(carbon)plan

AUG 18, 2025

Mr. Jordan Wildish
Department of Ecology
300 Desmond Drive SE
Lacey, WA 98503

RE: Comments pertaining to US Forest Protocol Draft rule language

Dear Mr. Wildish:

Thank you for the opportunity to comment on the Department of Ecology's draft version of its US Forest Protocol (hereinafter, "Draft Protocol").[1] Throughout my comments, I will also refer to an Ecology document that provides additional justification for its proposed changes (hereinafter, "Justification Document").[2]

For context, CarbonPlan is a nonprofit research organization with extensive experience in studying the science and mechanics of the global offsets market. Furthermore, I served on Ecology's US Forest Offset Technical Working Group. My comments draw on that background, as well as my training as a forest ecologist who has published extensively on the terrestrial carbon cycle.

Before getting to the main body of my comments, I want to call attention to the fact that the materials that Ecology has released for comment are incomplete. Ecology acknowledged that additional materials are forthcoming during a public meeting associated with this comment period.[3] Those additional materials include: full descriptions of assessment areas, calculated common practice values, and updated wildfire and disease/insect risk factors. All of these factors are central to calculating credits, so as a result, it is nearly impossible to accurately evaluate the Draft Protocol without these details. This undermines Ecology's efforts to obtain public input. Furthermore, comments submitted in this first round of input could very well be rendered obsolete based on details contained within currently undisclosed information. That places a significant burden on the public to continually engage with Ecology over multiple rounds of review.

More troubling, the Draft Protocol provided by Ecology contains at least one obvious error. The Draft Protocol requires that improved forest management projects on public lands submit a report from the "Carbon On Line Estimator (COLE)" tool.[4] The Draft Protocol links to http://www.ncasi2.org/COLE/ for generating those reports. That link, however, appears to have been abandoned and, on some occasions, seems to prompt the user to install what appears to be malware. Altering the address to http://www.ncasi.org/COLE/ (dropping the

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1 Washington Department of Ecology, Draft U.S. Forest Protocol, Rule Development Phase (Jul. 15, 2025).

2 Washington Department of Ecology, Proposed revisions to U.S. Forest Protocol, Rule Development Phase (Jul. 15, 2025)

3 Washington Department of Ecology, U.S. Forest Protocol Public Meeting, (Jul. 24, 2025).

4 Draft Protocol at §6.2.2.1.

2 from the url) redirects to a NCASI website that suggests that the COLE tool has been offline for around six years "due to server failure in 2019." This raises serious questions about the text of the Draft Protocol. Does Ecology intend to have some projects submit COLE reports? If so, how should they be generated?

Such errors are especially concerning given the inherent asymmetry of forest carbon offsets as a policy instrument: forest offsets allow the certain and irreversible emission of fossil CO_2 to be exchanged for claimed carbon storage that is vulnerable to reversal, measurement error, and non-additionality. When incorporated into a compliance program that places a cap on emissions, flawed offsets can result in the emission of additional CO_2 to the atmosphere that might otherwise have been addressed by real emissions reductions at regulated facilities. These risks are only heightened by the exceptionally long atmospheric lifetime of CO_2 — additional emissions of fossil CO_2 lead to effectively permanent increases in global temperatures.[5] This physical reality of the global carbon cycle leaves no room for accounting errors when it comes to offsetting. I am concerned the Draft Protocol fails to reach this standard.

The remainder of my comments focus on three areas: shortcomings with Ecology's initial proposal to cap maximum risks due to wildfire and disease/insects; concerns about untested and unjustified changes adopted from version 5.1 of the Climate Action Reserve's forest protocol; and feedback on Ecology's proposed novel revisions to the calculation of common practice and crediting of initial carbon stocks.

01 — Financially conflicted and scientifically unjustified revisions to buffer pool natural risk factors

Despite not having access to all of the materials necessary to assess the proposed changes, Ecology's brief description of its proposed changes to the calculation of wildfire and disease/insect risks in its Justification Document raise two immediate red flags.

First, Ecology specifies that wildfire risk will be capped at 12 percent and disease/insect risk will be capped at 8 percent.[6] However, Ecology fails to provide any justification for these values. Additionally, it seems unlikely that Ecology has drawn these maximum values from the scientific literature. For example, the maximum fire risk of 12 percent is substantially lower than previously published estimates of 100-year wildfire risks on a per-supersection basis.[7] There is also a growing body of literature describing regions where current forest ecosystems are out of equilibrium with anticipated climate conditions.[8] These regions, sometimes dubbed "zombie forests," are at high risk of losing carbon in the coming decades as patterns and frequency of disturbances (e.g., wildfire) and climate continue to change, which raises the question of whether it is appropriate to develop offset projects within them at all.

The same goes for Ecology's proposed maximum risk for disease/insect losses of 8 percent.

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[5] Raymond T. Pierrehumbert, Short-Lived Climate Pollution, *Annual Review of Earth and Planetary Sciences* (2013).

[6] Justification Document at Revision 6.

[7] William R.L. Anderegg et al., Climate-driven risks to the climate mitigation potential of forests, *Science* (2020) (see Figure 4).

[8] *See, e.g.,* Avery P. Hill et al., Low-elevation conifers in California's Sierra Nevada are out of equilibrium with climate Open Access, *PNAS Nexus* (2023).

Such an assumption is, quite simply, ecologically indefensible. For example, imagine a project consisting entirely of ash trees — a genus of tree that has been devastated by the emerald ash borer.[9] Such a project would clearly demand a disease/insect risk that exceeds 8 percent. In fact, there are even counterexamples in the family of projects enrolled in California's forest offset program, from which Ecology's Draft Protocol takes inspiration. Several projects have large fractions of tanoak trees, which are especially susceptible to the pathogen *Phytophthora ramorum* that causes the forest disease known as sudden oak death.[10] Based on my understanding of the literature, Ecology could not justify assigning such projects with a maximum risk value of 8 percent.

There should, in fact, be no need to cap risk values in the first place. Any method that meets the statutory requirement that offsets are real and permanent would need to account for the *actual* 100-year integrated risk of disease/insect and wildfire, as opposed to an artificially capped risk factor. Furthermore, these risk assessments must take climate change into account, which they do not currently appear to.

The second red flag involves Ecology's disclosure that they have contracted "SIG GIS", which I interpret to mean the Spatial Informatics Group (SIG), to produce its new wildfire and disease/insect risk numbers.[11] To my knowledge, Ecology has not previously disclosed they are working with SIG to develop new risk values. If true, this would be notable because SIG has a significant conflict of interest; it has a history of helping develop forest offset projects within the context of the California compliance forest offset program. Furthermore, several projects SIG has been involved with are located in fire- and disease-prone ecosystems — the exact types of projects SIG's analysis could most affect financially.[12] The failure to prominently disclose such a conflict raises questions as to the impartiality of Ecology's proposed changes to risk factors.

Finally, Ecology should fully disclose the data, code, and methods used to generate any new wildfire and disease/insect risk factors used by the Draft Protocol. This is an important step in transparency, especially if Ecology plans to base its approach on analyses from conflicted parties. Furthermore, there is clear precedence for such disclosure. When California updated the common practice values used in its Forest Offset program in 2015, they publicly posted all the necessary data and code needed to reproduce that analysis.[13]

02 — Inadequate justification for adopting crediting-friendly elements of the Climate Action Reserve Forest Protocol v5.1

Ecology's Draft Protocol draws heavily from version 5.1 of the Climate Action Reserve's forest protocol, a little-used protocol within the voluntary carbon market.[14] However, many

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[9] See, *e.g.*, Daniel A. Herms and Deborah G. McCullough, Emerald Ash Borer Invasion of North America: History, Biology, Ecology, Impacts, and Management, *Annual Review of Entomology* (2014) (describing the possibility that emerald ash borer could "functionally extirpate ash" from North America).

[10] Grayson Badgley et al., California's forest carbon offsets buffer pool is severely undercapitalized, *Frontiers in Forests and Global Change* (2022).

[11] Justification Document at Revision 6.

[12] See, *e.g.*, ACR211 and ACR303.

[13] California Air Resources Board, FIA Common Practice Data, (no date).

[14] It is my understanding that no credits have been issued to an offset project using v5.1 of the CAR forest protocol as of Aug. 18, 2025.

of the adopted provisions from that protocol lack adequate scientific justification and methodological rigor. Notably, many of the elements that Ecology proposes adopting from version 5.1 of CAR's forest protocol come with significant risks for over-crediting.

Inadequate recognition of uncertainty in forest type classification: Ecology's Draft Protocol allows projects to define forest types using two different methods: by comparing project species to a species list in the Assessment Area Data File or by using the LANDFIRE Existing Vegetation Type (EVT) dataset.[15] This introduces a potentially subtle loophole that could result in over-crediting. Developers would suddenly have an incentive to find locations where the LANDFIRE EVT dataset tends to misclassify forest types with high common practices as those with significantly lower common practices. Ecology should anticipate that such patterns will emerge, especially given that the LANDFIRE EVT product has extensively documented the accuracy of its classification approach.[16]

Using the LANDFIRE EVT data poses a problem because it could give developers optionality in selecting how they determine forest types. When advantageous, projects could strategically use the LANDFIRE EVT classification. And because the protocol explicitly allows projects to use LANDFIRE EVT without consideration for its accuracy or whether it blatantly disagrees with ground observations, auditors and verifiers could find themselves powerless to object to clearly misclassified forest types. Instead, Ecology should put forth an approach that takes into account the fact that land cover classifications are necessarily subject to uncertainty.

Vegetation management plan deduction applies to both wildfire and disease/insect risk factors: Ecology has proposed allowing projects to reduce buffer pool contributions for disease/insect risks after filing a vegetation management plan.[17] This expands the vegetation management plan deduction to apply to both wildfire risks and disease/insect risks, whereas the current California forest offset protocol only allows vegetation management actions to decrease wildfire risks. This means that rather than disease/insect risk being a fixed deduction (up to eight percent, as currently proposed), the disease/insect risk can be reduced by up to 80 percent through taking unspecified management actions. The maximum exception — an 80 percent reduction in risk — means disease/insect contributions to the buffer pool could be as low as 1.6 percent, even for projects that are deemed the most vulnerable to disease/insect risks (0.08 * (1-0.8)). That is nearly half the disease/insect risk of California's current offset protocol.

As noted above, it's trivial to identify counterexamples where such steep discounts in risk factors do not appear to be justified. Theoretical projects that have a substantial component of tanoak or ash appear to invalidate Ecology's proposed deductions. Instead of allowing blanket deductions, Ecology must establish a quantitative approach for quantifying disease/insect risk reductions on a regional and species-specific basis over the next century.

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[15] Draft Protocol at §4.

[16] LANDFIRE, LANDFIRE (LF) 2016 Remap EVT Agreement Assessment, (no date).

[17] Draft Protocol at §A.4.

Unwarranted maximum risk adjustment factors: Ecology has also proposed significantly expanding the maximum allowable risk reduction for both wildfire and disease/insect risks — from a maximum of 50 percent to 80 percent. That represents a 60 percent increase in the maximum allowable deduction relative to California's forest offset protocol. Furthermore, I was unable to find any justification for this change, either by Ecology or the Climate Action Reserve, which adopted this change in v5.0 of their forest protocol. In fact, the only discussion of the changes within v5.0 of CAR's forest protocol I was able to find was a brief 30 minute video posted on CAR's website and a short summary of changes.[18] By my reading, neither the video nor the summary of changes mentions the increased maximum risk adjustment factor. At present, it appears this reduction originated through an internal process at the Climate Action Reserve, and I have no insight into how such crediting-friendly changes were made. No academic literature appears to be cited, nor is other rationale provided for the change. Ecology must more fully describe why it believes such generous deductions are warranted.

Practically speaking, Ecology's proposed change could result in projects contributing *fewer* credits to the buffer pool. Given that Ecology has proposed capping the combined risk of wildfire and disease/insect risk at 20 percent, allowing an 80 percent reduction for submitting a vegetation management plan would drop the combined risk to 4 percent (0.2 * (1-0.8)). Currently, the lowest possible contribution to the buffer pool under California's forest protocol for wildfire and disease/insect risk is 5 percent.

Beyond the values of the risk deductions themselves, the Draft Protocol fails to specify basic requirements for what those vegetation management plans must contain. The Draft Protocol simply states that a project can secure an 80 percent reduction in its wildfire and disease/insect risk if an "[a]pproved vegetation management plan exists, and the plan is being implemented across at least 80% of the intended implementation area" and that "[t]he vegetation management plan must be approved by a state agency or, if approval by a state agency is not possible, developed under the oversight of a Professional Forester and reviewed by Ecology and the approved offset project registry."[19] As written, it's not even clear that the vegetation management plan must demonstrate that it would have a plausible chance of affecting wildfire or disease/insect risk. Furthermore, there is no discussion of how long the vegetation management plan must stay in place. If vegetation management plans are essential to lowering risk and Ecology credits are meant to last for 100 years, shouldn't Ecology require that the vegetation management plan will also stay in place for 100 years? Such a vague standard, for such a generous deduction, does not feel justified.

Ecology argues that its approach is partially motivated by its desire to "increase the incentive for project proponents to implement risk mitigation measures."[20] However, in the context of an offsetting program, those incentives must not tradeoff with the ability of the program to produce real, additional, and permanent offsets that are suitable for exchanging with novel emissions of fossil CO_2.[21] The numbers must exactly balance out, not just be generally in the right direction. The occurrence of wildfire and disease/insect outbreaks are not swayed by even the best of intentions.

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[18] Climate Action Reserve, Version 5.0 First Public Comment Period Workshop, (Nov. 14, 2018); Climate Action Reserve, Summary of Changes from V4.0 to V5.0, (Oct. 2019).

[19] Draft Protocol at §A.4.

[20] Justification Document at Revision 6.

[21] RCW § 70A.65.170(2)(b)(i).

Regardless of what approach Ecology ultimately adopts for considering risk deductions from vegetation management plans, Ecology should require that the full contents of those plans be made publicly available so neutral third parties can scrutinize their implementation and raise concerns should they arise.

03 — Feedback on novel revisions to common practice and baseline calculations

Ecology has also proposed significant revisions to how it calculates common practice and allocates offsets when projects exceed common practice. Many of these changes stand to improve crediting outcomes. In this section, I will discuss areas that require further clarification and outline approaches for potentially improving the rigor of Ecology's proposed approach. It is worth noting that the precision of my comments is somewhat limited by the fact that Ecology has yet to disclose details about its exact definition of assessment areas and their associated common practice values.

First, it would help if Ecology clarified its use of the term "ecoregion" throughout the text. For example, Ecology states that common practice will be defined "for each Forest Type and each Ecoregion[.]" Which ecoregions is Ecology referring to? There are several ecoregion datasets, including one produced by the US Forest Service, one by US Environmental Protection Agency, and many others.[22] The US Forest Service also has a set of "ecosections" that differ from previously defined USFS ecoregions.[23] To add to the confusion, other parts of the Draft Protocol refer to *supersections*, which represents an approach developed by the Climate Action Reserve that has been used in several forest offset protocols. Does the Draft Protocol use both ecoregions and supersections?

Second, Ecology proposes using the FIA EVALIDator tool for deriving common practice.[24] It would be useful for Ecology to describe the precise inputs it plans to use in combination with this tool. That will facilitate the ability to check the outputs of EVALIDator against other implementations of FIADB population estimators, like FIESTA and rFIA. Such checks are important, as previous errors in calculation of common practice have resulted in over-crediting.[25]

Third, Ecology should describe how it will handle uncertainty when estimating common practice by forest type and ecoregion. Subsetting the FIA database by forest type and smaller regional areas can quickly result in small sample sizes.[26] Thankfully, the FIA program

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[22] Robert G. Bailey, Description of the Ecoregions of the United States, *US Department of Agriculture, Forest Service* (Mar. 1995) (describing the development of the US Forest Service ecoregions); James M. Omernik and Glenn E. Griffith, Ecoregions of the conterminous United States: Evolution of a Hierarchical Spatial Framework, *Environmental Management*, (2014) (describing the subsequent and independent development of ecoregions by the US Environmental Protection Agency).

[23] David T. Cleland et al., Ecological subregions: Sections and subsections for the conterminous United States, *U.S. Department of Agriculture, Forest Service* (2007).

[24] Justification Document at Revision 2.

[25] See, *e.g.*, Lisa Song and James Temple, The Climate Solution Actually Adding Millions of Tons of CO2 Into the Atmosphere, *ProPublica* and *MIT Technology Review* (Apr. 29, 2021) (describing an error in calculating common practice in New Mexico that resulted in one assessment area of the California Forest Offset protocol having a value of 0 tCO_2 per acre).

[26] Grayson Badgley et al., Systematic over-crediting in California's forest carbon offsets program, *Global Change Biology* (2022) at page 1441 (describing the tradeoff between ecological rigor and smaller sample sizes).

has produced several ways for calculating the uncertainty associated with biomass estimates derived from its standard methods.[27] Failure to account for uncertainty could leave room for project developers to exploit forest types with small sample sizes where the sampling error produces artificially low baseline estimates that enable over-crediting. One safeguard Ecology might consider against this sort of strategic behavior would be using something like the 90th percentile of observed biomass within a forest type, as opposed to the mean, when setting common practice.

Fourth, Ecology proposes portioning out credits for carbon stocks above common practice in a uniform manner over a project's entire 10-year crediting period.[28] Ecology explains that the change "is intended to reflect the most realistic business-as-usual scenario and is similar to the existing crediting approach for avoided conversion projects."[29] In fact, Ecology can even better take into account the business-as-usual scenario by simply using the project's baseline without any averaging whatsoever — changes in project carbon stocks could easily be compared against changes in baseline carbon stocks on a year-by-year basis. Not only would this accomplish Ecology's stated goal of more accurately representing the baseline scenario, it would also at least partially address a long-standing and unaddressed criticism about baseline averaging resulting in the underestimation of project leakage.[30]

Finally, on a positive note, it is encouraging to see that the Draft Protocol intends to move away from the use of logical management units and has instead decided to use more well-defined geographic regions in the form of nationally defined hydrological units. It is worth noting that HUC-14 watersheds are not universally defined across the United States.[31] For consistency across all projects, Ecology should consider using HUC-12 as the finest hydrological unit allowed under its Draft Protocol.

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[27] See, e.g., Scott A. Pugh et al., FIADB Population Estimation User Guide, US Department of Agriculture, Forest Service (2018) at Chapter 4 (describing how to produce "green book" estimates with sampling errors).

[28] Draft Protocol at §6.2.1.2.

[29] Justification Document at Revision 2.

[30] Barbara Haya, The California Air Resources Board's U.S. Forest offset protocol underestimates leakage, University of California, Berkeley, (2019).

[31] US Geological Survey, Hydrologic Unit Codes (HUCs) Explained, (no date).

Sincerely,

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