CENTER *for* BIOLOGICAL DIVERSITY

THE JOHN MUIR PROJECT *of* EARTH ISLAND INSTITUTE

February 25, 2021

Sequoia National Forest
Giant Sequoia National Monument
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Re: Castle Fire Restoration Project

Dear USFS:

The Center for Biological Diversity and John Muir Project submit the following scoping comments regarding the Castle Fire Restoration Project that has been proposed for the Sequoia National Forest and Giant Sequoia National Monument.

The scoping letter refers to the proposed project as an "ecological restoration project," but does not discuss the fact that the Castle fire itself was (and continues to be) ecologically restorative in that it created (and set in motion the creation of) essential wildlife habitat for numerous species. Similarly, the scoping letter asserts that "removing dead and dying trees, combined with restoration efforts, including planting and seeding, would re-establish healthy forest conditions that provide wildlife habitat," but does not discuss the fact that the Castle Fire, including in the areas that burned at moderate-high severity, itself provides, in its current state, important and essential wildlife habitat, i.e. healthy forest conditions. *See, e.g.,* Roberts et al. 2021[1] ("More species (48% of the community) reached peak abundance at moderate-high-severity-fire locations than at low-severity fire (8%), silvicultural management (16%), or undisturbed (13%) locations"); ("We conclude that a significant portion of the bird community in the Sierra Nevada region is dependent on moderate-high-severity fire"); ("the one post-disturbance habitat type that did show strong influence on more species than any of the other types, moderate-high-severity fire, is a uniquely important component of the landscape").

The scoping letter states that the Project seeks to conduct the following actions: "Fall and remove dead/dying trees using mechanical ground-based equipment. Trees may be removed through a variety of methods. Trees with commercial value for sawtimber or biomass could be sold. Trees not sold could be chipped for ground cover, lopped and scattered, piled and burned, or placed for erosion control." However, it is unclear how much post-fire logging will occur (e.g. acres) and it is likewise confusing as to what exactly is intended. For example, while much of the scoping letter gives the impression that the Project is intended to allow general salvage logging,

[1] Roberts, L.J.; Burnett, R.; Fogg, A. 2021. Fire and Mechanical Forest Management Treatments Support Different Portions of the Bird Community in Fire-Suppressed Forests. Forests 12, 150

the scoping letter also states that "the majority of the project is immediately adjacent to California Highway 190, Mountain Home State Forest, Balch Park, the communities of Alpine Village, Camp Nelson, Cedar Slope, Coy Flat, Doyle Springs, Pierpoint, Ponderosa, and Sequoia Crest, and a few small private inholdings." That information suggests the Project is largely a hazard tree project, not a general salvage project. It is therefore unknown what exactly is being proposed.

The scoping letter states that the USFS will rely on "wildlife habitat needs as specified in the management plans for the forest and the GSNM." The GSNM Plan states: "In areas burned by wildfire, including high- and mid-severity patches, manage snag levels to meet ecological restoration objectives, with consideration for the spatial arrangement and density of snags for wildlife needs. Include site-specific considerations such as a wider range of snag sizes and densities, and focal placement of snags and snag patches." That management direction, in light of the best available science regarding post-fire wildlife habitat in high- and mid-severity patches (see citations below), should mean that the felling of dead trees will not be authorized other than to address hazard trees. The following publications support that outcome: Blakey et al. 2019[2] (discussing bat use of severely burned forest); Bond et al. 2009[3], 2013[4] (discussing spotted owl use of severely burned forest); Bradley et al. 2016[5] (discussing logging and fire severity); Buchalski et al. 2013[6] (discussing bat use of severely burned forest); Burnett et al. 2010[7], 2012[8] (discussing avian use of severely burned forest); Campos and Burnett 2015[9], 2016[10], 2017[11] (discussing avian and bat use of severely burned forest); Fogg et al. 2015[12], 2016[13] (discussing avian use of severely burned forest); Hanson and Chi 2020[14] (discussing woodpecker use of severely burned forest); Hanson and Chi 2020[15] (discussing postfire logging); Hanson and North

[2] Blakey, Rachel & Webb, Elisabeth & Kesler, Dylan & Siegel, Rodney & Corcoran, Derek & Johnson, Matthew. 2019. Bats in a changing landscape: Linking occupancy and traits of a diverse montane bat community to fire regime. Ecology and Evolution.

[3] Bond, M. L., D. E. Lee, R. B. Siegel, & J. P. Ward, Jr. 2009. Habitat use and selection by California Spotted Owls in a postfire landscape. Journal of Wildlife Management 73: 1116-1124

[4] Bond, ML, DE Lee, RB Siegel, and MW Tingley. 2013. Diet and home-range size of California spotted owls in a burned forest. Western Birds 44:114-126

[5] Bradley, C. M., C. T. Hanson, and D. A. DellaSala. 2016. Does increased forest protection correspond to higher fire severity in frequent-fire forests of the western USA? Ecosphere 7

[6] Buchalski, M.R., J.B. Fontaine, P.A. Heady III, J.P. Hayes, and W.F. Frick. 2013. Bat response to differing fire severity in mixed-conifer forest, California, USA. PLOS ONE 8: e57884

[7] Burnett, R.D., P. Taillie, and N. Seavy. 2010. Plumas Lassen Study 2009 Annual Report. U.S. Forest Service, Pacific Southwest Region, Vallejo, CA

[8] Burnett, R.D., M. Preston, and N. Seavy. 2012. Plumas Lassen Study 2011 Annual Report. U.S. Forest Service, Pacific Southwest Region, Vallejo, CA

[9] Campos, Brent R. and Ryan D. Burnett. 2015. Avian monitoring of the Storrie and Chips Fire Areas: 2014 report

[10] Campos, Brent R. and Ryan D. Burnett. 2016. Bird and Bat Inventories in the Moonlight, Storrie, and Chips Fire Areas: 2015 report to the Lassen and Plumas National Forests

[11] Campos, B.R., R.D. Burnett and Z.L. Steel. 2017. Bird and bat inventories in the Storrie and Chips fire areas 2015-2016: Final report to the Lassen National Forest. Point Blue Conservation Science, Petaluma, CA.

[12] Fogg, Alissa M., Zachary L. Steel and Ryan D. Burnett. 2015. Avian Monitoring of the Freds and Power Fire Areas

[13] Fogg, Alissa, Zack Steel, and Ryan Burnett. 2016. Avian Monitoring in Central Sierra Post-fire Areas

[14] Hanson, C.T.; Chi, T.Y. 2020. Black-Backed Woodpecker Nest Density in the Sierra Nevada, California. Diversity 12, 364

[15] Hanson CT and Chi TY. 2021. Impacts of Postfire Management Are Unjustified in Spotted Owl Habitat. Front. Ecol. Evol. 9:596282

2008[16] (discussing woodpecker use of severely burned forest); Hanson and North 2009[17] (discussing the flushing that occurs in trees post-fire); Hanson 2014[18] (discussing avian use of severely burned forest); Loffland et al. 2017[19] (discussing bee use of severely burned forest); Roberts et al. 2021[20] (discussing avian use of severely burned forest); Seavey et al. 2012[21] (discussing woodpecker use of severely burned forest); Siegel et al. 2012[22], 2013[23], 2014[24], 2014[25], 2016[26], 2019[27] (discussing woodpecker use of severely burned forest); Stillman et al. 2019[28] and 2019[29] (discussing woodpecker use of severely burned forest); Taillie et al. 2018[30] (discussing avian use of severely burned forest); Tingley et al. 2014[31], 2016[32] (discussing woodpecker use of severely burned forest); White et al. 2016,[33] 2019[34] (discussing avian use of

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[16] 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

[17] Hanson, C.; North, M. 2009. Postfire survival and flushing in three Sierra Nevada conifers with high initial crown scorch. International Journal of Wildland Fire 18: 857–864

[18] Hanson, C.T. 2014. Conservation concerns for Sierra Nevada birds associated with high- severity fire. Western Birds 45: 204-212

[19] Loffland, H.L., J.S. Polasik, M.W. Tingley, E.A. Elsey, C. Loffland, G. Lebuhn, and R.B. Siegel. 2017. Bumble bee use of post-fire chaparral in the central Sierra Nevada. The Journal of Wildlife Management 81:1084–1097

[20] Roberts, L.J.; Burnett, R.; Fogg, A. 2021. Fire and Mechanical Forest Management Treatments Support Different Portions of the Bird Community in Fire-Suppressed Forests. Forests 12, 150

[21] 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

[22] Siegel, R.B., M.W. Tingley, and R.L. Wilkerson. 2012. Black-backed Woodpecker MIS surveys on Sierra Nevada national forests: 2011 annual report. Report to U.S.D.A. Forest Service Pacific Southwest Region. The Institute for Bird Populations, Point Reyes Station, CA

[23] 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

[24] Siegel, R.B., M.W. Tingley, and R.L. Wilkerson. 2014. Assessing home-range size and habitat needs of Black-backed Woodpeckers in California: report for the 2013 field season. Report to U.S.D.A. Forest Service Pacific Southwest Region. The Institute for Bird Populations, Point Reyes Station, CA

[25] Siegel, R.B., R.L. Wilkerson, M.W. Tingley, and C.A. Howell. 2014. Roost sites of the Black-backed Woodpecker in burned forest. Western Birds 45:296–303

[26] Siegel, R.B., M.W. Tingley, R.L. Wilkerson, C.A. Howell, M. Johnson, and P. Pyle. 2016. Age structure of Black-backed Woodpecker populations in burned forests. The Auk: Ornithological Advances 133:69–78

[27] Siegel, R.B., S.A. Eyes, M.W. Tingley, J.X. Wu, S.L. Stock, J.R. Medley, R.S. Kalinowski, A. Casas, M. Lima-Baumbach, and A.C. Rich. 2019. Short-term resilience of Great Gray Owls to a megafire in California, USA. The Condor: Ornithological Applications 121:1–13

[28] Stillman, A.N., R.B. Siegel, R.L. Wilkerson, M. Johnson, and M.W. Tingley. 2019. Age-dependent habitat relationships of a burned forest specialist emphasise the role of pyrodiversity in fire management. Journal of Applied Ecology 56:880-890

[29] Stillman, A.N., R.B. Siegel, R.L. Wilkerson, M. Johnson, C.A. Howell and M.W. Tingley. 2019. Nest site selection and nest survival of Black-backed Woodpeckers after wildfire. The Condor: Ornithological Applications XX:1–13

[30] Taillie, P. J., R. D. Burnett, L. J. Roberts, B. R. Campos, M. N. Peterson, and C. E. Moorman. 2018. Interacting and non-linear avian responses to mixed-severity wildfire and time since fire. Ecosphere 9(6):e02291. 10.1002/ecs2.2291

[31] Tingley, M.W., R.L. Wilkerson, M.L. Bond, C.A. Howell, and R.B. Siegel. 2014. Variation in home range size of Black-backed Woodpeckers (*Picoides arcticus*). The Condor: Ornithological Applications 116: 325–340

[32] Tingley, M.W., V. Ruiz-Gutiérrez, R.L. Wilkerson, C.A. Howell, and R.B. Siegel. 2016. Pyrodiversity promotes avian diversity over the decade following forest fire. Proceedings of the Royal Society B 283:20161703.

[33] White, A. M.; Manley, P. N.; Tarbill, G. L.; Richardson, T. W.; Russell, R. E.; Safford, H. D.; Dobrowski, S. Z. 2016. Avian community responses to post-fire forest structure: implications for fire management in mixed conifer forests. Animal Conservation. 19(3): 256-264

severely burned forest). Moreover, endangered fishers as well as spotted owls (a Forest Service Sensitive Species) will use the burned areas. Both of these rare species are known to make significant use of post-fire landscapes (see, e.g., Hanson 2013 and 2015 (re fisher)[35]; and Bond et al. 2009, 2013[36]; Hanson et al. 2018[37]; Lee 2018 and 2020[38]; Lee and Bond 2015[39] (re spotted owl)).

In addition to the significant impacts that can occur to wildlife from post-fire logging at any time of the year, if such logging occurs in the spring and early-summer (up until the end of July), it can be especially destructive because it can outright kill the chicks of nesting birds that are still in their nests, and are not big or old enough to fly away and survive. For example, during nesting season, when snags with nest cavities containing chicks of woodpeckers, bluebirds, or other cavity-nesting bird species are felled, the chicks are killed, either due to impact or starvation soon after logging. Similarly, chicks of shrub/ground-nesting birds, such as orange-crowned warblers, yellow warblers, chipping sparrows, wrentits, and mountain quail, are killed when logging occurs during nesting season, as the tractors, dozers, and feller-bunchers roll over, crush, and kill the chicks in their nests. This creates a highly amplified adverse impact because it involves not only the destruction and removal of post-fire snag forest habitat, but also direct mortality. The Forest Service is aware of this issue as its Conservation Strategy for black-backed woodpeckers states: "To avoid cutting down active nest trees . . . avoid harvest between May 1 and July 4 (though some outlier nests may already be active in late April and others may still be active throughout all of July) . . . ." And an earlier version of the Strategy further notes that this "management recommendation will protect dozens of other nesting bird species associated with burned forests in addition to the Black-backed Woodpecker." Similarly, post-fire habitat avian research in the Sierra Nevada, conducted by Point Blue Conservation Science (Campos and Burnett 2016, Campos et al. 2017), recommend the following: "Whenever possible restrict activities that depredate breeding bird nests and young to the non-breeding season (August–March)."

The scoping letter argues that "without specific management action, such as planting and seeding, native vegetation would be outcompeted by invasive plants," but this ignores that post-fire logging itself can greatly contribute to the introduction of invasive plants (e.g., McGinnis et al. 2010[40]). Likewise, while the scoping letter asserts that "trees not sold could be chipped for ground cover, lopped and scattered, piled and burned, or placed for erosion control," such action

[34] White, A.M., G.L. Tarbill, B. Wilkerson, and R. Siegel. 2019. Few detections of Black-backed Woodpeckers (Picoides arcticus) in extreme wildfires in the Sierra Nevada. Avian Conservation and Ecology 14:17
[3535] Hanson, C. 2015. Use of Higher Severity Fire Areas by Female Pacific Fishers on the Kern Plateau, Sierra Nevada, California, USA. Wildlife Society Bulletin, 39(3), 497-502
[36] Bond, ML, DE Lee, RB Siegel, and MW Tingley. 2013. Diet and home-range size of California spotted owls in a burned forest. Western Birds 44:114-126
[37] Hanson et al. 2018. Effects of post-fire logging on California spotted owl occupancy. Nature Conservation. 24. 93-105
[38] Lee, D. E. 2020. Spotted owls and forest fire: Reply. Ecosphere, 11(12)
[39] Lee DE, Bond ML. 2015. Occupancy of California spotted owl sites following a large fire in the Sierra Nevada. The Condor 117: 228–236
[40] McGinnis, T.W., J.E. Keeley, S.L. Stephens, and G.B. Roller. 2010. Fuel buildup and potential fire behavior after stand-replacing fires, logging fire-killed trees and herbicide shrub removal in Sierra Nevada forests. Forest Ecology and Management 260:22-35

can contribute to fuel introduction and thus contradicts a stated intent of the Project (Safford 2008; Bradley et al. 2006; Stephens and Moghaddas 2005[41]; McGinnis et al. 2010[42]).

Last, as described above, wildlife takes a particularly hard direct hit from salvage logging, but so too does the landscape due to the fact that salvage logging also leads to a loss of soil nutrients, chronic sedimentation and erosion, reduction in carbon storage, exotic species introduction, and reduced resilience and resistance of the landscapes to future disturbances.[43] Scientists have time and again made clear that post-fire logging causes severe damage to our ecosystems, including aquatic ecosystems.[44] Karr et al. 2004, pp.1029-1030 describes several ways that salvage logging delays or prevents natural recovery of aquatic ecosystems:

- Increased runoff and erosion alter river hydrology by increasing the frequency and magnitude of erosive high flows and raising sediment loads. These changes alter the character of river channels and harm aquatic species ranging from invertebrates to fishes (Waters 1995).
- Construction and reconstruction of roads and landings (sites to which trees are brought, stacked, and loaded onto trucks) often accompany postfire salvage logging. These activities damage soils, destroy or alter vegetation, and accelerate the runoff and erosion harmful to aquatic systems (figure 1).
- By altering the character and condition of forest vegetation, salvage logging after a fire changes forest fuels and can increase the severity of subsequent fires (CWWR 1996, Odion et al. 2004).
- Postfire salvage logging undermines the effectiveness of other costly postfire rehabilitation efforts, most of which are aimed at reducing soil erosion and runoff (Robichaud et al. 2000).
- Postfire salvage logging generally damages soils by compacting them, by removing vital organic material, and by increasing the amount and duration of topsoil erosion and runoff (Kattleman 1996), which in turn harms aquatic ecosystems. The potential for damage to soil and water resources is especially severe when ground-based machinery is used.
- Postfire salvage logging has numerous ecological ramifications. The removal of burned trees that provide shade may hamper tree regeneration, especially on high-elevation or dry sites (Perry et al. 1989). The loss of future soil organic matter is likely to translate into soils that are less able to hold moisture (Jenny 1980), with implications for soil biota, plant growth (Rose et al. 2001, Brown et al. 2003), and stream flow (Waring and Schlesinger 1985). Logging and associated roads carry a high risk of spreading nonindigenous, weedy species (CWWR 1996, Beschta et al. 2004).

Considerable evidence exists showing that salvage logging projects will not benefit the goal of reforestation, and instead will significantly harm the environment. For instance, impacting early successional N-fixers can "significantly affect a major pathway of nutrient replenishment in the

[41] Stephens, S.L. and J.J. Moghaddas. 2005. Silvicultural and reserve impacts on potential fire behavior and forest conservation: 25 years of experience from Sierra Nevada mixed conifer forests. Biological Conservation 25:369-379

[42] McGinnis, T.W., J.E. Keeley, S.L. Stephens, and G.B. Roller. 2010. Fuel buildup and potential fire behavior after stand-replacing fires, logging fire-killed trees and herbicide shrub removal in Sierra Nevada forests. Forest Ecology and Management 260:22-35

[43] See e.g. DellaSala and Hanson 2015, DellaSala et al 2017, Hutto and Gallo 2006, and Thompson et al 2007

[44] See e.g. Karr, J.R., J.J. Rhodes, G.W. Minshall, F.R. Hauer, R.L. Beschta, C.A. Frissel, and D.A. Perry. 2004. The effects of postfire salvage logging on aquatic ecosystems of the American west. Bioscience 54(11): 1029-1035

postfire environment" (Beschta et al., 2004[45]). By circumventing natural succession, important steps in forest development and recovery may not be met. Moreover, ground based logging systems such as skidders, fellerbunchers, whole-tree harvesters, and tractors are the most disruptive to recovering soils and should be avoided as operational machinery (Beschta et al., 1995[46]). Sexton 1998 found that in an Oregon ponderosa pine fire site, salvage logging impaired regeneration by negatively affecting microsite conditions. Logged sites were warmer, drier, and windier than unlogged sites. Donato et al. 2006 found that salvage logging reduced regeneration by 71% in Douglas fir forests of southern Oregon by disturbing soil and burying seedlings in logging debris. They wrote: "Our data show that postfire logging, by removing naturally seeded conifers and increasing surface fuel loads, can be counterproductive to goals of forest regeneration".

Regarding reburns, Fogg et al. 2016 notes that "large shrub fields that have burned multiple times by high severity fire supports a rich community of early seral birds and plants (Fontaine et al. 2009, Campos and Burnett 2015); a climate-adapted approach may be to allow these areas to remain chaparral while establishing forest cover in areas predicted to be forested under future climate scenarios." And in Oregon, Donato et al. 2006 found that salvage logging "significantly increased both fine and coarse downed woody fuel loads….In terms of short-term fire risk, a reburn in logged stands would likely exhibit elevated rates of fire spread, fireline intensity, and soil heating impacts….Therefore, the lowest fire risk strategy may be to leave dead trees standing as long as possible, allowing for aerial decay and slow, episodic input to surface fuel loads over decades."

Sincerely,

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[45] Beschta et al. 2004. Postfire Management on Forested Public Lands of the Western United States. Conservation Biology. 18. 957 - 967

[46] Beschta et al. 1995. Wildfire And Salvage Logging. Recommendations for Ecologically Sound Post-Fire Salvage Management and Other Post-Fire Treatments On Federal Lands in the West. Report, Pacific Rivers Council

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