

DRAFT - SUMMARY

JOINT STAKEHOLDER SCIENCE COMMITTEE MEETING

LAKE TAHOE WEST RESTORATION PARTNERSHIP

Tuesday, June 25th, 2019, 9:00am to 3:00pm

Lahontan Water Board Annex, Hearing Room, 971 Silver Dollar Avenue, 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

On June 25th, 2019, the Lake Tahoe West (LTW) Stakeholder Science Committee met with the Interagency Design Team (IADT) to hear and discuss feedback from stakeholders on the Landscape Restoration Strategy (LRS). Multiple Stakeholders agreed that there was not enough justification presented in the body of the LRS to make the case for several of the recommended policy changes. The IADT also shared how the team plans to address stakeholder feedback in Draft 2. Modeling results from updated runs of Scenarios 1-4 were reviewed, as well as the approach to Scenario 5. The IADT and the Stakeholder discussed the pros and cons of developing a Scenario 5, and it was decided that the IADT and Science Team will not produce a Scenario 5. Instead, the IADT and Science Team will focus their efforts on generating the rest of the results for updated Scenario 4.

Contents

Meeting Synopsis	1
Action Items	1
Opening Remarks	2
Stakeholder Feedback on Draft 1	2
Discussion of Stakeholder Feedback	3
Updated Scenarios 1-4: Results	7
Scenario 5: Set-Up	8
Meeting Attendees	10

Action Items

1. **Sarah** will send both PowerPoints from the Stakeholder meeting to Stakeholders.
2. **Bri** will work to schedule a webinar in August to present modeling results.

Opening Remarks

- The IADT will be sharing the updated results from Scenarios 1-4.
- Stakeholder meeting schedule through 2019.
 - Stakeholders and IADT will meet once a month except for the month of July. [*Note: we added a workshop for the Stakeholder Community Committee on July 10.*]
 - All Stakeholders are highly encouraged to attend the Stakeholder Community Committee meeting on July 10 from 1:00pm – 4:00pm at the Tahoe Public Safety Center/Station 51.

Stakeholder Feedback on Draft 1

- Each Stakeholder recaptured the top three things from the LRS that most caught their attention:
 - First Stakeholder response:
 - The LRS was laid out well, organized, and easy to read.
 - Liked the table that highlighted the comparison between LTW and other large landscape scale projects.
 - It was not clear exactly how the science results supported the policy recommendations suggested in the LRS.
 - Second Stakeholder response:
 - The LRS was well-organized.
 - There is not yet enough science/justification presented in the body of the LRS to make the case for policy changes.
 - Are the differences observed in scenario results because of differences in treatment extent or treatment intensity?
 - Mismatch between decrease in early seral vs. increase in high severity area.
 - Why are riparian areas being targeted as fuel breaks? Is this because they're naturally moist or is there additional treatment being done to make them into breaks?
 - Third Stakeholder response:
 - The perspective of how the LRS could be used in other regions beyond LTW was valuable.
 - Fourth Stakeholder response:
 - The LRS should mention the collaborative overlap between LTW and development of the Programmatic Timberland Environmental Impact Report (PTEIR) being developed for Tahoe.
 - Shared outreach opportunities exist between LTW and PTEIR.
 - Fifth Stakeholder response:
 - There were no major issues in the LRS, but there were a few points that could use clarification.
 - In the LRS there was a section that made it sound like forest thinning treatments could lead to a more homogenous structure on the landscape than prescription

fire. There needs to be clarification on this because normally a prescription is written to not be homogenous.

- Does an increased use of fire act as an effective substitute for thinning hold true in stands with high density and large stand diameter?
- The LRS should be careful about highlighting reduced risk from wildfire. Even a moderate intensity wildfire can cause serious damage.
- Is the emphasis on erosion and sediment loads from steep slopes discussed in the LRS inconsistent with steep slope change?
- The LRS might be overselling the differences between LTW and other traditional projects approach in the comparison table. This comparison table should be reviewed.
- Response from other USFS personnel:
 - Pointed out the lack of references and rationale (which the team is still working on).
 - People wanted to see references and thought process for why the IADT chose specific numbers such as the goal of 40,000 acres of treatment.
 - The IADT is currently working on a rationale section. This section will be present in draft two.

Discussion of Stakeholder Feedback

- The discussion of stakeholder feedback section aimed to review the key science-related comments and questions as well as the other comments/questions from stakeholders.
- Science-Related Comments and Questions:
 - Many clarifying questions about model results, statements about results, and evidence in general.
 - Need more evidence to support:
 - Large tree removal (also clarify whether just in aspen or anywhere).
 - 30-50% slope.
 - Thinning in PACs.
 - Treating as extensively/intensively as proposed.
 - Argument that Scenario 3 performs better for wildlife not supported by the data.
 - What did modeling say? What other evidence supports?
 - Fire assumptions.
 - Did Scenario 3 account for pile burning? (smoke impacts from?).
 - What results assume same impacts from prescribed and low severity wildfire?
 - Roads:
 - How did models address distance of treatments from roads – mechanical and prescribed fire?
 - What did models say about treating in wilderness?
 - Water clarity.

- Need more clarity on water quality results from large fires (Blackwood event in Scenario 4). Is this really a comparable event across scenarios?
 - Impacts to mid-lake versus nearshore which is currently at risk from algae etc?
 - How did the models address bark beetles? What are uncertainties in those assumptions?
 - Need more discussion of model uncertainty.
 - More clarity in text on what each Scenario addressed (comparison table).
 - Suggest including more of the current conditions and maps from the LRA – identify the most dire areas in need of treatment.
 - Some like science briefs; others feel not detailed enough to really understand the modeling. Will there be a GTR with all results?
- Stakeholder question - What is the aversion to having larger openings on the landscape? Incorporating openings into the landscape can help with fire and regeneration.
 - Response- The reason the IADT didn't emphasize going larger on gaps was because there is not currently data to support that gaps were larger historically.
- Stakeholder question - What is the discrepancy between increased fire on the landscape and shrub regeneration?
 - Response - Science Team member said that even though fire is occurring on the landscape, fire is still well below the natural range of variation. The conversion of early seral to forest outpaces what would result from fire.
- General Stakeholder questions about fire -
 - LTW also has to be realistic about fire and keep in mind the air board regulations. If burning increases in the Sierra Nevada it will be difficult to ramp up burning in the basin.
 - The LRS is aiming for primarily low and moderate fire severity on the landscape, but high severity fire still has a place on the landscape.
 - The LRS should be careful about assigning a Natural Return Interval/Natural Range of Variability for fire in the LTW footprint. The LTW has many homes in its footprint and there is substantial risk as well as social issues surrounding increased fire.
 - The IADT knows that there should be more fire on the landscape, but this is difficult to do in the LTW footprint and there is not a clear amount of fire that has been determined through modeling.
 - How does the LRS talk about fire in a way that's substantive when there is still so much uncertainty about how much fire to put on the landscape?
 - Fire will be on the landscape whether we want it or not, the main point is that the LRS articulates the particular challenges that the basin experiences in relation to fire.
 - The LRS language will continue to work on promoting acceptance of more fire on the landscape—this document represents a good opportunity to start working on social acceptability.
- Next issues of focus from Stakeholder comments: Slopes, PACs, large diameter trees, and extensive vs. intensive treatment.
 - Slopes: Allow mechanical treatment on slopes above 30%.

- The goal of this policy change is to increase the amount of landscape that can be treated. There is more operational ability that is needed to move the landscape towards resilience.
- Extensive vs. intensive treatment:
 - Scenario 3 allowed for more treatment on the landscape because the model was allowed to treat in PACs, on steep slopes, and it took treatment outside the WUI. The central question from stakeholders is did Scenario 3 do better because of the expanded treatment area in result of policy recommendations (treating in PACs, on steep slopes) or just because it went outside the WUI?
 - Stakeholder comment: There is little information/modeling done in regards to treating >30% slopes vs. not treating >30% steep slopes. This is the key piece of modeling the IADT needs.
 - The Stakeholders were not necessarily against the policy recommendation to allow mechanical treatment on steep slopes, but more data is needed to support this recommendation.
 - Stakeholder question: How much more cost effective is mechanical treatment as opposed to hand thinning on steep slopes? Could we get to acre goals without steep slopes?
 - Response: IADT agreed that a brief cost comparison should be done. In theory it's cheaper to do mechanical treatment but does this actually hold true?
- Perhaps the steep slopes code change should be tied into Phase 3 instead of the LRS. The LRS could just have a section that highlights, "policy changes that will be explored in Phase 3".
- PACs
 - The current forest plan allows you to treat PACs in the WUI but outside of the WUI you can only use fire in PACs.
 - The IADT wants to expand treatment options in PAC outside of the WUI because some of the PACs may not be ready for fire.
 - Path moving forward with PAC policy recommendation:
 - IADT and Stakeholders agreed a project specific Forest Plan Amendment will be the best option.
 - Add this language into the Goal 3 statement.
- Removing large diameter trees:
 - This is not a policy change, the current forest plan and TRPA allow for removal of large diameter trees.
 - While it's not a policy change, in practice the USFS and CTC do not usually remove large diameter trees because of the social views around removing large diameter trees.
 - IADT has not articulated where, when, and why large trees would need to be removed from the landscape (except in aspen stands).

- This issue of large diameter trees might not even need to be addressed in the LRS since it is not an official policy change and would only be used in prescriptions on a case by case basis.
 - Stakeholder recommendation: In the Science Integration write-up, just say something to the tune of “reductions of relatively large trees”. The policy flexibility exists to allow the IADT to implement the reduction of large trees on the landscape and it does not need to be specifically called out.
 - Some large diameter trees could be left on the landscape. If treatments start removing numerous large diameter trees, there might be some judgement regarding the real purpose of this removal. Large snags being left on the landscape could be good for wildlife. Intensive vs. extensive treatment?
- Other Stakeholder comments/questions:
 - Should clarify what thinning means and when/where.
 - Should clarify when prescribed fire can be used as substitute or complement for thinning – what about high-density, large average stand diameter stands?
 - Should clarify how all of the numbers of acres treated in different objectives add up - are they overlapping?
 - Should acknowledge benefit of pyro-diversity; high severity fire is not all bad.
 - Roads comments/clarifications:
 - Should discuss risks of storm events to new road.
 - Should note costs of new roads including maintenance.
 - Should emphasize more strongly that impacts to air and water quality are short term; long-term positive tradeoffs.
 - Economics.
 - Needs more discussion of costs and avoided costs.
 - More discussion of potential economic solutions - what has worked elsewhere?
 - Suggestions regarding map of local and regional facilities; may be inaccuracies.
 - Should note how LTW builds on other collaboratives – Sagehen, Dinkey.
 - Need picture of west shore community, not Stateline.
 - Burn days – may need more clarity/discussion of this policy context.
 - Suggest more discussion of how air quality regulations disincentive burning – important issue regionally if not LTW.
 - Suggestion reconsidering the objective of “Prescribed fire on 80% of allowable burn days”. Placer County allows fire on probably 80% of days b/w November and July; also seems unrealistic.
 - Suggest changing Goal 2 wording: Forests “bounce back” from fire etc. (implies faster recovery than actual).
 - The need to address species composition does not come through clearly (increase pine, decrease fir).
 - Include Nevada in land agencies!

- “Race to restore ecosystems” – should explain that restoring resilience takes a long time due to many social, political, economic factors.
- Table on Traditional Forest Management vs. LTW approach needs more nuance in some statements.
- The prescribed fire acreage objective might not be achievable.
 - Population growth in Reno will make smoke impacts from prescribed fire more of an issue. Of this list, which ones do people think they would want to talk about?
- Change "bounce back" wording to forests "recover".
- Roads modeling does not currently factor in the probability of fire. The WEPP road model calculates the probability of storms in general, but not fires on top of road building.
- How should the LRS quantify the prescribed burning objective?
 - There is a difference between “allowable” burn days and “operational” burn days.
 - It might be difficult to put an exact number on this objective. Perhaps the LRS should not say 80% of burn days but utilize some other language that just generally encourages managers to burn.
 - The LRS could say: Treatments will prepare X percent of the landscape to be ready for prescribed burning. This allows you to incorporate metrics and take advantage of that area when you have allowable burn days.

Updated Scenarios 1-4: Results

- Updated Scenario 4 vs. Updated Scenario 4b: Goal for both was to increase the amount of prescribed fire to better match IADT intent.
 - Updated Scenario 4: Ramp up acreage of Prescribed fire.
 - Updated Scenario 4b: Opening up the timing of Prescribed burns to go outside of fall season.
- Overview:
 - Adjustments to Scenario 4 in LANDIS modeling:
 - More prescribed fire in LTW.
 - Ignite Prescribed fires throughout the year based upon fire weather constraint.
 - 90 days of Prescribed fire is close to overall average of "burn days" estimated by Randy Striplin in his analysis (based upon air quality, fire weather, and resource availability).
- LANDIS Team incorporated additional updates in new (interim) runs for all 4 scenarios.
 - Revised treatment of managed wildfire/suppression.
 - Increased wildfire suppression effectiveness for all ignitions under Scenarios 1,2,3 (Under Scenario 4, lightning ignitions outside of WUI have less suppression)
 - Made beetle outbreaks more responsive to climate.

- Restricted frequency retreatment intervals.
 - More dead biomass removed during harvests to better match IADT intent.
- Results of overall adjustments:
 - Modest reduction in total wildfire area burned.
 - Large reductions in amount of low severity wildfire.
 - More high severity fire in Scenarios 1 and 2
- With updates, the total amount of forest carbon peaks around year 87 and declines, rather than continuing to increase.
 - This may reflect greater tree mortality from insects associated with extended late century droughts.
 - Scenario 4b stores the least amount of carbon because of more burning.
- Under updates, areas of old trees (>130 years) decline from a midcentury peak.
 - Scenario 3 outperforms other scenarios under old and new assumptions.
 - Updated Scenario 4 updated performs worse likely due to the fact that Prescribed fire is killing more trees that will become old.
- Implications for Additional Modeling.
 - Updates to suppression may be a more accurate representation of fire outcomes.
 - Prescribed fire may be a blunter tool than thinning--resulting in more reductions in older trees and carbon by later decades.
- Updates regarding prescribed burning in LANDIS:
 - Previously the datasets did not distinguish Prescribed fire from low severity wildfire.
 - Low severity wildfire as opposed to PRESCRIBED fire reduces sediment loads in half, making estimated loads comparable to loads from thinning.
- Climate drives a lot of changes.
 - Evaluating more projections helps to smooth this variability.
 - Extended drought period is showing up from climate effects.
- Questions from Stakeholders and IADT:
 - Are the updated 4 and 4b results in all of the downstream models?
 - No, 4 and 4b results are just in LANDIS.
 - What qualifies as an extended drought?
 - 100 consecutive days with little to no precipitation.

Scenario 5: Set-Up

- Fire assumptions:
 - Scenario 1 and 2 - full fire suppression as originally intended.
 - Fire suppression is not relaxed outside WUI.
 - Scenario 5 - updated assumptions for fire suppression intended to represent the intent for the LRS.
 - Managed wildfire in wilderness and general forest.
 - Prescribed fire assumptions updated to reflect LRS.

- Less Prescribed fire during first decade of LRS, more in second decade of LRS.
- Updated insect mortality assumptions.
 - Scenario 1-4 originally used time between outbreaks to model outbreaks instead of climate.
- Vegetation treatment from LRS:
 - Decade 1: 2010-2020 (base data is 2010 data).
 - Deterministically place where treatments are placed on the landscape.
 - Using actual treatment data from completed work at current pace and scale.
- Decade 2: 2020-2030 LRS treatments (40,000 acres over 20 years).
 - Treatments are primarily thinning treatments in decade 1 of LRS.
 - 20,000 acres of thinning.
 - 5000 acres of Prescribed fire.
 - 25000 acres of total treatment.
 - Deterministically determine where treatments are placed on the landscape.
 - Complete all currently planned, but not implemented treatments.
 - Strategically placed treatments on portions of the landscape.
 - Limit placements.
 - Decade 3: 2030-2040 LRS treatments.
 - Increase acres of Prescribed fire in decade 2 of LRS.
 - 7500 acres of thinning.
 - 7500 acres of Prescribed fire.
 - 15,000 acres of total treatment.
 - Deterministically determine where treatments are placed on landscape.
 - Strategic placed treatments on portions of the landscape
 - Decade 4 through 10
 - Allow LANDIS to place treatments stochastically.
 - Increased use of Prescribed fire.
 - 600 acres of thinning annually.
 - 900 acres of Prescribed fire annually.
 - 1500 acres of treatments/year.
 - 2.5%/year of 25% of landscape per decade
- Keep in mind that LANDIS modeling is not exact representation of LRS. LANDIS will be stochastic.
- LRS calls out the following:
 - Place treatments to maximize benefits for multiple resources.
 - Goal 2: The strategic placement of treatments slows fire spread and allows managers to be able to increase use of fire as a tool (roads, ridges, riparian areas).
- The IADT and Stakeholders discussed the pros and cons of moving forward with Scenario 5.

- The Stakeholders and IADT came to the conclusion that there was not a need to move forward with a Scenario 5. The Science Team will instead focus on producing the rest of the updated Scenario 4.

Meeting Attendees

Organizing and Participating Agencies

CTC – California Tahoe Conservancy

FWS – Friends of the West Shore

NFF – National Forest Foundation

SFL - Sierra Forest Legacy

CSP – California State Parks

NTFPD – North Tahoe Fire Protection District

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

NDF – Nevada Division of Forestry

LSLT – The League to Save Lake Tahoe

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

NCSU – North Carolina State University

Stakeholder Science and Community Committee Members

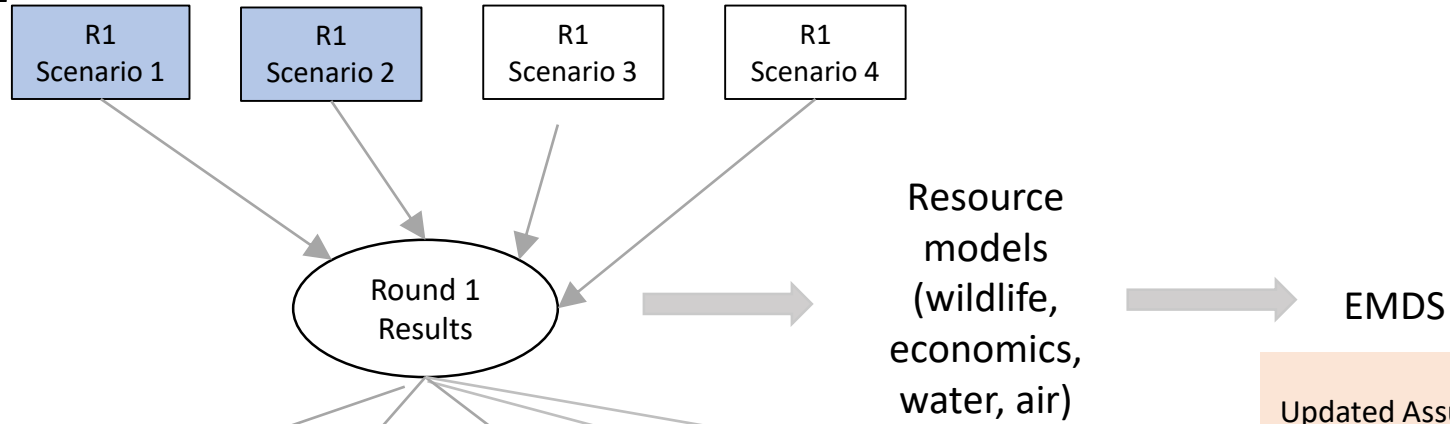
1. Eric Horntvedt, NTFPD
2. Jennifer Quashnick, FOWS
3. Sue Britting, SFL
4. Roland Shaw, NDF
5. Zach Bradford, LSLT

Staff

1. Jen Greenberg, CTC
2. Christine Aralia, CTC
3. Sarah Di Vittorio, NFF
4. Brian Garrett, USFS LTBMU
5. Bri Tiffany, NFF
6. Shana Gross, USFS LTBMU
7. Stephanie Coppeto, USFS LTBMU
8. Dan Shaw, CSP
9. Jason Vasques, CTC
10. Jonathan Long, USFS PSWRS
11. Silver Hartman, CSP
12. Charles Maxwell, NCSU

LANDIS Round 1

1

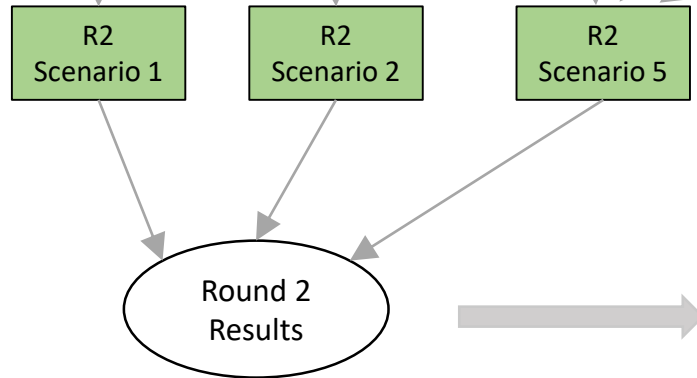


Updated Assumptions:

- 1) More treatment using prescribed fire in Scenario 4b (similar amount to R1 Scenario 3) (also accounts for fire weather in allowing prescribed fire)
- 2) Increasing suppression outside of WUI for scenarios 1-3
- 3) Bark beetles more responsive to climate (rather than periodic)
- 4) Adjusting retreatment interval and removal of dead biomass to better match IADT intentions
- 5) Adding more climate change projections

LANDIS Round 2

2



Round 2 will help to evaluate sensitivity for key parameters:

- Amount and type of fire including large high severity patches
- Biomass / carbon
- Water quality
- Old trees / seral stages
- Economics

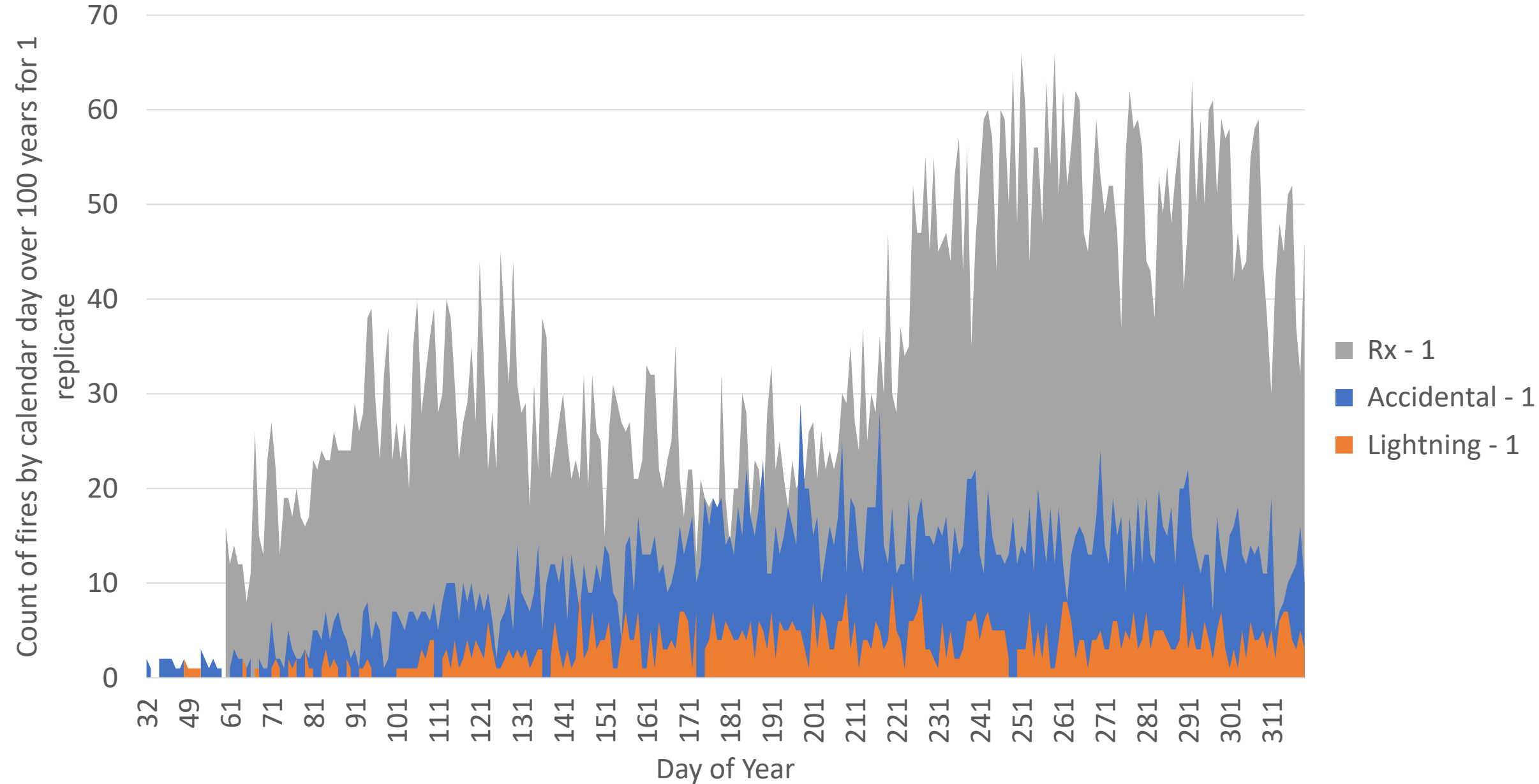
Overview

- Updates made to Scenario 4 to accommodate more Rx fire
- Updates made to overall model (applied to all Scenarios)
- Comparison of these interim results (old results versus updated results for all scenarios)
- Updates regarding prescribed fire and water quality
- Projected climate as driver for key indicators

Adjustments to Scenario 4 in LANDIS modeling

- More prescribed fire in LTW (~3000 acres, meaning ~10,000 acres basin-wide rather than 3000 acres basin-wide)
- Ignite prescribed fires throughout year based upon fire weather constraints
 - *This doesn't change ecological effects (since severity of prescribed burns are set to low severity), but results suggests that to meet the target, about 90 prescribed fires (about 120 acres each) would happen throughout the year, concentrated in the spring and fall)

Histogram of fire seasonality, LTB for revised Scenario 4



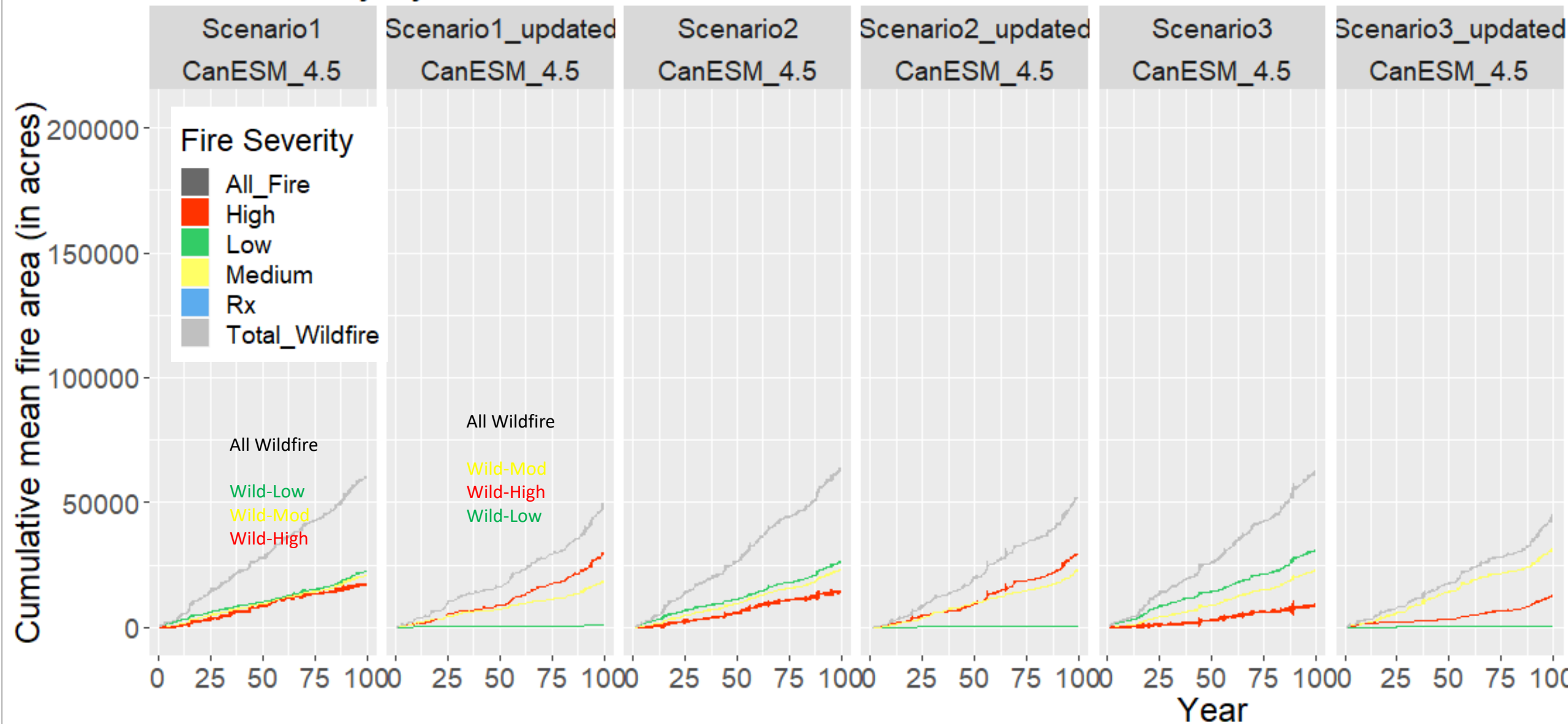
LANDIS Team incorporated additional updates in new (interim) runs for all 4 scenarios

- Revised treatment of managed wildfire/suppression
 - Increased wildfire suppression effectiveness for all ignitions under Scenarios 1, 2, 3 (Under Scenario 4, *lightning ignitions outside of WUI have less suppression*)
- Made beetle outbreaks more responsive to climate (climatic water deficit and minimum winter temperature) rather than being periodic
- Restricted frequency retreatment intervals
- More dead biomass removed during harvests

Results of Overall Adjustments

- Modest reductions in total wildfire area burned
- Large reductions in amount of low severity wildfire
- More high severity under scenarios 1 and 2, slightly more under 3

Fire Severity by area, LTW



Cumulative mean fire area (in acres)

Scenario3
CanESM_4.5

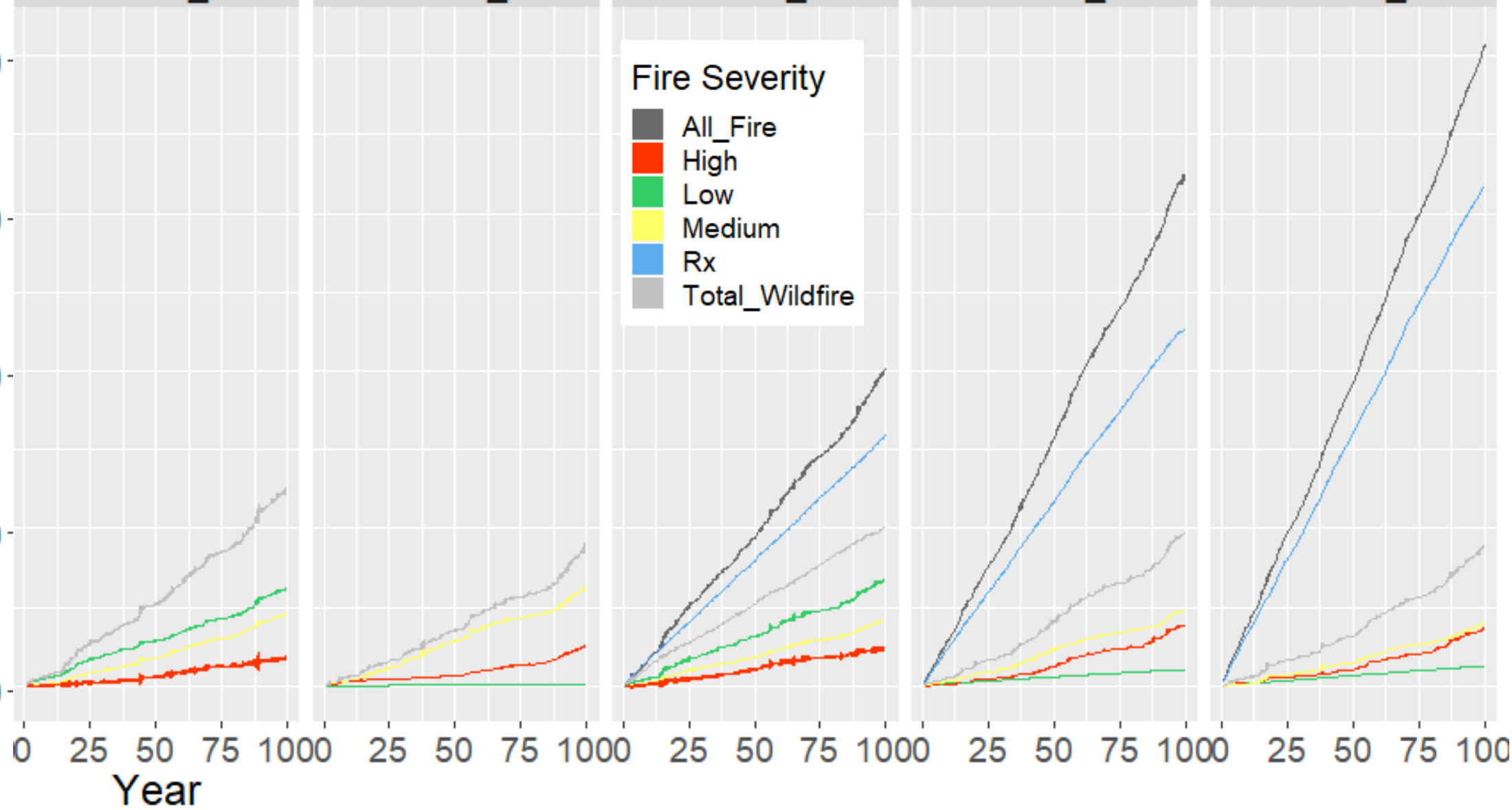
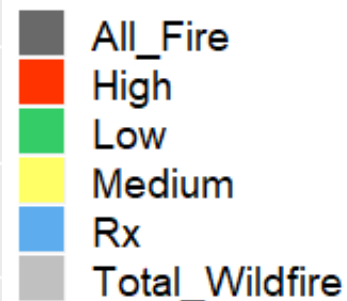
Scenario3_updated
CanESM_4.5

Scenario4
CanESM_4.5

Scenario4_updated
CanESM_4.5

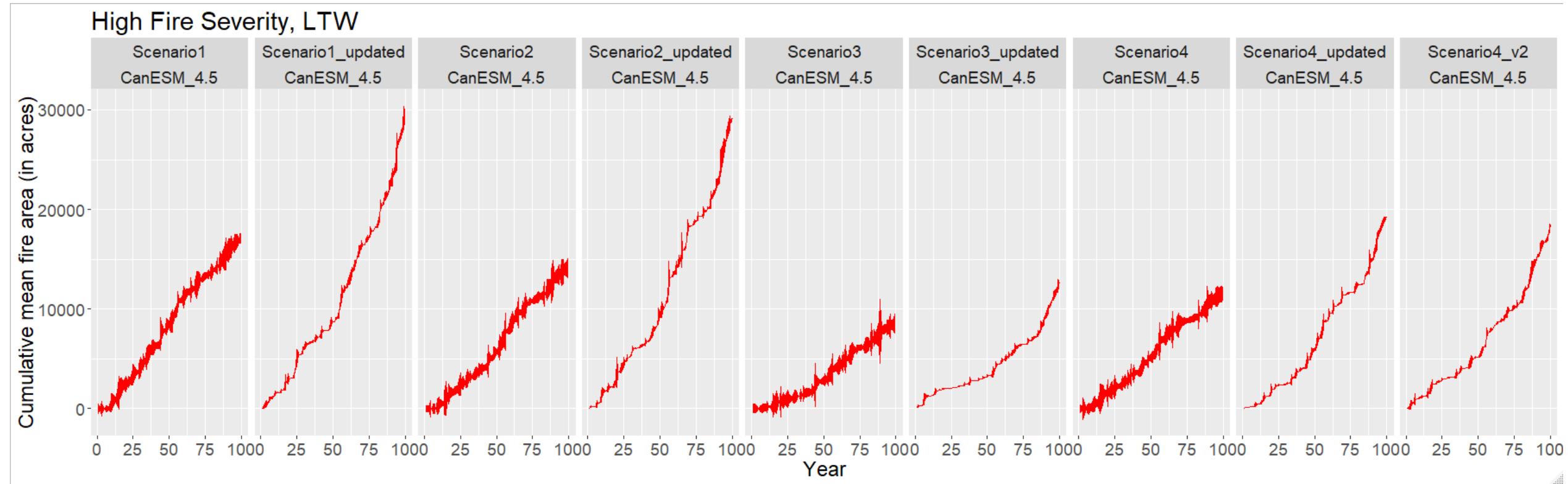
Scenario4_v2
CanESM_4.5

Fire Severity



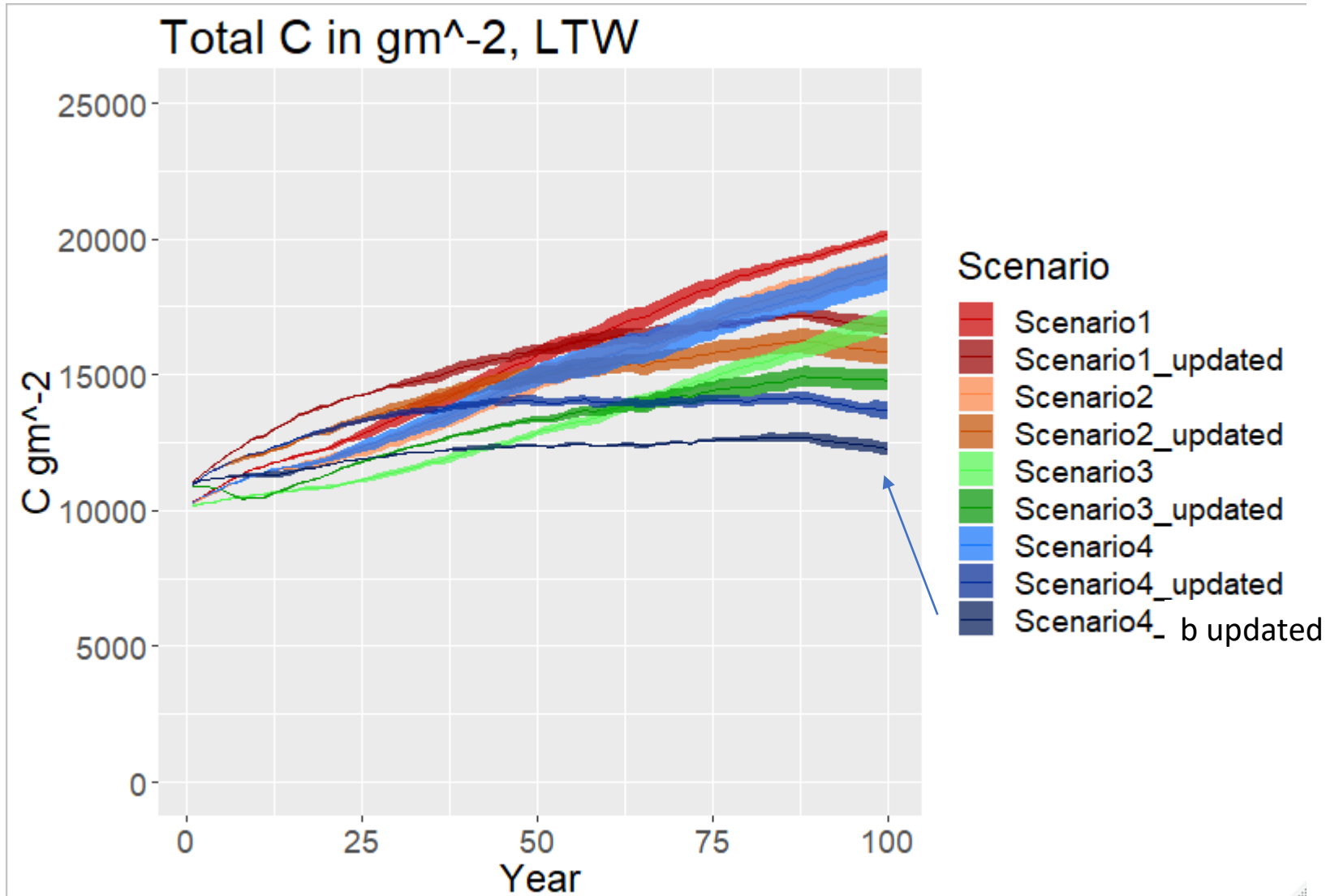
Area burned at High Severity Increased with updates

This may reflect fewer “lightly suppressed” wildfires under all scenarios



All results based upon CanESM 4.5 Projection

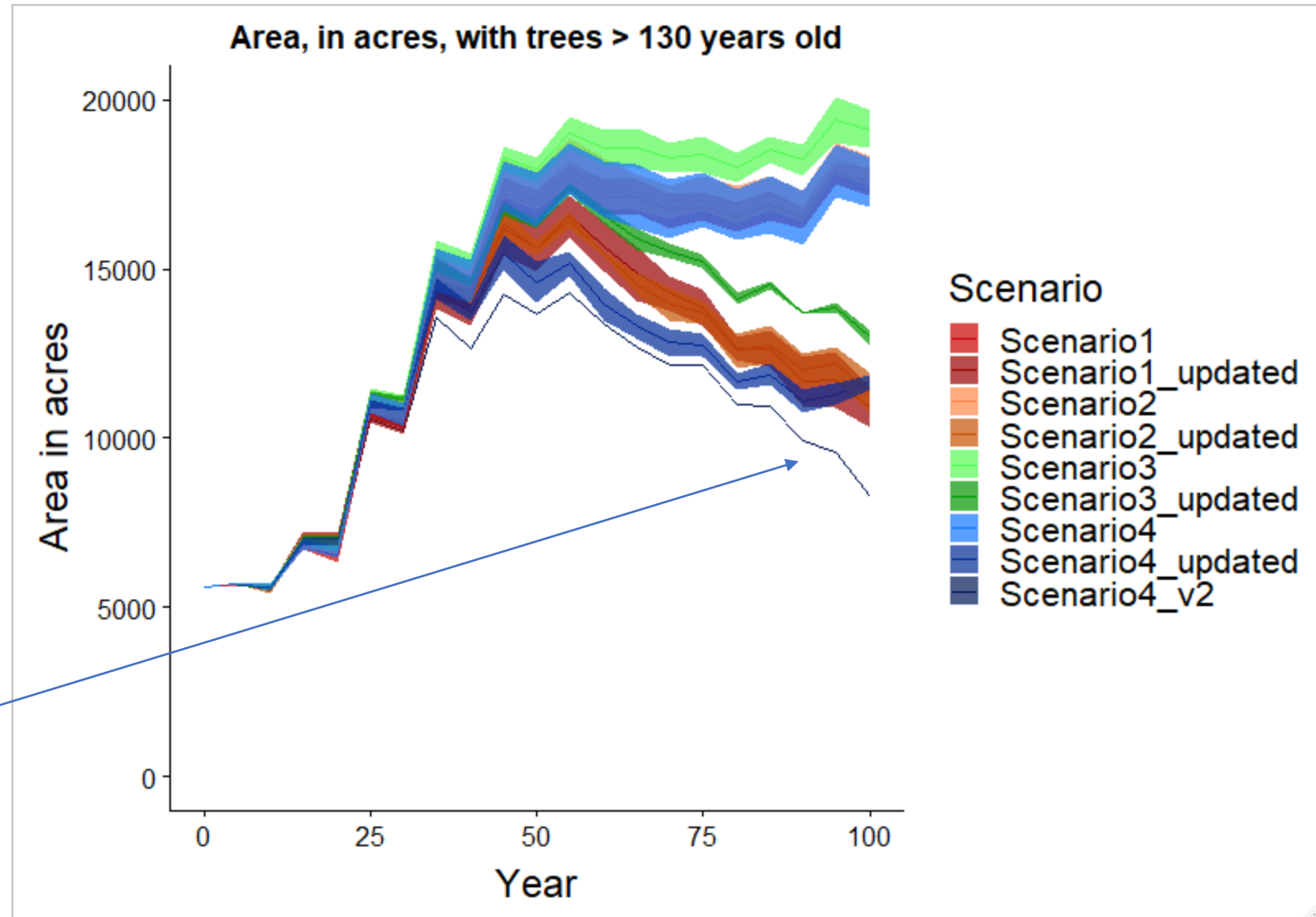
Total in-forest carbon peaks and declines with updates
This may reflect greater mortality from insects



Under updates, areas of Old Trees (>130 years) decline from mid-century peak, likely reflecting increased beetle disturbance

Scenario 3 outperforms other scenarios under old and new assumptions

Scenario 4' performs worse—Rx fire may be killing more trees that will become old



Implications for Additional Modeling

- **Updates to suppression may be a more accurate representation of fire outcomes (e.g., less fire, but more severe)**
- **Only Scenario 4 has significant amounts of low severity wildfire with updates**
- **Prescribed fire may be a blunter tool than thinning—resulting in more reductions in older trees and carbon by later decades**
 - **Mortality from landscape-scale burning is an important issue to consider using adaptive management**
 - **Special measures (e.g., raking) might be important to conserve larger trees**
 - **Phasing in burning following thinning might mitigate these effects**

Focal metrics for new analyses

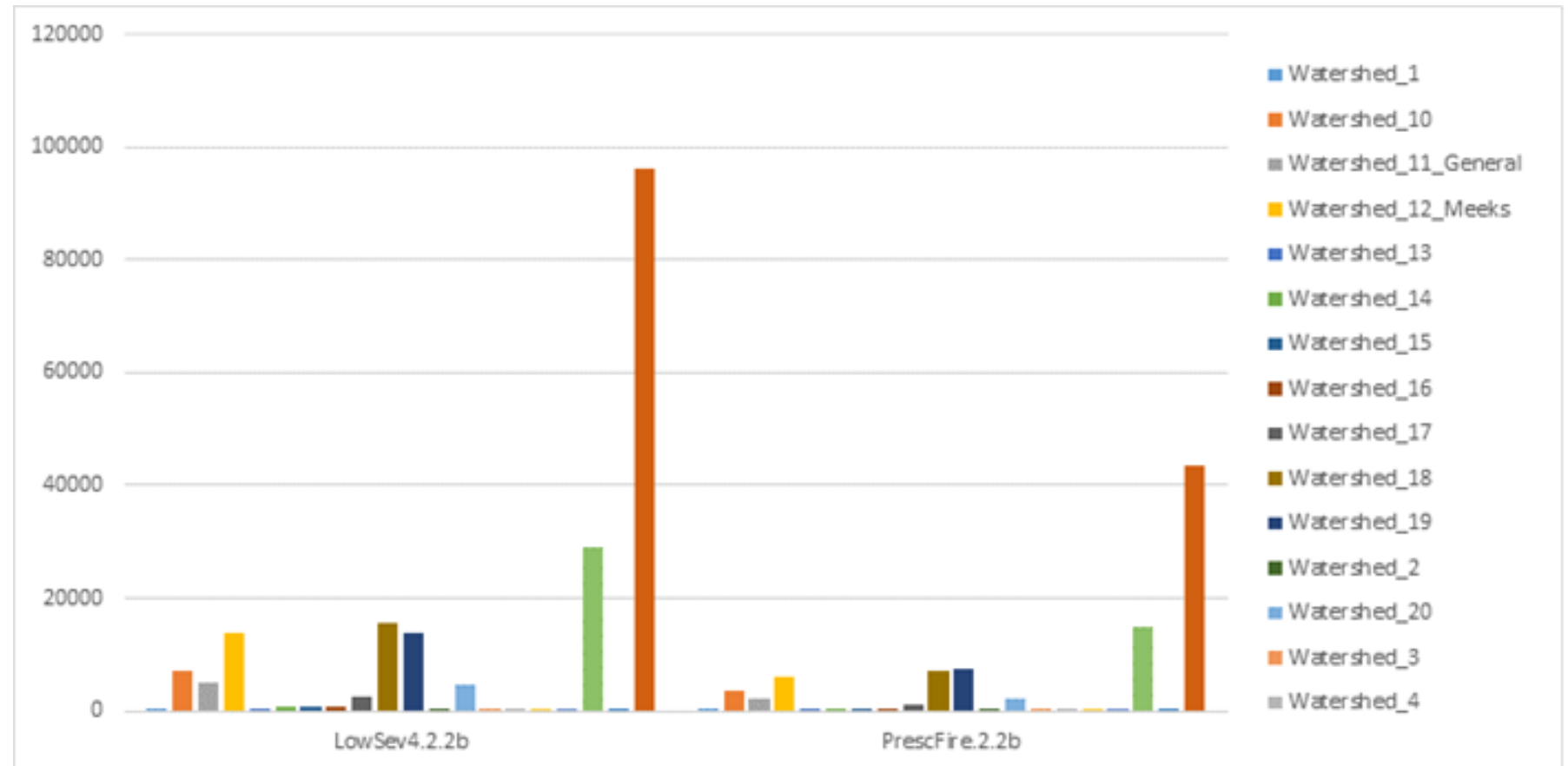
- Area burned by severity by zone
- Property risk
- Costs of implementation and suppression
- Daily emissions
- Carbon
- Area of old trees, late successional forest
- Vegetation types
- Water quality (for 20 LTW watersheds)

Updates Regarding Prescribed Burning in LANDIS

- Previously, the datasets did not easily distinguish the prescribed fire from low severity wildfire, now we should be able to do that.

WEPP team added new runs assuming higher cover (85%) after prescribed fire than for low severity fire (80%)

Initial comparison suggests that this would reduce loading in half, making estimated loads comparable to loads from thinning



Climate drives a lot of changes

- Single projections have different patterns for high values of CWD
- The ones used in previous runs had high peaks in certain years (e.g., 22) and certain decades (50-59, 70-79, 90+)
- This pattern may explain variability in key indicators used in EMDS
- Evaluating more projections helps to smooth this variability

