April 6, 2009

SENT VIA EMAIL

Attn: Forest Practice
Director and Review Team
California Department of Forestry/CAL FIRE
6105 Airport Road
Redding, CA 96002
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Re: Comments on Timber Harvesting Plan: Typhoid Sally (2-07-134-SHA)

Dear CAL FIRE:

The Center for Biological Diversity (“Center”) submits the following additional comments1 for the Typhoid Sally Timber Harvesting Plan (“THP”), 2-07-134-SHA. The Center is a non-profit, public interest, conservation organization dedicated to the protection of native species and their habitats through applying sound science, policy and environmental law. The Center has over 40,000 members, many of whom reside in California.

The following comments primarily address a recent submission from SPI regarding the impacts of clear-cut logging on greenhouse gas (“GHG”) emissions. However, from the outset, it should be emphasized, as recently put by the Attorney General’s Office, that “the plain intent of the Legislature in enacting the [Forest Practice Act] was to require the Board to view the forests of the state as a complete working ecosystem, and not only as a producer of high quality timber, but also as forestlands valuable in their own right as a public resource.” Advice Regarding Board of Forestry’s Regulatory Authority to Provide for the Restoration of Resources at 4 (emphasis added). “[T]he protection of California’s watersheds and soils has been an important goal of the FPA since its enactment in 1973,” id. at 5, and “the explicit language of the FPA requires that the Board balance timber production and protection and restoration of forest resources. However, the FPA does not require that this balance be affirmatively struck in favor of timber production . . . . [B]oth CEQA and CESA assure that forest resources . . . be protected during timber operations and thus balance the Board’s authority to weigh too heavily in favor of timber production.” Id. at 8 “The requirements of CEQA, CESA, and the functional equivalent certification of the THP review process all require that the Board consider and mitigate for adverse environmental impacts when making its decisions.” Id. at 9.

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1 The Center submitted initial comments for this THP on December 19, 2008. The comments submitted today are in addition to those.
As the lead agency, it is CAL FIRE’s duty to ensure that all THPs conform with applicable law. With regard to GHG emissions analysis under CEQA, the Attorney General’s Office has recently stated that:

Lead agencies should make a good-faith effort, based on available information, to calculate, model, or estimate the amount of CO2 and other GHG emissions from a project, including the emissions associated with vehicular traffic, energy consumption, water usage and construction activities.

The question for the lead agency is whether the GHG emissions from the project . . . are considerable when viewed in connection with the GHG emissions from past projects, other current projects, and probable future projects.

Unlike more localized, ambient air pollutants which dissipate or break down over a relatively short period of time (hours, days or weeks), GHGs accumulate in the atmosphere, persisting for decades and in some cases millennia. The overwhelming scientific consensus is that in order to avoid disruptive and potentially catastrophic climate change, then it’s not enough simply to stabilize our annual GHG emissions. The science tells us that we must immediately and substantially reduce these emissions.

The decisions that we make today do matter. Putting off the problem will only increase the costs of any solution. Moreover, delay may put a solution out of reach at any price. The experts tell us that the later we put off taking real action to reduce our GHG emissions, the less likely we will be able to stabilize atmospheric concentrations at a level that will avoid dangerous climate change.²

[Agencies should] evaluate at least one alternative that would ensure that the [agency] contributes to a lower-carbon future.

See Climate Change, the California Environmental Quality Act, and General Plan Updates: Straightforward Answers to Some Frequently Asked Questions California Attorney General’s Office [Rev. 3/06/09] (emphasis added).

² This goes to the heart of the problem. A clear-cut immediately disrupts the ongoing process of C sequestration by a forest, causes net emissions for many years following the clear-cut (the emissions only begin to be rectified once net annual sequestration outpaces annual emissions), and any expected net benefits in terms of C sequestration occur far in the future, many decades after harvest. In fact, SPI’s own analysis, biased as it is, shows this to be true.
The California Resources Agency has also addressed the issue of GHG emissions and has pointed out that the following must be considered when assessing GHG emissions associated with logging:

- **Type of Forest Management (Clear Cutting or other types of logging management)**
- **Age of forest at issue, tree type**
- **Store of Carbon in Bio Mass, Soil, and Old Growth**
- **Rate new growth sequesters carbon**
- **Changes to system overall**
- **Reduction of carbon stores v. rate of carbon uptake**
- **Increases and Decreases in Carbon to Environmental Setting**
- **Cumulative Impacts**
- **Fair Argument: A lead agency must require an EIR (or its equivalent- THP) where it is presented with substantial evidence supporting a fair argument that significant environmental impacts may result from a project, even though there is also substantial evidence in the record to the contrary. (Application of Thresholds to facts).**

See Powerpoint Presentation of Resource Agency (presented at February, 2009, Board of Forestry meeting).

The above statements from the Attorney General and Resources Agency make clear that business-as-usual is no longer an option. Agencies must now give careful attention to the greenhouse gas emissions associated with the projects they approve and must actually calculate, model, or estimate all of the emissions associated with a particular project. Here, that means accurately calculating the emissions associated with the clear-cutting of forest that contains a considerable number of trees over 100 years of age, and calculating the emissions associated with a) severe soil disturbance, b) loss of understory, c) site preparation/prevention of development of understory (e.g., herbicide use), d) burning or decay of leftover slash material, and e) emissions associated with the actual cutting, movement and development of wood products (i.e., gray emissions). It also means fully acknowledging what is lost (i.e., are we losing any large old trees, and even if not, approximately how many trees of each age class and type of tree being lost must be determined and assessed), and what is foregone (i.e., addressing

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3 Noticeably absent from SPI’s statement is an analysis of how clear-cutting in particular contributes to GHG emissions.

4 Again, noticeably absent from SPI’s statement is an accurate accounting of the age class of the stands, i.e. a description of harvest by approximate number of trees of each age class and species.

5 The SPI Statement almost completely ignores the issue of soil carbon and does not calculate the emissions associated with loss of soil carbon stores.

6 While there may not be large amounts of old-growth on SPI property, there are trees over 100 years of age at issue in this THP, yet SPI does not accurately describe approximately how many trees of each age class are at issue in this THP.
the fact that SPI even-aged management will never allow the stands to develop the large carbon stores associated with forest stands dominated by large, old trees, or even reach an age that has the highest rate of carbon sequestration). In short, generalized claims about how forests can be carbon sinks does not constitute an adequate analysis because it does not account for what is occurring in this instance – this THP proposes the complete loss of 129 acres of mostly native mixed-species multi-story forest with high biodiversity value via clear-cutting and conversion to single-species plantation with greatly reduced environmental functions.

**CEQA/FPA and Informed Decision-making**

The THP is considered the functional equivalent of an environmental impact report (“EIR”) that would normally be prepared under CEQA. However, while THPs are subject to the Forest Practice Act, they are also subject to the California Environmental Quality Act (“CEQA”) which mandates that environmental impacts, including cumulative impacts, be considered and analyzed, and significant impacts then avoided and/or mitigated. See *Sierra Club v. State Bd. of Forestry* (1994) 7 Cal. 4th 1215, 1228 (“in approving timber harvesting plans, the [agency] must conform not only to the detailed and exhaustive provisions of the [Forest Practice] Act, but also to those provisions of CEQA from which it has not been specifically exempted”).

CEQA demands, among many other things, that enough information be provided regarding a project to allow informed decision-making. The statement submitted by SPI regarding greenhouse gas emissions associated with its clear-cut logging practices falls well short of that standard and is therefore deficient from an informational standpoint. As stated by the Supreme Court in *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal. 4th 412, 449-50 (emphasis added):

> The preparation and circulation of an EIR is more than a set of technical hurdles for agencies and developers to overcome. The EIR’s function is to ensure that government officials who decide to build or approve a project do so with a full understanding of the environmental consequences, and, equally important, that the public is assured those consequences have been taken into account.


One major problem is that the current THP fails to describe the approximate number of trees of each species by age class and diameter. Without that information, it is not possible to perform an accurate accounting of the carbon emissions because tree species, age, and diameter are necessary to conduct an accurate accounting. The THP does admit that “stands are highly variable in tree density and age classes. Stand age represented by dominant and co-dominant trees ranges from 70 to over 100 years old, with an approximate average age of 100 years. The stands to be harvested have average diameters from 20-36 inches.” But this tells us relatively
little. In other words, what we do know is that there exist large, old trees in the THP area, but we do not know the approximate number and type of tree at each age class. If, as the THP states, the average age of the trees is 100, then there must be a great number of trees over the age of 100 and consequently, there are a significant number of trees for which we do not know their actual age class (or size) and type of tree. Only with that information (and more, as described in the Center’s first comment letter) can CAL FIRE and the public accurately estimate the carbon emissions that would be associated with the clear-cutting of all of these trees. Again, larger, older trees are a major carbon store, and can have high rates of carbon uptake. Thus, until we have enough information to accurately assess the amount of carbon that would be cut, the THP fails as an informational document.

CAL FIRE is aware that “disclosure of potential significant adverse impacts pertaining to large old trees is required, even in those situations involving a single tree or small stand of trees less than 20 acres in size (i.e. does not meet the minimum stand acreage for Late Succession Forest Stands per 14 CCR § 895.1).” The situation here demands an accounting of large, old trees, even if they are in groups smaller than the 20 acre minimum stand size associated with Late Succession Forest Stands. Large, old trees, as explained extensively in the Center’s initial comment letter, represent a major carbon store and their loss is of great significance. In other words, while the “description of the environmental setting shall be no longer than is necessary to an understanding of the significant effects of the proposed project and its alternatives,” 14 CCR 15125, here, knowledge of the approximate number of large, old trees that would be cut is absolutely necessary in order to determine the effects of the clear-cut. Therefore, SPI’s failure to provide enough information to assess how many large old trees will be cut, as well as its failure to provide information about how many early to mid-aged trees will be cut, is prejudicial to informed decision-making. See San Joaquin Raptor/Wildlife Rescue Ctr. v. County of Stanislaus (1994) 27 Cal. App. 4th 713, 723 (“Knowledge of the regional setting is critical to the assessment of environmental impacts. Special emphasis should be placed on environmental resources that are rare or unique to that region and would be affected by the project.”); Cadiz Land Co. v. Rail Cycle (2000) 83 Cal. App. 4th 74, 94 (finding environmental setting description inadequate because “an estimate of the volume of groundwater in the aquifer is critical to a well-informed determination of whether the risk of groundwater contamination is worth taking . . . . Because the EIR must be certified or rejected by public officials, it is a document of accountability. If CEQA is scrupulously followed, the public will know the basis on which its responsible officials either approve or reject environmentally significant action, and the public, being duly informed, can respond accordingly to action with which it disagrees.”); 14 CCR 897 (“The information in [THPs] shall also be sufficiently clear and detailed to permit adequate and effective review by responsible agencies and input by the public to assure that; significant adverse individual and cumulative impacts are avoided or reduced to insignificance.”)

Another major informational deficiency of the THP is its failure to disclose the impacts of the clear-cutting on greenhouse gas emissions associated with the release of soil carbon stores. Belowground carbon stores may equal aboveground live tree biomass, and can have similar

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7 See March 2, 2005, Department of Forestry and Fire Protection Memorandum Re Disclosure, evaluation and protection of large old trees.
impacts on greenhouse gas emissions. Clear-cutting causes a pulse of carbon to be released from forest soils because it generates large, instant input of material into the soil carbon pool. This input includes tree biomass in the form of roots and stumps (combined these represent 20-25% of live forest biomass), and slash (including tree branches, tops, small trees, parts of bark and other logging debris, which together represent 15-20% of live forest biomass). This added material decomposes over time and generates a substantial pulse of carbon release lasting for many years. In addition, the removal of the forest canopy by clear-cutting exposes the soil to direct sunlight, which tends to increase soil respiration; soil preparation (such as discing) for tree planting also increases soil respiration; and soil erosion associated with clear-cutting and soil preparation can cause significant losses of soil carbon. All of these factors are significant and potentially substantial additions to the greenhouse gas emissions, and therefore are impacts of the project, and can be estimated using available survey techniques and indices.

Furthermore, there is an informational deficiency in SPI’s statement in terms of the accounting. What is absolutely certain are the carbon emissions in the short term associated with the clear-cutting. However, the long-term sequestration that SPI points to in an attempt to compensate for the emissions is significantly less certain. Consequently, it is crucial that SPI disclose all emissions from all pools and sources, including foregone pools (e.g., the future sequestration by the current forest that would have occurred but for the clear-cut), in order to accurately and adequately explain the circumstances of the THP’s impacts on carbon emissions and sequestration. So far, SPI continues to ignore the fact that: a) significant impacts that will occur in the short term cannot be dismissed based on uncertain future mitigation (especially when, as here, that future mitigation will likely not make up for the carbon lost due to clear-cutting), and b) all pools and sources of emissions must be accounted for including the emissions associated with i) decay, ii) soil, understory, litter, and duff impacts, iii) cutting, site preparation, transportation, and manufacturing emissions, and iv) foregone carbon sequestration. There is simply no escaping the need for immediate GHG reductions and all SPI offers is uncertain mitigation in the far off future for significant impacts that will occur in the short term. It takes decades for a replanted forest to make up for all the carbon lost to a clear-cut, and even after many decades, there may still be a net loss of carbon (due to the lack of information from SPI, this cannot be fully determined). The below graph (from Olga Krankina, Assistant Professor, Forest Science, Oregon State University) illustrates the problem well, and while the graph uses an old-growth forest as the starting point, the problem can still occur when starting from the point that this THP starts from, namely, a mostly native mixed-species multi-story forest which will be completely destroyed via clear-cutting and converted to a plantation.
Converting old-growth forests in productive forests such as those in the Pacific Northwest is highly unlikely to result in the forest storing more carbon. In this series of simulations old-growth forest landscapes are converted to plantation forest landscapes with differing intervals between harvests. As the interval between harvests is shortened, the stored carbon store decreases. The gains in wood products stores do not fully offset this loss.

**SPI’s Statement**

The statement submitted by SPI regarding greenhouse gas emissions largely ignores the issues raised by the Center in its initial comment letter, and fails to adequately address the carbon emissions associated with clear-cutting. CBD will not repeat many of the points raised in its first comment letter but does submit the following.

1. **Impacts of clear-cutting**

In particular, the SPI statement fails to address the potentially great differences in GHG emissions from *clear-cutting* compared to less intensive harvest scenarios. Because the THP still does not address the impacts of clear-cutting, the THP’s conclusions about carbon emissions are not meaningful and cannot substitute for the required cumulative impact analysis. *Joy Road Area Forest & Watershed Assn. v. California Dept. of Forestry & Fire Protection* (2006) 142 Cal. App. 4th 656, 676 (“[T]he cumulative impact analysis must be substantively meaningful. A cumulative impact analysis which understates information concerning the severity and significance of cumulative impacts impedes meaningful public discussion and skews the...
decisionmaker's perspective concerning the environmental consequences of the project, the necessity for mitigation measures, and the appropriateness of project approval.”); Communities for a Better Environment v. California Resources Agency (2002) 103 Cal. App. 4th 98, 117 (“The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.”)

In addition, SPI relies extremely heavily on reference to the SPI paper (James, C., et al.) to dismiss concerns over the impacts of greenhouse gas emissions from their even-age management scenario. However, the SPI statement fails to address the issues raised by the Center with regard to the serious inadequacies of that paper. In particular, the SPI statement fails to address that: a) the James et al’s conclusions are based on a comparison of incomparable management scenarios, and fail to include critical comparisons of alternatives; b) James et al’s estimate of the carbon pool is incomplete, not scientifically valid, and not justified; and c) James et al used incorrect assumptions and statistics that biased the results in favor of intensive management.

2. Impacts of climate change on the project

SPI makes some unfounded conclusions with regard to climate change impacts on the forest ecosystem and vegetation growth rates. SPI attempts to dismiss the problem that their analysis ignores the impacts of climate change by first attempting to limit the discussion of the impacts of climate change to changes in growth rates, and second, by limiting the discussion of growth rates to changes in precipitation.

SPI relies entirely on findings from a new model in Battles et al (2009), which projects an increase in pine yield over baseline by 2100. However, when reporting this findings, California Climate Action Team (2009)\(^8\) was careful to point out that these preliminary results come from a newly developed model that focuses on growth in a commercial pine plantation and are limited to a 50-year period, the results contradict earlier published results by Battles (2008) that projected a 25% reduction in growth rate, and that further evaluations are needed to better estimate the reliability of the new model. Climate Action Team (2009), page 1.13. Perhaps most significantly, Battles (2009) does not appear to differentiate between rain and snowfall in winter precipitation, and effects of declining snowpack. This is a potentially critical point, as Battles (2008) stated that, “The intensity and extent of the moisture deficit that develops during the summer are considered to be limiting factors in the growth and viability of Sierran conifers (Royce and Barbour 2001a). Higher summer temperatures in a Mediterranean climate (absent any changes in precipitation) could induce greater tree water stress through higher evapotranspiration rates and/or faster depletion of moisture in the soil profile. These changes would hasten the onset of drought stress that occurs in the late summer and early fall before the winter rains return. The result would be a shorter growing season due to lack of moisture, which

is already recognized as a primary growth constraint on most commercial timber sites in Sierran forests (Royce and Barbour 2001b).”

In addition, Climate Action Team (2009) cites Shaw et al. (2008) who found that “the impact of climate change on carbon sequestration depends in part on whether the future will be warmer and wetter...or hotter and drier.” One model projected “an increase in aboveground carbon for both the lower (B1) and higher (A2) emissions scenarios above the baseline scenario (Figure 10). In contrast, the hotter, drier model (GFDL) projects much lower carbon stocks than the baseline scenario, with a marked drop around 2080 in the A2 emissions scenario. The climate future generated by CCSM3 results in an even sharper decline in carbon stocks over the 21st century, with the largest loss expected under the A2 scenario. By 2070 to 2099, carbon stocks could increase by 9 percent in the warmer, wetter future, or drop by 26 percent in the hotter, drier scenario.” Climate Action Team (2009), page 1.15.

SPI claims that “While some models indicate less snow and more rain, that still does not impact the forest vegetation’s ability to continue to grow because the forest depends on water that is stored in the soil...It does not necessarily affect forest vitality because no runoff occurs until the soil has been recharged.” (Page 55.4) This is not an accurate depiction of the scientific understanding of the climate change projections for California. The Intergovernmental Panel on Climate Change Fourth Assessment Report (2007)9 includes a compilation of more than 20 climate models, and projects an average annual temperature increase of 2.5 to 3.5 C in California, with increases greater in the Sierra Nevada. Annual precipitation is projected to change only 0-5%, but summer precipitation is projected to decrease by as much as 15% while winter precipitation is expected to fall increasingly as rain, with decreasing snowpack. Hayhoe (2004)10 provides downscaled projections for California, projecting increases in winter temperatures of 2-4 C in winter and 5-10 C in summer in the Sierra Nevada. California Climate Change Center (2006) states that “if heat-trapping emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent.” Again, this is a potentially critical point, as Battles (2008) stated that, “The intensity and extent of the moisture deficit that develops during the summer are considered to be limiting factors in the growth and viability of Sierran conifers (Royce and Barbour 2001a). Higher summer temperatures in a Mediterranean climate (absent any changes in precipitation) could induce greater tree water stress through higher evapotranspiration rates and/or faster depletion of moisture in the soil profile. These changes would hasten the onset of drought stress that occurs in the late summer and early fall before the winter rains return. The result would be a shorter growing season due to


lack of moisture, which is already recognized as a primary growth constraint on most commercial timber sites in Sierran forests (Royce and Barbour 2001b).

SPI narrowly and incorrectly cites USCCSP (2008) as saying that forest growth rates will increase. “Although SPI did not assume any increased growth in our Option A modeling, with the available water we will likely see increased growth in young forests on fertile soils…” SPI statement, page 55.4. However, this statement in USCCSP (2008) derives from IPCC (Field et al., 2007) which stated that “vegetation growing season has increased by an average of 2 days per decade since 1950 in Canada and the conterminous United States, with most of the increase resulting from earlier spring warming (Bonsal et al., 2001; Easterling 2002; Bonsal and Prowse, 2003; Feng and Hu, 2004). While this allows a greater period of growth and, thus, potential to increase productivity, earlier warming can also contribute to dryer conditions and increased potential for disturbance, both of which may act to offset the increases… Easterling et al. (2007) cited research projecting short-term productivity increases in California forests, in the area available for productive softwood growth, through 2020 with reductions in the long run (up to 2100) (Mendelsohn, 2003) …At lower elevations, however, growth was negatively correlated with summer temperature, suggesting water limitations. (Peterson and Peterson, 2001; Peterson et al., 2002 in Field et al., 2007).” (emphasis added)

3. Surface and soil carbon stores

SPI claims that reductions in carbon stored in duff and litter components are “short lived as the planted trees soon begin to augment this pool.” SPI statement, page 55.5. For this assertion, SPI cites Baldocchi (2008), that states, “[i]n general, there is a large respiratory pulse from the ecosystem within a few years after disturbance. Many sites become carbon neutral within a decade, plus/minus a few years through natural and managed stand reestablishment — former plant colonies sprout from roots, pioneer species invade and establish seedlings/saplings, or managers plant new seedlings.” Baldocchi (2008), p. 13. However, this use of Baldocchi (2008) inappropriately conflates the difference between short-term carbon flux and long-term carbon balance. SPI is confusing the point at which a site begins to sequester more carbon than it emits in a given year, with the point at which the forest cumulatively sequesters (stores) as much carbon or more than was released due to the disturbance. In fact, the timeframe noted in Baldocchi (2008) refers only to the point at which the annual carbon flux at the site turns negative (sequestering carbon), not the time necessary to overcome the negative carbon effects of the clear-cutting.

In addition, SPI characterizes the Baldocchi (2008) study as “relating disturbance (both logging and fire) to age since disturbance; found on most sites that net carbon exchange from the atmosphere became negative…in 10 years or less.” SPI statement, page 55.5. However, SPI fails to note that these findings include post-burn sites which Baldocchi (2008) identifies as likely to more quickly become carbon neutral than post-harvest sites. “There are some differences in the carbon-flux trajectory among sites that have been burnt and logged (Amiro et al. 2006). Burnt

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sites tend to produce a smaller, post-disturbance respiratory pulse than do logged sites. This is because burnt sites have many aerial snags that take several years to rot at the base, fall and come in contact with the wetter soil to begin respiration (Amiro et al. 2006). They may also experience a rapid recovery in photosynthesis, as do boreal forests when aspen stems shoot out from below ground roots. Logged sites, in contrast, have much residue on the surface and organic matter in the soil that readily decomposes (Law et al. 2003; Clark et al. 2004; Amiro et al. 2006).” Baldocchi (2008), p. 14. Furthermore, Amiro et al (2006) included only one harvested site, and found that site to be a significant net carbon source 8 years after harvest. In short, it appears that SPI’s statement that “many sites become carbon neutral within a decade” relies entirely on data from post-burn sites, and ignores conflicting data from post-harvest sites.

The SPI statement also fails to acknowledge that regardless of what happens in ten years, clear-cutting is causing significant emissions, and hence, is a significant source of emissions as soon as the cut takes places. There is no question that the clear-cutting will lead to immediate carbon emissions, from all pools and from gray emissions, and it can take many years, if ever, for the forest to return to being a net sink of carbon emissions as opposed to a net source.

The Center’s initial comments raised the issue that clear-cutting reduces the carbon stored in forest soils and floors. The only comment in the SPI statement responsive to this point is the claim that unpublished research “indicates that there have been net gains in soil carbon irrespective of roots in the 15 years since the initial sampling [after clear-cut]…Thus it is appropriate to assume that there is no significant emission from the belowground carbon pool, and in fact SPI management is likely increasing this carbon pool.” SPI statement, page 55.5. However, the McFarlane study was not provided with the SPI statement, and therefore, because the public cannot assess it independently, this study cannot be relied upon. More importantly, the McFarlane study does not appear to directly address the issue of soil carbon loss due to disturbance from clear-cutting. Clear-cutting potentially reduces carbon soil more significantly and for longer periods than selective harvest or other management scenarios because clear-cutting exposes a greater proportion of the soil surface to direct sunlight, and soil treatment following clear-cutting on many SPI projects includes discing the soil several inches deep, leading to greater respiration rates and loss of subsurface carbon. Jandl et al (2007) “reviewed the experimental evidence for long-term carbon (C) sequestration in soils as consequence of specific forest management strategies” and found that

In the years following harvesting and replanting, soil C losses may exceed C gains in the aboveground biomass. The long-term balance depends on the extent of soil disturbance.

In a comparative study, harvesting turned forests into a C source because soil respiration was stimulated, or reduced to a lesser extent, than photosynthesis (Kowalski et al., 2004). A scheme of C dynamics after harvest shows the almost immediate C loss that is followed by a slow recovery of the C pool.

Measurement of net ecosystem C exchange showed that for at least 14 years after logging, regenerating forests remained net sources of CO2 owing to increased rates of soil respiration (Olsson et al., 1996; Schulze et al., 1999; Yanai et al., 2003). Reductions in soil C stocks over 20 years following clear cuts can range between 5 and 20 t C/ha and are therefore significant compared to the gain of C in biomass of the maturing forest (Pennock and van Kessel, 1997).

Continuous-cover forestry, including selective harvesting, resembles thinning with respect to its effect on the soil C pool, and is considered a possible measure to reduce soil C losses compared with clear-cut harvesting (ECCP-Working group on forest sinks, 2003).

At the landscape level, longer rotation lengths with more old forests lead to higher C pools than short rotations with only young plantations.

What is beyond dispute is that the formation of a stable soil C pool requires time. Avoiding soil disturbances is important for the formation of stable organomineral complexes which in turn are crucial elements in the process of C soil sequestration.

Furthermore, Janisch and Harmon (2002), similarly addressed the impact of release of carbon from coarse woody debris (CWD) from harvest actions, and reported durations of several decades to return to cumulative sequestration in harvested old-growth. “Because CWD is ultimately oxidized unless it enters some form of permanent storage, stands should be treated as CO2 sources at least until regenerating live tree mass balances the CO2 debt generated by clear-cutting. This point is critical because if the C fixation rate exceeds the C loss rate, stands with absolute CO2 debts relative to pre-harvest C storage will register as CO2 sinks during ‘instantaneous’ or short-term monitoring of NEP. When NEP accounting includes decomposition of all CWD, the source-to-sink transition changes to 27-57 years (Scenario 2), 38-165 years (Scenario 3) and 105-200+ years (Scenario 4) (based on mean live tree growth versus range of CWD).”

4. Substitution effect

SPI inappropriately refers to the California Climate Action Registry (CCAR) as justification for SPI’s estimates of carbon sequestration. “The 100-year permanency period is the same as that used by the California Climate Action Registry for its analysis of a permanent carbon offset.” SPI statement, page 55.6. However, this is a mischaracterization of the CCAR protocols currently under revision. Contrary to SPI’s assertion, the current CCAR revision has deliberately and specifically excluded wood products discarded in landfills, both because the estimates of carbon permanency in landfills is highly uncertain and disputed, and because attributing carbon offsets to carbon discarded in landfills creates perverse disincentives to diverting wood waste to much more responsible and carbon effective end uses.

In addition, SPI claims, on page 55.8 of their statement, that “using [harvested] biomass to generate electricity and steam nets 16.25 tons of CO2 benefits for each ton of CO2 emitted in the...
collection process.” However, this relies on an extremely optimistic set of assumptions, not disclosed by SPI. More importantly, this reduction in emissions occurs if (and only if) there is an assured reduction in the use of electricity and steam generated by fossil fuels, not identified in the THP. Lastly, the THP includes no actual plans for biomass or co-generation facilities.

5. Potential carbon sequestration

SPI fails to address the fact that carbon sequestration would be greater if stands were not harvested, and that much sequestration is foregone as a result of clear-cutting. SPI asserts that its “forests are managed second- and third-growth forests and not old growth so we do not analyze converting an old-growth forest to a managed forest…” SPI statement, page 55.6. However, the question is not whether the carbon loss from this THP is equivalent to the harvest of an old-growth forest, but whether the stand would sequester more carbon if it were not harvested. For instance, as discussed in Hudiburg et al (2009)13:

Decrease in NPP with age was not general across ecoregions, with no marked decline in old stands (200 years old) in some ecoregions. In the absence of stand-replacing disturbance, total landscape carbon stocks could theoretically increase from 3.2 ± 0.34 Pg C to 5.9 ± 1.34 Pg C (a 46% increase) if forests were managed for maximum carbon storage.

Trends in NPP with age vary among ecoregions, which suggests caution in generalizing that NPP declines in late succession. Contrary to commonly accepted patterns of biomass stabilization or decline, biomass was still increasing in stands over 300 years old in the Coast Range, the Sierra Nevada and the West Cascades, and in stands over 600 years old in the Klamath Mountains. If forests were managed for maximum carbon sequestration total carbon stocks could theoretically double in the Coast Range, West Cascades, Sierra Nevada, and East Cascades and triple in the Klamath Mountains (Fig. 8).

The SPI statement also declares that “[s]ome would assert that SPI could store even more carbon by not harvesting or harvesting by different silvicultural methods…While, it may appear based on superficial analysis, that more wood could be stored by simply letting the forest continue to grow, that dangerous conclusion ignores the grave risks of wildfire and disease potential that such dense stocking creates.” SPI statement, page 55.8. This statement incorrectly implies that the clear-cut harvest in this project significantly reduces the landscape-scale factors that affect wildfire and disease potential and that no harvest scenarios other than clear-cutting would achieve reductions in these risks. More importantly, this statement is unresponsive to the point that clear-cutting has significantly greater greenhouse gas impacts than other harvest scenarios, harvest scenarios that themselves can reduce risk from fire, etc.

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The SPI statement on 55.8 cites Hurteau and North (2009) as purported evidence that harvesting sequesters more carbon than developing old-growth. “A recent publication addressing this question and clearly coming down on the side of active management suggests that management to produce large well-spaced pine forests (similar to SPI’s management strategy) is the best overall carbon solution.” SPI statement, page 55.8. However, this is a gross mischaracterization of that study. The applicable quote from Hurteau and North (2009) is: “Although the concept of restoring forests in the western US to some pre-settlement target may not be feasible as the climate changes, reducing fire severity and increasing and stabilizing tree-based C storage may be achieved with fuel treatments that promote low-density, large pine-dominated stand structures.” It is completely inappropriate for SPI to compare a clear-cut and plantation system with the fuel treatments proposed in Hurteau and North (2009), which focused on fuels reduction and understory thinning with large-tree retention. Furthermore, it is critical to note that the Hurteau and North (2009) study is explicitly based on a comparison of carbon stores in response to a hypothetical, uniform, modeled fire. That is, Hurteau and North (2009) model which forest structures store the most carbon after a modeled fire, not “the best overall carbon solution” as SPI mischaracterizes it. Lastly, it is important to note that the Hurteau and North (2009) study does not include soil carbon stores, and models only a simulated uniform fire.

**CEQA/FPA Alternatives Analysis**

Because clear-cutting leads to significant carbon emissions (i.e. greater than 0), the THP’s alternatives analysis fails as a matter of law. Here, the THP neglects to provide a description of “at least one alternative that would ensure that the [agency] contributes to a lower-carbon future.” Instead, SPI simply asserts that its method of choice, clear-cutting, is the only possible alternative. This misses the point of CEQA, which is to provide decision-makers with alternatives that would lessen or avoid the impacts of the proposed project. Here, there needs to be at least one alternative that would provide for a lower carbon future than clear-cutting does. The FPA likewise demands as much — as stated at 14 CCR 897:

> RPFs who prepare plans shall consider the range of feasible silvicultural systems, operating methods and procedures provided in these rules in seeking to avoid or substantially lessen significant adverse effects on the environment from timber harvesting. RPFs shall use these rules for guidance as to which are the most appropriate feasible silvicultural systems, operating methods and procedures which will carry out the intent of the Act.

Moreover, a recent court decision makes clear that just because a project proponent wants to do things a certain way does not mean the CEQA analysis must bend over backwards to accommodate the project proponent. Feasible alternatives must be considered regardless of the project proponent’s position on the alternatives. For instance, in *Preservation Action Council v City of San Jose* (2006) 141 Cal.App. 4th 1355, the defendant relied heavily on the real parties’ project objectives in order to reject an alternative. The court found that “the project objectives in the DEIR appear unnecessarily restrictive and inflexible.” *Id.* at 1360. Put another way, “the willingness of the applicant to accept a feasible alternative . . . is no more relevant than the financial ability of the applicant to complete the alternative. To define feasible [in such fashion] would render CEQA meaningless.” *Uphold Our Heritage v. Town of Woodside* (2007) 147 Cal.
This same principle was reiterated in Save Round Valley Alliance v. County of Inyo (2007) 157 Cal. App. 4th 1437, 1460, where the court found that “the willingness or unwillingness of a project proponent to accept an otherwise feasible alternative is not a relevant consideration.” This was so despite the project proponent’s explicit unwillingness to accept a proposed alternative. Id. The Court found that the alternative should have been analyzed regardless, and noted that an “applicant’s feeling about an alternative cannot substitute for the required facts and independent reasoning.” Id. at 1458, quoting Preservation Action Council, 141 Cal. App. 4th at 1356. Thus, while SPI may desire to clear-cut in this area, CDF nonetheless has an independent obligation to assess a lower carbon alternative. This is also necessary in order to allow for informed decision-making. In short, CDF can not simply acquiesce to SPI’s desires; CEQA demands just the opposite. In the words of the Save Round Valley Court, “the agency preparing the EIR may not simply accept the proponent’s assertions about an alternative.” Id. at 1460. Consequently, thus far, the THP’s analysis of alternatives is deficient.

CONCLUSION

The Typhoid Sally THP must be revised in light of its informational and other deficiencies. SPI has also still failed to, among other things, quantify the direct and indirect greenhouse gas emissions resulting from the project, and properly consider mitigation and alternatives. Until all issues are adequately addressed and the THP re-circulated for comments, the proposed harvest is unlawful.

Thank you for your consideration of these comments. Please contact us if you have any questions.

Sincerely,

______________________________
Chris Kassar, Center for Biological Diversity

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Brian Nowicki
Center for Biological Diversity
Literature Cited


