



Carbon and Forest Management Work Group

Meeting 6: April 10, 2024 | 9:00 am – 3:00 pm

Meeting Summary and Notes

Meeting Overview

The sixth meeting of the Washington Department of Natural Resources (DNR) Carbon and Forest Management Work Group took place on Wednesday, April 10th, 2024, from 9 am – 3 pm, via Zoom Webinar. The purpose of this meeting was to develop a deeper understanding of the carbon model methodology and to finalize the list of management scenarios for the carbon study contractors to model. Representatives from BluePoint Planning, the firm hired to facilitate the work group in partnership with DNR staff, opened the meeting with an overview of the agenda:

1. Welcome and Updates
2. Carbon Model Methodology Presentation
3. Overview of Proposed and Finalized Management Scenarios
4. Finalizing Management Scenarios
5. Next Steps

After a brief overview of the meeting objectives and agenda, Alex Tekatch, Systems Ecologist at ESSA, the carbon study contractor, presented on the carbon model methodology. Work group members asked clarifying questions about the methodology and data. Some questions asked during the meeting will be answered by DNR in a Q&A document after the meeting, due to their complex nature-.

Next, Theresa Keith, Forestry Policy Advisor at DNR, gave an overview of the six management scenarios that would be considered at the meeting. BluePoint Planning reviewed the formal voting process, as laid out in the [work group charter](#), that would be used throughout the meeting. Work group members used a thumbs-up/thumbs-sideways/thumbs-down scale to indicate their position on each vote. One work group member designated an alternate for the meeting, and another member served as a designated proxy for an absent member.

The work group then discussed and voted on the second set of management scenarios developed by both work group members and DNR. There were only four slots available for additional scenarios to be modeled by the carbon study contractor, because four scenarios were already approved at the previous meeting. Of the six scenarios on the agenda for the meeting, four were voted down. Two scenarios were not discussed due to time limitations. Three new “combination” scenarios were proposed during the meeting; two were voted down and one was not voted on due to time constraints.

After a review of the next steps, BluePoint closed the meeting. All meeting materials, including the presentations and recording, are posted on DNR’s Carbon and Forest Management [Work Group website](#).

Attendees

Work Group Members

- Matt Comisky, American Forest Resources Council
- Heidi Eisenhour, Jefferson County
- Brel Froebe, Center for Responsible Forestry (alternate for John Talberth, 2nd half of meeting)
- Steve Hinton, The Tulalip Tribes (alternate for Ryan Miller)
- Randy Johnson, Clallam County
- Hannah Jones, Firelands Workers United
- Ed Murphy, Sierra Pacific Industries





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- Bryan Pelach, Washington Conservation Action (alternate for Paula Swedeen, 1st half of the meeting)
- Miguel Perez-Gibson, Washington Conservation Action (alternate for Paula Swedeen, 2nd half of the meeting)
- Russ Pfeiffer-Hoyt, Washington State School Directors Association
- Jason Spadaro, Washington Forest Protection Association
- John Talberth, Center for Sustainable Economy (first half of the meeting)

Not in attendance: Pat Tonasket, Confederated Tribes of the Colville Reservation

Washington DNR Staff

- Allison Bailey
- Cathy Chauvin
- Theresa Keith
- Kristoffer Larson
- Sharon Lumbantobing
- Ryan Murphy
- Denise Roush-Livingston
- Daniel Teimouri
- Ben Welna

Facilitator (BluePoint Planning)

- Nora Bayley
- Mindy Craig
- Lauren Schmitt
- Chris Mendoza, Mendoza Environmental (sub-consultant to BluePoint Planning)

Contractors, Wood Basket Study, Evergreen Economics

- Ted Helvoigt

Contractors, Carbon Study, ESSA

- Cedar Morton
- Graham Mushet
- Eric Neilson
- Don Robinson
- Frank Poulsen
- Ira Sutherland
- Alex Tekatch

Work group meetings are public, meaning that members of the public may join the meeting to observe. No public comment is allowed. Six members of the public attended the sixth work group meeting.





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Meeting Highlights and Themes

- **Formal Voting:** As agreed upon in the [work group charter](#), work group members used a thumbs-up/thumbs-sideways/thumbs-down scale to indicate their preference for each proposed management scenario. Thumbs-up and thumbs-sideways were considered “pro” votes, while thumbs-down was considered “against.”
 - One work group member designated an alternate for this meeting.
 - One work group member served as the designated proxy for another member absent during voting for the first vote. The absent work group member designated a new alternate for the remaining votes.
- **ESSA Carbon Model Methodology Presentation:** This presentation gave an overview of the forest carbon model process that the carbon study contractor, ESSA, will use to analyze the management scenarios the work group chooses. Important details include the following:
 - The selected modeling tool, the Forest Vegetation Simulator (FVS), will be used for both the initial modeling of scenarios, from February to October of 2024, and for the refinement of the modeling of scenarios, from January to June of 2025.
 - Work group members asked questions about where the data inputs that will inform the modeling will come from. The majority of the input data in the model comes from DNR. United States Department of Agriculture (USDA) Forest Inventory and Analysis (FIA) data was used by FVS developers to create the “variants” that are available in FVS.
 - Inputs to the FVS model include the variables that were selected by the work group in the management scenarios, such as rotation length and thinning.
- **Management Scenario Votes:** The work group discussed and voted on the second set of management scenarios to be modeled by the carbon study contractor. Important details include the following:
 - There was space for four scenarios to be approved for modeling by the carbon study contractor. Sixteen total scenarios will be modeled: eight without climate change and eight with climate change as a factor. Four scenarios were approved at the March meeting and are being modeled without and with climate change.
 - Of the six scenarios on the agenda for the meeting, four were voted down. Two scenarios were not discussed at all due to time constraints. Three new “combination” scenarios were proposed during the meeting; two were voted down and one was not voted on due to time constraints.
- **Next Steps:** The next meeting is scheduled for Wednesday, May 8, 2024, from 9 am to 3 pm.



Detailed Notes

Formal Voting

As agreed upon in the [work group charter](#), work group members used a thumbs-up/thumbs-sideways/thumbs-down scale to indicate their preference for each proposed management scenario. Thumbs-up and thumbs-sideways were considered “pro” votes, while thumbs-down were considered “against.” For a scenario to pass, it needed to receive a supermajority of 75 percent of thumbs-up or thumbs-sideways votes; in this meeting, 11 members were present, so a supermajority was nine pro votes.

Work group members are allowed to designate an alternate if they are unable to attend the meeting or can designate another work group member to act as a proxy and vote for them during meetings with formal votes. One work group member designated an alternate for this meeting. One work group member served as the designated proxy for another member absent during voting for the first vote. The absent work group member designated a new alternate for the remaining votes.

Voting Logistics

- Vote thumbs up/down/sideways:
 - Thumbs up: Full endorsement of scenario
 - Thumbs sideways: Consent to scenario with reservations
 - Thumbs down: Formal disagreement with scenario
- **Supermajority of 75%** must vote thumbs up or sideways for a scenario to advance to modeling.
- If all members present, must have 9 thumbs up or sideways votes.



Figure 1 - Slide from Meeting presentation titled, "Voting Logistics"

Carbon Model Methodology Presentation

This presentation gave an overview of the forest carbon model process that the carbon study contractor, ESSA, will use to analyze the management scenarios the work group chooses. The selected modeling tool, the Forest Vegetation Simulator (FVS), will be used for both the initial modeling of scenarios, from February to October of 2024, and for the refinement of the modeling of scenarios, from January to June of 2025.



The presentation walked through the basic modeling process, shown in the image above, from the preparation of inputs to the carbon modeling itself to the results and analysis.

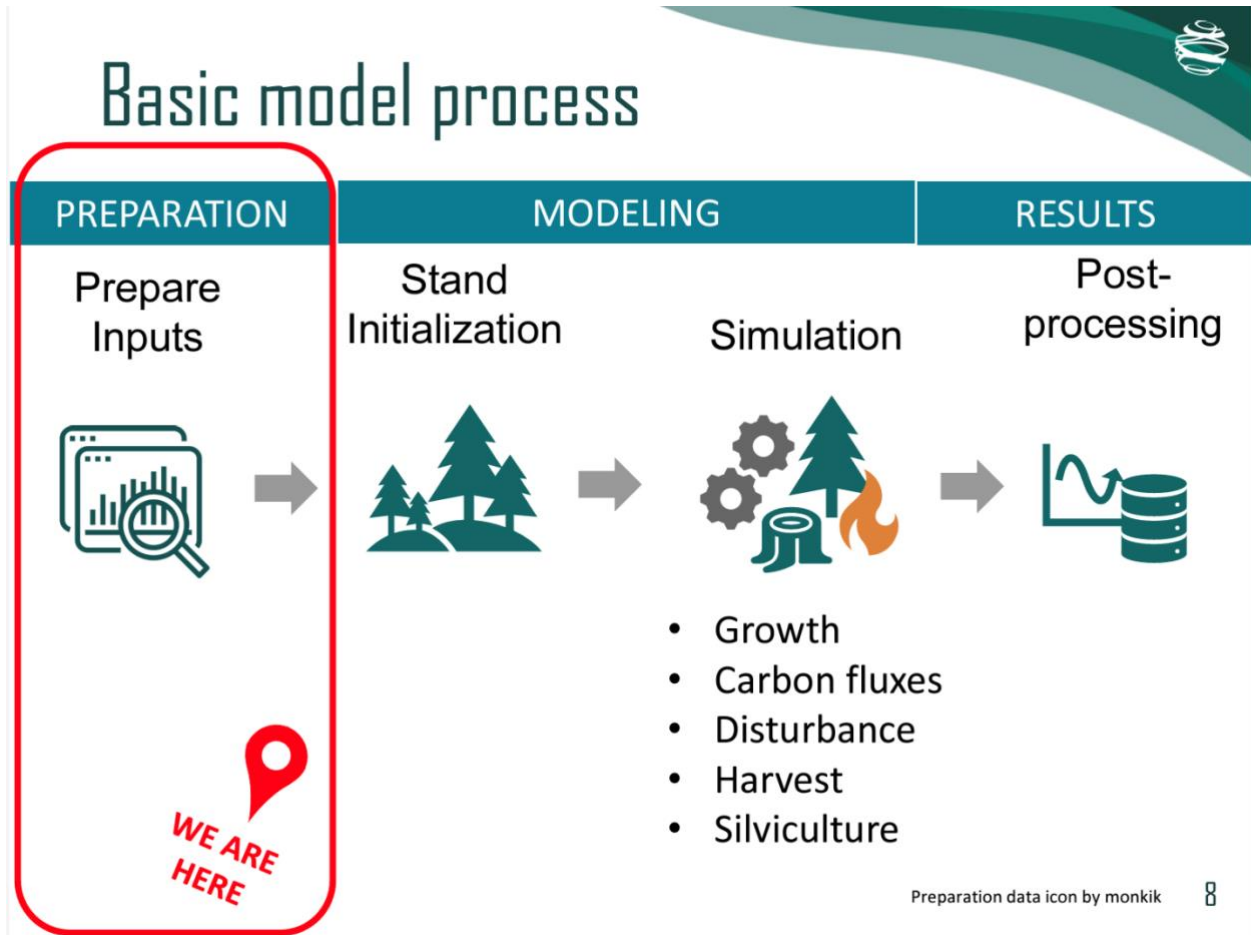


Figure 2 - Slide from Carbon Model Methodology presentation titled, "Basic Model Process"

To prepare the inputs to the model, DNR data must be gathered, such as the study area boundary, forest inventory, and harvest limits. The model must be configured to match the specifics of the study area, with variables such as tree growth, silviculture, and climate change.

Next, stand initialization is conducted to generate initial forest conditions as a starting point. This is done using forest inventory data, including tree diameter, species, density, and down wood. Then the model simulation is run, using parameters selected by the work group in the management scenarios. Variables for the model could include rotation length, thinning, and others. The model will incorporate climate change into half of the scenarios (eight total) using Climate-FVS, which requires climate and species viability data.

Finally, once all modeling is completed, outputs for carbon will be produced and compared across all scenarios. ESSA will present the results of the carbon modeling to the work group in October 2024. Refinement will occur based on DNR and work group feedback.

Work group members asked questions about where the data inputs that will inform the modeling will come from. The majority of the input data comes from DNR. United States Department of Agriculture



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(USDA) Forest Inventory and Analysis (FIA) data was used by FVS developers to create the “variants” that are available in FVS.

Members also asked about using volume versus age to determine when to harvest a stand. DNR is using volume thresholds instead of stand age for harvest rotations; more information can be viewed here: [Proposed Management Scenarios for March 13, 2024 Work Group Meeting](#).

The Carbon Model Methodology presentation can be viewed on the work group website here: [Carbon Model Methodology](#). Questions asked throughout the meeting will be answered by DNR in a Q&A document sent out and uploaded to the [work group website](#) after the meeting.

Finalizing Management Scenarios

Scenario 8 Vote

Scenario 8, Lengthen Harvest Rotation and Significantly Increase Thinning was a new scenario. This scenario would lengthen harvest rotations by increasing the minimum threshold of board feet/acre available for harvest. The current DNR operations minimum of 30,000-35,000 board feet/acre (which corresponds to roughly 50-80 years) is increased in this Scenario to a minimum of 50,000-55,000 board feet/acre (which corresponds to roughly 75-130 years). The scenario would also significantly increase thinning. All thinning in riparian and upland areas must follow *State Trust Lands Habitat Conservation Plan* (HCP) requirements.

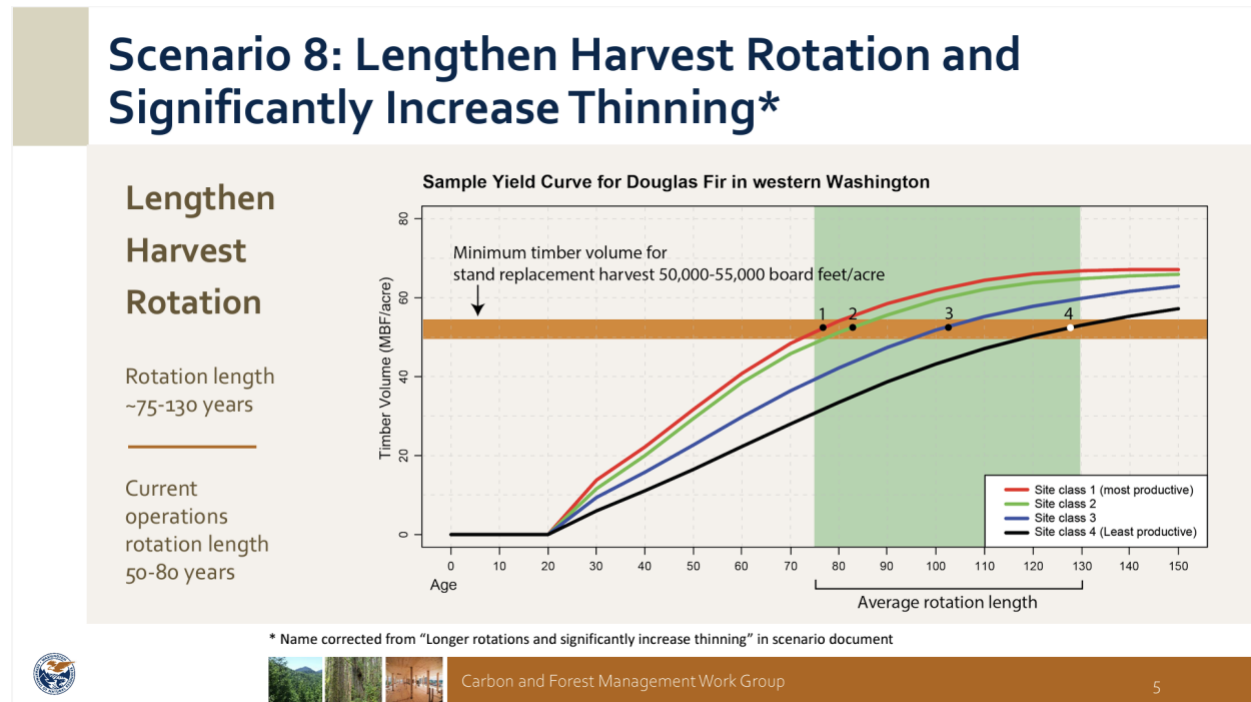


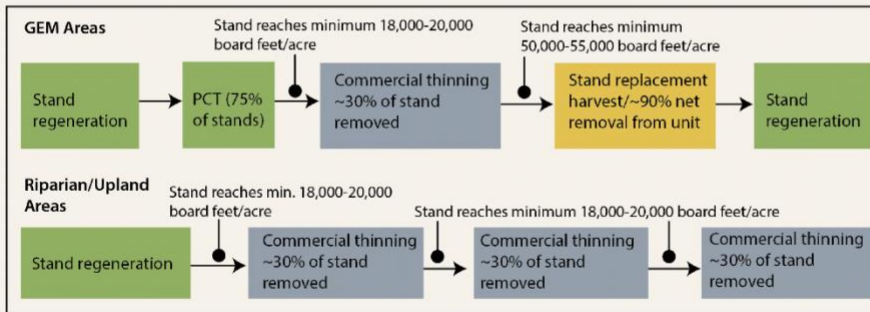
Figure 3 - Slide from Scenario presentation titled, "Scenario 8: Lengthen Harvest Rotation and Significantly Increase Thinning"





Scenario 8: Lengthen Harvest Rotation and Significantly Increase Thinning*

Significantly increase thinning



- Added PCT
- Removed two-decade waiting period between thinnings
- Thinning in riparian and upland areas must follow HCP* requirements

* State Trust Lands Habitat Conservation Plan



Figure 4 - Slide from Scenario presentation titled, "Scenario 8: Lengthen Harvest Rotation and Significantly Increase Thinning"

Work group members questioned the use of a non-spatial model. Members also asked about reflecting HCP requirements in the modeling; ESSA replied that they are working to build HCP-related dynamics into the model. Some work group members were concerned about using volume instead of age to determine when to harvest a stand. Other work group members wanted more detail about how the scenario would be implemented and were concerned about using a scenario that is infeasible to implement in real life.

Scenario 8: Lengthen Harvest Rotation and Significantly Increase Thinning

- a) Thumbs-up: 4
- b) Thumbs-sideways: 4
- c) Thumbs-down: 3

This scenario received eight votes to pass and three to not pass. This scenario did not pass but will be voted on with friendly amendments at the next work group meeting.

Scenario 9 Vote

Scenario 9, Increased Emphasis on Silviculture, was a new scenario that would increase the percentage of seedlings DNR plants grown from improved seed stock, increase planting density by site class, increase site preparation and release treatments, and require one commercial thinning entry per harvest rotation in GEM areas. This scenario was proposed by a work group member, who worked with DNR to finalize the scenario.

Many work group members expressed their interest and support for Scenario 9 but thought that it should be combined with other scenarios instead of being a standalone scenario. Some work group members expressed their concern that scenarios that meet the intent of the proviso would not be modeled. One work group member proposed combining Scenario 9 with Scenario 4 and another





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proposed combining it with Scenario 3. Both Scenario 3 and Scenario 4 were previously voted on and approved at the March work group meeting. Another suggestion was to combine Scenario 9 with Scenario 8.

Scenario 9: Increased Emphasis on Silviculture

- a) Thumbs-up: 5
- b) Thumbs-sideways: 1
- c) Thumbs-down: 5

This scenario received six votes to pass and five to not pass. This scenario did not pass.

Scenario 9 + Scenario 8: Lengthen Harvest Rotation and Significantly Increase Thinning

- a) Thumbs-up: 4
- b) Thumbs-sideways: 1
- c) Thumbs-down: 6

This scenario received five votes to pass and six to not pass. This scenario did not pass.

Scenario 9 + Scenario 3: Shorten Harvest Rotation

- a) Thumbs-up: 5
- b) Thumbs-sideways: 0
- c) Thumbs-down: 5
- d) Abstain: 1

This scenario received five votes to pass and five to not pass, with one work group member abstaining. This scenario did not pass.

The work group also suggested combining Scenario 9 with Scenario 4 (Significantly Increase Thinning), but the work group did not have time to vote on it.

Scenario 6 Vote

Scenario 6, Increase Deferrals, Option A, would defer 100 percent of older, “carbon-dense,” structurally complex forests (as DNR defines them within its *Policy for Sustainable Forests*) in GEM areas from stand replacement harvest. This is the only definition of structurally complex forest recognized by DNR. This scenario was discussed and placed in the “parking lot” at the March work group meeting, with a final vote planned for this work group meeting.

Scenario 6: Increase Deferrals, Option A

- a) Thumbs-up: 0
- b) Thumbs-sideways: 4
- c) Thumbs-down: 7

This scenario received four votes to pass and seven votes to not pass. This scenario did not pass.

Scenario 7 Vote

Scenario 7: Increase Deferrals, Option B, contains the same deferral as Scenario 6 but would also defer 100 percent of less complex forest stands as selected by the work group. This scenario was discussed and placed in the “parking lot” at the March work group meeting, with a final vote planned for this work group meeting.





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- a) Thumbs-up: 5
- b) Thumbs-sideways: 1
- c) Thumbs-down: 5

This scenario received six votes to pass and five votes to not pass. This scenario did not pass.

Scenario 10

Scenario 10, Multiple Dials, was introduced at the meeting but not discussed in detail or voted on due to time constraints.

Scenario 5

Scenario 5 was voted down at the March meeting (1 thumbs-up, 0 thumbs-sideways, 10 thumbs-down) but at the end of the meeting one work group member asked for it to be brought forward again at the April meeting. A second work group member agreed with this idea. It was thus put in the “parking lot” to be voted on in this work group meeting. Scenario 5 was not discussed in detail or voted on due to time constraints at the April meeting.

The full presentation with more details on each scenario can be viewed on the work group website:

[Scenario Presentation](#).

Summary of Voting

Of the scenarios voted on at this meeting, none were passed. Only four scenarios of the six on the agenda were voted on, as were two additional combinations of scenarios. One suggested combination of Scenario 9 was not voted on.

Scenario	Pass	No Pass – April meeting	No Vote
Scenario 5: Thinning Only			X
Scenario 6: Increase Deferrals, Option A		X	
Scenario 7: Increase Deferrals, Option B		X	
Scenario 8: Lengthen Harvest Rotation and Significantly Increase Thinning*		X	
Scenario 9: Increased Emphasis on Silviculture		X	
Scenario 9 + Scenario 8		X	
Scenario 9 + Scenario 3: Shorten Harvest Rotation		X	
Scenario 9 + Scenario 4: Significantly Increase Thinning			X
Scenario 10: Multiple Dials			X

*Will be modified and voted on during the next work group meeting.





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Next Steps

The next meeting of the work group is scheduled for May 8th, 2024, from 9 am – 3 pm. The focus and goal of the next meeting is to finalize the list of management scenarios to give to the carbon study contractors to model. The proposed topics for the meeting are:

- Discussion and vote on the remaining scenarios to model.



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Raw Notes: Verbal and Written Communication

These notes include verbal and written questions and comments from the Zoom chat log.

- Comments from the Zoom chat are denoted with (chat) at the beginning of the comment or question.
- Questions and comments from the work group members are denoted with **WG** at the beginning of the comment or question.
- Responses from DNR staff or BluePoint Planning staff are noted with **DNR** or **BPP**, respectively.
- Responses from the other two contractors, Evergreen Economics and ESSA are noted with **Evergreen** or **ESSA**, respectively.

Welcome

1. WG: With Csenka and Duane gone, who from DNR can answer those big questions?
 - a. BPP: Have people here who can answer those questions, Theresa Keith from DNR will be there to answer questions.
2. WG: Have same question as above, also – will DNR share discussion of the refinement of scenarios that happened outside of the public meeting?
 - a. BPP: Those conversations were primarily answering questions to figure out different elements, not crafting something new.

Presentation from ESSA – Carbon Model Methodology

1. (chat) WG: Can you share with us the total number of plots included in the 2024 Stand inventory?
 - b. (chat) ESSA: 3,156 plots in the study area from the 2024 stand inventory from DNR.
 - c. (chat) WG: Do we know the distribution of those plots? And are they ground-based? I assume these are the RSFRIS "verification" plots.
 - i. (chat) ESSA: DNR will get back to you with responses about more detailed questions about the inventory.
3. (chat) WG: How are you handling blowdown? Especially large-scale events
 - a. (chat) ESSA: Still working on blowdown methods. We can speak to how FVS handles it more broadly.
 - b. (chat) ESSA: Re: how blowdown is handled. The geographic scale is up to the scenario and we could set up (e.g.,) a large-area event if asked. In the past we have modeled this using a diameter range (e.g., >18" of all species), frequency (e.g., every 40 years) and mortality rate (e.g., 5% for those candidate trees). It is quite flexible.
4. WG: Didn't see site class listed – how to handle site class? Stand level or individual tree level?
 - a. ESSA: Site class would be included in 2024 forest inventory. Four classes for 2024, very productive to least. More productive site classes will grow faster.
 - b. WG: If modeling each tree's growth?
 - i. ESSA: Done at a stand level, each tree's growth is dependent on stand structure.
 - c. (chat) ESSA: Correction: site class information is actually contained in the Large Data Overlay.
5. WG: Based on this presentation, for carbon modeling all lands DNR manages in Western Washington? Doesn't come through in scenario documents sent out. Modeling all acres for carbon? Or only a subset of those, only operable acres?





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- a. ESSA: Modeling carbon for all DNR-managed lands west of the cascades.
6. WG: Assuming going to stratify DNR inventory? 443 plots per acre? DNR traditionally stratifies by site class and species. At what scale would it be done?
 - a. ESSA: Still working out methods regarding stratification. Exploring different ways of stratifying landscape. Site index and species could be two ways, with others too. Depends on how big the simulation effort becomes.
7. WG: Where did stand boundaries come from?
 - a. ESSA: Some of these are DNR questions, not ESSA. Potentially changing based on scenarios that are voted on, deferrals are not all fixed, some scenarios might have additional deferrals. Will be doing refinements later.
8. (chat) WG: What is the projected date for the Q/A Phase?
 - a. ESSA: Early results in October, then 6–8-week review phase, then refinement in January 2025.
9. WG: To what extent is the FVS model populated by actual data from DNR lands, for growth and mortality? Seems like the model won't spit out soil carbon changes across the scenarios.
 - a. ESSA: Each variant is developed based on actual measurement data based on stands. Example – large tree model driven by tree diameter. Data to develop variants comes from FIA remeasurement plots, across entirety of the state.
 - b. ESSA: Soil carbon – treated as living and dead roots component.
 - i. WG: Soil organic carbon not included?
 - ii. ESSA: Yes, correct.
10. WG: Want a better understanding of what 2024 forest inventory means. Is this 2024 forest inventory referring to how they used to do it, plus growth to bring it up to 2024? Or are actual measurements included? Would be helpful to see the datasets be run, would help us understand the scenarios.
 - a. (chat) DNR: Our data specialist could not make it today, so we will likely need to get back to you on the question re: 2024 data.
 - b. DNR: To clarify – Large data overlay does have historical harvest information. Distinction between FIA and DNR data – model has trained some parameters on FIA data, but actual data used in the model is DNR data.
 - c. ESSA: FIA data used in model development process, to develop regression to drive the model. The majority of model input data comes from DNR.
11. (chat) WG: Regarding inventory question. An additional follow-up question. How is the "stand data" populated? Remote sensed data applied to computer-generated stand polygons. Or "forester-developed stand polygons" that have field-based inventory plots within a stand?
12. WG: Don't understand if major forest events will be modeled? Areas that blow down along coast after thinning, fire history.
13. (chat) WG: Just so it is not lost, my request for some sort of yield tables for different sites, so we can understand volume vs actual rotation age.
14. BPP: Want to make it clear that there are things that need to be known for today, to make a vote, but other things that could be discussed in the future after voting.
15. WG: Heard correctly – fire would not likely factor much into modeling.
 - a. ESSA: Still determining wildfire rates, assume would be higher than current rates.
16. WG: Lots of questions. Issue about origin of the stands is important. Different trajectories between managed stands and non-managed stands. Changing parameters as moving to more



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managed lands over time. Want to make sure ESSA is thinking through this. To understand – without yield table, no idea of what using volume means instead of rotation age.

- a. DNR: Volume depends on type of site class, could have young site class with high volume.
17. (chat) WG: I do think modeling rotation based on harvest acreage per year is simpler and gets around the volume threshold issue just raised...
18. WG: Start-stop discussion gives me concern. Curious how the process impacts the ability to model a sustainable harvest number of multiple decades, how to determine what is the right stopping point?
 - a. ESSA: Using average harvest, stopping happens at every time step to reduce fluctuations.
 - b. WG: Helpful if that is footnoted in the reports. Other factors that drive average harvest rate.
 - c. ESSA: Best way to handle it is to model now, then discuss during the review phase in the fall.
19. WG: Seems like would be easy to plug in values of soil loss, would like to dive deeper into that.
20. WG: One reason it's preferable to use age, not volume.
21. (chat) WG: I disagree. Harvesting and road building definitely causes a loss of soil carbon, and the amount is fairly constant across dozens of studies. I will send the ESSA team what I have.
22. BPP: DNR is taking notes on all questions and will get back to everyone.
23. ESSA: Can't do everything that soil carbon is doing. FVS soil carbon is in LIVE and DEAD pools and doesn't vanish at harvest. LIVE roots become DEAD at harvest and follow their own decay-based trajectory. FVS has a duff carbon pool that has an extremely low decay rate, which might capture some of the dynamics you're thinking of.

Overview of scenarios

1. Background on scenarios from March meeting:
https://www.dnr.wa.gov/publications/bc_cfm_m5_scenarios.pdf. This document explains why DNR is using volume thresholds instead of stand age for harvest rotations.

Discussion and voting of scenarios

1. Scenario 8
 - a. WG: Riparian zone must be tied to a non-riparian zone harvest. Don't see how this model accounts for that.
 - i. DNR: Related to questions from last meeting about spatial factors of model. Not specific plot being harvested in this scenario.
 - ii. ESSA: Understandable but can't include that level of spatial detail in this project.
 - b. WG: Please in report back to work group disclose that there's no spatial connectivity in the models. Concerned that we are risking violating HCP policy, highly unlikely to get a second entry. How to ensure compliance with regulatory policy?
 - i. DNR: How HCP requirements taken into consideration in modeling? Can ESSA speak to that?



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1. ESSA: Not there yet. Similar way to smoothing out the harvest (stop/start), if knowing that not all lands are managed as they could be, could build in simple relationship into the model.
 - ii. WG: How did different DNR sustainable harvest calculations handle this? Concerned that if no spatial connectivity, will miss certain things in modeling. Certain treatments assumed to be one-and-done.
- c. WG: As a modeler, this was a scenario with confusion from non-spatial tie, and confusion from every site class on the landscape using targets of volume, riparian zone would arrive earlier than the uplands. If don't get to assumed growth rates, will have other issue of using sustainable harvest number as a stop, what if you don't get to the sustainable harvest number in the period?
- d. WG: Concerned that DNR isn't listening to work group members and their expertise with volume versus age.
 - i. BPP: Trying to be consistent, opinions are being listened to.
- e. (chat) WG: We have experience with not reaching SHC targets in the past, no? What can we learn from that?
- f. WG: Not a fan of doing scenarios that are infeasible. Scenario 2 – on rotation ages. If raise the bar, then Site Class 3 and 4 bars don't reach that bar until over 100 years in age. Logic going to have consequences, adding commercial thinning won't address that issue. Concerned about using one bar for all site indexes.
- g. WG: Agree – age is better trigger than volume. Look at treating Site Class 1 and 2 differently than Site Class 3 and 4.
- h. BPP: Many comments on how the model is working, not on what is being modeled.
- i. DNR: Want to underscore – a lot of complexity in this process, model won't be perfect. DNR is appreciative of expertise from the work group.
 - i. (chat) WG: Yes. I am concerned that we won't get to discussing the scenarios on the table - as well as others that folks might want to consider.
- j. WG: Important scenario to consider
- k. WG: Turning dials – Incredibly important dials, not feeling like we get to see the actual turning of the dials with this scenario. Just one period of lengthening harvest rotations?
 - i. DNR: Earlier scenarios (which were voted in) modelled each factor separately; this is the combined version.
- l. WG: Valid concerns with this scenario with actual feasibility, will come to feasibility later in the process. Not assessing if could be implemented in landscape but if it's a valid scenario in the first place.
- m. WG: One aspect of concern is possible over estimation of timber yield, way to communicate the results to offer degree of variance, range, to deal with issues but still can see impact of the scenario?
 - i. ESSA: Asking if we could pull out the results after modeling and make a statement on the results? That would be difficult to do. Build in 10% adjustment, could accommodate that in modeling
- n. WG: Concern isn't just about overstating volume; concern is about approving scenarios that are not practical or possible without changing DNR policies or Habitat Conservation Plan (HCP). Objective function in the model? What are we trying to optimize?



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- i. DNR: What are we trying to optimize? This modeling exercise differs from others, this is not an optimization exercise, not optimizing for carbon. Running models to see what would happen to carbon values. Don't know what the results will be, consideration of practicality is warranted, but also need some experimentation.
- ii. (chat) ESSA: We are not doing an optimization exercise. Outputs will be tons of carbon and volume of merchantable timber from the carbon modeling.
- iii. (chat) DNR: DNR explained DNR's next steps after we receive this group's recommendations in this presentation:
https://www.dnr.wa.gov/publications/bc_cfm_m4_scen_proc.pdf
- o. WG: Someone has to be reminded that this model will not answer these questions. Variability of site and lower spatial detail, it becomes complicated, won't have answer with refined ability to look at these things.
- p. WG: Created by legislative proviso to do this work together, need to stay open
- q. WG: What could we all agree on – Can ESSA differentiate between thinning volume and final harvest volume?
 - i. ESSA: Differentiate between a pre-commercial thin, commercial thin, and a final harvest? Yes, we can do that.
 - ii. WG: Want to make sure that scenarios are legal under HCP rules and want to see Site Class 3 and 4 treated differently from Site Class 4.
- r. (chat) WG: Scenario 8 as configured is not consistent with "ALL" laws and policies.
- s. WG: Don't mind modeling to understand implications, but don't understand modeling things if they are infeasible?
- t. (chat) WG: I understand DNR's process is a stepped process. But the question is, how will the fiduciary obligations to the various beneficiaries be addressed by this trust blind "landscape" level carbon number.
- u. WG: Good intent – increased carbon sequestration while also balancing needs of mills, beneficiaries. Changing the dials, kind of changing them blindly.
- v. BPP: Economics – that's the wood basket study.
- w. DNR: At last meeting, had a friendly amendment, suggest make clear that the scenario would entail the following, include language to meet HCP requirements and legal bounds.
- x. ESSA: From modeling point of view, no issue with different thresholds based on site class, work group would have to agree on the thresholds. Might not have time today to come up with thresholds.
- y. WG: For chart, why can't they go down to x axis and identify rotation age? Could present carbon per acre on the same chart?
 - i. DNR: Could be misleading to put that over the generic growth on the chart.
 - ii. ESSA: Many factors that go into yield curves.
- z. (chat) WG: Instead of arbitrarily selecting a different volume/acre trigger, it would be helpful if these volume/acre over time graphs also included carbon sequestration per acre over time.
- aa. BPP: Friendly amendment to set thresholds based on site classes.
- bb. BPP: Vote without the amendment, second run will have a chance to add those modifications.



Carbon and Forest Management Work Group

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Meeting Summary and Notes

- i. WG: Site class effect already in the chart, would need difference in the thresholds.
- cc. Scenario 8 Vote
 - i. Thumbs-up: 4
 - ii. Thumbs-sideways: 4
 - iii. Thumbs-down: 3
 - iv. Result: No pass
- dd. BPP: What would get the “down” votes to “sideways” or “up”?
 - i. WG: Didn’t want to vote thumbs up because concerned about not having enough scenarios at the end of the day. Metering out votes because concerned about getting to the four scenarios.
 - ii. WG: Based on conversation, don’t see that anything could change vote quickly.
 - iii. WG: No, want to understand carbon sequestration per acre.
 - 1. BPP: Can’t say what it is before we model it.
 - 2. WG: DNR could chart above ground carbon
- ee. WG: Seems like popularity of this scenario, would like to see a form of the model to understand trends, no scenario represents full proposal. Stated on slide that it would follow HCP guidelines. Could go on to the other scenarios and return to this one. Way to not stall this scenario but still come back to it.

Discussion and Voting of Scenarios, Cont.

1. Process Questions

- a. DNR: Want to amend Scenario 8, and then bring it up at the end of the meeting.
- b. WG: Process question – order of talking about scenarios – Scenario 10 involves both Scenario 6 and 7, seems backwards to do Scenario 6 and 7.
 - i. BPP: Already talked about Scenarios 6 and 7 in March meeting. Want all information on the new scenarios before that.
 - ii. WG: Scenario 10 dependent on getting clarity on Scenarios 6 and 7
 - iii. BPP: Scenario 10 encompasses Scenario 8 plus some additional things. Would make sense to do Scenario 9, then 6, 7 and 10.
- c. WG: Catching up – status of last scenario – 8?
 - i. BPP: 3 no votes, did not move forward. Will bring it back later at end of meeting.
 - ii. WG: Some scenarios may provide data that some people won’t want to see. Don’t see how work group is meeting objectives of the proviso and charter. Also think that voting process is wrong, 83% majority.
 - iii. BPP: For voting, decision-making process – differences of opinion. Down a person, without a proxy. At last meeting, stayed at 9 for the majority. Makes the bar even higher than what we first agreed to.
 - 1. WG: Amend the charter to show that? Seems absurd but should amend the charter to show that.
 - 2. DNR: Thank you for pointing all of this out.
- d. WG: Supportive of moving ahead, lots of things to cover today. Clearly of variety of viewpoints trying to work through, move ahead in spirit of collaboration.



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Meeting Summary and Notes

- e. DNR: Will cover Scenario 9, then 6 and 7, then 5, 10 and back to 8
2. Scenario 9 – Increased Emphasis on Silviculture
- a. WG: Excited to see silviculture considered, but don't see it as a standalone scenario. Could be a part of Scenario 8? Can't support as a standalone scenario.
 - b. WG: Having this as a baseline, to build on DNR current practices. Support this scenario.
 - c. WG: Question for modelers – how to prove out certain assumptions. Planting density, how well can we predict growth rates? Given climate change, etc.
 - i. ESSA: Climate FVS has a mechanism built in for improvement, to emulate changes you expect. Otherwise, back of the envelope method. Increase in density of stocking, easy to implement.
 - d. BPP: Keeping time limit to discussion, so we can get through things.
 - e. WG: Appropriation to DNR to do increased silviculture on their lands, acknowledged that it was needed, as a scenario would support the proviso
 - f. WG: Not sure why this isn't a basis for what DNR does normally?
 - g. WG: Hope that field foresters could help inform this scenario. Similar to Scenario 4, that was already voted on. If blending with another scenario, recommend Scenario 4.
 - h. WG: Intention behind funding of this work group and proviso, want to better understand carbon benefits of deferrals of older forests. Concerned that those won't get modeled.
 - i. WG: Preference would be to add this to all scenarios, but if we don't want to mess with scenarios already approved, should have at least one scenario with emphasis on silviculture. Interested in seeing the baseline of cost in carbon stored and sequestered and financial cost. Have to take full context of budget proviso into account. Not just pick out pieces to support. Want this scenario to be included.
 - j. WG: Earlier point made, need business as usual scenario, could be included as that type of scenario. If standalone, would like it called business as usual, otherwise, will vote no.
 - k. WG: Important to include, but given constraints with only having 4 scenarios, would like to build this into another scenario.
 - i. DNR: Is there a scenario you suggest for bundling?
 - ii. WG: Scenario 8 was thrown out, maybe Scenario 4.
 - l. WG: Business as usual? Already have a scenario for that, could combine it with that scenario.
 - m. WG: Increasing silviculture, making that business-as-usual changes the comparison for all alternatives to business as usual.
 - n. (chat) WG: Would a possible amendment be to include it in Scenario 1, as per the previous suggestion?
 - o. DNR: Would be significantly more resources than applied for DNR current operations.
 - p. WG: Amendment to process suggestion – sideways vote is another scenario?
 - i. BPP: Yes, confusing, would just be a possible inclusion, at some other point. Someone could present proposal with a change.
 - ii. WG: Would make it part of Scenario 8
 - iii. BPP: Vote on 9 alone, and 9 added to 8?
 - q. (chat) WG: I would then offer I want to see it added to 3 as well.
 - i. DNR: If feasible for ESSA to include, then could move forward with it.



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- ii. ESSA: Potentially some flexibility, key is trying to stay on project timeline.
 - r. WG: If open to combining with already approved, then best fits with Scenario 4, to isolate impacts and benefits of shortened rotations.
 - s. BPP: Will vote on both recommendations
 - t. (chat) WG: I was down because we have not solidified Scenario 8.
 - u. WG: Point of process – want to wait because Scenario 8 has not been solidified.
 - v. WG: Like this option to be modeled, need to reset to consider all these scenarios as a whole, within overall goal of achieving all the proviso goals.
 - w. Scenario 9 Vote
 - i. Thumbs-up: 5
 - ii. Thumbs-sideways: 1
 - iii. Thumbs-down: 5
 - iv. Result: No Pass
 - x. Scenario 9 + Scenario 8 Vote
 - i. Thumbs-up: 4
 - ii. Thumbs-sideways: 1
 - iii. Thumbs-down: 6
 - iv. Result: No pass
 - y. Scenario 9 + Scenario 3 vote
 - i. Thumbs-up: 5
 - ii. Thumbs-sideways: 0
 - iii. Thumbs-down: 5
 - iv. Abstain: 1
 - v. Result: No Pass
- 3. Scenario 6 – Increase Deferrals, Option A
 - a. WG: Clarity on what Paula did for this scenario – next step to get together with DNR staff when back in office.
 - b. DNR: To clarify process – additional forest to add to deferred category. Don't have parameters on hand, so want to get across the intent of the scenario.
 - c. WG: Missing solid structurally complex stands. Want to involve Dr. Donato from DNR.
 - i. DNR: Point of clarification – select group of stands with complexity that you'd like to see included, need to make sure that we are modeling what work group members want to see. Can't change definition of structurally complex forest now but could add additional stands if wanted.
 - d. WG: Also, stands DNR considers to be structurally complex.
 - e. WG: Is what will be modeled outside of deferral assuming business as usual? Ramping up of activity?
 - i. DNR: As it was proposed, would be current operations with increased deferrals.
 - ii. WG: No commercial thinning?
 - 1. DNR: Yes, that is what scenario is proposing.
 - f. WG: Question for DNR – what is the estimate for how much land will already meet this definition?



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- g. WG: Diminishing land base in WA, difficult without more details. Wish to stop referring to these as deferrals, these are removals. Struggling to see how alternative move the dial towards meeting the needs of the proviso. Need more details, else a “no” vote.
 - i. BPP: Reminder that economics analysis will be coming after this.
 - h. WG: Because proviso needs, should select scenarios that present range of information, either 6 or 7 should be included in the information we have.
 - i. WG: Dismissing a scenario because it doesn’t solve every problem is funny logic. No scenario solves every problem or fulfills every mandate from the proviso.
 - j. WG: If scenarios are basically surrogates for policy proposals, then won’t get anywhere.
 - k. (chat) WG: That logic kicked out other scenarios.
 - l. WG: Was in the room for developing the budget proviso language. Struggling to understand what is being accomplished here.
 - m. WG: Thinking about proviso that puts certain amount of acres into conservation, those acres must be structurally complex. Would be great to have more information to vote on.
 - n. (chat) WG: I agree that silviculture should be built in somewhere.
 - o. (chat) WG: We had overwhelming agreement that silviculture belongs, just not consensus on where. The suggestion of incorporating it in scenario 4 wasn't voted on, that could still be an opportunity if it's re-tooled and presented to the work group.
 - p. (chat) WG: I do as well but didn't feel like we knew enough about the 4 versions we were voting on.
 - q. Scenario 6 Vote
 - i. Thumbs-up: 0
 - ii. Thumbs-sideways: 4
 - iii. Thumbs-down: 7
 - iv. Result: No Pass
4. Scenario 7
- a. Scenario 7 Vote
 - i. Thumbs-up: 5
 - ii. Thumbs-sideways: 1
 - iii. Thumbs-down: 5
 - iv. Result: No Pass
5. Next steps/next meeting
- a. Next meeting in May to continue discussing all these things. Want to make sure the whole work group is in attendance or sending alternate.
 - b. Next meeting: May 8th, 2024.
 - c. (chat) WG: Could we get a consensus vote on scenario 5? Does anyone really want that one?
 - d. DNR: Need to revisit Scenario 8, haven’t had a chance to vote on 10 or 5. Scenario 5 had little support going into today, so hopefully a short conversation at the next meeting.
 - e. BPP: Didn’t vote on Scenario 9 combined with Scenario 4, can do that at the next meeting.