Betsy Herbert, Ph.D.
150 Thayer Rd.
Santa Cruz, CA 95060

December 9, 2009

California Department of Forestry and Fire Protection (CalFire)
135 Ridgeway Avenue
Santa Rosa, CA 95401

To CalFire:

Please enter my comments to the administrative record for 1-08NTMP-009MEN (the Bower NTMP). As a forest policy expert and a manager of forest land for a public water district, my concerns about the Bower NTMP fall into two general categories.

First, I share concerns expressed by the California Department of Fish and Game (CDFG) and the North Coast Regional Water Quality Control Board with regards to ensuring the protection of wildlife habitat, water quality, and carbon stores provided by the late successional forest stands proposed for harvest under the Bower NTMP.

The California Department of Fish and Game (CDFG) identified the last known 18 acres of late successional forest stands (LSFS) in the Doty Creek watershed, land subject to the Bower NTMP. Large redwood trees here are estimated to be at least 120 to 450 years old. These old trees provide suitable nesting and roosting sites for both marbled murrelets and spotted owls, both listed species that depend on this rare habitat type for survival. The Bower NTMP proposes cutting down most of the old growth redwood and other mature trees in Unit 9, along with harvesting many of the largest trees on approximately 600 acres of forest in the Gualala River watershed. I support CDFG recommendations to protect the late successional forest in Unit 9.

Because the Gualala River watershed is a public water supply, managing the forest toward old-growth would preserve valuable natural ecosystem services provided by old-growth redwoods, such as water filtration (Marcot, 1997; Herbert, 2007). Marcot (1997) emphasized that maintaining biodiversity of old forests in the West is necessary to preserve invaluable ecosystem functions. I quote from my own published research on the subject of forest management by public water utilities (Herbert, 2007):

> "Mature forests provide three ecosystem functions of direct relevance to water utility watersheds: 1) older forests have a higher capacity for intercepting fog and rain (FEMAT, 1993); 2) they maintain a low soil-erosion potential, and 3) they enhance channel stability by producing woody debris with longer retention times because of their size and resistance to decay (Harmon et al., 1986)."

Second, I take issue with memo in the Bower NTMP file from William E. Snyder, Deputy Director of CalFire, dated November 12, 2009, on the subject of "Greenhouse Gas Consideration and Evaluation."

The Snyder memo was written in response to concerns raised in a previous letter from CDFG about the proposed logging of the aforementioned 18 acres of old growth forest on the Bower NTMP. CDFG argued that old growth forests sequester more carbon than second growth forests and that the removal of old growth will have adverse impacts on greenhouse gas sequestration.

The Snyder memo counters the CDFG argument by stating the following:

> "A number of researchers have found that managed forests have been shown to sequester more carbon and have fewer emissions than unmanaged forests (Birdsey et al. 2000, Krankina and Harmon, 2006)." [1]

Unfortunately, the Snyder memo did not provide full references for the sources that were cited. However, because I am familiar with the work of Krankina and Harmon, I thought it unlikely that any work co-authored by these scientists would support the argument that Snyder's memo attributes to them. So, I located the following two works, which are apparently are the same as referenced by Snyder:

1. O.N. Krankina and M.E. Harmon. 2006. Forest Management Strategies for Carbon Storage. In: Forests, Carbon & Climate Change - Summary of Science Findings, Oregon Forest Resources Institute, pp. 79-92. [http://www.oregonforests.org/assets/uploads//For_Carbon_fullrpt.pdf]

2. Birdsey, R.A., R. Alig, and D. Adams. 2000. Mitigation activities in the forest sector to reduce emissions and enhance sinks of greenhouse gases. p. 112–131. In L.A. Joyce and R.A. Birdsey (ed.) The impact of climate change on America's forests: A technical document supporting the 2000 USDA Forest Service RPA assessment. RMRS-GTR-59. USDA For. Serv., Rocky Mountain Res. Stn., Fort Collins, CO.

After reading these sources, I find it unconscionable that the deputy director of CalFire is referencing them to make the argument that logging of old growth will help lead to a "net benefit from a climate perspective" (Snyder, 2009).

I quote from Krankina and Harmon (2006):

> "The goal of increasing carbon storage on forest lands is fully synergistic with the goal of conservation of old-growth forests and endangered species that depend on these ecosystems. Other management objectives that restrict timber harvest (for example, buffers along streams to improve fisheries or along highways to enhance the visual appeal for tourists) also lead to greater carbon stores on-site."

---

[1] Note: The term "managed forest" is a common euphemism for a forest that is managed primarily for commercial timber, while an "unmanaged forest" usually refers to a forest that is managed for something other than commercial timber (such as for protection of a public water supply or for passive recreation). An old-growth forest stand would have to be considered an "unmanaged forest."

The second two quotes are from Birdsey et al. (2000):

> "Conversion of mature or old-growth forest to young forest, which may have a faster growth rate, will reduce C storage until the harvested C remaining in products and landfills, plus additional C in the forest ecosystem from renewed growth, reaches the pre-harvest level. This may take 200 years or more in the case of old growth (Harmon et al., 1990)."

And:

> "The effects of reduced harvest on C storage are evident in the estimated past and prospective C flux for National Forest lands (fig. 8.6, Birdsey and Heath 1995). High rates of harvesting in the 1970-1990 period caused emissions of 50 Tg C/year or more, while the significantly reduced harvest of the 1990s, if sustained, will cause a prolonged addition of C to National Forest lands, more than 80 Tg C/year. In the unlikely event that all harvesting were stopped in the United States, public and private timber lands could sequester an additional 4328 Tg C/year over a 50-year projection (Heath et al., 1993)."

The following graph, also from Birdsey et al. (2000), clearly shows that carbon stores increase as harvest levels decrease.

Birdsey, Alig, and Adams

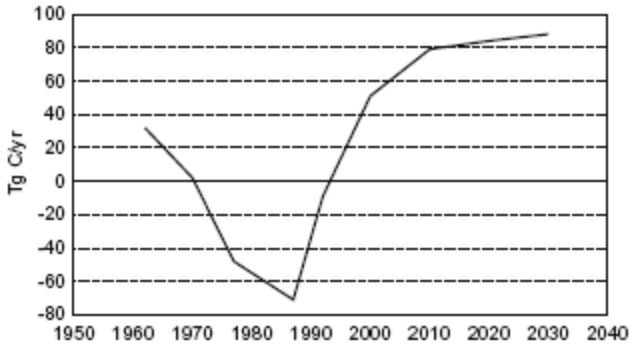

Figure 8.6—Past and prospective C flux on National Forest lands. Trends reflect high levels of harvest in the 1970s and 1980s, then a reduction in harvest in the 1990s resulting from legal and administrative requirements. Harvested C remaining in wood products and landfills is not included (from Birdsey and Heath 1995).

Furthermore, Snyder over-estimates the amount of carbon storage in wood products resulting from actively managed forests. According to an Oregon State University presentation (Krankina, 2008), for carbon retained in wood products, "rates of carbon loss through decomposition and combustion are similar to decomposition rates of coarse woody debris on the forest floor." Furthermore, it takes a very long time for even a fast-growing small tree to begin storing the same amount of carbon as the large tree that was cut to make wood products (Krankina, 2008; Birdsey et al., 2000; Harmon et al., 1990).

In summary, I don't believe that the Snyder memo accurately interprets the scientific sources that it references. Indeed, these articles support the view that fully protecting and preserving these late successional forest stands would preserve existing carbon stores and ongoing carbon sequestration of mature redwood trees. In addition, preserving the late successional stands would preserve invaluable ecosystem functions including water filtration, and would protect biodiversity. Therefore, I request that CalFire require the protection of the late-successional forest stands within the Bower NTMP area. Cutting the old trees would do irreparable harm to the beneficial uses of water in the Gualala River watershed and to the species that depend on old-growth habitat, as well as reduce the immense capacity of the forest to store and sequester carbon.

Sincerely,

References:

Birdsey, R.A., R. Alig, and D. Adams. 2000. Mitigation activities in the forest sector to reduce emissions and enhance sinks of greenhouse gases. p. 112–131. In L.A. Joyce and R.A. Birdsey (ed.) The impact of climate change on America's forests: A technical document supporting the 2000 USDA Forest Service RPA assessment. RMRS-GTR-59. USDA For. Serv., Rocky Mountain Res. Stn., Fort Collins, CO.

FEMAT (Forest Ecosystem Management Assessment Team). 1993. Forest Ecosystem Management: An Ecological, Economic, and Social Assessment. Report of the Forest Ecosystem Management Assessment Team. GPO Pub. 1996-793-01, Washington.

Harmon, M. E. et al., 1986. Ecology of Coarse Woody Debris in Temperate Ecosystems. Adv. Ecological Res., 15:133.

Harmon, M.E.; Ferrell, W.K., Franklin, J.F. 1990. Effects on carbon storage of conversion of old-growth forests to young forests. Science. 247: 699-702.

Herbert, Elizabeth. 2007. "Forest Management by West Coast Water Utilities: Protecting the Source?" Journal of the American Water Works Association. 99:2; pp. 91-106.

Krankina, O.N. and M.E. Harmon (2006). Forest Management Strategies for Carbon Storage. In: Forests, Carbon & Climate Change - Summary of Science Findings, Oregon Forest Resources Institute, pp. 79-92.
[http://www.oregonforests.org/assets/uploads//For_Carbon_fullrpt.pdf]

Krankina, Olga N. 2008. Forest management and mitigation of climate change: in search for synergies. Presentation, Oregon State University, 1/25/08.

Marcot, B. G. 1997. Biodiversity of Old Forests of the West: A Lesson from Our Elders. Creating a forestry for the 21st Century: the Science of Ecosystem Management. (K.A. Khom, & J.F. Franklin, editors). Island Press, Washington.