



# Sierra Pacific Industries

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Mary Nichols, Chair ([mnichols@arb.ca.gov](mailto:mnichols@arb.ca.gov))  
Members of the Board ([arbboard@arb.ca.gov](mailto:arbboard@arb.ca.gov))  
California Air Resources Board  
P.O. Box 2815  
Sacramento, CA 95812

## **Re: Comments on Climate Action Registry Forest Sector and Project Protocols**

Dear Secretary Nichols and Members of the Board:

These are the comments of Sierra Pacific Industries (SPI) regarding the Air Resources Board's consideration of endorsing the California Climate Action Registry's (CCAR) forest sector and project protocols. In general, while there are some entities that would find the protocol useful, most small landowners, and virtually all large landowners such as SPI would not be able to use it. Further, the protocol contains a number of technical problems which would need to be remedied before it could reach the level of credibility needed to assure that it accurately measures baselines and carbon sequestration.

As it is currently drafted, in all likelihood the CCAR protocol would apply to less than two percent of the private forest lands in California, and to none of the state or federally owned lands. The California Air Resources Board must endorse a protocol that works for all landowners, including those who own working forests, if the state wants to realize the full value of forest carbon sequestration in meeting its Assembly Bill 32 emission targets. A protocol should be in place by the August, 2008 deadline set by the Western Climate Initiative for designing a multi-sector market-based mechanism. We are willing to work with the Board to help develop such a protocol for California.

Below are our specific comments on the CCAR protocol.

### **I. The Permanent Conservation Easement Requirement will Prohibit Most Landowners from Using the Protocol**

The requirement that a permanent conservation easement be in place before a landowner could utilize the CCAR protocol is prohibitive. Most private landowners will not encumber their lands in perpetuity either because their corporate structure does not allow it, or they do not wish to make decisions for their heirs. These landowners are sequestering carbon from the atmosphere and will continue to do so for the foreseeable future. Yet, they would be unable to participate in carbon offset markets if the CCAR protocol is the only acceptable mechanism for measuring carbon sequestration in forests. Further, a permanent conservation easement is a land-use mechanism which does not

guarantee the permanence of carbon. In addition, the 9.8 million acres of productive national forest timberland would be excluded because federal laws would prohibit the establishment of a permanent conservation easement.

**Recommendation:** The Board should work towards the adoption of a protocol for working landscapes that does not require a permanent conservation easement. Alternative mechanisms such as binding contracts could be utilized to assure that forests will continue to sequester carbon and not be converted to other uses during the period of the contract.

## **II. Baseline**

The project baseline qualitative characterization is a long-term projection of the forest management practices or activities that would have occurred (or absence thereof) within a project's physical boundaries in the absence of the project. Under the CCAR protocol, the carbon baseline can be established by making an assumption that the volume of standing timber on a landscape could be completely harvested in the minimum number of years allowed under the state's forest practice rules. This approach, however, does not consider what actually happened on the land during that period. It assumes that the harvest occurred, and the actual standing volume is measurable as stored carbon. In our view, this methodology underestimates the baseline and overestimates the amount of carbon sequestered.

Further, we do not believe that this method is fully consistent with the Forest Practices Act or implementing regulations. For example, Section 897 (b)(1)(B) states that management on a specific ownership must maintain functional wildlife habitat in sufficient condition for continued use by the existing wildlife community within the planning watershed. This rule alone calls into question the validity of a project that sets a baseline using a 16-20 year total harvest regime. In other words, does a 16-20 year old forest maintain functional habitat for diverse populations of wildlife species? We don't believe so.

**Recommendation:** Require that the forest carbon baseline be measured as the standing inventory at year 1990 or at the time of purchase of the land, whichever is later.

## **III. Additionality**

Additionality is defined as forest project practices that exceed the baseline characterization, including any applicable mandatory land use laws and regulations.

Additionality should not be based on land use laws and regulations, but rather on the quantity of forest carbon stored in forest and product pools. As investments in forest management increase, the result is greater tree growth which translates to greater carbon sequestration. Forest practice laws and regulations will determine the level of timber harvesting, forest stocking and regeneration, as well as incorporate protections for public trust resources. Further, using the CCAR standard for additionality would put California forest landowners at a competitive disadvantage to other forest landowners in other

states and nations who have lower forest practice requirements and thus a lower carbon baseline.

**Recommendation:** Carbon additionality should be measured as the net increased level of carbon stored as a result of growing more wood on a given acreage while accounting for the storage of carbon in wood products. Importantly, in our view, all of a landowner's forests should be included in these calculations. Otherwise, a landowner could separate a portion of his or her lands through the project protocol which could ignore losses occurring on other areas of their forest.

#### **IV. Forest Product Carbon**

The CCAR protocol puts wood product carbon in an "optional" category that cannot be certified or recognized as offsets to greenhouse gases. It is well established in the international scientific community that carbon is stored in wood products for many decades after harvest, and approximately one half of the dry weight of solid wood products is carbon. Thus, ignoring this sector eliminates a large pool of stored carbon.

**Recommendation:** We recommend that forest product carbon must be considered a mandatory pool, along with above and below-ground living biomass, and that it be tracked, registered and certified. The owner of the rights to the product carbon should be able to register the product carbon. Registration rights for product carbon may be transferred among parties however the registering party must demonstrate ownership of the product carbon through market based buy/sell agreements or contracts.

Standardized look up tables should be included in the protocol to determine the amount of carbon stored in forest products. Appropriate tables have been developed such as the DOE 1605b GHG Registry found at <http://www.pi.energy.gov/enhancingGHGregistry/documents/PartIForestryAppendix.pdf> on page 162. The values in these tables are discounted for uncertainty and provide users with a simplified approach to determining product carbon levels.

#### **V. Natural Forest Management**

Natural forest management is defined as Forest management practices that promote and maintain native forests comprised of multiple ages and mixed native species in the overstory and understory. During the September 6<sup>th</sup> workshop on the CCAR protocol, there was significant confusion among the panelists, the staff, and the audience with regard to whether even-age forest management is allowed under the CCAR protocol. Some thought that the natural forest management requirement applies to every acre individually, while others believed it applies to an overall ownership. Dr. Panek stated that forests must be managed under uneven-age management regimes under the CCAR protocol. This must be clarified by the Air Resources Board before the Board recognizes the CCAR protocol.

**Recommendation:** In our view, there is no valid reason for requiring multiple ages of mixed species on every acre. Indeed, natural forests before the intervention of humans often consisted of large tracts of even-age stands which were generated from fires.

Today’s management often mimics this type of forest through the practice of even-age forestry. In general, the species composition, sunlight, rain, and other factors must be considered in any protocol, and broad management prescriptions should not be applied to forestlands across the state.

## **VI. Technical Comments**

### **A. Snags and Lying Dead Wood**

The CCAR forest protocol requires the quantification of a number of carbon pools in forest projects, including lying dead wood and snags. Table 1 shows a ‘reasonable’ distribution of carbon in a mixed conifer forest. Also included are the forest carbon pools that are required by CCAR to be used in certification processes. Other pools may be reported but they are optional and not used in carbon accounting.

Table 1. Carbon Distribution in a medium size mixed conifer forest<sup>1</sup>

<b>Pool</b>	<b>Carbon %</b>	<b>CCAR Required</b>
Soil	38	
Litter and Duff	8	
Lying Dead Wood	1	x
Snags	2	x
Shrubs	1	
Live Trees	50	x
<b>Totals %</b>	<b>100</b>	<b>53</b>

<sup>1</sup>/Percentages are intended to be indicative of magnitude only  
Actual composition will vary with site-specific factors.

#### **Findings:**

- a. The CCAR protocol requires an estimate of snags and lying dead wood that would increase field measurements by about 50% if done properly. This extra effort is made for only about three percent of the carbon.
- b. The CCAR protocol also requires future projections of the carbon in snags and lying dead wood. Currently available growth models are incapable of directly accomplishing this.
- c. The ‘desired’ result of snag and lying dead wood carbon is the difference between project and baseline stocks and temporal changes in project stocks. Based on repeated inventories, other carbon researchers have assumed that the snag and lying dead wood carbon in forests is at equilibrium (recruitment equals decomposition). Similar assumptions are often used for soil, duff and litter, and shrub layer carbon pools.

#### **Recommendation:**

Ignoring snags and lying dead wood in carbon calculations would simplify the carbon budget and certification efforts. This suggestion is made because the supporting research is absent and the fieldwork is too time-consuming. We recommend removing these two measurements from the CCAR protocol and assume that these values are in equilibrium.

## B. Live Tree Carbon Estimates

As stated in the protocol, live tree biomass (carbon) has above ground (stem, branches, foliage) and below ground components. The protocol states that a prescribed set of species-specific allometric equations (live tree carbon =  $.5 * (\text{Tree Diameter})$ ) can be used estimate carbon for individual trees. Project carbon is then derived by standard statistical expansion procedures.

Even though the CCAR protocol forms the basis for an appraisal system, to our knowledge this standard has never been scientifically peer reviewed by an impartial third party.

1. The equations CCAR prescribes are only for above ground live biomass. Roots are roughly an additional 20%, yet there is no direction for how this component should be estimated or incorporated in carbon calculations.
2. The equations stated in the protocols can be applied 'as is' in quantifying carbon in CA forest projects with no checks as to their validity required.
3. The carbon equations adopted by CCAR are not for individual species, but rather a national composite of species with similar morphological characteristics (Jenkins et al, 2003)<sup>1</sup>. For example, the 'pine' equation is a composite composed of 14 species of pine trees, most of which come from data collected in the eastern U.S.
4. Virtually none of the data employed by Jenkins comes from California.
5. Jenkins notes that the equations are for national scale biomass estimation. In other words, they were designed to treat the whole U.S. as a single forest project.
6. Only tree diameter breast height (DBH) was considered as a predictor variable because it was the lowest common denominator in the studies examined.
7. Jenkins cites statistics indicating the difference between individual studies and the composite equations can be in excess of 35%.
8. Jenkins cites minimally 10 considerations (sources of bias) practitioners should consider before applying the national scale estimators to regional or site-specific cases.

Thus,

- 1) The live tree carbon estimation equations proposed by CCAR are at best arbitrary and have never been checked as to validity in California.
- 2) Numerous species-specific biomass equations that are at least constructed with data from the western United States are available but do not seem to have been investigated.
- 3) A wealth of relatively precise stem-wood/bark volume equations is available for specific regions and species in California. These equations use tree diameter and height rather than just diameter as in the allometric equations and tend to be on the order of five times more precise. Published wood density factors can be used to convert these estimates to biomass/carbon. Stem wood and bark typically account for 60-80% of the

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<sup>1</sup> Jenkins et al., 2003, National-Scale Biomass Estimators for United States Tree Species, Forest Science 49(1) pages 12-35.

above ground biomass. The remainder (foliage and branches) can be estimated by reasonable judgment. This entire research database has apparently been ignored in the forest protocol measurement specifications.

**Recommendation:**

An independent committee of measurement professionals (biometricians and mensurationists) should be convened to assess the validity of carbon estimation. An approach could be taken that is similar to the current Board of Forestry Technical Advisory Committee which was assigned to review the Threatened and Impaired Watershed Rule Package. We believe this group should review current carbon estimates, address the four points listed below, and develop carbon approximations for the foliage and branches. We believe that these items must be vetted by the appropriate professionals to maintain transparency in calculating carbon sequestered.

C. Forest Project Carbon Estimation

1. The forest protocols have deductions based on the precision of sampling estimates. Rather than, say, use the lower limit of the confidence interval as the amount that can minimally be 'certified,' the CCAR protocol uses accelerating deductions (15 - 20% C.I get a 30% reduction in the forest carbon pool). This seems arbitrary.
2. Protocol confidence bounds are computed by treating inventory estimates based on allometric biomass equations as though they were measurements. These estimates are the largest source of error (bias) in the system.
3. Both the project activity (AC) carbon and the project baseline carbon (BC) are initially derived from the same inventory and sampling procedures. In year '0', they are identical. However, it is unclear why AC is subject to deductions but BC isn't.
4. Forecasting errors in growth projections are apparently similarly ignored and can be substantial.

**Summary**

In summary, the CCAR protocol could be used by some landowners in California who want to establish a permanent conservation easement on their lands. However, as demonstrated here, there are a number of technical problems with the protocol that must be addressed before it can be validated. Further, the vast majority of forestland owners in the state would not use this protocol for the reasons given above. We believe it is in the best interest of the Board to develop a mechanism that can be fairly applied to any landownership to accurately account for the amount of carbon that is sequestered and stored. We would be willing to work with the Board in that regard.

Sincerely,



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