DRAFT SUMMARY

STAKEHOLDER SCIENCE COMMITTEE MEETING

LAKE TAHOE WEST RESTORATION PARTNERSHIP

Tuesday, October 2, 9:00 am to 1:00 pm
Tahoe Regional Planning Agency, 128 Market St, Stateline, NV 89410

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 (LTW) Stakeholder Science Committee (SSC) met on October 2, 2018, from 9:00am to 1:00pm at the Tahoe Regional Planning Agency (TRPA) in Stateline, Nevada. Meeting objectives were to: (1) Share and discuss modeling results: landscape and preliminary fine-scale fire results; and (2) Share and collect feedback on Landscape Restoration Strategy goals and objectives. Landscape and economic modeling results had three primary components: forest management revenues and costs, the health impacts of smoke, and property value at risk of wildfire. Of the three, forest management revenues/costs modeling is most complete, with full results planned for presentation at the upcoming November Stakeholder meeting. The Fine Scale Fire modeling focused on preliminary results from upland and riparian forest modeling, demonstrating that treatment increased the rate of fire spread, but reduced fire severity and canopy loss.

Contents

Meeting Synopsis 1
Welcome, Agenda Review, and Introductions 1
1. Landscape and Economic Modeling: Preliminary Results 1
2. Fine-scale Fire Modeling and Forest Vigor/Resilience Plot Monitoring: Preliminary Results 4
3. Landscape Restoration Strategy Goals and Objectives 7
Meeting Attendees 9

Welcome, Agenda Review, and Introductions

Sarah Di Vittorio was unable to make the meeting in-person – so Christina Restaino opened the meeting with a welcome, agenda review and introductions.

1. Landscape and Economic Modeling: Preliminary Results

Sam Evans reported initial results from the Economics modeling efforts, of which there were three main research components: (1) Forest management revenues and costs; (2) property value and wildfire risk; and (3) health costs of smoke. Economics modeling utilized (or will utilize) landscape-level outputs from LANDIS modeling (Scenarios 1 -4, 10 replicates of each) to make predictions about the performance of different forest management treatment

types/intensities in each of the three categories (as well as water quality and water yield) through time.

Forest Management Costs/Revenues:

- Subtasks: harvest and thinning cost, fire suppression costs, transport costs, timber and biomass revenue.
- Status: Preliminary results.
- Harvest characteristics include:
    - Stand: tree/acre in different size classes, biomass distribution, species composition.
    - Harvest: Biomass removed, technologies used.
    - Removal effort: GIS-derived information on yarding distance and slope for each stand.
    - Uses OpCost model (part of BioSum) to estimate management costs.
- To translate LANDIS outputs into cost/revenue estimation variables:
    - Uses FIA data to estimate size distribution and distributes LANDIS biomass outputs among size classes.
    - Uses four different size class "price points."
    - Estimates travel times using assumptions about speeds (based on road type), biomass/timber product goes to closest facility.
- Fire suppression – haven't settled on the best method yet, but will use fire incidence data from LANDIS.
    - Total area burned is same except for S4, though there are differences in acres burned by fire intensity (S1 most high intensity, S3 least).
        - Most high intensity fire is in the WUI (likely due to significance for ignitions).
- Full results should be available by next Stakeholder meeting (with net costs for all scenarios).

Questions/Comments:

- Q: Do prescribed burning costs account for differences between pile removals vs. burning?
    - No, but there is information removal vs. burning – will need to talk to LANDIS to see if data is available.
- Q: Are biomass removal estimates coming from mechanical only (with hand thinning assumed as pile burned)?
    - Yes, this is being built in. Not sure how hand thin overlaps with Rx burn area.
- Q: Do the "price points" distinguish between thinning costs (hand thinning/mechanical) vs. fire suppression costs?
    - Yes, and is being cross-checked with Basin data as much as possible. However, costs of timber contracts are sometimes difficulty to dissect (timber revenues are built into the price).

- Q: Can data be broken down between threat/defense/WUI zones and fire intensity categories?
    - Yes, this is possible.
- Q: Are results reflective of land within the LTW boundary only?
    - The graphs show basin-wide results, but data are readily available to reflect the LTW boundary only.

Health Impacts of Smoke

- Status: Literature review ongoing, methodology chosen (the US EPA's BenMAP), on-ongoing communication with smoke modeling team.
- Results from smoke team can be modeled in BenMAP as soon as they are ready.
- BenMAP will be used to value health outcomes (hospital visits, illness, etc.) with location specific data (demographic, background air quality data).
- Bases air pollution figures on fire intensity data in LANDIS, and use smoke dispersion modeling to map a given smoke plume. Will use representative fires to make predictions, not all fires (due to limited resources).
- Basic tradeoff – regular Rx fire smoke vs. decadal high intensity fire smoke. Scenarios 3 and 4 will be most closely examined.

Questions/comments:

- Q: Would modeling include increased emissions from vehicles for hauling material?
    - Not currently, but it could be added in.
    - Smoke modeling team is accounting for background pollutants and vehicle miles traveled. The level of temporal analysis would need to be expanded since hauling happens only seasonally.
        - Caltrans has data on health impacts of hauling biomass.

Property Value and Wildfire Risk

- Subtasks: Fire risk mapping, property value assessment (Zillow)
- Status: Literature review complete, completed wildfire risk assessment, and currently creating value-at-risk property layer. Full results will be available by November Stakeholder meeting.
- Modeling will look at the probability a given pixel will burn (from LANDIS, broken down by fire severity), crossed with data of property value (from Zillow) in each pixel.

Questions/comments:

- Q: Will the narrative/reporting of results integrate suppression costs?
    - Suppression costs are accounted for as a management costs.
- Q: Will fire risk data be separated by fire severity?
    - Data will be broken down by severity, with a focus on high severity fire.

    - Probability with be obtained by examining replicates.
    - Suggestion: A structure could still be vulnerable even in a low severity fire if the property is not properly managed. Use data to provoke people to administer effective fire clearance.
    - Suggestion: Also separate by moderate severity.
- Q: Were certain fuel models assumed specific to neighborhoods?
    - No, LANDIS uses vegetation data, but does not account for built environment.

Additional Work

- Will need to examine the effects to wildlife habitat using CA WHR categories. Three components of CA WHR will be estimated:
    - Biomass proportions used for forest type.
    - 95th percentile tree DBH used for each tree size
    - Biomass + tree size combined with FIA data to estimate canopy cover (based on relationships established by the USFS wildlife team).
- Will compare changes to habitat over time and across scenarios.

Questions/comments:

- Q: There appears to be a large shift from "mixed conifer" in eVeg to "Jeffery pine" – what is driving that?
    - Not certain, but classifications can be tweaked. Classifications depend on the defined thresholds for each forest type.
    - LANDIS reports more areas of low/no biomass than eVeg (ex. Angora fire reflected as montane chaparral). Some of the areas such as bare rock are "non-classified."
    - eVeg data might be from 2003.
- Q: Are maps coming from the Wildlife team's model?
    - Maps reflect the biomass figures from LANDIS results.
    - Canopy cover will be based on the Wildlife team's modeling, and coordination with Angela White is occurring.
- Q: Can tree size class and canopy cover data be used to verify modeling outputs?
    - Yes, the data for tree size class has been obtained, still working on getting it for canopy cover.
- Q: Do treatment allocations relate to forest type?
    - Forest types are built off LANDIS results, and do affect treatment location.

2. Fine-scale Fire Modeling and Forest Vigor/Resilience Plot Monitoring: Preliminary Results

Brandon Collins presented preliminary results of fine-scale fire modeling.

Subtasks:

- Fine-scale fire behavior modeling for an “upland” forest type (Stanislaus/Tuolumne Experimental Forest).
- Fine-scale fire behavior for a “riparian” forest (aspen restoration sites in LTBMU)
- Tree vigor forest resilience following thinning (Upland Fuels Project in LTBMU - Manley et al.).
    - Takes advantage of existing study on thinning (w/ pre/post treatment measurements and paired control sites).
- Modeling is based on Wildland-Urban Interface Fire Dynamic Simulator (WFDS)
    - Not just for the WUI, despite the name. The National Institute for Standards and Technology (NIST) originally developed it for that intent but expanded it for use in wildland applications.
    - Accounts for 3-D fuels complex: horizontal clumps and gaps, vertical ladder fuels, and linked surface and crown fuels.
    - Multiple wind speeds (moderate; 13mph = managed fire; high; 29mph = suppression focused wildfire).

Upland Forests analysis

- A 1929 vs. 2008 comparison:
    - 1929: Highly variable surface fuels, lots of gaps.
    - 2008: Loss of “gaps,” uniform surface fuels, denser and increased ladder fuels.
    - Modeling uses 1929 as a target for what treatments might look like.
- In fire modeling:
    - 1929: Exhibited far more heterogeneity in fire spread, likely driven by heterogeneity in forest.
    - 2008: more homogenous fire front, higher rates of spread - even in higher wind speeds. Much greater amounts of canopy consumption (In high wind speed, canopy consumption was: ~100% in 2008 vs. 40% in 1929; there were similar, but more pronounced differences in 13mph wind speed).

Riparian Forests analysis

- Analysis seeks to assess the effect of aspen restoration treatments on potential fire behavior while answering two main questions:
    - What effect does conifer removal have on potential fire behavior? Two levels (up to 14” and up to 30”).
    - What role (if any) do piles play on increasing fire hazard following treatment?
- Uses Pascal Berrill’s stem maps from aspen research.
    - Three sites: (1) Christmas Valley; (2) Ward Creek; and (3) Barker Pass Rd/Blackwood Creek.
    - Only (1) Christmas Valley and (2) Ward Creek have post-treatment maps.
- Inputs:
    - Plotted trees (species and location).
    - Made assumptions about crown width.

    - Surface fuels – spatial variability of surface fuels simulated based on cover type; used basal area (moving window) to populate 10m pixels.

- Preliminary results (managed wildfire scenario; higher wind speed modeling still being done):
    - Rate of spread increases with thinning, and intensity of thinning.
        - More stems creates more drag – slows wind speed.
    - Canopy consumptions decreases with thinning, and intensity of thinning (from between 5 and 10%, to 0%).
        - Consumption is very low for all scenarios.

Next Steps:

- Resolve issues with modeling piles:
    - Need more information on fuels amount/distribution and heat release rate/mass loss rate to simulate piles with managed fire and wildfire conditions.
- Finalize surface fuel representation:
    - Need to complete managed fire scenario and simulate wildfire scenario.

Tree vigor/forest resilience in completed treatments:

- Resampled treated and control sites for Upland Fuels Project:
    - Treatments were mechanical, cut-to-length, and hand thinning; completed 2007-2009.
    - ~100 0.25-acre plots were measured pre- (2006-07), post- (2008-10) treatment, and in 2018.
- 2018 measurements included:
    - Trees (dbh, live/dead), understory cover, fuels.
    - Overstory increment cores (~500 trees):
        - Compared tree growth responses after 2007-2009 in both treated and control sites.
        - Assessed tree vigor based on species ring width patterns.
- Result: Treated trees appear to be healthier during drought.
    - Also using species-specific patterns to indicate likelihood of tree mortality (Adrian Harpold's work).

Questions/comments:

- Suggestion: It would be useful to know absolute values for canopy consumption (relative scales do not reflect what the initial conditions are).
- Q: To what extent are fire effects modeling being verified using actual data (ex. Rim Fire)?
    - WFDS assumed to create realistic outputs – has been applied elsewhere.
    - Stem maps for the Rim Fire were not available, though it would be helpful to have for a reality check.

    - Need to know to what extent time needs to be allocated toward verification, given the intensity of modeling process and fine scale.

- Q: Were there specific gap sizes that were found to significantly affect fire spread?
    - Do not have a complete answer, but may be assessed (at least partially) using available results.
    - Will also depend on what vegetation is located in gaps.
    - Would need to run many more simulations to assess completely.
    - Chad Hoffman's work on stands in Colorado could be useful for answering this question.

3. Landscape Restoration Strategy Goals and Objectives

Jen Greenberg introduced the most recent version of the LRS Goals and Objectives Matrix, which had been updated based on Stakeholder and Executive Team feedback. The updated version includes reworked language and more defined categories (vision, goals, objectives, etc.). Actions and prioritization guidelines, project-level guidance and resource protection measures are still in development. Per the Executive Team's suggestion, objectives were made measurable whenever deemed possible or appropriate, with the exception of the objectives within the Community and Economics & Capacity goals (suggestions are welcome). Feedback will be used to create "option sets," to help fill in objectives.

Questions/Comments:

1. *Forest Structure*
    - Suggestion: Try to create consistency between the use of percentages and absolute values in the objectives. Translating percentages to project-level implementation may be difficult.
        - However, the use of percentages and values may be necessary for different categories in order to properly reflect the goal and potential variation into the future. It depends on what is ecologically relevant.
            - Could also say "X" acres over 10 years, for example, to account for variation from year to year.
    - Suggestion: Define the size of openings being considered, or at least a range of sizes.
        - Ultimately, the project will have to conform to the Forest Plan (which guides patch sizes and amounts). These details may be better suited for actions and prioritization guidelines or project-level guidance - input is welcome for targets.
        - Waiting to see what happens with actions & prioritization guidelines. Explore whether or not high severity fire patches may count as openings. Gaps will also be discussed and examined during October Field Visit.
        - Don't want to be repetitive with other documents but may need some qualifiers specific to LTW.
    - Suggestion: Objective "B" was too long, too much information.

- Objectives describing conditions were well-received.

2. *Fire*
   - Suggestion: Too much information in each objective – could be broken out into more.
     - Sue Britting can offer some ideas to decompose them.
   - Suggestion: Break up Objective "A" between the WUI and the general forest.

3. *Native Species and Ecological Communities*
   - Suggestion: Rather than "increase," and/or "maintain," be more specific (ex. "at least maintain or increase by X%").
     - There may be too many unknowns to specifically quantify in an ecologically relevant and measurable way within in a specific time period, but suggestions are welcome.
   - Suggestion: Make recommendations for areas of focus in Objective "C" based on modeling results.
     - May be addressed in actions and prioritization guidelines (based on biodiversity hotspots or where modeling shows a decrease).
   - Suggestion: In the ultimate strategy document – present goals, objectives, and actions and prioritization guidelines together.

4. *Water: Quality, Supply, and Hydrologic Function*

   - No suggested edits.

5. *Community*
   - Suggestion: Explicitly acknowledge the continuation of existing of recreational opportunities in Objective "D" (sentence is confusing).
   - Suggestion: Include a target for Objective "A" to make it more measurable.
   - Suggestion: For Objective "C" – make more measurable by working with tribal entities to cue up a number of projects. Could also specify watersheds/locations.
   - Suggestion: Emphasize the relationship with tribe more in Objective "C".
   - Suggestion: In Objective "B" – use standards as a benchmark (ex. from the Air Resources Board).
     - Objective "B" may have to be kept broad as it is not just intended for the Basin, but also downwind communities that smoke will effect. In order to meet our objectives relevant to air quality, we may be more dependent on the actions of upwind communities (ex. Ferguson Fire affecting air quality in the Basin).
   - Suggestion: Will need additional mitigation measures (ex. better outreach) given the amount of Basin-generated smoke may increase by putting more fire on the ground over the next 10-20 years.
     - Suggestion: Could suggest conditions when burning would occur.
     - Could be addressed in fire objectives as well (ex. # of high severity patches).

6. *Economics and Capacity*
    - Suggestion: The goal seems to only be addressing economics through restoration activities, and neglecting existing opportunities (ex. sustainable recreation, business activities, etc.). Suggest rewording sentence.
        - Ex. "Restoration of forest provides benefit to existing recreation opportunities and property values."

Meeting Attendees

Organizing and Participating Agencies

CSP – California State Parks
CTC – California Tahoe Conservancy
NFF – National Forest Foundation
SVAM – Squaw Valley-Alpine Meadows
TFFT – Tahoe Fire and Fuels Team
TRPA – Tahoe Regional Planning Agency
UCB – University of California, Berkeley
USFS LTBMU – U.S. Forest Service Lake Tahoe Basin Management Unit
USFS PSW – U.S. Forest Service Pacific Southwest Research Station
USFS PNW - U.S. Forest Service Pacific Northwest Research Station
US EPA – U.S. Environmental Protection Agency

Stakeholder Science and Community Committee Members

1. Jennifer Quashnick
2. Sue Britting
3. Jeff Brown
4. Casey Blann
5. Jack Landy US EPA

Staff

6. Jen Greenberg, CTC
7. Whitney Brennan, CTC
8. Svetlana Yegorova, CSP
9. Silver Hartman, CSP
10. Sarah Di Vittorio, NFF
11. Evan Ritzinger, NFF
12. Forest Schafer, TFFT
13. Christina Restaino, TRPA
14. Tim Holland, UCB
15. Sam Evans, UCB
16. Matthew Potts, UCB
17. Brandon Collins, UCB
18. Stephanie Coppeto, USFS LTBMU
19. Jonathan Long, USFS PSW