



### **SUMMARY AND RESPONSE TO PUBLIC COMMENTS**

A new improved forest management methodology entitled *Southwestern Forest Restoration: Reduced Emissions from Decreased Wildfire Severity and Forest Conversion* was developed by researchers at the Universities of Idaho and Northern Arizona and the National Forest Foundation for potential approval by the American Carbon Registry (ACR).

All new methodologies and methodology modifications, whether developed internally or brought to ACR by external parties, undergo a process of public consultation and scientific peer review prior to approval.

The draft methodology was posted for public comment from July 19, 2016 – August 17, 2016. Comments and responses are documented here. If applicable, additional public comments received after the formal close of the public comment period are also documented herein and were considered in the final version of the methodology.



#	Organization	Citation Reference	Comment	Author Response
1	Forest Stewards Guild	Webinar	How is charcoal accounted for in the methodology?	Answered in Webinar: The methodology accounts for the decomposition of dead and down trees which have been burnt over time in the methodology. The methodology requires decomposition factors used in modeling to be locally validated/calibrated (Section C.3.1.1).
2	University of Nevada Reno	Webinar	Can managing the forest and restoring the ponderosa health help reclaim some of the land lost to fires and re-vegetated with other habitat?	For the purposes of this methodology we focus on existing forest stands. Opportunities to restore and replant burned forests are available through the American Carbon Registry Afforestation and Reforestation of Degraded Lands methodology.
3	University of Nevada Reno	Webinar	What challenges do you anticipate in implementing this project in terms of the parties already using and managing the land. For example, will this affect current ranching and logging, and would there be benefits to these operations?	Multiple-use of public lands will be an issue that must be addressed on a project by project basis. For projects on National Forest lands we expect these issues to be addressed during the NEPA planning documents (EA or EIS). NEPA is required for all projects on public lands.
4	Winrock Intl.	Webinar	The protocol is unclear regarding the treatment of surface fuels and logging slash (lying dead wood pool) generated from thinning. This is an important pool, considering increased fire severity has been observed following thinning if logging slash/surface fuels accumulate and are subject to increased understory wind speeds and pre-drying of fine-fuels. Have you considered designating the 'lying dead wood' pool as an 'included' quantification pool and setting thresholds to regulate post-thinning surface-fuel accumulation in the understory?	Thank you for this comment. Lying dead wood pool is now included as is slash pile burning and/or removal for biomass energy (Section D 3.1.2.2).
5	Winrock Intl.	Webinar	As a follow up to the previous question, if surface fuels are drastically removed you may want to specify time of year for thinning treatments to be conducted. If performed in middle of summer, there is a potential for large nutrient export from the site. This would	Excellent point, however this methodology builds off of Forest Service prescriptions as described in the EA or EIS. These components and requirements are already included in NEPA planning documents, therefore additional requirements are extraneous.

			be less likely in winter operations when foliar nutrient content decreases.	
6	Winrock Intl.	Webinar	There seem to be logistical challenges regarding fuel reduction and resulting biomass/slash removal which lend this protocol more useful in forest stands with established road/skidding connectivity. Is this assertion correct or is there a way to apply this protocol to large, contiguous forests?	Access for forest thinning will be defined through NEPA planning documents. NEPA will be required for all projects performed on public lands. Existing infrastructure will be used to the greatest extent possible because adding new roads would incur significant costs and increase environmental impacts. Within the NEPA analysis all proposed pre-existing and new roads will be included. Forest conditions associated with high density are also associated with roads due to past logging practices. No new roads would be proposed for the purpose of increasing carbon offsets.
7	Winrock Intl.	Webinar	Regarding the soil organic carbon pool and its consideration as an excluded pool in this protocol. The authors acknowledge “potential large-scale storage reversals with high-severity fire” but exclude the pool for conservativeness. While excluding this pool is conservative in terms of carbon credit issuance, losses in soil organic carbon pools due to wildfire reversals are not accounted for/underestimated in this methodology. The authors should consider quantifying/modeling the soil carbon pool. If this pool can constitute a potential “large-scale reversal”, it could also be viewed as a large-scale source of carbon crediting, should adequate accounting be developed.	We agree that this is a pool which could experience large scale carbon storage reversals under the baseline scenario, while the restoration scenario experiences little impact. Within Arizona wildfires high severity is most often observed on slopes greater than 30%, creating hydrophobic soils and large scale mass wasting events, while mechanical fuel treatments are restricted to level areas where soil erosion where soil impacts are minimized. We further agree that this should be the focus of future research and possible inclusion into this methodology with additional information and methods. Methods to quantify and model this pool are currently lacking in other methodologies. Given the novel nature of this methodology we currently propose that soil carbon and biomass energy generation, both components which would increase the number of credits issued, be included in future iterations of this methodology.
8	Larson Consulting	Webinar	Will biochar be among the options available for comparison?	A biochar module may be considered once this methodology is approved but is currently outside the scope of this methodology
9	The Nature Conservancy	Webinar	Will the methodology be approved and implemented without a biomass component?	A biomass module may be considered once this methodology is approved but is currently outside the scope of this methodology
10	The Nature Conservancy	Webinar	Hauling costs of biomass are a critical hurdle in AZ. Do you envision funding could be used to offset costs to the private sector?	Funding generated from the sale of offsets will be negotiated on a project-by-project basis. A funding shortfall must be demonstrated in order to demonstrate additionality for a project. The source of this shortfall however is not specified by the methodology.

<b>11</b>	Trout Unlimited	Webinar	Has this Project / Proposal been discussed with the 4FRI Stakeholders Group?	Forest Service personnel on the 4FRI team are aware of this project and have been instrumental in its development. A formal presentation to the 4FRI Stakeholder Group is yet to occur. We anticipate giving a presentation once the methodology has been approved.
<b>12</b>	CA Dept. of Forestry and Fire Protection	Webinar	How do you go about determining the fire return interval to scale your Weibull probability? Is it based on an expected fire probability?	Fire Return Interval is based on either published datasets or the Western Wildfire Risk Explorer, links can be found within the methodology (Section C.3.1.2)
<b>13</b>	Adelante Consulting	Webinar	Can you explain what projects you will address first?	Currently, we are not a project developer. A project developer will work with the Forest Service or other public land managers to identify and develop projects that fit with the goals of this methodology. The Forest Service and other public land managers will not serve as the project developer.
<b>14</b>	Adelante Consulting	Webinar	Is the methodology being developed for SW mixed conifer forests and SW pinon/juiper woodlands?	We are willing to consider those ecosystems for future iterations with support, however they are currently outside of the scope of this methodology (Section B.1).
<b>15</b>	Adelante Consulting	General	It would be helpful to understand why 10,000 acres was chosen. And is there a maximum size for a project? Why not 5,000 acres?	10,000 acres is the minimum size of a restoration unit as defined by the USFS. Most restoration projects on public lands in the SW are substantially larger than 10,000 acres (e.g. the first EIS for the 4FRI is close to 500,000 acres) (Section A.1).
<b>16</b>	Adelante Consulting	p. 4	The methodology states ‘Biomass modules may be applicable and may be developed.’ There are CDM biomass methodologies available. Can they be used with this methodology?	As it stands CDM modules could compliment this methodology through capturing the carbon benefit of fossil fuels displacement. We intend to include a biomass energy component in future modules, currently it is an emission source.
<b>17</b>	Adelante Consulting	p. 4	Is there as definition of “little or no recent history of fuel reduction or restoration treatments”?	See Section A.2 ‘This methodology is applicable on public and Tribal forestlands in the Southwestern U.S. that are eligible for management activities (including: commercial or non-commercial harvesting; and/or prescribed fire activities) with no recent (20 years) fuels reduction treatments.’
<b>18</b>	Adelante Consulting	General	There is no guidance on the size of a plot. The methodology states the plots do not have to be contiguous but provides no guidance on a minimum or maximum size. This methodology could be applied to 10,000 one acre plots in Arizona and New Mexico as written.	Project boundary will coincide with restoration units described in the EIS or EA. The EIS or EA is necessary for approving any restoration project on public lands. The EIS or EA defines the boundary in which restoration activity can take place as the Analysis area. Restoration units divide the analysis area into parcels ranging from 10,000 to 100,000 acres in size. These are the units at which restoration treatment plans are described. (Section A.1). As a matter of common practice a public lands agency would not develop EIS or EA for restoration treatments on project areas of 1 acre.



				In the methodology we use the term Plot to refer to individual sampling units within a sampling design for characterizing the conditions of a larger area.
19	Adelante Consulting	General	The methodology suggests use of some current computer models. Other models will inevitably be developed. Perhaps the methodology could add an option for use of other models.	Yes we advocate within the methodology for the latest validated computer models to be used.
20	Adelante Consulting	General	As a practical matter how do you confirm a lack of fire event? Additional specific guidance on types of supporting documents needed for verification would be helpful.	Any fire detected by the land management agency within the project area will be documented and assessed. Fire severity class can be assessed using MTBS datasets or field visits.
21	Adelante Consulting	General	The start date is inconsistent within the document, after 2000, and after 1997 in another place.	This has been remedied, thank you (Sections B.3 and B.4.1)
22	Adelante Consulting	General	Plot data that is less than 10 years old is to be used. What if the start date is more than 10 years ago? What plot data should be used?	Projects that have already occurred (a start date more than 10 years ago) will not meet requirements of additionality. If plot data for a new project is more than 10 years old, the Forest Service or other land management agency will need to collect new plot data for the project to satisfy NEPA planning and restoration planning requirements.
23	Adelante Consulting	p. 7	What is a fuel reduction treatment? On p. 7, the methodology states that there is no recent fuel reduction treatment and has 10 years in parentheses. Does that mean if there was a fuel reduction treatment it has to be more than 10 years ago or is 10 years just an example?	Fuel reduction treatments reduce surface and ladder fuels, increase the height to live crown, decrease crown density, and retain large trees of fire-resistant species, with the goals of reducing the severity of fire when it occurs, and increasing the likelihood that the stand will survive a wildfire (Section A.1). Mechanical thinning and prescribed fire are the most common tools used to achieve these objectives. The requirement now states 20 years, and yes, if there has been a fuels treatment within the project area within the past 20 years the project would be ineligible.
24	Adelante Consulting	p. 8	On p. 8, harvested wood sources, how would wood sources subjected to pyrolysis be account for?	Wood sources subjected to pyrolysis are assumed to experience 100% combustion and all emissions are counted as a source to be conservative.
25	Adelante Consulting	p. 10	Does wood sources subjected to pyrolysis limit or negate leakage?	Given that this methodology <i>increases</i> wood extraction leakage is <i>de minimis</i> .
26	Adelante Consulting	p. 27	Why would Wilderness Study Areas and endangered species habitat automatically be	These types of protection may make continued maintenance of a project more difficult, costly, and potentially infeasible. Projects for this methodology will be

			considered protected areas, as that may have critical needs for restoration?	identified by the Forest Service or other land management agencies as in need of restoration and approved through NEPA process. If the goals of a carbon offset project are congruent with other management objectives a project may be considered.
27	Adelante Consulting	p. 33	In considering estimated carbon in wood products pools, how would wood sources subjected to pyrolysis be account for?	DUPLICATE
28	Adelante Consulting	General	“Project proponents must cite and document current scientific literature and/or data from land management agencies for all variables included in wildfire projections and effects.” Over time new variables may be developed that are not included in the methodology. How will they be incorporated into the project?	Developers are required to document current scientific literature. We expect the methodology to be updated over time, like other methodologies, and additional components may enter calculations.
29	Adelante Consulting	General	“A large repository of relevant material can be found at the Ecological Restoration Institute, Fulé Lab and Hurteau lab.” Should a list of references be provided as an appendix rather than suggested resources within the text?	As the literature is constantly progressing an appendix will be updated and inform the references used in the methodology.
30			Only ponderosa pine forests are appropriate forests. Why are only ponderosa pine forests included in this general methodology? What about Southwest mixed conifer forests, pinon-juniper woodlands, and pinon-juniper invasions of grassland savannahs?	While some of these ecosystems (namely dry mixed conifer) experience some of the same pressures and carbon shifts they are currently outside of the scope of this methodology. We are considering additional ecosystems for future iterations.
31	Blue Conservation Consulting	Webinar	Many carbon standards rely upon a long term management commitment. What sort of restoration return intervals are expected?	Restoration return intervals will project dependent. These frequency of restoration return will be designed to meet ecological and multiple-use goals.
32	The Nature Conservancy	Webinar	Is the proportion of high severity fire modeled based only on the Rodeo-Chedeski fire?	Answered in webinar: No, the proportion of high severity fire is not solely based on the Rodeo-Chedeski fire. Distribution of fire severity is determined through fire modeling using stand structure and climatic conditions, and it is ground-truthed with MTBS data in the region.
33	The Nature Conservancy	Webinar	Did you account for fire suppression in fire probability?	Fire suppression is defined as suppressing a fire once it has occurred. Fire probability is the risk of ignition, and is not affected by fire suppression.

<b>34</b>	The Nature Conservancy	Webinar	For existng baseline conditions, what data was used?	Data was sourced from the first EIS area of the 4FRI in our initial runs.
<b>35</b>	Natural Resources Conservation Service	Webinar	Could this modeling be used for small private landowners to estimate the net carbon benefits of forest treatments. And perhaps demonstrate to public agencies issuing grants of such benefits. The modeling seems to need an expert to preform the analysis for a given project.	Modeling for these projects is oriented toward estimating landscape scale carbon dynamics. This does not preclude small land owner if they are included within the project area but these models may not be spatially appropriate as stand alone carbon calculators of restoration benefits for small land owners.
<b>36</b>	Spatial Informatics Group LLC	General	Why is there a 10,000 acre minimum requirement for project areas?	10,000 acres is a nominal unit for the Forest Service, which has been used as a minimum size in restoration units. Restoration projects within the SWUS are targeting landscape scales, and 10,000 acres is well below current restoration efforts (e.g. the first EIS area alone for the 4FRI is close to 500,000 acres)
<b>37</b>	Spatial Informatics Group LLC	General	Would the project area have to be contiguous?	No, see applicability condition 3.
<b>38</b>	Spatial Informatics Group LLC	General	How could a proof of average against historic stocking be demonstrated?	We suggest the following database as a reference point to demonstrate stocking departure: <a href="http://library.eri.nau.edu/gsd/collect/erilibra/index/assoc/HASH40b3.dir/doc.pdf">http://library.eri.nau.edu/gsd/collect/erilibra/index/assoc/HASH40b3.dir/doc.pdf</a>
<b>39</b>	Spatial Informatics Group LLC	General	How does the protocol allow for repeated fuel treatments once the first round of treatments declines in efficacy over time?	First, restoration is designed to be self-reinforcing. It allows for the role of surface fire to re-enter the forest on a frequent basis. The end goal for land managers is 'let burn' scenarios, where naturally ignited fire is allowed to progress through forests while protecting the WUI. Second, given the pressures of additional temperatures and drying, SW PIPO forests are projected to vastly decrease productivity (see Tarancon et al 2014 <sup>1</sup> ). All that said, in the unlikely scenario that entry for fuels treatment is repeated, emissions and treatment effects are captured within growth and yield modeling (Climate FVS) and fire model behavior (see available list in methodology).
<b>40</b>	Spatial Informatics Group LLC	General	(SEE FULL COMMENT LETTER) - We therefore strongly argue to provide a much more detail-oriented framework for wildfire emissions	See response letter attached.

<sup>1</sup> Simulating post-wildfire forest trajectories under alternative climate and management scenarios AA Taracón, PZ Fule, KL Shive, CH Sieg, AS Meador... - Ecological Applications, 2014



			accounting in comparison to standard IFM protocols. Below we provide an incomplete list of major accounting elements that, in our experience, can strongly impact results not just in credit generation per se but also in making a project carbon beneficial in the first case and narrowing uncertainty: Fire return interval; Constant vs. Weibull based fire return probabilities; wildfire shadow emissions; avoided redirection or vegetation type conversion; uncertainty estimates; aggregated emissions accounting.	
41	U.S. Forest Service	General	<p>Forestland is defined a bit differently in different parts of the document. On page 6, it says, "Forestland is defined as land at least 10 percent stocked by trees of any size, and not currently developed for nonforest uses." This is different than the stated definition on page 13, under eligibility, "Forestland is defined as land at least 10 percent stocked by forest trees of any size, or formerly having such tree cover, and not currently developed for non-forest uses."</p> <p>o This is important because treatments such as meadow restoration or treatments in pine savannah are likely to modify tree cover to &lt;10 percent over some areas. Based on the current definitions it is unclear if these treatment areas would be fully eligible.</p>	We have changed this to be consistent with the definition used in the methodology (Section A.1). Treatments of meadows would be excluded from the project (assuming they do not meet the criteria of forestlands). They may exist within the project area but would not be assessed for the purposes of the project.
42	U.S. Forest Service	General	Would be helpful to identify the importance and carbon contributions of unique forest restoration treatments such as meadow restoration (clearing small diameter trees out of historical meadows) and restoration of pine	Yes but outside scope of this project

			savannahs, and how these types of treatments are addressed for carbon accounting. Both of these treatment types were included in the 1st 4FRI EIS.	
43	U.S. Forest Service	General	Would be helpful to have some guidance for how to account for carbon flux associated with disturbance and tree loss resulting from activities associated with forest restoration treatments including temporary road construction, log landings, helicopter landings, sortyards and log yards, etc.	Currently emissions associated with the transport and processing of SDW are captured within the methodology, as is mechanized fuels treatments. We recommend using an approved Greenhouse Gas Emissions Tool because specifying all potential types of emissions for a project is outside of the scope of this methodology. We recommend the wood products sector tool developed by the Greenhouse Gas Protocol (Section D.5).
44	Forestland Group	Editorial	Typo in page 38 of the proposed methodology: "extimation".	Fixed, thank you.
45	Oregon State University and University of Idaho	General	(SEE COMMENT LETTER FOR DETAILS AND COMPLETE DESCRIPTION) - Landscape approach is lacking, and baseline calculation is not adequate.	See response letter attached.
46	Oregon State University and University of Idaho	General	(SEE COMMENT LETTER FOR DETAILS AND COMPLETE DESCRIPTION) Insufficient accounting for all carbon changes	See response letter attached.