CENTER for BIOLOGICAL DIVERSITY

December 16, 2009

SENT VIA EMAIL

Director and Review Team
CAL FIRE
Resource Management
santarosapubliccomment@fire.ca.gov

Re: Comments on Nonindustrial Timber Management Plan: Bower (1-08-009-MEN)

Dear CAL FIRE:

The Center for Biological Diversity ("Center") submits the following comments for the Bower Nonindustrial Timber Management Plan ("NTMP"), 1-08-009-MEN. 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.

Legal Background

In addition to the Forest Practice Act and its implementing regulations ("FPRs"), NTMPs are subject to the California Environmental Quality Act ("CEQA") which mandates that environmental impacts be considered and analyzed, and significant impacts then avoided and/or mitigated.[1] NTMPs must also comply with the federal Endangered Species Act ("ESA"), as well as the California Endangered Species Act ("CESA").[2]

Both the federal and California Endangered Species Acts seek to conserve threatened and endangered species so that they can recover and be removed from the ESA list. Of course, for a species to stay viable and recover, it needs habitat, including unoccupied habitat.[3] That is why habitat protection is a fundamental aspect of the ESA and CESA – as stated in CESA:[4]

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[1] *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").

[2] *See* 14 CCR 896 ("The purpose [of the FPRs is to implement the FPA] in a manner consistent with other laws.").

[3] It is axiomatic that for an endangered species to recover in number, it needs unoccupied habitat into which it can expand.

[4] California Fish and Game Code, sections 2052 - 2061

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> The Legislature hereby finds and declares [that endangered and threatened species] are of ecological, educational, historical, recreational, esthetic, economic, and scientific value to the people of this state, and the conservation, protection, and enhancement of these species and their habitat is of statewide concern.
>
> The Legislature further finds and declares that it is the policy of the state to conserve, protect, restore, and enhance any endangered species or any threatened species and its habitat and that it is the intent of the Legislature, consistent with conserving the species, to acquire lands for habitat for these species.
>
> The Legislature further finds and declares that it is the policy of the state that state agencies should not approve projects as proposed which would jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species, if there are reasonable and prudent alternatives available consistent with conserving the species or its habitat which would prevent jeopardy. Furthermore, it is the policy of this state and the intent of the Legislature that reasonable and prudent alternatives shall be developed by the department, together with the project proponent and the state lead agency, consistent with conserving the species, while at the same time maintaining the project purpose to the greatest extent possible.
>
> The Legislature further finds and declares that it is the policy of this state that all state agencies, boards, and commissions shall seek to conserve endangered species and threatened species and shall utilize their authority in furtherance of the purposes of this chapter.
>
> "Conserve," "conserving," and "conservation" mean to use, and the use of, all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary.

Thus, while CESA prohibits the take of any listed endangered species, it also requires that agencies "use . . . all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary." Consequently, unoccupied habitat can not only not be ignored, it must be protected, especially when, as is the case here, it is habitat that is essential to nesting.

CEQA, likewise, can require that unoccupied habitat of endangered species be conserved. Because CEQA requires that significant environmental impacts be avoided or mitigated, if impacts to unoccupied habitat will be significant, then they must be avoided or mitigated. Moreover, in regard to project impacts to late-seral habitat, the FPR definition of a "Late Succession Forest Stand" (i.e., 20 acre minimum) is largely irrelevant from a CEQA perspective. If loss of any amount of late seral habitat is significant (whether it be .01 acres or 20 acres), then it must be avoided and/or mitigated. Put more broadly, compliance with the FPRs is not the same as compliance with CEQA. Only when all significant environmental impacts have been avoided or mitigated is CEQA compliance achieved.

A cumulative impact analysis is also a fundamental component of the NTMP review process.[5] Cumulative impact analysis ensures that the significant impacts of many different projects over time are identified so as to "alert the public and its responsible officials to environmental changes before they have reached ecological points of no return."[6] The FPRs adopt the CEQA Guidelines' definition of cumulative impacts: "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."[7]

If the information in a cumulative impacts assessment is not sufficiently clear and detailed to permit CDF, review team agencies, and members of the public to determine whether significant adverse cumulative impacts have been avoided or mitigated, the plan must be denied.[8] CDF must disapprove a NTMP that is "misleading in a material way" or that fails to include sufficient information to evaluate the plan's significant environmental impacts.[9] Furthermore, CDF must deny a plan that fails to "incorporate feasible silvicultural systems, operating methods, and procedures that will substantially lessen significant adverse impacts on the environment."[10]

It should also 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."[11] "[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."[12]

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[5] *See Joy Road Area Forest & Watershed Assn. v. California Dept. of Forestry & Fire Protection* (2006)142 Cal. App. 4th 656, 676; *Californians for Native Salmon etc. Assn. v. Department of Forestry* (1990) 221 Cal. App. 3d 1419, 1423

[6] *Sierra Club,* 7 Cal.4th at 1229; s*ee also* 14 CCR 897 (information shall be "sufficiently clear and detailed to permit adequate and effective review by responsible agencies and input by the public to assure that significant adverse . . . cumulative impacts are avoided or reduced to insignificance").

[7] 14 CCR 895.1; 14 CCR 15355

[8] 14 CCR 897, 898.2

[9] 14 CCR 898.1

[10] 14 CCR 898.1, 896; *see also Friends of the Old Trees v. Department of Forestry & Fire Protection* (1997) 52 Cal. App. 4th 1383, 1405 ("an alternative to a proposed project is just that—a description of *another* activity or project that responds to the major environmental issues identified during the planning process.")

[11] *Advice Regarding Board of Forestry's Regulatory Authority to Provide for the Restoration of Resources* at 4

[12] *Id*. at 8

"The requirements of CEQA, CESA, and the functional equivalent certification … review process all require that the Board consider and mitigate for adverse environmental impacts when making its decisions."[13]

The Bower NTMP fails to meet the requirements of the FPA, CEQA, CESA, and ESA because it fails to adequately address the project's impacts on late seral forest and wildlife in the area. Namely, the Bower NTMP fails to adequately: 1) identify, discuss, and analyze the baseline condition in the area (e.g., a severe lack of late-seral habitat); 2) discuss, analyze, and avoid impacts to endangered/threatened species and their habitat; 3) identify, discuss and analyze significant impacts to late-seral habitat as well as the non-listed species that use such habitat; 4) identify, discuss and analyze the NTMP's carbon emissions, and 5) properly identify, discuss, analyze and implement appropriate alternatives and/or mitigation.

Factual Background

In California, forest with late-seral characteristics (sometimes referred to as old-growth or mature forest) is extremely limited. "Most of the old-growth redwood (*Sequoia sempervirens*) in California has been cut; regenerating forests will probably never resemble those that were harvested, and what old growth remains on private land occurs in small, isolated remnant patches."[14] As stated in a recent discussion of the status of marbled murrelets, "In California, old-growth coastal redwood forests had been reduced by about 85 to 96 percent [as of 1997]."[15] Consequently, and as explained further below, California's remaining remnant patches of coastal old-growth are of great significance in terms of their importance to California's plant and wildlife communities, including, but not limited to, rare and endangered species.

In regard to late-seral habitat that would be impacts by the Bower NTMP, the RPF for the project notes that the area:

> contains certain structural elements common to late seral and true old growth stands, and it does contain individual trees with structural elements that can provide habitat value to certain wildlife species (emerging late seral habitat) . . . .
>
> The dominant characteristic of both Unit 9 stands is predominantly one of young growth timber stands with scattered remnant elements of late seral stands.[16]
>
> We have identified two areas within the DFG Designated LSFS: a Core Late-seral stand comprised of 12.8 acres and a Scattered Late-seral area encompassing 4.2 acres. A third area, an isolated pocket of Late-seral trees encompassing 0.7 acres, was also identified . . . .

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[13] *Id*. at 9

[14] Zielinski, William J. and Steven T. Gellman. 1999. Bat Use of Remnant Old-Growth Redwood Stands, *Conservation Biology*, Volume 13, No. 1: pages 160- 167

[15] U.S. Fish and Wildlife Service, Marbled Murrelet *(Brachyramphus marmoratus)* 5-Year Review (June 12, 2009)

[16] This makes protection of mature trees all the more important.

> Forty-four of the inventoried trees have been identified as available for harvest.[17] DFG has identified trees in the DFG Designated LSFS with branches of adequate size and with enough substrate to be suitable nest platforms for a marbled murrelet.
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> Ranking the 67 inventoried trees according to DFG's recommended method would result in retention of 40 trees instead of the 23 trees proposed in this NTMP.
>
> Removal of these trees is mitigated by retention of the 23 trees in the plan that are ranked as having the highest potential habitat value and by other stand management practices described in the plan. With the mitigation measures contained in the plan, removal of the large-diameter trees proposed in the plan will not add to any adverse cumulative effects that may exist in the Doty Creek Planning Watershed.

The DFG reports for this NTMP provide a better background regarding the proposed harvest and the history of harvest in the area, and also provide a good discussion of the importance of late seral forest in general. As discussed in one of the DFG reports:

> DFG's field observations revealed a stand embedded in Unit 9 that meets the structural definition of Late Succession Forest Stands as defined in the FPRs (14 CCR 895.1) - a stand with at least California Wildlife Habitat Relationships (WHR) size Class 5 with moderate to dense canopy cover (5M or 50).
>
> The only deficiency of the stand, hereinafter referred to as Unit 9-LS, relative to the FPRs definition is it does not meet FPRs requirement of 20 acres. DFG estimates it to be approximately 18 acres (see figures 3 through 6). This estimate is based on two field visits (Figure 5 and Figure 6) with a Global Positioning System (GPS) and examination of 2005 NAIP digital image mosaics for Mendocino County (USDA-FSA Aerial Photography Field Office 2005). Unit 9-LS is multi-layered with large dominant trees over smaller understory trees (Figure 7). In this area, DFG estimates the stand would be classified as WHR 6. The LSFS contains large trees, large trees with defects such as basal hollows, broken tops and large limbs, snags and large downed logs (see Figure 7 and Figure 8).
>
> DFG assesses late-seral habitat conditions with both the FPRs definition and a more ecological, albeit not well differentiated designation of late-seral forests. The assessed conditions include: ~ Dominant and predominant tree sizes are large relative to site conditions. ~ Evidence of decline, decadence, and other signs of "over-maturity" in the predominant and dominant trees in the stand. ~ Incidence of time-associated habitat features among the predominant and dominant trees. These include basal hollows, bark character (such as extensive charring, deep furrows and exfoliation), and mechanical damage or deformity (such as broken or reiterated tops). ~ Presence of mortality (snags and downed logs) consistent with the stand's forest type and position. ~ Area is

[17] This number could possibly be 37 but only if a wildlife biologist retained by the landowner determines that they warrant retention. As already noted, this contradicts even the findings of CDFG. And as explained below, it is antithetical to the protection and conservation of the marbled murrelet.

adequately large and contiguous, or is embedded in a mature forested landscape such that the area under review provides sustainable, interior late seral habitat conditions. Relative to continuity, the size of breaks that are significant are species-specific. But for the late-seral community as a whole, significant breaks probably are best approximated by forest structure effects on microclimate.

Field inspections revealed Unit 9-LS contains mature and old-growth (probably at least 120- to 450-years-old) redwood and Douglas fir trees, as well as snags and coarse woody debris (CWD). With the resources available, DFG was unable to identify any LSFS outside of the NTMP area; therefore, the Unit 9-LS appears to be the extent of LSFS in the PWS (Figure 3). The small proportion of the PWS area in late-seral stages is substantially less than an amount (Le. ,10%) recommended as necessary for sustaining forest ecosystem functions (Harris 1984, page 157). The current preponderance of early and mid-seral forests in the Doty Creek PWS is the result of past agricultural practices and timber harvesting. Information on the natural range of variability of seral forest distribution (prior to the advent of timber management in the 19th and 20th Centuries) in the coastal interior Douglas fir and redwood zone is lacking. However, the low amount of late-seral forest in the coniferous portion of the PWS is likely well below the natural range of variability for this resource.

Late-seral forests are a component of biological diversity in the PWS associated with natural changes in forests over one to several centuries (Spies et aI., 1994). Late-seral habitats can be viewed from several ecological perspectives; for example, biological growth, disturbance, forest and community structure, species, and ecological processes (Franklin et al., 1981). Central to all of these perspectives are the changes in forest ecosystems and communities that accrue during long periods of time that are free from large, high severity disturbance. Frequently recurring high intensity fires, windthrow events, or repeated timber harvests can remove large diameter trees faster than can be recruited to the stand and truncate succession before late-seral forest develops. The characteristics of structure, composition and processes that develop as dominant trees age and die constitute some of the most definitive features of late-seral forest habitats. Late-seral forest habitats thus emerge over time from the general accumulation of growth, small disturbances, natural tree mortality, and colonizing species (Spies et al., 1994). Together these processes produce structural complexity that shapes the terrestrial habitat and also affects the dynamics of watershed products such as temperature, water, nutrients, LWO, and sediment. Therefore, the NTMP should protect the existing late-seral habitat and structure by retaining the larger diameter conifers and existing late-seral components in the LSFS. Additionally, new studies also indicate old-growth forests remove carbon even when fully mature, and old forests are better than forest plantations at dependably removing carbon dioxide from the atmosphere (Luyssaert 2008). Carbon is sequestered for long periods in old-growth ecosystems, both in trees and down woody debris. Perhaps more importantly large amounts of carbon are sequestered in the soils and old tree root systems of old-growth forest, where undisturbed they act as underground carbon reservoirs (http://forests.org/archive/generallplnewfor.htm). In developing the

FPRs treatment of late-seral forest habitat, the Board derived a definition[18] based upon the WHR program (DFG 2002). Biologists agree that WHR habitat stages 5M, 50, and 6 represent habitat conditions provided by relatively large and dense trees; however, the WHR system does not specifically describe successional stages in old-growth stands (CDF 1994). Furthermore, WHR does not consider the area requirements of particular species, especially species dependent on late-seral stands that cannot be treated the same as more ubiquitous, early seral species in conservation planning (Noss 2000). In an ecological sense, late-seral forests are those in which the growth rate of the dominant trees is decreasing and in which senescence and decadence are common features. Use of the FPRs definition for late-succession forest stands is problematic because the determination is based on a simplified stand structure description (WHR), arbitrary area requirement and does not include information on decline or decadence. WHR classifies stands based on tree size (bole or crown diameter) and tree density (canopy closure). Additionally, WHR does not characterize or quantify decline, senescence, decadence, or mortality of the dominant trees. The FPRs definition provides insufficient guidance regarding the amount of habitat elements needed to classify the stand as late succession. Despite the use of selection and group selection (small clearcuts) proposed in Unit 9, DFG has determined the incremental loss of individual large decadent trees from within, and small clearcuts in the LSFS would contribute to significant adverse cumulative impacts to this resource and the associated wildlife community in the PWS.

[T]he NTMP fails to adequately protect large, decadent conifers exhibiting features beneficial to wildlife associated with LSFS habitat. The incremental use of selection and group selection harvests proposed in the NTMP – methods designed to remove without replacement the largest and most structurally complex trees over time -- will eliminate most of the existing late-seral habitat characteristics and contribute to further cumulative impacts impact to LSFS resources in the Doty Creek PWS.

The importance of late-seral forest habitats are extensively documented in the available literature. Some species such as the marbled murrelet, Pacific fisher *(Martes pennantr),* and the American marten *(Martes americana)* are strongly associated with late successional forest for part of their life cycle such as denning and nesting. Harris (1984) lists 118 vertebrate species out of 153 in Western Oregon that use late-seral forests as a primary habitat. The other 55 species use early seral stages as primary habitat. Of the vertebrate species associated with late-seral conditions, 47 use it as their primary habitat and, without this forest type, would not meet their habitat needs for essential behaviors such as reproduction.

Moreover, many of the species associated with the larger tree habitats are listed as endangered or threatened or are otherwise considered sensitive, whereas most of the early- and midseral species are not. For example, among the listed and sensitive species

[18] "Late Succession Forest Stands" means stands of dominant and predominant trees that meet the criteria of WHR class 5M, 5D, or 6 with an open, moderate or dense canopy closure classification, often with multiple canopy layers, and are at least 20 acres in size. Functional characteristics of late succession forests include large decadent trees, snags, and large down logs (14 CCR 895.1).

using size Class 5 and 6 stands for reproduction, foraging, or cover are the marbled murrelet, Pacific fisher, American marten, Sonoma tree vole *(Arborimus porno)*, northern spotted owl *(Strix occidentalis caurina)*, Vaux's swift *(Chaetura va uxr)* , purple martin *(Progne subis)*, peregrine falcon *(Falco peregrinus)*, pallid bat *(Antrozous pallidus)*, long-eared myotis *(Myotis evotis)*, and Townsend's big-eared bat *(Corynorhinus townsendir)*. These declining or sensitive species associated with late-seral redwood and Douglas fir forests rely upon the presence of adequate area of large tree stands with sufficient late seral habitat elements such as snags, decadent live trees, and coarse woody debris for cover, foraging, and reproduction.

The principal structural components of old-growth forests are individual large old trees, snags, and logs (Bingham and Sawyer 1991, Franklin et al. 1981, Franklin and Spies et al. 1991, Maser et al. 1988). Large old trees, large snags, and large downed wood may all be considered "critical habitat elements" in late-seral forests because they are required components for a variety of wildlife species, they are present at low densities in managed forests, and they take a long time to develop (often longer than the typical harvest rotation period).

The NTMP is located in a region forested with predominately early- to mid-seral forest conditions. The remaining forests in the PWS are commercial timberland, thus recruitment of late-seral conditions will be minimal, at best. Early- to mid-seral forest types were likely a small fraction of the forested PWS prior to the initiation of logging and other agricultural practices. Wildlife species associated with late-seral conditions in the PWS have already been adversely affected by this reduction in old forested area. Trees in all size classes up to the maximum management diameter are normally retained in selection silviculture. Through successive harvest entries, trees specified for retention during prior harvests may be harvested in subsequent harvests. This approach does not ensure that retained trees and trees in the larger diameter classes will be allowed to eventually develop into snags or large green wildlife trees. This allows potential depletion of late-seral habitat elements and their recruits over time as existing snags and senescing trees deteriorate or where the stand is damaged by windthrow caused by adjacent forest opeinings (Chen et aI., 1995) including watercourse protection zones (Reid and Hilton 1988). Without measures to mitigate the loss of large decadent trees, the cumulative impact of multiple harvests in the LSFS at rates that exceed their recruitment will reduce their numbers on the landscape. Uneven-aged silviculture should be mitigated in late-seral habitats to prevent harvests that reduce the number and density of individual large, old trees and their benefits to a multitude of species and forest processes.

DFG evaluated the proposed NTMP's potential to individually or cumulatively impact the LSFS values of Unit 9-LS. The NTMP stand conditions were compared to those in Montgomery Woods State Reserve, a fully functioning late-seral stand for which stand data are available (Giusti 2007), although DFG acknowledges the inherent potential differences between the two locations. As presented in Table 2, the Montgomery Woods State Reserve old-growth stand structure includes 21 trees per-acre greater than 40 inches DBH. In the NTMP's LSFS area, pre-harvest estimates for conifers greater than 40 inches

DBH is approximately five TPA, less than one quarter the density of large conifers compared to Montgomery Woods State Reserve.

The high percentage of large structural conifer removal in the LSFS will likely severely impact or eliminate its current late-seral functionality for wildlife including potentially present State and federally listed and other sensitive species. The pre-project deficiency of large trees in the late-seral habitat is indicative of several timber entries and evidence of an already present cumulative adverse impact. DFG finds that any additional reduction in the large tree component in the LSFS would add to past and reasonably foreseeable future impacts and is therefore cumulatively significant. DFG finds the NTMP's proposed selection and group selection method would not avoid or mitigate long-term impacts to late-seral forest habitats.

In DFG’s opinion, the proposed NTMP can adequately address specific cumulative impacts to biological resources by including measures that will retain late-seral tree structure and more appropriately represent a selection harvest alternative that provides for late-seral forest contiguity; i.e., recruitment into larger size classes with structural complexity.

DFG recommends the NTMP implement a selection harvest that focuses more on the smaller trees because most of the trees in the LSFS area are less than 40 inches DBH. Selection conducted to maintain or enhance late-seral attributes would essentially be a thin or selection from below and only rarely from the larger trees with very low scores as identified on the scorecard. The intent would be to promote growth into the larger size classes more quickly than what the proposed harvest currently reflects.

Large old decadent trees that were once abundant as wildlife habitat prior to the extensive historic logging of late-seral redwood forests are now relatively rare and often scattered on commercial and non-commercial timberlands. These forest elements are considered irreplaceable features for wildlife habitat. Considering the habitat values that large old trees provide to a broad range of species (Franklin et aI., 2000, Mazurek and Zielinski 2004) harvesting any of these uncommon or rare habitat elements may be incompatible with the overall intent as stated in (14 CCR 897(b)(1)(B) of the FPRs (Shintaku 2005).

Mature forest stands with late-seral habitat elements have greater structural diversity and thus provide greater habitat value than stands without such elements. In comparison to older trees, young second-growth conifers typically have relatively simple architecture such as a single main bole with a crown comprised of small diameter horizontal lateral branches. Snags (standing dead or mostly dead trees) are important forest habitat elements which provide nesting, denning, foraging, and roosting opportunities for a variety of species. Important characteristics of snags include density, diameter, height, and state of decay. Birds and mammals typically select the largest snags available (Richter 1993). Large snags provide all the habitat functions of small snags, but small snags do not provide all the functions of large snags. Large snags also have longer persistence (Richter 1993). Most researchers have recommended snag management focus

> on larger snags, e.g., minimum snag DBH greater than or equal to 20 inches to achieve adequate habitat value (Richter 1993).
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> Protecting the old and large diameter conifers in the LSFS and the matrix will ensure large snags are continuously recruited in the stands at rates and conditions described above.
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> late-seral habitat and by extension late-seral components in the PWS are extremely rare outside of the Unit 9-LS. The Unit 9-LS and matrix in Unit 9 contains most (if not all) of the high quality late-seral wildlife habitat in the PWS. DFG agrees the localized frequency of late and diverse seral components appears high in Unit 9, especially in the 9-LS, but from a cumulative impact perspective, the amount of high quality wildlife habitat in the PWS is quite low.
>
> DFG's recommendations are based on the finding that functional habitat for existing wildlife, particularly those associated with late-seral riparian and upland habitats will not be maintained by incrementally reducing or removing already limited late-seral habitat and late-seral elements.
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> According to the NTMP's cumulative impacts assessment under "The Landowner's Objectives in Undertaking the Project Are: "the NTMP has potential to reduce carbon emissions by absorbing carbon in its forests and storing carbon in "long-lived wood products". DFG finds its recommendations for late seral habitat in Unit 9 and late seral components in the remaining NTMP area should be made part of the project. DFG's recommendations are designed to further reduce CWEs to biological resources to a level below significant and specifically address the landowner's objectives regarding reducing carbon emissions in the state.

While the DFG report cites to various important literature, one study in particular does an excellent job of explaining the importance of mature forest habitat, as well as explaining the significance of individual large, old, trees. As discussed in Mazurek 2004:[19]

> In coast redwood (Sequoia sempervirens) forests, only 3–5% of the original old-growth redwood forest remains, largely as fragments scattered throughout a matrix of second and third-growth forests (Fox, 1996; Thornburgh et al., 2000). The remnants vary in size from large, contiguous forest patches protected in state and federal parks to patches of only a few hectares in size, to individual legacy trees in managed stands. Individual old-growth trees that have, for one reason or another been spared during harvest, or have survived stand-replacing natural disturbances, are referred to as ''legacy'' trees (Franklin, 1990). We define legacy trees as having achieved near-maximum size and age, which is significantly larger and older than the average trees on the landscape. This distinguishes them from other 'residual' trees, which may also have been spared from harvest but are not always larger and older than the average trees in the landscape.

[19] Mazurek, M. J. and W. J. Zielinski. 2004. Individual legacy trees influence vertebrate wildlife diversity in commercial forests. *Forest Ecololgy and Management* 193: 321-334.

The rarity of old-growth forests in managed landscapes combined with the rising economic value of old-growth redwood increases the likelihood that legacy stands and individual legacy trees will be harvested. At this time, there is no specific requirement for the retention of legacy trees during timber harvests on private or public lands in California. Exceptions occur on lands owned by companies that are certified as sustainable forest managers (Viana et al., 1996; Smart- Wood Program, 2000) and as such, are required to maintain and manage legacy old-growth trees. A number of studies have demonstrated the importance of legacy and residual trees to wildlife.

As measured by species richness, species diversity, and use by a number of different taxa, legacy trees appear to add important foraging and breeding habitat value to redwood forests managed for timber. The use of legacy trees by wildlife was demonstrated by evidence of their nesting, roosting and resting; behaviors which were not observed at control trees. This difference is probably related to the structural complexity offered by redwood legacy trees (Bull et al., 1997; Laudenslayer, 2002). Control trees were smooth-boled with very few large horizontal limbs, few cavities, and no basal hollows. Legacy trees possess these structural features, which probably account for their greater attractiveness to a variety of wildlife species.

The presence of a basal hollow, which only occur in legacy trees, was the feature that appeared to add the greatest habitat value to legacy trees and, as a result, to commercial forest stands. However, we did not sample specifically for wildlife that may benefit from the presence of large horizontal branches (e.g. platform nesting wildlife). Basal hollows were used by every taxa sampled, but appear to be particularly important to bats and birds. In addition to the fact that guano was collected at every hollow we sampled, individual bats were observed in hollows, and reproduction was documented. Use of basal hollows by bats has been observed in other redwood regions (Gellman and Zielinski, 1996; Zielinski and Gellman, 1999; Purdy, 2002) and there are several previous reports of basal hollows used by bats for reproduction (Rainey et al., 1992; Mazurek, in press). Hollows also appear to be important nest sites for some bird species, in particular Vaux's swifts (Hunter and Mazurek, in press). Because roost and nest availability can limit the populations of birds and bats (Humphrey, 1975; Kunz, 1982; Brawn and Balda, 1988; Christy andWest, 1993; Raphael and White, 1984), basal hollows may play a critical role in the redwood region if they provide roost and nest sites in forests that are otherwise deficient. The increased use of legacy trees by insectivorous birds and bats may also be because the rugosity of the bark may harbor a greater diversity and abundance of insects (Ozanne et al., 2000; Willett, 2001; Summerville and Crist, 2002). Bark gleaners, such as brown creepers (Certhia americana), have been correlated with the abundance of spiders and other soft-bodied arthropods that are significantly associated with bark furrow depth (Mariani and Manuwal, 1990); this may also explain the disproportionate use of legacy trees by nuthatches and woodpeckers. Finally, basal hollows not only benefit the wildlife that use them but the trees in which they are found. The feces of animals that are attracted to hollows can be an important source of nutrients for trees that may be on nutrient-poor sites (Kunz, 1982; Rainey et al., 1992). … Our conclusions about the value of legacy trees to wildlife in the redwood region are supported by the results of studies on individual species of wildlife elsewhere. … Our work was directed at assessing the value of individual legacy trees in stands, but there is a considerable body of research on the related question of what value residual trees and patches have in maintaining wildlife diversity in forests. Residual structures may not be as old as the legacy structures we studied, but they can add important structural diversity to which many species of wildlife respond.

Our traditional view of conservation reserves is of large protected areas. However, few landscapes provide us with the opportunity to preserve large tracts of land and we must consider conserving biodiversity within the matrix of multiple use lands (Lindenmayer and Franklin, 1997). Given the fragmented nature of mature forests in the redwood region, remnant patches of old-growth and individual legacy trees may function as 'mini-reserves' that promote species conservation and ecosystem function. Legacy structures increase structural complexity in harvested stands and, as a result, can provide the 'lifeboats' for species to re-establish in regenerating stands (Franklin et al., 2000). Although the lifeboat function may not be entirely fulfilled for vertebrates with large area needs, these habitat elements may make it possible for some species to: (1) breed in forest types where they may otherwise be unable, and (2) secure a greater number of important refuges from climatic extremes and predators. In addition, these functions may allow legacy trees to provide some measure of habitat connectivity ('stepping stones') to larger more contiguous tracts of old-growth forests (Tittler and Hannon, 2000; Noss et al., 2000). Because of their rarity in commercial forests, the first step in the management of legacy trees is to determine their locations and protect them from logging or from physical degradation of the site. Because legacy redwoods with basal hollows are even more rare, locating and protecting these should be the highest priority. In addition, the circumstances that lead to their genesis will be difficult to recreate, especially on commercial timberland. Hollows form by repeated exposure of the base of trees to fire (Finney, 1996), and because most fires on private land are suppressed, prescribed fire would need to be repeatedly applied to trees that would be designated as 'future legacies' and which would be excluded from harvest in perpetuity. We hasten to add, however, that legacy trees without basal hollows appear to have significant benefits to wildlife. Even without management to encourage basal hollows we suggest that managers plan for the recruitment of trees that are destined to become legacies. This will require their protection over multiple cutting cycles. We expect that new silvicultural methods will be required to prescribe the process of identifying, culturing, and protecting residual legacy trees. Although we do not believe that any one tree will protect a species, we do believe that the cumulative effects of the retention, and recruitment, of legacy and residual trees in commercial forest lands will yield important benefits to vertebrate wildlife and other species of plants and animals that are associated with biological legacies. The results of our study beg us to consider habitat at a spatial scale that is smaller than that of habitat patches or remnant stands; we conclude that individual trees can have very important values to wildlife.

Finally, the following information helps describe the dire situation faced by the endangered marbled murrelet and established why it is absolutely necessary to maintain its remaining habitat.[20] This information was not adequately discussed or addressed in the NTMP and much of it was ignored. These excerpts all demonstrate the great value of the NTMP's mature forest stands and trees as well as the urgency that is required in terms of ensuring nesting habitat for the marbled murrelet. For instance, the document cited by the RPF, PSW-GTR-152, notes that:

> For a sample of 16 nests in the Pacific Northwest the mean stand age was 522 years with the youngest stand age reported as 180 years old (*table 2*). The oldest stand was 1,824 years old located on the mainland coast of British Columbia, and was dated using nearby stumps from a recent clear-cut. To date, all 61 tree nests found in North America have been found in stands described as old-growth or mature forests.
>
> We found that all nest trees throughout the geographic range were located in stands defined by the observers as oldgrowth and mature stands or stands with old-growth characteristics. The youngest age reported for a nesting stand was 180 years. Marbled Murrelet occupancy of stands, and the overall abundance of the species has been related to the proportion of old-growth forest available from studies conducted in California. . . .
>
> [S]maller stands will have fewer nesting and hiding opportunities for Marbled Murrelets. They may be choosing lower canopy closures immediately around the nest to improve flight access, but select nest platforms with dense overhead cover for protection from predation, as indicated by the extremely high cover values found directly over the nest.
>
> The final rule listing Marbled Murrelets as threatened (U.S. Fish and Wildlife Service 1992) regards loss of older forests and associated nest sites as the main cause of decline in murrelet populations. When nest sites are limiting, the loss of nesting habitat has both immediate and long term impacts on the reproductive potential of a murrelet population. While alcid populations have been shown to recover in a relatively short period from episodic anthropogenic mortality events, such as gill net and oil spill mortality (Piatt and others 1991; Carter and others 1992), loss of nesting habitat directly affects the long term reproductive potential of a population. This is especially true for tree-nesting Marbled Murrelet populations where the creation of nesting habitat is extremely time-consuming, perhaps 200 years. Fragmentation of old-growth also has the potential of reducing murrelet breeding success by increasing the densities of predator populations. Corvids are "edge species" that have been found to increase in numbers with increased forest fragmentation
>
> Factors that increase fragmentation, such as a wildfire or timber harvest, could reduce murrelet breeding success both through the reduction of cover and the increase in predator densities. This reduced breeding success could be expected to increase the rate, and possibly the distance, of breeding dispersal. The distances moved would probably relate to the level of disturbance and the threat that the predators pose to adult birds. The reduction and fragmentation of habitat would also act to increase the distance prospecting prebreeders would have to travel to find a suitable nest site.

[20] The literature also makes clear that protecting individual nesting trees is not the same as protecting habitat.

> The occupation of newly available suitable habitat by Marbled Murrelets in Washington, Oregon, and California may be delayed by the small stand size, high fragmentation and disjunct distribution of the old growth forest. The small size and apparently low breeding success (Nelson and Hamer, this volume b) of the population can be expected to further slow occupation of newly available habitats. Because almost all prospecting of currently unoccupied suitable habitat would occur through natal dispersal, low productivity would reduce the potential of a population to disperse. This would result in a lack of detections in stands that have the potential of supporting murrelet breeding, but have not yet been discovered by murrelets. The importance of this apparently suitable but currently unoccupied habitat to the future of the species needs to be recognized.
>
> The most important factor in indicating occupied stands was density of the old-growth cover, that is, the percent of the area covered by the crowns of old-growth trees. Occupied stands had a higher percentage of old-growth cover than stands with murrelets only present, or in stands with no detections.

It is also of great relevance that in the Mendocino area, murrelets are at extremely low numbers. As stated in the Marbled Murrelet 5-Year Review, "At the Conservation Zone scale, murrelet at-sea density estimates from Conservation Zones 1-5 in 2008 ranged from 0.14 birds/km^2 in Conservation Zone 5 to 4.14/km^2 in Conservation Zone 4 (Table 3). At-sea densities followed the same general pattern as observed previously, with high densities in Oregon and northern California (Conservation Zones 3 and 4), and very low densities in Conservation Zone 5."[21] In other words, we should be extremely concerned about the murrelet population in Mendocino and should therefore be conserving all available nesting habitat. All further fragmentation must be avoided if we actually want to give this bird a chance at viability or recovery. Moreover, as pointed out by a Cal Fire biologist, habitat "should be protected from windthrow or other environmental effects . . . . Trees immediately adjacent to the retained tree of interest should also be retained."[22]

Excerpts from the Marbled Murrelet Recovery Plan emphasize the same points:[23]

> The marbled murrelet was federally listed as a threatened species mainly due to the substantial loss of older forest nesting habitat. The low elevation, older forests close to

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[21] U. S. Fish and Wildlife Service , Marbled Murrelet *(Brachyramphus marmoratus)* 5-Year Review (June 12, 2009)

[22] Predation and wind throw are currently serious problems for murrelets. *See, e.g.,* USFWS 5-year Review ("The following actions were identified as necessary [:] … decreasing risk of . . . windthrow, … reducing nest predation . . . ."); *See also* Chen et al. 1999. Microclimate in Forest Ecosystem and Landscape Ecology: Variations in local climate can be used to monitor and compare the effects of different management regimes. *BioScience*, Vol. 49 No. 4; 288-97 ("strong winds near abrupt edges can be the primary cause of tree mortality, through windthrow . . .")

[23] Recovery Plan For The Threatened Marbled Murrelet in Washington, Oregon, and California, U.S. Fish And Wildlife Service, 1997.

the coast, which marbled murrelets require for nesting, have been heavily harvested throughout the bird's range and are severely degraded due to fragmentation.

Loss of marbled murrelet nesting habitat is a major cause of the species' decline. Activities causing habitat loss are considered by the U.S. Fish and Wildlife Service to pose one of the highest risks of take based on our current understanding of the species' population trends. Habitat loss has negative effects that may last decades to centuries, depending on the extent of the habitat modification and its location on the landscape. Recruitment of juvenile marbled murrelets into the adult breeding population is believed to be occurring at extremely low rates. Therefore, maintenance of known and potential nesting habitat is a primary goal of this recovery plan.

The weight of evidence indicates that the major factors in marbled murrelet decline from historical levels in the early 1800's (or earlier) are (1) loss of nesting habitat and (2) poor reproductive success in the habitat that does remain, a phenomenon that appears due in large part to increased vulnerability of nests to predators in highly fragmented landscapes.

Logging proceeded in the forests of Sonoma and Mendocino counties throughout the 20th century, such that almost all old growth forest had been lost in this region by the mid to late 1900's.

Estimates for the amount of reduction of northern California's coastal old-growth redwood forests range from approximately 85 to 96 percent (Green 1985, Fox 1988, Larsen 1991). In addition, past and current forest management practices also have resulted in a forest age distribution skewed toward younger even-aged stands at a landscape scale (Hansen et al. 1991, McComb et al. 1993). Generally, older forests with large, old trees appear to be needed to develop the proper broad, horizontal branching structure in the forest canopy for the placement and visitation of nests.

The principal factor considered to affect the marbled murrelet throughout the southern portion of its range (from British Columbia south to California) is the loss of nesting habitat (older forests) (U.S. Fish and Wildlife Service 1992a), mainly from commercial timber harvest and forest management practices.

The geographical area of suitable marbled murrelet habitat was greatly reduced in Washington, Oregon, and California during the 1 800s and 1900s. Most suitable nesting habitat (old-growth and mature forests) on private lands within the range of the Washington, Oregon, and California population has been eliminated by timber harvest (Green 1985, Norse 1988, Thomas et al. 1990). Remaining tracts of potentially suitable habitat on private lands throughout the range are subject to continuing timber harvest operations. In most areas, second-growth forests have been or are planned to be harvested before they will attain the characteristics of older forests. Thus, this habitat loss is largely permanent, without considerable change in management actions over the next century.

Impacts due to timber harvest may include a complete loss of habitat (clear-cut), a degradation of habitat (some selective harvest), or harvest of unsuitable habitat adjacent to and contiguous with suitable habitat. Impacts from timber harvest can also occur in unsuitable habitat that is not contiguous with suitable habitat, but is in the vicinity (within 0.8 kilometers (0.5 miles)). Clear cutting of marbled murrelet habitat and other harvest prescriptions that produce even-aged, monotypic forest ecosystems produce habitat unsuitable for the marbled murrelet.

Take of marbled murrelets is not likely in suitable habitat that has been surveyed[24] to protocol with no occupancy detected (incidental take may still occur due to the potential for survey error). However, it is important to note that adverse effects to the species may still result from modification of suitable unoccupied habitat. As the population recovers, or as other occupied areas are lost to timber harvest or natural processes (e.g., wildfire), these areas may be used by dispersing or colonizing birds.

Maintenance of marbled murrelet populations on private lands is critical in arresting the decline of the species in the next 50—100 years. This is especially true where additional nesting habitat is not expected to be available on nearby Federal lands. While the Endangered Species Act section 9 prohibition against unauthorized incidental take provides some protection for the marbled murrelet, this may not be sufficient to protect and enhance habitat on non-Federal lands in the long term. This is because a continuing decline in populations would be expected to eventually result in unoccupied habitat where the prohibition against take may not apply. This unoccupied, but suitable, habitat might then be harvested, continuing the erosion of habitat that is needed to recover the species.

Much of the remaining marbled murrelet nesting habitat in [Zone5] is located on private lands. The maintenance of this population will require considerable cooperation between State, Federal and private management representatives. Recovery efforts in this Conservation Zone could enhance the probability of survival and recovery in adjacent Conservation Zones by minimizing the current gap in distribution. The population is so small that immediate recovery efforts may not be successful at maintaining this population over time and longer term recovery efforts (e.g., developing new suitable habitat) may be most important. However, if this small population can be maintained over the next 50 years, it will greatly speed recovery in this Conservation Zone.

The Mendocino Zone extends south from the southern boundary of Humboldt County, California, to the mouth fan Francisco Bay. It includes waters within 2 kilometers (1.2

[24] The limitations of surveys should also be noted:

> Because of their small body size, cryptic plumage, crepuscular activity, fast flight speed, solitary nesting behavior, and secretive behavior near nests located in densely forested habitat, the nests of the marbled murrelet have been extremely difficult to locate (Hamer and Nelson 1 995b). The first tree nest in North America was not located until 1974 (Binford et al. 1975), even though ornithologists had been searching for the nest site of the marbled murrelet in North America for many decades. (1997 Recovery Plan)

miles) of the Pacific Ocean shoreline and extends inland a distance of up to 40 kilometers (25 miles) from the Pacific Ocean shoreline. The very small nesting and at-sea population of marbled murrelets along the coast of Mendocino, Sonoma and Main Counties is important to future reconnection of marbled murrelet populations in northern and central California, if they can survive over the short term. Almost all of the older forest has been removed from this area, although small pockets fold-growth forest occur in State parks and on private lands.

Stands should not be designated as unsuitable habitat because they have
(1) small patches of habitat or a few remnant old-growth trees;
(2) smaller limb sizes;
(3) little moss cover on tree branches;
(4) poor access conditions for birds; or
(5) particular aspects may cause suitable habitat to go unsurveyed. Field assessments prior to determining habitat suitability are of vital importance to the conservation and protection of marbled murrelet breeding sites.

Fragmentation of the remaining older forests may have resulted in increased populations of nest predators, and increased visibility and vulnerability of flying or nesting adults to potential predators. This change in turn has probably led to increased rates of predation on nests and possibly on adults. Rates of predation on marbled murrelet nests appear to be high, based on field observations, compared to most other seabirds and are due most often to predators whose populations have apparently increased as a result of forest fragmentation and related human activities.

Marbled murrelets use forests that primarily include typical old-growth forests (characterized by large trees, a multistoried stand, and moderate to high canopy closure), but also use mature forests with an old-growth component. Trees must have large branches or deformities for nest platforms, with the occurrence of suitable platforms being more important than tree size alone. The earliest possible recovery time for nesting habitat, once lost, is generally 100—200 years.

The effects of deforestation are chronic and can persist for 100-200 years until forests have regrown to achieve structure that permits marbled murrelet nesting. If forests were protected from cutting and were able to mature to old growth characteristics, the number of nesting marbled murrelets and their nesting success should increase slowly to levels typical of other alcids.

[W]e have concluded that the next 50 years will be the most critical period for marbled murrelet conservation efforts. Marbled murrelet populations in the Pacific Northwest are likely to continue to decline, certainly as a result of low reproduction due primarily to loss of nesting habitat.

Although some currently mature forest will become suitable nesting habitat during the next 50 years, most younger forest habitat will not become available for nesting marbled murrelets until after the year 2040 (U.S. Department of Agriculture et al. 1993). Until that time, immediate conservation efforts that minimize and mitigate the loss of actual and potential nest sites, as well as increase adult survivorship, will be necessary.

The most likely causes of poor reproduction appear to be due to the effects of deforestation, as discussed above. Deforestation has occurred on a large scale and in many areas may require a century or more of forest regrowth to reverse the trend (U.S. Department of Agriculture et al. 1993).

The three separate areas where marbled murrelets currently are found in California correspond to the three largest remaining blocks of old-growth coastal conifer forests (Carter and Erickson 1992). These populations are largely separated by areas of second-growth forest not used by marbled murrelets. A large break in the main breeding distribution is located at the southern portion of the range in California, where approximately 480 kilometers (300 miles) separate the southernmost breeding population in San Mateo and Santa Cruz counties (central California) from the next largest populations to the north in Humboldt and Del Norte counties (northern California). Most of this largely unpopulated section, especially in Mendocino County, probably contained significant numbers of marbled murrelets prior to extensive logging (Carter and Erickson 1988, Paton and Ralph 1988). Based on extrapolation from currently known population numbers in relation to remaining available nesting habitat, it was estimated that at least 60,000 marbled murrelets may have been found historically along the coast of California (Larsen 1991). The population size of marbled murrelets has been estimated for California over the past 20 years. Sowls et al. (1980) estimated the breeding population to be about 2,000 breeding birds. Carter and Erickson (1992) suggested that between 1,650 and 2,000 breeding birds might constitute the state's breeding population. Carter et al. (1992) derived a population estimate of 1,821 breeding birds. Ralph and Miller (1995) estimated a total state population of approximately 6,000 birds, including breeding and nonbreeding birds, from more intensive at-sea surveys specifically designed to estimate population size for marbled murrelets. Differences between estimates does not indicate that marbled murrelet numbers have increased over time between the censuses, because different methods and assumptions were used in estimating population numbers.

Long-term actions include increasing the amount, quality and distribution of suitable nesting habitat. Increasing the stand size of suitable habitat to provide more interior forest conditions and increasing the number of stands of suitable nesting habitat are considered key to long-term recovery. Within secured habitat areas, this means protecting currently unsuitable habitat to allow it to become suitable, reducing fragmentation, providing replacement habitat for current suitable nesting habitat lost to disturbance events and habitat lost to both timber harvest and disturbance events in the past. In the long term, the distribution of nesting habitat should be improved.

The demographic bottleneck that the marbled murrelet population may experience during the next 50 to 100 years makes the maintenance of marbled murrelet populations not found within Federal lands (mainly on state and private lands) an important component of more guaranteed viability and eventual recovery over the coming decades and into the future.

Management recommendations for the marbled murrelet need to address two different biological time frames, which reflect

(1) aspects of the murrelet's life history and demographic trends, and

(2) the length of time required to develop the majority of new nesting habitat or improve current forest habitat conditions. Short-term actions must address the apparent rapid decline of current populations and the need for immediate stabilization. The ability of marbled murrelet populations to recover rapidly is low due to the low reproductive potential of the species. Long-term actions address the long time-frames required to cultivate or enhance mature forest habitat conditions or to improve marine habitat quality because of the nature and complexity of these ecosystems. Little additional older forest habitat will become available until after 2040.

Improving the distribution of nesting habitat helps to buffer existing populations against poor breeding success and catastrophic loss and probably facilitates gene flow among separated populations. Three major gaps in existing habitat are particularly apparent:

(1) from the southern Olympic Peninsula in Washington to Tillamook in northwestern Oregon;

(2) between Patrick's Point and southern Humboldt Bay in northern California (see Figure 1); and

(3) throughout most of the Mendocino Zone and the northern part of the Santa Cruz Mountains Zone (between southern Humboldt County and central San Mateo County).

These three geographic gaps represent probable partial barriers to gene flow across them. They include large areas of second-growth forests that originated after logging, from fire (parts of northwestern Oregon), or from natural discontinuities of nesting habitat (especially parts of northern and central California). Gap areas often have a high proportion of private lands and little or no Federal land. State lands cover significant portions of northwest Oregon (the Tillamook and Clatsop State Forests) and southwest Washington. Silvicultural techniques to create suitable habitat at both the stand and landscape level (discussed in task 3.2.1.3) may be particularly beneficial to marbled murrelet recovery in the long term if applied in these areas.

The more contiguous the habitat distribution, the lower the likelihood of future large gaps in distribution of the species due to catastrophic events such as oil spills or large wildfires. Preventing further erosion of the already patchily-distributed nesting habitat is a key element in buffering the species against such catastrophic events. This is especially important in areas where gaps already occur. Furthermore, it is currently unknown how nesting success differs with distance from the coast, and far inland habitats may be as important to species survival as those nearer to shore. Therefore, it is important to maintain both north/south and east/west distribution of suitable habitat.

Decrease fragmentation by increasing the size of suitable stands to provide a larger area of interior forest conditions. The majority of suitable nest stands currently exist as small islands within a matrix of younger forests.

> It also would be desirable to increase and block up suitable nesting habitat in the Mendocino and Santa Cruz Mountains Zones. Little habitat remains outside parks in these two zones, such that an increase in the short term does not appear feasible.

Other federal documents further explain:

> Forests with older residual trees remaining from previous forest stands may also develop into nesting habitat more quickly than those without residual trees. These remnant attributes can be products of fire, wind storms, or previous logging operations that did not remove all of the trees (Hansen *et al* 1991; McComb *et al.* 1993).[25]
>
> [N]esting habitat appears to be the most important factor affecting marbled murrelet distribution and numbers. (Nelson *et al.* 1992; Ralph *et al.* 1995b; Ralph and Miller 1995; Strong 1995; Varoujean *et al.* 1994).[26]
>
> [Timber harvest can] have the following effects on the primary constituent elements of murrelet critical habitat:
> (1) Removal or degradation of individual trees with potential nesting platforms, or the nest platforms themselves, that results in a significant decrease in the value of the trees for future nesting use. Moss may be an important component of nesting platforms in some areas.
> (2) Removal or degradation of trees adjacent to trees with potential nesting platforms that provide habitat elements essential to the suitability of the potential nest tree or platform, such as trees providing cover from weather or predators.
> (3) Removal or degradation of forested areas with a canopy height of at least one half the site-potential tree height and regardless of contiguity, within 0.8 km (0.5 mile) of individual trees containing potential nest platforms. This includes removal or degradation of trees currently unsuitable for nesting that contribute to the structure/integrity of the potential nest area (i.e., trees that contribute to the canopy of the forested area). These trees provide the canopy and stand conditions important for marbled murrelet nesting.[27]

The recent 2009 5-Year Review, unfortunately, discusses how the situation for murrelets in California has only gotten worse:

> Conclusions, Population Size and Trend: With declines documented separately for Conservation Zones 1 through 5 and Conservation Zone 6, we conclude that the listed population has declined significantly since 2002, the year of the estimate in the Service's previous 5-year review (McShane et al. 2004). For Conservation Zones 1 through 5 combined, population estimates from NWFP monitoring for 2000-2008 indicate an annual rate of decline in the range of 2.4 to 4.3 percent. For Conservation Zone 6, new data indicate an annual decline of about 15 percent between 2003 and 2008. Based on the

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[25] 61 Fed. Reg. 26255, 26264

[26] *Id*. at 26258

[27] *Id*. at 26271

> tri-state estimate of about 24,400 birds used in the analysis for the 2004 5-year review (USFWS 2004, p. 18), the 2008 population estimate of about 18,000 birds represents a decline of about 26 percent across the listed range from that estimate. This is significant new information regarding population size and trend.
>
> Since the analysis for the 2004 5-year review, new modeling by Raphael et al (2006) has revised the previous information on amount and distribution of habitat. Results from Raphael et al. (2006) also indicate that losses of potential nesting habitat in the 1994-2003 period may be greater than previously estimated, with losses ranging from about 61,000 to 279,000 acres in the 5-Conservation Zone area, with about 10 to 28 percent of habitat loss occurring on Federal lands, and about 72 to 90 percent on non-Federal lands (difference of about 7 percent of total baseline habitat).

Finally, other literature makes similar statements:

> We measured offshore Marbled Murrelet (Brachyramphus marmoratus) abundance from April through October between 1989 and 1998, in northern California and southern Oregon and investigated its relationships with marine and terrestrial habitats. We found that higher murrelet abundance offshore was strongly related to the presence of large, clustered and unfragmented old-growth forests on nearby inland areas. Murrelets were most abundant offshore of contiguous old-growth forest adjacent to relatively abundant medium-sized, second-growth coniferous forests. Compared to the forest habitat, marine habitat was relatively unimportant in determining murrelet abundance offshore; high marine primary productivity and nutrients were not associated with high murrelet numbers. Tidal flat shorelines were weakly associated with more murrelets, independent of inland habitat. Our findings suggest management efforts to conserve the Marbled Murrelet should focus on protecting or creating large, contiguous blocks of old-growth habitat, features which currently are rare in the study area.[28]
>
> The remaining old-growth redwood forest in California corresponds to where we found the highest concentrations of murrelets (Figs. 1a-c; Table 1; Fox 1989). Del Norte and Humboldt Counties had the largest stands of old-growth redwood in California, 58,078 ha or 69% of the state’s 84,240 ha (Table 1; Fox 1989). The rest of the old-growth redwood exists primarily in San Mateo and Santa Cruz Counties (22%). Only 2% remains of the original old-growth in Mendocino, Sonoma, and Marin Counties, where the largest grove, Montgomery Woods State Park, is only 160 ha. In contrast, Del Norte and Humboldt Counties have four large parks: Jedediah Smith Redwoods (3543 ha); Prairie Creek Redwoods (4250 ha); Redwood National Park (8100 ha); and Humboldt Redwoods (8400 ha), all with high murrelet detection rates. Santa Cruz and San Mateo Counties also have

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[28] Miller, Sherri L.; Meyer, Carolyn B.; Ralph, C. John. 2002. Land and seascape patterns associated with marbled murrelet abundance offshore. *Waterbirds* 25(1):100-108

> relatively large parks with high activity levels: Butano (600 ha), Portola (570 ha) and Big Basin Redwoods (810 ha).[29]

All of this information is highly relevant to the NTMP especially given that the NTMP has thus far determined that it is okay to cut over half of the indentified large, old, trees and thus further degrade and fragment available habitat.

Legal Violations

The Forest Practice Rules themselves explicitly acknowledge the importance of mature forest stands and the need to avoid their fragmentation:

> Determination of the presence or absence of mature and over-mature forest stands and their structural characteristics provides a basis from which to begin an assessment of the influence of management on associated wildlife. These characteristics include large trees as part of a multilayered canopy and the presence of large numbers of snags and downed logs that contribute to an increased level of stand decadence . . . . The area should include a multi-layered canopy, two or more tree species with several large coniferous trees per acre..., large conifer snags, and an abundance of large woody debris. Previously harvested forests are in many possible stages of succession and may include remnant patches of late seral stage forest which generally conform to the definition of unharvested forests but do not meet the acreage criteria.
>
> The fragmentation and resultant isolation of late seral habitat types is one of the most significant factors influencing the sustainability of wildlife populations not adapted to edge environments.
>
> The loss of a key habitat element may have a profound effect on a species even though the habitat is otherwise suitable. Each species may have several key limiting factors to consider. For example, a special need for some large raptors is large decadent trees/snags with broken tops or other features. Deer may have habitat with adequate food and cover to support a healthy population size and composition but dependent on a few critical meadows suitable for fawning success. These and other key elements may need special protection.[30]

Moreover, under 14 CCR 897, projects “shall be considered in the context of the larger forest and planning watershed in which they are located, so that biological diversity and watershed integrity are maintained within larger planning units and adverse cumulative impacts . . . are reduced.”

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[29] Paton, Peter W.C, And C. John Ralph. 1990. Distribution Of The Marbled Murrelet At Inland Sites In California *Northwestern Naturalist* 71:72-84

[30] 14 CCR 952.9

This NTMP is highly deficient in providing the information and analysis necessary for informed decision-making, for avoiding and mitigating significant impacts, and for achieving compliance with CESA. The NTMP asserts that:

> The harvesting regime proposed in this NTMP for the DFG designated LSFS stand coincides with the successful nesting habitat conditions outlined by the USFWS. A multiple layered canopy will be retained, canopy openings will be created, and the stand will be managed to achieve a high composition of conifer trees.

The literature outlined above, however, paints a different picture, and describes the importance of maintaining the remaining large, old, trees, and avoiding habitat fragmentation. The NTMP's conclusory statements miss the point of CESA and CEQA, which require conservation of endangered species, as well as avoiding and mitigating significant impacts. Moreover, as explained further below, despite the NTMP's statements to the contrary, the proposed project, as presented, in combination with the impacts of past and future projects will likely cause or add to significant cumulative impacts to biological resources within the biological resources assessment area.

<u>The NTMP Ignores the Current Baseline Regarding Late Seral Forest and Consequently Fails to Adequately Address Cumulative Impacts</u>

The NTMP fails to adequately consider the present existing baseline condition – in which the vast majority of mature forest has already been logged[31] – as a factor contributing to significant cumulative impacts, and consequently, the NTMP improperly concludes that its impacts will be cumulatively insignificant. In *Environmental Protection and Information Center v. California Department of Forestry*, the California Supreme Court noted the importance of assessing cumulative impacts in their proper context:

> We agree . . . that the statutory injunction to assess 'the incremental effects of an individual project . . . in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects . . . signifies an obligation to consider the present project in the context of a realistic historical account of relevant prior activities that have had significant environmental impacts . . . . This historical information also may help to identify previous activities that have caused intensive environmental impacts in a given area, the full effects of which may not yet be manifested, thereby disclosing potential environmental vulnerabilities that would not be revealed merely by cataloging current conditions.[32]

In short, until the past is fully accounted for, decisionmakers and the public are denied a proper context for the NTMP's impacts. Thus, the NTMP's failure to appropriately acknowledge and account for, and then analyze, the substantial impacts of historical logging (and the consequent

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[31] E.g., Mazurek 2004, "In coast redwood (Sequoia sempervirens) forests, only 3–5% of the original old-growth redwood forest remains, largely as fragments scattered throughout a matrix of second and third-growth forests (Fox, 1996; Thornburgh et al., 2000)."

[32] (2008) 44 Cal. 4th 459, 524-25

fact that an entire habitat type is now almost gone), prevents any real assessment of the harm that will likely occur by removing what are now the very last vestiges of available old-growth. This is especially true in light of the fact that the habitat at issue is virtually all of the remaining mature forest left in the watershed.

Furthermore, CEQA case law confirms that where the environmental baseline demonstrates existing significant impacts, this heightens, rather than reduces, the scrutiny that must be applied in the resulting cumulative impact assessment. Here, the historical loss of old-growth trees, the consequent present condition of such habitat (i.e., the lack thereof), and the importance of such habitat to wildlife (as already described in the factual background section and elsewhere in these comments), has made that which remains exceedingly valuable, and its further loss is therefore a cumulatively significant impact.[33] Until the NTMP both acknowledges and accounts for the baseline situation, it will fail CEQA's mandate to avoid significant cumulative impacts.

Similarly, even the FPRS specifically require continuity of late seral forest habitat to be addressed as part of the NTMP's cumulative impact analysis.[34] CEQA cases recognize the importance of considering habitat fragmentation in assessing potential cumulative impacts.[35] Here, however, the NTMP does not analyze the fact that it will cause further loss and fragmentation of already depleted mature forest stands. Indeed, in the watershed, mature forest habitat is so depleted that Unit 9 represents virtually all of the mature forest present in the watershed. This failure also violates 14 CCR 897. (NTMP must "[r]etain or recruit late and diverse seral stage habitat components for wildlife.").

In sum, a cumulative impact analysis "must be substantively meaningful."[36] Here, the record shows that there will be great loss of mature forest habitat should the NTMP be approved, and that it will occur in an area already severely depleted of old-growth. The NTMP does not, however, disclose or analyze why, in light of this evidence, the cumulative impacts of the project are not significant: "A cumulative impact analysis which understates information concerning the severity and significance of cumulative impacts impedes meaningful public discussion and

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[33] *See e.g.* ,*Los Angeles Unified School Dist. v. City of Los Angeles* (1997) 58 Cal. App. 4th 1019, 1026 (additional increase in noise level of another 2.8 to 3.3 dBA was significant given that the existing noise level of 72 dBA already exceeded recommended maximum of 70 dBA.)*; Communities for a Better Environment* (2002) 103 Cal. App. 4th 98, 117 (Cal. App. 3d Dist. 2002) (CEQA regulation that "compares the incremental effect of the proposed project against the collective cumulative impact of all relevant projects" is contrary to CEQA); *id*. at 114 ("[E]nvironmental damage often occurs incrementally from a variety of small sources. These sources appear insignificant when considered individually, but assume threatening dimensions when considered collectively with other sources with which they interact."); *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal. App. 3d 692, 720 ("[p]erhaps the best example of [a cumulative impact] is air pollution, where thousands of relatively small sources of pollution cause a serious environmental health problem"); *id*. at 718 (relevant question is "whether any additional amount of precursor emissions should be considered significant in light of the serious nature of the ozone problems in this air basin.")

[34] *See* 14 CCR 952.9

[35] *See e.g., Sierra Club,* 7 Cal. 4th at p. 1221 ("The amount of old-growth habitat has diminished and the distribution of that habitat has been fragmented considerably in the past few years.")

[36] *Joy Road,* 142 Cal. App. 4th at 676

skews the decisionmaker's perspective concerning the environmental consequences of the project [and], the necessity for mitigation measures."[37] Put another way, the NTMP violates CEQA's "fundamental goal of fostering informed decision making."[38]

The NTMP review process substitutes for the CEQA review process "intended to demonstrate to an apprehensive citizenry that the agency has, in fact, analyzed and considered the ecological implications of its action" and to permit public "accountability and informed self-government."[39] As explained further below, the NTMP's failure to conduct a meaningful and proper impacts analysis is also prejudicial because it has resulted in a false conclusion that no significant cumulative impacts to important habitat and wildlife will occur, which in turn precluded the NTMP from avoiding such impacts.

The NTMP Would Likely Cause Significant Impacts to Critically Endangered Marbled Murrelets and Would Violate CESA

The marbled murrelet is listed as state endangered, federally threatened, and is a sensitive species as defined by FPR § 895.1. Because the NTMP proposes to harvest trees within the LSF area, the NTMP does not retain or recruit late and diverse seral stage habitat components nor does it provide for functional connectivity between habitats. The proposed harvest will further fragment habitat and will deplete mature forest habitat.

CAL FIRE is required to disapprove a plan if implementation of the plan would result in take, jeopardy, or adverse modification of habitat, in violation of the federal or California Endangered Species Acts. Here, as the murrelet information provided in the factual background section explains, the habitat at stake in this NTMP is of incalculable importance to the future well-being of one of the most endangered populations on earth; in fact, the murrelet's endangered status is largely due to the fact that so little mature forest, upon which the species depends, is left in the area. In short, the situation could not be more stark. The current baseline, as discussed above, tells us that this California population of the marbled murrelet could not be in much worse condition (absent extirpation). Therefore, any further negative contribution to the current baseline will indeed preclude conservation of this bird, will jeopardize its continued existence[40] and will adversely modify habitat essential to its continued existence in violation of CESA. The NTMP does not even address that fact and this is especially problematic given that it takes many, many years for trees to achieve old-growth status. Thus, not only would this NTMP cause significant, unavoided/unmitigated impacts to the murrelet (and hence be in violation of CEQA[41]

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[37] *Joy Road, supra,* 142 Cal. App. 4th at 676

[38] *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 402-403

[39] *See Joy Road,* 142 Cal. App.4th at 670

[40] Due to the murrelet's critically endangered status in the area, its continued existence is already in jeopardy; therefore, when addressing impacts to the murrelet or its habitat, the question now is not whether the impacts will cause jeopardy – that is established – the question should only be how to avoid the impact.

[41] The NTMP also therefore violates CEQA's mandate to provide the information necessary for the public and decisionmakers to make an informed decision. *Vineyard Area Citizens for Responsible Growth, Inc. v. City of*

and the FPRs[42]), it would also violate CESA's mandate that a) endangered species be "conserve[d], protect[d], restore[d], and enhance[d]", b) jeopardy be avoided, and c) habitat essential to the continued existence of endangered species be protected.[43] As such, this NTMP must be rejected.

The NTMP would also cause illegal habitat fragmentation. In other words, not only will important murrelet habitat be destroyed, but habitat outside the NTMP will also lose ecological value due to the fact that mature forest habitat in the region will be further depleted and fragmented by this NTMP. This is especially so from a cumulative impact perspective. In short, overall habitat in the area would be diminished, remaining habitat would be further isolated, and connectivity amongst habitat would be reduced. This reduction in size and connectivity of habitat will likely increase the influence of adverse environmental and demographic stochastic events on the murrelet thus pushing it closer to extirpation on the Mendocino coast. Again, we are dealing with a baseline situation that shows the Mendocino coast murrelet population to be critically endangered; therefore, any additional loss of habitat, any additional fragmentation, and any further harm to habitat connectivity, should be considered significant, should be considered antithetical to the conservation of the species, and should be considered to jeopardize the continued existence of the murrelet population that calls this NTMP's watershed home.

Moreover, movement of murrelet individuals among habitat must be sufficient to repopulate unoccupied areas; of course, the more fragmented the area, the more difficult it becomes to repopulate unoccupied habitat. Thus, this NTMP must be rejected due to its impacts to murrelet habitat. As discussed in the USFWS 5-year Review, in order to adequately protect murrelets, necessary actions include "implementing short-term actions to stabilize and increase the population that include maintaining potential suitable habitat in large contiguous blocks and buffer areas, maintaining habitat distribution and quality, … implementing long-term actions to stop population decline and increase population growth by increasing the amount, quality and distribution of suitable nesting habitat, decreasing fragmentation, protecting "recruitment" habitat, [and] providing replacement habitat through silvicultural techniques . . . ." As things stand, the NTMP as proposed would do just the opposite and would further negatively contribute to an already bad situation. As explained in *Sierra Club v. State Bd. of Forestry*, 7 Cal. 4th at 1234:

Rancho Cordova (2007) 40 Cal. 4th 412, 442. (finding that information must "be presented in a manner calculated to adequately inform the public and decision makers, who may not be previously familiar with the details of the project.")

[42] E.g., Cal Fire must disapprove a plan that could jeopardize the continued existence of any endangered species (14 CCR 898.2) and must make "mandatory Findings of Significance [when the] project has the potential to substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; substantially reduce the number or restrict the range of an endangered, rare or threatened species; or eliminate important examples of the major periods of California history or prehistory." 14 CCR 15065.

[43] *See also Nat'l Wildlife Fed'n v. NMFS*, 524 F.3d 917, 933 (9th Cir. 2008) ("[Allowing a species to be] gradually destroyed, so long as each step on the path to destruction is sufficiently modest . . . is one of the very ills the ESA seeks to prevent.")

> [The] express goals of CEQA . . . include preventing the elimination of fish or wildlife species due to man's activities, ensuring that fish or wildlife populations do not drop below self-perpetuating levels, and preserving for future generations representations of all plant and animal communities and examples of the major periods of California history. The possible destruction of both old-growth-dependent species and their habitat from the harvesting of old-growth timber can therefore be fairly described as significant and adverse.

Here, the record shows that marbled murrelets are on the cusp of extinction in the area due in part to logging activities. Yet the NTMP contains little discussion of how the absence of this species in the NTMP area is correlated with the loss of adequate high quality habitat in the planning area. This failure of the NTMP to explain why the unretained trees are not important or why they are not necessary to prevent fragmentation renders the NTMP illegal.[44] NTMPs must consider their impacts "in the context of the larger forest and planning watershed in which they are located, so that biological diversity and watershed integrity are maintained and adverse cumulative impacts are reduced."[45] Thus, while the marbled murrelet may not be present in the NTMP area at this time, the unoccupied habitat is nonetheless critical for this species to have any chance of surviving into the future and should be retained. Regardless, until the NTMP adequately addresses the baseline situation, properly discusses the cumulative impact to murrelets of loss of old growth habitat and loss of habitat connectivity, and then addresses appropriate alternatives or mitigation, it violates CEQA and the FPA.

<u>The NTMP Fails to Adequately Address the Importance of the Late Seral Forest Habitat</u>

As stated in a CAL FIRE memorandum, "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)."[46] The situation here demands a proper analysis and mitigation for impacts to large old trees not only due to the impacts to murrelet habitat but also due to the importance of old-growth to wildlife, plants, and the environment in general. As explained below, the NTMP's failure to adequately discuss the importance of large old trees to wildlife is prejudical to informed decision-making and precludes necessary mitigation.[47]

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[44] Large old trees will likely develop into nest trees and at the very least maintain the mature forest characteristics of the stand.

[45] 14 CCR 897

[46] *See* March 2, 2005, Department of Forestry and Fire Protection Memorandum Re Disclosure, evaluation and protection of large old trees.

[47] *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 ("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,

While the DFG reports make plain that the NTMP cannot be approved as is, additional scientific publications likewise highlight the significant impacts. For instance, a 2001 journal article notes the importance of old-growth to often overlooked arthropods and demonstrates that the NTMP is deficient in both its discussion of significant impacts and its failure to address alternatives or to provide for adequate mitigation:[48]

> Extensive logging has reduced old-growth redwood forests from 800,000 hectares in 1850 to about 30,000 hectares by the early 1990s (Snyder 1992; Barbour et al. 1993).
>
> Spiders and other arthropods have been found to react to habitat differences, individually through behavior, and collectively through the assembly of communities (Uetz 1979; Robinson 1981; Gunnarsson 1990; Uetz 1990; Sundberg & Gunnarsson 1994; Pettersson et al. 1995; Halaj et al. 1998). Diversity and abundance declined with decreased structural complexity, which could be a reflection of reduced habitat or resources.
>
> A consistent finding of this project was the negative association between the number of logging events and the abundance and diversity of spiders and other arthropods. This finding occurred even though the tree farm uses selective harvesting techniques that are considered a model for sustainable redwood forestry (D. Herrman, personal communication). While the tree farm may be sustainable with respect to redwood biomass and financial integrity for the near future, findings from this study and from Hoekstra et al. (1995) show that these forestry techniques do not result in a diversity or abundance of forest floor arthropods comparable to those found in old growth. Because these arthropods are important in decomposition and nutrient cycling (Ausmus 1977; Crossley 1977; Reichle 1977; van der Drift & Jansen 1977; Peterson & Luxton 1982; Wallwork 1983; Verhoef & de Goede 1985; Visser 1985), events that disrupt these communities could be expected to disrupt these cycles that are needed for the sustenance of the primary production that forms the basis of the forest. It appears that tracts of undisturbed land are needed to preserve species diversity, maintain the integrity of communities, and serve as a control for our management experiments (Harris 1984; Barbour et al. 1993). Forest management, especially for timber production, could benefit from expanding the set of parameters examined when making decisions. The monitoring of redwood forests can and should include arthropods.

Another journal publication made similar findings regarding the importance of old-growth to bats. The article, *Bat Use of Remnant Old-Growth Redwood Stands,* notes that:

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being duly informed, can respond accordingly to action with which it disagrees."); 14 CCR 897 ("The information in [NTMPs] 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.")

[48] Willett, Terrence R.. 2001. Spiders and Other Arthropods as Indicators in Old-Growth Versus Logged Redwood Stands, *Restoration Ecology,* Vol. 9 No. 4, pp. 410–420

[O]lder forests favor abundant and diverse communities of forest bats (Thomas 1988; Fenton et al. 1992; Huff et al. 1993; Krusic et al. 1996; Parker et al. 1996).

[W]e sought to understand how bats use old trees in small remnant patches of old growth versus old trees in contiguous, unfragmented forest. This information may help managers assign value to the increasingly rare patches of old (>500 years) redwood forest within the extensive matrix of younger stands (5–80 years old) in the north coast of California.

Basal hollows in redwood trees are important roost sites for bats in coastal northern California. Hollows form as the result of periodic fires and subsequent wood decay (Fritz 1932; Finney 1996) and can become very large and persist for centuries before the tree falls. Forest-dwelling bats use the fire-scar cavities in redwood as maternity, day, and night roosts and occupy hollows during every month of the year (Rainey et al. 1992; Gellman & Zielinski 1996). Trees with the largest hollow volumes and those nearest to available surface water appear to receive the greatest use by roosting bats (Gellman & Zielinski 1996).

We conducted a study to compare the use by bats of hollow, old-growth redwood trees in contiguous forest and in remnant stands to determine the importance of these increasingly rare landscape features to the community of forest bats in the northern coastal region of California.

The guano data demonstrate a significantly greater use of old-growth trees in residual stands than within the contiguous forest. This suggests that either more bats use each of these trees or individual bats return to use these trees more frequently than they do trees within the unfragmented forest in the park. Although the ultrasound data were not statistically different, the isolated stands also had a higher index of bat activity (passes per night). It is clear that bats are making significant use of old-growth remnants, which make up a small proportion of the landscape.

Our data demonstrate that small remnants of original or old-growth forest continue to function as important habitat for forest bats. This conclusion agrees with the work of Crampton and Barclay (1996), who found that Myotis activity levels did not change substantially following forest fragmentation, and of Fenton et al. (1992), who found that bat captures generally remained high as long as some original forest remained. Erickson and West (1996) found that Myotis activity was greater in mature stands, but there was no difference for a number of other species. We do not believe, however, that there is anything inherently attractive about the remnants that resulted in the increased use of basal hollows in trees that occur there. Neither is there reason to suspect that a landscape dominated by young, developing forest with a few remnants would provide better habitat for forest bats than an intact, continuous forest; substantial evidence exits to the contrary (Thomas 1988; Fenton et al. 1992; Huff et al. 1993; Krusic et al. 1996; Parker et al. 1996). The lower availability of basal hollows in the remnants and their fortuitous proximity to water probably explain why individual hollows in remnants received greater use by bats compared to those in hollows in the parkland reserve. The Wilson Creek watershed is an example of how an extremely modified landscape can continue to

> provide habitat for bats when most but not all of the large-cavity roosting structure has been eliminated. Our data provide an indication of the value of remnants to forest bats. The practice of harvesting the remnants to "clean up" all the miscellaneous fragments of old growth in a landscape and to bring all the stands into rotation for efficient management will probably affect bats and other wildlife. Marbled Murrelets and Northern Spotted Owls have also been reported to either nest or occur in small remnant stands of old-growth redwood (Miller & Ralph 1995; L. Diller, personal communication).
>
> Remnants are the only old growth that occur in many watersheds. They should be viewed as the nuclei for the restoration of habitat, or at least as stepping stones in a management scheme to link larger units of forest managed for late-seral structure and function. A similar value has been recognized for small, isolated fragments of tropical forest, despite the fact that they may not be able to support all species (Turner & Corlett 1996). Remnants that are close to protected parkland, like those considered here, may actually expand the effective size of the park for species that can move easily between areas. It is apparent from the number of species associated with late-seral forest and whose habitat has been reduced by timber harvest (U.S. Forest Service & U.S. Bureau of Land Management 1994) that many species in addition to bats would benefit from protecting and linking the best of the remaining fragments of original forest.

In addition to arthropods and bats, the NTMP blows off impacts to species like the Vaux's swift, a California Bird Species of Special Concern whose range includes the redwood forests of San Mateo county.[49] The Vaux's swift is associated with trees that "grow large enough, persist long enough, and have decay, fire, or primary excavators such as Pileated Woodpeckers (*Drycopus pileatus*), or otherwise develop large and accessible cavities. … While published details are limited, most California nests have been in burned-out and hollow Redwood snags or stumps." *Id*. The California Bird Species of Special Concern account goes on to state the following:

> Numerous studies have shown a strong positive association between the presence of Vaux's Swifts and old-growth forests (Bull and Collins 1993), presumably reflecting the swifts' requirement of large cavities for nesting. In California, the highest densities of swifts are found in the Redwood zone, the lowest in the Douglas-fir (*Pseudotsuga menziesii*) and other forest types found further inland (Sterling and Paton 1996). The relationship between swifts and Redwood forests may be explained by characteristics of these trees that favor the formation of large and long-lasting cavities. Redwoods can live over 2000 years and reach >7 m dbh (Sawyer et al. 2000). They are also resistant to fire and decay and will remain standing for very long periods while declining or completely dead. The presence of swifts in second-growth Redwood forests may be explained by the

[49] *See* Shuford, W. D., and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento ("The range of the Vaux's Swift in coastal California generally follows the distribution of Redwoods, but probably is patchy because of forest fragmentation. Although lacking prior to 1945, confirmed breeding records now exist for Del Norte, Mendocino, Sonoma, Marin, San Mateo, and Santa Clara counties…")

> presence of remnant or residual old-growth trees (Sterling and Paton 1996). These scattered residual trees—formerly left during initial harvest(s) due to the presence of "cull" wood, deformity, or other defect—are often excellent potential nest and roost sites.[50]

An NTMP that fails to include adequate information regarding sensitive species[51] necessarily contains insufficient information for evaluation of the plan's potentially significant impacts. As explained in *Sierra Club*:[52]

> The absence of any information regarding the presence of the four old-growth-dependent species on the site frustrated the purpose of the public comment provisions of the Forest Practice Act. It also made any meaningful assessment of the potentially significant environment impacts of timber harvesting and the development of site-specific mitigation measures impossible. In these circumstances prejudice is presumed.

Moreover, "the burden is not on the objectors to show that a project will cause a significant effect on the environment. The burden is on the EIR to consider and decide if a project will cause a significant effect."[53] Therefore, until the NTMP considers and accounts for its impacts to all wildlife, and then properly avoids or mitigates significant impacts, it is deficient, especially given that published literature has time and again explained the great significance of mature forest for wildlife like the Vaux's swift, arthropods, and bats. "The ultimate decision of whether to approve a project, be that decision right or wrong, is a nullity if based upon an EIR that does not provide the decision-makers, and the public, with the information about the project that is required by CEQA."[54] Moreover, in light of the baseline condition which shows late-seral trees to be extremely deficient in the area, it should be plain that in order to adequately safeguard species in the watershed that use trees with mature characteristics, it is necessary to retain all such trees as well as retain all trees approaching a mature stage.

<u>The NTMP Fails to Adequately Address Its Carbon Emissions</u>

If the NTMP is to meet its CEQA obligations, it must also assess the significant contribution of logging to carbon emissions. Some industry advocates like to argue that old-growth forests are "carbon neutral" – that is, they no longer remove carbon from the atmosphere at significant rates. However, older forests can continue to remove carbon from the atmosphere at considerable rates. Luyssaert et al (2008) state: "Our results demonstrate that old-growth forests can continue to accumulate carbon, contrary to the long-standing view that they are carbon neutral."

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[50] *Id*.

[51] The NTMP mentions some of these species but in conclusory fashion asserts that mature forest is inconsequential to these species.

[52] 7 Cal. 4th at 1237

[53] *Napa Citizens for Honest Gov't v. Napa County Bd. of Supervisors* (2001) 91 Cal. App. 4th 342, 384-385

[54] *San Joaquin Raptor/Wildlife Rescue Ctr.,* 27 Cal. App. 4th at 721-22

Regardless, older forests store the most amount of carbon and therefore their loss is significant. Old growth forests have an especially vast amount of live vegetation including huge trees, large downed logs, a healthy understory and a rich ground layer. Each of these elements stores considerable amounts of carbon and so it follows that ancient forests and trees are the "banks" holding the most carbon. A report from the IPCC has echoed this sentiment pointing out that the best way to preserve the carbon stored in a forest is to preserve the forest itself: "The theoretical maximum carbon storage (saturation) in a forested landscape is attained when all stands are in old-growth state (Nabuurs et al. 2007)." In short, regardless of what rate old-growth forests sequester additional carbon, the fact remains that old-growth trees have a vast amount of stored carbon and therefore there loss is undoubtedly significant. The following chart helps illustrate the carbon storage within the components of a young forest and old forest:

	60-year-old forest	**Old-growth forest**
Foliage	5.5	6.2-7.0
Branches	7.0	26.3
Boles (wood and bark)	145	323
Roots (fine)	5.6	5.6
Woody debris and forest floor	10.9-26.1	123
Total	**203-218**	**555-556**

Figure 3: Above-ground (non-soil) carbon stores in old-growth forest vs. 60-year-old forest. Numbers in MG of carbon per hectare. Source: Harmon et al. 1990.[55]

The chart shows that it is not only older trees that hold large amounts of carbon; forest floors in older forests contain significantly more carbon than forest floors of cutover forests (Lecomte et al. 2006; Fredeen et al. 2005; Harmon et al. 1990). Luyssaert et al (2008) reported similar findings:

> In our model we find that old-growth forests accumulate 0.4 ±0.1 tC ha^{-1} yr^{-1} in their stem biomass and 0.7±0.2 tC ha^{-1} yr^{-1} in coarse woody debris, which implies that about 1.3 ±0.8 tC ha^{-1} yr^{-1} of the sequestered carbon is contained in roots and soil organic matter.

Because old-growth forests steadily accumulate carbon for centuries, they contain vast quantities of it. The impacts to that carbon from this NTMP must be accounted for and avoided or mitigated. Nor has the NTMP addressed the cumulative significance of its carbon impact.

The Bower NTMP does include some commendable steps toward providing a site-specific analysis of greenhouse gas emissions (compared to the operations wide assessments conducted by companies such as SPI). However, it is deficient overall for the following reasons:

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[55] Harmon, Mark E., William K. Ferrell, and Jerry F. Franklin. 1990. Effects on Carbon Storage of Conversion of Old-Growth Forests to Young Forests. *Science* 247:699-702

- The included tables are largely inscrutable, with many of the key calculations and assumptions not shown in either the text or the tables. As such, it is impossible for the public to follow, let alone replicate, many of the key analyses, such as what carbon sources are included as emissions and what is counted as carbon sequestration. Until the calculations are fully explained, all the work shown, and any assumptions described, the GHG analysis is illegal.

- The analysis appears to rely entirely on regional estimates for estimates of initial standing inventory and as inputs into the forest growth models. Site-specific inventories would not only provide greater precision and accuracy, but would allow for a meaningful comparison among sites and projects.[56]

- The NTMP fails to include greenhouse gas emissions from the combustion of fuels associated with the transport of logs and other materials from the project site. This is an easily estimated emission, and is relevant as the analysis purports to track forest carbon as wood products all the way to the landfill.

- It is inappropriate to discount GHG emissions using a "fossil fuel offset" if the NTMP contains no specific plan or guarantee that slash, debris, or mill waste will be utilized in a biomass energy facility. In fact, there does not appear to be a biomass plant associated with the project. In personal communication, Bill Snyder of Cal Fire stated that the GHG analysis did not include a "fossil fuel offset." However, this issues needs to be clarified in the NTMP because currently the GHG analysis on page 6 states that "Utilization of portions of logs not converted to products was assumed to be primarily biomass to energy," and the GHG Calculator appears to include biomass combustion.

- The GHG analysis appears to entirely fail to account for mill waste. Mill waste can be a substantial emissions source. Under the assumptions provided in the GHG Calculator for each harvest unit, including mill waste would increase estimated emissions by approximately 40%. The GHG analysis also appears to assume there will be no emissions from soil due to the harvest or the skid trails.

- The GHG analysis appears to calculate "ending inventory" as the entire standing inventory (per acre) for the site at 100 years, not the net carbon sequestered above initial inventory. That is, this inventory includes trees that existed before the first harvest, as well as tree growth independent of regeneration of cut trees. This results in a substantial inflation of the amount of carbon sequestered by the project. The sequestered carbon should be calculated as the final inventory over starting inventory. In addition, it is important to note that even net growth over-counts sequestration, as it includes tree growth that would have occurred regardless of the harvest. That is, the most appropriate

[56] "The estimates in the look-up tables are called "average estimates," indicating that they should be used when it is impractical to use more resource-intensive methods to characterize forest carbon, that is, particularly when more specific information is not available. Because these tables represent averages over large areas, the actual carbon stocks and flows for specific forests, or projects, may differ. The look-up tables should not be used when conditions for a project or site differ greatly from the classifications specified for the tables." Smith et al, page 1.

calculation for sequestration caused by the project would be the ending inventory compared to the inventory that would have occurred in the absence of the project.

- Pages 3-4 of the GHG analysis discuss the "AB32 Context" of the project, including the statewide emissions reductions required by 2020. However, the analysis does not consider--in fact, fails to even mention--the fact that there are substantial emissions in the near-term that will confound efforts to achieve the required reductions by 2020. (2020 language from SPI comments…)

- The NTMP GHG analysis relies on hypothetical emissions reductions based on unenforceable actions, actions uncertain to occur, undertaken by other entities, or occurring in other economic sectors, in order to offset the greenhouse gas emissions of the harvest.[57] These include the hypothetical sequestration of wood products in landfills, the use of processing debris, and the combustion of harvest debris in biomass energy facilities and cogeneration facilities. Without commitment in the NTMP to guarantee the use of these pathways, these reductions are purely hypothetical and speculative and obscure the disclosure of the true emissions of the project. The NTMP must clearly identify the physical impacts (emissions) caused by the project, aside from the assertion of hypothetical reductions of those impacts through actions beyond their control.[58]

- In addition, the GHG analysis states on page 7, "It is anticipated that as long as the FIA monitoring determines maintenance or increases in carbon stock, timber harvesting activities in this landowner category should not have an adverse impact on GHG targets." However, the AB32 Scoping Plan sets the goal for forestry at maintaining current levels of sequestration in the forest sector, which it estimates as 5 MMTCO2E per year. Although this is acknowledged to be an intentionally low estimate, it is meant to represent the net growth above and beyond harvest.[59] The Bower NTMP appears to result in forest inventories lower at the end of the 100-year project than the initial inventories in some units, which appears to contradict the statement above and to contradict the intention of AB32.

- The NTMP on page 6 identifies 173,568 tons CO2E emitted by the project. However, this appears instead to be the amount of carbon sequestration estimated to occur over the extent of the project. The NTMP should disclose the total emissions of the project, before reducing those calculated emissions through the various assumptions.

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[57] An agency approving a project application must ensure that mitigation measures are "fully enforceable through permit conditions, agreements, or other measures." CEQA § 21081.6(b). "The purpose of these requirements is to ensure that feasible mitigation measures will actually be implemented as a condition of development, and not merely adopted and then neglected or disregarded." *Fed'n of Hillside & Canyon Ass'ns v. City of Los Angeles* (2000) 83 Cal. App. 4th 1252, 1261 (italics removed).

[58] *See, e.g.,* 14 CCR 15126.4

[59] "The Forest sector is unique in that forests both emit greenhouse gases and uptake carbon dioxide (CO2). While the current inventory shows forests as a sink of 4.7 MMTCO2E, carbon sequestration has declined since 1990. For this reason, the 2020 projection assumes no net emissions from forests." AB32 Scoping Plan, page 12.

- The Bower NTMP uses a number of deductions to reduce the amount of calculated greenhouse gas emissions from the project, which involves a series of selection harvests at regular intervals over a 100-year period. The estimated GHG emissions from the harvest of trees and the processing of the wood are reduced by the amount of carbon projected to be in use as wood products or in a landfill at 100 years from the initiation of the project. In all, these two reductions amount to (i.e. offset) approximately 67% of the reported emissions for the project. There are several problems with the assumptions and methodology used in this approach.

    - The use of a 100-year horizon for estimating GHG emissions masks the true emissions from the project. Carbon removed from the forest system is certain to eventually be emitted into the atmosphere.

    - Furthermore, the 100-year horizon used in the context of GHG emissions has generally been used to provide a limit to the impact caused by individual actions. The Energy Information Administration's Voluntary Reporting of Greenhouse Gases program from which some of the methodologies used in the Bower NTMP were adapted defines the "100-Year Residual Carbon Stock" (the amount of carbon in use and in landfills) as "the estimated carbon stock remaining in the harvested wood one hundred years after the year of harvest." Instructions for Form EIA, page 39.[60] That is, the 100-year timeline extends from each harvest event. In contrast, the Bower NTMP counted only those GHG emissions that occur within 100 years of initiating the plan, which includes sequential harvests throughout the 100 years. As a result, the GHG analysis determined that harvests of exactly the same size will result in different GHG emissions based solely on the date of the harvest—with later harvests having smaller emissions than earlier harvests of the exact same size. The problem with this approach is most clearly demonstrated by the fact that a harvest occurring at year 100 of the plan is assumed to have zero emissions from wood products. This fails to estimate using a 100-year horizon extending from each harvest under the plan. The methodology for the 100-year timeline used in the Energy Information Administration's Voluntary Reporting of Greenhouse Gases program requires the reporting entity "to estimate the quantity of carbon remaining in harvested wood products at 100 years after harvest, and report that quantity in the year of harvest." Technical Guidelines for Form 1605(b), page 233. [61]

    - The GHG analysis fails to count emissions from wood products and landfills even though these emissions are certain to occur. All of the carbon in use as wood products or in a landfill will eventually be emitted into the atmosphere as greenhouse gases. These emissions are ongoing and certain, continuing and increasing in the years beyond the 100 year evaluation period. There is no reason that these emissions should be ignored or discounted.

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[60] http://www.eia.doe.gov/oiaf/1605/pdf/EIA1605_Instructions_10-23-07.pdf

[61] http://www.eia.doe.gov/oiaf/1605/January2007_1605bTechnicalGuidelines.pdf
Technical guidelines

- In addition, reducing the calculated GHG emissions from the harvest by the amount of carbon projected to be in use as wood products or in a landfill at 100 years conflates deferred emissions with true emissions reductions. Under the methodology used in the Bower NTMP, actions that are expected to merely postpone GHG emissions for 100 years are awarded exactly the same weight as measures that would reduce the actual GHG emissions from the project (such as reducing fossil fuel use in harvesting and processing).

- The Bower NTMP GHG analysis appears to assume that wood products are sequestered forever in landfills and have no emissions. However, wood products deposited in a landfill decompose in anaerobic conditions and emit their carbon as methane, a greenhouse gas 23 times as powerful as carbon dioxide. "Methane emissions from landfills, generated when wastes decompose, account for one percent of California's greenhouse gas emissions." AB32 Scoping Plan, page 62. One percent of California's annual greenhouse gas emissions is approximately 4.7 million metric tons of CO_2 equivalent.[62] Considering that this is roughly equivalent to the amount of greenhouse gas the entire forest sector is expected to sequester each year under AB 32, it is inappropriate for the GHG analysis to discount this potentially substantial emission. In fact, the AB32 Scoping Plan calls for efforts to reduce the deposit of wood and other organic materials in landfills. "Greenhouse gas emissions can be substantially reduced by properly managing all materials to minimize the generation of waste, maximize the diversion from landfills, and manage them to their highest and best use." AB32 Scoping Plan, page 62. "Extended producer responsibility and commercial recycling are additional ways to address GHG reductions. Extended producer responsibility would address the problem that many items are now produced without regard to their end-of-life disposition." AB32 Scoping Plan, page C-159.[63]

[62] Forecasted BAU emissions in 2020 for landfills are 7.7 MMTCO2E. This forecast uses a recognized landfill gas emissions model developed by the Intergovernmental Panel on Climate Change (IPCC) and data from the California Integrated Waste Management Board (CIWMB). The forecast reflects assumptions regarding the continued decay of existing waste in landfills and estimates on the amount and character of new waste deposited in landfills through 2020. AB32 Scoping Plan, page F-5.

[63] "When organic materials, construction materials and other municipal solid wastes are discarded, they end up in landfills. In California however, much of the waste is turned into renewable resources and in the process, California realizes significant greenhouse gas (GHG) emission reductions. Increasing waste diversion from landfills beyond the current rate of 54 percent (which exceeds the 50 percent mandate) provides additional recovery of recyclable materials that will directly reduce GHG emissions. Recycled materials can reduce the GHG emissions from multiple phases of product production including extraction of raw materials, preprocessing and manufacturing. Furthermore, use of composted organic materials provides environmental benefits such as carbon storage in soils and reduced use of fertilizers, pesticides, and water, rather than placing these materials into a landfill to decompose into methane and other gases." AB32 Scoping Plan p C-158.

- The use of the 100-year evaluation period in the GHG analysis contradicts the intentions of the Energy Information Administration's Voluntary Reporting of Greenhouse Gases program, from which much of the methodology is derived. The EIA program includes a 100-year projection of forest carbon with the understanding that the actual forest growth and carbon pools will be monitored and estimates adjusted over time. "As a general rule, all changes in carbon stocks should be accounted for by periodic inventory and reporting. Such changes in carbon stocks are a response to the logical progression of events that affect an activity or entity over time and should be monitored accordingly. Calculations should include effects on all carbon pools, both positive and negative, so that reporters can record the net effect on carbon flow. Thus, for most cases, permanence is not an issue because the periodic inventory and annual reports should reflect changes in net carbon flows, whether positive or negative, when they occur." Technical Guidelines for Form 1605(b), page 243. In contrast, the NTMP would claim numerous emissions reductions for the entire 100 years at the beginning of the project, and has no provision to ensure that these reductions—tree regeneration and growth, persistence as wood products, continued management of landfills—actually occur. In fact, through the assumption of these reductions at the beginning of the project, the NTMP determines that the emissions from the project are insignificant and dismisses any need to address or mitigate the impacts. "Based on this analysis, it is the Department's conclusion, that while emissions will occur from this project, the amount of CO2 sequestered by this type of project will likely significantly offset the emissions… Because the proposed management and growth and yield projections indicate that the forests managed under this NTMP will continue to be a net carbon sink, mitigation to offset an adverse site-specific GHG impact is not necessary." Bower NTMP, page 6. This is highly speculative, considering the level of uncertainty surrounding relatively large estimates of reductions expected to occur as much as 100 years after the initiation of the project. However, the NTMP goes even further, asserting that this conclusion can be extended to other projects. "It is also the Department's conclusion that this relationship between sequestration and emissions would be applicable to a fairly broad range of selection harvesting. The project will continue to sequester carbon and the lands managed under the NTMP will continue to be a carbon sink." Bower NTMP, page 6.

Estimates for carbon associated with wood products and landfills come from the U.S. Energy Information Administration's "Voluntary Reporting of Greenhouse Gases Program," 1605(b) tables.[64]

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[64] The estimates for carbon associated with wood products and landfills come from the U.S. Energy Information Administration's "Voluntary Reporting of Greenhouse Gases Program," established by Section 1605(b) of the Energy Policy Act of 1992. The Energy Policy Act of 1992 amended Title III of the Energy Conservation and Production Act (42 U.S.C. 6831).
http://www.eia.doe.gov/oiaf/1605/original1605(b)_program.html
http://www.eia.doe.gov/oiaf/1605/1605text.html
http://www.eia.doe.gov/oiaf/1605/FAQ_GenInfoA.htm

The NTMP Must Analyze and Adopt All Feasible Mitigation Measures And Alternatives

A NTMP is required to consider mitigation or alternatives to the proposed action that could avoid or substantially lessen the significant impacts of eliminating wildlife habitat.[65] The discussion must focus on alternatives capable of avoiding any significant adverse environmental effects or reducing them to a level of insignificance, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly. Here, as discussed above, the NTMP assumes that it will not have significant impacts on mature forest or on wildlife. Based on that erroneous and unsubstantiated assumption, the NTMP never considers viable alternatives or enforceable mitigation measures that would avoid or substantially lessen the impacts. The failure to consider alternatives or mitigation that would avoid significant impacts is contrary to CEQA and the FPA.

A rigorous analysis of alternatives to the project is absolutely necessary. "Without meaningful analysis of alternatives in the EIR, neither courts nor the public can fulfill their proper roles in the CEQA process."[66]

Here, potential alternatives include avoided/reduced cutting. All of these alternatives, and any others, must be considered and fully discussed and analyzed, as they would "avoid or reduce" the cumulatively significant effect of the NTMP. Thus far, the NTMP's alternatives section contains only a conclusory discussion of the spectrum of alternatives, makes no real effort to analyze alternatives that would avoid cutting old-growth areas, and provides no discussion of how each alternative would differ based in terms of impacts to late seral trees and wildlife.

Moreover, 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."[67] 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."[68] This same principle was reiterated in *Save Round Valley Alliance v. County of Inyo*,[69] 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

[65] Pub. Res. Code 21002; 21080.5(d)(2)(A); 14 CCR 896, 898

[66] *Laurel Heights Improvement Ass'n,* 47 Cal.3d at 404. Moreover, "[a] potential alternative should not be excluded from consideration merely because it would impede to some degree the attainment of the project objectives, or would be more costly." *Save Round Valley Alliance v. County of Inyo* (2007) 157 Cal. App. 4th 1437, 1456-57 (quotations omitted)

[67] *Id*. at 1360

[68] *Uphold Our Heritage v. Town of Woodside* (2007) 147 Cal. App. 4th 587, 601

[69] 157 Cal. App. 4th at 1460

project proponent's explicit unwillingness to accept a proposed alternative.[70] 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."[71] Thus, while the project proponent may desire to cut old-growth and the trees needed to protect the old-growth, CAL FIRE nonetheless has an independent obligation to assess alternatives that would avoid that impact. This is also necessary in order to allow for informed decision-making. In short, CAL FIRE can not simply acquiesce to the NTMP's desires; 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."[72] Consequently, thus far, the NTMP's analysis of alternatives is deficient as it provides no meaningful discussion of alternatives that would avoid or mitigate the impacts to old-growth and the wildlife that could use that old-growth

In addition to thoroughly evaluating project alternatives, "the [NTMP] must propose and describe mitigation measures that will minimize the significant environmental effects that the EIR has identified."[73] Mitigation of a project's significant impacts is one of the "most important" functions of CEQA.[74] Therefore, it is the "policy of the state that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures which will avoid or substantially lessen the significant environmental effects of such projects."[75] Importantly, mitigation measures must be "fully enforceable through permit conditions, agreements, or other measures" so "that feasible mitigation measures will actually be implemented as a condition of development."[76] Thus far, not only does the NTMP fail to adequately address its significant impacts and its wildlife impacts, it fails to discuss appropriate measures to avoid those impacts.

CONCLUSION

The Bower NTMP must be revised in light of its informational and other deficiencies. Until all issues are adequately addressed and the NTMP re-circulated for comments, the proposed harvest is unlawful.[77]

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[70] *Id.*

[71] *Id.* at 1458, quoting *Preservation Action Council,* 141Cal. App. 4th at 1356

[72] *Id.* at 1460

[73] *Napa Citizens for Honest Gov't*, 91 Cal.App.4th at 360

[74] *Sierra Club v. Gilroy City Council* (1990) 222 Cal.App.3d 30, 41

[75] Pub. Res. Code § 21002

[76] *Federation of Hillside & Canyon Ass'ns v. City of Los Angeles* (2000) 83 Cal.App.4th 1252, 1261

[77] Should new information be added to the record, including in the Official Response, then the NTMP must be re-circulated. *See Friends of the Old Trees v. Department of Forestry & Fire Protection*, 52 Cal. App. 4th at 1402 ("In any event, it is undisputed the Department's response was not prepared as part of the THP that was available for public comment but was only issued after the THP had been approved. If CEQA is scrupulously followed, the public will know the basis on which its responsible officials either approve or reject environmentally significant

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

Sincerely,

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action, and the public, being duly informed, can respond accordingly to action with which it disagrees. In pursuing an approach that releas[es] a report for public consumption that hedges on important environmental considerations while deferring a more detailed analysis to [a report] that is insulated from public review the Department pursued a path condemned as inconsistent with the purpose of CEQA in this division's opinion in Mountain Lion Coalition v. Fish & Game Com. Certainly, the Department cannot expect the public's access to information after the fact to substitute for the opportunity to influence the Department's decisions before they are made.")