Data Submitted (UTC 11): 6/16/2022 7:00:00 AM
First name: George
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Organization: KS Wild
Title:
Comments: Thank you for considering our scoping comments and literature attachments.
RE: Antelope and Tennant Salvage Timber Sale Proposal[ldquo]Salvage logging of large snags and down boles does not contribute to recovery of latesuccessionalforest habitat; in fact, the only activity more antithetical to the recovery processwould be removal of surviving green trees from burned sites. Large snags and logs of decayresistant species, such as Douglas-fir and cedars, are critical as early and late successionalwildlife habitat as well as for sustaining key ecological processes associated with nutrient,hydrologic, and energy cycles.[rdquo]-Dr. Jerry Franklin, 1/20/04.[ldquo]When wildfires do occur on federal lands they create an opportunity for development of highqualityearly successional ecosystems. Intensive salvage operations and associated sitepreparation and tree planting are not appropriate if a management goal is to utilize suchevents to provide for early successional ecosystems. Salvage and related activities can greatlyreduce the potential for full development of early successional ecosystems by removingimportant legacies, eliminating important constituent species, and abridging the duration ofearly successional development.[rdquo]-Dr. Jerry Franklin and Dr. Norm Johnson, 2/15/12.[ldquo]While the severity varied throughout the fire area, young timber plantations carried the firewhile older stands tended to be more resistant. This is mostly due to young timber plantationshaving a high density of ground fuels.[rdquo]-BLM Douglas Complex Fire 9/5/13 Burned Area Emergency Rehabilitation PlanDear Forest Service Planners,Thank you for the opportunity to provide scoping comments regarding the Antelope andTennant Salvage Logging Project. As the quotations above indicate, and as will bediscussed throughout these comments, post-fire salvage logging does not contribute tothe recovery of forest ecosystems. Rather, the significant impacts of commercial salvagelogging inhibit forest recovery and increase fire hazard. It is incontrovertible that a strongconsensus exists among fire ecologists that post-fire salvage logging harms and delaysforest recovery.The Antelope and Tennant Salvage Logging Project scoping letter indicates that thepurpose of the project is primarily to aid reforestation and reduce future fuel loading.Please note that salvage logging is antithetical to achievement of these two managementobjectives. In the body of our scoping comments (below) we will reference acceptedpeer-reviewed scientific publications establishing that post-fire salvage logging increasesfuel loading while decreasing conifer reestablishment of burned sites.We are extremely concerned that the Forest Service appears committed to conductingpost-fire salvage logging within the Late Successional Reserve land use allocation andwithin Northern spotted owl critical habitat. We sincerely hope the agency will take thisopportunity to achieve the project purpose and need by protecting, rather than degrading,this fragile post-fire landscape.Please note that we generally support the limited and responsible removal of hazard anddanger trees adjacent to forest roads that are designated as open in the Motor Vehicle UseMap. However, we oppose the exploitation of roadside logging as a means to re-open andlog along level one roads or as a timber grab to clearcut large continuous forest swaths.UTILIZE THE WKRP POST-FIRE RECOMMENDATIONSUnfortunately, the Klamath National Forest has often pursued an insular [ldquo]all or nothing[rdquo]approach to post-fire management that maximizes logging while largely ignoringconcerns regarding the impacts of salvage logging on wildlife, soils and watersheds.We urge the Forest Service to seriously engage with stakeholders and communities whocare about the future of this planning area. Please do not simply pursue a controversialsalvage logging agenda that emphasizes timber production. Please consider andimplement the recommendations contained in the attached Western Klamath RestorationPartnership document.TWELVE THOUSAND ACRES OF SALVAGE LOGGING NECESSITATES AN EISThe scope and scale of the proposed post-fire logging is massive and significant by anymeasure. Just as the Klamath National Forest documented the Westside salvage loggingproject in an Environmental Impact Statement (EIS) so must it conduct an EIS prior tologging thousands of acres across the Tennant and Antelope fire footprints.THE SIX SHOOTER AND HARLAN PROJECTS ARE SIGNIFICANTOur organizations were largely supportive of the proposed Six Shooter and Harlanprojects as initialy proposed by the KNF. That support appears to be misplaced. TheForest Service cannot legally rely upon prior analysis of green tree thinning projects tosupport post-fire clearcutting and plantation establishment that may increase fire hazardand inhibit natural conifer regeneration.

The physical circumstances in these two projectareas have dramatically changed and the impacts of post-fire logging were not analyzedor contemplated during the Six Shooter and Harlan planning processes. Had Six Shooterand Harlan initially consisted of post-fire salvage logging proposals our comments onthose projects would have looked very different and our organizations would have filedobjections to the decision documents.LOGGING WITHOUT A DECISION, A PUBLIC PROCESS, OR ANY ANALYSISThe Klamath National Forests practice of conducting extensive roadside post-fire loggingwith taxpayer fire money via the Incident Management Team breaks trust and preventstransparency with the public. The extensive secret roadside logging in this project areawas not supported by any environmental analysis or public process and was not evenauthorized by a Forest Service decision document. Secret logging unsupported byplanning, process or a decision is a violation of both NEPA and NFMA. The secretlogging also involves significant impacts that necessitate completion of an EIS for thisproject.SCIENCE INDICATES THAT SALVAGE LOGGING INVOLVES SIGNIFICANTENVIRONMENTAL IMPACTS SUCH THAT AN EIS MUST BE PREPAREDThe agency should be aware of and incorporate the findings contained in the followingdocuments that address common assumptions often relied upon by Forest Service timberplanners in their analysis of fire ecology and post-fire logging.Attachment 1 is a peer-reviewed study by Donato et al. entitled Post-WildfireLogging Hinders Regeneration and Increases Fire Risk published in Sciencexpress,January 5, 2006.The paper concludes:Our data show that postfire logging, by removing naturally seeded conifers and increasingsurface fuel loads, can be counterproductive to goals of forest regeneration and fuel reduction.In addition, forest regeneration is not necessarily in crises across all burned forest landscapes.The results presented here suggest that postfire logging may conflict with ecosystem recoverygoals.Attachment 2 is a peer-reviewed study conducted by Odion et al. entitled FireSeverity in Conifer Forests in the Sierra Nevada, California published inEcosystems, 2006, 9, 1177-1189.The abstract states:Natural disturbances are an important source of environmental heterogeneity that have beenlinked to species diversity in ecosystems. However, spatial and temporal patterns ofdisturbances are often evaluated separately. Consequently, rates and scales of existingdisturbance processes and their effects on biodiversity are often uncertain. We have studiedboth spatial and temporal patterns of contemporary fires in the Sierra Nevada Mountains,California, USA. Patterns of fire severity were analyzed for conifer forests in the three largestfires since 1999. These fires account for most cumulative area that has burned in recent years.They burned relatively remote areas where there was little timber management. To bettercharacterize high-severity fire, we analyzed its effect on the survival of pines. We evaluatedtemporal patterns of fire since 1950 in the larger landscapes in which the three fires occurred.Finally, we evaluated the utility of a metric for the effects of fire suppression. Known asCondition Class it is now being used throughout the United States to predict where fire will beuncharacteristically severe. Contrary to the assumptions of fire management, we found thathigh-severity fire was uncommon. Moreover, pines were remarkably tolerant of it. Thewildfires helped to restore landscape structure and heterogeneity, as well as producing fireeffects associated with natural diversity. However, even with large recent fires, rates of burningare relatively low due to modern fire management. Condition Class was not able to predictpatterns of high-severity fire. Our findings underscore the need to conduct more comprehensiveassessments of existing disturbance regimes and to determine whether natural disturbances areoccurring at rates and scales compatible with the maintenance of biodiversity.Attachment 3 is a peer-reviewed study conducted by Beschta et al. entitled PostfireManagement on Forested Public Land of the Western United States published inConservation Biology, Volume 18, No. 4 August 2004 pages 957-967.The abstract states:Forest ecosystems in the western United States evolved over many millennia in response todisturbances such as wildfires. Land use and management practices have altered theseecosystems, however, including fire regimes in some areas. Forest ecosystems are especiallyvulnerable to postfire management practices because such practices may influence forestdynamics and aquatic systems for decades to centuries. Thus, there is an increasing need toevaluate the effect of postfire treatments from the perspective of ecosystem recovery. Weexamined, via the published literature and our collective experience, the ecological effects ofsome common postfire treatments. Based on this examination, promising postfire restorationmeasures include retention of large trees, rehabilitation of firelines and roads, and, in somecases, planting of native species. The following practices are generally inconsistent with effortsto restore ecosystem functions after fire: seeding exotic species, livestock grazing, placement ofphysical structures in and near stream channels, ground-based postfire logging, removal oflarge trees, and road construction. Practices that adversely affect soil integrity, persistence orrecovery of native species, riparian functions, or water quality generally impede ecologicalrecovery after fire. Although research provides a basis for evaluating the efficacy of postfiretreatments, there is a continuing need to increase our understanding of the effects of suchtreatments within the context of societal and ecological goals for forested public lands of thewestern United States.Attachment 4 is a peer-reviewed study by researchers from the Corvallis ForestrySciences Lab who found that mixed-conifer and mixed evergreen-hardwood forests thatwere salvage logged (and planted) following the 1987 Silver Fire in the SiskiyouNational Forest experienced higher severity re-burn in the 2002 Biscuit Fire than didstands in the Silver Fire (subsequently burned in the Biscuit Fire) that were not subject tosalvage logging and artificial plantation establishment. Thompson, JR, TA Spies, LMGanio, 2007. Reburn Severity in Managed and Unmanged Vegetation in a LargeWildfire. Proceedings of the National Academy of Sciences. The abstract states:Debate over the influence of post wildfire management on future fire severity is occurring inthe absence of empirical studies. We used satellite data, government agency records, and aerialphotography to examine a forest landscape in southwest Oregon that burned in 1987 and thenwas subject, in part, to salvage-logging and conifer planting before it reburned during the 2002Biscuit Fire. Areas that burned severely in 1987 tended to reburn at high severity in 2002, aftercontrolling for the influence of several topographical and biophysical covariates. Areasunaffected by the initial fire tended to burn at the lowest severities in 2002. Areas that weresalvage-logged and planted after the initial fire burned more severely than comparableunmanaged areas, suggesting that fuel conditions in conifer plantations can increase fireseverity despite removal of large woody fuels.Attachment 5 is Hutto, R.L. 1995. Composition of bird communities followingstand-replacement fires in northern Rocky Mountain (U.S.A.) conifer forests.Conservation Biology 9: 1041-1058.The abstract states:During the two breeding seasons immediately following the numerous and widespread fires of1988, I estimated bird community composition in each of 34 burned-forest sites in westernMontana and northern Wyoming. I detected an average of 45 species per site and a total of 87species in the sites combined. A compilation of these data with bird-count data from more than200 additional studies conducted across 15 major vegetation cover types in the northern RockyMountain region showed that 15 bird species are generally more abundant in early post-firecommunities than in any other major cover type occurring in the northern Rockies. One birdspecies (Black-backed Woodpecker, Picoides arcticus) seems to be nearly restricted in itshabitat distribution to standing dead forests created by stand-replacement fires. Birdcommunities in recently burned forests are different in composition from those that characterizeother Rocky Mountain cover types (including early-successional clearcuts) primarily becausemembers of three feeding guilds are especially abundant therein: woodpeckers, flycatchers, andseedeaters. Standing, fire-killed trees provided nest sites for nearly two-thirds of 31 species thatwere found nesting in the burned sites. Broken-top snags and standing dead aspens were usedas nest sites for cavity-nesting species significantly more often than expected on the basis oftheir relative abundance. Moreover, because nearly all of the broken-top snags that were usedwere present before the fire, forest conditions prior to a fire (especially the presence of snags)may be important in determining the suitability of a site to cavity-nesting birds after a fire. Forbird species that were relatively abundant in or relatively restricted to burned forests, standreplacementfires may be necessary for long-term maintenance of their populations.Unfortunately, the current fire policy of public land-management agencies does not encouragemaintenance of stand-replacement fire regimes, which may be necessary for the creation ofconditions needed by the most fire-dependent bird species. In addition, salvage cutting mayreduce the suitability of burned-forest habitat for birds by removing the most importantelement--standing, fire-killed trees-needed for feeding, nesting, or both by the majority of birdspecies that used burned forest.Attachment 6 is Hutto, R.L. 2006. Toward meaningful snag-management guidelinesfor postfire salvage logging in North American conifer forests. Conservation Biology20: 984-993.The abstracts states:The bird species in western North America that are most restricted to, and therefore mostdependent on, severely burned conifer forests during the first years following a fire eventdepend heavily on the abundant standing snags for perch sites, nest sites, and food resources.Thus, it is critical to develop and apply appropriate snag-management guidelines to implementpostfire timber harvest operations in the same locations. Unfortunately, existing guidelinesdesigned for green-tree forests cannot be applied to postfire salvage sales because the snagneeds of snag-dependent species in burned forests are not at all similar to the snag needs ofsnag-dependent species in green-tree forests. Birds in burned forests have very different snagretentionneeds from those cavity-nesting bird species that have served as the focus for thedevelopment of existing snag-management guidelines. Specifically, many postfire specialistsuse standing dead trees not only for nesting purposes but for feeding purposes as well.Woodpeckers, in particular, specialize on wood-boring beetle larvae that are superabundant infire-killed trees for several years following severe fire. Species such as the Black-backedWoodpecker (Picoides arcticus) are nearly restricted in their habitat distribution to severelyburned forests. Moreover, existing postfire salvage-logging studies reveal that most postfirespecialist species are completely absent from burned forests that have been (even partially)salvage logged. I call for the long-overdue development and use of more meaningful snagretentionguidelines for postfire specialists, and I note that the biology of the most firedependentbird species suggests that even a cursory attempt to meet their snag needs wouldpreclude postfire salvage logging in those severely burned conifer forests wherein themaintenance of biological diversity is deemed important.Attachment 7 is Kotliar, N.B., S.J. Hejl, R.L. Hutto, V. Saab, C.P. Melcher, andM.E. McFadzen. 2002. Effects of fire and post-fire salvage logging on aviancommunities in conifer-dominated forests of the western United States. In: George, T.L.and D.S. Dobkin. Effects of habitat fragmentation on birds in western landscapes:contrasts with paradigms from the eastern United States. Studies in Avian Biology No.25. Camarillo, CA: Cooper Ornithological Society. p. 49-64.The abstract states:Historically, fire was one of the most widespread natural disturbances in the western UnitedStates. More recently, however, significant anthropogenic activities, especially fire suppressionand silvicultural practices, have altered fire regimes; as a result, landscapes and associatedcommunities have changed as well. Herein, we review current knowledge of how fire and postfiresalvaging practices affect avian communities in (1) burned vs. unburned forests, and (2)unsalvaged vs. salvage-logged burns. We also examine how variation in burn characteristics(e.g. severity, age, size) and salvage logging can alter avian communities in burns.Of the 41 avian species observed in three or more studies comparing early post-fire andadjacent unburned forests, 22% are consistently more abundant in burned forests, 34% areusually more abundant in unburned forests, and 44% are equally abundant in burned andunburned forests or have varied responses. In general, woodpeckers and aerial foragers aremore abundant in burned forests, whereas most foliage-gleaning species are more abundant inunburned forests. Bird species that are frequently observed in stand-replacement burns are lesscommon in understory burns; similarly, species commonly observed in unburned forests oftendecrease in abundance with increasing burn severity. Granivores and species common in opencanopy forests exhibit less consistency among studies. For all species, responses to fire may beinfluenced by a number of factors including burn severity, fire size and shape, proximity tounburned forests, pre- and post- fire cover types, and time since fire. In addition, post-firemanagement can alter species[rsquo] responses to burns. Most cavity-nesting species do not useseverely salvaged burns, whereas some cavity-nesters persist in partially salvaged burns. Earlypost-fire specialists, in particular, appear to prefer unsalvaged burns. We discuss severalalternatives to severe salvage-logging that will help provide habitat for cavity nesters.Attachment 8 is Kotliar et al. 2002. Fire on the Mountain: Birds and Burns in theRocky Mountains. USDA Forest Service Gen. Tech. Rep. PSW-GTR-191. 2005. Aversion of this paper was presented at the Third International Partners in FlightConference, March 20-24, 2002, Asilomar Conference Grounds, California.No abstract is available for this paper.Attachment 9 is an October 6, 2006 letter that appeared in Science volume 314 froma number of scientists concluding that:The effects of post-disturbance logging require careful consideration of whether to log at all,and if so, how to conduct such logging to minimize negative consequences. If we must conductpost-disturbance logging for timber production, stringent ecological safeguards must be in placeto minimize impacts to terrestrial and aquatic ecosystems. When viewed through an ecologicallens, a recently disturbed landscape is not just a collection of dead trees, but a unique andbiologically rich environment that also contains many of the building blocks for the rich forestthat will follow the disturbance.Attachment 10 is Smucker et al., 2005. Changes in Bird Abundance After Wildfire:Importance of Fire Severity and Time Since Fire. Ecological Applications, 15(5),2005, pp. 1535[ndash]1549 q 2005 by the Ecological Society of America.The abstract states:Fire can cause profound changes in the composition and abundance of plant and animal species,but logistics, unpredictability of weather, and inherent danger make it nearly impossible tostudy high-severity fire effects experimentally. We took advantage of a unique opportunity touse a before[ndash]after/control[ndash]impact (BACI) approach to analyze changes in bird assemblagesafter the severe fires of 2000 in the Bitterroot Valley, Montana. Observers surveyed birds using10-minute point counts and collected vegetation data from 13 burned and 13 unburned transectsfor five years before fire and three years after fire. We compared changes in vegetationvariables and relative bird abundance from before to after fire between the set of points thatburned and the set of points that did not burn. The magnitude of change in vegetation variablesfrom before to after fire increased with fire severity. The relative abundances of nine birdspecies showed significantly greater changes from before to after fire at burned pointscompared with unburned points. Moreover, when burned points were separated by whether theyburned at low, moderate, or high severity, an additional 10 species showed significant changesin relative abundance from before to after fire at one or more severities. Overall, almost twiceas many bird species increased as decreased significantly in response to fire. We also foundchanges in abundance between one year after and two years after fire for most species thatresponded to fire. Thus, species that have been termed [lsquo][lsquo]mixed responders[rsquo][rsquo] in the literatureappear to be responding differently to different fire severities or different time periods sincefire, rather than responding variably to the same fire conditions. These findings underscore theimportance of fire severity and time since fire and imply that both factors must be considered tounderstand the complexities of fire effects on biological communities. Because different birdspecies responded positively to different fire severities, our results suggest a need to managepublic lands for the maintenance of all kinds of fires, not just the low-severity, understory burnsthat dominate most discussions revolving around the use of fire in forest restoration.Attachment 11 is Kotliar et al, 2007. Avifaunal Responses To Fire in SouthwesternMontane Forests Along a Burn Severity Gradient. Ecological Applications, 17(2),2007, pp. 491[ndash]507 by the Ecological Society of AmericaThe abstract states:The effects of burn severity on avian communities are poorly understood, yet this informationis crucial to fire management programs. To quantify avian response patterns along a burnseverity gradient, we sampled 49 random plots (2001[ndash]2002) at the 17 351-ha Cerro Grande Fire(2000) in New Mexico, USA. Additionally, pre-fire avian surveys (1986[ndash] 1988, 1990) created aunique opportunity to quantify avifaunal changes in 13 pre-fire transects (resampled in 2002)and to compare two designs for analyzing the effects of unplanned disturbances: after-onlyanalysis and before[ndash]after comparisons. Distance analysis was used to calculate densities. Weanalyzed after-only densities for 21 species using gradient analysis, which detected a broadrange of responses to increasing burn severity: (I) large significant declines, (II) weak, butsignificant declines, (III) no significant density changes, (IV) peak densities in low- ormoderate-severity patches, (V) weak, but significant increases, and (VI) large significantincreases. Overall, 71% of the species included in the after-only gradient analysis exhibitedeither positive or neutral density responses to fire effects across all or portions of the severitygradient (responses III[ndash]VI). We used pre/post pairs analysis to quantify density changes for 15species using before[ndash]after comparisons; spatiotemporal variation in densities was large andconfounded fire effects for most species. Only four species demonstrated significant effects ofburn severity, and their densities were all higher in burned compared to unburned forests. Preandpost-fire community similarity was high except in high-severity areas. Species richness wassimilar pre- and post-fire across all burn severities. Thus, ecosystem restoration programs basedon the assumption that recent severe fires in Southwestern ponderosa pine forests haveoverriding negative ecological effects are not supported by our study of post-fire aviancommunities. This study illustrates the importance of quantifying burn severity and controllingconfounding sources of spatiotemporal variation in studies of fire effects. After-only gradientanalysis can be an efficient tool for quantifying fire effects. This analysis can also augmenthistorical data sets that have small samples sizes coupled with high non-process variation,which limits the power of before[ndash]after comparisons.Attachment 12 is a peer-reviewed paper entitled [ldquo]Salvage Logging, EcosystemProcess, and Biodiversity Conservation[rdquo] by Lindenmayer and Noss that appeared inConservation Biology Volume 20, No. 4, 949[ndash]958. 2006.The abstract for this paper states:We summarize the documented and potential impacts of salvage logging[mdash]a form of loggingthat removes trees and other biological material from sites after natural disturbance. Suchoperations may reduce or eliminate biological legacies, modify rare postdisturbance habitats,influence populations, alter community composition, impair natural vegetation recovery,facilitate the colonization of invasive species, alter soil properties and nutrient levels, increaseerosion, modify hydrological regimes and aquatic ecosystems, and alter patterns of landscapeheterogeneity. These impacts can be assigned to three broad and interrelated effects: (1) alteredstand structural complexity; (2) altered ecosystem processes and functions; and (3) alteredpopulations of species and community composition. Some impacts may be different from oradditional to the effects of traditional logging that is not preceded by a large natural disturbancebecause the conditions before, during, and after salvage logging may differ from those thatcharacterize traditional timber harvesting. The potential impacts of salvage logging often havebeen overlooked, partly because the processes of ecosystem recovery after natural disturbanceare still poorly understood and partly because potential cumulative effects of natural and humandisturbance have not been well documented. Ecologically informed policies regarding salvagelogging are needed prior to major natural disturbances so that when they occur ad hoc andcrisis-mode decision making can be avoided. These policies should lead to salvage-exemptionzones and limits on the amounts of disturbance-derived biological legacies (e.g., burned trees,logs) that are removed where salvage logging takes place. Finally, we believe new terminologyis needed. The word salvage implies that something is being saved or recovered, whereas froman ecological perspective this is rarely the case.Attachment 13 consists of an April 2006 open letter to Congress from an extremelylong and impressive list of scientists contending that:[N]o substantive evidence supports the idea that fire-adapted forests might be improved bylogging after a fire. In fact, many carefully conducted studies have concluded just the opposite.Most plants and animals in these forests are adapted to periodic fires and other naturaldisturbances. They have a remarkable way of recovering[frac34]literally rising from theashes[frac34]because they have evolved with and even depend upon fire.Attachment 14 is a February 24, 2006 peer-reviewed paper presented to the Societyfor Conservation Biology by Reed Noss, Jerry Franklin and William Baker entitled[ldquo]Ecology and Management of Fire-prone Forests of the Western United States.[rdquo]Key Findings of this paper include the following:[bull] Research by both ecologists and foresters provides evidence that areas affected bylarge-scale natural disturbances often recover naturally.[bull] Post-fire logging does not contribute to ecological recovery; rather it negativelyimpacts recovery processes, with the intensity of such impacts depending uponthe nature of the logging activity.[bull] Post-fire logging destroys much of whatever natural tree regeneration is occurringon a burned site.[bull] Evidence from empirical studies is that post-fire logging typically generatessignificant short- to mid-term increases in fine and medium fuels.[bull] There is no scientific or operational linkage between reforestation and post-firelogging; potential ecological impacts of reforestation are varied and may be eitherpositive or negative depending upon the specifics of activity, site conditions, andmanagement objectives. On the other hand, ecological impacts of post-fir loggingappear to be consistently negative.Attachment 15 is a peer-reviewed study by that appeared in November 2004 / Vol.54No.11 issue of BioScience entitled [ldquo]The Effects of Postfire Salvage Logging onAquatic Ecosystems in the American West[rdquo] by Karr et al.The authors found that:[bull] Postfire salvage logging generally damages soils by compacting them, by removingvital organic material, and by increasing the amount and duration of topsoil erosion andrunoff (Kattleman 1996), which in turn harms aquatic ecosystems.[bull] Postfire salvage logging has numerous ecological ramifications. The removal of burnedtrees that provide shade may hamper tree regeneration, especially on high-elevation ordry sites (Perry et al.1989). The loss of future soil organic matter is likely to translate intosoils 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 andSchlesinger 1985). Logging and associated roads carry a high risk of spreadingnonindigenous, weedy species (CWWR 1996, Beschta et al. 2004).[bull] Increased runoff and erosion alter river hydrology by increasing the frequency andmagnitude of erosive high flows and raising sediment loads. These changes alter thecharacter of river channels and harm aquatic species ranging from invertebrates to fishes(Waters 1995).[bull] Construction and reconstruction of landings (sites to which trees are brought, stacked,and loaded onto trucks) often accompany postfire salvage logging. These activitiesdamage soils, destroy or alter vegetation, and accelerate the runoff and erosion harmful toaquatic systems.[bull] By altering the character and condition of forest vegetation, salvage logging after a firechanges forest fuels and can increase the severity of subsequent fires (CWWR 1996,Odion et al. 2004).Attachment 16 consists of a September 2006 post-disturbance literature review byDr. Dominick A. DellaSala, Ph.D. for the National Center for Conservation Science& Policy.The executive summary for the review states:Post-disturbance recovery, much like fire itself, has been the subject of intense debate andwidespread misunderstanding regarding how and whether to treat regenerating landscapesfollowing large disturbance events. As HR4200 [ndash] the Forest Emergency Recovery andResearch Act [ndash] heads to the Senate for debate, it is important that lawmakers and landmanagers consider the latest science in making informed decisions about the management ofpublic lands following natural disturbances. Numerous scientific studies have demonstrated thatnatural disturbances, even very large ones such as volcanic eruptions, wildfires, and severewind storms, are critical to the health of terrestrial and aquatic ecosystems as they arecharacterized by unique biological communities and generate important structural elements thatforests depend on for decades to centuries. The standing dead, dying, and downed trees(especially large ones) and surviving green and scorched ones transfer their critical functionsfrom the predisturbed forest to the regenerating one. When post-disturbance [ldquo]salvage logging[rdquo]removes these important forest elements, it sets back recovery triggering ecosystem damagesthat may exceed the impact of the initial disturbance itself. Based on a review ofapproximately 38 scientific studies on post-fire logging and additional government reportspublished to date, not a single study indicated that logging benefits ecosystemsregenerating after natural disturbance. In fact, post-fire logging impedes regeneration whenit compacts soils, removes [ldquo]biological legacies[rdquo] (e.g., large dead standing and downed trees),introduces or spreads invasive species, causes soil erosion when logs are dragged across steepslopes, and delivers sediment to streams from logging roads. With post-disturbance loggingthese impacts occur when forest recovery is most vulnerable to the effects of additional,especially anthropogenic disturbances, creating cumulative effects that exceed logging ofundisturbed forests. Such effects can extend for a century or more, because of the removal oflong-persisting and functioning wood legacies. These findings are especially relevant to publiclands policy and management as postdisturbance logging currently generates ~40 percent of thetimber volume on Forest Service lands nation-wide (USFS Washington Office, timber volumespread sheets - Timber Management Staff, 2005 statistics). Therefore, the followingconclusions were provided to assist decision makers regarding post-disturbance managementdecisions: (1) post-disturbance landscapes should be allowed to regenerate naturally asevidence from several locations (Biscuit fire (sw Oregon), Storrie and Starr fires (CaliforniaSierra[rsquo]s), Yellowstone 1988 fires, Mt. St. Helens eruption, New England hurricanes and insectinfestations) indicates recovery can be surprisingly swift and many species that colonizedisturbed areas are adapted to them, contributing to recovery in unique ways; (2) road building(even temporary roads) damages regenerative processes in terrestrial and aquatic ecosystemsand should be avoided; (3) natural disturbances are characterized by unique biological legacies(large dead and dying trees) essential to regenerative processes [ndash] recovery is not possible intheir absence; and (4) if salvage logging is to take place for economic reasons, large treesshould be retained to protect their biological legacy functions and [ldquo]no harvest zones[rdquo]established on steep slopes with fragile soils, including areas of conservation and public healthconcern such as late-successional and old-growth forests, riparian areas, aquatic watershedsessential to drinking water municipalities, and roadless areas.Attachment 17a consists of Darren Clark[rsquo]s 2007 Master[rsquo]s Thesis in Wildlife Scienceentitled [ldquo]Demography and Habitat Selection of Northern Spotted Owls in Post-FireLandscapes of Southwestern Oregon.[rdquo]This 2007 study found that:Nesting, roosting and foraging habitat with low, moderate, or high severity burn was selected[as habitat] by spotted owls in post-fire landscapes. Furthermore, roosting and foraging habitatwith a moderate severity burn was also selected. These habitats were used in a similar mannerto early seral forests including: roosting and foraging habitat with low or high severity burn andsalvage logged areas. Non-habitat was the only habitat that was avoided.Attachment 17b is a 2013 published paper in the Journal of Wildlife Management.Relationship Between Wildfire, Salvage Logging, and Occupancy of NestingTerritories by Northern Spotted Owls Darren A. Clark, Robert G. Anthony andLawrence S. Andrews.Furthermore, Timbered Rock had a 64% reduction in site occupancy following wildfire (2003[ndash]2006) in contrast to a 25% reduction in site occupancy at South Cascades during the same timeperiod. This suggested that the combined effects of habitat disturbances due to wildfire andsubsequent salvage logging on private lands negatively affected site occupancy by spottedowls. In our second analysis, we investigated the relationship between wildfire, salvagelogging, and occupancy of spotted owl territories at the Biscuit, Quartz, and Timbered Rockburns from 2003 to 2006. Extinction probabilities increased as the combined area of early seralforests, high severity burn, and salvage logging increased within the core nesting areas (^b [frac14]1:88, 95% CI [frac14] 0.10[ndash]3.66). We were unable to identify any relationships between initialoccupancy or colonization probabilities and the habitat covariates that we considered in ouranalysis where the b coefficient did not overlap zero. We concluded that site occupancy ofspotted owl nesting territories declined in the short term following wildfire, and habitatmodification and loss due to past timber harvest, high severity fire, and salvage logging jointlycontributed to declines in site occupancy.Attachment 18 is a study that was published in the Wildlife Society Bulletin in 2002entitled [ldquo]Short-term effects of wildfires on spotted owl survival, site fidelity, matefidelity, and reproductive success[rdquo] by Bond et al.The abstract for this study states:The effects of wildfire on wildlife are important considerations for resource managers becauseof recent interest in the role of fire in shaping forested landscapes in the western United States.This is particularly true of wildfire effects on spotted owls because of the uncertainty ofimpacts of controlled burning within spotted owl habitat. Therefore, we documented minimumsurvival, site fidelity, mate fidelity, and reproductive success for 21 spotted owls after large(>540 ha) wildfires occurred within 11 owl territories in California, Arizona, and New Mexico.In each territory, fire burned through the nest and primary roost sites. Eighteen owls (86%)were known to be alive at least 1 year after the fires, which was similar to reported annual adultsurvival probabilities for the species. Of 7 pairs, of which both members were later resighted,all were located together on the same territories during the breeding season following fires, and4 pairs produced a total of 7 fledglings. No pair separations were observed after fire. On 8territories where fire severities were mapped, 50% experienced predominately low-tomoderate- severity fires while 50% experienced high-severity fires that burned large (>30%)area of the territories. We hypothesize that wildfires may have little short-term impact onsurvival, site fidelity, mate fidelity, and reproductive success of spotted owls.Attachment 19 consists of several news articles about the significant scientificcontroversy surrounding post-fire management. We incorporate these documentsinto our comments and into the administrative record for the Antelope and TennantFire Salvage Logging Project. The included documents are:[bull] In Fire's Wake, Logging Study Inflames Debate; University Study ChallengesCutting of Burnt Timber, The Washington Post, February 27, 2006, p.A3.[bull] In Bed With Big Wood, Willamette Week, April 19, 2006.[bull] Logging and Fire Debate Grows, Corvallis Gazette-Times, February 25, 2006[bull] Wildfire Logging Debate Heats Up, The Scientist, January 27, 2006.[bull] Logging Study Sets Off Own Firestorm, The Oregonian, January 20, 2006.[bull] A Student's Forest Paper Sparks One Hot Debate, L.A. Times, June 11, 2006.Attachment 20 is a 2009 peer-reviewed article by Bond et al. that appeared in TheJournal of Wildlife Management entitled [ldquo]Habitat Use and Selection by CaliforniaSpotted Owls in a Postfire Landscape.[rdquo]The abstract for this article states:Forest fire is often considered a primary threat to California spotted owls (Strix occidentalisoccidentalis) because fire has the potential to rapidly alter owl habitat. We examined effects offire on 7 radiomarked California spotted owls from 4 territories by quantifying use of habitatfor nesting, roosting, and foraging according to severity of burn in and near a 610-km2 fire inthe southern Sierra Nevada, California, USA, 4 years after fire. Three nests were located inmixed-conifer forests, 2 in areas of moderate-severity burn, and one in an area of low- severityburn, and one nest was located in an unburned area of mixed-conifer[ndash]hardwood forest. Forroosting during the breeding season, spotted owls selected low-severity burned forest andavoided moderate- and high-severity burned areas; unburned forest was used in proportion withavailability. Within 1 km of the center of their foraging areas, spotted owls selected allseverities of burned forest and avoided unburned forest. Beyond 1.5 km, there were nodiscernable differences in use patterns among burn severities. Most owls foraged in highseverityburned forest more than in all other burn categories; high-severity burned forests hadgreater basal area of snags and higher shrub and herbaceous cover, parameters thought to beassociated with increased abundance or accessibility of prey. We recommend that burnedforests within 1.5 km of nests or roosts of California spotted owls not be salvage-logged untillong-term effects of fire on spotted owls and their prey are understood more fully.-JOURNAL OF WILDLIFE MANAGEMENT 73(7):1116[ndash]1124; 2009.Attachment 21 consists of a peer-reviewed study by Saab et al. that appeared inForest Ecology and Management (2009) entitled [ldquo]Nest-site selection by cavitynestingbirds in relation to salvage logging.[rdquo]The abstract reads as follows:Large wildfire events in coniferous forests of the western United States are often followed bypostfire timber harvest. The long-term impacts of postfire timber harvest on fire-associatedcavity-nesting bird species are not well documented. We studied nest-site selection by cavitynestingbirds over a 10-year period (1994[ndash]2003), representing 1[ndash]11 years after fire, on twoburns created by mixed severity wildfires in western Idaho, USA. One burn was partiallysalvaged logged (the Foothills burn), the other was primarily unlogged (the Star Gulch burn).We monitored 1367 nests of six species (Lewis[rsquo]s Woodpecker Melanerpes lewis, HairyWoodpecker Picoides villosus, Black-backed Woodpecker P. arcticus, Northern FlickerColaptes auratus, Western Bluebird Sialia mexicana, and Mountain Bluebird S. currucoides).Habitat data at nest and non-nest random locations were characterized at fine (field collected)and coarse (remotely sensed) spatial scales. Nest-site selection for most species wasconsistently associated with higher snag densities and larger snag diameters, whereas wildfirelocation (Foothills versus Star Gulch) was secondarily important. All woodpecker species usednest sites with larger diameter snags that were surrounded by higher densities of snags than atnon-nest locations. Nests of Hairy Woodpecker and Mountain Bluebird were primarilyassociated with the unlogged wildfire, whereas nests of Lewis[rsquo]s Woodpecker and WesternBluebird were associated with the partially logged burn in the early years after fire. Nests ofwood-probing species (Hairy and Black-backed Woodpeckers) were also located in largerforest patch areas than patches measured at non-nest locations. Our results confirm previousfindings that maintaining clumps of large snags in postfire landscapes is necessary formaintaining breeding habitat of cavity-nesting birds. Additionally, appropriately managedsalvage logging can create habitat for some species of cavity-nesting birds that prefer moreopen environments. Our findings can be used by land managers to develop design criteria forpostfire salvage logging that will reserve breeding habitat for cavity-nesting birds.NEW PLANTATIONS INCREASE FIRE HAZARD[ldquo]Plantations are extremely flammable because of high crown to trunk ratio and because crownsare very close to the ground.[rdquo]-Upper South Fork Trinity River Happy Camp Creek Watershed Analysis, Shasta-TrinityNational Forest at page 21.Our organizations are extremely concerned that the proposed establishment of artificialplantations may increase future fire hazard in the planning area. The practice of plantingyoung tree plantations significantly increases fire hazard in the mid- to long-term. Treeplantations are more susceptible to intense fire behavior and severe fire effects thanunlogged mature forests, including burned forests (DellaSala et al. 1995, Odion et al.2004). The increased susceptibility of plantations to severe fire is due to:[bull] Structural characteristics, such as fine and interlocking branch structures situatedlow to the ground, which facilitate high heat energy output by fire and rapid fire spread(Sapsis and Brandow 1997).[bull] Warm, windy and dry microclimates compared to what would exist in anunlogged burned forest that possessed more structural diversity, ground shading andbarriers to lateral wind movement (Countryman 1955, van Wagtendonk 1996).[bull] Accumulations of large volumes of fine logging slash on the ground surface(Weatherspoon and Skinner 1995).In addition to these direct and indirect effects on the fire environment, the cumulativeeffects of plantation establishment include the creation of more highly flammable evenagedstands on a landscape already vulnerable to uncharacteristically large and severefires. The number and distribution of even-age tree plantations resulting from industrialtimber management has altered fire behavior and effects at both stand and landscapescales. (Frost and Sweeny 2000, Hann et al. 1997, Huff et al. 1995). Perry (1995)suggests that the existence of sufficient young tree patches on a forest landscape createsthe potential for [ldquo]a self-reinforcing cycle of catastrophic fires.[rdquo] Most plantations occurnear roads (DellaSala and Frost 2001), which presents an added risk of human-causedignitions during hot and dry conditions (USDA 2000).Please note that the BLM BEAR Report for the Douglas Fire acknowledged that [ldquo]whilethe [fire] severity varied throughout the fire area, young timber plantations carried the firewhile older stands tended to be more resistant. This is mostly due to young timberplantations having a high density of ground fuels.[rdquo] These findings are directly applicableto the Antelope and Tennant planning area.In summary, post-fire logging to facilitate plantation establishment will reinforce agrowing tendency toward high severity fire at a landscape scale. Please address peer16reviewed findings indicating that post-fire logging and plantation establishmentirreversibly hinder the natural low- and mixed-severity fire regime.FIRE AND FUELSThe Forest Service must use the best available science regarding the effects of fire or theproposed logging on fire and fuels, and document those conclusions in an EIS.Salvage logging would increase fire hazardIn the project area, where post-fire fuel loading is currently low, logging without timelyslash treatment is likely to be the single most important factor that will contribute to anincrease in potential wildfire severity (Weatherspoon 1996).There is no scientific, empirical evidence to prove that the presence of large-diameterstanding or downed fuels translates into high fire hazard. Besechta et al. (1995) stated,"We are aware of no evidence supporting the contention that leaving large dead woodymaterial significantly increases the probability of reburn" (p. 11).The Besechta Report prompted responses by agency scientists. These included Everett(1995): "There is no support in the scientific literature that the probability of reburn isgreater in post-fire tree retention areas than in salvage logged sites[hellip]The authors arecorrect that the intense reburn concept is not reported in the literature" (p. 4).The Forest Service's Pacific Northwest Research Station reviewed the scientific literatureand concurred that, "Following Besechta and others (1995) and Everett (1995), we foundno studies documenting a reduction in fire intensity in a stand that had previously burnedand then been logged" (McIver and Starr 2000).Small diameter surface fuels are the primary carriers of fire. Current fire spread modelssuch as the BEHAVE program do not consider fuels greater than three inches (3") indiameter because the fine sized surface fuels allow fires to spread. Commercial loggingoperations often remove large diameter fuels, which have higher surface area to volume(S/V) ratios that inhibit combustion. Moreover, logging leaves behind increased fireproneslash and other small diameter fuels. Indeed, it is highly likely that a significantamount small diameter material will be the outcome of your salvage logging proposal.Logging would create an immediate source of highly flammable fuel. The forthcomingNEPA document must disclose how many tons of slash would remain per acre and howits presence might influence the multitude of lightning strikes that occur in the watershedregularly.This issue is highly significant because other federal land agencies have acknowledged inNEPA documents that fine woody material up to three inches in diameter, such as thetops of trees, has the greatest influence on the rate of spread and flame length of a fire,which has direct impacts on fire suppression efforts (e.g., USDI 2002, USDA 1994).Salvage logging could increase fuel loadings by 10 tons to the acre or more. With thisimmediate change in the project area[rsquo]s fuel model, higher rates of fire spread, and greaterflame lengths would occur (Rothermel 1991). Direct attack of a fire would be limitedunder some weather conditions so indirect measures would become necessary. This, inturn, would increase the size and cost of a wildfire. Slash created by logging operations,if not treated, would also increase the duration and intensity of a ground fire.SOILSTotal organic matter remaining after the fire and after salvage is the key indicator for theissue of site productivity. Please address soil chemistry, productivity, hydrology, andbiological integrity on a site-specific (i.e., unit-by-unit) basis. Please map soil types andcomposites using field reconnaissance data and include the maps in the NEPA document.Include a qualified, journey-level soil scientist on the ID Team. Design actions andmitigation after you have collected field reconnaissance data on soils at every siteproposed for action. Please do not lump [ldquo]moderate[rdquo] and [ldquo]severe[rdquo] fire impacts to soils inyour forthcoming analysis.SLOPE STABILITY, LANDSLIDES AND SEDIMENTThe Forest Service should analyze and disclose the cumulative impacts of the fire, firesuppression activities, and post fire logging on slope stability, landslides and sedimentproduction via an EIS. This is particularly important in a planning area such as this thatincludes well-traveled public roads and salmon-bearing streams. Please note thatuncertainty and scientific controversy are both triggers necessitating completion of an EIS.TRACTOR YARDINGAs established in the peer-reviewed literature submitted with these scoping comments,ground-based yarding on post-fire soils is a particularly destructive and controversialpractice that necessitates the completion of an EIS.Please address the following conclusions from page 44 of the Doubleday Fire SalvageEnvironmental Assessment. March 2009. BLM-OR-MO50-0015-EA. Butte FallsResource Area. Medford District BLM:Tractor yarding causes soil compaction and displacement. Soil compaction is an increase inbulk density with a corresponding decrease in soil porosity. Compaction reduces soilproductivity through a reduction in root growth, tree height, and timber volume (Greacen andSands 19801; Froehlich and McNabb 19842) and may be produced by a single pass of logging1 Greacen, EL and R Sands. 1980. 1980 Compaction of forest soils. A review. Australian Journal of SoilResearch. 18(2):163-189.equipment across a site (Wronski 19843). Productivity losses have been documented for wholesites (West and Thomas 19814) and for individual trees (Froehlich 19795, Helms and Hipkin19866). Decreases in important microbial populations have also been observed in compactedsoils (Amaranthus et al. 1996.)7 Soil compaction may also increase surface runoff because ofreducing infiltration (Graecen and Sands 1980).8Soil displacement from tractor yarding occurs when the tracked equipment turns on its skidspushing the soil into small piles, or berms, along the skid trails. This displacement of the topsoilremoves the organic litter layer and exposes mineral soil. Removal of the loose, organic surfacematerials promotes surface sealing and crusting that decreases infiltration capacity and mayincrease erosion (Child et al. 1989).9 Soil displacement also results in a loss of important soilbiota, such as mycorrhizal fungi, which facilitates nutrient uptake by plants (Amaranthus et al.1989 and 1996).10ARTIFICIAL REPLANTING DOES NOT RECOVER FORESTSThe Forest Service is proposing activities to facilitate the artificial planting of trees, andassociated elimination of shrubs around planted sites, on thousands of acres in the firearea, implying that natural conifer regeneration would not effectively or adequately occurin the absence of such artificial planting.On August 1, 2006, a letter from nearly 600 American scientists opposed post-fire snagremoval and subsequent artificial replanting, share the finding that such activities do notrepresent the current state of scientific knowledge and [ldquo]would actually slow the naturalrecovery of forests and of streams and the creatures within them[hellip][rdquo] The scientistsconcluded that [ldquo]no substantive evidence supports the idea that fire-adapted forests mightbe improved by logging after a fire.[rdquo]2 Froehlich, HA, and DH McNabb. 1984. Minimizing soil compaction in Pacific Northwest forests. In ELStone (editor) Forest Soils and Treatment Impacts. Proceedings of 6th North American Soils Conference,June 1983, University of Tennessee, Department of Forestry, Wildlife and Fisheries, Knoxville, TN. P 159-192.3 Wronski, EB. 1984. Impacts of tractor thinning operations on the soils and tree roots in a Karri forest,Western Australia. Australian Forestry Research 14:319-332/4 West, S and BR Thomas. 1981. Effects of skid roads on diameter, height, and volume growth in Douglasfir.Soil Science Society of America Journal 45:629-632.5 Froehlich, HA. 1979. Soil compaction from logging equipment: effects on growth of young ponderosapine. Journal of Soil and Water Conservation 34:276-278.6 Helms, JA, and C Hipkin. 1986. Effects of soil compaction on tree volume in California ponderosa pineplantation. Western Journal of Applied Forestry. 1:121-124.7 Amaranthus, MP, and DA Perry. 1989. Rapid root tip and mycorrhizal formation and increased survivalof Douglas-fir seedlings after soil transfer. New Forests 3:77-82.8 Greacen, EL and R Sands. 1980. 1980 Compaction of forest soils. A review. Australian Journal of SoilResearch. 18(2):163-189.9 Childs, SW, SP Shade, DW Miles, E Shepard, HA Froehlich. 1989. Management of soil physicalproperties limiting forest productivity. In: DA Perry et al. (eds.) Maintaining the long-term productivity ofPacific Northwest forest ecosystems. Timber Press, Portland, OR.10 Amaranthus, MP, and DA Perry. 1989. Rapid root tip and mycorrhizal formation and increased survivalof Douglas-fir seedlings after soil transfer. New Forests 3:77-82.Patches of higher-intensity fire, wherein most or all trees are killed, do not [ldquo]remove[rdquo] thestand of trees, and do not put the area to a nonforest use. On the contrary, higherintensityfire patches create one of the most ecologically important and biodiverse foresthabitat types in western U.S. conifer forests: [ldquo]snag forest habitat[rdquo].The agency[rsquo]s apparent assumption that higher-intensity fire areas will not naturallyregenerate with conifers effectively is not supported by any citation to scientificliterature, and is directly contradicted by Forest Service data regarding natural post-fireconifer regeneration in large high-intensity fire patches (Collins et al. 2010).Specifically, the Forest Service found vigorous natural post-fire forest regeneration,dominated mostly by pines and oaks for trees over 1 centimeter in diameter at breastheight (Collins et al. 2010, Table 5), and hundreds of trees per acre overall, within severalyears to about a decade after high-intensity fire, even where native shrub cover was 90-100% (Collins et al. 2010, Tables 5 and 6). This is consistent with findings from otherstudies (Shatford et al. 2007). And, while a more recent report from Collins et al. (PlumasLassen Study 2011 Annual Report) claims to find little natural conifer regeneration inmany high-severity fire areas this is misleading because nearly half of the area surveyedhad been subjected to intensive post-fire logging, which damages soils and removes ordestroys natural seed sources[mdash]and many of the areas that were not post-fire salvagelogged were pre-fire clearcut.Further, the results of Collins et al. (2010 [Table 5]), who found and reported substantialnatural conifer regeneration[mdash]especially ponderosa pine and sugar pine[mdash]in highintensityfire patches, excluded salvage logged areas, unlike Collins et al. (2011). Collinset al. (2010) state that [ldquo]some areas within each of these fires experienced post-firemanagement, ranging from post fire salvage logging, tree release and weed management.These areas were removed from analysis.[rdquo] (emphasis added). Specifically, Collins et al.(2010 [Table 5]) found 158 ponderosa pine and sugar pine conifers per acre regeneratingin high-intensity fire patches in the Storrie fire[mdash]68% of the total natural coniferregeneration by species. Moreover, the plots in Collins et al. (2011 [see map]) within theStorrie fire area were concentrated at the edge of the fire in the areas subjected toextensive salvage logging and roadside hazard tree logging, which removes conifer(including pine) seed sources and tramples natural conifer regeneration with groundbasedmachinery (thus, even the plots that technically had not been post-fire logged wereoften adjacent to logged areas). Extensive natural conifer regeneration surveys deeperinto the Storrie fire, at seven years post-fire, revealed abundant natural coniferregeneration, especially pine (Hanson 2007b [Tables 1 through 4, and Appendix A]). Inaddition, over 95% of the conifer regeneration in Collins et al. (2010, 2011) was under0.1 cm in diameter at breast height (Collins et al. 2010); the plots used to determine thedensity of conifers of this size covered only 9 square meters of area per plot, and manyhigh-intensity fire patches in the study only had 3-5 plots for an entire high-intensity firepatch (Collins et al. 2011). This means that, even if 200-300 naturally-regeneratingconifers per hectare actually existed in a given high-intensity fire patch, the methods usedby Collins et al. would be very unlikely to detect conifers, as a matter of math andprobability.Siegel et al. (2011) concluded that native fire-following shrubs are vitally important tobiodiversity in complex early seral forest (CESF) created by high-intensity fire: [ldquo]Manymore species occur at high burn severity sites starting several years post-fire, however,and these include the majority of ground and shrub nesters as well as many cavity nesters.Secondary cavity nesters, such as swallows, bluebirds, and wrens, are particularlyassociated with severe burns, but only after nest cavities have been created, presumablyby the pioneering cavity-excavating species such as the Black-backed Woodpecker.Consequently, fires that create preferred conditions for Black-backed Woodpeckers in theearly post-fire years will likely result in increased nesting sites for secondary cavitynesters in successive years.[rdquo]Similarly, Burnett et al. have found that shrub dominated landscapes are criticallyimportant wildlife habitat: [ldquo]while some snag associated species (e.g., black-backedwoodpecker) decline five or six years after a fire [and move on to find more recent fireareas], [species] associated with understory plant communities take [the woodpeckers[rsquo]]place resulting in similar avian diversity three and eleven years after fire (e.g. Moonlightand Storrie).[rdquo] (Burnett et al. 2012). Burnett et al. (2012) also noted that [ldquo]there is a fiveyear lag before dense shrub habitats form that maximize densities of species such as FoxSparrow, Dusky Flycatcher, and MacGillivray[rsquo]s Warbler. These species have shownsubstantial increases in abundance in the Moonlight fire each year since 2009 but shrubnesting species are still more abundant in the eleven year post-burn Storrie fire. Thissuggests early successional shrub habitats in burned areas provide high quality habitat forshrub dependent species well beyond a decade after fire.[rdquo] (Burnett et al. 2012).CONIFER REGENERATION AND BRUSH FIELDSAttachment 22 is another peer-reviewed paper regarding post-fire forest successionentitled [ldquo]Conifer Regeneration After Forest Fire in the Klamath Siskiyous: HowMuch, How Soon?[rdquo] by Shatford, J.P.A.; Hibbs, D.E.; Puettmann, K.J. Journal ofForestry. Volume 105, Number 3, April/May 2007, pp. 139-146(8).The abstract of this paper states:The increasing frequency and extent of forest fires in the western United States has raisedconcerns over postfire management actions on publicly owned forests. Information on ecosystemrecovery after disturbance is lacking and has led to heated debate and speculation regarding thereturn of forest vegetation after disturbance and the need for management actions. One criticalquestion emerges, will these ecosystems recover on their own, and if so, over what time frame.We report on one aspect of recovery, the spatial and temporal variation of natural coniferregeneration evident 9-19 years after forest fires in California and Oregon. In contrast toexpectations, generally, we found natural conifer regeneration abundant across a variety ofsettings. Management plans can benefit greatly from using natural conifer regeneration butmanagers must face the challenge of long regeneration periods and be able to accommodate highlevels of variation across the landscape of a fire.Attachment 23 is a paper entitled [ldquo]Vegetation Response to a Short Interval BetweenHigh-Severity Wildfires in a Mixed-Evergreen Forest[rdquo] by Donato et al. in the Journalof Ecology. 2009, Volume 97. 142-154.Summary:1. Variations in disturbance regime strongly influence ecosystem structure and function. Aprominent form of such variation is when multiple high-severity wildfires occur in rapidsuccession (i.e. short-interval (SI) severe fires, or [lsquo]re-burns[rsquo]). These events have been proposedas key mechanisms altering successional rates and pathways.2. We utilized a natural experiment afforded by two overlapping wildfires occurring within a15- year interval in forests of the Klamath[ndash]Siskiyou Mountains, Oregon (USA). We tested forunique effects of a SI fire (15-year interval before 2002 fire) by comparing vegetationcommunities 2 years post-fire to those following a long-interval (LI) fire (> 100-year intervalbefore 2002 fire) and in mature/old-growth (M/OG) stands (no high-severity fire in > 100-year).3. Nearly all species found in M/OG stands were present at similar relative abundance in boththe LI and SI burns, indicating high community persistence through multiple high-severity fires.However, the SI burn had the highest species richness and total plant cover with additions ofdisturbance-associated forbs and low shrubs, likely due to a propagule bank of early seralspecies that developed between fires. Persistence of flora was driven by vegetative sprouting,on-site seed banks, and dispersal from off-site seed sources. Several broadly generalizable plantfunctional traits (e.g., rapid maturation, long-lived seed banks) were strongly associated withthe SI burn.4. Sprouting capacity of hardwoods and shrubs was unaltered by recurrent fire, but hardwood/shrub biomass was lower in the SI burn because individuals were smaller before the second fire.Conifer regeneration densities were high in both the SI and LI burns (range = 298[ndash]6086 and406[ndash]2349 trees ha., respectively), reflecting similar availability of seed source and germinationsubstrates.5. Synthesis. SI severe fires are typically expected to be deleterious to forest flora anddevelopment; however, these results indicate that in systems characterized by highly variablenatural disturbances (e.g., mixed-severity fire regime), native biota possess functional traitslending resilience to recurrent severe fire. Compound disturbance resulted in a distinct earlyseral assemblage (i.e. interval-dependent fire effects), thus contributing to the landscapeheterogeneity inherent to mixed-severity fire regimes. Process-oriented ecosystem managementincorporating variable natural disturbances, including [lsquo]extreme[rsquo] events such as SI severe fires,would likely perpetuate a diversity of habitats and successional pathways on the landscape.The great majority of areas that burn at high severity naturally regenerate conifersvigorously--starting shortly after the fire. See Shatford et al. (2007) in Journal ofForestry for more information.ACCURATELY

DESCRIBE FIRE INTENSITYPlease do not [ldquo]lump[rdquo] moderate and severe fire intensity in your analysis. The NEPAdocuments should clearly describe the differences in salvage logging impacts on foreststhat have experienced fire of different severity. For instance, soils that are severely burnedare likely to respond to ground-based yarding much differently than soils that aremoderately burned.FULLY DISCLOSE CUMULATIVE IMPACTSPlease disclose and analyze the cumulative impacts of the proposed fire salvage inconjunction with prior and foreseeable management activities in the watershed. Clearlyaddress the cumulative impacts on future fire behavior, snag retention, soil health,hydrology and wildlife.We believe that the significant cumulative impacts on these watersheds from past roadconstruction and federal logging, combined with the impacts of fire suppression, privateand county logging and proposed post-fire logging along with proposed Forest Servicelogging necessitate the completion of an EIS for this proposed timber sale.Please note that a proper consideration of the cumulative impacts of a project requires[ldquo]some quantified or detailed information;[hellip][g]eneral statements about some possibleeffects and some risk do not constitute a hard look absent a justification regarding whymore definitive information could not be provided.[rdquo] Ocean Advocates v. United StatesArmy Corps of Eng[rsquo]rs, 361 F.3d 1108, 1128 (9th Cir. 2004) (quoting Neighbors of CuddyMountain v. United States Forest Serv., 137 F.3d 1372, 1379-80 (9th Cir. 1998)). Theanalysis [ldquo]must be more than perfunctory; it must provide a useful analysis of thecumulative impacts of past, present and future projects.[rdquo] Id.The many severe cumulative impacts from timber sale activities, road construction andfire suppression in this planning area must be analyzed in a NEPA document such that:A proper consideration of the cumulative impacts of a project requires [ldquo]some quantified ordetailed information;[hellip]general statements about possible effects and some risk do notconstitute a hard look absent a justifications regarding why more definitive information couldnot be provided.[rdquo] Ocean Advocates, 361 F.3d at 1128 (quoting Neighbors of Cuddy Mountainv. US Forest Service, 137 F.3d 1372, 1379-80 (9th Cir. 1998)). The analysis [ldquo]must be more thanperfunctory; it must provide a useful analysis of the cumulative impacts of past, present, andfuture projects.[rdquo] Id.-KS Wild v. BLM 387 F 3d. 15269 (9th Cir. 2004).As discussed in the Ninth Circuit[rsquo]s ruling of July 24, 2007, NEPA requires disclosure ofthe cumulative impacts of multiple actions:One of the specific requirements under NEPA is that an agency must consider the effects of theproposed action in the context of all relevant circumstances, such that where [ldquo]several actionshave a cumulative[hellip]environmental effect, this consequence must be considered in an EIS.[rdquo]Neighbors of Cutty Mountain v. US Forest Service., 137 F.3d 1372, 1378 (9th Cir. 1998)(quoting City of Tenakee Springs v. Clough, 915 F.2d 1308, 1312 (9th Cir. 1990)). A cumulativeeffect is [ldquo]the impact on the environment which results from the incremental impact of theaction when added to other past, present, and reasonably foreseeable actions regardless of whatagency (Federal or non-Federal) or persons undertakes such other actions.[rdquo] 40 CFR [sect] 1508.7.Our cases firmly establish that a cumulative effects analysis [ldquo]must be more than perfunctory; itmust provide a useful analysis of the cumulative impacts of past, present, and future projects.[rdquo]Klamath Siskiyou Wildlands Center v. BLM, 387 F.3d 989, 993 (9th Cir. 2004). To this end, wehave recently noted two critical features of a cumulative effects analysis. First, it must not onlydescribe related projects but also enumerate the environmental effects of those projects. SeeLands Council v. Powell, 395 F.3d 1019, 1028 (9th Cir. 2005) (holding a cumulative effectsanalysis violated NEPA because it failed to provide adequate data of the time, place, and scale[rdquo]and did not explain in detail [ldquo]how different project plans and harvest methods affects theenvironment[rdquo]). Second, it must consider the interaction of multiple activities and cannot focusexclusively on the environmental impacts of an individual project. See Klamath SiskiyouWildlands Center, 387 F 3d at 996 (finding a cumulative effects analysis inadequate when [ldquo]itonly considers the effects of the very project at issue[rdquo] and does not [ldquo]take into account thecombined effects that can be expected as a result of undertaking[rdquo] multiple projects).-Oregon Natural Resources Council et al. v. Brong. 9th Circuit. July 24, 2007.Given the impacts of past Forest Service, private and county logging and road activitieson the hydrological and terrestrial health of the project area, it is vital that the agencyanalyze and disclose the cumulative impacts of past activities and its future plans.We contend that for a cumulative effects analysis to properly inform the decision-makerand the public, the agency must analyze spatially explicit logging occurring on privatelands now and in the foreseeable future within the project area watersheds. The loggingdata from ongoing private harvest must be considered [ldquo]available[rdquo] to the Forest Service forNEPA purposes. This private salvage logging is certain to occur and will have severeimpacts to the landscape since clearcuting and tractor logging is allowed along streams, onsteep slopes, and on post-fire soils. Subsequent discretionary decisions by the ForestService must quantitatively assess the effects of private salvage logging in combinationwith proposed federal logging.The Antelope and Tennant fires drew a heavy suppression response that included treefelling, road use, burnout and use of chemical retardants over broad areas. Backer andothers (2004) described numerous potentially significant adverse effects on theenvironment resulting from the suppression of fire including:[bull] Direct soil damage resulting from emergency road, fire line, and helispotconstruction.[bull] Hydrological impacts caused by fire lines, which route overland waterflow and disrupt soil infiltration.[bull] Chemical pollution of water and soil from aerial flame retardant drops.[bull] Destruction of snags and other ecologically significant large woody debris.[bull] Spread of highly flammable exotic plants.The public and the decision maker must be able to discern whether these factors resultedin significant impacts when considered cumulatively with the proposed action.Consideration and disclosure of cumulative impacts should include, but not be limited to,the following issues:1. All past [ldquo]shelterwood[rdquo] cuts and clear-cuts, including their impacts onoverall canopy cover, old growth quality and extent, and habitat suitabilityfor canopy dependent species including sensitive and indicator species.2. All past crown fires, including their impacts on overall canopy cover, oldgrowth quality, quantity and extent, and habitat suitability for canopydependent species including sensitive and indicator species.3. Past changes in forest structure, including those resulting from the fire,and their impacts on wildlife habitat and populations.4. Invasive plant populations occurring in past timber sales, along roads andin past fire perimeters, and the potential for the proposed action and/orspatially or temporally concurrent management to introduce and increaseinvasive plant populations within the project area. This analysis shouldalso evaluate invasive plant population responses to climate, seasonality,soil, slope, aspect, land uses, management activities, timing andinteractions therein.5. Overall fire management goals for the planning area. The Forest Serviceshould specifically frame the proposed action in terms of fire managementgoals, and it should demonstrate in the context of cumulative effectsanalysis[mdash]using maps, GIS and a Fire Management Plan[mdash]how theproposed restoration activities serve as a corrective step that facilitatemanaging natural fires both within and beyond the project area in thefuture.6. Location of the project area and proposed management activities,including roads and skid trails, in relationship to the location of importantwildlife habitat, both formally protected habitats and other importanthabitat, such as wildlife movement corridors.NOXIOUS WEEDSThe forthcoming NEPA document must adequately disclose and analyze the potential forproposed Forest Service activities to increase and hasten the spread of noxious weeds in theplanning area.Please note that federal timber planners in the Butte Falls Resource Area of the MedfordBLM plainly acknowledged that noxious weeds are a serious issue for post-fire loggingwhen it wrote the Timbered Rock Salvage Logging DEIS (Butte Falls RA). That DEISrecognized that [ldquo][P]rojects in these [action] alternatives could spread noxious weeds at ahigher rate than the No Action Alternative, due to a higher level of ground-disturbingactivities.[rdquo] (DEIS 3-150). The Timbered Rock DEIS further acknowledged that thehigher the burn severity the more vulnerable to noxious weed invasion and thatsubsequent loss of native vegetation [ldquo]may be irretrievable.[rdquo] (DEIS 3-151). Such analysismust be completed for the Antelope and Tennant salvage logging proposal.CALCULATING THE NUMBER OF LEAVE SNAGS PER ACREThe forthcoming NEPA document must fully analyze and disclose the ability of thetimber sale units to provide the required habitat for snag-dependent species. This analysismust be conducted on an acre-by-acre basis rather than [ldquo]masked[rdquo] by relying on snagsoutside of harvest units to alter the post-harvest per-acre snag numbers.BURNED FORESTS PROVIDE IMPORTANT WILDLIFE HABITATScientists have recently recommended that forest managers should ensure themaintenance of moderate and high severity fire patches to maintain populations ofnumerous native bird species positively associated with fire (Hutto 1995, Hutto 2006,Kotliar et al. 2002, Noss et al. 2006, Smucker et al. 2005). At the landscape level, highseverity habitat (unlogged) is among the most underrepresented, and rarest, of foresthabitat types (Noss et al. 2006). Indeed, the current annual spatial extent of wildland firein California[rsquo]s forests is about one tenth of what it was prior to fire suppression (Medler2006).Forests experiencing high severity burns, or [ldquo]snag forests[rdquo], are often incorrectly assumedby land managers to be [ldquo]damaged[rdquo] (USDA 2004). Ecologically, this is stronglycontradicted by the scientific evidence. Peak biodiversity levels of higher plants andvertebrates are found in patches of snag forest habitat[mdash]areas where most or all of thetrees are killed by fire (Noss et al. 2006), consistent with the principle that pyrodiversityenhances biodiversity, where mixed-severity fire effects occur (Chang 1996). Fireinducedheterogeneity, including a mix of low, moderate, and high severity patches, leadsto higher post-fire understory plant species richness compared to homogeneous lowseverity fire effects (Chang 1996, Rocca 2004). Mixed-severity fire, meaning aheterogeneous mix of high, moderate, and low severity effects, facilitates reproduction ofnumerous native herbaceous and shrub species (Chang 1996, Rocca 2004), thegermination of many of which is triggered by fire-induced heat, charate, or smoke(Biswell 1974, Chang 1996). These flowering plants, in turn, increase biodiversity offlying insects, including hymenopterans (bees, wasps, flying ants). And, fire-mediatedconifer mortality attracts bark beetles and wood-boring beetles, some species of whichhave evolved infrared receptors capable of detecting burned forests from over 161 kmaway (Altman and Sallabanks 2000, Hutto 1995). Other insect species are attracted by thesmoke from fires (Smith 2000).As a result, avian species richness and diversity increases in heavily burned patchesoccurring within a mix of low and moderate severity effects. Woodpeckers excavate nestcavities in snags and feed upon bark beetle and wood-boring beetle larvae in dead trees;Mountain Bluebirds (Sialia currucoides) and other secondary cavity-nesting species usenest holes created the previous year by woodpeckers; granivores such as the RedCrossbill (Loxia curvirostra) feed upon seed release from cones following fire; shrubdwellingspecies like the Blue Grouse (Dendragapus obscurus) nest and forage withinshrub growth scattered throughout high severity patches; while aerial insectivores such asthe Olive-sided Flycatcher (Contopus cooperi) prey upon the bark beetles that areabundant in snag patches (Altman and Sallabanks 2000, Hutto 1995). The Olive-sidedFlycatcher is listed by the U.S. Forest Service as a Species at Risk, meaning that there issignificant concern about the viability of its populations due to habitat scarcity and loss(USFS 2001). Populations of small mammals experience overall increases shortly afterhigh severity fire, and amphibians are positively associated with the large woody materialthat gradually accumulates in the decades following such fire effects (Smith 2000). Aswell, ungulates forage upon post-fire flora, and large predators frequently seek their preyin burned patches (Smith 2000).Studies have detected higher overall avian species richness in severely burned versusunburned forest in the western United States (Bock and Lynch 1970, Hutto 1995,Raphael and White 1984, Siegel and Wilkerson 2005). In one snag forest area resultingfrom the Manter Fire of 2000 in the southern Sierra Nevada, a total of 111 bird specieswere observed (Siegel and Wilkerson 2005). Following the 60,000 ha McNally Fire of2002 in Sequoia National Forest, Olive-sided Flycatchers were found in the burn area(Siegel and Wilkerson 2005). This species had previously been considered to beextirpated from Sequoia National Forest, possibly since 1930 (Altman and Sallabanks2000).Research has also indicated that numerous avian species, including several woodpeckerspecies, exhibit a preference for burned conifer forest habitat (Bock and Lynch 1970,Dixon and Saab 2000, Murphy and Lehnhausen 1998, Granholm 1982, Hutto 1995, Saabet al. 2002, Saab et al. 2004). Fire-killed trees provide nesting and foraging habitat fornumerous woodpecker species (Hutto 1995, Dixon and Saab 2000). Post-fire logging hasbeen described as a threat to such species (Dixon and Saab 2000, Kotliar et al. 2002,Lindenmayer et al. 2004, Murphy and Lehnhausen 1998, Saab et al. 2004).To conserve populations of species which prefer heavily burned forest patches in theeastern Cascades, Altman (2000) recommended that: at least 2% of the forestedlandscape be maintained in early post-fire habitat; at least 40-50% of such burned standsbe retained in an unlogged state; and, where salvage logging does occur, all snags (firekilledtrees) > 51 cm (20 inches) dbh and half of all snags 30-51 cm (12-20 inches) dbhshould be retained.There is perhaps no vertebrate species more strongly representative of the snag foresthabitat type than the Black-backed Woodpecker (Picoides arcticus) (Hanson 2007, Hutto1995). This species is a designated Management Indicator Species, acting as a bellwetherfor the viability of dozens of other species associated with snag forests (USDA 2004).One of only two woodpecker species globally with three toes instead of four, the BlackbackedWoodpecker is able to deliver exceptionally hard blows due to added heelmobility resulting from the lack of a fourth toe and, as a consequence, it can reach beetlelarvae that other woodpecker species cannot (Dixon and Saab 2000). One bird eats anastounding 13,500 beetle larvae per year (Hutto, unpublished data). From behind, the allblackcoloring of this species confers excellent camouflage against the charred bark of afire-killed tree. Though Black-backed Woodpeckers are occasionally, but rarely, seenoutside of stand-replacement burns, forests outside of snag forest habitat are believed tobe [ldquo]sink[rdquo] habitats which do not support them (Hutto 1995, Dixon and Saab 2000).In the northern Rocky Mountains, the Black-backed Woodpecker is largely restricted torecently severely burned conifer forest that is unlogged (Hutto 1995). The same is true inforests of the Sierra Nevada and southern Cascades (Hanson 2007).The Black-backed Woodpecker, which was historically [ldquo]quite numerous[rdquo] in SierraNevada mixed conifer forests (Cooper 1870), but later became [ldquo]rare[rdquo]

(Dawson 1923,Grinnell and Storer 1924, Siegel and DeSante 1999), appears to require a minimum highseverity patch size of 12-25 ha (Saab et al. 2002). [ldquo]Strong excavators[rdquo] such as the BlackbackedWoodpecker may effectively use snag forest habitat for only 5-7 years post-fire(Saab et al. 2004), relying upon a constantly replenished supply of this ephemeral habitatas new fires occur. However, large fires allow longer periods of occupancy, since it takesnest predators longer to recolonize the burn area (Saab et al. 2004). Other strongexcavators, such as the Hairy Woodpecker (Picoides villosus) and the White-headedWoodpecker (Picoides albolarvatus) are positively associated with burned forest as well(Saab et al. 2002, Saab et al. 2004).Heterogeneous fires are very important ecologically, since a number of species dependnot only upon burned forest habitat in general, but also specifically upon particular levelsof severity, with some requiring low or moderate severity burn patches and somerequiring only patches of high severity burned forest (Smucker et al. 2005, Kotliar et al.2007).Indeed, a recent scientific study of the northern Sierra Nevada and southern Cascades bythe Forest Service scientists concluded that:[ldquo][hellip]it is clear from the scientific data that burned forest, including stand replacing burns [highseverity fire patches], provide important bird habitat. The abundance and diversity ofwoodpecker species generally reaches a peak in recently burned forest. The Black-backedWoodpecker, a rare resident of the northern Sierra forest, predominantly occurs in recentlyburned forest. Olive-sided Flycatcher, a species declining throughout the Sierra Nevada, hasbeen shown to be strongly associated with burned forest as well. Thus, we promote the viewthat burned forest is important wildlife habitat.[rdquo] (USFS 2006).It is the diversity of fire effects that facilitates and maximizes native biodiversity(Connell 1978, Noss et al. 2006). It is, in fact, the unlogged high severity patches that aremost in deficit in west coast forests, probably more than any other single forest habitattype. Any post-fire logging would only un-do the benefits of heterogeneous fire effects.Attachment 24 is a peer-reviewed study conducted by Lee et al. for the Institute forBird Population published in The Condor 114(4): 792-802, The CooperOrnithological Society 2012. Its abstract concludes:Understanding how habitat disturbances such as forest fire affect local extinction andprobability of colonization[mdash]the processes that determine site occupancy[mdash]is critical fordeveloping forest management appropriate to conserving the California Spotted Owl (Strixoccidentalis occidentalis), a subspecies of management concern. We used 11 years of breedingseasonsurvey data from 41 California Spotted Owl sites burned in six forest fires and 145 sitesin unburned areas throughout the Sierra Nevada, California, to compare probabilities of localextinction and colonization at burned and unburned sites while accounting for annual and sitespecificvariation in detectability. We found no significant effects of fire on these probabilities,suggesting that fire, even fire that burns on average 32% of suitable habitat at high severitywithin a California Spotted Owl site, does not threaten the persistence of the subspecies on thelandscape. We used simulations to examine how different allocations of survey effort over 3years affect estimability and bias of parameters and power to detect differences in colonizationand local extinction between groups of sites. Simulations suggest that to determine whether andhow habitat disturbance affects California Spotted Owl occupancy within 3 years, managersshould strive to annually survey [ge]200 affected and [ge]200 unaffected historical owl sitesthroughout the Sierra Nevada 5 times per year. Given the low probability of detection in oneyear, we recommend more than one year of surveys be used to determine site occupancy beforemanagement that could be detrimental to the Spotted Owl is undertaken in potentially occupiedhabitat.NORTHER SPOTTED OWLSThe Forest Service must complete an EIS prior to removing elements of spotted owl habitatsuch as large snags and future sources of down wood. Please note that Bond 2009 (attachedto these scoping comments) recommends forgoing salvage logging activities within 1.5 kmof NSO nest sites. The impacts of proposed salvage logging activities trigger the duty underthe Endangered Species Act to consult with the US Fish and Wildlife Service regarding thisproject.How many acres of designated critical habitat is the agency proposing to salvage log? Howmany acres of designated critical habitat is the agency proposing to convert into fiberplantations? Does the agency contend that the removal of constituent elements of NSOcritical habitat (such as large snags and future down wood) is not a significant actionimpacting the critical habitat of a threatened species? How does the Forest Service intendto implement Recovery Actions 10 and 12 of the Northern Spotted Owl Recovery Plan?NATURAL DISTURBANCE CREATES HABITAT AND BIODIVERSITY WHILELOGGING HARMS FOREST HEALTHThe ecological differences between biologically rich stands that result from naturaldisturbance and stands that are subject to logging and yarding are well-known andestablished:Early-successional forest ecosystems that develop after stand-replacing or partial disturbances arediverse in species, processes, and structure. Post-disturbance ecosystems are also often rich inbiological legacies, including surviving organisms and organically derived structures such aswoody debris. These legacies and post-disturbance plant communities provide resources thatattract and sustain high species diversity, including numerous early-successional obligates, suchas certain woodpeckers and anthropods. Early succession is the only period when tree canopiesdo not dominate the forest site, and so this stage can be characterized by high productivity ofplant species (including herbs and shrubs), complex food webs, large nutrient fluxes, and highstructural and spatial complexity. Different disturbances contrast markedly in terms of biologicallegacies, and this will influence the resultant physical and biological conditions, thus affectingsuccessional pathways. Management activities, such as post-disturbance logging and dense treeplanting, can reduce the richness within and the duration of early-successional ecosystems. Wheremaintenance of biodiversity is an objective, the importance and value of these natural earlysuccessionalecosystems are underappreciated.-Swanson et al, The Forgotten Stage of Forest Succession: Early-Successional Ecosystems onForest Sites. 2010. Frontiers in Ecology and the Environment.Attachment 25a consists of the Swanson et al paper quoted above.Attachment 25b is [ldquo]Restoration Framework for Federal Forestsin the Pacific Northwest[rdquo] by Jerry F. Franklin and K. Norman Johnson whichsupports Swanson et al. 2011 need for unmanaged early succession forests.Franklin and Johnson (2012) state on p. 431: [ldquo]Theoretically, disturbances of either natural (e.g.,wildfire) or human (e.g., timber harvest) origin are capable of generating this stage. Largenatural disturbances often produce high-quality early seral ecosystems provided they are notintensively salvaged and replanted (Swanson et al. 2011), but such disturbances are poorlydistributed in time and space. For example, less than 1% of suitable NSO habitat (complexforest) was transformed by wildfire into early successional habitat between 1996 and 2006 inMF-dominated provinces of the Northwest Forest Plan (NWFP; USDI Fish and WildlifeService 2011). Areas devoted to intensive timber production generally provide little highqualityearly seral habitat for several reasons. First, few or no structures from the preharveststand (e.g., live trees, snags, and logs) are retained on intensively managed sites but areabundant after severe natural disturbances (Swanson et al. 2011). Additionally, intensive sitepreparation and reforestation efforts limit both the diversity and the duration of early seralorganisms, which may also be actively eliminated by use of herbicides or other treatments(Swanson et al. 2011). Consequently, many MF landscapes currently lack sufficientrepresentation of high-quality early seral ecosystems because of harvest, reforestation, and firesuppression policies on both private and public lands (Spies et al. 2007, Swanson et al. 2011)Attachment 26 is a 2013 letter to congress signed by 250 scientists asking that decisionmakers [ldquo]consider what the science is telling us: that post-fire habitats created by fire,including patches of severe fire, are ecological treasures rather than ecologicalcatastrophes, and that post-fire logging does far more harm than good to the nations publiclands.[rdquo]PROPOSED ACTION ALTERNATIVEOur organizations hereby propose that the Forest Service include analysis of an alternativebased upon all of the post-fire management recommendations contained in the peerreviewed1995 Bestcha paper provided as an attachment to these scoping comments.HOW MANY GREEN TREES WILL BE LOGGED?How many green (living) trees will be logged to facilitate yarding activities? How manygreen (living) trees will be logged under the assumption that they will die in the future?Please account for the following findings in your NEPA analysis:[ldquo]Our key findings on post-fire management are as follows. First, post-burn landscapeshave substantial capacity for natural recovery. Re-establishment of forest following standreplacementfire occurs at widely varying rates; this allows ecologically critical, earlysuccessionalhabitat to persist for various periods of time. Second, post-fire (salvage)logging does not contribute to ecological recovery; rather, it negatively affects recoveryprocesses, with the intensity of impacts depending upon the nature of the logging activity(Lindenmayer et al. 2004). Post-fire logging in naturally disturbed forest landscapesgenerally has no direct ecological benefits and many potential negative impacts (Beschta etal. 2004; Donato et al. 2006; Lindenmayer and Noss 2006). Trees that survive fire foreven a short time are critical as seed sources and as habitat that sustains biodiversityboth above- and belowground. Dead wood, including large snags and logs, rivals live treesin ecological importance. Removal of structural legacies, both living and dead, isinconsistent with scientific understanding of natural disturbance regimes and short-andlong-term regeneration processes. Third, in forests subjected to severe fire and post-firelogging, streams and other aquatic ecosystems will take longer to return to historicalconditions or may switch to a different (and often less desirable) state altogether (Karr etal. 2004). Following a severe fire, the biggest impacts on aquatic ecosystems are oftenexcessive 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 erosionand generally damages natural ecological values, for example by reducing tree regenerationand the recovery of native plant cover and biodiversity (Beyers 2004). Non-native plantstypically compete with native species, reducing both native plant diversity and cover(Keeley et al. 2006). Fifth, the ecological importance of biological legacies and ofuncommon, structurally complex early-successional stands argues against actions toachieve rapid and complete reforestation. Re-establishing fully stocked stands on sitescharacterized by low severity fire may actually increase the severity of fire because of fuelloadings outside the historical range of variability. Finally, species dependent on habitatconditions created by high severity fire, with abundant standing dead trees, requiresubstantial areas to be protected from post-fire logging (Hutto 1995).[rdquo]- Noss and others, Frontiers in Ecology & Environment (2006:485-86)Attachment 27 is a 2013 publication entitled Effects of Riparian Thinning on WoodRecruitment: A Scientific Synthesis Science Review Team Wood RecruitmentSubgroup Thomas Spies, Michael Pollock, Gordon Reeves and Tim Beechie. Thismost recent report from government scientist found that thinning caused significantreductions in future dead wood recruitment to streams. Removing commercial sized deadtrees from Riparian Reserves would harm streams in the long-term by reducing futurewood recruitment.Attachment 28 is a 2020 publication entitled Estimating Retention Benchmarks forSalvage Logging to Protect Biodiversity by Simon Thorn et al. The abstract for thisstudy indicates that:Forests are increasingly affected by natural disturbances. Subsequent salvage logging, awidespread management practice conducted primarily to recover economic capital, producesfurther disturbance and impacts biodiversity worldwide. Hence, naturally disturbed forests areamong the most threatened habitats in the world, with consequences for their associatedbiodiversity. However, there are no evidence-based benchmarks for the proportion of area ofnaturally disturbed forests to be excluded from salvage logging to conserve biodiversity. Weapply a mixed rarefaction/extrapolation approach to a global multi-taxa dataset from disturbedforests, including birds, plants, insects and fungi, to close this gap. We find that 75% of anaturally disturbed area of forest needs to be left unlogged to maintain 90% richness of itsunique species, whereas retaining 50% of a naturally disturbed forest unlogged maintains 73%of its unique species richness. These values do not change with the time elapsed sincedisturbance but vary considerably among taxonomic groups.Attachment 29 consists of a paper entitled Spotted Owls and Forest Fire: Reply, byDerek Lee in which he [ldquo]found significant positive effects on foraging habitat selection andrecruitment from mixed-severity forest fires, and significant positive effects onreproduction from high-severity fire.[rdquo]Attachment 30 is a 2020 peer reviewed study entitled Patterns of Bird SpeciesOccurrence in Relation to Anthropogenic and Wildfire Disturbance: ManagementImplications that was published in Forest Ecology and Management. The study foundthat:Twelve of 68 bird species occurred significantly more frequently in burned mixed-coniferforest than in any of the 13 unburned vegetation types, and most of them reached their greatestabundance in the severely burned portions of those forests[hellip]33 of 68 species (49%) weresignificantly more abundant in burned forests at some combination of times-sine fire and fireseverity than in unburned conifer forest[hellip] [Hence] [t]he presence of many species (especiallythose most specialized to use burned forest conditions) is incompatible with both pre-fire andpost-fire timber harvesting.ROADSBesechta et al. (1995) warned that even temporary road construction should be prohibitedon burned landscapes. Existing roads in the watershed are experiencing significantslumping and failure that contributes directly to sediment loading. Commercial landings,log decks, and hauling have similar direct impacts on soil and hydrological values.The construction of landings also causes erosion at elevated levels and contributessediment over considerable distances. (Detcheson and Megehan 1996). The increasedsedimentation should be considered in light of all past, present and foreseeable futureactivities in the watershed.The Flounce Around EA (a 500 acres matrix salvage timber sale in the Medford DistrictButte Falls Resource Area) acknowledges that:"Many of these roads were previously closed or had little traffic but were opened up during thesuppression effort of the Timbered Rock wildfire in the adjacent Elk Creek watershed in thesummer of 2002. As a result, many of these high gradient access roads have not been reblockedand winter traffic has destroyed many of the designated road drainage (i.e. water bars,water dips and culverts). This has caused damage to the road surfaces creating road relatederosion (rill, gullies) and subsequent sedimentation of the nearby stream channel."-Flounce Around EAPlease disclose if similar impacts occurred during fire suppression activities at theAntelope and Tennant fires. Please also disclose the cumulative and synergistic impact oftractor fire line construction.Roads can be expected to be the principal conduit for accelerated sediment delivery tostreams.

Watershed and stream recovery can be best accomplished by hydrologicallyobliterating roads in close proximity to fish bearing streams and reducing the percent ofremaining road miles that are connected to the stream system.CONCLUSIONPlease note that there is almost universal agreement that salvage logging does not leavewatersheds and forests in a healthier, more resilient state, and that the timber volumegained via salvage is neither predictable nor sustainable.We urge the Forest Service to familiarize itself with the growing body of literatureindicating that the post-fire ecosystems have more to offer than simply an opportunity forsalvage logging and plantation forestry.Thank you for considering our concerns and input in this planning process.