

January 14, 2019

Sent via email to: appeals-northern-regional-office@fs.fed.us

To: Objection Reviewing Officer
USDA Forest Service Northern Region
26 Fort Missoula Road
Missoula, MT 59804

1. Pursuant to 36 CFR Part 218, Alliance for the Wild Rockies (AWR) files this Objection to the Environmental Assessment (EA) and draft Decision Notice (DN) for the Camp Robin Project. This timber sale is proposed for the Bonners Ferry Ranger District on the Idaho Panhandle National Forests (IPNF) and the Responsible Official is Forest Supervisor Jeanne Higgins.

The DN's Selected Alternative is modified from the EA's Alternative 2, as per DN Table 2:

Table 2. Selected Alternative Commercial Vegetation Treatments

Treatment	Alternative 2	Selected Alternative	Change
Regeneration Harvest Prescriptions	Acres	Acres	Acres
Shelterwood with reserves	1,450	1,450	0
Seed Tree with reserves	1,713	1,713	0
Clearcut (US 95 ROW clearing)	10	10	0
Sub-Total	3,173	3,173	0
Intermediate Harvest Prescriptions	Acres	Acres	Acres
Commercial Thinning	1,082	1,082	0
Improvement Cut	596	585	-11
Single Tree Selection	38	38	0
Variable Density Thinning	916	13	-903
Sub-Total	2,632	1,718	-914
Total Commercial Harvest	5,805	4,891	-914
Pre-Commercial Thinning	89	89	0
Burn Only Unit	386	386	0
Total	6280	5366	-914

Road information is in DN Table 5:

Table 5. Selected Alternative road treatments

Road Treatments	Miles
Add to System	1.7
Reconstruction	9.8
Maintenance	54.0
Storage	11.9
Temporary Road Construction	13.1
Decommission	2.1

As discussed in our previous comments at p. 1, the DN would implement the 2015 Revised Forest Plan. In carrying out its mission, AWR has participated in the public processes concerning management of the IPNF since the early days of (original) 1987 Forest Plan implementation, and has taken legal action at times to force the Forest Service (FS) to manage the IPNF in conformance with environmental laws such as the Endangered Species Act (ESA), the National Forest Management Act (NFMA), and the National Environmental Policy Act (NEPA). AWR also fully participated in the public process as the FS developed its Revised Forest Plan, including commenting at every stage and submitting a formal objection. And because the FS provided essentially no relief in response to the formal objection, we incorporate the documentation of our participation in the Revised Forest Plan public process within this Objection (See “RFP process” subfolder included with digital submission of this Objection.) By implementing the Revised Forest Plan with this project, the FS would be violating laws and regulations.

On November 28, 2011 the Forest Service issued the Record of Decision for the Revised Forest Plan Amendments for Motorized Access Management within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones on the Kootenai, Idaho Panhandle and Lolo National Forests (aka “Access Amendments”). AWR fully participated in the public process during the development of the Access Amendments, and we incorporate our comments and appeal of that Decision within this Objection to the Camp Robin project. (See folder entitled “Acc Amend Participation”.)

AWR also participated during the public process as the Northern Rockies Lynx Management Direction (NRLMD) was developed, and continues to believe that the RFP/NRLMD does not consider the best available science, and incorporates its comments on that forest plan direction within this Objection of the Camp Robin timber sale. (See folder entitled “NRLMD Participation”.)

In addition to the issues AWR raised in the above contexts, AWR provided January 11, 2018 comments on the FS’s 12/18/2017 Camp Robin proposal. We incorporate that comment letter into this Objection. Below we also present additional discussions on the same issues raised in previous comments—explaining how the Camp Robin timber sale would not be in compliance with laws, regulations, and policy.

FOREST PLAN DIRECTION AND PLAN ELEMENTS

Objectors discussed the inadequacy of Forest Plan direction and Plan Elements (often in the context of specific species or resources such as soil) in our previous comment letter (pp. 4-8, 10, 44, 45, 49-50, 51, 54, 67-68, 70-71, 72, 77-78, 79-82.). Much of that referenced or quoted from our incorporated Objection to the Revised Forest Plan.

There are so many cumulative effects of the FS's chosen way of achieving forest plan "Desired Conditions" for vegetation (manipulate the habitat using heavy-handed industrial activities). The EA simply does not view ecological damage through the same lens as it does for vegetative conditions. Here is a simple list other factors directly influencing biological diversity under the FS's management regime, and their historic range of variability, or "HRV":

FACTOR	HRV
Road density	zero
Noxious weed occurrence	zero
Miles of long-term stream channel degradation ("press" disturbance)	zero
Culverts	zero
Human-induced detrimental soil conditions	<1%
Maximum daily decibel level of motorized devices	zero
Acres of significantly below HRV snag levels for many decades	zero
Roadless extent	100%
Extent of veg. communities affected by exotic grazers (livestock)	zero
Extent of veg. communities affected by fire suppression	zero

With no relief evident in the final Revised Forest Plan or its EIS, project design such as that leading to the Camp Robin proposal is symptomatic of the inadequacies of FS policies and plan direction.

Remedy: Select the No Action Alternative. Otherwise, prepare an EIS that addresses the issues identified in our objection to the Forest Plan and in our earlier comments on the Camp Robin project.

CANADA LYNX

Objectors discussed Canada Lynx in our previous comments (pp. 25-27). We supplement those comments with the following discussion.

The Camp Robin Wildlife Report states:

Lynx presence has been historically reported throughout the Idaho Panhandle, including both verified and unverified sightings from several locations on the Bonners Ferry Ranger District. Confirmed lynx sightings have been infrequent on the IPNF, but include documented lynx presence in the American- Canuck LAU in the early 2000s and more recently in 2011. In addition, from 2010-2014, focused surveys detected five individual lynx on the North Zone. This includes three individuals in the Purcell Mountains, one in the Selkirks, and one in the west Cabinet Mountains (Lucid et al. 2016). The west Cabinet

individual was unintentionally captured, and later released fitted with a radio-collar, in the Twentymile Creek area of the Bonners Ferry Ranger District well south of the project area. These surveys also detected 18 lynx in the Purcells and one lynx in the west Cabinets that were not identifiable to individual. Despite the limited number of verifiable sightings in the area, lynx analysis units have been designated to serve as the fundamental units for measuring Canada lynx recovery. Therefore, within lynx analysis units, lynx presence is assumed and the appropriate management emphasized.

The DN states that the Camp Robin timber sale “may affect but would not adversely affect” Canada Lynx.” the Canada lynx. However the EA does not present adequate analysis of effects on lynx, rendering any assumption of insignificance without sufficient analytical basis.

The EA states the Camp Robin timber sale “would harvest up to 138 acres of lynx habitat in the Round Prairie Lynx Analysis Unit (LAU)...” It also states, “Lynx analysis units are not intended to represent actual lynx home ranges, but their scale approximates the size of a female lynx home range (USDA Forest Service 2007).”

The Forest Plan/NRLMD Amendment allows essentially the same level of industrial forest management activities which occurred prior to Canada lynx listing under the ESA. The EA discloses, “Under alternative 2 about 11.9 percent of lynx habitat in the Round Prairie Lynx Analysis Unit (Table 24) would be in a stand initiation (seedling- sapling) structural stage that does not yet provide winter snowshoe hare habitat.” Also, “Approximately 357 acres of burn only prescription would occur within the LAU however it is non-lynx habitat consisting of predominantly pole size Douglas-fir and lodgepole pine overstory with benches of mixed shrub and scree openings moving upslope toward the ridge. This burn is intended to enlarge these openings...”

The FS fails to consider, apply, and incorporate best available science and fails to demonstrate consistency with all Forest Plan/NRLMD direction, in violation of NFMA, NEPA, and the ESA. The project will result in unauthorized take as defined by Section 9 of the ESA. The FS has duties under the ESA, 16 U.S.C. Section 1531 *et seq.*, to ensure that its actions do not jeopardize threatened and endangered species, that their actions do not result in unauthorized take of these species of wildlife, and that their actions promote recovery of these species.

The Camp Robin EA does not include an analysis comparing the historic range of lynx habitat components with current conditions, rendering cumulative effects analysis inadequate.

Lynx subsist primarily on a prey base of snowshoe hare, and survival is highly dependent upon snowshoe hare habitat, where young trees and shrubs grow densely. In North America, the distribution and range of lynx is nearly coincident with that of snowshoe hares, and protection of snowshoe hares and their habitat is critical for conserving lynx.

Lynx are highly mobile and generally move long distances [greater than 60 mi. (100 km.)]; they disperse primarily when snowshoe hare populations decline; subadult lynx disperse even when prey is abundant, presumably to establish new home ranges; and lynx also make exploratory movements outside their home ranges. 74 Peg. Reg. at 8617.

Lynx winter habitat in older, multi-storied forests, is critical for lynx preservation. (Squires et al. 2010.) It is also reported that lynx winter habitat should be “abundant and spatially well-distributed across the landscape” (Squires et al. 2010; Squires 2009) and in heavily managed landscapes, retention and recruitment of lynx habitat should be a priority.

Squires and Ruggiero, 2007 found that “lynx in western Montana prey almost exclusively on snowshoe hares during the winter with little use of alternative prey. Thus, reductions in horizontal cover for hares would degrade lynx habitat.”

Prey availability for lynx is highest in the summer (Squires et al. 2013), however winter is the most constraining season for lynx in terms of resource use; starvation mortality has been found to be the most common during winter and early spring. (Squires et al. 2010.) Openings, whether small in uneven-aged management, or large with clearcutting, remove lynx winter travel habitat on the affected acres, since lynx avoid openings in the winter. (Id.) Existing openings such as clearcuts not yet recovered are likely to be avoided by lynx in the winter. (Id.; Squires et al. 2006a.)

Squires, et al., 2008 report that “Lynx generally denned in mature spruce–fir (*Picea–Abies*) forests with high horizontal cover and abundant coarse woody debris. Eighty percent of dens were in mature forest stands... Management actions that alter spruce–fir forests to a condition that is sparsely stocked (e.g., mechanically thinned) and with low canopy closure (,50%) would create forest conditions that are poorly suitable for lynx denning.”

The Lynx Conservation Assessment and Strategy (LCAS 2000) notes lynx prefer to move through continuous forest (1-4); lynx avoid large openings, either natural or created (1-4); opening and open forest areas wider than 650 feet may restrict lynx movement (2-3); large patches with low stem densities may be functionally similar to openings, and therefore lynx movement may be disrupted (2-4). Squires et al. 2006a reported that lynx tend to avoid sparse, open forests and forest stands dominated by small-diameter trees during the winter.

Kosterman, 2014 finds that 50% of lynx habitat must be mature undisturbed forest for it to be optimal lynx habitat where lynx can have reproductive success and no more than 15% of lynx habitat should be young clearcuts, i.e. trees under 4 inched dbh. Young regenerating forest should occur only on 10-15% of a female lynx home range, i.e. 10-15% of an LAU. This renders inadequate the agency’s assumption in the Forest Plan/NRLMD that 30% of lynx habitat can be open, and that no specific amount of mature forest needs to be conserved. Kosterman, 2014 demonstrates that Forest Plan/NRLMD standards are not adequate for lynx viability and recovery.

Other recent science also undermines the adequacy of the Forest Plan/NRLMD. The FS essentially assumes that persistent effects of vegetation manipulations other than regeneration logging and some “intermediate treatments” are essentially nil. However, Holbrook, et al., 2018 “used univariate analyses and hurdle regression models to evaluate the spatio-temporal factors influencing lynx use of treatments.” Their analyses “indicated ...there was a consistent cost in

that lynx use was low up to ~10 years after **all silvicultural actions.**” (Emphasis added.) From their conclusions:

First, we demonstrated that lynx clearly use silviculture treatments, but there is a ~10 year cost of implementing any treatment (thinning, selection cut, or regeneration cut) in terms of resource use by Canada lynx. This temporal cost is associated with lynx preferring advanced regenerating and mature structural stages (Squires et al., 2010; Holbrook et al., 2017a) and is consistent with previous work demonstrating a negative effect of precommercial thinning on snowshoe hare densities for ~10 years (Homyack et al., 2007). Second, if a treatment is implemented, Canada lynx used thinnings at a faster rate post-treatment (e.g., **~20 years posttreatment to reach 50% lynx use**) than either selection or regeneration cuts (e.g., **~34–40 years post-treatment to reach 50% lynx use**). Lynx appear to use regeneration and selection cuts similarly over time suggesting the difference in vegetation impact between these treatments made little difference concerning the potential impacts to lynx (Fig. 4c). Third, Canada lynx tend to avoid silvicultural treatments when a preferred structural stage (e.g., mature, multi-storied forest or advanced regeneration) is abundant in the surrounding landscape, which highlights the importance of considering landscape-level composition as well as recovery time. For instance, in an area with low amounts of mature forest in the neighborhood, lynx use of recovering silvicultural treatments would be higher versus treatments surrounded by an abundance of mature forest (e.g., Fig. 3b). This scenario captures the importance of post-treatment recovery for Canada lynx when the landscape context is generally composed of lower quality habitat. Overall, these three items emphasize that both the spatial arrangement and composition as well as recovery time are central to balancing silvicultural actions and Canada lynx conservation. (Emphases added.)

So Holbrook et al., 2018 fully contradict Forest Plan assumptions that clearcuts/regeneration can be considered useful lynx habitat as early as 20 years post-logging. This assumption plays out in the EA: “Treated stands are expected to begin to provide high quality lynx foraging (snowshoe hare) habitat within approximately 16 to 20 years following harvest...”

The FS erroneously assume clearcutting/regeneration logging have basically the same temporal effects as stand-replacing fire as far as lynx re-occupancy. Yet contradicting such Forest Plan/NRLMD assumptions are the results of a study by Vanbianchi et al., 2017, who found, “Lynx used burned areas as early as 1 year postfire, which is much earlier than the 2–4 decades postfire previously thought for this predator.”

Kosterman, 2014, Vanbianchi et al., 2017 and Holbrook, et al., 2018 each demonstrate Forest Plan/NRLMD direction is not adequate for lynx viability and recovery, as the FS assumes.

Squires et al. (2013) noted that long-term population recovery of lynx, as well as other species as the grizzly bear, require maintenance of short and long-distance connectivity. The importance of maintaining lynx linkage zones for landscape connectivity should be maintained to allow for movement and dispersal of lynx. Lynx avoid forest openings at small scales, however effects on connectivity from project-created or cumulative openings were not considered by the EA in terms of this smaller landscape scale. Connectivity between project area LAUs and adjacent LAUs was not analyzed or disclosed in the EA.

The allowance of “exemptions” from Forest Plan direction is another issue of scientific controversy. The NRLMD allows for reduction of lynx foraging habitat within the wildland-urban interface. The problem with this approach is, the boundary of the wildland-urban interface is a changing geographical feature independent of FS or USFWS influence. As explained in the Flathead NF’s Hungry Lion Draft DN Responses to comments, “The Flathead County CWPP ...identifies the wildland-urban interface (WUI) boundary for the area covered by the plan....” In other words, the area exempt from Forest Plan standards is potentially ever-growing along with human population and development, and may be changed at any time by Boundary County without any forest plan amendment, NEPA analysis, or ESA consultation.

The EA states, “The proposed mountain bike trail traverses habitat outside and inside of the Round Prairie LAU.” Yet the EA fails to properly analyze how much lynx habitat is affected by mountain bike travel, snowmobiles and other recreational activities. As the Kootenai NF’s Galton FEIS states, “The temporal occurrence of forest uses such as... winter (skiing and snowmobiling) ... may result in a temporary displacement of lynx use of that area...”

How the Canada lynx Environmental Baseline was quantified does not appear in the Camp Robin EA.

The EA states, “The Round Prairie Lynx Analysis Unit is an identified linkage area that may provide connectivity between the Purcell and Selkirk mountain ranges.” Yet no analysis examines the quality of habitat in that, or other linkage/connectivity areas.

Because the FS does not consider the best available science and for the reasons stated herein, the FS is unable to demonstrate it is managing consistent with NFMA, the Forest Plan and the ESA. The inadequacy of cumulative effects analysis violates NEPA.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies identified in our comments and in the above discussions

GRIZZLY BEAR

Objectors discussed the grizzly bear in our previous comments (pp. 22, 27-28, 39, 42, 72, 80). We supplement those comments with the following discussion.

Here in the Cabinet-Yaak Ecosystem (CYE), the population size is approximately half of the recovery goal of 100 bears (Kendall et al. 2016), with human-caused mortality being the primary factor keeping the population in peril. The precarious status of the population means the FS should genuinely “manage ...for grizzly bear habitat maintenance, improvement, and minimization of grizzly-human conflict” in Management Situation 1 area as the Recovery Plan intends. Instead, the FS prioritizes adverse and otherwise risky habitat modifications which hinder, rather than assist in recovery of this ESA-listed species.

Great Bear Foundation et al., 2009 discusses in great detail how the selected Access Amendment Alternative leads to a significant deterioration in an already unacceptable Baseline Condition for

grizzly bears. The scientific discussions in Great Bear Foundation et al. 2009, as well as AWR comments on the Access Amendment DSEIS refute the FS's claim to be utilizing the best available science for the grizzly bear.

The FS manages most of the habitat in the CYE, but instead of exercising its discretion to increase habitat security via substantial road reductions and minimizing industrial and motorized disturbance, the agency prefers to log, mine, and otherwise manipulate and disrupt the grizzly's habitat to the limits allowed by its already inadequate regulatory mechanisms. Since 2010, the FS:

- Declined the opportunity to select an Access Amendment alternative that would have provided a higher level of habitat protections for grizzly bears and for a whole host of other wildlife species;
- Continued to neglect its duty to identify the forestwide minimum road system under the Travel Management Rule Subpart A;
- Recommended a minimum of the inventoried roadless areas in the CYE Recovery Zone (RZ) for Wilderness in the RFP; and
- Approved more major timber sales and mining in the CYE RZ.

Such actions reveal a practice and pattern of failing to prioritize the needs of the grizzly bear within MS 1. The FS must undertake a full cumulative effects analysis that considers all management activities (public and private) in the CYE.

The FS refuses to recognize that the critically low population level means that research results cannot statistically validate its management direction. The agency should dump its reckless resource extraction paradigm and adopt an enlightened management philosophy based on the Precautionary Principle.¹

The EA fails to adequately analyze and disclose cumulative impacts on land of other ownerships due to their unknown duration, location, and intensity.

We incorporate Willcox, 2017 within this objection.

The FS fails to recognize that Bear Management Units (BMUs) do not protect enough habitat to satisfy most individual grizzly bears' needs in the CYE.

Merrill, 2003 states:

Our analysis shows that grizzly bears have little or no opportunity to select home ranges with lower road density or higher percentages of core... Because grizzly bears could not have selected home ranges having more core area and lower road densities, and there has been no growth in the population, there is no basis to conclude the proposed access standards are sufficient to insure the recovery of the Cabinet-Yaak and Selkirk grizzly bear populations.

¹ The **precautionary principle** or precautionary approach to risk management states that if an action or policy has a suspected risk of causing harm to the public or to the environment, in the absence of scientific consensus that the action or policy is not harmful, the burden of proof that it is *not* harmful falls on those taking an action. https://en.wikipedia.org/wiki/Precautionary_principle

The FS has no plan to provide scientifically defensible habitat protections outside the CYE RZ that would allow for a larger protected zone and/or natural augmentation from outside the RZ. The FS has no cogent methodology that provides scientifically defensible habitat protections inside the CYE RZ that would facilitate functional connectivity between and among BMUs.

The EA indicates recognition of the importance of the project area for grizzly bears has heightened in recent years:

The Camp Robin Project is largely within the Mission-Moyie Bears Outside of Recovery Zone (BORZ) area, which was expanded in 2016 (from 58,472 acres to approximately 87,175 acres) due to additional credible grizzly bear occurrences that have been documented since the Record of Decision was signed in 2011 for the Forest Plan Amendments for Motorized Access Management within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones (USDA Forest Service, 2011).

The EA states, “The project is within an area of recurring use adjacent to the Cabinet- Yaak Recovery Area and would result in changes to linear road miles.” The DN states the Camp Robin timber sale “may affect but would not adversely affect” grizzly bears. However the EA does not present adequate analysis of effects on grizzly bears, rendering any assumption of insignificance without sufficient analytical basis.

The EA discloses “Alternative 2 would temporarily increase linear road miles during project implementation but would reduce linear road miles long term in the Mission-Moyie BORZ area. ... Although short-term (during implementation) impacts may occur, long-term (after 8-10 years) improvements to grizzly bear forage in the BORZ would be realized.” That discussion is based upon the false assumption that likely or foreseeable management actions involving road construction over temporal scales has been adequately analyzed. It basically assumes the Camp Robin timber sale is the only management action that would occur in the cumulative effects analysis area; that the agency will not be planning for or conducting other management actions that increase, however “temporarily”, road or other motorized access in the next 8-10 years or during a reasonably foreseeably longer period. This is proven in that the EA fails to examine the ever-changing road/motorized access situation in the project area or BORZ in the recent past, even though the agency has data which describes that picture of motorized access. The EA discloses this ever-changing road situation:

Additionally, temporary road construction of about 13 miles would be required to implement alternative 2. About 6.5 miles of these temporary roads have existing prisms. Since none of these roads would be available to public use during implementation as per Access Amendment direction, they would not permanently increase linear road miles in the Mission-Moyie BORZ area.

As illustrated by the other ongoing and/or foreseeable timber projects in the BORZ and in adjacent areas, the implicit assumption of some post-project period of no management disturbance is not based on reality. The FS will be continuously disturbing the BORZ and the Access Amendment/Forest Plan allowance of this situation does not comply with NFMA, NEPA, and the ESA.

The EA claims, “Alternative 2 would reduce road miles in the BORZ area by placing approximately 4.7 miles of open roads, and 0.7 miles of currently restricted roads, into long-term storage.” Yet the fact that grizzly bears do not soon trust habitat improvements is also acknowledged: “improvements in habitat effectiveness may not occur in the short-term as it may take some time for avoidance behavior to change.” Furthermore, the FS proposes to increase recreational impacts—both motorized and non-motorized. “Alternative 2 would convert approximately 2.6 miles of U-roads and previously closed roads to motorized trails that accommodate OHV travel (off highway vehicles >50 inches wide).” And “Alternative 2 proposes the addition of approximately 4.1 miles of new mountain bike/hiker, non-motorized trail within the Mission-Moyie BORZ.” The FS excuses itself with rationale such as “this part of the District is already relatively roaded and the presence of grizzly bears in BORZ indicates that some bears have apparently acclimated to the conditions within them and, at least in the short term, are able to meet their needs and avoid human encounters resulting in mortality.”

Moreover, the EA does not disclose how effective road closures are for the purpose of eliminating human access behind the closures. Please see AWR’s Amended Complaint for case CV-18-67-DWM for the purposes of explaining how roads affect wildlife, how pervasive ineffective closures are on national forest land, and also for forest plan consultation requirements. The EA admits this is already a problem in the project area (“old road prism currently receiving some unauthorized OHV usage”) without providing a comprehensive analysis of how extensive such violations are in the project/cumulative effects analysis area.

The EA acknowledges “Ongoing timber harvest within the Mission-Moyie BORZ includes timber sales authorized under decisions for Hellroaring and Deer Creek projects.” Also, “North Zone Roadside Salvage proposes salvage of standing dead, down and live hazard trees on about 3,000 acres in the Mission-Moyie BORZ area.” Yet the EA fails to adequately quantify such cumulative effects.

Because the FS does not consider the best available science and for the reasons stated herein, the FS is unable to demonstrate the Camp Robin timber sale would be consistent with NFMA, the Forest Plan and the ESA. The inadequacy of the cumulative effects analysis violates NEPA.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies in our previous comments and in above discussions.

FISHER

Objectors discussed the fisher in our previous comments (pp. 14-16, 21, 72). We supplement those comments with the following discussion.

The EA acknowledges adverse impacts on fisher:

Alternative 2 proposes timber harvest on approximately 2,837 acres of capable fisher denning/resting habitat. This includes about 748 acres of seedtree harvest, 658 acres of shelterwood harvest, 10 acres of clearcut harvest, and about 243 acres of variable density thinning. Proposed regeneration harvest includes up to 240 acres in stands that provide potentially suitable fisher denning/resting habitat.

...Regeneration harvest of stands that are not currently suitable denning/resting habitat would similarly set them back to an earlier successional stage that would probably require between 50 and 100 years (depending upon how many residual green trees remain after harvest) to reach suitable condition.

...The proposed harvest treatments would create some additional fragmentation... Large openings (greater than 40 acres) proposed in alternative 2 resulting in loss of canopy cover would fragment fisher habitat, decrease connectivity among potentially suitable habitat patches, and may cause fisher to expend energy to circumvent openings.

The proposed mountain bike trail traverses an area that was identified as potentially suitable fisher habitat during a habitat review. ... fishers ...would be expected to move away from the trail when humans are present.

The FS provides no assurances that a viable population of fishers exists now in the IPNF, and fails to provide a proper cumulative effects analysis on fisher viability. The EA violates NEPA and NFMA.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies in our previous comments and in above discussions.

PINE MARTEN

Our previous comments at p. 16 asked:

Does the IPNF have a viable population of pine marten? Please disclose the FS's strategy and best available science for insuring viable populations of the pine marten, a species whose habitat is significantly altered by thinning and other active forest management (Moriarity et al., 2016; Bull and Blumton, 1999; Hargis et al., 1999 and Wasserman et al., 2012).

The EA and Wildlife Report fail to address the issue of marten habitat, in fact the FS ignored our comment entirely. The FS provides no assurances that a viable population of marten exists now in the IPNF, and fails to provide a proper cumulative effects analysis on marten viability. The EA violates NEPA and NFMA.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies in our previous comments and in above discussions.

NORTHERN GOSHAWK

Objectors discussed the northern goshawk in our previous comments (pp. 16-18). We supplement those comments with the following discussion.

The EA and failed to address the issue of northern goshawk habitat, in fact the FS entirely ignored our goshawk comment. The FS provides no assurances that a viable population of

northern goshawks exists now in the IPNF, and fails to provide a proper cumulative effects analysis on northern goshawk viability. The EA violates NEPA and NFMA.

The FS's Samson (2006) reports says that 110 breeding individuals (i.e. 55 pairs) are necessary for a viable goshawk population in R1. USDA Forest Service, 2005e is a map showing the results from the 2005 R1 region-wide goshawk survey using the FS's Woodbridge and Hargis goshawk monitoring protocol. That 2005 detection map says there were 40 detections in 2005 in Region 1. So the results of this survey essentially show that the population in Region 1 has not been viable according to the agency's own science (only 40 instead of 55). And some of the detections may have been individuals using the same nest, so the number of nests (and therefore number of breeding pairs) could be even lower than 40.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies in our previous comments and in above discussions.

BLACK-BACKED WOODPECKER

Objectors discussed the black-backed woodpecker in our previous comments (pp. 22-25, 42, 45, 71-72). We supplement those comments with the following discussion.

The Wildlife Report discloses that the Camp Robin timber sale "may impact individuals or habitat for ...black-backed woodpecker." Yet the EA presents no analysis at all for this species. The word "woodpecker" cannot even be found in the NEPA document (EA).

Please see Hanson Declaration, 2016 for an explanation of what a cumulative impact is with regard to the backed woodpecker, how the FS failed apply the best available science in their analysis of impacts to Black-backed Woodpeckers for a timber sale, why FS's (including Samson's) reports are inaccurate and outdated, and why FS's reliance on them results in an improper minimization of adverse effects and cumulative impacts to black-backed woodpeckers with regard to the agency's population viability assessment.

In the Sierra Nevada, Black-backed Woodpeckers preferentially foraged in severely burned stands with larger snags and higher snag densities (Hanson and North 2008).

Bond et al., 2012a explain the need for a conservation strategy for the black-backed woodpecker: In California, the Black-backed Woodpecker's strong association with recently burned forest, a habitat that is ephemeral, spatially restricted, and often greatly modified by post-fire logging, as well as the species' relative rarity, may make the woodpecker vulnerable to declines in the state. Additionally, Black-backed Woodpeckers in California are affected by the management of unburned forests – both because pre-fire stand conditions affect the suitability of post-fire habitat for the species, and because a substantial proportion of California's Black-backed Woodpeckers nest and forage at a low population density in unburned forests. Conserving the Black-backed Woodpecker in California likely requires appropriate management and stewardship of the habitat where this species reaches its highest density – recently burned forest – as well as appropriate management of 'green' forests that have not burned recently.

The Boise National Forest adopted the black-backed woodpecker as a management indicator species (MIS) in its revised forest plan in 2010:

The black-backed woodpecker depends on fire landscapes and other large-scale forest disturbances (Caton 1996; Goggans et al. 1988; Hoffman 1997; Hutto 1995; Marshall 1992; Saab and Dudley 1998). It is an irruptive species, opportunistically foraging on outbreaks of wood-boring beetles following drastic changes in forest structure and composition resulting from fires or uncharacteristically high density forests (Baldwin 1968; Blackford 1955; Dixon and Saab 2000; Goggans et al. 1988; Lester 1980). Dense, unburned, old forest with high levels of snags and logs are also important habitat for this species, particularly for managing habitat over time in a well-distributed manner. These areas provide places for low levels of breeding birds but also provide opportunity for future disturbances, such as wildfire or insect and disease outbreaks (Dixon and Saab 2000; Hoyt and Hannon 2002; Hutto and Hanson 2009; Tremblay et al. 2009). Habitat that supports this species' persistence benefits other species dependent on forest systems that develop with fire and insect and disease disturbance processes. The black-backed woodpecker is a secondary consumer of terrestrial invertebrates and a primary cavity nester. Population levels of black-backed woodpeckers are often synchronous with insect outbreaks, and targeted feeding by this species can control or depress such outbreaks (O'Neil et al. 2001). The species physically fragments standing and logs by its foraging and nesting behavior (Marcot 1997; O'Neil et al. 2001). These KEFs influence habitat elements used by other species in the ecosystem. Important habitat elements (KECs) of this species are an association with medium size snags and live trees with heart rot. Fire can also benefit this species by stimulating outbreaks of bark beetle, an important food source. Black-backed woodpecker populations typically peak in the first 3–5 years after a fire. This species' restricted diet renders it vulnerable to the effects of fire suppression and to post-fire salvage logging in its habitat (Dixon and Saab 2000).

... Black-backed woodpeckers are proposed as an MIS because of their association with high numbers of snags in disturbed forests, use of late-seral old forest conditions, and relationship with beetle outbreaks in the years immediately following fire or insect or disease outbreaks. Management activities, such as salvage logging, timber harvest, and firewood collection, can affect KEFs this species performs or KECs associated with this species, and therefore **its role as an MIS would allow the Forest to monitor and evaluate the effects of management activities on identified forest communities and wildlife species.** (Emphasis added.)

The FS provides no assurances that a viable population of black-backed woodpeckers exists in the IPNF, and fails to provide a proper cumulative effects analysis on black-backed woodpecker viability. The EA violates NEPA and NFMA.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies in our previous comments and in above discussions.

PILEATED WOODPECKER

Objectors discussed the pileated woodpecker in our previous comments (pp. 10, 18-20, 71). We supplement those comments with the following discussion.

Despite our extensive comments regarding the pileated woodpecker, the word “woodpecker” cannot even be found in the EA.

Bull et al. 2007 represents over 30 years of investigation into the effects of logging on the pileated woodpecker and is recent research information on such effects.

The 1987 Forest Plan’s old-growth standards were largely built around the habitat needs of its indicator species, the pileated woodpecker. Bull and Holthausen 1993, provide field tested management guidelines. They recommend that approximately 25% of the home range be old growth and 50% be mature forest.

The FS’s Vizcarra, 2017 notes that researchers “see the critical role that mixed-severity fires play in providing enough snags for cavity-dependent species. Low-severity prescribed fires often do not kill trees and create snags for the birds.”

On the same subject, Hutto 2006, notes from the scientific literature: “The most valuable wildlife snags in green-tree forests are relatively large, as evidenced by the disproportionate number of cavities in larger snags (Lehmkuhl et al. 2003), and are relatively deteriorated (Drapeau et al. 2002).”

The FS provides no assurances that a viable population of pileated woodpeckers exists now in the IPNF, and fails to provide a proper cumulative effects analysis on pileated woodpecker viability. The EA violates NEPA and NFMA.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies in our previous comments and in above discussions.

WOLVERINE

Objectors discussed the wolverine in our previous comments (pp. 20-22, 72). Despite our comments about the wolverine and the fact that Wildlife Report admits the Camp Robin timber sale “could potentially affect ...North American wolverine” the EA presents no analysis at all for this species.

In its Order dated 4/4/16, the U.S. District Court of Montana ruled: “The United States Fish & Wildlife Service's Withdrawal of its Proposed Rule to list the distinct population segment of the North American wolverine occurring in the contiguous United States as a threatened species under the Endangered Species Act, 79 Fed. Reg. 47,522 (Aug. 13, 2014), is hereby VACATED.” Therefore the status of the wolverine is proposed for listing under the ESA, and the FS must undergo formal consultation with the U.S. Fish & Wildlife Service

Results from Scrafford et al., 2018 “show that roads, regardless of traffic volume, reduce the quality of wolverine habitats and that higher-traffic roads might be most deleterious. We suggest that wildlife behavior near roads should be viewed as a continuum and that accurate modeling of behavior when near roads requires quantification of both movement and habitat selection. Mitigating the effects of roads on wolverines would require clustering roads, road closures, or access management.”

The FS provides no assurances that a viable population of wolverine exists now in the IPNF, and fails to provide a proper cumulative effects analysis on wolverine viability. The EA violates NEPA and NFMA.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies in our previous comments and in above discussions.

WESTERN (BOREAL) TOAD

Objectors discussed the boreal toad in our previous comments (pp. 13-14, 72). We supplement those comments with the following discussion.

Despite our comments and the fact that the Wildlife Report admits the Camp Robin timber sale “may impact individuals or habitat for ...western toad” the EA presents no analysis at all for this species.

The FS has no scientifically-based viability strategy for this Sensitive species, no metrics for describing the quantity and quality of habitat need to assure viability, and no way of quantifying cumulative effects. USDA Forest Service, 2011c states:

According to historical records, the western (boreal) toad ... was widely distributed and very common in Montana and other western states, but the species may have undergone severe population decreases in the past 25 years (Currim 1996).

The FS doesn’t really know why western toad populations have declined so drastically, except that it is associated with activities such as those approved by the Camp Robin DN: “Timber harvest, increased vehicle use, road maintenance, and road construction may kill individual adult and juvenile boreal toads using upland habitats.” (USDA Forest Service, 2011c at 3-304.)

The Lolo NF’s Sunrise Fire Salvage EA states, “The critical factor in whether toads can exploit open habitats appears to be the presence of adequate retreat sites [refugia] where toads can escape predators and maintain water balance (Guscio et al. (2007).” The EA doesn’t consider this science.

The FS provides no assurances that a viable population of boreal toads exists now in the IPNF, and fails to provide a proper cumulative effects analysis on boreal toad viability. The EA violates NEPA and NFMA.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies in our previous comments and in above discussions.

ELK AND OTHER BIG GAME

Objectors discussed elk in our previous comments (pp. 28-29, 70, 71, 72, 81). We supplement those comments with the following discussion.

The EA does not present an adequate quantitative or qualitative analysis of security and thermal cover.

The science is clear that motorized access via trail, road, or oversnow adversely impact habitat for the elk. Servheen, et al., 1997 indicate that motorized trails increase elk vulnerability and reduce habitat effectiveness, and provide scientific management recommendations.

Also, Ranglack, et al. 2017 investigated habitat selection during archery and rifle hunting seasons.

The EA fails to provide a proper cumulative effects analysis of elk and big game species habitat, and does not demonstrate consistency with forest plan direction. The EA violates NEPA and NFMA.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies in our previous comments and in above discussions.

OLD GROWTH

Our previous comments discussed old growth extensively (pp. 10-13, 44, 69, 72-75, 79; also regarding the old-growth associated pileated woodpecker, fisher, northern goshawk, pine marten).

Our comments asked, “Please provide an **estimate** of how much old growth in the Camp Robin project area has been destroyed by logging. What is the HRV for old growth forestwide?” The FS avoids making even an estimate of forestwide amount and distribution of old-growth habitat in terms of the HRV

In reality, the FS only uses as criteria the minimum number of trees per acre of a specific diameter and age for each type of Green et al old growth. That’s it.

The FS doesn’t explain why it uses estimates of the same or similar parameters (how many trees per acre over a certain diameter, the total stand density, the forest type...) to make estimates of the HRVs upon which Forest Plan Desired Conditions are based, which in turn are what wildlife habitat coarse screening—and therefore viability determinations—are based.

On one hand the FS throws up its hands and says it doesn’t have enough data to make any historic estimates on the quality of habitat which sustained old-growth associated wildlife prior to management, and on the other hand assumes these species will remain viable based upon

amounts of forest stands that fall within size classes which have no demonstrable scientific or biological connection to old-growth associated wildlife.

This implausible reality the FS wants to believe under the new Forest Plan is being foisted onto old-growth associated wildlife and the public who happen to prefer seeing wildlife more than clearcuts.

Gautreaux, 1999 states:

...research in Idaho (Lesica 1995) of stands in Fire Group 4, estimated that over 37% of the dry Douglas-fir type was in an old growth structural stage (>200 years) prior to European settlement, approximately the mid 1800's.

Based on research of Fire Group 6 in northwest Montana (Lesica 1995) it was estimated that 34% of the moist Douglas-fir type was in an old growth structural stage (>200 yrs.) prior to European settlement, approximately the mid 1800's.

Based on fire history research in Fire Group 11 for northern Idaho and western Montana (Lesica, 1995) it was estimated that an average of 26% of the grand fir, cedar, and hemlock cover types were in an old growth structural stage prior to European settlement.

...fire history research in Fire Group 9 for northern Idaho and western Montana (Lesica, 1995) estimated that 19-37% of the moist lower subalpine cover types were in an old growth structural stage (trees > 200 yrs.) prior to European settlement. While this estimate is lower than suggested by Losensky's research...

Lesica found an estimated 18% of the cool lodgepole pine sites was in an old growth structural stage (>200 years) prior to European settlement, approximately the mid 1800's. ... This same research in Fire Group 8 in drier, lower subalpine types of Montana had over 25% of the stands in an old growth structural stage during the same historical period.

Also, Lesica (1996) states, "Results of this study and numerous fire-history studies suggest that **old growth occupied 20-50% of many pre-settlement forest ecosystems in the Northern Rockies.**" (Emphasis added.) Lesica, 1996 (also cited in Gautreaux, 1999) stated forest plan standards of maintaining approximately 10% of forests as old-growth in the Northern Region **may extirpate some species.** This is based on his estimate that 20-50% of low and many mid-elevation forests were in old-growth condition prior to European settlement. This should be considered some of the best science on historic range of old growth necessary for insuring viability of old-growth associated species.

The EA doesn't disclose its criteria for classifying stands into size classes. The FS apparently wants its habitat quality assessments and criteria to remain vague and opaque to the public. This is the definition of arbitrary and capricious.

After forest plan revision the IPNF has greatly weakened protections for old growth, and in fact the Forest Plan provides direction for logging old growth that lacks scientific support. USDA Forest Service, 1987b contains a list of "species ... (which) find optimum habitat in the "old"

successional stage...” USDA Forest Service, 1990a states that “we’ve recognized its (old growth) importance for vegetative diversity and the maintenance of some wildlife species that depend on it for all or part of their habitat.” USDA Forest Service 1987a, and USDA Forest Service 1987b also provides biological information concerning old growth and old-growth associated wildlife species.

The FS provides no assurances that a viable population of old growth associated species exists now in the IPNF, and fails to provide a proper cumulative effects analysis of population viability. The EA violates NEPA and NFMA.

Hutto, et al., 2014 set out to understand the ecological effects of forest restoration treatments on several old-growth forest stands in the Flathead National Forest. They found:

Relative abundances of only a few bird species changed significantly as a result of restoration treatments, and these changes were characterized largely by **declines in the abundances of a few species associated with more mesic, dense-forest conditions, and not by increases in the abundances of species associated with more xeric, old-growth reference stand conditions.** (Emphasis added.)

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies in our previous comments and in above discussions.

SNAGS

Our previous comments discussed snags extensively (pp. 5, 8-10, 12, 13, 19, 42, 44-45; also regarding several wildlife species).

Our previous comments were critical of forest plan direction for desired amounts of snags, that this is not supported by reliable historic data taken from IPNF surveys or scientific research (pp. 8-10, 13). The EA was non responsive to those comments.

Bate et al. (2007), found that snag numbers were lower adjacent to roads due to removal for safety considerations, removal as firewood, and other management activities. Other literature has also indicated the potential for reduced snag abundance along roads (Wisdom et al. 2000).

Dudley & Vallauri, 2004 state:

Up to a third of European forest species depend on veteran trees and deadwood for their survival. Deadwood is providing habitat, shelter and food source for birds, bats and other mammals and is particularly important for the less visible majority of forest dwelling species: insects, especially beetles, fungi and lichens. Deadwood and its biodiversity also play a key role for sustaining forest productivity and environmental services such as stabilising forests and storing carbon.

Despite its enormous importance, deadwood is now at a critically low level in many European countries, mainly due to inappropriate management practices in commercial forests and even in protected areas. Average forests in Europe have less than 5 per cent of the deadwood expected in natural conditions. The removal of decaying timber from the

forest is one of the main threats to the survival of nearly a third of forest dwelling species and is directly connected to the long red list of endangered species. Increasing the amounts of deadwood in managed forests and allowing natural dynamics in forest protected areas would be major contributions in sustaining Europe's biodiversity.

For generations, people have looked on deadwood as something to be removed from forests, either to use as fuel, or simply as a necessary part of "correct" forest management. Dead trees are supposed to harbour disease and even veteran trees are often regarded as a sign that a forest is being poorly managed. Breaking up these myths will be essential to preserve healthy forest ecosystems and the environmental services they provide.

In international and European political processes, deadwood is increasingly being accepted as a key indicator of naturalness in forest ecosystems. Governments which have recognised the need to preserve the range of forest values and are committed to these processes can help reverse the current decline in forest biodiversity. This can be done by including deadwood in national biodiversity and forest strategies, monitoring deadwood, removing perverse subsidies that pay for its undifferentiated removal, introducing supportive legislation and raising awareness.

The FS provides no assurances that a viable population of snag dependent species exists now in the IPNF, and fails to provide a proper cumulative effects analysis of population viability. The EA violates NEPA and NFMA.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the legal, scientific and analytical deficiencies in our previous comments and in above discussions.

VEGETATION AND NATURAL PROCESSES

AWR discussed vegetation as relating to natural processes in our previous comments (pp. 5-8, 43). We supplement those comments with the following discussion.

Portraying the proposal as “restoration” is disingenuous—this project is all about tree farming for timber production. One of the touted “restoration” benefits is to increase the growth rate of the remaining trees, as if having large trees on the landscape for ecological benefits is the FS’s long term priority. Yet we find no plan that designates specific areas as recruitment old growth—for retention of any specified number of large trees across a wide landscape for an extended period of time into the future. Even the non-commercial treatments are largely tailored to maximize wood production.

See “Foresters and ecologists see forests differently” for a description of the huge difference between the Industrial Forestry worldview as demonstrated by the FS and an ecological perspective.

“Restoration” under this project will be too much focused on replacing the dynamic natural process that wildland fire provides with logging and other mechanical vegetation manipulations intended to create static structural conditions. This invokes the scenario of a never-ending cycle

of “fuel reduction” followed by fire suppression, necessitating later fuel reduction and more fire suppression... The FS has never analyzed and disclosed the economic and ecological costs of its perpetual manipulate-and-control management regime.

The FS fails to provide a definition of “increasing resilience” which includes metrics for valid and reliable measurement. This term, “resilience” is relied upon heavily by the FS to claim management actions are “moving toward” Forest Plan “Desired Conditions” but it is not supported by science. The EA also has no scientific basis for its claims that proposed vegetation “treatments” will result in sustainable vegetation conditions under likely climate change scenarios.

The FS defends its use of Historic Range of Variability (HRV) for vegetative conditions as being relevant for project or forest plan Desired Conditions (DCs), but there are many unexamined cumulative effects of the FS’s chosen way of achieving those DCs or the HRV—which is to manipulate the habitat using heavy-handed industrial activities. The EA simply does not view ecological damage through the same lens as it does for vegetative conditions HRVs.

Hayward, 1994 states:

Despite increased interest in historical ecology, scientific understanding of the historic abundance and distribution of montane conifer forests in the western United States is not sufficient to indicate how current patterns compare to the past. In particular, knowledge of patterns in distribution and abundance of older age classes of these forests is not available. ...Current efforts to put management impacts into a historic context seem to focus almost exclusively on what amounts to a snapshot of vegetation history—a documentation of forest conditions near the time when European settlers first began to impact forest structure. ...The value of the historic information lies in the perspective it can provide on the potential variation... I do not believe that historical ecology, emphasizing static conditions in recent times, say 100 years ago, will provide the complete picture needed to place present conditions in a proper historic context. Conditions immediately prior to industrial development may have been extraordinary compared to the past 1,000 years or more. Using forest conditions in the 1800s as a baseline, then, could provide a false impression if the baseline is considered a goal to strive toward.

Frissell and Bayles (1996) ask:

From the point of view of many aquatic species, the range of natural variability at any one site would doubtless include local extirpation. At the scale of a large river basin, management could remain well within such natural extremes and we would still face severe degradation of natural resource and possible extinction of species (Rhodes et al., 1994). The missing element in this concept is the landscape-scale *pattern* of occurrence of extreme conditions, and patterns over space and time of recovery from such stressed states. How long did ecosystems spend in extreme states vs. intermediate or mean states? Were extremes chronologically correlated among adjacent basins, or did asynchrony of landscape disturbances provide for large-scale refugia for persistence and recolonization of native species? These are critical questions that are not well addressed under the concept of range of natural variability as it has been framed to date by managers.

...The concept of range of natural variability also suffers from its failure to provide defensible criteria about **which factors ranges should be measured**. Proponents of the concept assume that a finite set of variables can be used to define the range of ecosystem behaviors, when ecological science strongly indicates many diverse factors can control and limit biota and natural resource productivity, often in complex, interacting, surprising, and species-specific and time-variant ways. **Any simple index for measuring the range of variation will likely exclude some physical and biotic dimensions important for the maintenance of ecological integrity and native species diversity.** (Emphases added.)

If Desired Conditions must be maintained through repeated management/manipulation the management paradigm would be at odds with natural **processes**—the real drivers of the ecosystem. McClelland (undated) criticizes the aim to achieve desired conditions by the use of mitigation measures calling for retention of specific numbers of certain habitat structures:

The snags per acre approach is not a long-term answer because it **concentrates on the products of ecosystem processes rather than the processes themselves**. It does not address the most critical issue—long-term perpetuation of diverse forest habitats, a mosaic pattern which includes stands of old-growth larch. **The processes that produce suitable habitat must be retained or reinstated by managers. Snags are the result of these processes** (fire, insects, disease, flooding, lightning, etc.). (Emphases added.)

Dimensions that create significant adverse impacts on native species diversity include those not historically not found in nature, including road densities, edge effects due to logged openings, noxious weeds and other invasive species, livestock, compacted and otherwise productivity-deficient soil conditions, and many human-caused fires.

Biologist Roger Payne has the following to say about the same kind of hubris represented by the FS's view that it can manipulate and control its way to a restored forest using intensive industrial management:

One often hears that because humanity's impact has become so great, the rest of life on this planet now relies on us for its succession and that we are going to have to get used to managing natural systems in the future—the idea being that since we now threaten everything on earth we must take responsibility for holding the fate of everything in our hands. This bespeaks a form of unreality that takes my breath away... The cost of just finding out enough about the environment to become proper stewards of it—to say nothing of the costs of acting in such a way as to ameliorate serious problems we already understand, as well as problems about which we haven't a clue—is utterly prohibitive. And the fact that monitoring must proceed indefinitely means that on economic grounds alone the only possible way to proceed is to face the fact that by far the cheapest means of continuing life on earth as we know it is to **curb ourselves instead of trying to take on the proper management of the ecosystems we have so entirely disrupted**.

(Payne 1995, emphasis added.) Not accompanying all the EA's hypothetical promises of improving nature are any acknowledgments of the potential or degree of unintended side effects that pose risk or present likely damage to some other composition, structure, or function of the ecosystem. Regarding this characteristic agency hubris, Frissell and Bayles (1996) comment:

Most philosophies and approaches for ecosystem management put forward to date are limited (perhaps doomed) by a failure to acknowledge and rationally address the overriding problems of uncertainty and ignorance about the mechanisms by which complex ecosystems respond to human actions. They lack humility and historical perspective about science and about our past failures in management. They still implicitly subscribe to the scientifically discredited illusion that humans are fully in control of an ecosystemic machine and can foresee and manipulate all the possible consequences of particular actions while deliberately altering the ecosystem to produce only predictable, optimized and socially desirable outputs. Moreover, despite our well-demonstrated inability to prescribe and forge institutional arrangements capable of successfully implementing the principles and practice of integrated ecosystem management over a sustained time frame and at sufficiently large spatial scales, would-be ecosystem managers have neglected to acknowledge and critically analyze past institutional and policy failures. They say we need ecosystem management because public opinion has changed, neglecting the obvious point that public opinion has been shaped by the glowing promises of past managers and by their clear and spectacular failure to deliver on such promises.

Karr (1991) cites a definition of ecological integrity as “the ability to support and maintain “a balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region.” Karr (1991) also cites a definition of ecological health: “a biological system ... can be considered healthy when its inherent potential is realized, its condition is stable, its capacity for self-repair when perturbed is preserved, and **minimal external support for management is needed.**” (Emphasis added.) The EA definition of resilience misses that last aspect of ecological health—specifically that it doesn’t need management meddling.

Likewise Angermeier and Karr (1994) describe biological integrity as referring to “conditions under little or no influence from human actions; a biota with high integrity reflects natural evolutionary and biogeographic processes.”

A plethora of scientific evidence suggest that “Desired Conditions” be more properly stated in terms of **desired future dynamics**, much in line with evolving science.

The EA analysis includes such statements that value trees that better resist insects and disease. The EA does not reconcile such statements with the following best available science concerning forests:

“(A)tributes such as decadence, dead trees ...are important...” (Green et al., 1992).

“Accumulations of large-size dead standing and fallen trees that are high relative to earlier stages.” (Id.)

“Decadence in the form of broken or deformed tops or bole and root decay.” (Id.)

“The big trees were subsidizing the young ones through the fungal networks. Without this helping hand, most of the seedlings wouldn’t make it.” (Suzanne Simard:
<http://www.ecology.com/2012/10/08/trees-communicate/>)

“Disrupting network links by reducing diversity of mycorrhizal fungi... can reduce tree seedling survivorship or growth (Simard et al, 1997a; Teste et al., 2009), ultimately

affecting recruitment of old-growth trees that provide habitat for cavity nesting birds and mammals and thus dispersed seed for future generations of trees.” (Simard et al., 2013.) (Also see the YouTube video “Mother Tree” embedded within the Suzanne Simard “Trees Communicate” webpage at: <https://www.youtube.com/watch?v=-8SORM4dYG8&feature=youtu.be>) and also this one on the “Wood Wide Web” on Facebook: <https://www.facebook.com/BBCRadio4/videos/2037295016289614/>.

Gorzelak et al., 2015:

...found that the behavioural changes in ectomycorrhizal plants depend on environmental cues, the identity of the plant neighbour and the characteristics of the (mycorrhizal network). The hierarchical integration of this phenomenon with other biological networks at broader scales in forest ecosystems, and the consequences we have observed when it is interrupted, indicate that underground “tree talk” is a foundational process in the complex adaptive nature of forest ecosystems.

Also see: “Trees Talk to Each Other in a Language We Can Learn, Ecologist Claims”.

The scientists involved in research on ectomycorrhizal networks have discovered connectedness, communication, and cooperation between trees, traditionally viewed as separate competing organisms. Such connectedness is usually studied within single organisms, such as the interconnections in humans among neurons, sensory organs, glands, muscles, other organs, etc. necessary for individual survival. The tree farmers writing the Camp Robin EA fail to consider the ecosystem impacts from industrial management activities on this mycorrhizal network—or even acknowledge they exist. The industrial forestry management paradigm destroys what it refuses to see.

Remedy: Select the No Action Alternative. Otherwise, prepare an EIS that addresses the analytical and scientific issues identified in comments and in above discussions.

SOILS

AWR discussed Soils quite extensively in previous comments (pp. 53-67).

The EA states:

There are signs of activity in many units, but only 2 units (27 and 54) are currently estimated to exceed threshold levels of detrimental disturbance (Soils Report p. 20).

Seven other units are projected to reach the upper edge of the threshold. These units are 2, 18, 19, 42, 45, 49, and 51. The two units that exceed the 15% threshold have existing road prisms that are not part of the transportation system.

The EA states that “Allowing for a short term increase in detrimental soil disturbance in order to remove several existing non-system road prisms would result in beneficial gains to hydrologic and ecosystem functions.” However, the FS cites no studies or follow-up monitoring that

indicates any site² meeting detrimental soil disturbance (DSD) criteria have been remediated as the EA claims.

The Camp Robin EA does not adequately demonstrate project consistency with Forest Plan or Region 1 Soil Quality Standards (SQS) and the EA does not provide sufficient disclosure of the limitations of its DSD methodology.

The EA doesn't provide enough detail to indicate the thoroughness of the surveys, including whether all sources of DSD were inventoried. Geist et al., 1990 describe a methodology using a sampling grid, and they demonstrate that taking bulk soil density samples is quite feasible. This is necessary because deep, not necessarily visible subsurface compaction has been detected long after logging activities (e.g. Page-Dumroese, 1993).

Craigg and Howes (in Page-Dumroese, et al. 2007) state:

Meaningful soil disturbance standards or objectives must be based on measured and documented relationships between the degree of soil disturbance and subsequent tree growth, forage yield, or sediment production. Studies designed to determine these relationships are commonly carried out as part of controlled and replicated research projects. The paucity of such information has caused problems in determining threshold levels for, or defining when, detrimental soil disturbance exists; and in determining how much disturbance can be tolerated on a given area of land before unacceptable changes in soil function (productive potential or hydrologic response) occur. Given natural variability of soil properties across the landscape, a single set of standards for assessing detrimental disturbance seems inappropriate.

Craigg and Howes (in Page-Dumroese, et al. 2007) state:

Each soil has inherent physical, chemical, and biological properties that affect its ability to *function* as a medium for plant growth, to regulate and partition water flow, or to serve as an effective environmental filter. When any or a combination of these inherent factors is altered to a point where a soil can no longer *function* at its maximum *potential* for any of these purposes, then its quality or health is said to be reduced or impaired (Larson and Pierce 1991).

Page-Dumroese, et al., 2007 discuss wildly variable results of different soil compaction instruments, which indicates the FS must explain the limitations of the compaction survey methodology. Merely used a shovel test for determining compaction, without providing a scientific basis for its accuracy or validity, is arbitrary and capricious.

Recent research reveals even more profound biological properties of forest soil. “(R)esource fluxes through ectomycorrhizal (EM) networks are sufficiently large in some cases to facilitate plant establishment and growth. Resource fluxes through EM networks may thus serve as a method for interactions and cross-scale feedbacks for development of communities, consistent with complex adaptive system theory.” (Simard et al., 2015.) The FS has never considered how management-induced damage to EM networks causes site productivity reductions.

² Such as a single plot location detrimentally compacted that later is found to be not detrimentally compacted following active remediation.

Amaranthus, Trappe, and Molina (in Perry, et al., 1989a) recognize “mycorrhizal fungus populations may serve as indicators of the health and vigor of other associated beneficial organisms. Mycorrhizae provide a biological substrate for other microbial processes.”

Remedy: Select the No Action Alternative. Otherwise, prepare an EIS that addresses the analytical and scientific issues identified in previous comments and in above discussion.

NOXIOUS WEEDS

Objectors discussed noxious weeds in previous comments (pp. 3, 44, 66, 80). We supplement those comments with the following discussion.

The Camp Robin EA does not disclose the degree to which the productivity of the land and soil has been affected in the project area and forestwide due to noxious weed infestations, and how that situation is expected to change in the coming years and decades. The EA lacks analysis of the effectiveness of the forestwide noxious weed treatment program. The Bonners Ferry Noxious Weeds EIS and IPNF noxious weed treatment programs are mitigation for management activities which exacerbate the spread of noxious weeds. The EA fails to disclose the effectiveness of these mitigations. The Lolo NF’s Jam Cracker EA states:

Any activity that exposes soil has the potential to accelerate weed spread. Factors limiting weed spread are shade from tree canopies, higher soil moisture, needle and grass litter that provides a mulch-like covering of the ground, lack of exposed soil, and native plant competition.

USDA Forest Service, 2015a indicates:

Infestations of weeds can have wide-ranging effects. They can impact soil properties such as erosion rate, soil chemistry, organic matter content, and water infiltration. Noxious weed invasions can alter native plant communities and nutrient cycles, reduce wildlife and livestock forage, modify fire regimes, alter the effects of flood events, and influence other disturbance processes (S-16). As a result, values such as soil productivity, wildlife habitat, watershed stability, and water quality often deteriorate.

Alternative 2 activities will worsen the noxious weed spread in the project area, and even if post-disturbance treatments are implemented, their uncertain efficacy means that the project will significantly increase noxious weed occurrence.

Controlling noxious weeds and preventing their spread is a huge issue that the FS does not have a grip on. Current methods are obviously not working, weeds spread on forest roads, in cutting units, landings, burn piles, and onto private property. The best way to prevent weeds from spreading out of control is not to disturb the soil and native vegetation.

The selected alternative would carry the highest risk of weed introduction, spread, establishment, and persistence due to more soil disturbance, as well as travel through infestations, proximity to known infestations and increasing available direct sunlight in the road corridors.

The EA fails to present any numerical estimate of noxious weed infestations in the project area. There appears to be no on-the-ground survey data.

The Fisheries Report states:

(W)e felt it would be worthwhile to move away from the requirements of the 1995 Bonners Ferry Noxious Weeds EIS and transition to an herbicide that is safer to the environment and would allow more effective use.”

Weed treatments on the Bonners Ferry Ranger District are typically conducted according to the guidelines, priorities, approved herbicides, methods, and required BMPs established in the Bonners Ferry Noxious Weeds EIS (USDA 1995). However, for the CRP, we are proposing to use a newer herbicide, aminopyralid, which can be used more effectively and is safer for aquatic environments, but was not covered in the original Weeds EIS.

Yet the IPNF is “moving away from the requirements of the ...Weed EIS” using improper NEPA—the Camp Robin EA. An EIS is required.

Remedy: Select the No Action Alternative. Otherwise, prepare an EIS that addresses the analytical and scientific issues identified in EA comments and in above discussions.

WATER QUALITY, RIPARIAN AND AQUATIC HABITAT

AWR discussed these issues in our previous comments (p. 1-2, 50-59, 60, 66 68) and as well in where those comments discussed relevant Revised Forest Plan direction. We also incorporate this objection section on TRAVEL MANAGEMENT, ACCESS AND RECREATION, and we also supplement with the following.

The EA (and specialist reports on hydrology and fisheries) reach broad, sweeping conclusions of no significant impacts based on analyses that cite little or no supporting data. The assurances are not based upon adequate analysis in any case, and appear to be weak justifications for “no impacts” conclusions made before any hard look is actually taken. The EA also fails to state all the relevant forest plan direction and demonstrate project compliance with it.

There is no accounting for the chronic sediment impacts of having the road and travel system on the landscape. Despite loads of scientific evidence of the damage inflicted upon streams and aquatic habitat of such a “press” regime, the EA and reports downplay and brush aside such possibilities and indeed, take no critical look at all. The FS basically pretends it can have its cake and eat it too.

The EA and reports fail to report any numbers/estimates for the sediment generated by soil-disturbing project activities alone, instead jumping to estimates based on assumptions of overall reductions due to restoration and mitigation. The EA thus masks the true impacts of the industrial activities approved by the DN.

For example, from the Watersheds, Hydrology and Aquatic Resources section:

Activity generated sediment delivery to project area streams is expected to be minimal, site specific, short term and almost solely related to the proposed road management. Long term, the likelihood of large sources of sediment reaching streams or wetlands/peatland would be reduced under alternative 2 because several current and potential erosion and delivery sources would be remedied (Hydrology Report, pp 38-49).

What is meant by “minimal, site specific, (and) short term” is not explained.

Some sediment generating actions are dismissed altogether, with inaccurate claims, such as “Alternatives 2 proposes to construct 6.49 miles of temporary road on existing road prisms **causing no new ground disturbance.**” (Emphasis added.)

Then there are vague, self-contradictory disclosures such as: “the **vast majority** (~6.5 miles) of this temporary road would not be near streams and would **mostly** be located near ridges or at mid slope away from riparian areas.” Impacts of the exceptions to those “mostly” etc. claims are not disclosed.

The EA states, “Sediment modeling data in addition to research studies and monitoring results conducted on the Idaho Panhandle National Forests verify that when riparian habitat conservation areas are incorporated into timber sales, sediment delivery to stream channels is not measurable or is negligible (Reid and Hilton 1988; Belt et al. 1992; USDA Forest Service 2000b).” The EA is citing very old sources; the most recent being the Forest Plan Monitoring and Evaluation Report published in 2000. But if you read that report, whereas some results were positive, it’s often not so rosy. E.g., under “Best Management Practices Monitoring” the report includes these statements:

- Site review showed that logging activity during the winter disturbed wetlands. District hydrologist suggests clearly map wetlands and mark with flagging high enough to be seen during winter logging operations.
- Some concerns where slash piles were burned only 50 feet from a live draw. Purchaser also placed toxic trash such as old oil and fuel cans in slash pile.
- Review of sale revealed that purchaser did not construct skid trails in accordance to specifications by sale administrator.
- Stream buffers were adequate but concerns with skid trail construction and location. Trails were eroding.
- Field review by the lead forester moving the cutting boundary to better protect stream zones resolved sites that had questionable proper buffer widths.
- Road failed in two locations in the spring of 1999. First failure was from a plugged culvert resulting in severe erosion to road prism. The second failure resulted in a mass failure. Road prism was destroyed and some sediment reached the stream of N.F. Granite Creek. No repairs have been made to these failures.

- Slide crossed Road 1124 and into the main stem of N.F. Granite Creek. District removed a portion of the failure that covered the road but no other rehabilitation or stabilization work was done.
- Water bars were not angled properly and there were no clear outlets for water bars. District hydrologist will continue to work with the road maintenance crews to improve the construction of future water bars.
- According to the field review, not all of the water bars are still effective...
- While work was effective at controlling road runoff and stabilizing soils, work would have been more effective immediately after logging.
- ... where roads were closed with guardrails and the pipes were left in place, there are problems with erosion.
- The concern is for the two remaining culverts and lack of maintenance of ditch lines and water bars. Road is physically closed but decision needs to be made to either maintain or remove culverts.
- ... some crossings should have been wider to accommodate runoff.
- Fill slope failure at one site. All culverts are functioning well. Some evidence of cut slopes slumping above several relief culverts, which increases potential for culverts plugging.
- Rill erosion noted on several skid trails. Slope steepness on upper end of suitable skidding with tractor in area where soil is easily saturated. Hydrologist recommended that logging on landforms where saturated overland flow is likely be flagged during forest plan revision.
- Slash that supported landing failed and traveled to within 40 feet of stream. Landing now within INFISH buffer of stream. Landing will have to be rehabilitated to assure it does not affect water quality.
- Road triggered 2 fill failures that contributed sediment down reconstructed channel. Log and rock structures still in place but weakened by 1999 snowmelt.
- Stream gradient and flood-prone width not fully reestablished on 4 of 8 crossings. Down cutting noted and channel widening activating slopes to produce sediment. Rock armor was added to channel banks. 2 plugged relief culverts were not removed as prescribed. Additional water bars constructed to stabilize poor cross-drainage.

- System roads with gates are lacking in maintenance due to budget constraints. Culverts and drainage ditches in these systems a major concern for water resource. District hydrologist working with other district people to find solution for this problem.

Perhaps this is why the FS refuses to conduct adequate monitoring of forest plan implementation and—where it does conduct monitoring—ignores or misrepresents the results.

The EA does not take a hard look at the condition of all streams and water bodies in the affected watersheds, and explain how those conditions contribute to fish population and trends. The EA does not disclose populations and population trends of native fish and other aquatic species of interest in all the project area streams, and compare those numbers to minimum viable populations.

The EA acknowledges that the Sensitive “Native westslope cutthroat trout (*Oncorhynchus clarki lewisi*) has suitable habitat and is known to occur throughout the project area streams.” Also “...surveys in the project area in 2017 found westslope cutthroat trout in Meadow Creek and Mission Creek” (Fisheries Report). However the FS presents no westslope cutthroat trout (WCT) population numbers or trends in WCT numbers for any project area streams in the EA or Fisheries Report.

Numbers and trends for measured parameters for habitat conditions are likewise sparse if not entirely absent. The Fisheries Report states, “The six riparian management objectives that guide the assessment of impacts and properly functioning riparian areas include maintaining pool frequency, water temperature, large woody debris, bank stability, lower bank angle (undercutting) and width-to-depth ratio.” The EA fails to include an analysis of the trends toward attainment of these Forest Plan riparian management objectives.

US Fish and Wildlife Service, 2010 provides a discussion of biological effects of sediment on bull trout and other fish.

USDA Forest Service, 2017c explains that native westslope cutthroat trout have declined due to habitat degradation:

The distribution and abundance of westslope cutthroat trout has declined from historic levels (less than 59 percent of historically occupied stream habitat) across its range, which included western Montana, central and northern Idaho, a small portion of Wyoming, and portions of three Canadian provinces (Liknes and Graham 1988, Shepard et al. 2005). Westslope cutthroat trout persist in only 27 percent of their historic range in Montana. Due to hybridization, genetically pure populations are present in only 2.5 percent of that range (Rieman and Apperson 1989). Introduced species have hybridized or displaced westslope cutthroat trout populations across their range. Hybridization causes loss of genetic purity of the population through introgression. Within the planning area, genetically pure populations of westslope cutthroat trout are known to persist in Ruby Creek (MFISH 1992, 2012). Some of these remaining genetically pure populations of westslope cutthroat trout are found above fish passage barriers that protect them from hybridization, but isolate them from other populations.

Brook trout are believed to have displaced many westslope cutthroat trout populations (Behnke 1992). Where the two species co-exist, westslope cutthroat trout typically predominate in higher gradient reaches and brook trout generally prevail in lower gradient reaches (Griffith 1988). This isolates westslope cutthroat trout populations, further increasing the risk of local extinction from genetic and stochastic factors (McIntyre and Rieman 1995).

Habitat fragmentation and the subsequent isolation of conspecific populations is a concern for westslope cutthroat trout due to the increased risk of local and general extinctions. The probability that one population in any locality will persist depends, in part on, habitat quality and proximity to other connected populations (Rieman and McIntyre 1993). Therefore, the several small, isolated populations left in the project area are at a moderate risk of local extirpation in the event of an intense drainage-wide disturbance.

Habitat degradation also threatens the persistence of westslope cutthroat trout throughout their range. Sediment delivered to stream channels from roads is one of the primary causes of habitat degradation. Sediment can decrease quality and quantity of suitable spawning substrate and reduce overwintering habitat for juveniles which reduces spawning success and increases overwinter mortality. Roads can also alter the drainage network of a watershed and thereby increase peak flows. The end result of increased peak flows is decreased channel stability and accelerated rates of mass erosion. Across their range the strongest populations of westslope cutthroat trout exist most frequently in the wilderness, Glacier National Park, and areas of low road densities or roadless areas (Liknes and Graham 1988, Marnell 1988, Rieman and Apperson 1989, Lee et al. 1997).

The Kootenai NF's Flower Creek Forest Health project EA states:

Fine sediment can greatly reduce the capability of winter and summer rearing habitats and decrease survival to emergence when sediment levels reach 30% or greater (Shepard et al. 1984). Fine sediment may have the greatest impact on winter rearing habitat for juvenile salmonids. Fine sediments can cap or fill interstitial spaces of streambed cobbles. When interstitial rearing space is unavailable, juvenile salmonids migrate until suitable wintering habitat can be found (Hillman et al. 1987). Fine sediment can also alter macroinvertebrate abundance and diversity.

The FS is "proposing to use a newer herbicide, aminopyralid, which can be used more effectively and is safer for aquatic environments, but was not covered in the original Weeds EIS." The FS fails to take a hard look at ecological impacts of this newly utilized herbicide, which it obviously now wants to use far more widely than just this project area without proper NEPA.

The EA discussion of Cumulative Effects is also very inadequate, not explaining what it is about past actions which have had significant impacts on project area resources. Instead there are vague summary statements such as:

(P)ast activities that may have, or had, the greatest impact on the fisheries resource in the cumulative effects area included wildfire, fire suppression activities, road construction and maintenance, timber harvest, and private land activities (wetland modifications) (Fisheries

Resource Report pp, 17-21 and 32-37 and Hydrology Report pp, 49-56), which may have resulted in in some reduced riparian habitat complexity, shade and accessibility and has likely caused some sediment inputs over historic natural conditions.

The EA acknowledges “**the risk of** sedimentation that currently exists on the project area road system mainly found at road/stream crossings.” (Emphasis added.) Yet this risk is not quantified, and not even thoroughly described in the EA or specialist reports. We only can read about some sites to be addressed, however one cannot tell if those are even the highest priority or highest risk sites.

The EA states, “A soil erosion model known as FSWEPP (Hydrology Report, pp 39-41) provided estimates of sediment delivery from the proposed project activities compared to the existing condition; these are displayed in Table 29.” Yet Table 29 only displays two independent numbers for “sediment delivery estimates (average annual tons/year) for Alternative 2.” It also states, “Values are calculated as the difference from the existing condition.” The EA says, “Modeling projections indicate a reduction in sediment delivery of approximately 1.2 tons per year collectively can be achieved from the proposed road management actions...” What year the FS is talking about is not well explained. The Hydrology Report claims “the proposed road would directly and/or indirectly reduce approximately 1.2 tons of sediment annually and into perpetuity (long-term).” However, “ditch relief culverts ...and graveling the driving surface over the crossings (and) adding drainages dips” (EA) don’t work forever, so this makes no sense.

Impacts within specific project area watersheds are masked by conclusory statements about the entire project area, such as “Modeling projections indicate a reduction in sediment delivery of approximately 1.2 tons per year **collectively** can be achieved from the proposed road management actions...” (Emphasis added.) It fails to disclose if some watersheds are modeled to increase sediment yields—a distinct possibility.

The EA discloses “Measurable increases in water yield and/or peak flows could occur at the project area scale within Mission Creek and Gillon Creek (small individual catchments) (Hydrology Report, pp 41-42 and 44-47).” Also:

Forest canopy openings within a defined drainage or catchment area can affect water yields and peak flows by changing the quantity and timing of water to the system. In some systems changes in the magnitude, intensity, or duration of peak flows have the potential to change stream channel and/or morphological characteristics (erode stream banks) leading to decreased water quality and aquatic habitats.

Kappesser, 1992 stresses the importance and sensitivity of headwater streams:

Headwaters harvest is known to have a disproportionately large influence on channel condition.

The stability condition of a watershed may be broadly determined by evaluation the level of harvest activity (ECA), **its special distribution with regard to headwater harvest** and rain on snow risk, and the density of roading in the watershed with consideration of road location relative to geology and slope. (Emphasis added.)

Yet the significance of peak flow increases in small catchment with a high proportion of logging canopy removal is apparently ignored because these are “small.”

The Hydrology Report discloses relatively high amounts of logging in these small areas:

Mission Creek, 33% of the area proposed for regeneration harvest, “707 acres of regeneration harvest. Very small assessed catchment relative to harvest amount elevates the % new canopy opening. Slight measurable changes in water yield/peak flows may occur within the project area reaches of mission creek but would be unmeasurable at a larger basin scale.”

Identified as “RMC”, 22% of the area proposed for regeneration harvest, 1240 acres of regeneration harvest. Slight measurable changes in water yield/peak flows may occur within the project area reaches of Gillon creek but would likely be undetectable at a larger basin scale.

Identified as “CC-MR”, 30% of the area proposed for regeneration harvest, 375 acres of regeneration harvest. Very small assessed catchment relative to harvest amount elevates the % of new canopy opening proportionally. Slight measurable changes in water yield/peak flows may occur within the project area adjacent ephemeral reaches (1st order streams) but would be unmeasurable and undetectable at a larger basin scale or within the any reach of the Large Moyie River.

Yet the Hydrology Report dismisses these impacts because they “would be unmeasurable at a larger basin scale.” This attempts to dilute potentially significant site-specific impacts by inappropriately diverting attention to larger areas.

Mazza, 2015 addresses the importance of headwater riparian zones: “Riparian areas, where the terrestrial mingle with the aquatic, are special places. Riparian area around headwaters are particularly important because they have strong ecological connections to uplands and provide resources to the downstream system.”

An article in the October 19, 2015 edition of *The Spokesman-Review* discusses the importance of headwater streams that provide essential cold water refuges for west slope cutthroat and bull trout. “One of the things we’re seeing is that the colder areas are typically in the headwaters,” said Dan Issak, a research fisheries biologist with the U.S. Forest Service in Boise. “Those are warming up a lot more slowly than streams at lower elevations.”

The Fisheries Report states:

The spatial boundary for analyzing the direct, indirect, and cumulative effects to the fisheries resource is the project area boundary (N-07) which contains a small section of Mission Creek, Bush Creek, Rock Creek, Gillon Creek, Fry Creek, and the Meadow Creek watershed.

Meadow Creek and Mission Creek and the smaller sized Rock Creek and Brush Creek all found in the southern part of the project area and Gillon Creek, Round Prairie Creek and the large Moyie River in the Northern part of the project area.

The EA and Specialist Reports fail to address FW-DC-AQH-05 from the Revised Forest Plan:

Stream channels supply the required structure for desired stream habitat features such as pools, pool tails, banks, large woody material, backwaters, and riffles that provide aquatic species the necessary niches for holding, overwintering, spawning, cover, rearing, and feeding. The following criteria *generally* describe desired stream habitat conditions:

Stream water temperatures are within the state water quality requirements (IDAPA 58.01.02) for salmonid spawning, cold water biota and bull trout:

Salmonid spawning: daily maximum temperature is less than or equal to 13 °C (55.4 °F); maximum daily average temperature is less than or equal to 9 °C (48.2 °F).

Cold water biota: daily maximum temperature is less than or equal to 22 °C (71.6 °F); maximum daily average is less than or equal to 19 °C (66.2 °F).

Bull trout: Maximum weekly (7-day average) maximum temperature for June, July, and August is less than or equal to 13 °C (55.4 °F); maximum daily average (September, October) is less than or equal to 9 °C (48.2 °F).

Large woody debris occurs in near natural patterns of size and amount in channel, stream banks, and floodplain. Adequate sources of large woody debris are available for both long and short term recruitment based on riparian stocking densities.

Pool frequency varies by reach type:

- 1 per 5 to 7 channel widths in pool-riffle stream reaches;
- 1 per 2 to 4 channel widths in step-pool stream reaches.

Large pools for adult holding, juvenile rearing, and overwintering are common. Large pools are considered to have a residual pool depth greater than one meter, in streams with a wetted width greater than three meters (9.84 feet) wetted width.

Channel substrate is appropriate in size and distribution, based on geology, gradient, and topography, and supports spawning, macroinvertebrate production, and juvenile rearing.

Bankfull width-to-depth ratios are appropriate to channel type (see glossary):

- less than or equal to 12 in A, E, G channel types;
- greater than or equal to 12 in B, C, F channel types;
- greater than 40 in D channel types.

Bank stability in forested stream reaches:

- greater than or equal to 90 percent stable in C channel types;
- greater than or equal to 95 percent stable in A, B, and E channel types.

Habitat features at smaller scales are influenced by stream gradient, channel and floodplain width, elevation, geology, water quality, riparian vegetation, and other factors. Therefore, while these criteria generally describe desired habitat conditions, these values may not be achievable in all stream channel types.

One forest plan element the EA does not demonstrate consistency with is FW-DC-AQS-02: “Non-native fish species (e.g., brook trout, rainbow trout, and brown trout) are not expanding into tributary streams on NFS lands. Impacts of non-native fish species on native salmonids, such as hybridization or displacement, are minimized to the extent possible.” In fact the Fisheries Report discloses the situation is just the opposite:

Meadow Creek and several of its smaller tributaries likely contain resident westslope cutthroat trout populations such as Wall Creek. Non-native species such as rainbow trout are likely contained in the Meadow Creek watershed as well due to stocking as recently as 1996. Eastern brook trout were stocked in the 1960s. Both species have been identified throughout the project area.

Idaho Department of Fish and Game (IDFG) has stocked Brush Lake extensively over the past two decades. Species stocked include eastern brook trout, various strains of rainbow trout...

(C)ompetition (displacement) and predation by nonnative species and hybridization with nonnative species has ...contributed to declines throughout their native range (McIntyre and Reiman 1995).

(N)on-native brook trout were found in almost every stream westslope cutthroat trout were found leading to concerns of predation, competition, and displacement. Additionally, the presence of non-native rainbow trout in the Moyie River increases the possibility of genetic introgression through hybridization.

Another forest plan element the EA does not demonstrate consistency with is FW-GDL-AQS-01: "Management activities that may disturb native salmonids, or have the potential to directly deliver sediment to their habitats, should be limited to times outside of spawning and incubation seasons for those species..." Nothing in the EA or Fisheries Report addresses this Guideline regarding timing of activities that inevitably increase sediment yields into streams.

The Camp Robin Fisheries Report states, "Removing the known fish passage barrier on NFS Road 2405 would reduce aquatic habitat fragmentation and increase available and rearing habitat for westslope cutthroat trout in the Meadow Creek watershed." Yet from the EA and Specialist Reports, we cannot tell if all such barriers are being addressed, as the Forest Plan requires.

The EA states:

Log-haul on road segments is not expected to damage adjacent stream channels directly, indirectly over the existing conditions given the limited amount of live stream crossings and the use of BMP such as road maintenance/improvements, dust abatement and operational limitations such as road closures and haul suspension during wet periods and/or storm events which would greatly reduce potential for sedimentation caused by log-haul on roads within the project area (N-04). Therefore the effects of log hauling will not be discussed further in this analysis.

The above flies in the face of the best scientific information available, some of it the FS's own. This is discussed at the bottom of page 50 of our previous comments. Also, USDA Forest Service, 2016b states, "Increased heavy-truck traffic related to log hauling can increase rutting and displacement of road-bed material, creating conditions conducive to higher sediment delivery rates (Reid and Dunne, 1984)." The abstract from Reid and Dunne, 1984 states:

Erosion on roads is an important source of fine-grained sediment in streams draining logged basins of the Pacific Northwest. Runoff rates and sediment concentrations from 10

road segments subject to a variety of traffic levels were monitored to produce sediment rating curves and unit hydrographs for different use levels and types of surfaces. These relationships are combined with a continuous rainfall record to calculate mean annual sediment yields from road segments of each use level. A heavily used road segment in the field area contributes 130 times as much sediment as an abandoned road. A paved road segment, along which cut slopes and ditches are the only sources of sediment, yields less than 1% as much sediment as a heavily used road with a gravel surface.

USDA Forest Service, 2017e states:

Potential sediment delivery from roads used for log haul was evaluated using three methods: road encroachment, stream crossings, and sediment modeling. ... Roads within 300 feet of a water body are the most probable to deliver sediment (Belt et al. 1992). ... Road/stream crossings have a high potential to deliver sediment directly into streams. ... Sediment delivery to streams from existing roads and from project-related road activities was modeled using the Roaded WEPP module of the Water Erosion Prediction Project (WEPP).

So despite the fact that increased sediment impacts from log hauling would likely be significant, the Camp Robin EA fails to quantify, estimate, analyze or disclose such impacts.

The Fisheries Report states, “The project area streams are 303(d) listed for temperature concerns and have approved TMDL’s.” Project consistency with the TMDL is not demonstrated in the analysis. The Hydrology Report explains the way the FS is dealing with the fact that some project area streams are WQLS-impaired because of elevated stream temperatures:

The water temperature TMDL’s for the project area streams indicate that preserving or improving riparian shade and restoring natural channel widths are recommended as the primary activities for implementation of the temperature TMDL (N-01).

The water temperature TMDL’s for the project area streams indicate that preserving or improving riparian shade and restoring natural channel widths are recommended as the primary activities for implementation of the temperature TMDL (N-01).

... The surrogate measure for water temperature is area of riparian vegetation preserved or improved

However, US Fish and Wildlife Service, 1998 (the INFISH Biological Opinion) recognizes, upland forest canopy removal raises stream temperatures. The EA fails to consider best available science which indicates the openings created by the project clearcuts would result in increases to water in streams (Id.):

Groundwater entering streams (especially small streams) may be an important determinant of stream temperatures (Spence et al. 1996) or may provide localized thermal refugia in larger stream systems. Where groundwater flows originate above the neutral zone (16-18 meters below the surface in general) groundwater temperatures will vary seasonally, as influenced by air temperature patterns (Spence et al. 1996). Timber harvest from upland areas exposes the soil surface to greater amounts of solar radiation than under forested conditions (Carlson and Groot 1997), elevating daytime temperatures of both air and soil (Fleming et al. 1998, Buckley et al. 1998, Morecroft et al. 1998) and increasing diurnal temperature fluctuations (Carlson and Groot 1997). Relationships between shallow source groundwater flows and air and soil temperatures indicate that harvest activities in upland areas may increase stream temperatures via increasing temperature of shallow groundwater inflows. Other pathways for harvest actions to influence stream temperature include changing the volume and timing of peak flows, elevating suspended sediment levels, and altering channel characteristics (Chamberlin et al. 1991, Spence et al. 1996, USDA and USDI 1998a).

The FS claims, “Unit 38 is located on the south side of Mission Creek and therefore the trees in this unit have very little influence on the amount of shade provided to Mission Creek.” Why would reducing shading on the south side of a creek—the direction from which the mid-day sun shines much of the year—not be temperature issue?

The Hydrology Report is misleading in stating, “Despite the interest that peak flow and water yield changes from forest management has garnered, to date no field studies explicitly link peak flow increases with changes in channel morphology (*Grant 2008*).” This implies that increases in peak flows caused by management don’t harm streams. There’s plenty of science that implicate elevated water yield in causing stream damage. Why does the Hydrology Report state that there is “aggradation” in project area streams, for example? Also, see the FS’s own McClelland et al., 1997 and Johnson, 1995.

The Camp Robin analysis did not utilize the FS’s Watershed Condition Framework³ (2011). The Watershed Condition Framework is explained (Id.):

The Watershed Condition Framework (WCF) is a comprehensive approach for proactively implementing integrated restoration on priority watersheds on national forests and grasslands.

The WCF proposes to improve the way the Forest Service approaches watershed restoration by targeting the implementation of integrated suites of activities in those watersheds that have been identified as priorities for restoration. The WCF also establishes a nationally consistent reconnaissance-level approach for classifying watershed condition, using a comprehensive set of 12 indicators that are surrogate variables representing the underlying ecological, hydrological, and geomorphic functions and processes that affect watershed condition. Primary emphasis is on aquatic and terrestrial processes and conditions that Forest Service management activities can influence. The approach is designed to foster integrated ecosystem-based watershed assessments; target programs of work in watersheds that have been identified for restoration; enhance communication and

³ Watershed Condition Framework: A Framework for Assessing and Tracking Changes to Watershed Condition. United States Department of Agriculture Forest Service; FS-977; May 2011

coordination with external agencies and partners; and improve national-scale reporting and monitoring of program accomplishments. The WCF provides the Forest Service with an outcome-based performance measure for documenting improvement to watershed condition at forest, regional, and national scales.

The six steps of the WCF are—

Step A: Classify the condition of all 6th-level watersheds in the national forest by using existing data layers, local knowledge, and professional judgment.

Step B: Prioritize watersheds for restoration: establish a small set of priority watersheds for targeted improvement equivalent to a 5-year program of work.

Step C: Develop Watershed Restoration Action Plans that identify comprehensive project-level improvement activities.

Step D: Implement integrated suites of projects in priority watersheds.

Step E: Track restoration accomplishments for performance accountability.

Step F: Verify accomplishment of project activities and monitor improvement of watershed and stream conditions.

The national database implementing Step A indicates that project area streams Mission Creek, Rock Creek, Meadow Creek are considered to be “Functioning at Risk.” This is not revealed in the EA or specialist reports. Instead the Hydrology Report relies upon a “Proper Functioning Condition (PFC) assessment” which “involves using a standard checklist to consistently assess the hydrology, soils, and vegetation of riparian areas. The checklist and its summarization are used to classify the health or state of physical processes of riparian-wetland areas.” The Report does not correlate its assessment to the WCF, but its methodology “to assess proper function condition (PFC)” is cited as “Pritchard 1998” which does not appear in EA or Report lists of literature cited. The Hydrology Report lists the “Meadow Creek Reach 2 Stream Segment” as “Functioning at Risk” but other reaches of Meadow Creek are said to be “Properly Functioning Condition”; also Mission Creek and Rock Creek are described as “Properly Functioning Condition” in the Hydrology Report. The discrepancies between the WCF assessment and the PFC assessment are not reconciled anywhere.

We do read from the Hydrology Report, “Several factors were identified as limiting channel functionality, which included a lack of large woody debris, inadequate riparian vegetation (i.e., structure and composition), and excessive bank erosion and channel aggradation.” Where? To what degree? Why? The Hydrology Report gives no indication.

The EA states, “Modeling projections indicate a reduction in sediment delivery of approximately 1.2 tons per year collectively can be achieved from the proposed road management actions...” and this 1.2 tons figure is mentioned several times in the Hydrology Report. However, nowhere is there any reporting of how many tons/year of excess, over-natural sediment is being dumped into streams by poorly maintained roads, or other risk factors in any project area watershed. The FS cannot present a credible cumulative effects analysis without disclosure of such ongoing impacts. Apparently the FS is only presenting sediment reduction modeling on a few miles of project area roads—those getting needed improvement because previous BMPs were ineffective or their benefits expired years ago.

In fact, the EA and Hydrology Report fail to disclose anywhere the total miles of road in the Project Area.

We know that there are “Approximately 92 miles of Forest Service administered routes ...available for motorized recreation.” Furthermore, the EA indicates that “37 miles of motorized trails exist within the project area.” But the FS fails to analyze the past, ongoing, and future impacts on watersheds of all the roads (current extent apparently unknown) and the similar impacts of these motorized trails.

The Hydrology Report indicates that riparian road density alone is extremely high:

Table 3. Road miles and road densities within project analysis units (N-34)

6th level HUC Watershed Name	Approximate Road Miles in Project Area by drainage	Project Area Riparian Road Density (mi/mi²)
Mission Creek	14	4.1
Round Meadows Creek	27	3.1
Copper Creek – Moyie River	8	3.9
Meadow Creek	75	3.1
Dawson Lake-Kootenai River	33	5.2
Rock Creek – Kootenai River	26	3.0
Brush Lake – Kootenai River	17	1.9
Fleming Creek	8	1.8

The EA states, “Alternatives 2 proposes to reconstruct approximately 7.23 miles of currently gated or barriered road that is not currently hydrologically inert (has inherent higher risk of sedimentation) due to the existence of drainage structures that remain.” But how many additional miles exist in the project area which also are “not currently hydrologically inert (has inherent higher risk of sedimentation) due to the existence of drainage structures”? This is a critical element omitted from the analysis. U.S. Fish and Wildlife Service, 2015 states:

Culverts that remain in the road behind gates and berms that are not properly sized, positioned, and inspected ...have an increased risk for failure by reducing awareness of potential maintenance needs. The accumulation of debris has the potential to obstruct culverts and other road drainage structures. Without maintenance and periodic cleaning, these structures can fail, resulting in sediment production from the road surface, ditch, and fill slopes. The design criteria to address drainage structures left behind gates and berms require annual monitoring of these structures.

Roads influence many processes that affect aquatic ecosystems and fish: human behavior (poaching, debris removal, efficiency of access for logging, mining, or grazing, illegal species introductions), sediment delivery, and flow alterations (Trombulak and Frissell 2000). (Also see: Gucinski et al. 2001; Wisdom et al., 2000; Pacific Rivers Council, 2010.)

Frissell, 2014 states:

Roads are ecologically problematic in any environment because they affect biota, water quality, and a suite of biophysical processes through many physical, chemical, and biological pathways (Trombulak and Frissell 2000, Jones et al. 2000). The inherent contribution of forest roads to nonpoint source pollution (in particular sediment but also nutrients) to streams, coupled with the extensive occurrence of forest roads directly adjacent to streams through large portions of the range of bull trout in the coterminous US, adversely affects water quality in streams to a degree that is directly harmful to bull trout and their prey. This impairment occurs on a widespread and sustained basis; runoff from roads may be episodic and associated with annual high rainfall or snowmelt events, but once delivered to streams, sediment and associated pollutant deposited on the streambed causes sustained impairment of habitat for salmon and other sensitive aquatic and amphibian species. Current road design, management of road use and conditions, the locations of roads relative to slopes and water bodies, and the overall density of roads throughout most of the Pacific Northwest all contribute materially to this impairment. This effect is apart from, but contributes additively in effect to the point source pollution associated with road runoff that is entrained by culverts or ditches before being discharged to natural waters.

Ongoing and proposed activities will deliver sediment into stream networks. Sediment in streams degrades native fish habitat by filling in interstitial spaces and pools, and decreasing inter-gravel dissolved oxygen concentrations. Deposited sediments harm native fish directly by smothering eggs in redds, altering spawning habitat, and reducing overwintering habitat for fry, and indirectly by altering invertebrate species composition, thereby decreasing abundance of preferred prey.

The FS fails to acknowledge the known limitations of the Forest Plan/INFISH direction. INFISH deals primarily with riparian zone protection, and does not consider instream and stream bank erosion and sediment deposition during high water yield events, such as spring runoff and ROS events. ROS events can be the most channel changing, sediment producing events and can have a significant adverse effect on fish and their habitat.

The EA does not contain a monitoring and maintenance plan for culverts that will be left on closed roads.

The EA does not demonstrate consistency with Forest Plan Standard RF-2, which requires development and implementation of a Road Management Plan or a Transportation management Plan, which must address, among other items, "Criteria that govern road ...maintenance and management." The EA does not analyze or disclose project area criteria, nor consider "Requirements for pre-, during, and post storm inspection and maintenances." The EA does not demonstrate consistency with Forest Plan Standards RF-3, RF-4, and RF-5.

The Forest Plan/INFISH has no standards for cobble embeddedness or percent fines of sediment. Therefore, as the EA exemplifies, the FS feels free to ignore these habitat needs in its discussion of habitat quality.

Remedy: Select the No Action Alternative. Otherwise, prepare an EIS that addresses the analytical and scientific issues identified in our comments and in above discussions.

DIVERSITY

AWR raised the topic of diversity in many places in our previous comments. This included discussion of old-growth forest and snags—both addressed in separate sections of this Objection. Our comments also included discussing population viability (a necessary element for maintaining the diversity NFMA requires) more generally (pp. 42, 44, 50, 57, 68-70, 72) and species-specifically (pp. 10-29 of our comment letter), as well as habitat fragmentation and connectivity (pp. 6, 15, 25-26, 28, 40, 43, 64, 65, 72-75, 80). We supplement those comments with the following discussions.

Habitat connectivity and fragmentation

The EA does not present an analysis of the quality of habitat in corridors, areas of assumed habitat connectivity, or linkage zones.

State-of-the-art conservation biology and the principles that underlie the agency's policy of "ecosystem management" dictate an increasing focus on the landscape-scale concept and design of large biological reserves accompanied by buffer zones and habitat connectors as the most effective (and perhaps only) way to preserve wildlife diversity and viability (Noss, 1993).

Population viability

The Wildlife Report indicates the negative impacts from the proposed logging on several wildlife species:

...the Camp Robin Project may impact individuals or habitat for Flammulated Owl, Pygmy Nuthatch, fisher, fringed Myotis, Bald Eagle, black-backed woodpecker, common loon, gray wolf, Townsend's big-ear bat, and western toad...

Traill et al., 2010 and Reed et al., 2003 are published, peer-reviewed scientific articles addressing what a true "minimum viable population" would be, and how that number is typically drastically underestimated. The FS has not identified the best available science that provides scientifically sound, minimum viable population estimates of any of the above species the Wildlife Report indicates would be harmed by the timber sale, or indeed any Sensitive, Threatened, Endangered Proposed, Candidate, MIS or Focal species on the IPNF.

Considering potential difficulties of using population viability analysis at the project analysis area level (Ruggiero, et. al., 1994a), the cumulative effects of carrying out multiple projects simultaneously across the IPNF makes it imperative that population viability be assessed at least at the forestwide scale (Marcot and Murphy, 1992). Also, temporal considerations of the impacts on wildlife population viability from implementing something with such long duration as a Forest Plan must be considered (id.) but this has never been done by the IPNF. It is also of paramount importance to monitor population during the implementation of the Forest Plan in order to validate assumptions used about long-term species persistence i.e., population viability (Marcot and Murphy, 1992; Lacy and Clark, 1993).

The FS has stated: “Well distributed habitat is the amount and location of required habitat which assure that individuals from demes, distributed throughout the population’s existing range, can interact. Habitat should be located so that genetic exchange among all demes is possible.” (Mealey 1983.)

In the absence of meaningful thresholds of habitat loss and no monitoring of wildlife populations at the Forest level, projects will continue to degrade wildlife habitat across the IPNF over time. (See also Schultz 2012.). The FS would never be able to detect the likelihood of complete extirpation of any wildlife species from the IPNF, using such methodology.

The FS relies upon Region-wide database analyses by Samson to conclude that species viability is assured, although the FS does not address the age and reliability of the data. The FS must consider Samson’s conclusions for the longer term, for any wildlife species, which is far less certain.

Sampson did not evaluate long-term viability for the fisher and marten, but did for the goshawk, pileated woodpecker, flammulated owl and black-backed woodpecker. Sampson concluded that “In regard to long-term viability, this conservation assessment has found that long-term habitat conditions in terms of Representativeness, Redundancy, and Resiliency are “low” for all species.” The FS must disclose Sampson’s long-term viability conclusions. Sampson merely uses home range size for each species and makes assumptions of overlap in ranges of males and females. Home range size is then multiplied by the effective population size (n_e - a number that includes young and non-breeding individuals - Allendorf and Ryman 2002) and this is projected as the amount of habitat required to maintain a minimal viable population in the short-term. This simplistic approach ignores a multitude of factors and makes no assumptions about habitat loss or change over time. For the fisher and marten, Samson uses a “critical habitat threshold” as calculated in another publication (Smallwood 2002).

There are several problems with such an approach and the risk to the species would be extremely high if any of the species ever reached these levels in the Northern Region. Surely, all six species would be listed as endangered if this was to occur and the probabilities for their continued existence would be very low. There is also no way NFMA and ESA requirements could be met of maintaining species across their range and within individual National Forests with such an approach. Mills (2007) captured the futility of such approach in his book on Conservation of Wildlife Populations: “MVP is problematic for both philosophical and scientific reasons. Philosophically, it seems questionable to presume to manage for the minimum number of individuals that could persist on this planet. Scientifically, the problem is that we simply cannot correctly determine a single minimum number of individuals that will be viable for the long term, because of inherent uncertainty in nature and management...”

Samson also admits that “Methods to estimate canopy closure, forest structure, and dominant forest type may differ among the studies referred to in this assessment and from those used by the Forest Service to estimate these habitat characteristics” and that “FIA sample points affected within the prior 10 years by either timber harvest or fire are excluded in the estimates of habitat for the four species” and finally that “FIA does not adequately sample rare habitats”. This

especially concerning given the reliance on the FIA queries to identify suitable habitat and the fact that the data used in the analysis is now over 20 years old. There have been more wildfires in this time frame, and more large timber sales. Also, the IPNF's own 2000 forest plan monitoring and evaluation report (USDA Forest Service, 2000c) provides an example of the FS acknowledging the problems of stale data, leading to the limitation of models the FS typically uses for wildlife habitat assessments and therefore viability determinations:

Habitat modeling based on the timber stand database has its limitations: the data are, on average, 15 years old; canopy closure estimates are inaccurate; and data do not exist for the abundance or distribution of snags or down woody material...

Remedy: Select the No Action Alternative. Otherwise, prepare an EIS that addresses the analytical and scientific issues identified in our comments and in above discussions.

TRAVEL MANAGEMENT, ACCESS AND RECREATION

Objectors discussed these issues quite extensively in previous comments (pp. 2-3, 27, 29-30, 50-51, 68-69). We provide additional discussion.

“In terms of motorized access routes (includes roads and motorized trails) within the BORZ, there would be a net decrease of about 1.8 miles and 2.5 miles of open and total motorized routes, respectively.”

Road Decommissioning –These unclassified roads are mostly old skid trails or brushed-in spurs which are generally impassable and do not provide legal public access.

Reducing roads and therefore their impacts beyond what the FS seems willing would benefit not only grizzly bears, but most other natural aspects of the ecosystem, as the Access Amendment Draft SEIS states:

- Alternative D Modified would convert the most roads and consequently would provide the highest degree of habitat security and a lower mortality risk to the **Canada lynx**. (P. 70.)
- Alternative D Modified would provide a higher degree of habitat security (for **gray wolves**) than Alternative E Updated... (P. 74.)
- Alternative D Modified ... could contribute to a cumulative increase in habitat security for **black-backed woodpeckers** (and **pileated woodpeckers**) because timber sales or other ground disturbing or vegetation management activities would be less likely to occur in Core Areas. Newly dead trees that support wood boring beetle populations would be less likely to be removed during vegetation management activities or by woodcutters. Alternative D Modified could provide slightly more secure habitat than Alternative E Updated. (P. 84, 112.)
- Alternative D Modified ... could contribute to a cumulative increase in habitat security because timber sales or other ground disturbing or vegetation management activities would be less likely to occur in Core Areas. Snags would be less likely to be removed during vegetation management activities or by woodcutters. Alternative D Modified could provide slightly more secure habitat (for **Townsend's big-eared bats, flammulated owls, fringed myotis bats**) than Alternative E Updated. (Pp. 85, 86, 95.)

- Alternative D Modified and Alternative E Updated provide different levels of habitat security (for **peregrine falcon, fisher, wolverine**) based on the relative amount of wheeled motorized vehicle access. (Pp. 87, 89, 91.)
- Alternative D Modified, which closes the most miles of road in suitable habitat, would be the preferred alternative for the western toad. (P. 101.)
- Alternative D Modified closes the most miles of road in suitable habitat and would provide the greatest benefits for the **goshawk**. (P. 103.)
- Alternative D Modified, which closes the most miles of road in suitable habitat, would be the best Alternative for **elk**. (P. 104.)
- Alternative E Updated would provide some security and reduced vulnerability (for **moose**), but not as much as Alternative D Modified. (P. 104.)
- Although Alternative D Modified and Alternative E Updated would benefit **mountain goats**, Alternative D Modified would improve security and reduce the risk of displacement more than Alternative E Updated. (P. 109.)
- Alternative D Modified would improve security (for **pine marten**) more than Alternative E Updated. (P. 110.)

The FS relies heavily upon BMPs to address the issues associated with logging roads, but only implemented within the context of timber sales such as Camp Robin. However, comprehensive monitoring of the effectiveness of logging road BMPs in achieving water quality standards does not demonstrate the BMPs are protecting water quality, nor does it undermine the abundant evidence that stormwater infrastructure along logging roads continues to deposit large quantities of sediment into rivers and streams (Endicott, 2008). Even as new information becomes available about BMP effectiveness, many states do not update their logging road BMPs, and some states have retained BMPs that have been discredited for some time, such as using fords when they are known to have greater water quality impacts than other types of stream crossings. (Id.) If the measure of success is whether a nonpoint source control program has achieved compliance with state water quality standards, the state forest practices programs have failed.

Again, these programs are only triggered when active logging operations occur. The lack of a requirement in most states to bring existing, inactive logging roads and other forest roads up to some consistent standard results in many forest roads that are not currently being used for logging falling through the regulatory cracks and continuing to have a negative impact on our water quality. Currently, only the State of Washington requires that old roads be upgraded to comply with today's standard BMPs. Across most of the country, the oldest, most harmful logging roads have been grandfathered and continue to deliver sediment into streams and rivers. (Id.)

BMPs are "largely procedural, describing the steps to be taken in determining how a site will be managed," but they lack "practical in-stream criteria for regulation of sedimentation from forestry activities." (Id.) The selection and implementation of BMPs are often "defined as what is practicable in view of 'technological, economic, and institutional consideration.'" (Id.) The ultimate effectiveness of the BMPs are therefore impacted by the individual land manager's "value system" and the perceived benefit of protecting the resource values as opposed to the costs of operations. (Id.)

The EA's descriptions of "Road Storage" does not assure no impacts to wildlife. They may "no longer be drivable" but with only "a short section of full recontouring" they typically facilitate human access with the remaining road prism. Since the FS is increasing both motorized and Nonmotorized recreation routes with this project, the agency is relying upon user compliance with closures, without presenting in the EA any analysis of closure effectiveness. This is a failing policy; as admitted in the EA there are already violations the FS is willing to ignore and reward illegal users for: "Alternative 2 proposes to convert 3.06 miles of old road prism currently receiving some **unauthorized OHV usage** to the FS greater than 50" OHV trail system, bringing the prism up to BMP standards but **allowing motorized usage**." (Emphases added.)

The EA's descriptions of "Road Storage" also fail to assure no impacts to water quality and fish habitat. Although "High risk culverts or drainage structures that are causing appreciable sedimentation would be removed" the EA doesn't indicate that all culverts and drainage structures would be removed from behind the installed barriers or recontoured sections. Such features would not be accessible for critical maintenance. For one example, where "cross ditches would be installed" on these stored roads, the FS relies upon a BMP which, as we discuss, would not be reliable over the duration of storage before the FS busts in again to upgrade BMP conformance and maintain the road for re-use.

The EA also waffles on what would be done with "temporary" roads—in places stating they would be "fully re-contoured" or obliterated after use, other places merely "placed in an undrivable condition" or "would be closed." And the mere present existence of "undetermined" roads reveals an agency unable or unwilling to eliminate non-system roads.

The EA assumes that project road work and BMP implementation will adequately mitigate the problems chronically posed by the road network, despite the fact that the FS knows otherwise. The FS admits these problems in a non-NEPA context (USDA Forest Service, 2010t):

Constructing and improving drainage structures on Forest roads is an ongoing effort to reduce road-related stream sediment delivery. Although BMPs are proven practices that reduce the effects of roads to the watershed, it is not a static condition. Maintaining BMP standards for roads requires ongoing maintenance. Ecological processes, traffic and other factors can degrade features such as ditches, culverts, and surface water deflectors. Continual monitoring and maintenance on open roads reduces risks of sediment delivery to important water resources.

Also in a non-NEPA context, one R-1 forest supervisor (Lolo National Forest, 1999) frankly admits that projects are a "chance to at least correct some (BMP) departures rather than wait until the funding stars align that would allow us to correct all the departures at once."

Ziemer and Lisle (1993) note a lack of reliable data showing that BMPs are cumulatively effective in protecting aquatic resources from damage. Espinosa et al., 1997 noted that the mere reliance on BMPs in lieu of limiting or avoiding activities that cause aquatic damages serves to increase aquatic damage. Even activities implemented with somewhat effective BMPs still often contribute negative cumulative effects (Ziemer et al. 1991b, Rhodes et al. 1994, Espinosa et al. 1997, Beschta et al. 2004).

In analyses of case histories of resource degradation by typical land management (logging, grazing, mining, roads) several researchers have concluded that BMPs actually increase watershed and stream damage because they encourage heavy levels of resource extraction under the false premise that resources can be protected by BMPs (Stanford and Ward, 1993; Rhodes et al., 1994; Espinosa et al., 1997). Stanford and Ward (1993) termed this phenomenon the “illusion of technique.”

The extreme contrast between streams in roaded areas vs. unroaded areas found on the Lolo NF (Riggers, et al. 1998) is one more testament to the failures of the FS’s BMP program.

Roads influence many processes that affect aquatic ecosystems and fish: human behavior (poaching, debris removal, efficiency of access for logging, mining, or grazing, illegal species introductions), sediment delivery, and flow alterations. We incorporate The Wilderness Society (2014) which discusses some of the best available science on the ecological impacts of roads.

The Camp Robin EA does not consider the fact that roads increase the efficiency of water transport during storm or snowmelt events, elevating water yields well above natural, with damaging effects. The EA ignores water yield and peak flows as factors. FS hydrologist Johnson, 1995 discusses many forms of road-related and other cumulative impacts the EA fails to consider.

The Hydrology Report indicates why this is important: “Runoff from rain falling on snow has been associated with increased risk of damage to stream banks and flooding. Available data indicates that rain falling on snow in open areas produces more water available for runoff than rain falling in forested areas. Much of the project area (~80%) falls in the rain-on-snow zone based on elevation (between 3500’ and 4500’).”

The EA does not demonstrate the project area is being managed consistent with Travel Management Regulations. The IPNF participated in a sham Region 1-directed Travel Analysis Process (TAP) that failed to follow the Travel Management Rule Subpart A requirements for involving the public in a science-based effort to identify the forestwide minimum road system. The Camp Robin EA does not analyze or disclose the project area road system’s needed long-term financial investments, nor the associated ecological impacts due to inadequate maintenance funding. The EA rests on the assumption that this project will adequately mitigate the problems chronically posed by the road network by project road work and BMP implementation, despite the fact that FS officials are aware this is not the case (USDA Forest Service, 2010t, Lolo National Forest, 1999).

The EA does not disclose if the FS has surveyed the project area with the detail needed to determine if all non-system (e.g., “undetermined” or “nonsystem” or “unclassified” etc.) roads existing in the project area have been identified, so their ecological liabilities can be accounted for.

The EA does not present an analysis of the ongoing adverse impacts of the roads in the project area which will not be maintained or upgraded by the project. It ignores their cumulative

impacts. As indicated by the limited range of alternatives, the FS refuses to properly address the issue.

Forest Service scientists Gucinski et al. (2001) identify many of the highly adverse impacts of forest roads. Concerning road density impacts on fish populations, they note:

(I)ncreasing road densities and their attendant effects are associated with declines in the status of four non-anadromous salmonid species. These species are less likely to use highly roaded areas for spawning and rearing and, if found, are less likely to have strong populations. This consistent pattern is based on empirical analysis of 3,327 combinations of known species' status and subwatershed conditions, limited primarily to forested lands administered by the Forest Service and the Bureau of Land Management.

The FS doesn't explain how it proposes to afford maintaining the road system in the IPNF when the funding is woefully inadequate, nor can the agency adequately analyze and disclose the impacts because as a result, watershed conditions will continue to deteriorate from naturally increasing erosion of roads. In other words, the FS fails to consider the long-term budget shortfalls for road maintenance in the Forest, and doesn't analyze or disclose the ecological impacts of this ongoing situation.

The general lack of funding to maintain roads enables continuing erosion and sediments which damage instream aquatic habitat features. Many impacts are because so many existing forest roads were built prior to the accumulation of empirical and scientific evidence revealing the old road designs were ecological liabilities. Undersized or undermaintained culverts are an example, which tend to blow out during flooding events which turn out to be not that unusual. Culverts have also been placed in a manner—or eroded to the point where—fish passage is blocked in one or both directions. Forest Service hydrologist Johnson (1995) identifies other significant hydrological liabilities of old forest roads.

Scientific information from government studies conducted for the Interior Columbia Ecosystem Management Project strongly indicates the high negative correlation between road density and fish habitat conditions. USDA Forest Service & USDI Bureau of Land Management, 1996a state:

High integrity [forests] contain the greatest proportion of high forest, aquatic, and hydrologic integrity of all [] are dominated by wilderness and roadless areas [and] are the least altered by management. [] Low integrity [forests have] likely been altered by past management [] are extensively roaded and have little wilderness. (Pp. 108, 115 and 116).

And USDA Forest Service & USDI Bureau of Land Management (1996) state “Increasing road density is correlated with declining aquatic habitat conditions and aquatic integrity. [] An intensive review of the literature concludes that increases in sedimentation [of streams] are unavoidable even using the most cautious roading methods.” (P. 105).

A plethora of scientific information indicate the highly significant nature of departures from historic conditions that are the impacts on forest ecosystems caused by motorized travel routes and infrastructure. From the Wisdom et al. (2000) Abstract:

Our assessment was designed to provide technical support for the ICBEMP and was done in five steps. ... Third, we summarized the effects of roads and road-associated factors on populations and habitats for each of the 91 species and described the results in relation to **broad-scale patterns of road density**. Fourth, we mapped classes of the current abundance of source habitats for four species of terrestrial carnivores in relation to **classes of road density** across the 164 subbasins and used the maps to identify areas having high potential to support persistent populations. And fifth, we used our results, along with results from other studies, to describe broad-scale implications for managing habitats deemed to have undergone long-term decline and for managing species negatively affected by **roads or road-associated factors**. (Emphases added.)

Likewise, Wisdom, et al. (2000) state:

Our analysis also indicated that >70 percent of the 91 species are affected negatively by one or more factors associated with roads. Moreover, maps of the abundance of source habitats in relation to classes of road density suggested that road-associated factors hypothetically may reduce the potential to support persistent populations of terrestrial carnivores in many subbasins. Management implications of our summarized road effects include the potential to mitigate a diverse set of negative factors associated with roads.

The Forest Service's 2001 Roadless Area Conservation Rule FEIS states: "The use of temporary roads may have the same long lasting and significant ecological effects as permanent roads, such as the introduction of nonnative vegetation and degradation of stream channels." Practically all vegetation management projects nowadays include utilization of "temporary" roads, yet even though temporary roads would allegedly be decommissioned after the logging is completed, there is a likelihood that the FS would later construct another "temporary" road on these same sites for the next round of "treatments." The Forest Plan lacks a programmatic limitation on the use of temporary roads, so their long-term effects can be quantified.

Roads influence many processes that affect aquatic ecosystems and fish: human behavior (poaching, debris removal, efficiency of access for logging, mining, or grazing, illegal species introductions), sediment delivery, and flow alterations. We incorporate The Wilderness Society (2014) which discusses some of the best available science on the ecological impacts of roads.

The Forest Plan FEIS economic analysis cannot assure sources of funds needed to maintain the road system. When the Camp Robin project mitigation stops, the trajectory for fish habitat conditions will be downward. Beschta et al., 2004 state:

(R)oad and landing construction is expensive and can siphon limited funds away from effective restoration measures, such as obliteration and maintenance. The backlog in maintenance of U.S Forest Service roads has been estimated to be several billion dollars (U.S. Department of Agriculture Forest Service 2000), and road construction inevitably adds to this seemingly insurmountable backlog.

Remedy: Choose the No Action Alternative. Alternatively, prepare an EIS for this project which is tiered to a science-based forestwide Travel Analysis Process so that it is fully consistent with the Travel Management Regulations and related directives. Prepare an EIS that incorporates the revised forest-wide TAP and includes alternatives that implement the minimum road system.

INVENTORIED ROADLESS AREAS AND UNROADED AREAS

We discussed the roadless area issue in our previous comments (pp. 77-78).

The EA states, “no changes are expected to occur to the Hellroaring IRA (#128) (see Figure 10 in Recreation Report p. 20). No activities would be conducted within the IRA, however; within the adjacent unroaded area contiguous to the IRA, timber harvest prescribed burning being proposed.”

The FS failed to provide proper analysis of uninventoried roadless areas that make up the Roadless Expanse. Roadless characteristics and Wilderness values would be degraded.

The EA ignores the plain language of the FS Northern Region guidance for roadless area analysis as documented in “Our Approach to Roadless Area Analysis of Unroaded Lands Contiguous to Roadless Areas” (12/2/10). There is no consideration in the EA of uninventoried, unroaded lands adjacent to either IRA and of Camp Robin timber sale impacts to roadless characteristics and wilderness qualities of those areas. There is no map displaying IRA boundaries, the adjacent roads, and proposed project activities that potential impact roadless/unroaded.

A growing number of scientific studies indicate the significant value of roadless areas smaller than 5,000 acres and larger than 1,000 acres (Strittholt and D.A. DellaSala, 2001; DeVelice and Martin, 2001; Loucks et al., 2003; Crist et al., 2005; Nott et al., 2005).

In a letter to President Clinton urging the protection of roadless areas, 136 scientists noted:

There is a growing consensus among academic and agency scientists that existing roadless areas—***irrespective of size***—contribute substantially to maintaining biodiversity and ecological integrity on the national forests. The Eastside Forests Scientific Societies Panel, including representatives from the American Fisheries Society, American Ornithologists’ Union, Ecological Society of America, Society for Conservation Biology, and The Wildlife Society, recommended a prohibition on the construction of new roads and logging within existing (1) roadless regions larger than 1,000 acres, and (2) ***roadless regions smaller than 1,000 acres that are biologically significant***.... Other scientists have also recommended protection of all roadless areas greater than 1,000 acres, at least until landscapes degraded by past management have recovered.... As you have acknowledged, a national policy prohibiting road building and other forms of development in roadless areas represents a major step towards balancing sustainable forest management with conserving environmental values on federal lands. In our view, a scientifically based policy for roadless areas on public lands should, at a minimum, protect from development all roadless areas larger than 1,000 acres and ***those smaller areas that have special ecological significance because of their contributions to regional landscapes***. (Emphases added) [Scientists Roadless letter, 1997.]

The failure to take a hard look at the impacts to the Roadless Expanse(s) in its entirety violates NEPA.

Most roadless areas, particularly in the interior West are at middle to high elevations (Henjum et al. 1994). Higher elevations are cooler, receive more moisture, and have a shorter summer dry season than lower elevations. They are typically characterized by a regime of low-frequency, high-intensity fires. Roadless areas are therefore less likely to have current fire regimes that are significantly different from historical conditions (Agee 1997; Beschta et al. 2004) and are therefore of lower priority for mechanical fuels treatment. Roadless areas have a lower potential for high-intensity fires than roaded areas partly because they are less prone to human caused ignitions (DellaSala et al. 1995, USDA Forest Service, 2000e). The EA fails to acknowledge the best scientific information that recognizes the high ecological integrity and functioning of unmanaged areas.

Remedy: Select the no-action alternative. Otherwise, prepare an EIS for the project, and evaluate the location of roadless area boundaries and analyze and disclose impacts on entire Roadless Expanses.

CARBON SEQUESTRATION AND CLIMATE CHANGE

We discussed carbon sequestration and climate change in our previous comments (pp. 8, 10, 30-42, 48, 78-79). We supplement those comments with the following discussion.

How can our national forests be considered “suitable” for activities that contribute to—rather than reduce—the greatest threat to the Earth’s biosphere? The present level of carbon dioxide (CO₂) in Earth’s atmosphere is already dangerous and not sustainable under any definition of the word.

A landmark report from the United Nations’ scientific panel on climate change paints a far direr picture of the immediate consequences of climate change than previously thought and says that avoiding the damage requires transforming the world economy at a speed and scale that has “no documented historic precedent.”

The report, issued October 8, 2018 by the Intergovernmental Panel on Climate Change, a group of scientists convened by the United Nations to guide world leaders, describes a world of worsening food shortages and wildfires, and a mass die-off of coral reefs as soon as 2040—a period well within the lifetime of much of the global population.

The report “is quite a shock, and quite concerning,” said Bill Hare, an author of previous I.P.C.C. reports and a physicist with Climate Analytics, a nonprofit organization. “We were not aware of this just a few years ago.” The report was the first to be commissioned by world leaders under the Paris agreement, the 2015 pact by nations to fight global warming.

The authors found that if greenhouse gas emissions continue at the current rate, the atmosphere will warm up by as much as 2.7 degrees Fahrenheit (1.5 degrees Celsius) above preindustrial levels by 2040, inundating coastlines and intensifying droughts and poverty. Previous work had focused on estimating the damage if average temperatures were to rise by a larger number, 3.6

degrees Fahrenheit (2 degrees Celsius), because that was the threshold scientists previously considered for the most severe effects of climate change.

The new report, however, shows that many of those effects will come much sooner, at the 2.7-degree mark.

Former US Forest Service Chief Abigail Kimbell and Hutch Brown (in USDA Forest Service, 2017b) discuss some effects of climate change on forests:

Even if global greenhouse gas buildups were reversed today, global temperatures would continue to rise for the next hundred years, bringing regional warming, changes in precipitation, weather extremes, severe drought, earlier snowmelt, rising sea levels, changes in water supplies, and other effects. As it is, global greenhouse emissions are still rising, exacerbating all of these long-term effects. The capacity of many plant and animal species to migrate or adapt will likely be exceeded. Ecosystem processes, water availability, species assemblages, and the structure of plant and animal communities and their interactions will change. **In many areas, it will no longer be possible to maintain vegetation within the historical range of variability. Land management approaches based on current or historical conditions will need to be adjusted.** (Emphasis added.)

Global climate change is a significant threat to humanity and forests. Climate change is caused by excess CO₂ and other greenhouse gases transferred to the atmosphere from other pools. All temperate and tropical forests, including those in this project area, are an important part of the global carbon cycle. There is significant new information reinforcing the need to conserve all existing large stores of carbon in forests, in order to keep carbon out of the atmosphere and mitigate climate change. Since all forests are an important part of the global carbon cycle, the agency must do its part by managing forest to maintain and increase carbon storage. Global warming is caused by the *cumulative* buildup of greenhouse gases, including carbon, in the atmosphere. Logging will add to the cumulative total carbon emissions so it is clearly part of the problem and must be minimized and mitigated. Logging will not only transfer carbon from storage to the atmosphere but future regrowth is unlikely to ever make up for the effects of logging, because carbon storage in logged forests will lag carbon storage unlogged forests for decades or centuries.

The Committee of Scientists, 1999 recognize the importance of forests for their contribution to global climate regulation. Also, the 2012 Planning Rule recognizes, in its definition of *Ecosystem services*, the “Benefits people obtain from ecosystems, including: (2) *Regulating services*, such as long term storage of carbon; climate regulation...”

The IPNF plan revision draft EIS defines **carbon sequestration**: “...the process by which atmospheric carbon dioxide is taken up by vegetation through photosynthesis and stored as carbon in biomass (trunks, branches, foliage, and roots) and soils.”

The FS has not taken a “hard look” at how agency actions would be in accord with its 2010 National Roadmap for Responding to Climate Change, which includes guidance to:

- a. Assess vulnerability of species and ecosystems to climate change
- b. Restore resilience

- c. Promote carbon sequestration
- d. Connect habitats, restore important corridors for fish and wildlife, decrease fragmentation and remove impediments to species migration.

The National Fish, Wildlife and Plants Climate Adaptation Strategy (<https://www.wildlifeadaptationstrategy.gov/>) describes climate change effects and emphasizes conservation of habitats and reduction of non-climate stressors to help fish and wildlife adapt.

The EA fails to provide estimates of the total amount of CO₂ or other greenhouse gas emissions caused by FS management actions and policies—forestwide, regionally, or nationally. Instead, agency policymakers seem comfortable maintaining a position that they need not take any leadership on this issue, and obfuscate via this EA to justify their failures.

It is clear that the management of the planet's forests is a nexus for addressing this largest crisis ever facing humanity. Yet the EA provides a minimal quantitative analysis of project- or agency-caused CO₂ emissions or consider the best available science on the topic. Basically, it cites one scientific reference that is said to support the idea that logging is good for the climate, and ignores a robust body of science that indicates just the opposite. This is immensely unethical and immoral. The lack of detailed scientific discussions in the EA concerning climate change is far more troubling than the document's failures on other topics, because the consequences of unchecked climate change will be disastrous for food production, sea level rise, and water supplies, resulting in complete turmoil for all human societies. (For a sobering perspective, see "When Will Climate Change Make the Earth Too Hot For Humans?") This is an issue as serious as nuclear annihilation (although at least with the latter we're not already pressing the button). The FS's treatment of the issue of climate change is shameful, destructive, short-sighted, reckless, and irresponsible.

The EA provided a pittance of information on climate change effects on project area vegetation. The EA provides no analysis as to the veracity of the project's Purpose and Need, the project's objectives, goals, or desired conditions. The FS has the responsibility to inform the public that climate change is and will be bringing forest change. For the Camp Robin project, this did not happen, in violation of NEPA.

The EA fails to consider that the effects of climate change on the project area, including that the "desired" vegetation conditions will likely not be achievable or sustainable. The EA fails to provide any credible analysis as to how realistic and achievable its desired conditions are in the context of a rapidly changing climate, along an unpredictable but changing trajectory.

The Camp Robin EA fails to analyze and disclose how climate change is already influencing forest ecology, and even more so in the future. This has vast ramifications as to whether or not the forest in the project area will respond as the FS assumes. As the Forest Plan FEIS states, "Forest Plan management strategies may affect the composition, structure, and landscape pattern of forests. This could influence the susceptibility and resiliency of the forests to significant disturbance agents such as large intense wildfires, insect and disease epidemics, weather events, and climate change." One of the needs for forest plan revision revolves around "concerns that the forest composition, structure, and pattern had shifted away from historical conditions to the

extent that ecosystems, and the goods and services that it provided, may not be sustainable, especially in light of potential impacts from climate change.” (Id.)

In a literature review, Simons (2008) states, “Restoration efforts aimed at the maintenance of historic ecosystem structures of the pre-settlement era would most likely reduce the resilient characteristics of ecosystems facing climate change (Millar 1999).” The project area and IPNF have been fundamentally changed, so the agency must consider how much native forest it has fundamentally altered compared to historic conditions forestwide before pursuing “treatments” here. And that includes considering the effects of human-induced climate change. Essentially, this means considering new scientific information on all kinds of changes away from historic conditions.

The FS’s position on project impacts on climate change is that the project would have a miniscule impact on global carbon emissions. The obvious problem with that viewpoint is, once can say the same thing about every source of carbon dioxide (and other anthropogenic greenhouse gas) emission on earth, and likewise justify inaction as does this EA. In their comments on the Kootenai NF’s Draft EIS for the Lower Yaak, O’Brien, Sheep project, the EPA rejected that sort of analysis, basically because the scale of analysis dilutes cumulative effects. We would add that, if the FS wants to refer to a wider scope to analyze its carbon footprint, we suggest that it actually conduct such a cumulative effect analysis and disclose it in a NEPA document.

The Camp Robin EA has no scientific basis for its claims that proposed vegetation “treatments” will result in sustainable vegetation conditions under likely climate change scenarios. It also fails to provide a definition of “increasing resilience” that includes metrics for valid and reliable measurement of resilience. The scientific literature even debates if the same tree species mix that has historically inhabited sites can persist after disturbances, including the types of disturbances proposed under project action alternatives.

DellaSala and Koopman, 2015 conclude:

Wildfire is not increasing compared to historic periods – Wildfires, including very large ones, for the most part, are not increasing in western forests based on published accounts that use historical baselines. Recent increases (past few decades) in acres burned in places (e.g., Sierra Mountains) are ostensibly due to a climate signal but even those have less fire today compared to historical times when fire was much more prevalent.

Large fires are driven more by climate than fuels – Large fires are mainly controlled by extreme weather events, and extreme events are likely to increase as the climate changes.

Most carbon is stored, not emitted, during fires – Large fires are not currently big emitters of carbon dioxide given that fine fuels, not large trees, are combusted and most carbon remains stored in dead trees on site with sequestration rapidly following re-vegetation post-fire.

Maturing natural forests are not accumulating more fuels – As the time between fires increases in mixed-severity fire systems, this is not necessarily associated with higher fire

risk presumably due to shading of combustible understory plants as forests mature. Tree plantations accumulate unnaturally high fuel loads and are the biggest fire risk.

Thinned areas and fire outbreaks are unlikely to overlap – Because fires in any single location are extremely rare, the chance of thinned areas, even over large landscapes, encountering fire within the timeframe that thinning is most effective is very low. Thinning over large landscapes is a net emitter of carbon dioxide. To reduce emissions, thinning should be limited to small trees, areas nearest homes, and plantations.

Biomass is “renewable” only over long time frames while drastic greenhouse gas emissions cuts are needed over shorter time frames – There is a mismatch between the deep and immediate cuts that are needed to prevent catastrophic climate change and the emissions trajectory associated with using biomass for energy production, which immediately releases energy production, which immediately releases decades to centuries of carbon stored in forests to the atmosphere and requires many decades of regrowth to sequester that carbon again.

Biomass can produce higher CO₂ emissions than coal – The amount of carbon dioxide released from woody biomass combustion per unit of energy produced is comparable to coal and much larger than oil and natural gas.

Hanson, 2010 addresses some of the false notions often misrepresented as “best science” by agencies and extractive industries:

Our forests are functioning as carbon sinks (net sequestration) where logging has been reduced or halted, and wildland fire helps maintain high productivity and carbon storage.

Even large, intense fires consume less than 3% of the biomass in live trees, and carbon emissions from forest fires is only tiny fraction of the amount resulting from fossil fuel consumption (even these emissions are balanced by carbon uptake from forest growth and regeneration).

"Thinning" operations for lumber or biofuels do not increase carbon storage but, rather, reduce it, and thinning designed to curb fires further threatens imperiled wildlife species that depend upon post-fire habitat.

The Forest Plan does not provide meaningful direction on climate change. Nor does the EA acknowledge pertinent and highly relevant best available science on climate change. This project is in violation of NEPA.

The Forest Plan FEIS ignores the cumulative CO₂ emissions from forest management on other ownerships in the region or beyond. Since harvested wood products are a net source of CO₂ emissions on national forests in the region, and given the less regulated logging on non-federal ownerships, clearly timber management continues to be a net source of CO₂. Omitting such a cumulative effects analysis allows the agency to avoid describing the opportunity found on national forests to counterbalance some CO₂ emissions from other forest ownerships, resulting in

a range of alternatives where none really address climate change. This is a violation of NEPA, as well as the public trust.

The Camp Robin EA does not analyze or disclose the body of science that implicates logging activities as a contributor to reduced carbon stocks in forests and increases in greenhouse gas emissions. The EA fails to provide estimates of the total amount of carbon dioxide (CO₂) or other greenhouse gas emissions caused by FS management actions and policies—forestwide, regionally, or nationally. Agency policymakers seem comfortable maintaining a position that they need not take any leadership on this issue, and obfuscate via this EA to justify their failures.

The best scientific information strongly suggests that management that involves removal of trees and other biomass increases atmospheric CO₂. Unsurprisingly the EA doesn't state that simple fact. The EA fails to present any modeling of forest stands under different management scenarios. The FS should model the carbon flux over time for its proposed stand management scenarios and for the various types of vegetation cover found on the IPNF.

Respected experts say that the atmosphere might be able to safely hold 350 ppm of CO₂.⁴ So when we were at pre-industrial levels of about 280 ppm, we had a cushion of about 70 ppm which represents millions of tons of GHG emissions. Well, now that cushion is completely gone. We are already above 400 ppm CO₂ and rising, so what's the safe level of additional emissions (from logging or any other activity)? It's negative. There is no safe level of additional emissions that our earth systems can tolerate. In fact, we need to be removing carbon, not adding carbon to the atmosphere.⁵ How could we do that? By growing forests. Logging moves us away from our objective while conservation moves us toward our objective.

Researchers Mackey, et al., 2013 “clarify some well-established fundamentals of the global carbon cycle that are frequently either misunderstood, or seemingly overlooked.” These authors state: “At present some forests have carbon sequestration potential due to depletion of carbon stocks from past land use.” The authors call this potential, “Reforestation of previously cleared or logged land...” They do not attribute this potential to “increasing forest resilience to disturbance” or the kind of forest “restoration” implied by this EA.

Mackey, et al., 2013 also make the following points:

- Avoiding and reducing land carbon emissions is therefore an integral part of any comprehensive approach to solving the climate change problem.
- In addition to deforestation, forests have been degraded by land-use activities such as logging and soil disturbance that deplete their organic carbon stocks and emit CO₂. Emissions from forest degradation are poorly quantified globally, but estimates indicate that they increase regional carbon emissions by nearly 50% over deforestation alone.

⁴ <http://www.350.org/about/science>.

⁵ “To get back to 350 ppm, we’ll have to run the whole carbon-spewing machine backwards, sucking carbon out of the atmosphere and storing it somewhere safely. ... By growing more forests, growing more trees, and better managing all our forests, ...” <http://blog.cleanenergy.org/2013/11/26/exploring-biocarbon-tools/comment-page-1/#comment-375371>

- The capacity of the land to remove atmospheric carbon and store it in vegetation and soil is limited to the amount previously depleted by land use.
- If the forest is allowed to develop into an ecologically mature state, the carbon stock approaches a dynamic equilibrium with prevailing environmental conditions, where respiration approximately balances photosynthesis. At this point, the depleted land carbon stock has been refilled and the sink function has gone. The mitigation value of the ecosystem resides in maintenance of the stored carbon stock.
- Ecologically mature (>200 years) and old-growth forests aged up to 800 years can continue to function as sinks. ... In terms of carbon mitigation policy, the primary reason to conserve forests is the carbon stocks they contain. The idea that replacing primary forests by plantations will ‘create sinks’ and thereby be positive for climate mitigation is incorrect, as it fails to account for the loss of carbon stock from the primary forest. Furthermore, plantation forests store less carbon than the pre-existing natural primary forest, secondary (regenerating) natural forests or a primary forest under the same environmental conditions.
- Consistent with our understanding of the lifetime of the airborne fraction of a pulse of CO₂, the most effective form of climate change mitigation is to avoid carbon emissions from all sources.

Pecl, et al. 2017 “review the consequences of climate-driven species redistribution for economic development and the provision of ecosystem services, including livelihoods, food security, and culture, as well as for feedbacks on the climate itself.” They state, “Despite mounting evidence for the pervasive and substantial impacts of a climate-driven redistribution of Earth’s species, current global goals, policies, and international agreements fail to account for these effects. ... To date, all key international discussions and agreements regarding climate change have focused on the direct socioeconomic implications of emissions reduction and on funding mechanisms; **shifting natural ecosystems have not yet been considered in detail.**” (Emphasis added.)

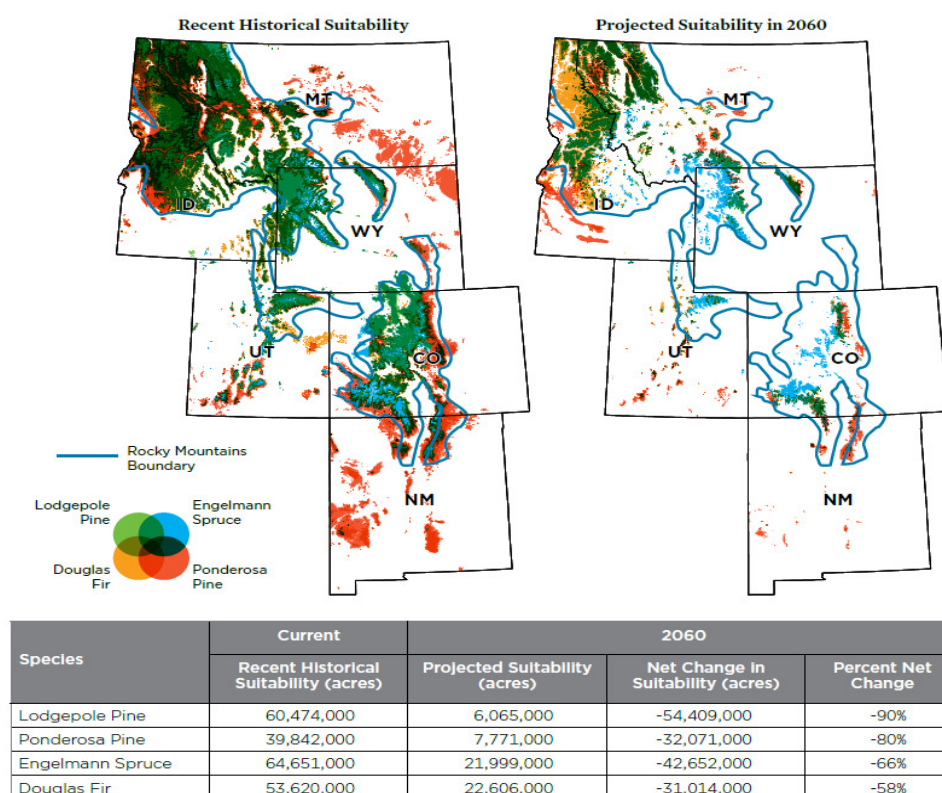
Pecl, et al. 2017 conclude:

The breadth and complexity of the issues associated with the global redistribution of species driven by changing climate are creating profound challenges, with species movements already affecting societies and regional economies from the tropics to polar regions. Despite mounting evidence for these impacts, current global goals, policies, and international agreements do not sufficiently consider species range shifts in their formulation or targets. Enhanced awareness, supported by appropriate governance, will provide the best chance of minimizing negative consequences while maximizing opportunities arising from species movements—movements that, with or without effective emission reduction, will continue for the foreseeable future, owing to the inertia in the climate system.

For only one example of what Pecl et al. are talking about, the Camp Robin EA doesn’t consider climate change effects on reforestation success. Figure 5 on the following page is from a report by the Union of Concerned Scientists & Rocky Mountain Climate Organization (Funk et al., 2014). The caption under Funk et al.’s Figure 5 and Table 1 states:

Much of the current range of these four widespread Rocky Mountain conifer species is projected to become climatically unsuitable for them by 2060 if emissions of heat-trapping gases continue to rise. The map on the left shows areas projected to be climatically suitable for these tree species under the recent historical (1961–1990) climate; the map on the right depicts conditions projected for 2060 given medium-high levels of heat-trapping emissions. Areas in color have at least a 50 percent likelihood of being climatically suitable according to the models, which did not address other factors that affect where species occur (e.g., soil types). Emissions levels reflect the A2 scenario of the Intergovernmental Panel on Climate Change. For more about this methodology, see www.ucsusa.org/forestannex.

FIGURE 5 AND TABLE 1. Projected Changes in Suitable Ranges for Key Rocky Mountain Tree Species



Moomaw and Smith, 2017 identify the need for forest protection to be an urgent, national priority in the fight against climate change and as a safety net for communities against extreme weather events caused by a changing climate. As those authors explain,

Global climate change is caused by excess CO₂ and other greenhouse gases transferred to the atmosphere from other pools. Human activities, including combustion of fossil fuels and bioenergy, forest loss and degradation, other land use changes, and industrial processes, have contributed to increasing atmospheric CO₂, the largest contributor to global warming, which will cause temperatures to rise and stay high into the next millennium or longer.

The most recent measurements show the level of atmospheric carbon dioxide has reached 400 parts per million and will likely to remain at that level for millennia to come. Even if

all fossil fuel emissions were to cease and all other heat-trapping gases were no longer emitted to the atmosphere, temperatures close to those achieved at the emissions peak would persist for the next millennium or longer.

Meeting the goals of the Paris Agreement now requires the implementation of strategies that result in negative emissions, i.e., extraction of carbon dioxide from the atmosphere. In other words, we need to annually remove more carbon dioxide from the atmosphere than we are emitting and store it long-term. Forests and soils are the only proven techniques that can pull vast amounts of carbon dioxide out of the atmosphere and store it at the scale necessary to meet the Paris goal. Failure to reduce biospheric emissions and to restore Earth's natural climate stabilization systems will doom any attempt to meet the Paris (COP21) global temperature stabilization goals.

The most recent U.S. report of greenhouse gas emissions states that our forests currently “offset” 11 to 13 percent of total U.S. annual emissions. That figure is half that of the global average of 25% and only a fraction of what is needed to avoid climate catastrophe. And while the U.S. government and industry continue to argue that we need to increase markets for wood, paper, and biofuel as climate solutions, the rate, scale, and methods of logging in the United States are having significant, negative climate impacts, which are largely being ignored in climate policies at the international, national, state, and local levels.

The actual carbon stored long-term in harvested wood products represents less than 10 percent of that originally stored in the standing trees and other forest biomass. If the trees had been left to grow, the amount of carbon stored would have been even greater than it was 100 years prior. Therefore, from a climate perspective, the atmosphere would be better off if the forest had not been harvested at all. In addition, when wood losses and fossil fuels for processing and transportation are accounted for, carbon emissions can actually exceed carbon stored in wood products.

(Also see: “US Needs to Massively Scale Up Forest Protection to Tackle Climate Change” and “Scripps says climate change may represent ‘existential’ threat to humanity”.)

Like all forests, the IPNF is an important part of the global carbon cycle. Clear scientific information reinforces the critical need to conserve all existing stores of carbon in forests to keep it out of the atmosphere. Given that forest policies in other countries and on private lands are politically more difficult to influence, the FS must take a leadership role to maintain and increase carbon storage on publicly owned forests, in order to help mitigate climate change effects.

Global warming and its consequences may be effectively irreversible, which implicates certain legal consequences under the National Environmental Policy Act (NEPA), the National Forest Management Act (NFMA) and the Endangered Species Act (ESA) (e.g., 40 CFR § 1502.16; 16 USC §1604(g); 36 CFR §219.12; ESA Section 7; 50 CFR §§402.9, 402.14). All net carbon emissions from management activities represent “irretrievable and irreversible commitments of resources.”

The effects of climate change have already been significant, particularly in the region. Westerling, et al. 2006 state:

Robust statistical associations between wildfire and hydro-climate in western forests indicate that increased wildfire activity over recent decades reflects sub-regional responses to changes in climate. Historical wildfire observations exhibit an abrupt transition in the mid-1980s from a regime of infrequent large wildfires of short (average of one week) duration to one with much more frequent and longer-burning (five weeks) fires. This transition was marked by a shift toward unusually warm springs, longer summer dry seasons, drier vegetation (which provoked more and longer-burning large wildfires), and longer fire seasons. Reduced winter precipitation and an early spring snowmelt played a role in this shift. Increases in wildfire were particularly strong in mid-elevation forests. ...The greatest increases occurred in mid-elevation, Northern Rockies forests, where land-use histories have relatively little effect on fire risks, and are strongly associated with increased spring and summer temperatures and an earlier spring snowmelt.

Running, 2006 cites model runs of future climate scenarios from the 4th Assessment of the Intergovernmental Panel on Climate Change, stating:

(S)even general circulation models have run future climate simulations for several different carbon emissions scenarios. These simulations unanimously project June to August temperature increases of 2° to 5°C by 2040 to 2069 for western North America. The simulations also project precipitation decreases of up to 15% for that time period (11). Even assuming the most optimistic result of no change in precipitation, a June to August temperature increase of 3°C would be roughly three times the spring-summer temperature increase that Westerling *et al.* have linked to the current trends. Wildfire burn areas in Canada are expected to increase by 74 to 118% in the next century (12), and similar increases seem likely for the western United States.

Pederson et al. (2009) note that western Montana has already passed through 3 important, temperature-driven ecosystem thresholds.

The Pacific Northwest Research Station, 2004 recognizes “(a) way that climate change may show up in forests is through changes in disturbance regimes—the long-term patterns of fire, drought, insects, and diseases that are basic to forest development.”

Depro, et al., 2008 found that ending commercial logging on U.S. national forests and allowing forests to mature instead would remove an additional amount of carbon from the atmosphere equivalent to 6 percent of the U.S. 2025 climate target of 28 percent emission reductions.

The EA does not analyze or disclose the body of science that implicates logging activities as a contributor to reduced carbon stocks in forests and increases in greenhouse gas emissions.

Forest recovery following logging and natural disturbances are usually considered a given. But forests have recovered under climatic conditions that no longer exist. Higher global temperatures and increased levels of disturbance are contributing to greater tree mortality in many forest ecosystems, and these same drivers can also limit forest regeneration, leading to vegetation type conversion. (Bart et al. 2016.)

The importance of trees for carbon capture will rise especially if, as recent evidence suggests, hopes for soils as a carbon sink may be overly optimistic. (He et al., 2016.) Such a potentially reduced role of soils doesn't mean that forest soils won't have a role in capture and storage of carbon, rather it puts more of the onus on aboveground sequestration by trees, even if there is a conversion to unfamiliar mixes of trees.

The Camp Robin EA ignores the large body of science on forest management's adverse effects on carbon sequestration. Also, the FS likes to claim that carbon emissions from projects such as Camp Robin are minimal in the overall context of such things, however the FS avoids the logical step of analyzing and disclosing the cumulative effects of overall agency management contributions to climate change.

The EA also ignores CO₂ and other greenhouse gas emissions from other common human activities related to forest management and recreational uses. These include emissions associated with machines used for logging and associated activities, vehicle use for administrative actions, livestock grazing, and recreational motor vehicles. The FS is simply ignoring the climate impacts of these management and other authorized activities.

Kassar and Spitler, 2008 analyzed the carbon footprint of off-road vehicles in California:

Off-road vehicles in California currently emit more than 230,000 metric tons — or 5000 million pounds — of carbon dioxide into the atmosphere each year. This is equivalent to the emissions created by burning 500,000 barrels of oil. The 26 million gallons of gasoline consumed by off-road vehicles each year in California is equivalent to the amount of gasoline used by 1.5 million car trips from San Francisco to Los Angeles.

. . . Off-road vehicles emit considerably more pollution than automobiles. According to the California Air Resources Board, off-road motorcycles and all-terrain vehicles produce 118 times as much smog-forming pollutants as do modern automobiles on a per-mile basis.

. . . Emissions from current off-road vehicle use statewide are equivalent to the carbon dioxide emissions from 42,000 passenger vehicles driven for an entire year or the electricity used to power 30,500 homes for one year.

Also, Sylvester, 2014 provides data on the amount of fossil fuel being consumed by snowmobiles in Montana, from which one can calculate their carbon footprint. The study finds that resident snowmobilers burn 3.3 million gallons of gas in their snowmobiles each year and a similar amount of fuel to transport themselves and their snowmobiles to and from their destination. Non-residents annually burn one million gallons of gas in snowmobiles and about twice that in related transportation. So that adds up to 9.6 million gallons of fuel consumed in the pursuit of snowmobiling each year in Montana alone. Multiply that by 20 pounds of carbon dioxide per gallon of gas (diesel pickups spew 22 pounds per gallon) and snowmobiling releases 192 million pounds (96 thousand tons) of climate-warming CO₂ per year into the atmosphere.

This indicates managers are able to estimate fossil fuel emissions created by motor vehicles on the Forest. But the Camp Robin EA fails to disclose fossil fuel emissions such as those caused by recreational activities and resource management.

The FS distracts from the emerging scientific consensus that removing wood or *any* biomass from the forest only worsens the climate change problem. Law and Harmon, 2011 conducted a literature review and concluded ...

Thinning forests to reduce potential carbon losses due to wildfire is in direct conflict with carbon sequestration goals, and, if implemented, would result in a net emission of CO₂ to the atmosphere because the amount of carbon removed to change fire behavior is often far larger than that saved by changing fire behavior, and more area has to be harvested than will ultimately burn over the period of effectiveness of the thinning treatment.

In 2016, Professors Bev Law and Mark Harmon of Oregon State University wrote the following in a letter to members of the U.S. Senate in response to a bill introduced that would essentially designate the burning of trees as carbon neutral:

The [carbon neutrality] bills' assumption that emissions do not increase atmospheric concentrations when forest carbon stocks are stable or increasing is clearly not true scientifically. It ignores the cause and effect basis of modern science. Even if forest carbon stocks are increasing, the use of forest biomass energy can reduce the rate at which forest carbon is increasing. Conservation of mass, a law of physics, means that atmospheric carbon would have to become higher as a result of this action than would have occurred otherwise. One cannot legislate that the laws of physics cease to exist, as this legislation suggests.

(Law and Harmon, 2016) Best available science supports the proposition that forest policies must shift away from logging if carbon sequestration is prioritized. Forests must be preserved indefinitely for their carbon storage value. Forests that have been logged should allowed to convert to eventual old-growth condition. This type of management has the potential to double the current level of carbon storage in some regions. (*See* Harmon and Marks, 2002; Harmon, 2001; Harmon et al., 1990; Homann et al., 2005; Law, 2014; Solomon et al., 2007; Turner et al., 1995; Turner et al., 1997; Woodbury et al., 2007.)

Kutsch et al., 2010 provide an integrated view of the current and emerging methods and concepts applied in soil carbon research. They use a standardized protocol for measuring soil CO₂ efflux, designed to improve future assessments of regional and global patterns of soil carbon dynamics:

Excluding carbonate rocks, soils represent the largest terrestrial stock of carbon, holding approximately 1,500 Pg (10¹⁵ g) C in the top metre. This is approximately twice the amount held in the atmosphere and thrice the amount held in terrestrial vegetation. Soils, and soil organic carbon in particular, currently receive much attention in terms of the role they can play in mitigating the effects of elevated atmospheric carbon dioxide (CO₂) and associated global warming. Protecting soil carbon stocks and the process of soil carbon sequestration, or flux of carbon into the soil, have become integral parts of managing the global carbon balance. This has been mainly because many of the factors affecting the flow of carbon into and out of the soil are affected directly by **land-management practices**.

(Emphasis added.) Van der Werf, et al. 2009 discuss the effects of land-management practices and state:

(T)he maximum reduction in CO₂ emissions from avoiding deforestation and forest degradation is probably about 12% of current total anthropogenic emissions (or 15% if peat degradation is included) - and that is assuming, unrealistically, that emissions from deforestation, forest degradation and peat degradation can be completely eliminated.

...reducing fossil fuel emissions remains the key element for stabilizing atmospheric CO₂ concentrations.

(E)fforts to mitigate emissions from tropical forests and peatlands, and maintain existing terrestrial carbon stocks, remain critical for the negotiation of a post-Kyoto agreement. Even our revised estimates represent substantial emissions ...

Keith et al., 2009 state:

Both net primary production and net ecosystem production in many old forest stands have been found to be positive; they were lower than the carbon fluxes in young and mature stands, but not significantly different from them. Northern Hemisphere forests up to 800 years old have been found to still function as a carbon sink. Carbon stocks can continue to accumulate in multi-aged and mixed species stands because stem respiration rates decrease with increasing tree size, and continual turnover of leaves, roots, and woody material contribute to stable components of soil organic matter. There is a growing body of evidence that forest ecosystems do not necessarily reach an equilibrium between assimilation and respiration, but can continue to accumulate carbon in living biomass, coarse woody debris, and soils, and therefore may act as net carbon sinks for long periods. Hence, process-based models of forest growth and carbon cycling based on an assumption that stands are even-aged and carbon exchange reaches an equilibrium may underestimate productivity and carbon accumulation in some forest types. Conserving forests with large stocks of biomass from deforestation and degradation avoids significant carbon emissions to the atmosphere. Our insights into forest types and forest conditions that result in high biomass carbon density can be used to help identify priority areas for conservation and restoration.

Harmon, 2009 reviews how the forest ecosystem stores carbon, the issues that must be addressed when assessing any proposed course of action, and some common misconceptions. He also reviews and assesses some of the more common proposals as well as general scientific concerns about the forest system as a place to store carbon.

Campbell et al., 2011 also refute the notion that fuel-reduction treatments increase forest carbon storage in the western US:

It has been suggested that thinning trees and other fuel-reduction practices aimed at reducing the probability of high-severity forest fire are consistent with efforts to keep carbon (C) sequestered in terrestrial pools, and that such practices should therefore be rewarded rather than penalized in C-accounting schemes. By evaluating how fuel treatments, wildfire, and their interactions affect forest C stocks across a wide range of spatial and temporal scales, we conclude that this is extremely unlikely. Our review reveals high C losses associated with fuel treatment, only modest differences in the combustive

losses associated with high-severity fire and the low-severity fire that fuel treatment is meant to encourage, and a low likelihood that treated forests will be exposed to fire. Although fuel-reduction treatments may be necessary to restore historical functionality to fire-suppressed ecosystems, we found little credible evidence that such efforts have the added benefit of increasing terrestrial C stocks.

Mitchell et al. (2009) also refute the assertion that logging to reduce fire hazard helps store carbon, and conclude that although thinning can affect fire, management activities are likely to remove more carbon by logging than will be stored by trying to prevent fire.

Forests affect the climate, climate affects the forests, and there's been increasing evidence of climate triggering forest cover loss at significant scales (Breshears et al. 2005), forcing tree species into new distributions “unfamiliar to modern civilization” (Williams et al. 2012), and raising a question of forest decline across the 48 United States (Cohen et al. 2016).

In 2012 Forest Service scientists reported, “Climate change will alter ecosystem services, perceptions of value, and decisions regarding land uses.” (Vose et al. 2012.)

The 2014 National Climate Assessment chapter for the Northwest is prefaced by four “key messages” including this one: “The combined impacts of increasing wildfire, insect outbreaks, and tree diseases are already causing widespread tree die-off and are virtually certain to cause additional forest mortality by the 2040s and long-term transformation of forest landscapes. Under higher emissions scenarios, extensive conversion of subalpine forests to other forest types is projected by the 2080s.” (Mote et al. 2014.)

None of this means that longstanding values such as conservation of old-growth forests are no longer important. Under increasing heat and its consequences, we're likely to get unfamiliar understory and canopy comprised of a different mix of species. This new assortment of plant species will plausibly entail a new mix of trees, because some familiar tree species on the IPNF may not be viable—or as viable—under emerging climate conditions.

That said, the plausible new mix will include trees for whom the best policy will be in allowing them to achieve their longest possible lifespan, for varied reasons including that big trees will still serve as important carbon capture and storage (Stephenson et al. 2014).

Managing forest lands with concerns for water will be increasingly difficult under new conditions expected for the 21st century. (Sun and Vose, 2016.) Already, concerns have focused on new extremes of low flow in streams. (Kormos et al. 2016.) The 2014 National Climate Assessment Chapter for the Northwest also recognizes hydrologic challenges ahead: “Changes in the timing of streamflow related to changing snowmelt are already observed and will continue, reducing the supply of water for many competing demands and causing far-reaching ecological and socioeconomic consequences.” (Mote et al. 2014.)

Heat, a long-established topic of physics, plays an equally important role at the level of plant and animal physiology—every organism only survives and thrives within thermal limits. For example, Pörtner et al. (2008) point out, “All organisms live within a limited range of body

temperatures... Direct effects of climatic warming can be understood through fatal decrements in an organism's performance in growth, reproduction, foraging, immune competence, behaviors and competitiveness.” The authors further explain, “Performance in animals is supported by aerobic scope, the increase in oxygen consumption rate from resting to maximal.” In other words, rising heat has the same effect on animals as reducing the oxygen supply, and creates the same difficulties in breathing. But breathing difficulties brought on by heat can have important consequences even at sub-lethal levels. In the case of grizzly bears, increased demand for oxygen under increasing heat has implications for vigorous (aerobically demanding) activity including digging, running in pursuit of prey, mating, and the play of cubs.

Malmsheimer et al. 2008 state, “Forests are shaped by climate. Along with soils, aspect, inclination, and elevation, climate determines what will grow where and how well. Changes in temperature and precipitation regimes therefore have the potential to dramatically affect forests nationwide.”

Kirilenko and Sedjo, 2007 state “The response of forestry to global warming is likely to be multifaceted. On some sites, species more appropriate to the climate will replace the earlier species that is no longer suited to the climate.”

Some FS scientists recognize this changing situation, for instance Johnson, 2016:

Forests are changing in ways they’ve never experienced before because today’s growing conditions are different from anything in the past. The climate is changing at an unprecedented rate, exotic diseases and pests are present, and landscapes are fragmented by human activity often occurring at the same time and place.

The current drought in California serves as a reminder and example that forests of the 21st century may not resemble those from the 20th century. “When replanting a forest after disturbances, does it make sense to try to reestablish what was there before? Or, should we find re-plant material that might be more appropriate to current and future conditions of a changing environment?

“Restoration efforts on U.S. Forest Service managed lands call for the use of locally adapted and appropriate native seed sources. The science-based process for selecting these seeds varies, but in the past, managers based decisions on the assumption that present site conditions are similar to those of the past.

“This may no longer be the case.”

There is scientific certainty that climate change has reset the deck for future ecological conditions. For example, Sallabanks, et al., 2001:

(L)ong-term evolutionary potentials can be met only by accounting for potential future changes in conditions. ...Impending changes in regional climates ...have the capacity for causing great shifts in composition of ecological communities.

The issue of forest response to climate change is also of course an issue of broad importance to community vitality and economic sustainability. Raising a question about persistence of forest

stands also raises questions about hopes—and community economic planning—for the sustainability of forest-dependent jobs. Allen et al., 2015 state:

Patterns, mechanisms, projections, and consequences of tree mortality and associated broad-scale forest die-off due to drought accompanied by warmer temperatures—“hotter drought”, an emerging characteristic of the Anthropocene—are the focus of rapidly expanding literature.

...(R)ecent studies document more rapid mortality under hotter drought due to negative tree physiological responses and accelerated biotic attacks. Additional evidence suggesting greater vulnerability includes rising background mortality rates; projected increases in drought frequency, intensity, and duration; limitations of vegetation models such as inadequately represented mortality processes; warming feedbacks from die-off; and wildfire synergies.

...We also present a set of global vulnerability drivers that are known with high confidence: (1) droughts eventually occur everywhere; (2) warming produces hotter droughts; (3) atmospheric moisture demand increases nonlinearly with temperature during drought; (4) mortality can occur faster in hotter drought, consistent with fundamental physiology; (5) shorter droughts occur more frequently than longer droughts and can become lethal under warming, increasing the frequency of lethal drought nonlinearly; and (6) mortality happens rapidly relative to growth intervals needed for forest recovery.

These high-confidence drivers, in concert with research supporting greater vulnerability perspectives, support an overall viewpoint of greater forest vulnerability globally. We surmise that mortality vulnerability is being discounted in part due to difficulties in predicting threshold responses to extreme climate events. Given the profound ecological and societal implications of underestimating global vulnerability to hotter drought, we highlight urgent challenges for research, management, and policy-making communities.

Also see: “Scientists Letter to the Senate on carbon neutrality of forest biomass.”

Climate change science suggests that logging for sequestration of carbon, logging to reduce wild fire, and other manipulation of forest stands does not offer benefits to climate. Rather, increases in carbon emissions from soil disturbance and drying out of forest floors are the result. Managers of national forest lands can best address climate change through minimizing development of forest stands, especially stands that have not been previously logged, by allowing natural processes to function. Furthermore, any supposedly carbon sequestration from logging are usually more than offset by carbon release from ground disturbing activities and from the burning of fossil fuels to accomplish the timber sale, even when couched in the language of restoration. Reducing fossil fuel use is vital. Everything from travel planning to monitoring would have an important impact in that realm. The EA fails to analyze, disclose, and consider scientific information that is not in agreement with its position on soil carbon storage, logging, and wildfire.

We have no more time to prevaricate, and it's not a battle we can afford to lose. We each have a choice: submit to status quo and enable the lurch towards disaster, or empower ourselves to limit greenhouse gas emissions so not just a couple more generations might survive.

The EA fails to consider best available scientific information on climate change as it relates directly, indirectly, and cumulatively to the Camp Robin Project, in violation of NEPA.

Remedy: Choose the No Action Alternative. Revise the Forest Plan to take a hard look at the science of climate change. Prepare an EIS for this project if the FS still wants to pursue it, which includes an analysis that examines climate change in the context of project activities and Desired Conditions. We also would welcome, finally, an EIS on the whole of U.S. Government climate policies.

FIRE POLICY

AWR raised issues regarding fire in our previous comments (pp. 5-7, 22-25, 34, 36, 38, 42-49, 71-72, 73-74, 78, 79). We supplement those comments with the following discussion.

The EA states, under “Why Are We Proposing This Project?”: “We are also concerned about areas where forest fuel accumulations are high and could contribute to extreme wildfire behavior (such as crown fire); making suppression difficult near private lands.” The EA also alleges a “Need” for the Camp Robin timber sale, “Fire suppression policies of the early 1900s have had an effect on our current forest structure and composition found in the project area. While well intended, fire suppression has effectively removed the natural role of fire, which periodically cleaned the forest of accumulated debris (“forest fuels”)...” The notion that fires “clean” the forest of “debris” is a linguistic distortion intended to allow FS managers to now claim they are “cleaning” things up when in fact the timber industry would be cleaning up at the expense of taxpayers and wildlife.

As far as the “restoration” being alleged to address the impacts of long-term fire suppression, there is no cogent plan for integrating wildland fire back into this ecosystem. The Revised Forest Plan and this EA are all about continuing a repressive and suppressive regime, however the FS has never conducted an adequate cumulative effects analysis of its forestwide fire suppression. The “plan” is clearly to log now, suppress fires continuously, and log again in the future based on the very same “need” to address the ongoing results of fire suppression.

“Fire suppression activities ... can also slow the development of quality late-successional habitat where it does not currently exist by encouraging growth of higher densities of smaller-diameter shade-tolerant species and contributing to higher incidences of insects and disease. This can result in fuel loading that may cause larger, hotter future wildfires.” Yet this is exactly what the FS proposes to do—landscape fire suppression with more management piled on to mitigate the damage it causes.

True restoration of already logged and roaded watersheds would prioritize removing the impediments to natural recovery.

News articles in the printed media recognize the ecological benefits of wildland fires and better forest policy (See the folder entitled “News Articles”).

Nothing in the EA informs the public about wildland fire ecology. The FS is institutionally in denial of the highly restorative and beneficial effects of wildland fire—proposing to prevent all severe fire and irrationally maintaining a position that management alone restores forests.

Implicit in the EA is an assumption that fire risk can be mitigated to a significant degree by reacting in opposition to natural processes—namely the growth of various species of native vegetation (misleadingly referred to as “fuels”). We believe the FS oversells the ability of land managers to make conditions safe for landowners and firefighters. This can lead to landowner complacency—thereby increasing rather than decreasing risk. Many likely fire scenarios involve weather conditions when firefighters cannot react quickly enough, or when it’s too unsafe to attempt suppression. With climate change, this is likely to occur more frequently. Other likely scenarios include situations where firefighting might be feasible but resources are stretched thin because of priorities elsewhere.

We strongly support government actions which facilitate cultural change towards private landowners being primarily responsible for mitigating the safety and property risks of fire, by implementing firewise activities on their property. Indeed, the best available science supports such a prioritization. (Kulakowski, 2013; Cohen, 1999a) Also, see Firewise Landscaping⁶ as recommended by Utah State University, and the Firewise USA website by the National Fire Protection Association⁷ for examples of educational materials.

The forest plan definition of WUI has allowed entities other than the public to set WUI boundaries outside of NEPA and NFMA processes, and defines it so vaguely as to allow expansion of the WUI—again outside NFMA and NEPA processes.

We want the FS and the public to be comfortable with unplanned wildland fires under some weather conditions in sensible locations, so that the ecosystem benefits can be realized. Simply stated, at the time that response to any given fire is contemplated, we want decision makers to have publicly vetted documentation—for that specific fire area—of the benefits of the process that helps create habitat conditions for wildlife, restores forest composition, recycles soil nutrients, creates large dead logs that fall into streams forming native fish habitat, as well as many others. That will provide the public, the news media, and politicians with a fully vetted set of justifications for managing with—rather than against—the native ecosystem process of fire. We believe that such planning can and must be undertaken for sustainable forest management to evolve away from the unacceptable present situation. If the FS is unwilling to perform such an analysis for projects such as Camp Robin, then it must undergo programmatic analysis of its fire suppression policies, disclosing the impacts and ecological harm that the agency will subsequently claim must be later addressed by vegetation management and fuel treatment

⁶ <https://extension.usu.edu/ueden/ou-files/Firewise-Landscaping-for-Utah.pdf>

⁷ <http://www.nfpa.org/Public-Education/By-topic/Wildfire/Firewise-USA/The-ember-threat-and-the-home-ignition-zone>

projects across the landscape. Not to mention the enormous financial costs—also never analyzed or disclosed at any planning level.

The Forest Plan FEIS analysis of fire suppression fails to address the constrained budget scenario which implies the FS will not be allocated enough funding to address the problems it states are perpetuated by fire suppression.

What we get from FS managers nowadays are project-level NEPA documents like the Camp Robin EA, which implement a hybrid, reactionary management scheme, continuing to replace wildland fire with logging and burning, but not in the context of any analysis of cumulative, forestwide impacts.

The IPNF has not conducted a thorough and complete analysis of forestwide cumulative effects of fire management policies, including fire suppression policies. The Forest Plan and its FEIS did not include a programmatic analysis of the cumulative effects of fire suppression. Part of the agency's mantra for more management includes mitigating the impacts of fire suppression. So to comply with NEPA, the FS must conduct a programmatic analysis of the cumulative effects of its fire suppression policies. Until it does so, the FS cannot assure viability of species that depend upon the effects of natural wildland fire such as the black-backed woodpecker (Hutto 1995, Hutto 2006, Hutto 2008); boreal toad, (Hutto 2006); mountain bluebird, American three-toed woodpecker, and olive-sided flycatcher (Hutto 2005, Hutto 2006).

Odion and DellaSala, 2011 describe this situation: "...fire suppression continues unabated, creating a self-reinforcing relationship with fuel treatments which are done in the name of fire suppression. Self-reinforcing relationships create runaway processes and federal funding to stop wildfires now amounts to billions of tax dollars each year." Also see Hutto et al., 2016.

DellaSala et al., 2018 summarize some of the latest science around top-line wildfire issues, including areas of scientific agreement, disagreement, and ways to coexist with wildfire. It is a synopsis of current literature written for a lay audience and focused on six major fire topics:

1. Are wildfires ecological catastrophes?
2. Are acres burning increasing in forested areas?
3. Is high severity fire within large fire complexes (so called "mega-fires") increasing?
4. What's driving the recent increase in burned acres?
5. Does "active management" reduce wildfire occurrence or intensity?
6. Will more wildfire suppression spending make us safer?

The premise that thinning and other mechanical treatments replicate natural fire is contradicted by science (for example see Rhodes and Baker 2008, McRae et al 2001, and Rhodes 2007).

Zald and Dunne, 2018 state, "intensive plantation forestry characterized by young forests and spatially homogenized fuels, rather than pre-fire biomass, were significant drivers of wildfire severity."

In his testimony before Congress, DellaSala, 2017 discusses "...how proposals that call for increased logging and decreased environmental review in response to wildfires and insect

outbreaks are not science driven, in many cases may make problems worse, and will not stem rising wildfire suppression costs” and “what we know about forest fires and beetle outbreaks in relation to climate change, limitations of thinning and other forms of logging in relation to wildfire and insect management” and makes “recommendations for moving forward based on best available science.”

The EA doesn’t provide a genuine discussion of the varying amounts and levels of effectiveness of fuel changes attributable to: the varying ages of past logged areas, the varying forest types, the varying slash treatments, etc. This is true for land of other ownerships also. The EA simply does not disclose how the vegetation patterns that have resulted from past logging and other management actions would influence fire behavior.

The FS must disclose that most wildland fire ignitions are human-caused, and occur near roads.

DellaSala, et al. (1995) state:

Scientific evidence does not support the hypothesis that intensive salvage, thinning, and other logging activities reduce the risk of catastrophic fires if applied at landscape scales ... At very local scales, the removal of fuels through salvage and thinning may hinder some fires. However, applying such measures at landscape scales removes natural fire breaks such as moist pockets of late-seral and riparian forests that dampen the spread and intensity of fire and has little effect on controlling fire spread, particularly during regional droughts. ... Bessie and Johnson (1995) found that surface fire intensity and crown fire initiation were strongly related to weather conditions and only weakly related to fuel loads in subalpine forest in the southern Canadian Rockies. . . . Observations of large forest fires during regional droughts such as the Yellowstone fires in 1988 (Turner, et al. 1994) and the inland northwest fires of 1994 . . . raise serious doubts about the effectiveness of intensive fuel reductions as “fire-proofing” measures.

The EA fails to acknowledge that mixed-severity and even low-severity fire regimes result in much more variable stand conditions across the landscape through time. Assumptions that drier forests did not experience stand-replacing fires, that fire regimes were frequent and nonlethal, that these stands were open and dominated by large well-spaced trees, and that fuel amounts determine fire severity (the false thinning hypothesis that fails to recognize climate as the overwhelming main driver of fire intensity) are not supported by science (see for example Baker and Williams 2015, Williams and Baker 2014, Baker et al. 2006, Pierce et al. 2004, Baker and Ehle 2001, Sherriff et al. 2014). Even research that has uncritically accepted the questionable ponderosa pine model that may only apply to the Mogollon Rim of Arizona and New Mexico (and perhaps in similar dry-forest types in California), notes the inappropriateness of applying that model to elsewhere (see Schoennagel et al. 2004). The EA’s assertion that the proposed treatments will result in likely or predictable later wildland fire effects is of considerable scientific doubt (Rhodes and Baker, 2008).

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Veblen (2003) states:

The premise behind many projects aimed at wildfire hazard reduction and ecological restoration in forests of the western United States is the idea that unnatural fuel buildup has resulted from suppression of formerly frequent fires. This premise and its implications need to be critically evaluated by conducting area-specific research in the forest ecosystems targeted for fuels or ecological restoration projects. Fire regime researchers need to acknowledge the limitations of fire history methodology and avoid over-reliance on summary fire statistics such as mean fire interval and rotation period. While fire regime research is vitally important for informing decisions in the areas of wildfire hazard mitigation and ecological restoration, there is much need for improving the way researchers communicate their results to managers and the way managers use this information.

Hutto (2008) states:

(C)onsider the question of whether forests outside the dry ponderosa pine system are really in need of “restoration.” While stem densities and fuel loads may be much greater today than a century ago, those patterns are perhaps as much of a reflection of human activity in the recent past (e.g., timber harvesting) as they are a reflection of historical conditions (Shinneman and Baker 1997). Without embracing an evolutionary perspective, we run the risk of creating restoration targets that do not mimic evolutionarily meaningful historical conditions, and that bear little resemblance to the conditions needed to maintain populations of native species, as mandated by law (e.g., National Forest Management Act of 1976).

Kauffman (2004) suggests that current FS fire suppression policies are what is catastrophic, and that fires are beneficial:

Large wild fires occurring in forests, grasslands and chaparral in the last few years have aroused much public concern. Many have described these events as “catastrophes” that must be prevented through aggressive increases in forest thinning. **Yet the real catastrophes are not the fires themselves but those land uses, in concert with fire suppression policies that have resulted in dramatic alterations to ecosystem structure and composition.** The first step in the restoration of biological diversity (forest health) of western landscapes must be to implement changes in those factors that have resulted in the current state of wildland ecosystems. Restoration entails much more than simple structural modifications achieved through mechanical means. **Restoration should be undertaken at landscape scales and must allow for the occurrence of**

dominant ecosystem processes, such as the natural fire regimes achieved through natural and/or prescribed fires at appropriate temporal and spatial scales.
(Emphases added.)

Riggers et al., 2001 state:

(T)he real risk to fisheries is not the direct effects of fire itself, but rather the existing condition of our watersheds, fish communities, and stream networks, and the impacts we impart as a result of fighting fires. Therefore, attempting to reduce fire risk as a way to reduce risks to native fish populations is really subverting the issue. If we are sincere about wanting to reduce risks to fisheries associated with future fires, we ought to be removing barriers, reducing road densities, reducing exotic fish populations, and re-assessing how we fight fires. At the same time, we should recognize the vital role that fires play in stream systems, and attempt to get to a point where we can let fire play a more natural role in these ecosystems.

Those fisheries biologists emphasize, “the importance of wildfire, including large-scale, intense wildfire, in creating and maintaining stream systems and stream habitat. ... (I)n most cases, proposed projects that involve large-scale thinning, construction of large fuel breaks, or salvage logging as tools to reduce fuel loading with the intent of reducing negative effects to watersheds and the aquatic system are largely unsubstantiated.” They point out that logging, thinning and fire suppression can have harmful effects on watersheds (Id.). In the Camp Robin EA we instead get a lot of scare about later wildfire damage in the absence of this timber sale, without any rational analysis or reasonable discussion of the risks either with or without the timber sale. In the fisheries section of the EA we get this rare admission: “However, sedimentation associated with an unplanned high intensity wildfire would still be a reasonable threat even with implementation of alternative 2.” For the most part, however, the EA pretty much paints the picture that the timber sale will be the great savior of all the natural resources in the project area and doesn’t present rational analyses comparing fire effects of No Action vs. Alternative 2.

Noss et al. (2006) state:

Forest landscapes that have been affected by a major natural disturbance, such as a severe wildfire or wind storm, are commonly viewed as devastated. Such perspectives are usually far from ecological reality. Overall species diversity, measured as number of species—at least of higher plants and vertebrates – is often highest following a natural stand replacement disturbance and before redevelopment of closed-canopy forest (Lindenmayer and Franklin 2002). Important reasons for this include an abundance of biological legacies, such as living organisms and dead tree structures, the migration and establishment of additional organisms adapted to the disturbed, early-successional environment, availability of nutrients, and temporary release of other plants from dominance by trees. Currently, early-successional forests (naturally disturbed areas with a full array of legacies, i.e. not subject to post-fire logging) and forests experiencing natural regeneration (i.e. not seeded or planted), are among the most scarce habitat conditions in many regions.

Baker et al., 2006 state:

Because multiple explanations exist for the presence and abundance of young, shade-

tolerant trees, these trees need to be dated and linked definitively to a particular land use (e.g. livestock grazing, logging, fire exclusion) before their removal is ecologically appropriate in restoration, and so that the correct land use, as discussed later, can be modified.

...Identification of which land uses affected a stand proposed for restoration is essential. Fire exclusion, logging and livestock grazing do not have the same effects on these forests, their effects vary with environment, and they require different restoration actions. Before restoration begins, it makes sense to modify or minimize the particular land uses that led to the need for restoration, to avoid repeating degradation and ongoing, periodic subsidies that merely maintain land uses at non-sustainable levels (Hobbs & Norton, 1996). For example, thinning an overgrazed forest, without restoring native bunchgrasses lost to grazing, may simply lead to a new pulse of tree regeneration that will have to be thinned again.

To us, this means making a firm commitment to allowing wildland fire to play its natural role on the landscape, avoiding the knee-jerk firefighting and fire suppression actions that are all too commonly applied as soon as a fire is detected.

There has been extensive research in forests about the ecological benefits of mixed-severity (which includes high-severity) fire over the past two decades, so much so that in 2015 science and academic publishing giant Elsevier published a four hundred page book, *The Ecological Importance of Mixed-Severity Fires: Nature's Phoenix* which synthesizes published, peer-reviewed science investigating the value of mixed- and high-severity fires for biodiversity (DellaSala and Hanson, 2015). This book includes research documenting the benefits of high-intensity wildfire patches for wildlife species, as well as a discussion of mechanical “thinning” logging, approved here, and its inability to reduce the chances of a fire burning in a given area, or alter the intensity of a fire, should one begin under high fire weather conditions, because overwhelmingly weather, not vegetation, drives fire behavior (DellaSala and Hanson, 2015, Ch. 13, pp. 382-384).

Mixed-severity fires, and in particular patches of high-severity fire, benefit grizzly bears by increasing cover of berry producing shrubs (such as huckleberry) that the bears rely upon to get fat before winter, and promoting regeneration of whitebark pine— the seeds of which are an important food source for the bears (DellaSala and Hanson, 2015, Ch. 4, pp. 89, 101).

Tingley et al., 2016 note the diversity of habitats following a fire is related to the diversity of burn severities: “(W)ithin the decade following fire, different burn severities represent unique habitats whose bird communities show differentiation over time... Snags are also critical resources for many bird species after fire. Increasing densities of many bird species after fire— primarily wood excavators, aerial insectivores, and secondary cavity nesters—can be directly tied to snag densities...”

Similarly, Hutto and Patterson, 2016 state, “the variety of burned-forest conditions required by fire-dependent bird species cannot be created through the application of relatively uniform low-severity prescribed fires, through land management practices that serve to reduce fire severity or

through post-fire salvage logging, which removes the dead trees required by most disturbance-dependent bird species.”

Hutto et al., 2016 urge “a more ecologically informed view of severe forest fires”:

Public land managers face significant challenges balancing the threats posed by severe fire with legal mandates to conserve wildlife habitat for plant and animal species that are positively associated with recently burned forests. Nevertheless, land managers who wish to maintain biodiversity must find a way to embrace a fire-use plan that allows for the presence of all fire severities in places where a historical mixed-severity fire regime creates conditions needed by native species while protecting homes and lives at the same time. This balancing act can be best performed by managing fire along a continuum that spans from aggressive prevention and suppression near designated human settlement areas to active “ecological fire management” (Ingalsbee 2015) in places farther removed from such areas. This could not only save considerable dollars in fire-fighting by restricting such activity to near settlements (Ingalsbee and Raja 2015), but it would serve to retain (in the absence of salvage logging, of course) the ecologically important disturbance process over most of our public land while at the same time reducing the potential for firefighter fatalities (Moritz et al. 2014). Severe fire is not ecologically appropriate everywhere, of course, but the potential ecological costs associated with prefire fuels reduction, fire suppression, and postfire harvest activity in forests born of mixed-severity fire need to be considered much more seriously if we want to maintain those species and processes that occur only where dense, mature forests are periodically allowed to burn severely, as they have for millennia.

Bradley et al., 2016 found that areas of more intensive management tend to burn more severely than unmanaged forests:

There is a widespread view among land managers and others that the protected status of many forestlands in the western United States corresponds with higher fire severity levels due to historical restrictions on logging that contribute to greater amounts of biomass and fuel loading in less intensively managed areas, particularly after decades of fire suppression.

... On the contrary, using over three decades of fire severity data from relatively frequent-fire pine and mixed-conifer forests throughout the western United States, we found support for the opposite conclusion—burn severity tended to be higher in areas with lower levels of protection status (more intense management)... Our results suggest a need to reconsider current overly simplistic assumptions about the relationship between forest protection and fire severity in fire management and policy.

The EA fails to reconcile the above scientific perspectives.

The EA primarily discusses fuel conditions only in the areas proposed for treatment, yet wildland fire operates beyond artificial ownership or other boundaries. In regards to the proper cumulative effects analysis area for fire risk, Finney and Cohen (2003) discuss the concept of a “fireshed involving a wide area around the community (for many miles that include areas that fires can come from).” In other words, for any given entity that would apparently have its risk of

fire reduced by the proposed project (or affected cumulatively from past, ongoing, or foreseeable actions on land of all ownerships within this “fireshed”)—just how effective would fuel reduction be? The EA fails to include a thorough discussion and detailed disclosure of the current fuel situation within the fireshed within and outside the proposed treatment units, making it impossible to make scientifically supportable and reasonable conclusions about the manner and degree to which fire behavior would be changed by the project.

The EA also fails to deal with the fuels issue on the appropriate temporal scale. How landscape-level fire behavior at any period except for very shortly after treatment would be changed or improved is ignored.

Rhodes (2007) states: “The transient effects of treatments on forest, coupled with the relatively low probability of higher-severity fire, makes it unlikely that fire will affect treated areas while fuel levels are reduced.” (Internal citations omitted.) And Rhodes also points out that using mechanical fuel treatments (MFT) to restore natural fire regimes must take into consideration the root causes of the alleged problem:

In order to be ultimately effective at helping to restore natural fire regimes, fuel treatments must be part of wider efforts to address the root causes of the alteration in fire behavior. At best, MFT can only address symptoms of fire regime alteration. Evidence indicates that primary causes of altered fire regimes in some forests include changes in fuel character caused by the ongoing effects and legacy of land management activities. These activities include logging, post-disturbance tree planting, livestock grazing, and fire suppression. Many of these activities remain in operation over large areas. Therefore, unless treatments are accompanied by the elimination of or sharp reduction in these activities and their impacts in forests where the fire regime has been altered, MFT alone will not restore fire regimes. (Internal citations omitted.)

Cohen, 1999 recognizes “the imperative to separate the problem of the wildland fire threat to homes from the problem of ecosystem sustainability due to changes in wildland fuels” (Id.). In regards to the latter—ecosystem sustainability—Cohen and Butler (2005) state:

Realizing that wildland fires are inevitable should urge us to recognize that excluding wildfire does not eliminate fire, it unintentionally selects for only those occurrences that defy our suppression capability—the extreme wildfires that are continuous over extensive areas. If we wish to avoid these extensive wildfires and restore fire to a more normal ecological condition, **our only choice is to allow fire occurrence under conditions other than extremes. Our choices become ones of compatibility with the inevitable fire occurrences rather than ones of attempted exclusion.** (Emphasis added.)

In support of focusing on manipulating limited areas near homes, Finney and Cohen, 2003, state: Research findings indicate that a home’s characteristics and the characteristics of a home’s immediate surroundings within 30 meters principally determine the potential for wildland-urban fire destruction. This area, which includes the home and its immediate surroundings, is termed the home ignition zone. The home ignition zone implies that activities to reduce the potential for wildland-urban fire destruction can address the necessary factors that determine ignitions and can be done sufficiently to reduce the likelihood of ignition. Wildland fuel reduction outside and adjacent to a home ignition zone might reduce the

potential flame and firebrand exposure to the home ignition zone (i.e., within 30 m of the home). However, the factors contributing to home ignition within this zone have not been mitigated. Given a wildfire, wildland fuel management alone (i.e., outside the home ignition zone) is not sufficient nor does it substitute for mitigations within the home ignition zone. ... (I)t is questionable whether wildland fuel reduction activities are necessary and sufficient for mitigating structure loss in wildland urban fires.

...(W)ildland fuel management changes the ... probability of a fire reaching a given location. It also changes the distribution of fire behaviors and ecological effects experienced at each location because of the way fuel treatments alter local and spatial fire behaviors (Finney 2001). **The probability that a structure burns, however, has been shown to depend exclusively on the properties of the structure and its immediate surroundings (Cohen 2000a).** (Emphasis added.)

Our take from Finney and Cohen (2003) is that there is much uncertainty over effects of fuel reduction. The authors point out:

Although the conceptual basis of fuel management is well supported by ecological and fire behavior research in some vegetation types, the promise of fuel management has lately become loaded with the expectation of a diffuse array of benefits. Presumed benefits range from restoring forest structure and function, bringing fire behavior closer to ecological precedents, reducing suppression costs and acres burned, and preventing losses of ecological and urban values. For any of these benefits to be realized from fuel management, a supporting analysis must be developed to physically relate cause and effect, essentially evaluating how the benefit is physically derived from the management action (i.e. fuel management). Without such an analysis, the results of fuel management can fail to yield the expected return, potentially leading to recriminations and abandonment of a legitimate and generally useful approach to wildland fire management.

In their conclusion, Graham, et al., 1999a state:

Depending on intensity, thinning from below and possibly free thinning can most effectively alter fire behavior by reducing crown bulk density, increasing crown base height, and changing species composition to lighter crowned and fire-adapted species. Such intermediate treatments can reduce the severity and intensity of wildfires for a given set of physical and weather variables. **But crown and selection thinnings would not reduce crown fire potential.** (Emphasis added.)

The EA fails to properly analyze and disclose timber sale impacts on the rate of fire spread. Graham, et al., 1999a point out that fire modeling indicates:

For example, the 20-foot wind speed⁸ must exceed 50 miles per hour for midflame wind speeds to reach 5 miles per hour within a dense Stand (0.1 adjustment factor). In contrast, in an open stand (0.3 adjustment factor), the same midflame wind speeds would occur at only a 16-mile-per-hour wind at 20 feet.

The EA also ignores the implications of how the fire regime is changing due to climate change.

⁸ Velocity of the wind 20 feet above the vegetation, in this case tree tops.

Many direct and indirect effects of fire suppression are must be analyzed and disclosed at the project level and as well as in the programmatic context. For example, Ingalsbee, 2004 describes the direct, indirect, and cumulative environmental impacts of firefighting:

Constructing firelines by handcrews or heavy equipment results in a number of direct environmental impacts: it kills and removes vegetation; displaces, compacts, and erodes soil; and degrades water quality. When dozerlines are cut into roadless areas they also create long-term visual scars that can ruin the wilderness experience of roadless area recreationists. Site-specific impacts of firelines may be highly significant, especially for interior-dwelling wildlife species sensitive to fragmentation and edge effects.

...Another component of fire suppression involves tree cutting and vegetation removal. Both small-diameter understory and large-diameter overstory trees are felled to construct firelines, helispots, and safety zones.

...A host of different toxic chemical fire retardants are used during fire suppression operations. Concentrated doses of retardant in aquatic habitats can immediately kill fish, or lead to algae blooms that kill fish over time. Some retardants degrade into cyanide at levels deadly to amphibians. When dumped on the ground, the fertilizer in retardant can stimulate the growth of invasive weeds that can enter remote sites from seeds transported inadvertently by suppression crews and their equipment.

...One of the many paradoxes of fire suppression is that it involves a considerable amount of human-caused fire reintroduction under the philosophy of "fighting fire with fire." The most routine form of suppression firing, "burnout," occurs along nearly every linear foot of perimeter fireline. Another form of suppression firing, "backfiring," occurs when firefighters ignite a high-intensity fire near a wildfire's flaming edge, with or without a secured containment line. In the "kill zone" between a burnout/backfire and the wildfire edge, radiant heat intensity can reach peak levels, causing extreme severity effects and high mortality of wildlife by entrapping them between two high-intensity flame fronts.

...Firelines, especially dozerlines, can become new "ghost" roads that enable unauthorized or illegal OHV users to drive into roadless areas. These OHVs create further soil and noise disturbance, can spread garbage and invasive weeds, and increase the risk of accidental human-caused fires.

...Roads that have been blockaded, decommissioned, or obliterated in order to protect wildlife or other natural resource values are often reopened for firefighter vehicle access or use as firelines.

...Both vegetation removal and soil disturbance by wildfire and suppression activities can create ideal conditions for the spread of invasive weeds, which can significantly alter the native species composition of ecosystems, and in some cases can change the natural fire regime to a more fire-prone condition. Firefighters and their vehicles can be vectors for transporting invasive weed seeds deep into previously uninfested wildlands.

...Natural meadows are attractive sites for locating firelines, helispots, safety zones, and fire

camps, but these suppression activities can cause significant, long-term damage to meadow habitats.

The EA states, “Fire suppression has allowed conifer species to outcompete much of the Aspen in these areas.” The IPNF has never conducted a forestwide analysis of such fire suppression impacts. How many acres of wetland RHCAs need to be logged on the entire Forest, as the FS proposes with Camp Robin?

The vast majority of acres burn under weather conditions that make control impossible, and that result in fires burning through treated areas as well as untreated. The FS must recognize the temporal gradients in vegetative recovery following treatments, which are the natural processes acting to regrow the components of natural vegetation the FS calls “fuel.”

Scientific information concerning fire suppression became a major theme of the Interior Columbia Basin Ecosystem Management Project (ICBEMP) in the 1990s: “Aggressive fire suppression policies of Federal land-managing agencies have been increasingly criticized as more has been learned about natural fire cycles.” (USDA FS & USDI BLM 1996, p. 22.) Also, “Substantial changes in disturbance regimes—especially changes resulting from fire suppression, timber management practices, and livestock grazing over the past 100 years—have resulted in moderate to high departure of vegetation composition and structure and landscape mosaic patterns from historical ranges.” (USDA FS & USDI BLM 2000, Ch. 4. P. 18.)

Such effects of fire suppression are not unique to this project area—similar language has been included in NEPA documents for all logging projects on this Forest for at least a decade. If fire suppression effects as described in the EA are occurring, it means that, as forestwide fire suppression continues, the results of this management include continuing **increases in these adverse effects across the entire forest**. So multiply the above list of effects times the extent of the entire forest, and what the agency tacitly admits is, forestwide fire suppression is leading to stand-replacing fires outside what is natural, and that alternation of fire regimes results in wide-scale disruption of habitats for wildlife, rare plants, tree insect and disease patterns and increases the occurrence of noxious weeds. Such analyses and disclosures are not found in the Forest Plan FEIS.

Even if there is scientific legitimacy to the claims that fuel reductions reduce ecological damage from subsequent fire—a claim that is scientifically controversial and unproven for the long term, and unquantified for any defined short term—the area affected by such projects in recent years is miniscule compared to the entire, fire-suppressed Forest.

It may be that fire suppression in the project area has not, in reality, caused a significantly elevated risk of abnormal fire in the project area. We believe the agency plays a fire-scare card in the EA largely to justify logging as “restoration.” However, playing the fire scare card is not just a project area issue—it's forestwide. The agency puts the joker in the deck, changing the whole game—not just one hand as the FS pretends.

Regardless of EA claims of unnatural conditions due to fire suppression, it doesn't provide scientific support for its claims that disturbance regimes have somehow been altered to the degree that its proposed actions are justified.

Wales, et al. 2007 modeled various potential outcomes of fire and fuel management scenarios on the structure of forested habitats in northeast Oregon. They projected that the natural disturbance scenario resulted in the highest amounts of all types of medium and large tree forests combined and best emulated the Natural Range of Variability for medium and large tree forests by potential vegetation type after several decades. Restoring the natural disturbances regimes and processes is the key to restoring forest structure and functionality similar to historical conditions.

Remedy: Choose the No Action Alternative. Supplement the Forest Plan FEIS to take a hard look at the cumulative effects of fire suppression policies. Prepare an EIS for this project if the FS still wants to pursue it, which addresses the scientific perspectives on fire we present above.

SCIENTIFIC INTEGRITY

AWR raised issues regarding the scientific integrity of FS NEPA analyses in our previous comments (pp. 4, 8, 10, 11, 13, 50, 54, 60, 62-63, 68, 70, 71, 72, 79, 82-108). We supplement those comments with the following discussion.

The FS has not determined the reliability of all the data used as input for the models used in the Camp Robin analysis. Since “an instrument’s data must be reliable if they are valid” (Huck, 2000) this means the data that is input to a model must accurately measure that aspect of the world it is claimed to measure, or else the data is invalid for use by that model. Huck, 2000 states:

The basic idea of reliability is summed up by the word consistency. Researchers can and do evaluate the reliability of their instruments from different perspectives, but the basic question that cuts across these various perspectives (and techniques) is always the same: “To what extent can we say the data are consistent?” ... (T)he notion of consistency is at the heart of the matter in each case.

...(R)eliability is conceptually and computationally connected to the data produced by the use of a measuring instrument, not to the measuring instrument as it sits on the shelf.

Beck and Suring, 2011 “remind practitioners that if available data are poor quality or fail to adequately describe variables critical to the habitat requirements of a species, then only poor quality outputs will result. Thus, obtaining quality input data is paramount in modeling activities.”

Data sources must be of high reliability. The document, “USDA-Objectivity of Statistical and Financial Information” is instructional on this topic.

Larson et al. 2011 state:

Although the presence of sampling error in habitat attribute data gathered in the field is well known, the measurement error associated with remotely sensed data and other GIS databases may not be as widely appreciated.

During litigation of a timber sale on the Kootenai NF, the FS criticized a report provided by Plaintiffs, stating “(Its) purported ‘statistical analysis’ reports no confidence intervals, standard deviations or standard errors in association with its conclusions.” As Huck (2000) states, the issue of “standard deviations or standard errors” that the FS raised in the context of litigation relates to the reliability of the data, which in turn depends upon how well-trained the data-gatherers are with their measuring tools and measuring methodology. In other words, different observations of the same thing must result in numbers that are very similar to result in small “standard deviations or standard errors” and thus high reliability coefficients, which in turn provide the public and decisionmakers with an idea of how confident they can be in the conclusions drawn from the data.

The next level of scientific integrity is the notion of “validity.” As Huck, (2000) explains, the degree of “content validity,” or accuracy of the model or methodology is established by utilizing other experts. This, in turn, demonstrates the necessity for utilizing the peer review process. The validity of the various models utilized in the Camp Robin EA’s analyses have not been established for how FS utilizes them. No studies are cited which establishes their content validity, and no independent expert peer review process of the models was cited.

So even if FS data input to a model is reliable, that still leaves open the question of model validity. In other words, are the models scientifically appropriate for the uses for which the Forest Service is utilizing them? The Nez Perce-Clearwater NF’s 2015 Clear Creek FEIS defines “Model” as “A theoretical projection in detail of a possible system of natural resource relationships. A simulation based on an empirical calculation to set potential or outputs of a proposed action or actions.” (G-14.)

From www.thefreedictionary.com :

Empirical – 1. a. Relying on or **derived from observation or experiment**: empirical results that supported the hypothesis. b. Verifiable or provable by means of observation or experiment: empirical laws. 2. Guided by practical experience and not theory, especially in medicine.

(Emphasis added.) So the FS acknowledges that the models are “theoretical” in nature but by calling the models “empirical” implies that they are somehow based in observation or experiment that support the hypotheses of the models. That would be required, because as Verbyla and Litaitis (1989) assert, “Any approach to ecological modelling has little merit if the predictions cannot be, or are not, assessed for their accuracy using independent data.” This corresponds directly to the concept of “**validity**” as discussed by Huck, 2000: “(A) measuring instrument is valid to the extent that it measures what it purports to measure.”

However, there is no evidence that the FS has performed validation of the models for the way they were used to support the Camp Robin EA’s analyses. There is no documentation of someone using observation or experiment to support the models’ inherent hypotheses. Ziemer

and Lisle, 1993 state: “For any model or evaluation procedure, independent verification is essential. First, individual modules must be tested by comparing predicted and measured values under a variety of field conditions at differing sites. Then, functioning of the entire model must be evaluated under a wide array of field conditions. Finding an adequate model verification program is rare; however, finding unverified model predictions for important management and policy decisions is common.”

The validity of habitat and other modeling utilized in land management plan development and the quality of scientific research are important topics. The documents, “USDA-Objectivity of Regulatory Information” and USDA-Objectivity of Scientific Research Information are instructional on this topic.

The Kootenai NF’s Elk Rice EA states, in modeling the amount of particulate produced by fire: “Be aware the modeling is not an attempt to depict reality, but merely an analysis for comparison purposes.” The Camp Robin EA doesn’t discuss the limitations of any modeling its analyses are based upon.

Larson et al. 2011 state:

Habitat models are developed to satisfy a variety of objectives. ...A basic objective of most habitat models is to predict some aspect of a wildlife population (e.g., presence, density, survival), so assessing predictive ability is a critical component of model validation. **This requires wildlife-use data that are independent of those from which the model was developed.** ...It is informative not only to evaluate model predictions with new observations from the original study site but also to evaluate predictions in new geographic areas. (Internal citations omitted, emphasis added).

USDA Forest Service 1994b states “It is important to realize that all models greatly simplify complex processes and that the numbers generated by these models should be interpreted in light of field observations and professional judgement.” (III-77.)

As we mention elsewhere in this objection, the IPNF 2000 forest plan monitoring and evaluation report (USDA Forest Service, 2000c) provides an example of the FS itself acknowledging the problems of data that is old and incomplete, leading to the limitation of models the FS typically uses for wildlife analyses:

Habitat modeling based on the timber stand database has its limitations: the data are, on average, 15 years old; canopy closure estimates are inaccurate; and data do not exist for the abundance or distribution of snags or down woody material... .

In that case, the IPNF expert believed the data were unreliable and thus they properly questioned the validity of model use.

Another Kootenai NF project EIS (USDA Forest Service, 2007a) notes the limitations of modeling methodology the Camp Robin EA relies upon for wildlife analyses (by Samson):

In 2005, the Regional Office produced a Conservation Assessment of the Northern goshawk, black-backed woodpecker, flammulated owl, and pileated woodpecker in the Northern Region (Samson 2005). This analysis also calculated the amount of habitat

available for these species, but was based on forest inventory and analysis (FIA) data. FIA data is consistent across the Region and the state, but **it was not developed to address site-specific stand conditions for a project area.** In some cases, these two assessments vary widely in the amount of habitat present for a specific species. (P. 116.)

Beck and Suring, 2011 state:

Developers of frameworks have consistently attained scientific credibility through published manuscripts describing the development or applications of models developed within their frameworks, but a major weakness for many frameworks continues to be a lack of validation. Model validation is critical so that models developed within any framework can be used with confidence. Therefore, we recommend that models be validated through independent field study or by reserving some data used in model development.

Larson et al. 2011 state:

(T)he scale at which land management objectives are most relevant, often the landscape, is also the most relevant scale at which to evaluate model performance. Model validity, however, is currently limited by a lack of information about the spatial components of wildlife habitat (e.g., minimum patch size) and relationships between habitat quality and landscape indices (Li et al. 2000).

Beck and Suring, 2011 developed several criteria for rating modeling frameworks—that is, evaluating their validity. Three of their criteria are especially relevant to this discussion:

Habitat– population linkage	Does the modeling framework incorporate vital rates (e.g., production, survival), other demographic parameters (e.g., density, population size); surrogates (e.g., quality of home ranges, habitat conditions in critical reproductive habitats, presence/absence) of population demographic parameters; or does the modeling framework model habitat conditions without specific consideration of wildlife population parameters?	0 = does not rely on population demographics or surrogates of modeled species 1 = relies on surrogates for population demographic parameters or framework; can utilize population demographics if desired, but is not dependent on them 2 = specifically relies on population demographics of modeled species
Scientific credibility	Has the framework gained credibility through publication of results, application of results, or other mechanisms to suggest acceptance by an array of professionals?	0 = limited credibility 1 = at least 1 publication of results using this framework, or other application of the modeling framework
Output definition	Is the output well defined and will it translate to something that can be measured?	1 = difficult 2 = moderate 3 = easy

A scientist from the research branch of the Forest Service, Ruggiero, 2007 states, “Independence and objectivity are key ingredients of scientific credibility, especially in research organizations that are part of a natural resource management agency like the FS. Credibility, in turn, is essential to the utility of scientific information in socio-political processes.”

Ruggiero, 2007 points out that the Forest Service's scientific research branch **is distinct** from its management branch:

The Forest Service is comprised of three major branches: the National Forest System (managers and policy makers for National Forests and National Grasslands), Research and Development (scientists chartered to address issues in natural resource management for numerous information users, including the public), and State and Private Forestry (responsible for providing assistance to private and state landowners). This article is directed toward the first two branches.

The relationship between the National Forest System and the Forest Service Research and Development (Research) branches is somewhat hampered by confusion over the respective roles of scientists (researchers) and managers (policy makers and those that implement management policy). For example, some managers believe that scientists can enhance a given policy position or management action by advocating for it. This neglects the importance of scientific credibility and the difference between advocating for one's research versus advocating for or against a given policy. Similarly, some scientists believe the best way to increase funding for research is to support management policies or actions. But, as a very astute forest supervisor once told me, "Everyone has a hired gun...they are not credible...and we need you guys [Forest Service Research] to be credible."

The Forest Service Manual (FSM) provides direction on how to implement statutes and related regulations. FSM 4000 – Research and Development Chapter 4030 states: "To achieve its Research and Development (R&D) program objectives, the Forest Service shall ... maintain the R&D function as a **separate entity** ... with clear accountability through a system that **maintains scientific freedom...**" (Emphasis added). This is difficult in today's political climate ("Help Wanted: Biologists to Save the West From Trump").

Ruggiero, 2007 discusses the risk to scientific integrity if that separation is not maintained, that is, if politics overly influences the use of scientific research:

This separation also serves to keep conducting science separate from formulating policy and the political ramifications of that process. The wisdom here is that science cannot be credible if it is politicized. Science should not be influenced by managers, and scientists should not establish policy. This logic keeps scientific research "independent" while ensuring that policy makers are free to consider factors other than scientific understandings. Thus, science simply informs decision making by land managers. As the new forest planning regulations clearly state, those responsible for land management decisions must consider the best available science and document how this science was applied (Federal Register 70(3), January 5, 2005; Section 219.11(4); p. 1059).

Sullivan et al. 2006 state that "Peer-reviewed literature ...is considered the most reliable mainly because it has undergone peer review." They explain:

Peer review.—A basic precept of science is that it must be verifiable, and this is what separates science from other methods of understanding and interpreting nature. The most direct method of verification is to redo the study or experiment and get the same results and interpretations, thus validating the findings. Direct verification is not always possible

for nonexperimental studies and is often quite expensive and time-consuming. Instead, scientists review the study as a community to assess its validity. This latter approach is the process of peer review, and it is necessary for evaluating and endorsing the products of science. **The rigor of the peer review is one way to assess the degree to which a scientific study is adequate for informing management decisions.**

Sullivan et al. 2006 contrast peer-reviewed literature with gray literature (such as Samson, 2005 and Samson, 2006,) which:

...does not typically receive an independent peer review but which may be reviewed in-house, that is, within the author's own institution. ...Gray literature, such as some agency or academic technical reports, ...commonly contains reports of survey, experimental or long-term historical data along with changes in protocols, meta-data, and the progress and findings of standard monitoring procedures.

Along with Ruggiero, 2007, Sullivan et al., 2006 discuss the dangers of the "Politicization of Science":

Many nonscientists and scientists believe that science is being increasingly politicized. Articles in newspapers (e.g., Broad and Glanz 2003) and professional newsletters document frequent instances in which the process and products of science are interfered with for political or ideological reasons. In these cases, the soundness of science, as judged by those interfering, turns on the extent to which the evidence supports a particular policy stance or goal. ...Politicization is especially problematic for scientists supervised by administrators who may not feel the need to follow the same rules of scientific rigor and transparency that are required of their scientists.

From the USFS's R1 "Our Approach to Effects Analysis: Desk Reference":

The scientific credibility of an analysis is enhanced when the methods used, judgments and assumptions made, interpretations, and conclusions drawn are based on a thorough review of the appropriate information. The most credible sources to the scientific community are research findings published in a refereed journal, followed by theses and dissertations, relatively formal agency reports, less formal reports of results from studies and organized data collection efforts, undocumented information from organized efforts, and lastly anecdotal, unsystematic experiences and beliefs.

Agency expert opinion and gray literature relied upon in the Camp Robin EA is not necessarily the same as "the best scientific information" available. Sullivan et al., 2006 discuss the concept of best available science in the context of politically influenced management:

Often, scientific and political communities differ in their definition of best available science and opposing factions misrepresent the concept to support particular ideological positions. Ideally, each policy decision would include all the relevant facts and all parties would be fully aware of the consequences of a decision. But economic, social, and scientific limitations often force decisions to be based on limited scientific information, leaving policymaking open to uncertainty.

The American Fisheries Society and the Estuarine Research Federation established this committee to consider what determines the best available science and how it might be used

to formulate natural resource policies and shape management actions. The report examines how scientists and nonscientists perceive science, what factors affect the quality and use of science, and how changing technology influences the availability of science. Because the issues surrounding the definition of best available science surface when managers and policymakers interpret and use science, this report also will consider the interface between science and policy and explore what scientists, policymakers, and managers should consider when implementing science through decision making.

As part of their implicit contract with society, environmental scientists are obliged to communicate their knowledge widely to facilitate informed decision making (Lubchenco 1998). For nonscientists to use that knowledge effectively and fairly, they must also understand the multifaceted scientific process that produces it.

Science is a dynamic process that adapts to the evolving philosophies of its practitioners and to the shifting demands of the society it serves. Unfortunately, these dynamics are often controversial for both the scientific community and the public. To see how such controversies affect science, note that over the last decade nonscientists have exerted increasing influence on how science is conducted and how it is applied to environmental policy. Many observers find this trend alarming, as evidenced by several expositions titled “science under siege” (e.g., Wilkinson 1998; Trachtman and Perrucci 2000).

To achieve high-quality science, scientists conduct their studies using what is known as the scientific process, which typically includes the following elements:

4. A clear statement of objectives;
5. A conceptual model, which is a framework for characterizing systems, stating assumptions, making predictions, and testing hypotheses;
6. A good experimental design and a standardized method for collecting data;
7. Statistical rigor and sound logic for analysis and interpretation;
8. Clear documentation of methods, results, and conclusions; and
9. Peer review.

The Committee of Scientists (1999) state:

To ensure the development of scientifically credible conservation strategies, the Committee recommends a process that includes (1) scientific involvement in the selection of focal species, in the development of measures of species viability and ecological integrity, and in the definition of key elements of conservation strategies; (2) independent scientific review of proposed conservation strategies before plans are published; (3) scientific involvement in designing monitoring protocols and adaptive management; and (4) a national scientific committee to advise the Chief of the Forest Service on scientific issues in assessment and planning.

NEPA states that “Accurate scientific analysis... (is) essential to implementing NEPA.” And the NEPA regulations at 40 CFR § 1502.24 (“Methodology and scientific accuracy”) state:

Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements. They shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other

sources relied upon for conclusions in the statement. An agency may place discussion of methodology in an appendix.

The EA does not conform to NEPA because the FS has not insured the reliability of data relied upon by the models, and the FS has not validated the models for the way the Camp Robin EA utilizes them. The Ninth Circuit Court of Appeals has declared that the FS must disclose the limitations of its models in order to comply with NEPA. The EA has failed to disclose these limitations.

The FS has not undertaken the process of a Science Consistency Review for the Forest Plan or for the EA's conclusions (Guldin et al., 2003, 2003b.) Guldin et al., 2003 state:

...outlines a process called the science consistency review, which can be used to evaluate the use of scientific information in land management decisions. Developed with specific reference to land management decisions in the U.S. Department of Agriculture Forest Service, the process involves assembling a team of reviewers under a review administrator to constructively criticize draft analysis and decision documents. Reviews are then forwarded to the responsible official, whose team of technical experts may revise the draft documents in response to reviewer concerns. The process is designed to proceed iteratively until reviewers are satisfied that key elements are **consistent with available scientific information**.

In other words, the FS can cite all the "best available science" it wants in preparing a forest plan or amendment, but it's another matter entirely whether or not such proposals are consistent with the cited science. Guldin et al., 2003 suggest the review ask and answer the following four questions:

1. Has applicable and available scientific information been considered?
2. Is the scientific information interpreted reasonably and accurately?
3. Are the uncertainties associated with the scientific information acknowledged and documented?
4. Have the relevant management consequences, including risks and uncertainties, been identified and documented?

Similarly, independent scientific review team Hayes, et al., 2011 conducted a "Science Review of the United States Forest Service Draft Environmental Impact Statement for National Forest System Land Management." The reviewers considered the following three questions:

1. Does the information accurately reflect the current peer-reviewed scientific literature and understanding? If not, what is missing or incorrectly presented?
2. Based on the current peer-reviewed scientific literature and understanding: does the documentation on environmental effects adequately respond to levels of uncertainty and limitations? If not, please describe what is missing or incorrect, and how the documentation can be improved.
3. What, if any, differing viewpoints should be included that are not mentioned in the DEIS regarding the effects of alternatives on climate change, restoration and resilience, watershed and water protection, diversity of plants and animal communities, sustainable use of public lands to support vibrant communities, forest threats, and monitoring.

Nie and Schembra, 2014 recommend that the agency solicit independent feedback on its use of science:

The 1997 (Tongass National Forest) Plan was written using an innovative process whereby scientists within the Pacific Northwest Research Station (an independent research arm of the USFS) were assembled into risk assessment panels “to assist decisionmakers in interpreting and understanding the available technical information and to predict levels of risk for wildlife and fish, old growth ecosystems, and local socioeconomic conditions resulting from different management approaches.”¹⁷² In this case, “science consistency checks” were used as a type of audit to ensure that the policy and management branch writing the Tongass Plan could not misrepresent or selectively use information in ways not supported by the best available science. The process, at the very least, facilitated the consideration of best available science when writing the Tongass Plan, even if parts of the Tongass Plan were based on factors going beyond science.

Also, in response to an appeal of its 1997 forest plan revision, the Black Hills National Forest was directed by the FS Washington Office to re-evaluate their Revised Forest Plan for its ability to meet diversity and viability requirements set in existing laws, and correct any deficiencies. FS biologists “interviewed accredited scientific experts to obtain information on Region 2 sensitive species for use during the Phase I Amendment” in order to remedy deficiencies in their revised forest plan. (USDA Forest Service 2000b.) Similarly, the Boise National Forest consulted with an independent scientist to review portions of their “Wildlife Conservation Strategy” proposed to amend their revised forest plan. And a Science Consistency Review was undertaken by the FS in the process of designing the Sierra Nevada Forest Plan Amendments.

Schultz (2010) provides a critique of FS wildlife analyses, and recommends peer review of large-scale assessments and project level management guidelines, and more robust, scientifically sound monitoring, and measurable objectives and thresholds for maintaining viable populations of all native and desirable non-native wildlife species.

Given the highly controversial nature of the Forest Plan, it is inexcusable and unreasonable that the FS has not undertaken a Science Consistency Review process.

Darimont, et al., 2018 advocate for more transparency in the context of government conclusions about wildlife populations, stating:

Increased scrutiny could pressure governments to present wildlife data and policies crafted by incorporating key components of science: transparent methods, reliable estimates (and their associated uncertainties), and intelligible decisions emerging from both of them. Minimally, **if it is accepted that governments may always draw on politics, new oversight by scientists would allow clearer demarcation between where the population data begin and end in policy formation** (Creel et al. 2016b; Mitchell et al. 2016). Undeniably, social dimensions of management (i.e., impacts on livelihoods and human–wildlife conflict) will remain important. (Emphasis added.)

In a news release accompanying the release of that paper, the lead author states:

In a post-truth world, **qualified scientists at arm’s length now have the opportunity and responsibility to scrutinize government wildlife policies and the data underlying them.**

Such scrutiny could support transparent, adaptive, and ultimately trustworthy policy that could be generated and defended by governments. (Emphasis added.)

The Camp Robin EA violates NEPA because the FS has not insured the professional and scientific integrity of its analyses.

NEPA regulations at 40 CFR § 1502.24 state, under **Methodology and scientific accuracy**: “Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements.” The Camp Robin EA violates NEPA in terms of methodology, scientific accuracy, and scientific integrity.

Remedy: Select the No Action Alternative. Otherwise, undertake the Science Consistency Review process for the Forest Plan, and prepare an EIS that addresses the analytical and scientific issues identified above.

CUMULATIVE EFFECTS

We raised issues regarding cumulative effects analyses in our previous comments (pp. 1, 3, 7, 10, 13, 15, 16, 25, 28, 31, 42, 45-46, 48, 53, 54, 56-61, 64, 70). Some of those comments were in regards to the need to incorporate previous monitoring results in order to be able to conduct the proper analysis (pp. 3-4, 16, 43, 53, 55, 59-60, 61, 63, 66, 68, 69-70, 71, 80-82, 83.)

The EA failed to adequately analyze cumulative effects of past, ongoing, and reasonably foreseeable actions. As discussed in other sections of this objection, the problem is evident in the analyses of most resources supposedly analyzed in the EA.

The EA states:

The Camp Robin Project is part of a broader collaborative forest landscape restoration program (CFLRP) proposal occurring in the lower Kootenai River Watershed. In 2011, a collaborative group known as the Kootenai Valley Resource Initiative (KVRI)¹ developed the Lower Kootenai River Watershed Collaborative Forest Landscape Restoration Proposal.

The FS has never conducted an analysis—not in an EIS, not in an EA—of the environmental impacts of this “broader collaborative forest landscape restoration program (CFLRP) proposal occurring in the lower Kootenai River Watershed.”

Following the January 2015 Record of Decision adopting the Revised Forest Plan, in 2016 the FS carried out an “administrative” change of its forest plan monitoring, altering the monitoring program outlined in the 2015 Revised Forest Plan without undertaking a NEPA process. This violated both NEPA and NFMA. The process did not conform to 2012 Planning Rule requirements.

The Revised Forest Plan states:

An interdisciplinary team will develop a **biennial** Monitoring Evaluation Report which will summarize the results of completed monitoring, evaluate the data, consider relevant

information from broad-scale or other monitoring efforts, and make recommendations to the responsible official. The monitoring evaluation report will indicate whether or not a change to the Forest Plan, management activities, or the monitoring program, or a new assessment, may be warranted based on the new information. The monitoring evaluation report is used to inform adaptive management of the Plan area. The Monitoring Evaluation Report will be made available to the public. (Emphasis added.)

Four years after adoption of the Revised Forest Plan, the FS has yet to issue a single “biennial” monitoring and evaluation reports.

Our previous comments requested, “Please provide an analysis of how well those past FS projects met the goals, objectives, desired conditions, etc. stated in the corresponding NEPA documents, and how well the projects conformed to forest plan standards and guidelines.” It’s a sensible, reasonable request so to be able to understand the cumulative effects of management, but the FS would rather wear blinders in terms of its performance with past projects.

Remedy: Select the No Action Alternative. Prepare an EIS that addresses the analytical and scientific issues identified. Conduct the required forest plan monitoring, and issue the reporting due two years ago. Undertake NEPA/NFMA analysis, involving the public in a forest plan amendment process to adopt the administrative change mentioned above or—better yet, improve the forest plan monitoring program as our forest plan objection discusses.

ALTERNATIVES

AWR raised issues regarding alternatives in our previous comments (pp. 2-3).

The EA did not include a reasonable range of alternatives, and rejected suggestions without adequate rationale.

Remedy: Select the No Action Alternative. Alternately, prepare an EIS with a full range of alternatives.

COLLABORATION

AWR raised this issue on page 2 of our previous comments.

The EA states:

The Camp Robin Project is part of a broader collaborative forest landscape restoration program (CFLRP) proposal occurring in the lower Kootenai River Watershed. In 2011, a collaborative group known as the Kootenai Valley Resource Initiative (KVRI)¹ developed the Lower Kootenai River Watershed Collaborative Forest Landscape Restoration Proposal. ... **We collectively designed** the Camp Robin proposal... (Emphasis added.)

The EA also states, “As one of several landscape restoration projects in the Lower Kootenai River Watershed, the Camp Robin Project is **designed to provide wood products** produced from our vegetation management prescriptions **to help contribute to the local economy.**”

A significant danger is that private, local interests are being elevated by the magic wand of “collaboration” over and above the interests of the owners of the land in general, the American public—regardless of where those Americans live or whether or not they can attend collaborative meetings to make sure their interests are being heard.

The timber-centric nature of the only action alternative contemplated in the EA is not surprising, given the local focus represented by KVRI and other collaborators. The much wider public interest of the owners of the IPNF, in general, is not of much concern to these narrow vested interests.

Nie and Metcalf, 2015 provide a social science analysis of the problems posed by collaboration. Among the many problems, it’s clear that most environmental groups don’t have the resources to participate meaningfully in long processes created by the collaborators. The authors cite an earlier inquiry in stating, “Organizational resources and capacity were found to be significant factors shaping the decision about whether to collaborate or sue. If trends in collaboration continue, says the author, ‘[W]e will see a marginalization of smaller, ideologically pure environmental groups [and] their values will not be included in decision making because they are unable or unwilling to collaborate...’.”

Nie and Metcalf, 2015 document perceptions of several negative outcomes of collaboration, from the perspective of those skeptical of the process.

- The under-representation of conservation interests in many collaborative efforts, a perception that there is a heavy skew of the membership of the group against conservation and in favor of the folks who are impacting the environment.
- An inappropriate and often dominant role played by the Forest Service in some collaborative processes.
- Those making a profit from federal lands will dominate these processes because they have the organizational and financial capacity and resources to participate over the long haul.
- Collaboration sets up two classes of citizens, those who are part of the process and those who aren’t, even if the latter participate fully in the NEPA process.
- Collaboration weeds out dissent and opposition and is most conducive to defending the status quo.
- Collaboration is undermining, subverting, and disempowering the more democratic NEPA process.
- There is a contrast between an exclusive and self-selected set of (often) paid interest groups participating in a collaborative versus a more broad-based and inclusive public participation process governed by NEPA.

- Collaborative groups having a disproportionate amount of influence with the Forest Service.
- Collaborative group recommendations precede NEPA analysis, and there is an implicit understanding the collaborative group's recommendation will be implemented, rendering the NEPA process a pro forma exercise.
- Laws such as the ESA are designed to be used and enforced by citizens, who forgo such rights by being included in collaborative groups.
- Collaborative groups do not consider the best available science on resource management.
- Collaborative groups promote logging which is a pretense or price to be paid for genuine forest restoration.

Dukes and Firehock, 2001 wrote a guide for environmental advocates which includes a set of principles. We suspect the collaborators to whom the EA attributes as proponents of this timber sale would never subscribe to those collaborative principles.

ECONOMICS

We raised issues regarding economics in our previous comments at page 78 and elsewhere. We supplement those comments with the following discussion.

With perpetual fire suppression under FS management of the project area virtually assured according to the Forest Plan and Camp Robin EA, proposed management activities would occur periodically, because they would be needed to maintain vegetation in the FS's version of a "safer" condition. The EA fails to provide a full and detailed accounting of the costs to those who would pay for this never-ending "fuels" cycle—the American public. It is also in the FS's best interest to know what sort of long-term financial commitments it is making. Further, the EA fails to disclose the inherent uncertainties of perpetually funding these activities, and the implications of their being left undone.

The FS must have a detailed long-term program for maintaining the allegedly safer conditions, including how areas will be treated in the future following proposed treatments, or how areas not needing treatment now will be treated as the need arises. The public at large and private landowners must know what the scale of the long-term efforts must be, including the amount of funding necessary, and the likelihood based on realistic funding scenarios for such a program to be adequately and timely funded.

FURTHER REMEDY

Provide the remedy requested AWR's Objection to the Forest Plan.

Objection respectfully submitted:

/s/

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