Carbon Sequestration Advisory Group Report

November 20, 2020

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Introduction

The carbon sequestration potential of natural and working lands can play a significant role in addressing climate change by reducing atmospheric greenhouse gas (GHG) concentrations (IPCC 2019, UNEP 2017). Natural and working lands address GHG concentrations by sequestering carbon in leaves, stems, and roots through photosynthesis and then by storing that carbon in live and dead biomass and in soils. Harvested wood products contribute by storing carbon in materials such as lumber and plywood.

The Washington State Department of Natural Resources (DNR) formed the Carbon Sequestration Advisory Group (CSAG) in November 2019 to guide DNR's work in 1) conducting carbon inventories and 2) compiling and providing access to information on existing incentive-based carbon sequestering programs for Washington landowners, as outlined in the Engrossed Substitute House Bill 1109 (ESHB 1109 Sec 308(24)) proviso (see Appendix B-1 for the exact proviso text). The CSAG is composed of a balance of representatives who characterize the diverse interests and expertise involved in the subject of carbon sequestration on natural and working lands. (See Appendix B-2 for a list of CSAG members and their affiliation and Appendix B-3 for CSAG member responses to this report.)

The CSAG held the first of five meetings in February 2020 and met roughly every other month until October 2020. Over the course of the eight months, the CSAG worked to provide advice, guidance, and recommendations to DNR in the agency's work to answer five questions, as outlined in the CSAG charter (see Appendix B-4 for the CSAG charter):

1. What are the results of carbon inventories required through the proviso?
2. What could be done to improve the efficiency and effectiveness of carbon inventories?
3. What are the existing opportunities for carbon compensation services and other incentive-based carbon reducing programs for forest landowners and managers?
4. What barriers exist, including costs, to the use of these services or programs?

5. Are there any recommendations for additional work or legislation that may be advisable resulting from the advisory group?

To answer these questions, the CSAG received presentations on the development of and results from carbon inventories and voluntary, incentive-based carbon sequestering programs (hereafter referred to as incentive-based programs) in Washington. During meetings, the CSAG collaborated through both plenary discussion and small group discussion to provide DNR information and feedback to improve the inventories under development, identify topics that require further investigation, and highlight opportunities for the CSAG to contribute meaningful recommendations for consideration by state policymakers. It is important to note that, overall, the CSAG's work was focused on carbon storage as it relates to Washington's forestlands and specific forest products, which is more specific than the natural and working lands definition in the proviso (which includes croplands, rangelands, wetlands, etc.). Meeting summaries document themes from these discussions and each meeting summary was reviewed and approved by the CSAG. Comprehensive meeting summaries are posted on the CSAG website and the main body of the summaries are appended to this report (see Appendix B-4).

Between Meetings 2, 3, and 4, two small groups called Incubator Teams (ITs) met to discuss specific topics identified at the CSAG meetings, advance conversations for the CSAG as a whole, and focus the CSAG recommendation process (Appendix B-2 indicates the CSAG members who participated in the ITs):

- The **Inventories IT** focused on improvements to carbon inventories; and
- The **Incentives IT** focused on addressing barriers to incentive-based programs.

Background on CSAG and This Report

The purpose of this CSAG report is to communicate the advisory group's findings, advice, and recommendations to DNR to be included in the agency's report to the Washington State Legislature. The CSAG report is an attachment to DNR's December 2020 report to the Legislature, Natural and Working Lands Carbon Inventories and Incentives in Washington, which provides more in-depth information about the state's carbon inventory results and information on incentive-based programs. The CSAG report was completed prior to completion of DNR's report and CSAG members did not review the contents of DNR's report prior to its completion and submittal to the Legislature. Many of the CSAG's deliberations focused on strategies to ensure policy makers have access to relevant and clear information for decision-making. For example, the CSAG provided input on methodologies during DNR's development of inventories and feedback about interpreting results that the CSAG anticipates will be incorporated into the forthcoming and future inventory reports. Furthermore, many of the CSAG recommendations focus on providing tools to assess and/or compile information about program efficacy for policy makers.

This report's format follows the legislative proviso and has separate sections on carbon inventories and incentive-based programs. The CSAG recognizes that inventories, models, and monitoring are fundamental tools to help understand conditions at a snapshot in time. In addition, the performance measures of incentive programs can be enhanced or helped by having a complete picture of the carbon sequestration trends and current status provided by inventories. The questions policymakers have about incentive programs can also help inform how to approach inventories, models, and monitoring. The CSAG's recommendations on incentives and inventories, though separate in this report, are complementary.

The backdrop for the work of the CSAG amplified the timeliness and importance of the CSAG's work and sharpened its deliberations.

- Recent 2019-20 Washington legislation underscores the importance of carbon sequestration on natural and working lands. For example, Engrossed Second Substitute House Bill 2311 (ESSBH 2311), which the Legislature passed in 2020, amends state greenhouse gas emission limits and states "the policy of [Washington is] to promote the removal of excess carbon from the atmosphere through carbon sequestration activities…to meet the state's greenhouse gas emissions reduction targets."

- The state's budget forecast will likely present challenges in prioritizing investments during the 2021 legislative session, especially given the strain presented by the COVID-19 pandemic. The CSAG avoided making sweeping statements regarding funding needs and considered economic realities in deliberations and development of recommendations. As a result, this report is largely silent on funding amounts. However, the CSAG recognizes that implementing the recommendations requires resources and new funding commitments in future years and supports state funding requests to implement CSAG recommendations.

- The CSAG demonstrated that groups with diverse representation grounded in data-driven conversations with a clear scope and expectations can productively engage on the topic of natural and working lands carbon sequestration and landowner incentive programs. The CSAG deliberations, simply put, reflect 'next steps' Washington can pursue as part of the forest sector's contribution to a broader and more inclusive state-wide carbon conversation.

Carbon Inventories – Findings and Recommendations

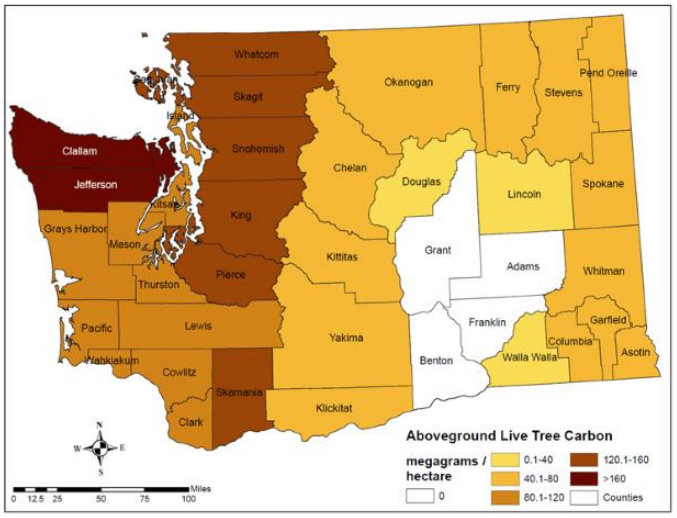
Information Shared with the CSAG

DNR, as part of its response to the legislative proviso, was responsible for developing and compiling the inventories the CSAG reviewed. The CSAG received five presentations and/or reports on Washington carbon inventories as outlined in Table 1 below (links to the presentations are in the first column). The inventory information provided to the CSAG included forest ecosystem carbon inventory methodology and Washington results from US Forest Service – Forest Inventory and Analysis (USFS-FIA); harvested wood products (HWP) carbon inventory methodology and preliminary Washington results from USFS; and estimated carbon emissions from wildfires in Washington from DNR. The CSAG provided extensive feedback to DNR during the presentations of the inventories regarding improvements to the inputs, framing and presentation of results and improvements to future inventory approaches. CSAG member-approved meeting minutes reflecting a synthesis of the feedback can be found in Appendix B-5.

Table 1: Carbon Inventory Presentations/Information

Presentation or Report	Presenter or Source of Report	Date Shared	Brief Description of Presentation
Overview of FIA and forest ecosystem carbon inventory methods	**USFS-FIA**	**Meeting 1 12 February 2020**	**FIA measures forested lands with field plots on a ten-year cycle. Presentation describes overall methods, plot design, and program history.**
	Excerpts from CSAG Meeting Summary (Full Set of Meeting Summaries in Appendix B-5) • FIA provides high-level data but doesn't address questions for landowners who want to know information relevant to their land. More detailed inventory data could be a valuable resource for them. • Plot types include corporate and non-corporate as types of private plots but don't specify management type. A small family tree farm could be an example of a corporate or non-corporate plot, depending on the ownership structure, and a land trust is an example of a non-corporate plot. • Remote sensing is used to support stratification (wherein FIA measures all the plots and groups them to reduce the sampling error). • Dynamic factors or rare events are difficult to capture on the plots, e.g., a fire needs to be large-scale to be represented. If there is a large disturbance year, FIA can't necessarily capture the event in its measurements. However, FIA is looking at Image-based Change Estimation (ICE) which uses National Aerial Imagery Program (NAIP) to categorize plots every two years and look at change. • If denied access to a plot, FIA will try for up to three years to get access. Ten years later, they will try again. FIA does not use another plot, but it keeps track of which plots are not sampled. ○ FIA compensates for denied access in post-stratification.		

	• FIA reports focus on status and trends, but do not provide projections (although FIA data are often used in projections). • How easily FIA can staff up: Given that it's difficult to hire at a federal level right now, if a state wants to invest in increasing the number of plots or frequency of measurements, it's easiest to partner with FIA and hire state employees; it would likely take a year to fully ramp up. There is also a question of whether there is an adequate labor pool for the field work. • Standard errors (SE) are low in terms of carbon stock measurements; they increase for carbon flux measurements.		
<u>WA forest ecosystem carbon inventory results</u>	**USFS-FIA**	**Meeting 1 12 February 2020**	**Presentation summarizes total 2007-16 WA forest land carbon stocks and flux (estimates of change) by pool (live trees, dead trees, etc.), landowner (private, USFS, DNR, etc.), and region.**
	Excerpts from CSAG Meeting Summary and Worksheets (Full Set of Meeting Summaries in Appendix B-5 and Notes from breakouts on the CSAG Website) In two breakout groups the CSAG shared their initial impressions of the results, conversations that CSAG needs to have in the future. While in breakouts CSAG members shared observations from three figures from the preliminary findings in the WA Forest Ecosystem Carbon Inventory results: • Washington carbon stocks and flux on forest land by region. (See Figure 1) • Washington carbon stocks and flux on forest land by region and pool. (See Figure 2 and Figure 3)		



Carbon Stocks and Flux on Forest Land by Western/Eastern Region

Western Region
Total stocks: 1,763 MMT (SE: 20.6 MMT)
C Stocks/ac: 146.2 MMT

CO_2e Flux: 15.0 MMT/yr (SE: 4.2 MMT/yr)
Flux/ac: 1.26 MT/yr

Eastern Region
Total stocks: 955 MMT (SE: 13.9 MMT)
C Stocks/ac: 94.4 MMT

CO_2e Flux: 1.1 MMT/yr (SE: 1.3 MMT/yr)
Flux/ac: 0.11 MT/yr

Figure 1 Carbon Stocks and Flux on Forest Land By Region

Western Washington

Forest Carbon Pools	Total Carbon (MMT)	Per Ac (MT)
Live Trees	792.7	65.7
Standing Dead	55.8	4.6
Understory Veg	15.3	1.3
Down Woody Debris	101.7	8.4
Forest Floor	75.8	6.3
Soil Organic C	721.9	59.9
All Pools	1,763.3	146.2

Eastern Washington

Forest Carbon Pools	Total Carbon (MMT)	Per Ac (MT)
Live Trees	290.9	28.9
Standing Dead	46.8	4.6
Understory Veg	12.9	1.3
Down Woody Debris	48.1	4.8
Forest Floor	53.1	5.3
Soil Organic C	502.9	50.0
All Pools	954.8	94.4

Figure 2 Forest Carbon Stocks by Region and Pool: 2007-16

Western Washington

Forest Carbon Pool	Net flux (CO_2e) Total *(MMT/yr)*	Per Ac *(MT/yr)*
Live Trees	16.3	1.37
Standing Dead	0.7	0.06
Understory Veg	-0.21	-0.01
Down Woody Debris	-5.5	-0.46
Forest Floor	0.4	0.04
Roots	3.3	0.28
Soil	-0.1	-0.01
Net flux All Pools	15.0	1.26

Eastern Washington

Forest Carbon Pool	Net flux (CO_2e) Total *(MMT/yr)*	Per Ac *(MT/yr)*
Live Trees	-1.2	-0.12
Standing Dead	3.3	0.33
Understory Veg	0.1	0.01
Down Woody Debris	-1.4	-0.13
Forest Floor	-0.2	-0.02
Roots	0.4	0.04
Soil	<-0.1	<0.01
Net flux All Pools	1.1	0.11

Figure 3 Annual Carbon Flux (CO2e) by Region and Pool: 2002-06 to 2012-16

HWP inventory methods	**USFS**	**Meeting 2 8 May 2020**	**USFS uses the IPCC production method (includes all HWP produced from timber harvested in the area and exports but excludes imports) to calculate HWP carbon stocks and flux.**

Excerpts from CSAG Meeting Summary (Full Set of Meeting Summaries in Appendix B-5)

- *Life Cycle Analysis vs HWP stocks and flux*: Washington DNR's approach to creating a carbon inventory of harvested wood products is not the same as a life cycle analysis (LCA). DNR is using this HWP analysis approach in order to be consistent with recent inventories in California and Oregon, and for consistency with international reporting standards for carbon stocks and fluxes. Washington already gathers certain components of an LCA through the GHG emissions inventory that the state Department of Ecology is required to perform every two years. That said, there are still numerous gaps in data availability for LCAs.
- *Salvage harvest*: Salvage harvests and the carbon from these harvests would be included in the HWP estimates in the same way as carbon from other harvests.
- *Recycling:* Factoring in recycling that happens in a different country is a national-level challenge for HWP analyses.
- *Landfill methane*: The question of how to factor in landfill management or recovering methane emissions is being explored at the national scale. Non-carbon emissions have changed over time and are regionally specific, so relying on national trends may not be appropriate. There's a data opportunity for time series information at the state level.
- *Washington-specific data, support from CSAG*: In order to get the best results, improve sensitivity analysis, and reduce uncertainty, USFS welcomes input from CSAG members on what information is available for use in the HWP model at each phase such as primary product ratios, conversion factors, end-use ratios, and the fate of wood in landfills.
- *Storage projections:* Projections are an interesting data point to consider; it connects the land today with the wood products pool that will occur in the future. Projections are not within the USFS HWP scope for this project.

	• *Regional variability in the state*: USFS has an opportunity to recognize the interest in the LCA community and building community in information to differentiate regional variability in wood supply. Also, note that if USFS does look to provide info on regional variability, county-level data may not create an accurate picture because HWP do not stay within county boundaries; wood supply boundaries should be considered instead. • *Substitution*: The substitution impact of harvested wood products (increased/decreased emissions attributable to the use of wood products rather than alternative materials) is not included in the scope of the USFS HWP assessment.		
WA HWP carbon inventory preliminary results	**USFS**	**Meeting 3 9 July 2020**	**Presentation includes preliminary results for WA HWP carbon stocks and flux and explains how it relates to the FIA forest ecosystem results.**
	Excerpts from CSAG Meeting Summary (Full Set of Meeting Summaries in Appendix B-5) • *Clear interpretation of results*. Decision makers will be challenged with competing interests and needs so they need a clear, concise message about what the inventory results can and cannot tell us - the 'so what' aspect of inventories. Graphs, charts, or other graphics can help. So can highlighting numbers for which there is high certainty and confidence. Another idea was to display results like a 'nutrition label.' • *Sensitivity of results*. Understanding the sensitivity of the HWP and forest ecosystem results to various inputs could improve understanding of the results and also indicate the type of incentives, actions, or policies that could make the most difference for carbon. • *Variation by geography and ownership*. While it is important to keep results and interpretation clear and simple, results should also include enough nuance and detail to describe important trends and changes in carbon dynamics by region (east/west, ecoregion, etc.) and by ownership. Understanding these variations can help to fine tune incentives and recommendations. • *Projections and scenarios*. The current inventories are carbon accounting tools and are based on measurements and modeling of past results. Building on this, policy makers are likely to ask for decision-making tools to guide decisions on the types of incentives that would be most beneficial. Projections and scenario development could help us understand what is likely to happen under various policies or other changes. Projections and scenarios can also help identify potential unintended consequences and who the winners and losers may be with any given inventory improvement strategy or policy intervention. • *Improvements to technical inventory methods*. Multiple potential improvements to technical inventory methods were suggested for exploration including intensifying the FIA plot grid in Washington, utilizing remote sensing in additional ways, and improving measurements about the disposition of products.		
Estimate of WA wildfire carbon emissions (2014-18)	**DNR, with support from University of Washington**	**Meeting 3 9 July 2020**	**Document estimates total acres burned in Washington and total wildfire emissions (metric tons CO2e) for five years between 2014 and 2018.**
	Excerpts from CSAG Meeting Summary (Full Set of Meeting Summaries in Appendix B-5)		

	• *Wildfires*: Emissions estimates from wildfires are calculated through a variety of reports. Wildfire emissions are reported on a national scale, including CO2 and non-CO2 emissions. Wildfire emissions are also captured in stock changes in the forest ecosystem estimates presented by USFS at CSAG meeting #1.

CSAG Findings and Recommendations to Improve Carbon Inventories

Inventories Recommendation 1

The CSAG finds that the suite of draft inventory results provides high-level insights on carbon storage and sequestration in Washington forest lands. That said, to maximize the usefulness of inventories, the CSAG recognizes the need for clear and concise messaging to policymakers and decision makers about inventory results. The messaging might include graphs, charts, or other graphics to help highlight areas of high certainty and confidence, and to communicate the meaning or importance of trends.

The CSAG recommends that DNR lead the development of a template (aka 'nutrition label') that could be used to communicate inventory results to policy makers in an easy-to-digest format but is granular enough to reflect the nuanced information needed for accurate interpretation. The CSAG recommends that, at a minimum, future inventory reports should:

- Provide summary information (including graphics);
- Provide a clear description of the carbon flow between live trees, mortality, harvest, standing dead wood, and downed woody debris and how that relates to carbon flux and change in carbon pools;
- Provide a clear description of the harvested wood products in use and solid waste disposal site pools to explain that carbon stocks in these pools are a function of harvests over the past 100 years.
- Wherever possible, summarize changes in the inventory over time by attributing changes in carbon stocks—particularly carbon losses—to specific drivers (e.g., wildfire, insect, harvest, development to non-forest, etc.).
- Convey the inventory results in non-technical terms to identify alternatives where carbon stocks and fluxes could be affected by policies and incentives seeking desired carbon outcomes;

Inventories Recommendation 2

The CSAG finds that the inventories describe high-level trends and changes in carbon dynamics by geography (east/west, ecoregion, etc.) and by ownership. CSAG also recognizes that while it is important to keep results and interpretation clear and simple, results should also include enough nuance and detail about variation by geography and ownership to help to fine-tune incentives and programs.

The CSAG recommends that the Legislature direct DNR to build on and enhance existing inventory information and link this inventory information with incentives tools and resources to inform new targeted assistance or investments. Combined with modeling the effectiveness of incentives on carbon sequestration, this effort should show policymakers the areas where carbon impacts can be improved as identified by the inventory, the range of potential incentives, who they best incentivize, where they're most applicable, and their potential impact on carbon flux. Although CSAG worked primarily with forest ecosystem and harvested wood products inventories, this recommendation applies to all carbon inventories for natural and working lands in Washington.

Inventories Recommendation 3

The CSAG finds that the current inventories are carbon accounting tools and are based on measurements and modeling of past results. Building on this, policymakers are likely to ask for decision-making tools to guide decisions on the types of incentives that would be most beneficial. CSAG finds that projections and scenario development will be necessary to understand the likely outcomes under various policies or other changes. Projections and scenarios can also help identify potential unintended social, economic, and ecological consequences. Furthermore, understanding the sensitivity of stocks, fluxes, and projections to various policy and management interventions could improve understanding of which policies could be most effective for carbon and other values such as resilience to wildfire.

The CSAG recommends that DNR, USFS, and other partners incorporate sensitivity analyses into inventories and projections of stocks and flux to improve understanding of the effects and outcomes of policies and to determine where investments will result in the greatest desired outcomes. The CSAG also recommends conducting sensitivity analyses to inform where to intensify or otherwise improve inventory activities, such as increasing FIA plot spatial and temporal intensity.

Additionally, the USFS Pacific Northwest Research Station's Carbon Dynamics Research Initiative has a working group exploring land management and policy scenarios for modeling, including harvested wood products. The CSAG recommends that WA DNR continue to participate in this initiative and work with USFS, and other partners to support and advance these and other carbon modeling efforts. This includes in the near-term working to identify research expertise needed to support running the models.

Inventories Recommendation 4

The CSAG finds that there are many potential improvements to technical inventory methods, including intensifying the FIA plot grid in Washington, utilizing remote sensing in additional ways, improving measurements and sampling to better determine the disposition of harvested wood products, and improving the ability of researchers to integrate data sets.

The CSAG recommends that the DNR and partners work to:

- Identify ways remote sensing can be acquired and applied to enhance accuracy, reduce errors, and increase frequency in estimates of carbon stocks and fluxes. e.g., the potential for Digital Aerial Photogrammetry to help increase the accuracy and effectiveness of FIA and other inventories.
- Ensure that raw data and data-derived products from the collection and processing of remote sensing and inventory data are openly accessible and well-documented. Models built to consume or predict data should also be designed to be transparent and reproducible.
- Develop pathways for integrating inventory databases (e.g., FIA, stand exams, watershed inventories) with geographic information systems and modeling programs (e.g., Forest Vegetation Simulator (FVS), Canadian Carbon Budget Model) at various state institutions and universities. Moreover, there is also an increased need to refine existing modeling parameters, which can be done by using repeat sampling of inventory data.

Inventories Recommendation 5

The CSAG finds that the forest ecosystem carbon and HWP inventories do not address the issue of product substitution. The CSAG believes that product substitution is an important opportunity worthy of exploration and additional inquiry as state of Washington works to achieve its carbon sequestration goals. The CSAG recommends that the state further explore the possible carbon and other social and environmental impacts associated with greater utilization of wood in construction and other applications, including the storage of carbon in harvested wood products; substitution in place of more carbon-intensive alternative materials (also referred to as substitution for "higher-embodied carbon materials"); end-of-life impacts; and impacts on forest carbon stock and sequestration. CSAG also recommends exploring the data and decision support tools that should be collected to better inform policy decisions.

Voluntary Incentive-based Carbon Sequestering Programs

Information Shared with the CSAG

Beginning at Meeting 2, the CSAG reviewed and helped to refine a compilation of information on existing opportunities for carbon compensation services and other incentive-based carbon-reducing or sequestering programs for landowners who are interested in voluntarily engaging in them. The information was provided by American Forests (a national nonprofit conservation organization) in a spreadsheet that captures information about incentive-based programs and opportunities that are available to Washington landowners, including

- Funding sources;
- Relationship to carbon, e.g., avoided conversion, forest management, etc.;
- Incentive type, e.g., grant, market, tax incentive, cost-share, etc.;
- Landowner type(s) served, e.g., private, tribal, local government, etc.; and
- Barriers to landowner participation.

The CSAG provided extensive feedback to DNR and American Forests during the compilation of the incentive-based programs, including: advising DNR on what kind of information would be useful to compile; suggestions on programs to include in the compilation; extensive feedback on the qualitative attributes compiled about each program; and the barriers to use of each program. The final spreadsheet (appended to the DNR report) and the CSAG meeting minutes (see Appendix B-4) reflect these contributions.

CSAG Findings and Recommendations for Incentive-based Programs

The CSAG recognizes that no single solution or incentive program exists to accommodate the variety of land types and landowners. Moreover, the CSAG recognizes there are multiple pathways for forest carbon sequestration or storage that play important roles in the carbon sequestration strategy for owners of private and other nonstate owned or managed forestland. These pathways have the potential to work together and complement each other at both a project level and across the landscape.

Incentives Recommendation 1

Avoided conversion describes the loss of forestland to deforestation or development to other land uses. The CSAG finds that maintaining productive natural and working forest lands of all types (forests owned and managed by both large and small private forest landowners as well as forests managed by public agencies and tribes) is important to support both carbon sequestration and a sector of Washington's economy. Unfortunately, forest lands around the state are threatened by conversion to other uses. The forthcoming forest ecosystem carbon report for Washington from USFS shows the conversion of forest land to other uses over the 2007-16 reporting period caused a net loss of 2.2 ± 1.6 million metric tons of carbon dioxide equivalent per year. In considering how to address the threat of forest land conversion, CSAG members recognize that there are unique barriers for different landowner types and landscapes.

For example, small forest landowners may lack the resources or knowledge needed to understand incentive opportunities, evaluate the costs and benefits of programs, or apply for support. Larger landowners, such as timber investment management organizations, may face barriers due to the limited availability of programs that provide carbon incentives at a scale that is relevant to their business model.

As a next step, the CSAG recommends that the state advance avoided conversion strategies (including state programs or state-enabled programs that exist at the local level) that target these and other barriers in order to make meaningful progress on the pressing issue of forestland conversion. Examples that the CSAG discussed include but are not limited to landowner assistance programs, conservation acquisition and easement programs, planning and other policies which create incentives and remove barriers to assure forests are not converted to non-forest uses.

Incentives Recommendation 2

The CSAG finds that DNR's list of incentive-based programs developed by American Forests is a useful resource that provides a record of the broad array of opportunities available to Washington landowners to steward their forests and produce harvested wood products in ways that store and sequester carbon. The CSAG believes there are many opportunities to improve access for landowners to existing programs and improve carbon outcomes by clearly identifying and investing in aspects of existing programs that promote carbon sequestration and storage. In addition to improved access to existing programs, and enhanced outcomes from existing programs, the CSAG believes that an important next area of inquiry is whether the existing programs are likely to produce the carbon storage and sequestration sought by the state.

The CSAG recommends the following:

- The state should provide resources to support existing networks and organizations, including DNR, in helping landowners implement or participate in incentive-based programs.
- DNR and other state agencies should assess existing incentive-based programs and look for changes or investments that improve the incentives for carbon storage and sequestration. This assessment should explore existing and potential opportunities for landowners to stack or combine incentives from multiple programs.
- DNR should conduct a 'gap analysis' on existing programs to identify where changes to existing programs would create a more effective carbon nexus and where inadequacies and room for improvement warrant exploration of new programs.

Incentives Recommendation 3

The CSAG finds that forest carbon offset projects, whether through voluntary markets, or through compliance cap and trade offset programs in other states, can offer a tool in the carbon sequestration toolbox – earning revenue for landowners while at the same time helping individuals and organizations, both in-state and out-of-state, offset their carbon footprint by storing and sequestering carbon. CSAG recognizes that offsets are a unique mechanism that needs rigorous quality assurances because the purchaser of an offset is typically counting that offset as a reduction in place of continuing to emit greenhouse gasses through other activities. In part due to the need for these assurances, offset projects can be complex and challenging for landowners. There are many different sets of rules (protocols) that

projects can use. The price can vary among markets and buyers. Some barriers are beyond the scope of what can be accomplished in Washington. For example, the California compliance market offset project participant faces the potential cost for invalidation of credits, the high cost of project development, and requirement to adopt California Forest Practices Rules or equivalent. These all serve as barriers for Washington landowners. Addressing these barriers and uncertainties for offset projects by increasing flexibility and accessibility could increase project registration, which could benefit landowners and increase sequestration. Increasing flexibility to address barriers such as high project development costs, invalidation, and project aggregation challenges could likely be addressed without risking changes to the credibility and accuracy of offset quantification.

The CSAG recommends that the state develop and pursue strategies to increase flexibility and accessibility for Washington landowners seeking to participate in forest carbon offset projects. Examples of increasing flexibility and accessibility may include, but are not limited to, addressing barriers such as high cost of carbon projects, invalidation, reversals, and project aggregation challenges.

Appendix B-1: Proviso in ESHB 1109

1FY 2019-2021 Budget: ENGROSSED SUBSTITUTE HOUSE BILL 1109, April 28, 2019

Sec. 308(Pages 238-9)

(24)(a) $250,000 of the general fund—state appropriation for fiscal year 2020 and $125,000 of the general fund—state appropriation for fiscal year 2021 are provided solely for the following activities:

(i) Conducting carbon inventories to build on existing efforts to understand carbon stocks, flux, trends, emissions, and sequestration across Washington's natural and working lands, including harvested wood products, wildfire emissions, land management activities, and sawmill energy use and emissions. Where feasible, the department shall use available existing data and information to conduct this inventory and analysis. For the purposes of this section, natural and working land types include forests, croplands, rangelands, wetlands, grasslands, aquatic lands, and urban green space.

(ii) Compiling and providing access to information on existing opportunities for carbon compensation services and other incentive-based carbon reducing programs to assist owners of private and other nonstate owned or managed forestland interested in voluntarily engaging in carbon markets.

(b) By December 1, 2020, the department must submit a report to the appropriate committees of the legislature summarizing the results of the inventories required under this section, and assessing actions that may improve the efficiency and effectiveness of carbon inventory activities on natural and working lands, including carbon sequestration in harvested forest products. The department must also describe any barriers, including costs, to the use of voluntary, incentive-based carbon reducing or sequestering programs. The department may also include recommendations for additional work or legislation that may be advisable resulting from the advisory group created in this subsection as part of this report.

(c) The department must form a natural and working lands carbon sequestration advisory group to help guide the activities provided in this section. The advisory group must be composed of a balance of representatives reflecting the diverse interests and expertise involved on the subject of carbon sequestration on natural and working lands.

Appendix B-2: CSAG Members, Affiliations, and IT Participation

Name	Affiliation	Inventory IT	Incentives IT
Patti Case	Green Diamond Resource Company		✓
Cody Desautel	Colville Tribes		
David Diaz	University of Washington	✓	
Joseph Donnegan	US Forest Service	✓	
Ara Erickson	Weyerhaeuser	✓	
Kathleen Farley Wolf	King County		✓
Indroneil Ganguly	University of Washington		
John Henrikson	Wild Thyme Tree Farm		✓
Theodore Holt *	The Nature Conservancy	✓	
Joe Kane*	Nisqually Land Trust		
Cherie Kearney	Columbia Land Trust		✓
Mo McBroom *	The Nature Conservancy		
Mark McPherson	City Forest Credits		✓
Gary Morishima	Quinault Indian Nation		
John-O Niles	Salesforce		
Julius Pasay	The Climate Trust	✓	
Lisa Remlinger *	Washington Environmental Council		
Steve Rigdon	Yakama Tribe	✓	
Max Scher *	Salesforce		
Reed Schuler *	Office of Governor Inslee		
Edie Sonne Hall	Three Trees Consulting	✓	
Jason Spadaro	SDS Lumber		
Skip Swenson	Forterra		✓
Bill Turner	Sierra Pacific Industries		✓
Mike Warjone	Port Blakely		
Andrea Watts	Wildcat Creek Tree Farm	✓	
Max Webster	Washington Environmental Council		✓
Elizabeth Willmott *	Microsoft		
Mark Wishnie	BTG Pactual Timberland Investment Group		
Lenny Young (CSAG Chair)	Washington Department of Natural Resources		

** CSAG members with an asterisk by their name were only able to participate in a portion of the meetings and were not part of the report's finalization process.*

Appendix B-3: CSAG Support for CSAG Report

A final draft of the CSAG report was distributed to all CSAG members to review in October 2020. All 23 CSAG members who were part of the report's finalization process responded to the final draft. Of those responses, all members agreed that the CSAG Report accurately reflects the group's deliberations. A few members provided additional comments as follows:

Name and Affiliation	Additional Comments
Patti Case, Green Diamond Resource Company	Thank you for the addition to the report reflecting the fact that CSAG members have not seen the DNR report; however, that reference does not quite clear up my concern that readers of the CSAG report may believe the DNR report reflects the CSAG's inventory recommendations. Since we have not seen the report, we are unable to assume this. The final report includes a reference to RCW 70.235.020, which amends the state greenhouse gas emissions limits. A second relevant bill passed in the 2020 legislature, RCW 70A.45.090, also references RCW 70.235.020 and further finds that "it is the policy of the state to support the contributions of all working forests and the synergistic forest products sector to the state's climate response." RCW 70A.45.090 should also be added as it was discussed during CSAG deliberations as an important policy backdrop for recognition of embodied carbon in harvested wood products.
Ara Erickson, Weyerhaeuser	While I agree the report represents our deliberations, I believe it is lacking much of the rich discussion we had when we reviewed the inventories. Combined with the fact that CSAG members did not have an opportunity to read or review the DNR report (drafts or final), I am submitting my agreement with a caveat. With the CSAG report lacking the detailed interpretation of the inventory finding and not being able to see these interpretations in the DNR report, I'm uncertain if some of the key findings will be included in the report to the legislature. One example is that when we reviewed the flux (or change) of carbon levels over time, we saw that private and public managed forests in Washington state are the largest consumers of atmospheric carbon (compared to unmanaged forests experiencing high rates of disease and mortality). Additionally, we discussed with the full CSAG that areas with strong markets for forest products matched areas experiencing healthy carbon sequestration; this is a critical takeaway that I would have liked to see in the report.
Kathleen Farley Wolf, King County	Incentives IT Recommendation 3 needs further clarification, including a discussion of which barriers are possible to address through action in WA state.
Indroneil Ganguly, University of Washington	The discussion summaries presented in Table 1 (Carbon Inventory Presentations/Information) of the CSAG Report are intended to highlight the ways these studies could be improved in the future, which resulted in an apparent critical tone of this section. However, the reader should note that CSAG overwhelmingly acknowledged the value of these reports. These reports, produced by USFS-FIA, are of immense value to the scientific and other stakeholders communities in the region.
Gary Morishima, Quinault Indian Nation	I raised a number of issues and concerns that I felt were important were for CSAG to address and provided related materials to facilitators and DNR staff, including the lack of attention to the urgent need to reduce atmospheric accumulation of greenhouse gases, questions regarding the efficacy of voluntary forest carbon offsets, inadequate opportunity to substantively engage in group discussions, and need for information to provide context and perspective. However, constraints and limitations of the process did not permit CSAG deliberation. A memo summarizing major concerns is attached to this response should additional information or clarification be needed. [See below.]

Edie Sonne Hall, Three Trees Consulting	Thanks for the opportunity to participate in the CSAG. This comment is more of a clarification than a misrepresentation. In regards to the sentence on page 4, "The CSAG report was completed prior to completion of DNR's report and CSAG members did not review the contents of DNR's report prior to its completion and submittal to the Legislature." I want to clarify that the CSAG did not see any of the DNR's report, not just a final version (e.g. 'prior to completion'). We spent a lot of time making sure that we all understood the inventory findings. I have every confidence DNR will be able to communicate, for example, the important difference between stock and flux, why there may be differences in forest growth and mortality both across regions and ownership types, and the fact that the method used to calculate HWP carbon storage is based on both past and current harvest levels, but I have not seen the report.
Jason Spadaro, SDS Lumber	First, I want to underscore that I agree that the CSAG report accurately represents the deliberations of the CSAG meetings, and thank DNR and Ross Strategic for their leadership. Because CSAG participants will not have an opportunity to review the DNR report (see explanation on page 4), I have not seen any written interpretation of inventory findings. In addition, the meeting summaries, while comprehensive, did not capture some of the insights that the CSAG experts derived from the inventory presentations. A key take-away from the Washington inventory presentation was the following: The key inventory metric when discussing carbon sequestration is flux, or the amount of change in the carbon level over time. We know that healthy, fast growing forests sequester carbon at a much higher rate than diseased or dying forests. Not surprisingly, the inventory showed that the managed forests in our state are the largest consumers of atmospheric carbon. Unmanaged forests, in particular in eastern Washington, which have the highest levels of disease and mortality, are often emitting more than they are sequestering. Further, areas with healthy timber markets also showed healthy sequestration, showing that forests can deliver atmospheric carbon reductions in products and forests simultaneously. Second, I note on page 5 a new paragraph referencing Engrossed Second Substitute House Bill 2311, which amends the state greenhouse gas emissions limits (RCW 70.235.020). While I understand that there are no additional changes that can be made to the CSAG report, if I had seen this language in a previous version I would have suggested adding reference to the second relevant bill passed in the 2020 legislature, RCW 70A.45.090, which also references RCW 70.235.020 and further finds that "it is the policy of the state to support the contributions of all working forests and the synergistic forest products sector to the state's climate response." RCW 70A.45.090 was discussed during CSAG deliberations as an important policy backdrop for recognition of embodied carbon in harvested wood products.
Mike Warjone, Port Blakely	If Greenhouse gas bills are to be referenced in specifically, as they are in the final version, we should include RCW 70A.45.090 as discussed in the meetings.

Quinault Indian Nation
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October 25, 2020

Shelby Thomas
Research Associate
Ross Strategic
1325 4th Ave, Suite 1600
Seattle WA 98101

Re: CSAG Report

Shelby,

Thank you for assistance in helping to organize CSAG and producing its report. Unfortunately, the choices on the fillable PDF form do not enable me to convey my comments regarding CSAG's report. The phrasing of Option 2(b) "CSAG deliberations are missing from the report, including: "is only limited to the CSAG deliberations and does not allow me to express seminal issues and concerns with the CSAG Report and process.

The purpose of this note is to formally convey major concerns for the record.

1. **Proviso in the authorizing statute and the CSAG Charter**. The narrow focus of CSAG on forest carbon sequestration did not allow CSAG to consider the central and far more urgent question that should be addressed: *"How can Washington State's working lands reduce the atmospheric accumulation of greenhouse gases (GHG)?"* There are far more significant, effective, and efficient and ways to sequester carbon than forests which can take decades to realize and fraught with uncertainties and risks from climate change, drought, insects, disease, and wildfire. Alternatives that deserve investigation include: revision of agricultural practices, blue carbon, carbon capture and geologic storage, reduction of GHG emissions, materials substitution, decarbonization, and improving energy efficiency.
2. **Questions regarding the effectiveness of voluntary forest carbon trading systems.** CSAG did not undertake deliberations regarding to determine whether carbon offsets, credits, or trading systems actually reduce accumulation of GHGs, preserve forests, or address issues relating to environmental justice and equity caused by the redistribution and reallocation of costs and benefits. Like other "nature-based" solutions[1], forest carbon offset systems must be properly designed, implemented, administered, and enforced to have a chance to be an

[1] Defined by the International Union for the Conservation of Nature as *"actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits*"

effective "win-win" tool to help contend with climate change. CSAG was not provide with guidelines for nature based solutions which have been developed and are readily available.[2] Despite the marketing hype and their political appeal, there have been numerous studies documenting fraudulent accounting and questioning claims regarding the legitimacy of forest carbon credit trading systems, including those established under the California Air Resources Board, the Clean Development Mechanism, the "Trillion Trees" campaign, REDD+, Bonn Challenge, New York Declaration on Forests. For example, in a May 7, 2019 "POLICY BRIEF: The California Air Resources Board's U.S. Forest offset protocol underestimates leakage", Barbara Haya, PhD, Research Fellow, Center for Environmental Public Policy, University of California, Berkeley, found

> *"Analysis of projects generating 80% of total offset credits issued by the California Air Resources Board's (ARB) U.S. Forest offset protocol finds that 82% of these credits likely do not represent true emissions reductions due to the protocol's use of lenient leakage accounting methods. The U.S. Forest protocol has generated 80% of the offset credits in California's cap-and-trade program. The total quantity of emissions allowed because of this over-crediting equals approximately 80 million tons of CO2, which is one third of the total expected effect of California's cap-and-trade program during 2021 to 2030 (ARB 2017)"*

Nor do forest carbon credits ensure forest preservation. In a May 22, 2019 article on forest carbon and forest preservation published in ProPublica, entitled "An Even More Inconvenient Truth: Why Carbon Credits for Forest Preservation May be Worse Than Nothing", Lisa Song reported:

> *"In case after case, I found that carbon credits hadn't offset the amount of pollution they were supposed to, or they had brought gains that were quickly reversed or that couldn't be accurately measured to begin with. Ultimately, the polluters got a guilt-free pass to keep emitting CO_2, but the forest preservation that was supposed to balance the ledger either never came or didn't last."*

Song's story was not without controversy. But even critical reactions such as the Environmental Defense Fund's May 23, 2019 article admitted:

> *"Many projects are not adequately monitored, or supported by a policy framework, political will, or the force of law for carbon crediting. As the story finds, there is evidence of many projects that claim they're protecting forest and sell carbon credits, but in the end don't actually protect the forest. Or of projects that protect a piece of forest here, while somebody slashes and burns over there – so those credits aren't really reducing emissions. Of course these scenarios are the opposite of stopping climate change: the*

[2] For example, see R. Parajuli et.al. "An Introduction to Forest Carbon Offset Markets", by the North Carolina Extension Service. July 15, 2019; Griscom, B. W., et al. (2017). Natural climate solutions. Proceedings of the National Academy of Sciences, 114 (44), 11645-11650; and E. Beasley et.al. GUIDE TO INCLUDING NATURE IN NATIONALLY DETERMINED CONTRIBUTIONS A checklist of information and accounting approaches for natural climate solutions. Produced by Conservation International, Nature4Climate, The Nature Conservancy, Environmental Defense Fund, National Wildlife Federation, Land Use and Climate Initiative, Climate Advisers, and Wildlife Conservation Society. September 2019.

polluter goes on polluting and the offset that was supposed to compensate for the pollution pollutes too." [3]

Because of the response, Song and ProPublica issued a further rejoinder:[4]

"When ProPublica published an investigation last week about the persistent problems of carbon credits linked to tropical forest preservation, supporters of the system vehemently disputed whether this meant these initiatives have been, and are likely to continue to be, failures.

These initiatives — known as REDD, or Reducing Emissions From Deforestation and Forest Degradation — allow polluters to offset a portion of their carbon emissions by paying to preserve trees that would otherwise have been cut down (some also reward preservation without giving others permission to pollute). In concept, at least, REDD offers an elegant, win-win solution for slowing climate change, preserving fragile ecosystems without sacrificing economic prosperity.

But our story — based on firsthand observation of the world's most renowned REDD program in the Brazilian state of Acre, interviews with dozens of scientists and a review of thousands of pages of studies, technical documents and other literature — presented evidence that, in actuality, such ventures have a poor record of delivering the emissions reductions and forest preservation they promise."

3. **Inadequate opportunity to deliberate**. Time constraints coupled with the necessity for CSAG to use virtual meeting platforms due to COVID-19 restrictions, prevented substantive deliberation regarding several important factors, such as: (a) the importance of understanding how different characteristics affect the ability of forests to sequester carbon. There are significant differences in how plantations, naturally regenerated forests, species composition, and density store forests influence carbon storage and emissions (forests emit volatile organic compounds, notably terpenes and isoprenes); (b) the need for active management to reduce risks from water stress, insects, disease, and wildfire; (c) requirements for harvesting, transportation, and processing infrastructure to enable landowners to benefit from maintaining working forests on the landscape; (d) impacts of taxation on forest land tenure and maintaining forests across multiple generations of owners; (e) challenges of capturing benefits from environmental services such as water quality and flows, soil conservation, fish and wildlife habitat, and recreational opportunities and values from non-timber forest products; (f) evaluating the complexity of rules and protocols employed by various carbon trading systems, particularly, how permanence, leakage, additionality, risk buffers, and costs and complexities of verification, measurement, reporting, and auditing affect landowner benefits.
4. **More information needed to provide context and perspective**. Information important to understand the potential significant role that Washington's working lands could play in

[3] Steve Schwartzman (Senior Director, Tropical Forest Policy) and Christina McCain (Director, Latin America). ,"What ProPublica's forest carbon credits story still gets wrong – and right (with update)". http://blogs.edf.org/climate411/2019/05/23/what-propublicas-forest-carbon-credits-story-gets-wrong-and-right/

[4] Lisa Song. "These 4 Arguments Can't Overcome the Facts About Carbon Offsets for Forest Preservation." May 31, 2019. https://www.propublica.org/article/these-4-arguments-cant-overcome-the-facts-about-carbon-offsets-for-forest-preservation.

addressing GHG emissions and meeting the State's climate goals was not provided. Nor was the need to integrate CSAG with other actions being undertaken (e.g., Washington's Forest Action Plan, 20-Year Forest Health Strategic Plan, the Sustainable Farm Bill).

More than half of Washington State (22 million acres) is forested, but 44% is managed by the Federal Government and subject to legislative and administrative requirements and policies that affect the ability to manage those lands for carbon sequestration. The 215,000 small forestland owners collectively manage 6.5 million acres of land face significantly different challenges than private or public forestland owners.

The term "flux" is employed extensively and without adequate discipline in the report; I am concerned that CSAG could well not have an adequate understanding or appreciation of what the term means or how it is to be applied. "Carbon flux" concerns the rate of exchange of carbon between four reservoirs or pools: the lithosphere (earth crust), hydrosphere (water), atmosphere (air), and biosphere (organisms). It is not measured with accuracy, but rather estimated with substantial uncertainty and involves multi-scale and attribute accounting complexities that are not well described or acknowledged in the CSAG Report (see Appendix D, Carbon Measurement Approaches and Accounting Frameworks, Second State of the Carbon Cycle Report, US Global Change Research Program; and "Carbon Accounting" produced by Forest Research, https://www.forestresearch.gov.uk/research/forestry-and-climate-change-mitigation/carbon-accounting/).

Sincerely,

Gary S. Morishima
Technical Advisor

Appendix B-4: CSAG Charter

The 2019 Washington State Legislature passed ESBH 1109, which includes a budget proviso (see Appendix 1) directing the Washington State Department of Natural Resources to conduct specific activities related to carbon sequestration on natural and working lands. These activities include formation of a Natural and Working Lands Carbon Sequestration Advisory Group to assist DNR with a report back to the Legislature by December 1, 2020. This charter establishes the purpose and roles for this advisory group.

2019 Legislative Charge to DNR (SHB 1109)

In 2019, the Legislature passed a budget proviso as a part of the state operating budget that directed DNR to undertake the following activities:

- Conduct carbon inventories to build on existing efforts to understand carbon stocks, flux, trends, emissions, and sequestration across Washington's natural and working lands, including harvested wood products, wildfire emissions, land management activities, and sawmill energy use and emissions; and
- Compile and provide access to information on existing opportunities for carbon compensation services and other incentive-based carbon reducing programs to assist owners of private and other nonstate owned or managed forestland interested in voluntarily engaging in carbon markets.

The Legislature specified that, where feasible, the department shall use available existing data and information to conduct this inventory and analysis. The Legislature also specified that for the purposes of this proviso, natural and working land types include forests, croplands, rangelands, wetlands, grasslands, aquatic lands, and urban green space.

The proviso requires that by December 1, 2020, the department must submit a report to the appropriate committees of the Legislature:

- Summarizing the results of the inventories required under this section;
- Assessing actions that may improve the efficiency and effectiveness of carbon inventory activities on natural and working lands, including carbon sequestration in harvested forest products; and
- Describing any barriers, including costs, to the use of voluntary, incentive-based carbon reducing or sequestering programs.

Finally, the proviso requires that the department must form a natural and working lands carbon sequestration advisory group to help guide the activities provided in this section. The advisory group must be composed of a balance of representatives reflecting the diverse interests and expertise involved on the subject of carbon sequestration on natural and working lands. In its report, the department may also include recommendations for additional work or legislation that may be advisable resulting from the advisory group.

The department notes that "the inventories required under this section" include harvested wood products, wildfire emissions, land management activities, and sawmill energy use and emissions, all of

which are inventories with relevance to the forest sector. The department also notes that the funding received for this proviso of $375,000 is sufficient to conduct these initial forest-related inventories, and to support facilitation for the work group. This level of funding is not sufficient to conduct new inventories outside this list specified by the legislature.

The department further notes that the legislature defines natural and working land types to include not only forests but also croplands, rangelands, wetlands, grasslands, aquatic lands, and urban green space. In light of this broad definition, the department acknowledges its intent to include in its final report to the legislature a summary of information currently available on inventories for this full range of natural and working land types.

Purpose of Work Group

The purpose of the Natural and Working Lands Carbon Sequestration Advisory Group (Advisory Group) is to provide advice and guidance regarding DNR's efforts to report back to the Legislature in the following areas specified in the budget proviso:

1. What are the results of carbon inventories required through the proviso?
2. What could be done to improve the efficiency and effectiveness of carbon inventories?
3. What are the existing opportunities for carbon compensation services and other incentive-based carbon reducing programs for forest landowners and managers who voluntarily engage in carbon markets?
4. What barriers exist, including costs, to the use of these services or programs?
5. Are there any recommendations for additional work or legislation that may be advisable resulting from the advisory group?

Roles and Responsibilities of Advisory Group Members

- Advise DNR on development of deliverables required by the Legislature.
- Review and help interpret results of deliverables.
- Assist DNR in creating linkages with other stakeholders outside the advisory group.
- Identify additional resources, including analyses, datasets, and experts for DNR to draw on as needed.
- Actively participate in five Advisory Group meetings. Meetings will likely be held in February, April, June, September, and October 2020.
- Work collaboratively with other CSAG members to develop recommendations for specific topics related to carbon sequestration in small groups between Advisory Group meetings.

Anticipated 2020 Timeline

Meeting #1	February 12	Discuss inventories and incentives
Meeting #2	May 8	Discuss inventories and incentives
Meeting #3	July 9 (tentative)	Discuss inventories and incentives
Small groups meet between meetings #3 and #4 to develop recommendations		
Meeting #4	Sept. 18 (tentative)	Vet recommendations
Meeting #5	Oct. 12 (tentative)	Finalize recommendations

Appendix B-5: CSAG Meeting Summaries

The CSAG's process and much of the context for its recommendations can be found in the meeting summaries, which were approved by each CSAG member. The appended summaries do not include referenced appendices or substantive meeting chat transcripts for those meetings held virtually. Click on the links below to view the entire summary, along with their respective appendices:

- Meeting 1, February 12, 2020
- Meeting 2, May 8, 2020
- Meeting 3, July 9, 2020
- Meeting 4, September 18, 2020
- Meeting 5, October 12, 2020

Carbon Sequestration Advisory Group

Meeting 1 Summary

MEETING INFORMATION

Date:	February 12, 2020
Time:	8:30am – 3:30pm
Location:	Lacey Community Center: 6729 Pacific Ave. SE, Olympia, WA 98503

9:00 AM: Opening remarks and introductions

- Welcome from Hilary Franz, Commissioner of Public Lands
- CSAG Members in attendance (listed alphabetically by last name):

Patti Case, Green Diamond	Cody Desautel, Colville Tribes (remote)
David Diaz, University of Washington	Joseph Donnegan, US Forest Service
Ara Erickson, Weyerhaeuser	Kathleen Farley Wolf, King County
Indroneil Ganguly, University of Washington	John Henrikson, Wild Thyme Tree Farm
Joe Kane, Nisqually Land Trust	Cherie Kearney, Columbia Land Trust
Mo McBroom, The Nature Conservancy	Mark McPherson, City Forest Credits
Gary Morishima, Quinault Indian Nation	Julius Pasay, The Climate Trust
Lisa Remlinger, Washington Environmental Council	Steve Rigdon, Yakama Tribe
Max Scher, Salesforce (remote)	Reed Schuler, Gov. Inslee's Office
Edie Sonne Hall, Three Trees Consulting	Jason Spadero, SDS Lumber
Skip Swenson, Forterra	Bill Turner, Sierra Pacific Industries
Mike Warjone, Port Blakely	Andrea Watts, Wildcat Tree Farm
Liz Willmott, Microsoft (remote)	Mark Wishnie, The Nature Conservancy (remote)
Lenny Young, DNR (CSAG Chair)	

- CSAG Staff:

Dan Stonington, DNR	Shelby Thomas, Ross Strategic
Rob Willis, Ross Strategic	

- Other Attendees:

Glenn Christensen, USFS Forest Inventory Analysis (presenter)	Matt Comisky (observer)
Olaf Kuegler, USFS Forest Inventory Analysis	

9:35 AM: Review legislative proviso and CSAG purpose, outcomes, roles, and responsibilities

- Lenny Young provided a copy of the budget proviso (ESHB 1109.SL, pp 238-239) that directs DNR to convene the CSAG and describes what DNR must accomplish with the $375,000 operating budget appropriation.
- The proviso is attached (see Appendix A) and also is available on the CSAG website.

- The CSAG went through the proviso line-by-line; Lenny addressed questions and comments that came up and the group resolved questions of scope and purpose. Discussion themes included:
    - CSAG's focus: CSAG will primarily advise on inventories and incentives relating to forest lands and forest products. At CSAG's second meeting on May 8, the group will resolve the extent to which to address carbon sequestration on other natural and working lands listed in the proviso (croplands, rangelands, wetlands, grasslands, aquatic lands, or urban green space).
    - CSAG's role in DNR's final report to legislature: There are two reports – the CSAG report to DNR, and the DNR report to the legislature. The CSAG Final Report will be appended to DNR's report to the legislature. CSAG members will not review DNR's report, but it will be distributed to CSAG members at the same time DNR submits it to the legislature.
    - Definition of "nonstate": Nonstate means all lands that are not owned by Washington.
    - Focus of incentives discussion: 24(a)(ii) has a more narrow focus ("owners of … forestland interested in voluntarily engaging in carbon markets") than 24(b), in which the proviso language creates broader opportunities for discussion and thinking on programs such as voluntary markets, compliance markets, or incentives such as EQIP.
    - When CSAG will discuss harvested wood products: HWP inventory methodology will be presented in Meeting 2 and the results will be discussed in Meeting 3.
- CSAG members reviewed and accepted CSAG outcomes, process for completing final report, and preliminary report content (see Appendix D).

10:15 AM: Review CSAG charter, schedule, timeline, and ground rules

- CSAG accepted the charter with the following clarifications and/or amendments:
    - Proviso clarifications as described above.
    - Modify CSAG purpose #3 to (additions in italics): What are the existing opportunities for carbon compensation services and other incentive-based carbon reducing programs for forest landowners *and managers* who *voluntarily* engage in carbon markets?
    - Any incentive-based carbon sequestration program would be for landowners and managers who *voluntarily* engage.
- The revised charter is available on the CSAG website.
- No questions or comments on CSAG schedule or timeline.
- Discussion themes about ground rules included:
    - Open public meetings: CSAG meetings are open for the public to attend, but not participate. CSAG will not take public testimony. Meeting notes and materials will be posted on the website. CSAG meetings will not be recorded.
    - DNR will provide via email detailed expectations for CSAG members around public meetings requirements.
    - "Proxy" vs. "alternate": Because the CSAG is not a voting body, it is more appropriate to use the word "alternate" when referring to a person who may attend meetings on a CSAG member's behalf.
- The CSAG reviewed and accepted the timeline (Appendix B), ground rules (Appendix C), and other relevant information regarding CSAG operations (Appendix D).

11:00 AM: 15-minute break

11:15 AM: Presentation 1: USFS Forest Inventory and Analysis (FIA) and Forest Inventory Methods

- Glenn Christensen presented information about the national FIA program, how data are collected and used, its role in the Pacific Northwest and Washington, and how it approaches forest carbon assessments and reporting. Glenn answered questions throughout the presentation.
- Presentation 1 slides are available on the CSAG website.
- Discussion and question themes included:
    - Plot data:
        - Data are available to landowners.
            - Inventory as a barrier to incentives: FIA provides high-level data but doesn't address questions for landowners who want to know information relevant to their land. More detailed inventory data could be a valuable resource for them.
        - Plot types include corporate and non-corporate as types of private plots but don't specify management type. A small family tree farm could be an example of a corporate or non-corporate plot, depending on the ownership structure, and a land trust is an example of a non-corporate plot.
        - Remote sensing is used to support stratification (wherein FIA measures all the plots and groups them to reduce the sampling error).
        - Plots in riparian zones can be classified as such.
        - Plots are measured at the same time every year (summer).
        - Dynamic factors or rare events are difficult to capture on the plots, e.g., a fire needs to be large-scale to be represented. If there is a large disturbance year, FIA can't necessarily capture the event in its measurements. However, FIA is looking at Image-based Change Estimation (ICE) which uses National Aerial Imagery Program (NAIP) to categorize plots every two years and look at change.
        - If denied access to a plot, FIA will try for up to three years to get access. Ten years later, they will try again. FIA does not use another plot, but it keeps track of which plots are not sampled.
            - FIA compensates for denied access in post-stratification.
    - FIA reports focus on status and trends, but do not provide projections (although FIA data are often used in projections).
    - How easily FIA can staff up: Given that it's difficult to hire at a federal level right now, if a state wants to invest in increasing the number of plots or frequency of measurements, it's easiest to partner with FIA and hire state employees; it would likely take a year to fully ramp up. There is also a question of whether there is an adequate labor pool for the field work.
    - National remote sensing work: Biomass research is happening at a national level; it uses local FIA data to train satellite instruments.
        - USFS Rocky Mountain is going to customize biomass maps down to the stand level (Rocky Mountain Research Station, Oakridge Laboratory).
    - Standard errors (SE) are low in terms of carbon stock measurements; they increase for carbon flux measurements.

12:30 PM: 30-minute lunch break

1:15 PM: Presentation 2: Washington's Forest Ecosystem Carbon Inventory

- Glenn Christensen presented information about FIA's forest ecosystem carbon inventory methods and terms, Washington's forest ecosystem carbon inventory results (stocks and flux) by region and ownership, and FIA next steps. Glenn answered questions throughout the presentation.
- Presentation 2 slides are available on the CSAG website.
- Discussion and question themes included:
    - Downed woody debris does not include piles because they are so variable.
    - All 22 million acres of forest in Washington are included in carbon stock numbers.
    - The model for soils may show a lower standard error for carbon flux than really exists, given that the model was not originally designed to show flux.
    - The bars on the annual change per acre graph (slide 21) are surprisingly similar.
    - It's difficult to compare live tree and dead tree data because they're the most dynamic. It's easier to compare a single pool.
    - "Growth" includes trees that have grown past one inch in diameter.
    - Net growth is volume at time 2 minus volume at time 1.
    - The data go through 2016 and do not capture wildfires since then.

2:15 PM: Break-out groups

- CSAG members and staff numbered off to form two groups: one group stayed in the main room with Rob and the remote participants, and the other group went into a separate room with Shelby to discuss:
    - Initial impressions of Glenn's second presentation.
    - Conversations that CSAG needs to have in the future.
    - Washington carbon stocks and flux on forest land by region.
    - Washington carbon stocks and flux on forest land by region and pool.
- Break-out group worksheets and photos of facilitator notes are available on the CSAG website.

3:15 PM: Regroup and next steps

- CSAG regrouped to cover next steps and logistics for Meeting 2.
    - Meeting 2 will be on May 8, 2020.
    - The agenda for Meeting 2 will be distributed two weeks prior to the meeting.
    - CSAG members should expect updated calendar invites for remaining meetings.
    - A draft Meeting 1 Summary will be posted on the CSAG website by March 2. CSAG will discuss any needed changes and approve a final meeting summary at the group's second meeting on May 8.

3:30 PM: Adjourn

Carbon Sequestration Advisory Group

Meeting 2 Summary

MEETING INFORMATION

Date: May 8, 2020

Time: 9:00am – 2:00pm

Location: Zoom virtual meeting

9:00 AM: Opening remarks and introductions

- Welcome from Lenny Young
- Throughout the meeting, CSAG members were encouraged to use the Zoom virtual meeting chat box to ask questions and make comments. The group chat transcript is included at the end of this summary.
- CSAG Members in attendance (listed alphabetically by last name):

Patti Case, Green Diamond	Cody Desautel, Colville Tribes
David Diaz, University of Washington	Joseph Donnegan, US Forest Service
Ara Erickson, Weyerhaeuser	Kathleen Farley Wolf, King County
Indroneil Ganguly, University of Washington	John Henrikson, Wild Thyme Tree Farm
Joe Kane, Nisqually Land Trust	Cherie Kearney, Columbia Land Trust
Mo McBroom, The Nature Conservancy	Mark McPherson, City Forest Credits
Gary Morishima, Quinault Indian Nation	John-O Niles, Salesforce (alternate for Max Scher)
Julius Pasay, The Climate Trust	Steve Rigdon, Yakama Tribe
Edie Sonne Hall, Three Trees Consulting	Jason Spadero, SDS Lumber
Skip Swenson, Forterra	Bill Turner, Sierra Pacific Industries
Mike Warjone, Port Blakely	Andrea Watts, Wildcat Tree Farm
Max Webster, Washington Environmental Council (alternate for Lisa Remlinger)	Mark Wishnie, BTG Pactual
Lenny Young, DNR (CSAG Chair)	

- CSAG Staff:

Dan Siemann, DNR	Dan Stonington, DNR
Shelby Thomas, Ross Strategic	Rob Willis, Ross Strategic

- Other Attendees:

Mike Anderson, The Wilderness Society	Glen Christensen, USFS-FIA
Brian Cochrane, SCC	Grant Domke, USFS (presenter)
Ben Donatelle, RCO	John Hagan, Maine Climate Table
Heath Heikkila, AFRC	Brian Kittler, American Forests (presenter)
Mike Nichols, USFS (presenter)	Representative Bill Ramos, 5th Legislative District

Jasmine Reppen, DNR	Nadia Tase, Cal Fire
Seth Zuckerman, NNRG	

9:30 AM: Presentation 1: Overview of Washington's Harvested Wood Products Assessment

- Grant Domke, USFS, presented the methods used to determine carbon stocks and fluxes associated with harvested wood products.
- The presentation slides are available on the CSAG website.
- Discussion themes and topics addressed in questions and answer session:
    - *Life Cycle Analysis vs HWP stocks and flux*: Washington DNR's approach to creating a carbon inventory of harvested wood products is not the same as a life cycle analysis (LCA). DNR is using this HWP analysis approach in order to be consistent with recent inventories in California and Oregon, and for consistency with international reporting standards for carbon stocks and fluxes. The State of Washington already gathers certain components of an LCA through the GHG emissions inventory that the state Department of Ecology is required to perform every two years. That said, there are still numerous gaps in data availability for LCAs.
    - *Wildfires*: Emissions estimates from wildfires are calculated through a variety of reports. Wildfire emissions are reported on a national scale, including CO2 and non-CO2 emissions. Wildfire emissions are also captured in stock changes in the forest ecosystem estimates presented by USFS at CSAG meeting #1. In addition, DNR is refining the agency's more detailed model for annual wildfire emissions estimates as part of the carbon budget proviso, and will have results to share with the group at future CSAG meetings.
    - *Salvage harvest*: Salvage harvests and the carbon from these harvests would be included in the HWP estimates in the same way as carbon from other harvests.
    - *Recycling:* Factoring in recycling that happens in a different country is a national-level challenge for HWP analyses.
    - *Production Method:* This project uses the IPCC Production method which has also been adopted by US EPA and used in recent analyses by California and Oregon. For the most part, there's not much controversy with the production approach at the state level. The controversy that does exist has been around biomass and concern that wood emissions from biomass are not captured in the inventory. If wood is cut in the US and then burned for energy in England, then England is utilizing that wood and the US is paying the emissions price. There are also some related questions about substitution effects.
    - *Landfill methane*: The question of how to factor in landfill management or recovering methane emissions is being explored at the national scale. Non-carbon emissions have changed over time and are regionally specific, so relying on national trends may not be appropriate. There's a data opportunity for time series information at the state level.
    - *Washington-specific data, support from CSAG*: In order to get the best results, improve sensitivity analysis, and reduce uncertainty, USFS welcomes input from CSAG members on what information is available for use in the HWP model at each phase such as primary product ratios, conversion factors, end-use ratios, and the fate of wood in landfills.
    - *Storage projections:* Projections are an interesting data point to consider; it connects the land today with the wood products pool that will occur in the future. Projections are not within the USFS HWP scope for this project.

- *Regional variability in the state*: USFS has an opportunity to recognize the interest in the LCA community and building community in information to differentiate regional variability in wood supply. Also, note that if USFS does look to provide info on regional variability, county-level data may not create an accurate picture because HWP do not stay within county boundaries; wood supply boundaries should be considered instead.
- *Substitution*: The substitution impact of harvested wood products (increased/decreased emissions attributable to the use of wood products rather than alternative materials) is not included in the scope of the USFS HWP assessment.
- *NASA carbon info:* CSAG should look at the Carbon Monitoring System by NASA

10:45 AM: 10-minute break

10:55 AM: Presentation 2: Forest Carbon Incentives in Washington

- Brian Kittler, American Forests, presented an initial compilation of information on existing opportunities for carbon compensation services and other incentive-based carbon reducing programs for landowners who are interested in voluntarily engaging in carbon markets.
- The presentation slides are available on the CSAG website.
- Topics addressed in question and answer session:
  - *Number of WA projects*: The information on the number of projects/acres under each program is specific to Washington state.
  - *Forest health:* The incentives list includes DNR, NRCS, and other programs related to cost-share for thinning for fire resiliency or other forest health objectives.
  - *Application info for landowners:* For the next version of the spreadsheet, there's information being compiled about how to apply to the various listed programs, such as contact information, application procedures, and amounts of funding available.
  - *Landowner types:* The next version of the spreadsheet will specify landowner types (industrial, family forest, NGO, tribes, etc.) that are accessing the different types of incentives/funding.
  - *Incentives for wood products*: American Forests would benefit from discussion among CSAG on the question of whether incentives for the use of wood building products should be identified (if existing) and considered as having carbon nexus.
  - *Sequestration potential:* The incentives list and CSAG discussion should focus more on sequestration potential and the contribution we are making to global GHG reductions. Which programs really move the needle in terms of additional sequestration? It would be helpful to put our state in the global context of the role that our state and lands can play.
  - *Washington Wildlife and Recreation Program*: The incentives list does include WWRP grants and projects but was filtered to exclude projects with less than 95% forest cover.
  - *Multi-purpose programs vs carbon explicit programs*: The incentives list is not currently organized to identify whether more generalized forest stewardship, conservation, and protection programs are more or less effective or accessible than carbon-explicit programs.
- The CSAG split into four breakout groups (facilitated by Dan Stonington, Dan Siemann, Lenny Young, and Rob Willis) to discuss what jumped out to them about the incentive types. After 20 minutes, the groups reconvened to share the results of their conversation. Breakout group notes are available on the CSAG website.

12:20 PM: 30-minute lunch break

12:50 PM: Introduce Incubator Teams and Round-table Discussion

- Lenny opened the round-table discussion by explaining that this time is designed to provide CSAG members with an open-ended opportunity to share their perspectives:
    - An opening comment highlighted that the CSAG's dialogue is important and timely, given the Legislature passed a net zero bill acknowledging the role of sequestration and also passed the forest products and climate bill. At the same time, there is an opportunity to get sequestration considered in the state energy policy. There should be robust engagement around these opportunities so that the net zero conversation in the state reflects the perspectives of CSAG.
- Facilitators shifted the conversation to introduce Incubator Teams to CSAG, which sparked discussion around what an appropriate and effective Incubator Team process would look like. CSAG members discussed topics including approach, scope, organization, workload, and representation. Ultimately, the CSAG decided:
    - There will be two Incubator Teams:
        - Actions to improve carbon inventories
        - Barriers to the use of incentive-based carbon reducing programs
    - The Incubator Teams will have a divide-and-conquer approach to take advantage of limited time and allow the CSAG to tackle several topics within their teams (including how HWP fits in).
    - Membership will be balanced and reflect the perspectives of the CSAG as a whole.

2:15 PM: Next steps

- CSAG regrouped to cover next steps and logistics for Meeting 3.
    - Meeting 3 will be on July 9, 2020. Anticipated meeting topics include:
        - Results from HWP
        - Follow up on Incentives spreadsheet
        - Discuss CSAG's policy interface
        - Wildfire emissions
        - Non-forest ecosystems
    - The agenda for Meeting 3 will be distributed two weeks prior to the meeting.
    - A draft Meeting 2 Summary will be distributed within ten business days. CSAG will discuss any needed changes and approve a final meeting summary at the group's third meeting.
    - All materials will be posted online on the CSAG website.

2:30 PM: Adjourn

Carbon Sequestration Advisory Group

Meeting 3 Summary

MEETING INFORMATION

Date: July 9, 2020

Time: 9:00am – 3:00pm

Location: Zoom virtual meeting

9:00 AM: Opening remarks and introductions

- Welcome from Lenny Young
- CSAG Members in attendance (listed alphabetically by last name):

Patti Case, Green Diamond	David Diaz, University of Washington
Joseph Donnegan, US Forest Service	Ara Erickson, Weyerhaeuser
Kathleen Farley Wolf, King County	Indroneil Ganguly, University of Washington
John Henrikson, Wild Thyme Tree Farm	Theo Holt, The Nature Conservancy
Cherie Kearney, Columbia Land Trust	Mark McPherson, City Forest Credits
Gary Morishima, Quinault Indian Nation	John-O Niles, Salesforce (alternate for Max Scher)
Julius Pasay, The Climate Trust	Steve Rigdon, Yakama Tribe
Edie Sonne Hall, Three Trees Consulting	Jason Spadero, SDS Lumber
Skip Swenson, Forterra	Bill Turner, Sierra Pacific Industries
Mike Warjone, Port Blakely	Max Webster, Washington Environmental Council (alternate for Lisa Remlinger)
Mark Wishnie, BTG Pactual	Lenny Young, DNR (CSAG Chair)

- CSAG Staff:

Dan Siemann, DNR	Dan Stonington, DNR
Shelby Thomas, Ross Strategic	Rob Willis, Ross Strategic

- Other Attendees:

Mike Anderson, The Wilderness Society	Glenn Christensen, USFS-FIA (presenter)
Brian Cochrane, SCC	Grant Domke, USFS (presenter)
Ben Donatelle, RCO	Andrew Gray, USDA
Alison Halpern, SCC	Heath Heikkila, AFRC
Brian Kittler, American Forests (presenter)	Mike Nichols, USFS (presenter)
Gail Sandlin, WA Dept. of Ecology	Andrew Yost, Oregon Dept. of Forestry

9:20 AM: CSAG Context and Discussion

CSAG members responded to a discussion prompt: How might events that have transpired since our first meeting, including current circumstances with COVID-19 and Washington's response to it, affect the CSAG's process in fulfilling its proviso? Discussion themes and comments included:

- Resources to address carbon sequestration may be more limited due to financial constraints and the attention COVID-19 requires.
- Since the COVID-19 health crisis began, there has been a huge flow of people from urban to rural communities. Avoiding conversion of working lands to other uses may be increasingly important.
- CSAG needs to be strategic and focus on areas where a real difference can be made in a short amount of time. CSAG should focus on ensuring that incentives are accessible, scalable, and tailored to situations in which they can be most successful.
- Because state funding may be limited, market forces are even more critical to consider – How can the market help CSAG reach its goals?
- There is an opportunity to tie our work into moving toward a Green Recovery and articulate how sustainable green jobs with the right incentives can help us emerge from our multiple crises. There is also the context of historical injustices and the need to lift up diverse communities in a recovery that considers the environmental, social, economic, and spiritual health of our lands and people for today's generations and many into the future.
- CSAG should stay anchored in our original charge from the legislature and strive for unbiased and comprehensive understanding, as well as outcomes and next steps that are relevant and easy for legislators and others to understand.
- There is the context of new state emissions reduction goals from the Legislature, which also recognized a priority to increase carbon sequestration.

9:35 AM: Carbon Inventories Work Session

- Inventory Incubator Team (IT) members shared their takeaways from the IT meetings between CSAG meetings 2 and 3. The takeaways included:
    - *Add interpretation*. The HWP and forest ecosystem data can be confusing and IT members encouraged more interpretation of what the data mean.
    - *Relate to incentives discussion*. Potential incentives could inform what questions should be asked of the inventory data; CSAG can think about questions that relate to potential incentives that exist or need to be created.
    - *Consider existing policies and levers*. CSAG should think about how inventories are geared toward activities, policies, and levers that already exist when developing recommendations.
- Presentation 1: Harvested Wood Products Assessment for Washington – Preliminary Results
    - Mike Nichols, USFS, and Grant Domke, USFS, presented preliminary carbon inventory results associated with harvested wood products (HWP) in Washington. Glenn Christensen, USFS-FIA, compared the HWP results with the forest ecosystem carbon inventory results he shared at Meeting 1.
    - The presentation slides are available on the CSAG website.
    - The question and answer session addressed:

- Captured emissions from landfills are not included in HWP results (they would be in a landfill assessment); USFS does not have a way to track methane produced by wood products and how much of that methane gets captured for reuse.
- The model accounts for recycling, which is included in 'recaptured.'
- The change in the standing dead carbon pool between FIA periods and the decrease in down woody debris may be a legacy of what was there prior to these FIA measurements.
- The soil and forest floor estimates are modeled and are the same size as the standard error; FIA is not as confident in these estimates and there's a lot we don't know about soil carbon.
- The HWP model's production approach accounts for where the harvested trees for HWP are grown, not where the HWP are manufactured.
- Changes in the HWP pool reflect the transfer of new wood from the forest entering the cumulative HWP pool. A year in which the 'products in use' category of HWP is negative does not indicate that there is an emission from the forest in that year.

10:45 AM: 15-minute Break

11:00 AM: Carbon Inventories Work Session, cont'd

- Breakout Groups
  - The CSAG broke into three breakout groups (facilitated by Dan Siemann, Dan Stonington, and Rob Willis) to discuss two questions:
    - What observations do you have about the forest ecosystem and HWP inventory results?
    - What questions do you anticipate policy makers asking about these results?
  - The breakout group notes are available on the CSAG website.
  - Themes that emerged from the three groups and the discussion that followed included:
    - *Clear interpretation of results*. Decision makers will be challenged with competing interests and needs so they need a clear, concise message about what the inventory results can and cannot tell us - the 'so what' aspect of inventories. Graphs, charts, or other graphics can help. So can highlighting numbers for which there is high certainty and confidence. Another idea was to display results like a 'nutrition label.'
    - *Sensitivity of results*. Understanding the sensitivity of the HWP and forest ecosystem results to various inputs could improve understanding of the results and also indicate the type of incentives, actions, or policies that could make the most difference for carbon.
    - *Variation by geography and ownership*. While it is important to keep results and interpretation clear and simple, results should also include enough nuance and detail to describe important trends and changes in carbon dynamics by region (east/west, ecoregion, etc) and by ownership. Understanding these variations can help to fine tune incentives and recommendations.
    - *Projections and scenarios*. The current inventories are carbon accounting tools and are based on measurements and modeling of past results. Building on this, policy makers are likely to ask for decision-making tools to guide decisions on the types of incentives that would be most beneficial. Projections and scenario development could help us understand what is likely to happen under various policies or other

changes. Projections and scenarios can also help identify potential unintended consequences and who the winners and losers may be with any given inventory improvement strategy or policy intervention.

- *Improvements to technical inventory methods*. Multiple potential improvements to technical inventory methods were suggested for exploration including intensifying the FIA plot grid in Washington, utilizing remote sensing in additional ways, and improving measurements about the disposition of products.

12:15 PM: 30-minute Lunch Break

12:45 PM: Barriers to Incentive-based Programs Work Session

- Brian Kittler, American Forests, presented an updated spreadsheet that separates incentive-based programs with and without an explicit carbon focus and identifies both common and specific barriers for the programs. The presentation included two preliminary recommendations developed by the Incentives IT:
    1. Support further analysis to identify useful information in addition to program barriers; and
    2. Turn the list into a resource for landowners.
- The CSAG discussed general reflections on common barriers as well as the two preliminary recommendations as a full group.
    - General reflections on common barriers included:
        - It would be worth distinguishing between barriers for programs that are pay for performance incentives as opposed to offset incentives or cost-share incentives.
        - The spreadsheet focuses on landowners and so it currently omits barriers for HWP such as public opposition to zoning codes that would allow more density in urban areas. This is a timely topic given the current context of trying to address historical disparities resulting from restrictive or exclusionary zoning.
        - The state could take action to address barriers to some incentive programs, but if there is a local implementation element as well, there may be additional barriers at the local level that also need to be addressed.
        - For CA market compliance offsets in Washington, three factors have served as barriers: a fear of invalidation of credits, the high cost of sequential sampling, and the clearcut size limit of 40 acres. Addressing these could increase adoption. Put another way, landowners need increased flexibility and increased accessibility to make offset projects work better for WA forests.
    - Discussion themes around the first recommendation included:
        - Further analysis should emphasize finding the tools that are working and identifying how we can improve, bolster, and fund them. Further analysis should go beyond a list of the barriers and ask what we can achieve and whether we are moving the needle.
        - Project examples will help put a finer point on what works and what doesn't.
        - Further analysis can identify how to create a mix of tools and resources for diverse user groups and diverse landowners.
        - A potential recommendation could be for the state to set up its own crediting system, standards, and registry. This could help create demand for carbon by adapting a system to fit the Washington context.
        - Setting up a new crediting system and registry is a complicated undertaking and there may be better options to pursue. These might include: increasing social license of managing forests; using innovative zoning tools to conserve resource

lands but still allow some development in areas less valuable for natural resources; increasing carbon storage on forest land; preventing losses to mortality and fire; providing incentives for silvicultural practices that increase sequestration; or creating incentives for wood substitution in building materials.

- Discussion themes around the second recommendation included:
  - This recommendation has a bureaucratic aspect to it. We should consider the social and political barriers that landowners face. Landowners often access resources through relationships.
  - Landowners are also finding information online more than ever before. We should consider whether we can make this incentive program list available online so that landowners can query what is applicable to them. Other examples of tools include American Forest Foundation's Wood Camp, and an online tool that Forterra is beta testing with partners in the Chehalis Basin: http://stg.forterra-chehalis.testcrafting.com/v5_0.html
  - The list may be better suited as a resource for intermediaries (e.g., industry associations or technical assistance providers) rather than landowners.
  - The list will be valuable for all types of landowners because they all face barriers.

2:05 PM: 15-minute Break

2:20 PM: Round Table Discussion

CSAG members discussed Incubator Team work to be done between Meetings 3 and 4. Ultimately, the group decided the two initial ITs focused on carbon inventories and barriers to incentive-based programs should continue and two additional ITs focused on wildfire emissions and non-forest ecosystems should form. Topics raised during the discussion included:

- The need to develop a final report relatively soon (by early November) and the benefits of dividing tasks and getting work done are worth the extra time. ITs were helpful and make space for bigger steps forward.
- Moving forward should not focus on additional work "massaging data" and should instead focus on framing questions to get to desired outcomes.
- The CSAG report content should be focused on the needs of the Legislature; it needs to synthesize the information, highlight the importance, and bring forward recommendations.
- The new ITs need to have specific tasks and a clear picture of how the information is going to come together in Meeting 4.

2:40 PM: Next steps

- CSAG regrouped to cover next steps and logistics for Meeting 4.
  - Meeting 4 will be on Friday, September 18, 2020. Anticipated meeting topics include:
    - IT work between Meetings 3 and 4
  - A draft Meeting 3 Summary will be distributed within ten business days. CSAG will discuss any needed changes and approve a final meeting summary at the group's fourth meeting.
  - All materials will be posted online on the CSAG website.
  - ITs will convene between Meetings 3 and 4.
  - The agenda for Meeting 4 will be distributed two weeks prior to the meeting.

2:45 PM: Adjourn

Carbon Sequestration Advisory Group
Meeting 4 Summary

MEETING INFORMATION

Date: September 18, 2020
Time: 9:00am – 1:45pm
Location: Zoom virtual meeting

9:00 AM: Welcome and Opening Remarks

- Welcome from Lenny Young
- CSAG Members in attendance:

David Diaz, University of Washington	Joseph Donnegan, US Forest Service
Ara Erickson, Weyerhaeuser	Kathleen Farley Wolf, King County
Indroneil Ganguly, University of Washington	John Henrikson, Wild Thyme Tree Farm
Theo Holt, The Nature Conservancy	Cherie Kearney, Columbia Land Trust
Mark McPherson, City Forest Credits	Gary Morishima, Quinault Indian Nation
John-O Niles, Salesforce (alternate for Max Scher)	Steve Rigdon, Yakama Tribe
Julius Pasay, The Climate Trust	Jason Spadero, SDS Lumber
Edie Sonne Hall, Three Trees Consulting	Bill Turner, Sierra Pacific Industries
Skip Swenson, Forterra	Max Webster, Washington Environmental Council (alternate for Lisa Remlinger)
Mike Warjone, Port Blakely	Lenny Young, DNR (CSAG Chair)
Mark Wishnie, BTG Pactual	

- CSAG Staff:

Dan Stonington, DNR	Shelby Thomas, Ross Strategic
Rob Willis, Ross Strategic	

- Other Attendees:

Glenn Christensen, USFS-FIA	Pascale Chamberland, UW
Brian Cochrane, SCC	Doug Cooper, Hampton Lumber
Chris Elder, Whatcom County	Sarah Zaniewski, Squaxin Tribe
Seth Zuckerman, Northwest Natural Resource Group	

9:20 AM: Draft Incentives Recommendations and Discussion

CSAG members reviewed collective edits and comments they made to potential incentives recommendations prior to Meeting 4. Observations on specific recommendations included:

Possible Incentives Recommendation 1

- The avoided conversion recommendation is an example of how the incentive recommendations need to be better tied into the inventory recommendations.
- In addition to avoided conversion, reforestation and afforestation are key components to mitigating conversion and maintaining forestland; these other components should be referenced or included.
- CSAG should consider whether other topics (e.g., wildfires, forest management, afforestation) should have a similar set of recommendations.

Possible Incentives Recommendations 2 and 4

- A gap analysis would be helpful to determine whether programs are adequately sequestering carbon, although, without carbon sequestration goals or targets, this may be difficult to determine.
- Small forest landowners need a program that specifically pays landowners for carbon sequestration and funds it at adequate amounts.
- Recommendation 2 as currently written needs to link to inventory information. This would help inform needs for program funding.
- Merging Recommendation 2 with Recommendation 4 could make them more substantial. The first component is how to boost existing programs. Then there is an opportunity to identify gaps and, perhaps, any new programs that may be needed.
- An analysis could estimate how much funding would be necessary to hit a particular carbon sequestration target.

Possible Incentives Recommendation 3

- Price point transparency for different options in the voluntary carbon market could be helpful.
- Carbon offsets are designed to compensate for continuation of emissions elsewhere and therefore do not necessarily reduce global atmospheric GHG concentrations. Offsets are also a small part of the overall picture of incentive programs.
- Ideas for advancing offsets include advocating for changes to the CA offset system, creating a separate crediting system in WA, developing cap and trade in WA, or linking WA to a regional offset market.
- Work on offsets should be mindful of potential impacts on wood supply and use of products.

10:30 AM: 15-minute Break

10:45 AM: Draft Inventories Recommendations and Discussion

CSAG members reviewed collective edits and comments they made to potential incentives recommendations prior to Meeting 4. Observations on specific recommendations included:

Possible Inventories Recommendation 1

- Further thoughtfulness is needed about communicating to legislators and how information is packaged. This information will be used by many groups for communication purposes, not just DNR or UW.

Possible Inventories Recommendation 2

- Flux information is important because it highlights where carbon sequestration work needs to happen.
- This recommendation should apply to harvested wood products and all land types, not just forestland.

Possible Inventories Recommendation 3

- Sensitivity analysis is an important next step; assumptions in the models need to be transparent to avoid misinterpretation.
- The idea behind sensitivity analysis is to make the research and inventory results actionable.

Possible Inventories Recommendation 4

- Inventories are currently limited in terms of small area estimation (finer scales). Linking inventories together would create a more holistic picture of forest conditions and be more scalable.
- There are many remote sensing opportunities that could be pursued, and it would be most beneficial if data were open and shared among parties.

Additional Possible Inventories Recommendations

- Inventory results are a snapshot in time. It may be beneficial to increase frequency of FIA data collection (currently every 10 years). More frequent information would be helpful as markets continue to evolve.
- There is a need to focus on the net impact of using wood materials versus other materials (substitution).
- Lack of funding is a key concern for incentive-based programs. The CSAG report should add a statement that encourages the Legislature to consider DNR requests to fund various carbon sequestration programs and implement recommendations.

12:00 PM: 45-minute Lunch Break

12:45 PM: Round Table Discussion

This discussion time was designed to capture any additional thoughts CSAG members had about recommendations. Some topics that were brought up include:

- Impacts of wildfires (loss of carbon stocks, carbon emissions, forest management, impacts of climate change that affect forest health) are top of mind for everyone right now and should be underscored in some way. We need to see this as a common problem so we can work together on solutions.
- We need to acknowledge that forests are changing and their character will continue to change.
- The CSAG focus was limited to forestry and should have been attuned to reducing GHG concentrations.
- As a diverse group, we recognize that there is no one solution. Instead, there are many different actions that will have an impact. This is an important finding from our journey of learning as a group – our recognition of all the different ways we can advance efforts to solve this massive challenge.

- The state energy strategy could be an opportunity to focus carbon sequestration work on specific targets.
- A big opportunity to sequester carbon lies in local-level action with landowners. The challenge is too complex for one size fits all solutions. Communities and landowners need to take ownership of what is in our backyard.

1:30 PM: Process to Finalize CSAG Report

- Draft of CSAG Report will be shared with CSAG members on Sept. 28
- CSAG members will have ~1 week to provide detailed feedback

1:40 PM: Next steps

- Meeting 5 on Monday, October 12, will focus on report revisions based on CSAG member edits and comments
- The final CSAG report will be distributed to the CSAG before DNR submits its report to the Legislature on December 01

1:45 PM: Adjourn

Carbon Sequestration Advisory Group
Meeting 5 Summary

MEETING INFORMATION

Date: October 12, 2020
Time: 9:00am – 1:45pm
Location: Zoom virtual meeting

9:00 AM: Welcome and Opening Remarks

- Welcome from Lenny Young
- CSAG Members in attendance:

Cody Desautel	Joseph Donnegan, US Forest Service
Ara Erickson, Weyerhaeuser	Kathleen Farley Wolf, King County
Indroneil Ganguly, University of Washington	John Henrikson, Wild Thyme Tree Farm
Cherie Kearney, Columbia Land Trust	Gary Morishima, Quinault Indian Nation
John-O Niles, Salesforce (alternate for Max Scher)	Julius Pasay, The Climate Trust
Edie Sonne Hall, Three Trees Consulting	Jason Spadero, SDS Lumber
Skip Swenson, Forterra	Bill Turner, Sierra Pacific Industries
Max Webster, Washington Environmental Council (alternate for Lisa Remlinger)	Mark Wishnie, BTG Pactual
Lenny Young, DNR (CSAG Chair)	

- CSAG Staff:

Dan Stonington, DNR	Shelby Thomas, Ross Strategic
Rob Willis, Ross Strategic	

- Other Attendees:

Brian Cochrane, SCC	Jason Callahan, Washington Forest Protection Association
Chris Elder, Whatcom County	Hilary Franz, Washington Commissioner of Public Lands
Heath Heikkila, American Forests	

9:10 AM: Non-forest Ecosystem Update

- DNR is working with Colorado State University to extract Washington-specific data from US EPA National Greenhouse Gas Inventory. The final DNR report will include cropland and grassland results from 1990-2015.
- Although the results are not ready as of Meeting 5, a snapshot of cropland soil carbon flux (below) was provided as an example.

Table 6-30: Net CO_2 Flux from Soil C Stock Changes in *Cropland Remaining Cropland* (MMT CO_2 Eq.)

Soil Type	1990	2005	2014	2015	2016	2017	2018
Mineral Soils	(58.2)	(62.4)	(44.7)	(44.9)	(54.3)	(55.1)	(49.4)
Organic Soils	35.0	33.4	32.5	32.1	31.6	32.8	32.8
Total Net Flux	**(23.2)**	**(29.0)**	**(12.2)**	**(12.8)**	**(22.7)**	**(22.3)**	**(16.6)**

Notes: Totals may not sum due to independent rounding. Parentheses indicate net sequestration.

9:25 AM: Revising Inventory Recommendations

CSAG members reviewed CSAG Report changes made by the consulting team between Meetings 4 and 5 based on the discussion during Meeting 4. Lenny Young, the CSAG Chair, encouraged members to share anything they believe should be in the CSAG Report and to keep the distinction between the CSAG Report and DNR's report in mind. Observations included:

- Because the CSAG did not have an opportunity to review DNR's report, they do not know whether DNR followed the recommendation to present inventory information in clear, non-technical terms that makes it easy for decision makers to identify where carbon stocks and fluxes could be affected by policies and incentives. Therefore, the CSAG cannot endorse DNR's representation of inventory results. The relationship between the CSAG process and DNR's report needs to be clear in the final CSAG Report.
- The CSAG Report does not include a dedicated section that describes the discussion CSAG members had regarding forest carbon inventories, methodologies, and interpreting results, despite the fact this work is outlined in the proviso.
- The CSAG discussions and recommendations have covered topics beyond carbon sequestration and it's more accurate to use the phrase "carbon impacts."
- Regarding Inventory Recommendation 4: It's important to distinguish between databases and models: inventory databases can be refined by using different techniques (e.g., remote sensing) and improve models.

10:35 AM: 10-minute Break

10:45 AM: Revising Inventory Recommendations, continued

CSAG observations, continued:

- Regarding Inventory Recommendation 5: There is a difference between "carbon stored in wood" and "embodied carbon:" Embodied carbon refers to carbon-intensive materials that are substituted for harvested wood products (which actually store carbon).

10:50 AM: Message from Hilary Franz, Commissioner of Public Lands

10:55 AM: Revising Incentives Recommendations

CSAG observations regarding the incentives recommendations included:

- The CSAG Report does not provide much context for incentive-based programs and their barriers.
- The CSAG discussed several types of barriers to incentive-based programs; this broad consideration should be reflected in the CSAG Report even if does not list every single barrier discussed.
- Specific to Incentives Recommendation 3: It's important to be very clear about what the CSAG is asking the state to do in terms of increasing flexibility and accessibility to carbon offset projects. Not all members feel this recommendation is clear enough. Additionally, several CSAG members don't feel comfortable recommending carbon offset programs without more context. (The CSAG did not have the opportunity to discuss carbon offset programs at length.) The CSAG discussed the idea of including a disclaimer with this recommendation along the lines of, "The CSAG was focused on removing barriers to landowner participation in offset markets and not on the climate effectiveness of the offset markets themselves," but ultimately decided not to include it because the same could be said for many of the incentive-based programs and in fact offset programs are the only programs with a carbon accounting methodology subject to scientific and public review. Instead, the recommendation will include preamble language to clarify that the CSAG didn't discuss or endorse the effectiveness of any protocols.

12:00 PM: 45-minute Lunch Break

12:45 PM: Revisions to CSAG Report, continued

Note: The discussion around Incentives Recommendation 3 continued into this time. The CSAG ended the meeting by discussing the Introduction section of the CSAG Report. Observations included:

- The CSAG is not a stand-alone effort yet the Report does not reference the Forest Action Plan, State Energy Strategy, Sustainable Farm and Field legislations, etc. The broader framework is important and DNR staff acknowledged that it will be included in the DNR report.

1:30 PM: Process to Finalize CSAG Report

- Final draft of CSAG report will be shared with CSAG members on Monday, October 19
- CSAG members will have one week (until Monday, October 26) to provide a response.
- The final CSAG Report and CSAG member responses will be appended to the DNR Report which will be submitted to the Legislature on December 01, 2020.

1:45 PM: Adjourn