CENTER *for* BIOLOGICAL DIVERSITY

THE JOHN MUIR PROJECT *of* EARTH ISLAND INSTITUTE

16 December 2013

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Sent via email: comments-pacificsouthwest-inyo@fs.fed.us

Re: Draft Inyo Forest Assessment

Dear Forest Supervisor:

The Center for Biological Diversity and the John Muir Project appreciate the opportunity to provide feedback on the draft Inyo National Forest Assessment and offer the following comments. We have also submitted comments regarding the Sierra and Sequoia National Forest Assesments, the Sierra NRVs as they relate to yellow pine and mixed-conifer forest, red fir forest, aspen, and montane chaparral, as well as comments on the draft Science Synthesis and the draft Bioregional Assessment, and we attach some of those here as well for reference.

We organize our comments as follows: Section 1 covers general issues, and Section 2 includes responses to specific statements in the Draft Assessment.

<u>Section 1</u>

- The fire deficit in the Sierra management region should be the foundation and basis for planning for more fire on the landscape of all severities; the Forest Service should acknowledge that the increased use of managed wildland fire and prescribed fire is ecologically appropriate and beneficial for forests and wildlife and is necessary in order to begin reducing the ongoing deficit in wildland fire. In addition:

    - Creating more fire on the landscape must include ensuring habitat for wildlife (e.g., black-backed woodpecker) that relies on forest that has burned at moderate/high severity in forest that pre-fire was CWHR 4D or above;

    - Post-fire landscapes, especially post-moderate/high severity fire landscapes, must be acknowledged as creating high bio-diversity and essential habitat for many species (e.g., Raphael et al. 1987, Burnett et al. 2010, Burnett et al. 2012, Hanson and North 2008, Hutto 2008, Saab et al. 2009, Swanson et al. 2011, Seavy et al. 2012, Buchalski et al. 2013, Siegel et al. 2010, 2011, 2012, 2013). For example, in the Moonlight Fire area, researchers explained that “[i]t is clear from our first year of monitoring three burned areas [Cub, Moonlight and Storrie Fires] that post-fire habitat, especially high severity areas, are an important component of the Sierra Nevada ecosystem." (Burnett et al. 2010). They also found that "[o]nce the amount of the plot that was high severity was over 60% the density of cavity nests increased substantially," and that "more total species were detected in the Moonlight fire which covers a much smaller geographic area and had far fewer sampling locations than the [unburned] green forest." (Burnett et al. 2010);

- In order to achieve more fire, the Inyo should do the following:
  - Identify constraints on prescribed fire and managed wildland fire (e.g., air quality; personnel availability; monetary resources; weather windows);
  - Set guidelines to assist in avoiding the identified constraints;
  - Remove all currently existing Plan restrictions (e.g., restrictions on the use of managed wildland fire outside of Wilderness) that prohibit or inhibit managed wildland fire or prescribed fire and instead set guidelines for how to achieve more prescribed fire and managed wildland fire;
  - Increase education regarding effective home protection from fire and, in regard to protecting human communities from fire, focus resources on making homes and structures fire resilient;
- In order to maintain the ecological value of fire:
  - It is essential that you address the current lack of protection for post-fire habitat, such as CWHR 4D or above that has burned at moderate/high severity. For example, the recommendations from the completed, "A Conservation Strategy for the Black-backed Woodpecker" (Bond et al. 2012), must be incorporated into the upcoming Inyo National Forest Plan revision in order to protect wildlife that relies on burned forest habitat;
  - You should change the current inadequate standard/guideline (which protects only 10% of burned forest [note that this 10% is not specific to moderate/high severity burned areas and therefore 100% of such areas can potentially be salvaged logged under current guidelines/standards]) to protect 100% of burned forest (except for hazard tree felling - i.e., human safety exemptions would be allowed). There does not exist any ecological basis for salvage logging and this is especially so in light of the deficit of such habitat on the landscape, especially the specific kind of habitat that some species rely on (e.g., post-moderate/high severity burned forest that pre-fire was CWHR 4D or above);
  - Do not use a desire for old forest conditions to drive post-fire actions – post-fire areas are complex and ecologically rich themselves, and should therefore not be seen as competition for old forest conditions. They should be allowed to

regenerate on their own, especially since such areas can themselves offer the types of values associated with late seral conditions (e.g., DellaSala et al. 2013; Donato et al. 2012);

- In addition to prohibiting salvage logging (except for safety reasons), the Forest Service should acknowledge and promote the importance of natural regeneration. Post-fire areas that are manipulated by salvage logging and/or by reforestation efforts are, from an ecological perspective, no longer as valuable as post-fire areas; rather, post-fire salvage logging and reforestation substantially reduce, and often locally eliminate, wildlife species strongly associated with the forest habitat created by moderate and high-severity fire patches (Hanson and North 2008, Hutto 2008, Burnett et al. 2011, 2012, Seavy et al. 2012, Siegel et al. 2012, 2013). Time since fire also provides important insights into the need to protect post-fire areas from manipulation. There is a continuum of use of post-fire areas over time by different species. Black-backed woodpeckers, for example, are well known to require areas with very high snag densities immediately post-fire – i.e., mature forest that has very recently experienced higher-severity fire, and has not been salvage logged (Hanson and North 2008, Hutto 2008, Saab et al. 2009, Seavy et al. 2012, Siegel et al. 2010, 2011, 2012, 2013). However, "while some snag associated species (e.g. black-backed woodpecker) decline five or six years after a fire [and move on to find more recent fire areas], [species] associated with understory plant communities take [the woodpeckers'] place resulting in similar avian diversity three and eleven years after fire (e.g. Moonlight and Storrie)." (Burnett et al. 2012). Burnett et al. (2012) also noted that "there is a five year lag before dense shrub habitats form that maximize densities of species such as Fox Sparrow, Dusky Flycatcher, and MacGillivray's Warbler. These species have shown substantial increases in abundance in the Moonlight fire each year since 2009 but shrub nesting species are still more abundant in the eleven year post-burn Storrie fire. This suggests early successional shrub habitats in burned areas provide high quality habitat for shrub dependent species well beyond a decade after fire." (Burnett et al. 2012). Raphael et al. (1987) found that at 25 years after high-severity fire, total bird abundance was slightly higher in snag forest than in unburned old forest in eastside mixed-conifer forest of the northern Sierra Nevada; and bird species richness was 40% higher in snag forest habitat. In earlier post-fire years, woodpeckers were more abundant in snag forest, but were similar to unburned forest by 25 years post-fire, while flycatchers and species associated with shrubs continued to increase to 25 years post-fire (Raphael et al. 1987). In ponderosa pine and Douglas-fir forests of Idaho at 5-10 years post-fire, levels of aquatic insects emerging from streams were two and a half times greater in high-severity fire areas than in unburned mature/old forest, and bats were nearly 5 times more abundant in riparian areas with high-severity fire than in unburned mature/old forest (Malison and Baxter 2010). Schieck and Song (2006) found that bird species richness increased up to 30 years after high-severity fire, then decreased in mid-successional forest [31-75 years old], and increased again in late-successional forest [>75 years]).

- It is imperative that "salvage" logging <u>not</u> be equated with ecological restoration, or forest management objectives other than economically-motivated multiple use. Noss and others (2006b: 485-86) caution that post-fire logging is counter to resilience of fire-adapted forest ecosystems for six reasons: "Our key findings on post-fire management are as follows. First, post-burn landscapes have substantial capacity for natural recovery. Re-establishment of forest following stand-replacement fire occurs at widely varying rates; this allows ecologically critical, early-successional habitat to persist for various periods of time. Second, post-fire (salvage) logging does not contribute to ecological recovery; rather, it negatively affects recovery processes, with the intensity of impacts depending upon the nature of the logging activity (Lindenmayer et al. 2004). Post-fire logging in naturally disturbed forest landscapes generally has no direct ecological benefits and many potential negative impacts (Beschta et al. 2004; Donato et al. 2006; Lindenmayer and Noss 2006). Trees that survive fire for even a short time are critical as seed sources and as habitat that sustains biodiversity both above- and belowground. Dead wood, including large snags and logs, rivals live trees in ecological importance. Removal of structural legacies, both living and dead, is inconsistent with scientific understanding of natural disturbance regimes and short- and long-term regeneration processes. Third, in forests subjected to severe fire and post-fire logging, streams and other aquatic ecosystems will take longer to return to historical conditions or may switch to a different (and often less desirable) state altogether (Karr et al. 2004). Following a severe fire, the biggest impacts on aquatic ecosystems are often excessive sedimentation, caused by runoff from roads, which may continue for years. Fourth, post-fire seeding of non-native plants is often ineffective at reducing soil erosion and generally damages natural ecological values, for example by reducing tree regeneration and the recovery of native plant cover and biodiversity (Beyers 2004). Non-native plants typically compete with native species, reducing both native plant diversity and cover (Keeley et al. 2006). Fifth, the ecological importance of biological legacies and of uncommon, structurally complex early-successional stands argues against actions to achieve rapid and complete reforestation. Re-establishing fully stocked stands on sites characterized by low severity fire may actually increase the severity of fire because of fuel loadings outside the historical range of variability. Finally, species dependent on habitat conditions created by high severity fire, with abundant standing dead trees, require substantial areas to be protected from post-fire logging (Hutto 1995)."

- The available wildlife science regarding post-fire bio-diversity shows that the mixed-severity fires that are occurring, such as the McNally Fire, are critical habitat for many rare species. In regard to the McNally Fire, for example, one study (Buchalski et al. 2013) found that most phonic groups of bats showed higher activity in areas burned with moderate to high-severity (see also Malison and Baxter 2010, finding greater bat activity was observed in high-severity burned riparian habitat within mixed-conifer forest than at unburned areas of similar habitat in central Idaho). Similarly, in the McNally area, California spotted owls were found to be preferentially selecting high-severity fire areas for foraging (Bond et al. 2009). And recent research indicates that Pacific fishers may benefit from mixed-severity fire (e.g., Hanson

2013—this is the only study to date that examines fisher response to an actual wildfire event).

- Regarding fire size and fire intensity trends in the Sierras, Hanson and Odion (2013) conducted the first comprehensive assessment of fire intensity since 1984 in the Sierra Nevada using 100% of available fire intensity data, and using Mann-Kendall trend tests (a common approach for environmental time series data – one which has similar or greater statistical power than parametric analyses when using non-parametric data sets, such as fire data). They found no increasing trend in terms of high-intensity fire proportion, area, mean patch size, or maximum patch size. Hanson and Odion checked for serial autocorrelation in the data, and found none, and used pre-1984 vegetation data (1977 Cal Veg) in order to completely include any conifer forest experiencing high-intensity fire in all time periods since 1984 (the accuracy of this data at the forest strata scale used in the analysis was 85-88%). Hanson and Odion also checked the results of Miller et al. (2009) and Miller and Safford (2012) for bias, due to the use of vegetation layers that post-date the fires being analyzed in those studies. Hanson and Odion found that there is a statistically significant bias in both studies ($p = 0.025$ and $p = 0.021$, respectively), the effect of which is to exclude relatively more conifer forest experiencing high-intensity fire in the earlier years of the time series, thus creating the false appearance of an increasing trend in fire severity. Miller et al. (2012a), acknowledged the potential bias that can result from using a vegetation classification data set that post-dates the time series. In that study, conducted in the Klamath region of California, Miller et al. used a vegetation layer that preceded the time series, and found no trend of increasing fire severity. Miller et al. (2009) and Miller and Safford (2012) did not, however, follow this same approach. Hanson and Odion also found that the regional fire severity data set used by Miller et al. (2009) and Miller and Safford (2012) disproportionately excluded fires in the earlier years of the time series, relative to the standard national fire severity data set (www.mtbs.gov) used in other fire severity trend studies, resulting in an additional bias which created, once again, the inaccurate appearance of relatively less high-severity fire in the earlier years, and relatively more in more recent years.

- Resilience requires reestablishing the ecological disturbances that forests and wildlife evolved with. For example, wildlife evolved with fire, not mechanical treatments, and therefore resilience is achieved through management that seeks to put fire back on the landscape such as via prescribed fire and managed wildland fire. Mechanical thinning, on the other hand, does not mimic natural wildlfire and can eliminate or reduce the value of mature forest habitat by eliminating or reducing structural complexity (which many rare wildlife species preferentially selects for). Structural complexity is key for species like the California spotted owl, Pacific fisher, and black-backed woodpecker, and therefore, mechanical thinning, when used in dense mature forest habitat, can eliminate or reduce the value of that habitat for these species, and reduce ecological resilience (see, e.g., Zielinski et al. 2006, Purcell et al. 2009, Bond et al. 2009, Hanson 2013).

- It is not appropriate or scientifically accurate to rely on time since fire to gauge likelihood of high-severity fire:

- Six empirical studies have been conducted in California's forests to assess the longstanding forest management assumption that the most fire-suppressed forests (i.e., the forests that have missed the largest number of fire return intervals) burn "almost exclusively high-severity", as the 2004 Sierra Nevada Forest Plan Amendment Final EIS (Vol. 1, p. 124) presumed. These studies found that the most long-unburned (most fire-suppressed) forests burned mostly at low/moderate-severity, and did not have higher proportions of high-severity fire than less fire-suppressed forests. Forests that were not fire suppressed (those that had not missed fire cycles, i.e., Condition Class 1, or "Fire Return Interval Departure" class 1) had levels of high-severity fire similar to, sometimes lower than, and sometimes higher than, those in the most fire-suppressed forests. The findings of these six studies are detailed below:

1)

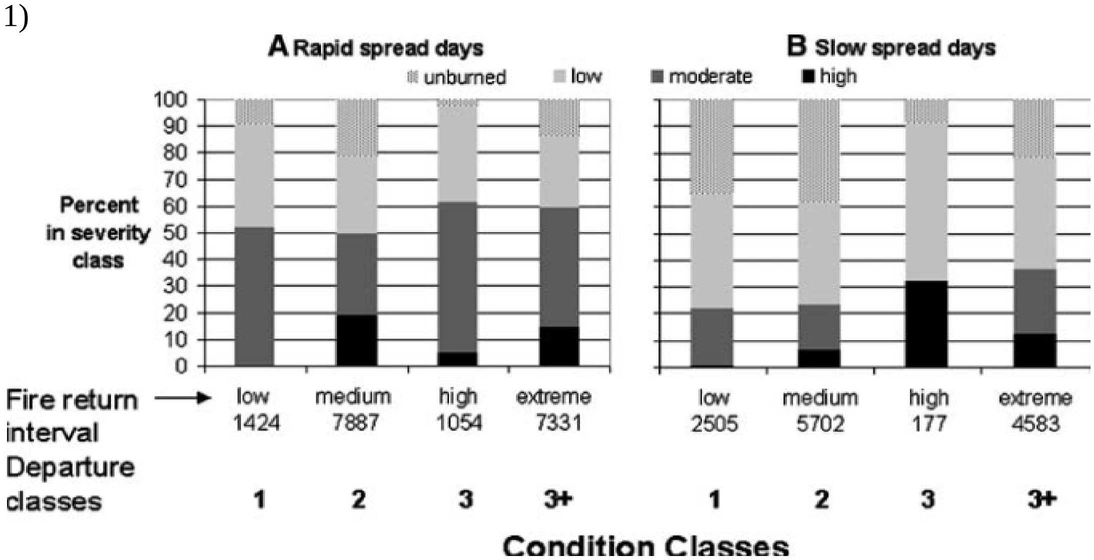

Figure 5 from Odion and Hanson (2006) (*Ecosystems*), based upon the three largest fires 1999-2005, which comprised most of the total acres of wildland fire in the Sierra Nevada during that time period (using fire severity data from Burned Area Emergency Rehabilitation (BAER) aerial overflight mapping), showing that the most long-unburned, fire-suppressed forests (Condition "Class 3+", corresponding to areas that had missed more than 5 fire return intervals, and generally had not previously burned for about a century or more) experienced predominantly low/moderate-severity fire.

2)

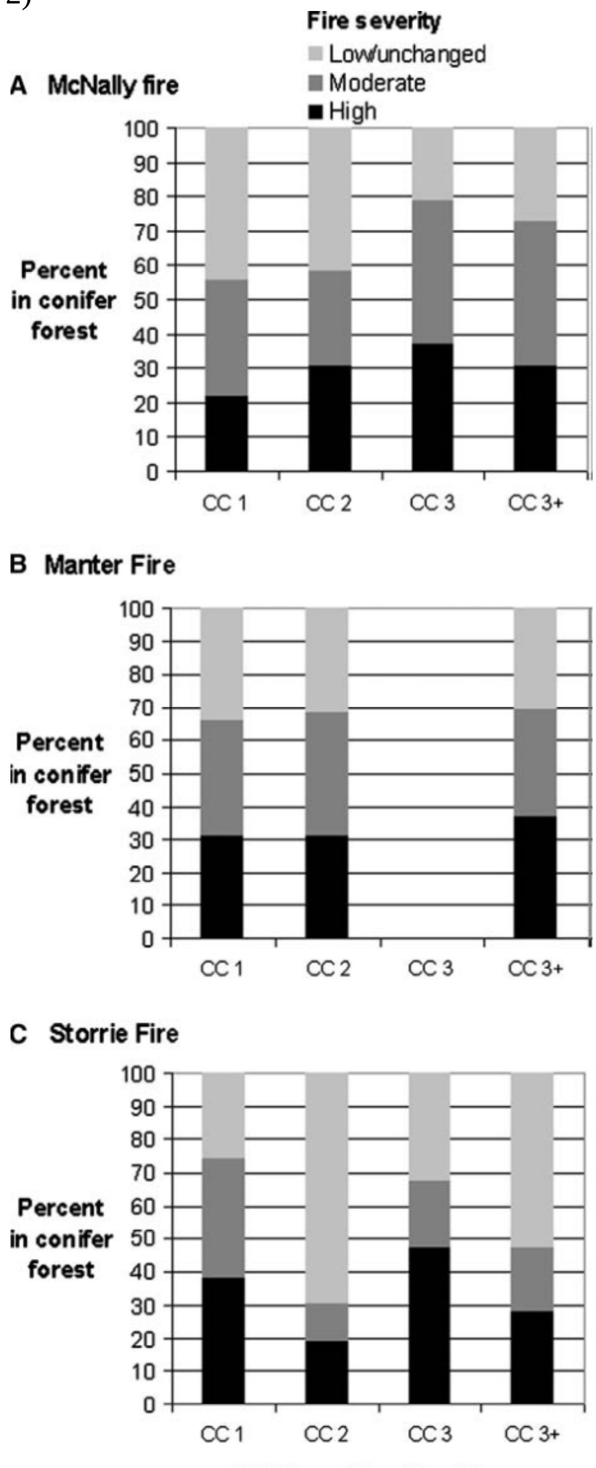

Figure 1 from Odion and Hanson (2008) (*Ecosystems*) (using fire severity data from satellite imagery for the same three fires analyzed in Odion and Hanson 2006), showing that the most long-unburned, fire-suppressed forests (no fire for a century or more) burned mostly at low/moderate-severity, and had levels of high-severity fire similar to less fire-suppressed forests (in one case, even less than Condition Class 1).

3) van Wagtendonk et al. (2012) (*Fire Ecology*), analyzing 28 fires from 1973-2011 in Yosemite National Park, found the following:

> "The proportion burned in each fire severity class was not significantly associated with fire return interval departure class…[L]ow severity made up the greatest proportion within all three departure classes, while high severity was the least in each departure class (Figure 4)."

The most long-unburned, fire-suppressed forests—those that had missed 4 or more fire return intervals (in most cases, areas that had not burned since at least 1930)—had only about 10% high-severity fire (Fig. 4 of van Wagtendonk e al. 2012).

4) Odion et al. (2004) (*Conservation Biology*), addressing numerous wildland fires covering a 98,814-hectare area in 1987 in the California Klamath region, found that the most fire-suppressed forests in this area (areas that had not burned since at least 1920) burned at significantly *lower* severity levels, likely due to a reduction in combustible native shrubs as forests mature and canopy cover increases:

> "The hypothesis that fire severity is greater where previous fire has been long absent was refuted by our study…The amount of high-severity fire in long-unburned closed forests was the lowest of any proportion of the landscape and differed from that in the landscape as a whole (Z = -2.62, n = 66, p = 0.004)."

5) Odion et al. (2010) (*Journal of Ecology*), empirically tested the hypothesis articulated in Odion et al. (2004)—i.e., that the *reduction* in fire severity with increasing time-since-fire was due to a reduction in combustible native shrubs as forests mature and canopy cover increases—and found the data to be consistent with this hypothesis.

6) Miller et al. (2012a) (*Ecological Applications*), analyzing all fires over 400 hectares 1987-2008 in the California Klamath region, found low proportions of high-severity fire (generally 5-13%) in long-unburned forests, and the proportion of high-severity fire effects in long-unburned forests was either the same as, or *lower than*, the high-severity fire proportion in more recently burned forests (see Table 3 of Miller et al. 2012a).

- It is necessary to incorporate the following scientific information into the discussion of fire in ponderosa-pine/Jeffrey-pine and mixed-conifer forest:

    - Contrary to assumptions (e.g., the 2004 Sierra Nevada Framework), considerable data and research exists that indicates that mixed-severity fire: a) is not limited to true fir and lodgepole pine and is instead also a natural condition in ponderosa-pine/Jeffrey-pine and mixed-conifer forest; b) generally dominated pre-fire suppression fire regimes in these forest types; and c) can include a significant proportion of high-severity fire including occasional large high-severity fire patches hundreds or thousands of acres in size (Baker 2006, Baker 2012, Baker et al. 2007, Beaty and Taylor 2001, Bekker and Taylor 2001, Bekker and Taylor 2010, Brown et al. 1999, Collins and Stephens 2010, Colombaroli and Gavin 2010, Hessburg et al. 2007, Iniguez et al. 2009, Klenner et al. 2008, Leiberg 1897, 1899a, 1899b, 1899c, 1900a, 1900b, 1900c, 1902, 1903, 1904a, 1904b, Nagel and

Taylor 2005, Sherriff and Veblen 2007, Shinneman and Baker 1997, Show and Kotok, 1924, 1925, Stephenson et al. 1991, Taylor 2002, USFS 1910-1912, Whitlock et al. 2008, 2010, Williams and Baker 2010, 2011, 2012a, 2012b, Wills and Stuart 1994).

- Beaty and Taylor (2001), in the western slope of the southern Cascades in California, found that historic fire severity in mixed-conifer forests was predominantly moderate- and high-severity, except in mesic canyon bottoms, where moderate- and high-severity fire comprised 40.4% of fire effects [Table 7].

- Bekker and Taylor (2001), another study in the western slope of the southern Cascades in California, found historic fire severity to be predominantly high-severity in their study area [Fig. 2F].

- Bekker and Taylor (2010), in mixed-conifer forests of the southern Cascades, found reconstructed fire severity to be dominated by high-severity fire effects, including high-severity fire patches over 2,000 acres in size [Tables I and II].

- Outside of the Cascades, Show and Kotok (1924), in ponderosa pine and mixed-conifer/pine forests of the Sierra Nevada, found that high-severity crown fires, though infrequent on any particular area, "may extend over a few hundred acres" in patches [p. 31; see also Plate V, Fig. 2, Plate VII, Fig. 2, Plate VIII, Plate IX, Figs. 1 and 2, and Plate X, Fig. 1], with some early-successional areas resulting from high-severity fire patches covering 5,000 acres in size or more [pp. 42-43]. Within unlogged areas, the authors noted many large early-successional habitat patches, dominated by montane chaparral and young, regenerating conifer forest, and explained that such areas were the result of past severe fire because: a) patches of mature/old forest and individual surviving trees were found interspersed within these areas, and were found adjacent to these areas, indicating past forest; b) snags and stumps of fallen snags, as well as downed logs from fallen snags, were abundant in these areas; c) the species of chaparral found growing in these areas are known to sprout abundantly following severe fire; and d) natural conifer regeneration was found on most of the area [p. 42], often growing through complete chaparral cover [p. 43].

- Similarly, Show and Kotok (1925) found that within the ponderosa pine and mixed-conifer/pine belt of the Sierra Nevada, 1 acre out of every 7 on average was dominated by montane chaparral and young regenerating conifer forest following high-severity fire [Footnote 2, and Figs. 4 and 5]; and on one national forest 215,000 acres out of 660,000 was early-successional habitat from severe fire [p. 17].

- Forest Service Timber Survey Field Notes from 1910-1912 show that surveys were conducted within primary forest to evaluate timber production potential in 16.2-ha (40-acre) plots within each 259.1-ha (640-acre) section in ponderosa pine and mixed-conifer forest on the westside of the Stanislaus National Forest, using one or more 1.62-ha transect per plot. The surveyors noted that surveys for individual tree size, density and species were not conducted in areas that had experienced high-severity fire sufficiently recently such that the regenerating areas did not yet contain significant merchantable sawtimber. Surveyors also noted that the dominant vegetation cover across the majority of many 259.1-ha sections was montane chaparral and young conifer regeneration following high-severity fire. For example (from a typical township in the data set): a) T1S, R18E, Section 9 ("Severe fire went through [this section] years ago and killed most of the trees and land was reverted to brush", noting "several large dense sapling stands" and noting that merchantable timber existed on only four of sixteen 16.2-ha plots in the section); b) T1S, R18E, Section 14 ("Fires have killed most of timber and most of section has reverted to brush"); c) T1S, R18E, Section 15 (same); d) T1S, R18E, Section 23 ("Most of timber on section has been killed by fires which occurred many years ago"); T1S, R18E, Section 21 ("Old fires killed most of timber on this section and most of area is now brushland".)

- Leiberg (1902) found that, in mixed-conifer forests in the central and northern Sierra Nevada, while some of the areas were open and parklike stands dominated by ponderosa pine, Jeffrey pine, and sugar pine, the majority were dominated by white fir, incense-cedar, and Douglas-fir, especially on north-facing slopes and on lower slopes of subwatersheds; such areas were predominantly described as dense, often with "heavy underbrush" from past mixed-severity fire. Natural heterogeneity, resulting from fire, often involved dense stands of old forest adjacent to snag forest patches of standing fire-killed trees and montane chaparral with regenerating young conifers: "All the slopes of Duncan Canyon from its head down show the same marks of fire—dead timber, dense undergrowth, stretches of chaparral, thin lines of trees or small groups rising out of the brush, and heavy blocks of forest surrounded by chaparral." [p. 171] Similarly, the USDA 1910-1912 Timber Survey Field Notes found that historic ponderosa pine and mixed-conifer forests of the central/southern Sierra Nevada [western slope] varied widely in stand density and composition; open and park-like pine-dominated stands comprised a significant portion of the lower montane and foothill zones, but dense stands dominated by fir and cedar, and by small/medium-sized trees, dominated much of the middle montane zone (It should be noted that the old-growth forests chosen for study by Scholl and Taylor 2010 and Collins et al. 2011 comprised only a very small portion of the 1910-1912 Stanislaus data set).

- Nagel and Taylor (2005) noted that "[c]haparral has been replaced by forest and this vegetation change has reduced the heterogeneity of the mixed conifer forest landscapes in the Sierra Nevada. . . Our study suggests that maintenance of chaparral should be an integral part of ecosystem restoration plans for mixed conifer forest landscapes in the Lake Tahoe basin and northern Sierra Nevada."

- Black-backed Woodpeckers should be designated as a Species of Conservation Concern (SCC):

    - Black-backed woodpeckers are an at-risk species and were recently determined by the USFWS to potentially merit listing under the federal ESA (i.e., USFWS 2013 positive 90-day finding on petition to list the population in OR/CA (as well as the Black Hills of South Dakota));

    - Black-backed woodpeckers are indicators for an entire forest ecosystem – complex early seral forest – and protecting them will help ensure protection for the many other species that rely on undisturbed, post-fire habitat;

    - In the fall of 2012, the Forest Service determined that there is significant concern about the conservation of Black-backed Woodpecker populations, in light of new scientific information indicating that current populations may be dangerously low and that populations are at risk from continued habitat loss due to fire suppression, post-fire logging, and mechanical thinning. The Conservation Strategy that was issued provides for key conservation measures to mitigate impacts to the population (Bond et al. 2012). The Conservation Strategy, and its measures, should be incorporated into the National Forest Plan as bare minimum standards for protecting this at-risk species. See Bond, M.L., R.B. Siegel, and D.L. Craig. 2012. A Conservation Strategy for the Black-backed Woodpecker *(Picoides arcticus*) in California—Version 1.0. The Institute for Bird Populations, Point Reyes Station, California, For: U.S. Forest Service, Pacific Southwest Region, Vallejo, CA (Conservation recommendations include: a) identify the areas of the highest densities of larger snags after fire, and do not salvage log such areas (Recommendation 1.1); b) in areas where post-fire salvage logging does occur, do not create salvage logging patches larger than 2.5 hectares in order to maintain some habitat connectivity and reduce adverse impacts on occupancy (Recommendation 1.3); c) maintain dense, mature forest conditions in unburned forests adjacent to recent fire areas in order to facilitate additional snag recruitment (from beetles radiating outward from the fire) several years post-fire, which can increase the longevity of Black-backed Woodpecker occupancy in fire areas (Recommendation 1.4); d) do not conduct post-fire salvage logging during nesting season, May 1 through July 31 (Recommendation 1.5)); and e) maintain dense, mature/old unburned forests in order to facilitate high quality Black-backed Woodpecker habitat when such areas experience wildland fire (Recommendation 3.1)); see also: a) Hanson and North (2008) (Black-backed Woodpeckers selected dense, old forests that experienced high-severity fire, and avoided salvage logged areas [see Tables 1 and 2]); b) Hutto (2008) (Figure 4a, showing about 50% loss of Black-backed Woodpecker post-fire occupancy due to moderate <u>pre</u>-fire logging [consistent with mechanical thinning] in areas that later experienced wildland fire); c) Odion and Hanson (2013) (High-severity fire, which creates primary habitat for Black-backed Woodpeckers, has declined >fivefold since the early 20th century in the Sierra Nevada and eastern Oregon Cascades due to fire suppression. Further, the current rate of high-severity fire in mature/old forest (which creates primary, or high suitability, habitat for this species) in the Sierra Nevada and eastern Oregon Cascades is so low, and recent high-severity fire in mature/old forest comprises such a tiny percentage of the overall forested landscape currently (0.66%, or about 1/150th of the landscape), that even if high-severity fire in mature/old forest was increased by several times, it would only amount to a very small proportional reduction in mature/old forest, while getting Black- backed Woodpecker habitat closer to its historical, natural levels. Conversely, the combined effect of a moderate version of current forest management—prefire thinning of 20% of the mature/old forest (in order to enhance fire suppression) over the next 27 years, combined with post-fire logging of one-third of the primary Black-backed Woodpecker habitat – would reduce primary Black-backed Woodpecker habitat to an alarmingly low 0.20% (1/500th) of the forested landscape, seriously threatening the viability of Black-backed Woodpecker populations); d) Rota (2013) (finding that Black-backed Woodpeckers in the Black Hills of South Dakota only maintain stable or increasing populations (i.e., viable populations) in recent wildland fire areas occurring within dense mature/older forest (which have very high densities of large wood-boring beetle larvae due to the very high densities of medium/large fire-killed trees). And, while Black-backeds are occasionally found in unburned forest or prescribed burn areas, unburned 'beetle-kill' forests (unburned forest areas with high levels of tree mortality from small pine beetles) and lower-intensity prescribed burns have declining populations of Black-backed Woodpeckers (with the exception of a tiny percentage of beetle-kill areas). The study shows that unburned beetle-kill forests do not support viable populations, but very high snag-density beetle-kill areas tend to slow the population decline of Black-backed Woodpeckers in between occurrences of wildland fire. Population decline rates are alarmingly fast in low-intensity prescribed burn areas, indicating that such areas do not provide suitable habitat. Black-backed Woodpeckers are highly specialized and adapted to prey upon wood-boring beetle larvae found predominantly in recent higher-severity wildland fire areas. Moreover, while Black-backed Woodpeckers are naturally camouflaged against the charred bark of fire-killed trees, they are more conspicuous in unburned forests, or low-severity burned forests, and are much more vulnerable to predation by raptors in such areas. For this reason, even when a Black-backed Woodpecker pair does successfully reproduce in unburned forest or low-severity fire areas, both juveniles and adults have much lower survival rates than in higher-severity wildland fire areas.); e) Seavy et al (2012) (Black-backed Woodpeckers selected sites with an average of 13.3 snags per 11.3-meter radius plot [i.e., 0.1-acre plot], or about 133 snags per acre.); f) Siegel et al (2013) (Black-backed woodpeckers strongly select large patches of higher-severity fire with high densities of medium and large snags, generally at least 100 to 200 hectares (roughly 250 to 500 acres) per pair, and post-fire salvage logging eliminates Black-backed woodpecker foraging habitat [see Fig. 13, showing almost complete avoidance of salvage logged areas]. Suitable foraging habitat was found to have more than 17-20 square meters per hectare of recent snag basal area [pp. 45, 68-70], and suitable nesting habitat was found to average 43 square meters per hectare of recent snag basal area and range from 18 to 85 square meters to hectare [p. 59, Table 13]. Moreover, Appendix 2, Fig. 2 indicates that the Sierra Nevada population of Black-backed Woodpeckers is genetically distinct from the Oregon Cascades population, though additional work needs to be conducted to determine just how distinct the two populations are. Siegel et al. 2013 also found that the small number of Black-backed Woodpeckers with mostly unburned forest home ranges had home ranges far larger than those in burned forest, and that the birds in unburned forest were traveling more than twice as far as those in burned forest in order to obtain lesser food than those in burned forests, indicating that such areas do not represent suitable, viable habitat for this species.)

  - It is important to keep in mind also that black-backed woodpeckers rely upon large patches (generally at least 200 acres per pair) of recently killed trees (typically less than 8 years post-mortality) with very high densities of medium and large snags (usually at least 80-100 per acre), and any significant level of post-fire salvage logging largely eliminates nesting and foraging potential;

- It is necessary to incorporate into planning the impacts of pesticides and rodenticides. For example, Thompson et al. (2013) recently found that in regard to fishers, likelihood of exposure to rodenticides was related to the presence of marijuana cultivation sites, and female fisher survival was influenced by the number of cultivation sites within its home range. Moreover, pesticides have been found to be prevalent in Sierra frogs even though they are many miles from where the pesticides are used for agriculture (Smalling et al. 2013).

Section 2

Best Available Science

The Assessment states the following regarding its approach to “best available science”:

> High quality and valid scientific information was considered particularly valuable. This type of information is characterized by clearly-defined and well-developed methodology, logical conclusions, reasonable inferences, adequate peer-review, suitable quantitative methodology, proper spatial and temporal context, and the use of relevant and credible citations.
>
> Accuracy and reliability of relevant information was determined by comparing the scientific certainty and quality of the information, and using the most scientifically certain information available. Information from the chapter papers without appropriate supporting citations or references was considered to be less certain under the draft directives.
>
> If the information appeared to be of comparable scientific certainty, then both points of view were carried forward and a data gap was identified as to the final conclusions. In this way conflicting information will be made available during public feedback opportunities, collaboration and the internal review process to

verify and validate the information meets the criteria to be considered BASI. An assumption of the planning process is that public feedback will help ensure that relevant, accurate, and reliable information is considered.

During the Science Synthesis comment period, the draft Bio-regional Assessment comment period, the NRV comment period, as well as during the WIKI comment periods, we submitted "[h]igh quality and valid scientific information." Yet, thus far, the vast majority of it has been ignored. We therefore submit it again below (and above), and note that there is no basis at all for Forest Service scientists to act as gatekeepers for which science to include. The information we submitted is certainly at least "of comparable scientific certainty" as compared to the science the Forest Service presented. It therefore should have been "carried forward". The Forest Service's approach deprives the agency itself, and more importantly, the public, of the ability to see and understand the breadth of the literature, and results in the censorship of science that contradicts the agency's management approach/assumptions. We therefore again request that the current approach to scientific literature end, and that the breadth of the literature be both acknowledged and incorporated.

The Black-backed Woodpecker

The draft Assessment, Chapter 5 Topic Paper, Appendix A, in regard to the black-backed woodpecker, states "No" in regard to the question "Best available science indicates substantial concern about species' capability to persist over the long-term in the plan area." No basis or citations are provided for this; moreover, the available information amply demonstrates at least "substantial concern," such as the FWS 90-day finding, the Forest Service's own BBWO Conservation Strategy, the petitions to list, as well as the following references:

Burnett, R.D., P. Taillie, and N. Seavy. 2011. Plumas Lassen Study 2010 Annual Report. U.S. Forest Service, Pacific Southwest Region, Vallejo, CA. ***(Black-backed Woodpecker nesting was eliminated by post-fire salvage. See Figure 11 [showing nest density on national forest lands not yet subjected to salvage logging versus private lands that had been salvage logged].)***

Burnett, R.D., M. Preston, and N. Seavy. 2012. Plumas Lassen Study 2011 Annual Report. U.S. Forest Service, Pacific Southwest Region, Vallejo, CA. ***(Black-backed Woodpecker potential occupancy rapidly approaches zero when less than 40-80 snags per acre occur, or are retained (Burnett et al. 2012, Fig. 8 [occupancy dropping towards zero when there are fewer than 4-8 snags per 11.3-meter radius plot—i.e., less than 4-8 snags per 1/10th-acre, or less than 40-80 snags per acre.)***

Hanson, C. T. and M. P. North. 2008. Postfire woodpecker foraging in salvage-logged and unlogged forests of the Sierra Nevada. Condor 110: 777–782. ***(Black-backed woodpeckers depend upon dense, mature/old forest that has recently experienced higher-severity fire, and has not been salvage logged; sBlack-backed Woodpeckers selected dense, old forests that experienced high-severity fire, and avoided salvage logged areas [see Tables 1 and 2].)***

Hanson, C.T., and D.C. Odion. 2013. Is fire severity increasing in the Sierra Nevada mountains, California, USA? International Journal of Wildland Fire: http://dx.doi.org/10.1071/WF13016

Hutto, R. L. 2008. The ecological importance of severe wildfires: Some like it hot. Ecological Applications 18:1827–1834. ***(Figure 4a, showing about 50% loss of Black-backed Woodpecker post-fire occupancy due to moderate pre-fire logging [consistent with mechanical thinning] in areas that later experienced wildland fire.)***

Odion, D.C., and Hanson, C.T. 2013. Projecting impacts of fire management on a biodiversity indicator in the Sierra Nevada and Cascades, USA: the Black-backed Woodpecker. The Open Forest Science Journal 6: 14-23. ***(High-severity fire, which creates primary habitat for Black-backed Woodpeckers, has declined fivefold since the early 20th century in the Sierra Nevada and eastern Oregon Cascades due to fire suppression. Further, the current rate of high-severity fire in mature/old forest (which creates primary, or high suitability, habitat for this species) in the Sierra Nevada and eastern Oregon Cascades is so low, and recent high-severity fire in mature/old forest comprises such a tiny percentage of the overall forested landscape currently (0.66%, or about 1/150th of the landscape), that even if high-severity fire in mature/old forest was increased by several times, it would only amount to a very small proportional reduction in mature/old forest, while getting Black-backed Woodpecker habitat closer to its historical, natural levels. Conversely, the combined effect of a moderate version of current forest management—prefire thinning of 20% of the mature/old forest (in order to enhance fire suppression) over the next two decades, combined with post-fire logging of one-third of the primary Black-backed Woodpecker habitat, would reduce primary Black-backed Woodpecker habitat to an alarmingly low 0.20% (1/500th) of the forested landscape, seriously threatening the viability of Black-backed Woodpecker populations.)***

Rota, C.T. 2013. Not all forests are disturbed equally: population dynamics and resource selection of Black-backed Woodpeckers in the Black Hills, South Dakota. Ph.D. Dissertation, University of Missouri-Columbia, MO. (***Rota (2013) finds that Black-backed Woodpeckers only maintain stable or increasing populations (i.e., viable populations) in recent wildland fire areas occurring within dense mature/older forest (which have very high densities of large wood-boring beetle larvae due to the very high densities of medium/large fire-killed trees). And, while Black-backeds are occasionally found in unburned forest or prescribed burn areas, unburned "beetle-kill" forests (unburned forest areas with high levels of tree mortality from small pine beetles) and lower-intensity prescribed burns have declining populations of Black-backed Woodpeckers (with the exception of a tiny percentage of beetle-kill areas). The study shows that unburned beetle-kill forests do not support viable populations, but very high snag-density beetle-kill areas tend to slow the population decline of Black-backed Woodpeckers in between occurrences of wildland fire. Population decline rates are alarmingly fast in low-intensity prescribed burn areas, indicating that such areas do not provide suitable habitat. Black-backed Woodpeckers are highly specialized and adapted to prey upon wood-boring beetle larvae found predominantly in recent higher-severity wildland fire areas. Moreover, while Black-backed Woodpeckers are naturally camouflaged against the charred bark of fire-killed trees, they are more conspicuous in***

unburned forests, or low-severity burned forests, and are much more vulnerable to predation by raptors in such areas. For this reason, even when a Black-backed Woodpecker pair does successfully reproduce in unburned forest or low-severity fire areas, both juveniles and adults have much lower survival rates than in higher-severity wildland fire areas.**)**

Saab, V.A., R.E. Russell, and J.G. Dudley. 2009. Nest-site selection by cavity-nesting birds in relation to postfire salvage logging. Forest Ecology and Management 257:151–159. ***(Black-backed Woodpeckers select areas with about 325 medium and large snags per hectare [about 132 per acre], and nest-site occupancy potential dropped to near zero when snag density was below about 270 per hectare, or about 109 per acre [see Fig. 2A, showing 270 snags per hectare as the lower boundary of the 95% confidence interval].)***

Seavy, N.E., R.D. Burnett, and P.J. Taille. 2012. Black-backed woodpecker nest-tree preference in burned forests of the Sierra Nevada, California. Wildlife Society Bulletin 36: 722-728. ***(Black-backed Woodpeckers selected sites with an average of 13.3 snags per 11.3-meter radius plot [i.e., 0.1-acre plot], or about 133 snags per acre.)***

Siegel, R.B., M.W. Tingley, and R.L. Wilkerson. 2011. Black-backed Woodpecker MIS surveys on Sierra Nevada national forests: 2010 Annual Report. A report in fulfillment of U.S. Forest Service Agreement No. 08-CS-11052005-201, Modification #2; U.S. Forest Service Pacific Southwest Region, Vallejo, CA. ***(Black-backed woodpecker occupancy declines dramatically by 5-7 years post-fire relative to 1-2 years post-fire, and approaches zero by 10 years post-fire [Fig. 15a].)***

Siegel, R.B., M.W. Tingley, R.L. Wilkerson, and M.L. Bond. 2012b. Assessing home range size and habitat needs of Black-backed Woodpeckers in California: 2011 Interim Report. Institute for Bird Populations. A report in fulfillment of U.S. Forest Service Agreement No. 08-CS-11052005-201, Modification 3; U.S. Forest Service, Pacific Southwest Region, Vallejo, CA. ***(See Figure 10, showing almost complete avoidance of salvage logged areas by Black-backed Woodpeckers in a radiotelemetry study in the southern Cascades in California.)***

Siegel, R.B., M.W. Tingley, R.L. Wilkerson, M.L. Bond, and C.A. Howell. 2013. Assessing home range size and habitat needs of Black-backed Woodpeckers in California: Report for the 2011 and 2012 field seasons. Institute for Bird Populations. ***(Black-backed woodpeckers strongly select large patches of higher-severity fire with high densities of medium and large snags, generally at least 100 to 200 hectares (roughly 250 to 500 acres) per pair, and post-fire salvage logging eliminates Black-backed woodpecker foraging habitat [see Fig. 13, showing almost complete avoidance of salvage logged areas]. Suitable foraging habitat was found to have more than 17-20 square meters per hectare of recent snag basal area [pp. 45, 68-70], and suitable nesting habitat was found to average 43 square meters per hectare of recent snag basal area and range from 18 to 85 square meters to hectare [p. 59, Table 13]. Moreover, Appendix 2, Fig. 2 indicates that the Sierra Nevada population of Black-backed Woodpeckers is genetically distinct from the Oregon Cascades population,***

though additional work needs to be conducted to determine just how distinct the two populations are.)

Tarbill, G.L. 2010. Nest site selection and influence of woodpeckers on recovery in a burned forest of the Sierra Nevada. Master's Thesis, California State University, Sacramento. ***(In post-fire eastside pine and mixed-conifer forests of the northern Sierra Nevada, Black-backed woodpeckers strongly selected stands with very high densities of medium and large snags, with well over 200 such snags per hectare on average at nest sites [Table 2], and nesting potential was optimized at 250 or more per hectare, dropping to very low levels below 100 to 200 per hectare [Fig. 5b].)***

Sincerely,

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