2017, at the Mountain Lab in South Lake Tahoe. The Committee reviewed a nearly finalized version of the Phase 1 Landscape Resilience Assessment (LRA) and discussed next steps and considerations for moving forward into Phase 2 of the Lake Tahoe West project. Discussion included comments and questions on individual indicators of landscape resilience, as well as how these indicators are packaged together into mapped assessments of resilience to inform Phase 2 management planning**.** The next meeting will be a SSC meeting on November 7, from 9am to 3pm at the North Tahoe Event Center in Kings Beach, focusing on development of potential Landscape Restoration Strategies (LRS) for Phase 2. The following meeting will be a joint SSC-Stakeholder Community Meeting on December 5, 2017, from 10am to 4pm at the Lake Tahoe Basin Management Unit Supervisor's Office in South Lake Tahoe. The December 5 meeting will continue the focus on the LRSs, and will seek a SSC recommendation on finalizing the LRA.

Contents

This meeting summary paraphrases individual comments and suggestions. Statements do not indicate consensus of the group unless they are preceded by the word "AGREEMENT". Statements are not attributed unless spoken by one of the organizing or participating agencies, or by a presenter.

Action Items

1. **All stakeholders** to provide their biographies (if have not already done so).
2. **IN PROGRESS - Mr. Bindl** to improve LRA map legends: (1) Add data year to Climatic Water Deficit map, (2) Update map legends to include thresholds.
3. **Interagency Design Team (IADT)** to explore the potential use of a smoothing function to thermal data, for Version 2 of the LRA.
4. **Ms. Coppeto** to explore available data on bats and temperature thresholds, for Version 2 of the LRA.
5. **IADT** to consider microclimate analysis for Version 2 of the LRA.
6. **All SSC members** to provide any feedback on the roll-up bundles (see Values-Disturbances-Indicators table, furthest right column and bottom row) by 10/13.
7. **IN PROGRESS - Sarah** will consider process steps, in conversation with LTW peers, for how the partnership can view the LRA findings through the lens of the LTW goals to advance Phase 2 strategies.
8. **DONE - The IADT** will ask Rob Scheller about the beetle issue at our upcoming meeting on 10/5. *Note*: There has been further follow up conversation on this issue, and the Science Team is working actively to address it.

1. Welcome and Opening Remarks

The meeting began with opening remarks from Sarah Di Vittorio, the new National Forest Foundation (NFF) facilitator and project manager. She reviewed the agenda, ground rules, and upcoming dates, and led introductions.

There were no interested party comments.

2. Field Visit Preparation

Sarah Di Vittorio reviewed the agenda for the October 4 Field Visit with SSC members to help members prepare and to address any questions. The overarching theme of the October 4 Field Visit will be to answer the questions: (1) What are we looking at on the landscape, (2) What would the landscape look like if it were more resilient, and (3) What management actions would we take to achieve a more resilient landscape?

Mason Bindl of the Tahoe Regional Planning Agency led a brief tutorial of how field visit participants could access and use Avenza Maps to view the LRA maps in the field and compare them with what they were seeing on the ground.

3. Update – Indicators for Landscape Resilience Assessment

Regarding Air Quality as a Removed Indicator

Randy Striplin of the US Forest Service (USFS) presented the work the Interagency Design Team (IADT) has done in the past month to examine the feasibility of developing an Air Quality indicator for the LRA..

- The Air Quality indicator is being developed as a removed indicator, with the potential for it to be worked on later and developed in Version 2 of the LRA.
- Considerations for developing Air Quality as an indicator include:
- Variance in daily meteorological conditions makes it difficult to predict or assess the impact of west-shore management actions on Air Quality.
    - Resilience may be best assessed by the community's ability to respond to poor Air Quality conditions. For example, indicators could address presence of warning systems and number of people reached with them. These would be non-spatial indicators.
    - There are existing warning systems for poor Air Quality conditions due to particulate matter. Agencies are coordinating on these: (1) USDA Forest Service website, (2) Prescribed Fire Information Reporting System, (3) US Environmental Protection Agency (AirNow), and (4) local air districts.
- Development of spatial indicators of Air Quality would require more monitors (there are currently only three in the Basin).

Discussion followed:

- Does the EPA site have other Air Quality information (Nitrogen, etc.)?
    - Information on Air Quality depends on the sensors being used. Different areas have different sensors.
    - The National Weather Service puts out very specific Air Quality alerts.
    - Alert Tahoe has cameras pointing at the Basin and is a quick and easy way for people to see where issues are.
    - We have had a little bit of an issue using EPA's AirNow, as there are only 3 sensors in this area.
- Did you consider showing information on what our track record has been, i.e. the percentage of times we have kept to standards while conducting prescribed fire? If we have a good track record, we should let people know.
    - Mr. Striplin – Community complaints are the primary method by which attainment of Air Quality standards is measured. Attainment depends highly on dispersion characteristics and the Forest Service sometimes gets complaints on bad dispersion days.
- Are we getting rid of this indicator? What are we doing about this?
    - Mr. Striplin – It will be developed as a removed indicator.

Regarding Thermal Tolerance, Climatic Water Deficit, and Snowpack Indicators

Shana Gross of the USFS presented revised LRA indicator maps for Climatic Water Deficit and Snowpack.

- The IADT developed an indicator on Climatic Water Deficit (CWD), a measure of water stress, to inform resilience to drought.
- There are thresholds when forests become more stressed from water deficit to the point where they are at risk of mortality from beetle infestation, fire, etc.
- CWD below 800mm equates to 90% tree mortality.
- Snowpack is a binary measure in the analysis – yes snowpack vs. no snowpack.

Discussion followed:

- Can you add information to the map legends or captions to clarify the thresholds you are using for resilience, years data were collected, and other information?
    - ACTION ITEM: Mr. Bindl to improve LRA map legends: (1) Add year to CWD map, (2) Update map legends to include thresholds.
- Climatic Water Deficit:
    - What year(s) of data did you use for the the CWD analysis?
        - Shana: We considered looking at average CWD over multiple years, but never reached thresholds that way. We looked at 2015 because it was a drought year.
        - 2014 was the driest year – should we be looking at that instead?
        - But the impacts carry over from year-to-year.
        - 2015 also had the lowest (none) snowpack.
        - The group agreed that 2015 makes sense.

Shana Gross and Stephanie Coppeto presented the IADT work to develop a thermal tolerance indicator, which is more methodologically feasible than an air temperature indicator.

- Thermal tolerance was analyzed using spotted owl data and three thresholds:
    - 30 degrees – piloerection (attempt to shed heat)
    - 34 – no days over that temp on the west shore
    - 35.2 – Same as 34 degrees
- The thermal tolerance indicator is based on the number of days that exceeded 30 degrees in 2025. Data were projected from 2025 based on median emissions scenarios.

Discussion followed:

- What is bad? How many days?
    - The scale is relative. Obviously, more is worse. Natural breaks were used to categorize data.
- Spotted owls are one of the most sensitive birds in the LTW region, so the analysis is not as conservative as some of the others.
- Air temperature data are at a very large grid size.
    - Could a smoothing function be applied to the temperature data because it has such large cells?
    - ACTION ITEM: IADT to explore the potential use of a smoothing function to thermal data.
    - Temperature will be kept as a “removed” indicator and will be revisited later.

- Could you use different species than spotted owl?
    - Spotted owl is the only bird species that had published paper on temperature thresholds.
    - We have only about 12-15 spotted owls in the Basin.
    - There is data on bats, based on hibernacula, but we cannot spatially map because we do not know locations of roosting sites.
    - ACTION ITEM: Ms. Coppeto to explore available data on bats and temperature thresholds, for *Version 2* of the LRA.
- Could the LRA look at microclimate?
    - It is very challenging methodologically and might not yield a lot of useful information compared to the amount of work that would go into it. It could be useful for some particular species.
    - Topography, slope can translate into microclimates.
    - ACTION ITEM: IADT to consider microclimate analysis for *Version 2* of the LRA.

4. Landscape Resilience Assessment – "Roll-up"

Mr. Schafer, Ms. Gross, and Mr. Bindl presented maps and bar charts showing assessment results for 'Resilience to Fire,' 'Resilience to Drought,' and 'Ecosystem Resilience.' The IADT is currently documenting the assessment methodologies including bundling of data to show landscape resilience to disturbances. Documentation of the methodology will be completed in the coming weeks and was not available for participants to review at this meeting. The IADT asked for committee member input on other possible ways to analyze the data to inform our understanding of landscape resilience.

Discussion followed:

Clarification of methodology (questions/comments are from stakeholders, unless otherwise indicated):

- IADT: Indicator values were averaged and then summed to form the roll-up. A 0.5 weight was assigned to proportional indicators.
- Can you explain what overlay and proportional indicators are?
    - Overlays are data that are useful for understanding the landscape but are not measures of resilience. Some examples include:
        - Vegetation type
        - Treated with fire (yes/no)
            - This is somewhat incorporated into stand structure
    - Proportional indicators show whether a feature is over- or under-represented across the entire landscape, but not at a specific spatial data point. For example:
        - There is too much mid-seral closed canopy across the landscape, but we do not know for a specific spot if it would be mid-seral closed canopy in a natural state.

- The LRA bundling methodology appears sound, based on today's presentation and discussion.

Interpretation of the assessment maps and bar charts (questions/comments are from stakeholders, unless otherwise indicated):

- Might the layman assume that the spots that are most resilient will need less attention?
    - That is not necessarily the case.
    - That is why we have separate indicator maps.
- Isn't there a "scale" issue when interpreting proportional indicators across the landscape? There may be value in analyzing these indicators at smaller scales, e.g. a watershed.
- Mr. Garrett clarified that lakes often appear red in these maps because of high human access.
- What if an area did not have data for a particular indicator?
    - That indicator is assigned a null value and the total is averaged by number of indicators we *do* have data on.
- What is the take-home lesson of bar chart showing the proportion of the landscape in each resilience category?
    - First, it can help us to identify spots where indicators are aligning.
    - Second, there will be some spots that are high on one scale and low on another. Because of that the distribution of the overall roll-up will trend to normal. It is important to have individual proportional understandings and understanding of how they fit into rest of landscape
        - Establishes baseline for comparison and future analysis
- Are these the same acres in each proportion of summed indicator values?
    - The IADT ran an analysis to see if there was correlation among pairs of indicators, to assess whether indicators could be cancelling each other out in the roll-ups. There were no strongly correlated pairs.
- Why do the bar charts show a bell-shaped distribution?
    - Because of the process of rolling up to 10 binary indicators.
- Can you clarify the timeline for the LRA and feedback from stakeholder committee members?
    - The IADT will work to finalize the methodology, based on the feedback we hear today. We wanted to check in today before we got much farther with applying these methods.
    - We expect to have the documentation ready in advance of the next stakeholder meeting.
- All of the bundled maps look very similar - are we losing key insights that are being buried in the bundling?
    - This is an inherent challenge with the bundling. For example the ecosystem resilience roll-up has 18 indicators. You cannot really interpret it without looking at the individual indicator data.

- IADT question to stakeholders: What is the key information that you would like to see? Are there other assessment maps you would like to see?
    - Stakeholders: It will be an iterative process of examining the data together.
- Use of PACs was an interesting use of an apples-to-apples comparison.
    - This could be used with other boundaries – such as meadows.
    - This could be a great way to apply the assessment.
    - Different roll-ups could be used for different purposes.
    - There is potential for within/without analysis for PACs and WUI, as well as other types of boundaries.
- ACTION ITEM: All SSC members to provide any feedback on the roll-up bundles (see Values-Disturbances-Indicators table, furthest right column and bottom row) by next week.

On potential use of the LRA for communication and to identify restoration goals and strategies (questions/comments are from stakeholders, unless otherwise indicated):

- What are the big picture findings of the assessment?
    - Does bundling work? What does it tell us?
    - What are the main findings with the indicators?
- Mr. Wright, CTC, on communication of findings:
    - There is high value in the LRA and these maps as communication tools.
    - It would be useful to have specific, thematic bundles to attract funding.
- How will the LRA findings help us identify restoration goals and strategies in Phase 2 of LTW?
    - Might want to loop back to "essential management questions" which we came up with in the beginning. This can help guide the discussion.
    - Sarah will consider process steps, in conversation with LTW peers, for how the partnership can view the LRA findings through the lens of the LTW goals to advance Phase 2 strategies.

5. Preparation for Phase II

Pat Manley provided updates and remarks on stakeholder contributions and questions from the previous SSC Meeting on September 6.

- Comment: LANDIS has errors in how it addresses beetle dynamics. Specifically, mountain pine beetle is treated as the primary cause of mortality for incense cedar, but it is not. The LANDIS developers should have worked with Chris Fettig.
    - The LANDIS model for beetle dynamics can be used to compare in LTW to see if its accurate and help improve later versions.
    - ACTION ITEM: The IADT will ask Rob Scheller about the beetle issue at the IADT upcoming meeting on 10/5.
- Will there be a Business As Usual strategy?
    - Yes, and a "no action scenario"

- Is LANDIS being used as the base model?
    - Yes
- What is nature of LANDIS outputs? What sort of inputs will create the outputs you are looking for?
    - There needs to be discussion of how this will look and be incorporated.
- For planning at a finer scale, we will use EcObject and other programs
- Does LANDIS give recommendations for what areas to treat?
    - Yes.
- There needs to be discussion between SSC and IADT of LANDIS/modeling outputs, what that means for management, and how it is incorporated with other data sets (EcObject, etc.) we are using.
    - We will begin having these conversations on joint IADT-Science Team meetings on 10/20 and 10/27.
- We need to decide on big picture landscape restoration strategies to feed into the models.
    - This work will start at the Nov. 7th workshop.

6. Closing Remarks

Ms. Di Vittorio thanked participants for attending and adjourned the meeting.

7. Attendees

Organizing and Participating Agencies
CTC – California Tahoe Conservancy
NFF – National Forest Foundation
RWQCB Lahontan - Lahontan Regional Water Quality Control Board
State Parks – California State Parks
TFFT – Tahoe Fire and Fuels Team
TRPA – Tahoe Regional Planning Agency
USFS – U.S. Forest Service

Stakeholder Science Committee Members

1. Jennifer Quashnick
2. Matt Freitas
3. Maureen McCarthy
4. Mollie Hurt
5. Tricia Maloney
6. Roland Shaw
7. Sue Britting

Staff

8. Daniel Shaw, State Parks

9. Jason Vasques, CTC
10. Sarah Di Vittorio, NFF
11. Forest Schafer, TFFT
12. Randy Striplin, USFS
13. Brian Garrett, USFS
14. Patricia Manley, USFS
15. Jen Greenberg, CTC
16. Kim Carr, NFF
17. Evan Ritzinger, NFF
18. Mason Bindl, TRPA
19. Shana Gross, USFS
20. Stephanie Coppeto, USFS
21. Whitney Brennan, CTC
22. Patrick Wright, CTC

Interested Parties from the Public
none