***DRAFT -* SUMMARY**

**Stakeholder Science Committee Meeting**

**Lake Tahoe West Restoration Partnership**

Tuesday, November 7, 9:00 am to 3:00 pm

North Tahoe Convention Center, 8318 N Lake Blvd, Kings Beach, CA 96143

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

## Meeting Synopsis

The Lake Tahoe West Restoration Partnership (Lake Tahoe West) Stakeholder Science Committee (SSC) met on November 7, 2017, at the North Tahoe Event Center in Kings Beach. The meeting goals were to: (1) Review the role of “potential landscape restoration strategies” in Phase 2 modeling and learn about key considerations for development of the potential strategies; (2) Collect stakeholder input and ideas on which treatment approaches will be important to vary in the modeling in order to evaluate trade-offs; (3) Collect stakeholder input and ideas on construction of initial modeling strategies; and (4) Provide an update on the process and timeline for Phase 2 and completion of Phase 1. The next SSC meeting will take place on December 5, 10am – 4pm at the Lake Tahoe Basin Management Unit in South Lake Tahoe. The goal of the next SSC meeting will be to present the final Landscape Resilience Assessment and seek the Stakeholder Science Committee’s recommendation for approval. The Interagency Design Team (IADT) will also provide an update on development of strategies for Phase 2 modeling.

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## Welcome, Agenda Review, and Introductions

Sarah Di Vittorio began the meeting with welcoming comments on the current state of the Lake Tahoe West project and overall goals for the day’s meeting. The meeting was designed to focus on initial stages of Phase 2, development of a Landscape Restoration Strategy. The goal of the next stakeholder committee meeting will be to wrap up Phase 1, development of the Landscape Resilience Assessment (LRA), by seeking the Stakeholder Science Committee recommendation for approval. Ms. Di Vittorio also presented the 2018 LTW proposed meeting calendar. There were no objections to the proposed meeting schedule (attached).

There were no interested party comments.

## Phase 1 and Phase 2 – Status and Next Steps

Ms. Di Vittorio provided a brief status update on the timeline of transition from Phase 1 into Phase 2 of the Lake Tahoe West project.

* Phase 1 has taken longer to complete than anticipated (about 4 months behind schedule).
  + Executive Summary still needs to be finalized.
  + Ms. Di Vittorio will send the final LRA materials for stakeholder review one week prior to the 12/5 meeting.
  + At the 12/5 meeting we will ask:: what did we learn from LRA? And, how does this inform our Lake Tahoe West goals?
  + This will inform development of the Landscape Restoration Strategy in Phase 2.
* We have begun Phase 2, but results are needed from Phase 1 to develop potential strategies for modeling. The overlap is causing Phase 2 to also move slower than anticipated.
* The Core Team is remapping the Phase 2 timeline.

## Lake Tahoe West Goals

Forest Schafer reviewed the LRA and how it may inform management goals of the Lake Tahoe West project.

* The following LTW goals were distilled from the Essential Management Questions developed by the Interagency Design Team and Stakeholder Science Committee:

1. Restore an ecological fire regime while protecting life and property and maintaining water quality.
2. Minimize impacts to air quality from prescribed burning restoration treatments.
3. Restore vegetative structural heterogeneity and species composition.
4. Maintain and restore wildlife populations and habitat (including plants and animals).
5. Maintain and restore water supplies and associated snowpack.
6. Maintain and restore appropriate carbon dynamics.
7. Take advantage of opportunities for restoration and recreation to benefit one another.

Mr. Schafer provided examples of how the LRA findings may be used add specificity to these LRA goals (see attached presentation slides).

Discussion followed:

* This would also be a good place to bring in the air quality indicator – call out thresholds based on goals.
* Q: What is the role of these goals?
  + Ms. Di Vittorio: They are to help us ensure we stay on the same page about what we are planning for and to help us get more specific.
* Patrick Wright, California Tahoe Conservancy: Some of these are outcome based, some are not. I would encourage the group to develop outcome-based goals and to share withthe Executive Team.
  + Mr. Schafer: The Executive Team should be aware of the goals. The goals come from the management questions, and will be refined as LRA progresses, with the intention of making them more accurate and data driven.
* It might be a good idea to look at California’s statewide goals, and potentially align/make adjustments to them. This would be especially beneficial from a funding perspective.
* We need to translate the goals down to metrics. There may be some tensions that need to be resolved – are we talking about resilience of natural ecosystems? Of socioecological systems?
* Q: Should we consider reclassifying the air quality indicator as “minimizing impacts to human health and lake water quality” instead?
* The essential management questions could simply be turned around directly into statements which reflect the management goals.

## Role and Features of “Potential Landscape Restoration Strategies” in LTW Phase 2 Modeling

Jonathon Long explained how potential landscape restoration strategies used in Phase 2 LANDIS modeling and discussed considerations for development of the strategies (see attached presentation slides):

* LANDIS modeling will incorporate major disturbances and dynamic processes, including climate change (CC).
* The current plan is to have 10 model runs:
  + 5 strategies x 2 climate scenarios (high and low CC).
* High contrast in the modeling strategies will best show differences in results of different treatment strategies and help us learn.
  + Fine scale treatment impacts may not show up in modeling, especially considering that the modeling timeframe is 50-100 years.
  + The group will address questions at broad or fine scale as appropriate.
* Mr. Long presented issues that could affect modeling for the group to prioritize and bin, with the goal of selecting the ones that are most important to concentrate on.
* We know we need “No Action” and “Business As Usual” strategies to serve as baselines.
  + (1) No action:
    - No further treatments.
    - Continued suppression of ignitions.
  + (2) Business as usual (BAU):
    - Focus on fuels reductions treatments in WUI.
    - Reliance on pile burning with limited understory burning.
    - Minimal managed wildfire.
* We need to decide how to develop contrasting management strategies. One approach would be to model high mechanical treatment and high prescribed fire treatment as contrasting strategies.
* We can use sensitivity analysis to test the effect of approaches such as biomass utilization vs. pile burning, treating in special habitat areas, salvage and replanting after fire, and treating on steep slopes.
* Timeline:
  + Baseline LANDIS modeling now through the end of 2017 while new management strategies are being formulated.
  + Presentation of initial results of some non-LANDIS models; engagement with managers (~January)
  + 1st quarter of 2018, LANDIS-II modeling of treatments for vegetation and fire and fuels, followed by subsidiary modeling of fire, wildlife, and air
  + Presentation of modeling results from management scenarios (~April)
  + Refine management strategy

Discussion followed. Questions were addressed by Mr. Long unless otherwise indicated:

**Regarding model scale:**

* Q: What is fine scale and what is large scale in the modeling?
  + 3 scales: Landscape scale (LANDIS), watershed scale (air/smoke, water quality/quantity), and fine-scale (e.g. specific thinning approach).
* Q: What would be the smallest treatment size relevant to LANDIS?
  + In theory, it goes down to one hectare, but something that small likely would not show up that well. Looking at treatments at a larger scale.
* Q: Are there plans to make adjustments to modeling/strategies after some have been run?
  + Yes, though there are limitations to how many iterations we can run.
* Q: We will likely want to implement combinations of different treatments – how will this fit into modeling and results?

**Regarding potential treatment constraints and how LANDIS will handle them:**

* Q: Will we be able to tell how much of the landscape can be treated with these constraints?
  + Yes, but there are some caveats – for example, it depends on which roads are reopened, which needs to be defined (TRWG Roads analysis).
* Some of these constraints may overlap with “high hanging fruit.” Part of the goal of LTW is to see where we can go beyond traditional constraints to address what is most needed on the landscape, rather than just going for the low hanging fruit.
* It would be helpful to have a clear list of what we agree are constraints to would help clarify terminology.
* We discussed the possibility of “no constraints,” but haven’t flushed out exactly what that looks like.
* What is a hard constraint? What is a soft constraint? What are we will to be flexible on?
* Q: Are roads a constraint?
  + Brian Garrett, Forest Service: Roads are a constraint because the west shore has lots of steep slopes and limited road networks. Roads are typically needed for any most treatment options (thinning, fire, etc.).
* How do we allow room for managers to take risks (treat with fire and without roads)?
* It would be valuable to also define where we should not be flexible on constraints.
  + Mr. Long: We need to know how constraints will be treated in order to run the model. Early on we want something as high contrast and simple as possible, and then we can add in the complexities.
* Q: Does LANDIS inform how to treat or just what treatment to use?
  + LANDIS will help inform some of this and treatments can get further specified through the model iterations. However, LANDIS operates at a relatively coarse scale and will be better answered by other models that work at finer scales. “How to treat” can be more of a finer scale question.
* Q: Could LANDIS be used as sort of an optimization model to determine best places for prescribed fire (where are ignitions most likely? where are we placing fire containers?)?
  + Mr. Long: Fire weather will have to come into the analysis to do this. LANDIS does not do that.
* Q: Do you think, if we had information on fire container locations, it would be able to feed into analysis?
  + We may want to keep things high contrast and less complex – base strategies on elevations, ecological communities, etc.
* LANDIS is an ecological model - it should be used to inform ecological indicators.

**Regarding the idea of using high mechanical treatment and high prescribed fire treatment as the two contrasting strategies for the modeling** (as suggested by Mr. Long in the above presentation):

* As an alternative to the “high fire versus high mechanical treatment” option, we could also develop scenarios as “goal oriented” toward ecosystem services.
* Biomass versus pile burning:
  + To increase contrast, the “Expanded Treatment - High mechanical” strategy should assume biomass removal instead of pile burning. Biomass removal would require more roads. High fire would use fewer roads and could be done more strategically (ex. use ridgelines).
  + Follow-up discussion acknowledged the tension between having realistic strategies and creating contrasts in the modeling.
  + Mr. Garrett: There are two points to consider: (1) If you went the route of no pile burning, you may severely limit where treatment can occur; (2) The contrast would come in with respect to the amount of treatment that is occurring.
* Mr. Wright: Keep in mind that the goals of modeling are to: (1) inform a strategy, (2) show differences, and (3) show benefits. We have to be able to show the benefits, this is what grant programs want to see.
* Q: The BAU scenario is very heavily focused on fuel reductions – it is almost goal oriented. Perhaps we should look at more goal oriented strategies?
  + This would be possible, but the two expanded strategies are also different because they go beyond the WUI and are over a much larger area
  + Differences between “Restoration” (i.e., through mechanical treatments) and “Fire” oriented treatments have been modeled before, and have not shown much contrast.
* Q: Where does economics (cost) come into the modeling of biomass removal treatments?
  + Mr. Long: It could be incorporated by distance to facility, distance to roads, etc. We were not planning on including that much detail, but we could look at building that in if desired.
* Q: Are the differences between the two treatments (high fire versus high mechanical treatment) sharp enough?
  + There will be differences spatially in where treatments occur - fire will probably be mostly used at higher elevation. We would need to discuss this further.
* Q: Whatever our strategies are, we need to “own” them. We need to decide how much we are willing to live with. Perhaps we may need to just accept living with smoke, for example. We should use modeling to decide where to treat and extent of treatment – what’s ideal? What’s realistic?
* Q: What about soil conditions? What are the effects of mechanical removal and Rx fire on soils/nutrients? What are the long-term/short-term tradeoffs of treatment options?
* Mr. Long: Previous analyses have looked at what management actions need to be taken to get to historical fire frequency - you have to pull out all the stops (mechanical treatment, prescribed fire, etc.). We have to consider not just what to do, but the intensity necessary to achieve our goals.

## How Would You “Pin the Corners”?

Ms. Di Vittorio led a discussion to collect stakeholder input and ideas on which treatment approaches will be important to vary in the modeling in order to evaluate tradeoffs.

* The group identified the following potential contrasts:
  + High fire vs. High mechanical (as proposed by Mr. Long, above)
  + Resilience/Benefits vs. Risk reduction (Goal oriented)
  + Pace and scale of restoration
  + Treatment intensity level
  + Biomass utilization vs. Pile burning
  + Fire risk vs. Restorations

In generating the above list, the following discussion occurred:

* We should link resilience and desired conditions with respect to the pinned corners. The “hows” (management strategies) should be linked to the “whats” (management goals).
* In thinking about resilience, we should consider how much uncertainty there will be in climate.
* Pacing and intensity of treatment is extremely limited by resources.
* Both “high fire” and “high mechanical” strategies have hurdles to overcome. The “high fire” strategy must overcome public perception, while “high mechanical” will have to overcome an absence of markets for the byproduct.
* Opening roads will come with costs of opening, maintaining, etc., as well as ecological costs. Will our modeling account for this?
  + Mr. Long: This is being considered - the economics team will endeavor to find information on costs.
* There is a huge water quality cost of having roads; it may not be worth it to open any roads.
* Roads, including road that could potentially be reopened, are identified and classified in the water quality modeling. Could it be possible to input potential road openings into a hierarchical structure in LANDIS?
  + Mr. Long: This could be possible in later modeling, if we want to get into those complexities.
* The main question is - how much of the landscape do we really need to affect to get us to a resilient landscape? Consideration of the economic questions and constraints would be further down the road, as necessary.
  + This could be one of the corners.
* There are 3 issues: (1) Fire/Mechanical; (2) How much do you treat; (3) Pacing/How fast?
  + These could serve as 3 axis and map out to 8 scenarios
  + If you tested the 8 scenarios 🡪 Will help figure out which of these 3 is really driving resilience
* There has been a lot of talk about increasing pace and scale of restoration. This could be a framework for it.
* Q: Would it be useful to have a middle ground of intensity of treatment?
  + Mr. Garrett: The middle ground comes in after you have results and are taking constraints into account.
* Pitting fire against mechanical treatment is concerning when we know we are going to have to use multiple methods. Perhaps one of the corners should be treat all ways, with best tools, as much as possible.
  + Yes, and perhaps another corner could be treating what is realistic under current constraints.
* Q: Could pace/scale be worked into a lever to be switched on/off in LANDIS modeling?
  + Mr. Long: This could feed into LANDIS really well, if these corners (everything, everywhere) can be defined.
* Assuming BAU represents WUI treatments given constraints that we currently have, this would be 2/3 of the landscape, leaving only 1/3 for differences. But perhaps some of the changes would occur within the WUI to increase contrasts.
* Location could be another axis.
* It would be useful to develop a matrix of all options and then select which are most interesting and informative to model.
* Mr. Long: To get to the possibilities matrix, think about what outcomes we want to achieve, and use that as a corner. Then, think about what the strategies we could use to get to that corner.
* Mr. Long: We do not need to treat 100% of the landscape to get to resilience. How much do we need to in order to get there?

## Small Group Exercise on Building Strategies

The committee organized themselves into four breakout groups to explore how to build contrasting strategies for modeling. Each group explored one of the following concepts/contrasts:

* High fire vs. high mechanical.
* Ecological benefits vs. risk reduction.
* Pace and scale.
* Full treatment, with constraints vs. full treatment, without constraints.

The groups were asked to address the following questions in building their contrasting strategies:

1. What areas of the landscape would be prioritized for management treatments in the next 10 years? (Please specify/distinguish among thinning and fire treatments)
2. What would be the intended treatment objectives? (e.g., effects on vegetation structure, composition, and fuels)
3. What other elements should be considered or incorporated into this strategic approach for it to be informative?

Mr. Garrett presented vegetation and treatment maps for the breakout groups to help in placing planning actions.

Following the small-group discussions, each group reported out on their results, as follows:

**Group 1: High fire vs. High mechanical**



**Group 2: Benefits vs. Risk reduction (Ecological resilience vs. community fire protection)**



**Group 3: Pace and scale**



**Group 4: Full treatment, with constraints vs. Full treatment, without constraints**



Discussion followed:

* When discussing pace and scale, moving slowly is not realistic, especially considering that LTW has a time constraint of 10 years. Is it more about what areas are prioritized?
* Mr. Long: There are a lot of synergies in what areas the groups chose to prioritize (ex. fire containers, meadows and riparian areas, etc.).
  + Thinking about constraints while modeling is less useful, though where we might want to talk about lifting constraints is putting roads on ridgelines.
  + Discussion about SEZs was also useful.
* Mr. Shaw explained the distinction between the concepts of fire return interval and fire rotation, as related to the pace/scale group’s discussion of disturbance frequency.
  + Fire return interval is defined across a landscape. If a fire return interval is 7-10 years, the entire landscape might take 200 years to be fully disturbed.
  + The calculation for the amount of area to treat can vary significantly based on how you define fire return interval. The pace/scale group was using this concept in a way that translated into much more frequent treatment.
  + “Catching up” (i.e., using a faster restoration pace now to make up for slow pace of the past) is another important notion that came out of the Pace/Scale group.
* It is ok to use FRID as a guide, but be careful not to just go after the hotspots of high departure. There are areas that we could restore more efficiently and effectively than the hotspots, giving us a better bang for our buck. There are other areas that could be leveraged to better meet management goals (meadows etc.).
* Outlining a robust monitoring effort is important to inform if we are having effects we did not anticipate. There is only so much area you can treat without hurting a species. Modeling efforts might help us to determine where those thresholds/areas of concern might be.
  + Mr. Long: In order that model this, we need to know what we are concerned about.

Ms. Di Vittorio explained that the Interagency Design Team (IADT) will use the ideas generated from this meeting to develop the contrasting modeling strategies, and will present those to the Stakeholder Science Committee at a future meeting (likely in January).

* Once modeling is being done, interaction with IADT and SSC should be more frequent. What is the best vehicle for this – could we use webinars?
  + The group noted a preference for in-person meetings but that focused one-hour calls could also be useful.
* Ms. Di Vittorio: we are at a transition point in this project, where there are many uncertainties about what the next steps look like. We are working to develop a more complete process map and timeline.
* Mr. Long: It will be important for the LANDIS group to present on results for the first BAU scenario so that the group can understand model inputs/outputs.
* We should invite the Environmental Review Team to engage in strategies development. The Environmental Review team could provide good feedback and insights, and it may also benefit their process.

## Closing Remarks

Ms. Di Vittorio thanked everyone for a productive meeting, calling attention to the engagement, commitment, hard work, and focus of the group as a whole. The next Stakeholder Science Committee Meeting will be December 5, from 10am to 4pm at the Lake Tahoe Basin Management Unit, 35 College Dr, South Lake Tahoe, CA 96150.

There were no interested party comments.

## Meeting Attendees

Organizing and Participating Agencies

CTC – California Tahoe Conservancy

NFF – National Forest Foundation

State Parks – California State Parks

TFFT – Tahoe Fire and Fuels Team

USFS LTBMU – U.S. Forest Service Lake Tahoe Basin Management Unit

USFS PNW – U.S. Forest Service Pacific Northwest Research Station

USFS PSW – U.S. Forest Service Pacific Southwest Research Station

**Stakeholder Science Committee Members**

1. Jeff Brown
2. Jennifer Quashnick
3. Matt Freitas
4. Tricia Maloney
5. Sue Britting

**Staff**

1. Brian Garrett, USFS LTBMU
2. Daniel Shaw, State Parks
3. Forest Schafer, TFFT
4. Jason Vasques, CTC
5. Jen Greenberg, CTC
6. Jonathan Long, USFS PNW
7. Patrick Wright, CTC
8. Randy Striplin, USFS LTBMU
9. Sarah DiVittorio, NFF
10. Evan Ritzinger, NFF
11. Stephanie Coppeto, USFS LTBMU
12. Whitney Brennan, CTC
13. Keith Slauson, USFS PNW
14. Eric Abelson, USFS PSW
15. Patrick Wright, CTC
16. Amy Jirka, TFFT

**Interested Parties from the Public**

none