December 14, 2018
Comment letter to CAR on the proposed dilution of the leakage estimates for forestry projects in V5

Dear Climate Action Reserve,

On November 1, 2018 CAR released a draft US Forest Protocol V5 for public review and comment. Since the purpose this 3rd party protocol is to eventually be funded by the California Air Resources Board for the purpose of generating truly global climate benefits, it is paramount that the quality of protocols be as high as possible. As CAR knows from the fact that no reforestation proposals, the slam dunk forest concept to generate truly new climate benefits, have ever been able to cover the transaction costs, it is very important to not allow accounting details to generate what may be climate benefits that are really just a shuffle of activities from one place to another.

Description of the change from CAR
"Updated IFM leakage deduction (Section 6.1.6) The Reserve has revised the leakage factor for IFM projects. In previous versions of the FPP, through FPP v3.3, this value was 20%. In FPP v4.0, it was revised to be represented as a sliding scale up to 80%. In FPP v5.0, a variable sliding scale is proposed. The exact deduction will depend on project harvesting conditions, as detailed in the Protocol. " (Forest Project Protocol. Summary of Proposed Revisions. November 2018).

The amazingly low, and never justified 20% leakage value in versions 1-3.3 most probably led to a lot of projects being given too many offset credits. This leakage estimate that is far below well known published estimates for leakage estimates for North American forest and forest product systems that are summarized in the 2018 Galik appendix referenced in the proposal (e.g. Wear and Murray 2004), and will eventually diminish the global reputation of the quality of ARB's offset program to which CAR projects apply. It was good that v4.0 at least used the 80% global leakage for wood production that is in line with estimates from empirical research published in Murray et al (2004) and Wear and Murray (2004). However, there is absolutely no empirical justification for allowing v5.0 projects to once again use much lower leakage rates. The exact wording of the proposed change for V5 is not that clear on how project proponents could use the much lower leakage number, but the proposed change would clearly allow project proponents to propose the lowest leakage estimate possible and essentially dare ARB to reject the proposal.

The TNC report of which the Galik (2018) appendix is just a part does a good job of summarizing the background of leakage in global carbon accounting.

"The purpose of accounting for leakage is to avoid overestimates of the carbon benefit that results from an activity intended to reduce net greenhouse gas emissions. Greenhouse gases have the same impact on climate change regardless of where they are emitted, so local emissions reductions should be discounted by any emissions increases that happen elsewhere as a result of the activity…
Other high-risk activities include eliminating timber harvest on forestlands traditionally included for wood production and prohibiting the conversion of natural landscapes to agriculture production." (TNC 2017, p 55)

"Improved Forest Management: Reductions are the result of increased productivity of managed forest systems. This can be yielded through either extended rotations for even-aged systems so as to sequester more carbon on the stump or in eventual wood products, and/or through increased productivity of the stand as a whole through appropriate silvicultural practices.
● Primary: it is possible that an individual actor may shift harvest activity to other holdings if activities (e.g., rotation extension) result in a decline in forest product yield.
● Secondary: additional harvests could occur if the activity results in a reduction in the supply or a change in the type of forest products either over the short or long term."

Galik in TNC 2018, appendix J, p7)

There is absolutely no evidence in any documentation mentioned by ARB in this proposal watering down on forest offset rigor to support the assertion that : "[IFM] Reductions [of emissions] are the result of increased productivity of managed forest systems. This can be yielded through either extended rotations for even-aged systems so as to sequester more carbon on the stump or in eventual wood products, and/or through increased productivity of the stand as a whole through appropriate silvicultural practices". (Galik in TNC 2018, appendix J. p 7)

It appears that the rationale for the 40% leakage rate is that projects still involve some harvesting should get twice as much benefit from the harvest reduction (even though a ton of harvest reduction is a ton of harvest reduction, no matter what else happens from the project).

Equation 6.10 must be used to estimate Secondary Effects for Improved Forest Management Projects. The percentage of the difference between actual and baseline harvested carbon applied as Secondary Effects in Equation 6.10 is based on the conditions shown in Table 6.3.

Table 6.3. Estimated Secondary Effects Based on Project Harvesting Conditions

Project Harvesting Condition	Project Harvesting Condition Variable (x)
Project includes a legal instrument, such as a conservation easement that disallows harvesting throughout the Project Life, or property has not harvested wood products for more than 20 years.	0.8 (80%)
Project has no legal encumbrance that disallows harvest activity and has harvested at least once in the previous 20 years.	0.4 (40%)[22]

[22] *An Overview of Leakage Risk and Mitigation Approaches for Land Management Activities in Merced County, California*, Christopher Galik, 2018.

It is worthwhile to review the single reference that CAR has provided to justify writing in a very low leakage rate for forestry projects that would have the effect of essentially overstating the true global climate benefit of ARB forest offset projects. Such a move could have serious negative reputational impacts to ARB's approach to offsets.

Stepping back from the problem that there is little empirical justification that holding higher inventories per acre will lead to an increase in overall forest productivity, we can focus on the basic leakage effect of less timber harvest in an ARB project. As the consultant, Dr. Galik points out in his 2018 appendix J to the TNC report, the global assessments of leakage is necessary and fairly well documented.

"The Factors Affecting Leakage Risk and Magnitude
As a general rule, there is a risk of leakage when an activity reduces access to a particular resource without providing access to alternatives (IPCC, 2000). As Chomitz (2002) notes, "most projects have to be considered as part of integrated systems" (p38). The reduction of a particular resource, product, or commodity in one place can thus be expected to lead to an increased production of the same or substitutable resource, product, or commodity elsewhere (e.g., Wear and Murray, 2004)." (Galik in TNC 2018, p 2)

"Also represented in the literature are empirical analyses of leakage resulting from GHG mitigation and related conservation activities. These studies use a variety of data and statistical techniques to assess changes associated with implementation of a particular program or project. Wear and Murray (2004) for example provide an empirical evaluation of inter-regional shifts in timber sales following restrictions on western forest harvests put in place starting in the

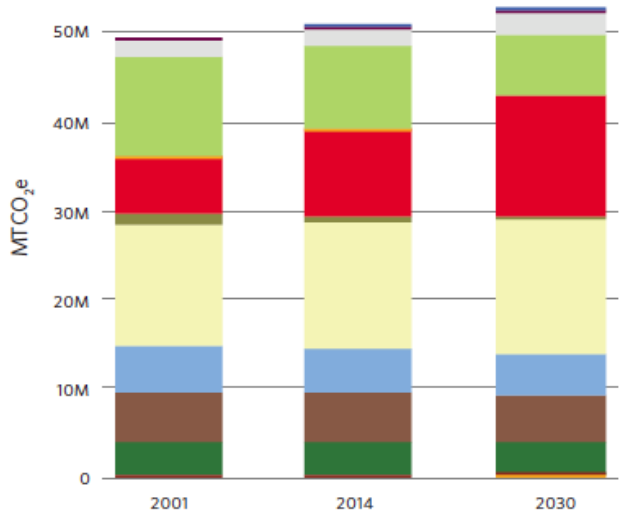
late 1980s. They find that consumption of timber in the U.S. is relatively unchanged in spite of western timber restrictions, suggesting substitution of supply. Although their analysis was not specifically designed to simulate the effects of carbon policy, estimated leakage rates ranged from 43% when assessing changes at the regional level, 58% when considering national changes in supply, and **84% when considering supply response at the international level**." (Galik in TNC 2018. p 4)

The whole basis in V5 to drop to 40% is from a simple assertion buried in a consultant's appendix to a report about Merced County where there was no change in the estimated forest carbon – from the baseline or from projects. (see Table 3.2 as well as figure 2.2 from the TNC Merced paper). This is earthquake country were more than 95% of residences are wood framed (US Census 2012 in PPIC 2018). Based on Murray (2004), if harvest levels inside an offset project drop, over 80% of the wood will simply come from harvests elsewhere, the price of wood and all building materials will go up (creating an 'secondary impact of an exacerbated housing shortage), and/or more cement and steel will be used instead of wood from sustainable forests (generating new demands for carbon offsets from cement and steel manufacturers)

Table 4.2. Adoption caps in TerraCount for each activity*

Activity	Adoption cap (acres)
Riparian restoration	25,000
Oak woodland restoration	52,000
Cover crops	55,000
Mulching	40,000
Improved nitrogen fertilizer management	80,000
Hedgerow planting	5,500
Native grassland restoration	17,000
Replacing synthetic nitrogen fertilizer with soil amendments	20,000
Compost application to non-irrigated grasslands	15,000

**Adoption caps were not set for two activities: avoided conversion to croplands; and avoided conversion to urban.*

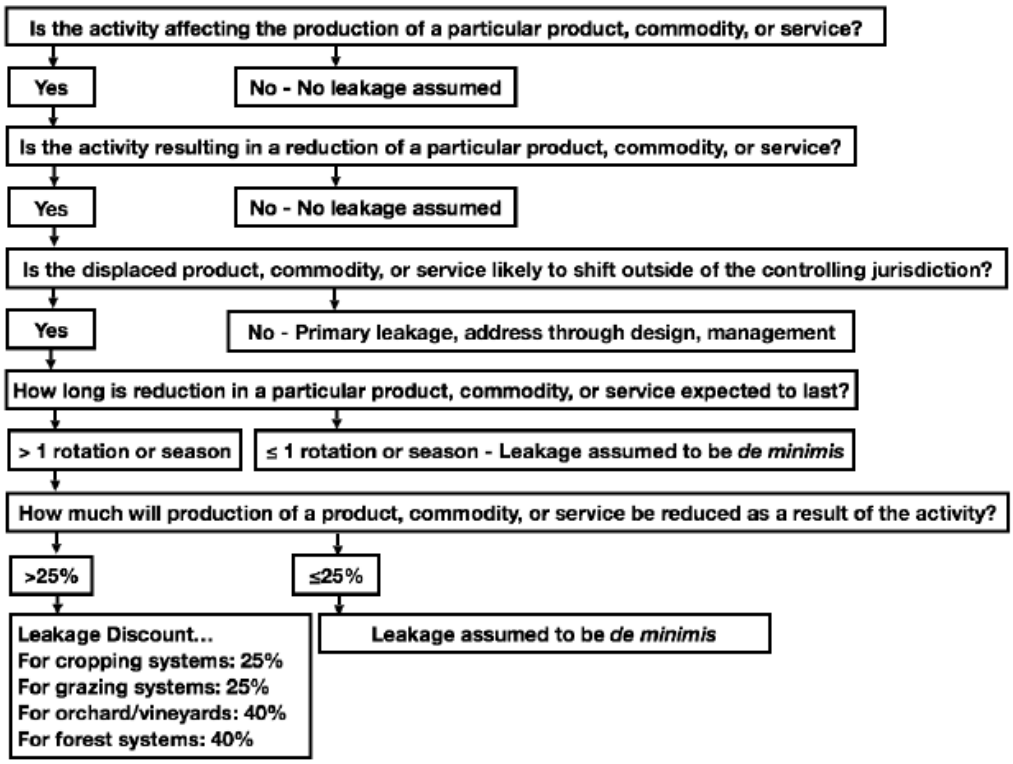


▲ **Figure 2.2.** Landscape carbon stocks by land cover type for Merced County: 2001, 2014 and projected baseline reference scenario values for 2030.

It is hard to understand why CAR is proposing using a cite from a consultant's appendix about a project in Merced County that had absolutely nothing to do with changes in forest carbon in the baseline or due to projects (of which there were many very climate beneficial projects described in the report) as a rationale to make a significant drop in the leakage rate that is well justified in relevant literature for similar conifer forests in North America. More to the point, the consultant's appendix does a good job summarizing the literature on why a leakage rate of 80% or greater would be accurate for projects in North America, but then simply introduces a 40% leakage suggestion with no justification in Figure H.1

The sole justification in Galik in TNC(2018) for lowering the leakage rate for forests is from the flowchart (Figure H.1) in appendix B as well as on p 56 of TNC (2017), that simply suggests a much lower leakage rate ('For forest systems: 40%") even though the paper clearly summarizes the literature showing that the global leakage for the West Coast of North America is well over 80%.

Figure H.1. Flow chart to determine default leakage risk for land-based GHG management and avoided conversion activities in Merced County.



As clearly documented in the most recent AB 1504 report submitted to the Board of Forestry, the elevated levels of mortality from wildfires, insects and disease on USFS timberlands represent large losses of forest benefits including carbon sequestration, wildlife habitats, legacy big trees, watershed soil protection, and aesthetics. Fortunately, examples of more active forest management to reduce these avoidable losses have been demonstrated in many well documented research projects in California, and can be seen at a much larger scale by looking at the much lower levels of mortality experienced on Private-Noncorporate Timberlands (basically family forest parcels) where owners have a wide set of goals for their forests.

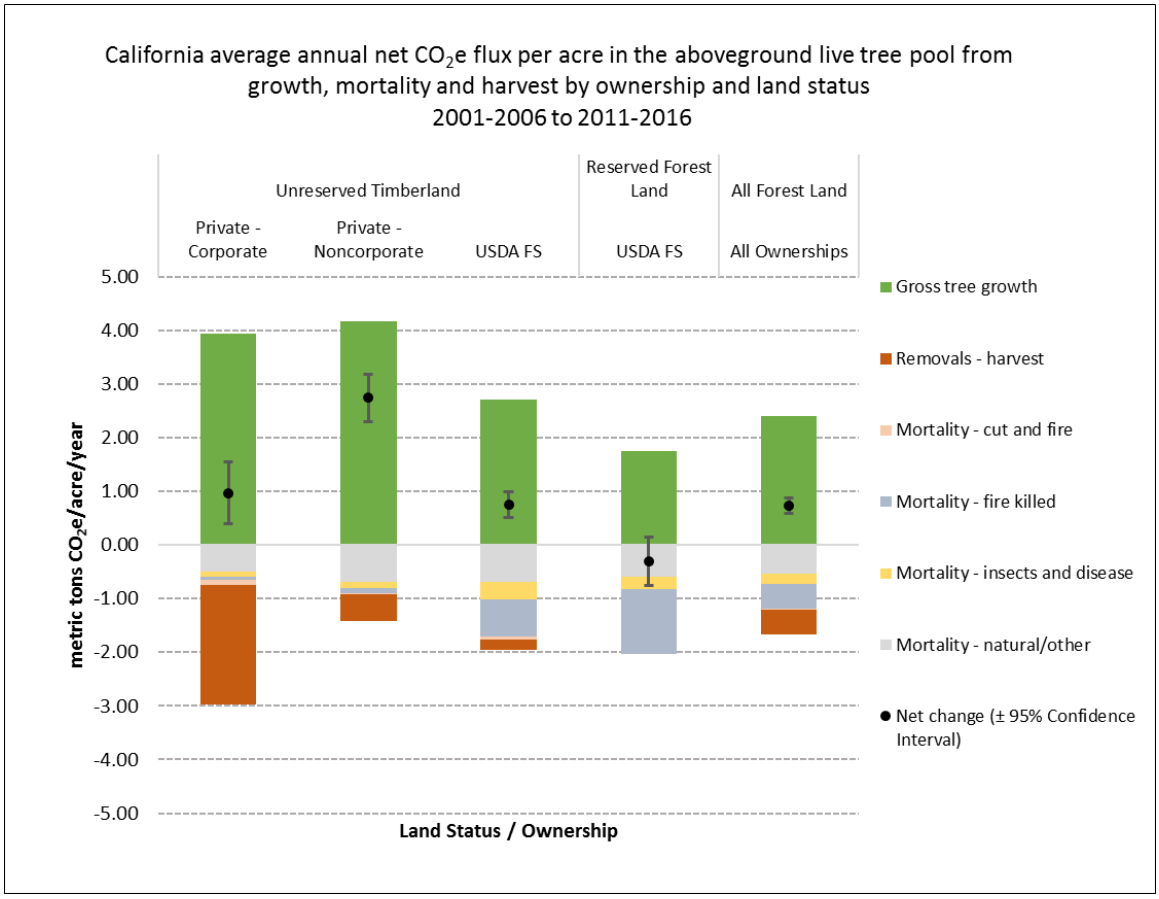


Figure 4.4. Average annual net CO2e flux per acre in aboveground live tree carbon pool from growth, mortality and harvest by ownership and land status of California's forests (MT CO2e/acre/year), 2001-2005 to 2011-2015. The "all ownerships" category includes all other state and federal agencies managing fewer overall acres of forest land in California. The error bars represent the 95% confidence interval of net change. Figure derived from Appendix 2, Table B12.

It is also very clear that the trends for wildfires in California's forests are increasing and that it is imperative that proactive steps be taken to invest in California's forest to reduce the level of forest losses to catastrophic wildfire. By reducing the leakage rate from 80% to 40%, CAR is making it more profitable for projects to claim global climate benefits by reducing harvest levels – and leaving more carbon at risk to an ever-increasing risk of catastrophic wildfire. We can only wonder whether the recent spate of wildfires would have been smaller if more fuels reduction projects had been undertaken (even if they are the opposite of the goal of CAR's IFM projects that are designed to pay for increased biomass (aka fuel) inventories per acre.

It is also clear that making it more remunerative to create CAR forest offset projects based on reducing harvests to increase inventories (aided in value by lower approved leakage estimates) also goes against the global consensus on the role of well managed forests. The most recent IPCC (2014) is very clear on pointing out the benefits of using wood building materials rather than GHG emission intensive cement and steel can have very large global climate benefits.

"Demand-side options related to wood and forestry: Wood harvest in forests releases GHG and at least temporarily reduces C stocks. Conservation of wood (products) through more efficient use or replacement with recycled materials and replacing wood from illegal logging or destructive harvest with wood from

certified sustainable forestry (Section 11.10) can save GHG emissions. Substitution of wood for non-renewable resources can reduce GHG emissions, e.g. when wood is substituted for emission-intensive materials such as aluminum, steel, or concrete in buildings. Integrated optimization of C stocks in forests and in long-lived products, as well as the use of by-products and waste for energy, can deliver the highest GHG benefits." (Smith et al. 2014. AFOLU , ch 11, p 838)

"Recent studies suggest that, where technically possible, substitution of wood from sustainably managed forests for non-wood materials in the construction sector (concrete, steel, etc.) in single-family homes, apartment houses, and industrial buildings, reduces GHG emissions in most cases (Werner et al., 2010; Sathre and O'Connor, 2010; Ximenes and Grant, 2013). Most of the emission reduction results from reduced production emissions, whereas the role of carbon sequestration in products is relatively small (Sathre and O'Connor, 2010). Werner et al. (2010) show that GHG benefits are highest when wood is primarily used for long-lived products, the lifetime of products is maximized, and energy use of woody biomass is focused on by-products, wood wastes, and end-of-lifecycle use of long-lived wood products." (p 840)

"optimal forest harvesting - In particular, optimizing forest management for mitigation is a complex issue with many uncertainties and still subject to scientific debate. Intensive forest management activities of the early- to mid-twentieth century as well as other factors such as recovery from past overuse, have led to strong forest C sinks in many OECD regions (Pan et al., 2011; Loudermilk et al., 2013; Nabuurs et al., 2013; Erb et al., 2013). However, the capacity of these sinks is being reduced as forests approach saturation (Smith, 2005; Körner, 2006; Guldea et al., 2008; Nabuurs et al., 2013; Sections 11.2.3, 11.3.2). Active forest management, including management for bioenergy, is therefore important for sustaining the strength of the forest carbon sink well into the future (Nabuurs et al., 2007, 2013; Canadell and Raupach, 2008; Ciais et al., 2008), although countries should realize that for some old forest areas, conserving carbon stocks may be preferential, and that the actively managed forests may for some time (decades) act as sources." (Smith et al. 2014, p 871)

Conclusion

The only outcome of allowing a new loophole in V5 of dropping the leakage rate for some projects will unfortunately be a higher likelihood of giving out too many offset credits to forestry projects that will most probably experience the much higher mortality rates have been documented on USFS timberlands in the AB 1504 reports. While the projects can initially be given many more offsets than they probably deserve, the increased mortality will most probably only show up after the initial set of consultants and ARB verifiers have moved on to new jobs. California's overall offset program will be left holding the bag for projects that ended up delivering less than promised.

Sincerely,

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