November 10, 2019

[redacted]

USDA Forest Service
Objection Reviewing Officer
26 Fort Missoula Road
Missoula, MT 59804

Subject: End of the World Project

Dear Sir:

Attached are my objections to the End of the World Environmental Assessment and Draft Record of Decision. Overall, I thought the proposal was very excessive, given the past history of timber harvest in the project area and ongoing impacts to water quality, soils, fisheries and wildlife.

Objection 1 – Inadequate Public Comment Period

I am very disappointed that the only opportunity to comment on this project by the general public was during the scoping period. The general public was never given an opportunity to comment on the Environmental Assessment and only those like myself who did provide some comment on the very limited scoping document are allowed to object to the proposal. Further, complicating the short time frame for review was the fact that another project (Stray Creek) was released during the same 30-day comment period. This is not the way to garner public trust in your operations.

Objection 2 – Inadequate Range of Alternatives

Only two action alternatives have been considered and both include extensive timber harvest of either 158.8 or 144.1 million board feet. I believe this is the largest timber sale in the last 30-years on the Nez Perce National Forest and there does not appear to be any tolerance for a more moderate proposal on your part. The project is so large that Forest specialists have not even had an opportunity to review it on the ground. The general consensus appears to be that you will let the layout people fix the problems as they encounter them on the ground. Your large proposal has not even considered proposed activity on the adjacent Hungry Ridge project and the myriad of other ongoing projects you have proposed across the Forest. In short, this is a very large timber sale being conducted with very little public comment and oversight. Please consider

developing an alternative that is more responsive to resource issues other than the amount of timber harvest.

Objection 3 – Failure to reduce activity levels in Jungle Creek and Cold Springs Creek due to high existing levels of sedimentation and indefensible sediment yield protections for the No Action alternative

Table 1 of the watershed report suggests that all eighteen Forest Plan watersheds are currently meeting Forest Plan sediment standards as predicted by the NEZSED model. However, current conditions in two steams (Jungle Creek and Cold Springs Creek) do not meet sediment objectives due to high levels of existing instream sedimentation or cobble embeddedness. Sediment yields will increase significantly with the implementation of Alternative B (Watershed Report – Table 5), but sediment standards (% over baseline) as projected in the NEZSED model remain below Forest Plan objectives in all streams except Jungle Creek. Instead of reducing the amount of activity in Jungle Creek, the NEZSED model was rerun so that activities were spread over two different years and this modification allowed the high level of activity to move forward under NEZSED model predictions. Concerns regarding the existing instream condition of Jungle Creek and Cold Springs Creek did not appear to influence thinking that activity levels should be reduced in these two drainages.

There was also an interesting analysis in the watershed report regarding the impact of wildfire if the No Action alternative is selected (Watershed Report - Table 2). This analysis makes very dire predictions in regard to what might occur should the No Action alternative be selected and if a large wildfire were to occur. This analysis is total speculation and the chances of a large-scale wildfire will not be significantly greater if the No Action Alternative was selected. In fact, just the opposite may be true. Several researchers (Baker 2015, Rhodes and Baker 2008, Noss et al. 2006, Stone et al. 2004, Brown 2000) have recently found that partial cut timber harvest (Like that being proposed on Alternative B) can actually accelerate fuel drying and increase the risk of wildfire. Logging and road building operations will also increase the risk of an accidental wildfire start. In Northern Idaho and most other locations, weather is the most important factor in the start and spread of wildfire. When hot, windy and dry conditions occur, Alternative B is not going to stop a wildfire and assigning speculative prejudiced scenarios to what is supposed to be a scientific evaluation of the facts is not appropriate.

Objection 4 – Lack of data to support the upward trend analysis in Jungle Creek and Cold Springs Creeks

Cobble embeddedness conditions are displayed in the Aquatics report (Table 1) and reveal that Forest Plan standards for cobble embeddedness are not being achieved in Jungle Creek and Cold Springs Creek. Since these streams are nor currently meeting Forest Plan fisheries standards an upward trend analysis is required before additional timber harvest can occur. In 2017, cobble embeddedness was 54% in Jungle Creek and 49% in Cold Springs Creek. No other historical

cobble embeddedness figures are presented in the aquatics report to help establish if there is a positive upward trend.

The aquatics report suggests that there is likely a positive trend in the two streams because there has been no timber harvest since 1984 in Jungle Creek and 1993 in Cold Springs Creek. The Aquatics Report also suggests that watershed improvements proposed in Alternative B, would help to contribute to a positive upward trend. According to the aquatic analysis watershed improvements in Jungle Creek "would decommission 1 mile of road (0.4 within RHCAs) and remove 4 culverts associated with them. It would replace three culverts to provide for upstream fish passage and access to 0.8 miles of currently inaccessible habitat. It would also replace 3 undersized culverts to reduce the failure risk". In Cold Springs Creek Alternative B "would decommission 0.5 mile of road (no RHCA and no culverts)".

The existing equivalent clear-cut acres (ECA) in Jungle Creek is 2% and this will increase to 14% under Alternative B. In Cold Springs Creek the existing ECA is 4% and this will increase to 25% under Alternative B. This is a significant level of activity in both drainages that has the potential to negatively impact these drainages. The facts only suggest that the levels of cobble embeddedness remain high, time has not corrected the existing problem and watershed improvements may help in the future. Upward trend has not been demonstrated by the Forest Service, and there are no reasons why proposed watershed improvements could not be accomplished without more timber harvest in these two drainages. There is certainly more than enough timber harvest in the surrounding project area watersheds to offset this loss of timber harvest.

Objection 5 – Lack of concern regarding Water Yield and Equivalent Clear-cut Acres (ECA)

Another measure of watershed condition is the amount of timber harvest that has occurred in the watershed. Equivalent Clearcut Acres (ECA) is often used as a measure of stream condition and this information is presented in the watershed report. According to the National Marine Fisheries Service (1998) an existing ECA (equivalent clear-cut acres) in a 6th Code HUC watersheds of less than 15% is generally indicative of good or high-quality stream condition, 15-20% is considered indicative of moderate quality stream condition and ECA of greater than 20% is indicative of low or poor-quality.

The End of the World watershed report erroneously reports that streams with moderate stream quality have an ECA of 15-30% and streams in poor quality have an ECA greater than 30%. These figures only apply to small zero and first order headwater sub-basins located within the larger 6th Code HUC watersheds. Forest Plan watersheds are generally 5th and 6th Code HUC watersheds.

Table 1 (This Document) summarizes the information from the End of the World Watershed report in regard to ECA changes from the existing condition to those that will occur as a result of

implementation of proposed Alternative B. There are eighteen Forest Plan watersheds and in terms of ECA, the existing ECA is Good in 14 drainages, Moderate in one drainages and Poor in three drainages according to guidance in the NMFS Matrix (1998). With implementation of Alternative B, four watersheds will move from the Good to Moderate Condition, five watersheds will move from Good condition to Poor condition including Cold Springs Creek which has already been shown to have high cobble embeddedness and not meeting Forest Plan standards and one watershed moves from the Moderate to Poor condition (Table 1). Thus, five Forest Plan watersheds remain in Good Condition, four move to moderate condition and the other nine watersheds will be in Poor Condition according to NMFS Matrix (1998).

It is unclear what is happening in the NF of White Bird Creek, Pinnacle Creek and the South Fork Face Drainage 01. Numbers provided in the watershed report show improving ECAs with the implementation of Alternative B. This appears to be an error as new harvest under Alternative B should cause an increase in ECA and not decrease.

Table 1 – Forest Plan Stream ECA from the End of the World Watershed Report

Stream	Area (ac)	Existing ECA %	Existing Rating	Alternative B ECA %	Alternative B Rating
NF WHITE BIRD (HUC 12)	**21,070**	**20**	**POOR**	**23**	**POOR**
FISH	5,756	9	GOOD	27	POOR
GOODWIN	715	3	GOOD	31	POOR
GOOSE	3,022	20	POOR	23	POOR
NF WHITE BIRD	10,051	30	POOR	20	POOR
TOLLGATE	1,561	2	GOOD	24	POOR
S. FORK WHITE BIRD (HUC 12)	**22,964**	**14**	**GOOD**	**20**	**POOR**
ASBESTOS	1,681	2	GOOD	10	GOOD
COLD SPRINGS	1,087	4	GOOD	25	POOR
JUNGLE	1,155	2	GOOD	14	GOOD
LITTLE WHITE BIRD	3,425	13	GOOD	18	GOOD
PINNACLE	2,518	26	POOR	25	POOR
S. FK WHITE BIRD	13,072	16	MODERATE	21	POOR
SF CLEARWATER	**26,913**	**3**	**GOOD**	**12**	**GOOD**
BIVOUAC	411	3	GOOD	21	POOR
BULLY	3,471	3	GOOD	17	MODERATE
COVE	3,606	6	GOOD	14	GOOD
DUMP	1,300	3	GOOD	18	MODERATE
GROUSE	3,556	2	GOOD	16	MODERATE
JUNGLE	286	5	GOOD	19	MODERATE
S. FORK FACE 01	3,783	11	GOOD	5	GOOD

Objection 6 – Existing Road Densities are very high and the EA suggests that 28 miles of road decommissioning is planned, but there are no assurances that this work will get done

Road density is another measure of watershed condition identified in the 1998 NMFS Matrix. Road densities less than 1 mile per square mile is considered to reflect high-quality stream condition, 1 to 3 miles per square mile is considered moderate-quality and greater than 3 miles per square mile is considered low-quality. The watershed report does not break down road density by Forest Plan watershed, but numbers provided in the watershed report for the three HUC 12 watersheds suggest that road densities are already very high (3.4-3.8 miles per square mile). Road decommissioning will reduce 7-12 miles of road in each of the HUC 12 drainages and a total of 28 miles road will be decommissioned in the project area. This improvement will be offset by 16 miles of new temporary road construction, 1 mile of new road construction and 1 mile of road reconstruction. Overall road density is not expected to be changed significantly in the project area as a result of implementation of Alternative B.

There are no requirements in the Environmental Assessment that require completion of road decommissioning prior to the implementation of this rather large timber sale. The project is going to open several miles of the existing road network to log hauling, construct several miles of new temporary road and harvest 144 million board feet of timber if approved. It would seem that the Forest Service could require some of this work to be done upfront to assure that it will be completed and help to offset the impact of all of this proposed activity. This could reduce the Forest's reliance on the Nez Perce tribe to complete road decommissioning with funding from the Bonneville Power Association. That funding is designed to mitigate for habitat losses associated with the Snake River dams and it is not be utilized to offset sediment production that results from new timber sales or new road construction.

Objection 7 – Detrimental Soil Disturbance

The current Nez Perce Forest Plan allows Detrimental Soil Disturbance (DSD) to occur on 20% of timber harvest units, but Regional soil guidelines restrict soil disturbance to 15% in new harvest units. The End of the World project is allowing DSD to increase to 20% and ignoring Regional guidance.

I could not find a summary of DSD impacts by harvest unit in the project file, but there is a listing of "landscape" DSD impacts in the Soils Report. It is very unclear how these "landscape" units relate to actual harvest units and the map provided in the soils report is of very poor quality and not very helpful. Presumably, the landscape units are much larger than actual harvest units and DSD impacts would tend to be diluted in these larger areas.

The soils report suggests that at least two of the landscape units (D and I) will have DSD impacts of 16%, which suggests there will be much higher impacts in the several of the smaller harvest

units. It is not unreasonable to assume that some of the smaller harvest units will exceed both Forest Plan and Regional standards.

All new harvest units should be designed to meet Regional soils standards of 15%, and the analysis DSD impacts within individual harvest units needs to be completed before the Decision Notice for the End of the World project is signed. If the analysis is not done now, it will never be completed and the opportunity for the correction of existing DSD impacts will be lost. Existing DSD impacts need to be determined by a qualified soil scientist or geologist, and those specialists need to assist layout foresters and technicians in avoiding new impacts in proposed harvest units. Responsibility, for identifying existing impacts and avoiding new impacts should not be delegated entirely to field personnel who often have little training, experience and time to make these determinations.

Objection 8 – Overconfidence that landslide risk can be avoided by sale layout

According to the soils report there are 15,885 acres of landslide prone soils in the project area, but these areas have not been specifically identified or excluded from the proposed harvest units or road locations. The Forest Service claims, landside prone areas will be excluded during sale layout by layout foresters and technicians (See objection 9). From the memo discussed in Objection 9 it can be seen that "field crews (as opposed to specialists) would be bearing the majority of the burden of ground-truthing and figuring out implementation issues as field work happens".

Do these people really have the expertise and training to evaluate unstable landslide prone areas and know when they are working in high risk areas? Identifying areas of high landslide risk is a complex undertaking even for trained geologists. The soils report suggests that "During timber sale layout, qualified forestry personnel will ensure that landslide prone areas are field verified and excluded from harvest. Site-specific indicators (steep concave slopes; hydrophytic vegetation; slumps, draws, and basins; last landslide locations; and obvious soil movement areas) ensure that all landslide prone areas are properly identified, buffered, and excluded from harvest during the layout process."

Who are these "qualified" forestry personnel and what kind of training do they have? Sale layout by similarly qualified personnel has not prevented harvest and road related mass failures in the recent past and it is unlikely that they will in the future. During the 1995-1996 flood event on the Nez Perce/Clearwater National Forest there were over 860 landslides, most of which were attributed to roads and/or timber harvest (McClelland et al. 1999). Landslides have continued to occur across the Forest since the 1995-1996 flood event and there was even a large recent landslide along Highway 14 that forms the southern boundary of the project area just a few years ago.

Because the incidence of landslides has decreased since the 1995-1996 flood event, the Forest Service claims they have learned from past mistakes and that they can now predict and avoid

high risk areas. While, I do agree that we have learned some things and that there are measures that can be taken to avoid high risk landslide prone areas, I don't believe this task should be delegated entirely to field personnel. High risk areas should be identified during the NEPA process. Measures should then be taken prior to the layout phase to either avoid (exclude from harvest or road construction) or mitigate (provide special protection measures) where activities like a system road must cross a high-risk location. The risk of additional landslides is still a very real when timber harvest road construction is proposed in high risk areas. The time to avoid these problems is when the management actions are being developed and not during the implementation phase of the project.

The environmental assessment needs to recognize that a single landslide could significantly impact project area streams and produce significantly more sediment than what is currently being predicted by the NEZSED model. The NEZSED model was never designed to include the impact of mass wasting.

Objection 9 - Why is sale layout being conducted prior to the NEPA analysis? I found this memo in the project file suggesting that the Forest Service is moving forward with the proposal long before it has accepted any meaningful public comment via the NEPA process. This prejudices the decision maker to adopt the already laid out alternative, since the Forest Service has already invested a great deal of funding in this work. This is especially interesting since the layout is evidently occurring in the Jungle Creek drainage which does not meet Forest Plan standards for fisheries and water quality and the memo is asking for carte blanche authority to open grown over temporary roads.

"From: Ridley, Stephanie - FS Sent: Friday, September 6, 2019 9:33 AM To: Anderson, Zoanne - FS ; Shinn, Jeffrey -FS ; Millet, Nathan -FS ; Smith, Karen A -FS ; drea ; Rozin, Alexandra - FS Cc: Lane, Andrew B -FS ; Hake, Kevin M -FS ; Brown, Brittni - FS ; Fischer, Jennie -FS ; Harries, Susan K -FS ; Brown, Joan -FS

Subject: End of the World implementation question

Hi everyone, Wanted touch base with you about temp roads and logging systems for the End of the World project. The SZ timber crew has started layout in the first EOW sale (called Jungle Bird) and we've had a few questions come up:

1. As we're doing layout we're finding many existing road prisms (most are re-vegetated) from past harvest. We need a way to be able to use these existing prisms as temp roads when appropriate. Using the higher-resolution Lidar now available to us, we can see where these existing prisms are (see the attached map). Given the huge amount of "potential temp roads" on the landscape, to make a unit-by-unit assessment of which roads might be necessary prior to layout for the entire EOW project area would be time-consuming and we still might make the wrong call where many stacked prisms exist.

I need to know if there's a blanket statement we can add to the NEPA stating something like "existing prisms might be used for temporary road construction where necessary." Would that throw off the analysis numbers? Would it be acceptable to leave it open-ended? The benefit to using temp roads on existing prisms (which could be stated in the NEPA) is that the prism would be re-contoured after use, whereas they are growing suppressed trees and creating erosion issues in their current state.

The current temp roads layer used for the EOW analysis was assuming new temporary road construction. In many cases those "new" temp roads might not be necessary where we have existing prisms. The overall temp road mileage for the project might not change that much (although it's hard to know until field work takes place). In many cases it would probably be a difference in temp road location (rather than mileage) within units.

2. The higher resolution Lidar now available has also made it possible to further refine logging systems based on slope analysis. Roughly 1/3 of the original acres analyzed as cable are actually tractor. Can we make this change at this point?

3. How was tractor/jammer analyzed? As we're doing layout we're assuming some percentage of TJ units will be tractor logged and some percentage will be a cable system. Is this in keeping with the analysis?

4. Due to the fact that we made LARGE units during the NFMA process with very little field recon, the layout crew is dropping a lot of areas due to water, lack of volume, logging system issues, etc. This is a natural part of the layout process in any sale, but we want to be sure we're communicating about these decisions as we go. We plan to keep track of the dropped areas in GIS with the reason for dropping it in the attribute table so that these NEPA-cleared acres can be tracked and available for alternate treatment if anyone wants to pursue that.

Recall the whole narrative of this NEPA process was that field crews (as opposed to specialists) would be bearing the majority of the burden of ground-truthing and figuring out implementation issues as field work happens. This is our attempt at transparency to address issues we're finding and hope we can find solutions to make this project workable.

Let me know what you think! Thanks!

Stephanie Ridley Forester Forest Service Nez Perce-Clearwater National Forests p: 208-983-4043 stephanie.ridley@usda.gov 104 Airport Road Grangeville, ID 83830 www.fs.fed.us Caring for the land and serving people"

Objection 10 - Tractor Harvest on slopes over 35%

Why is timber harvest by ground-based equipment being allowed on slopes between 35 and 45% when past operations have shown that tractor harvest on such steep slopes has led to increased ground disturbance and sedimentation? When harvest is conducted by tractor on such steep

slopes it is often necessary to construct excavated skid trails that cause unnecessary resource damage and there is a much greater risk to the safety of operators.

Objection 11 – Timber harvest and fuel treatments in existing old growth

The End of the World wildlife report identifies five old growth analysis areas and includes a map of possible old growth stands within those old growth compartments. As detailed in the wildlife report, most old growth stands are located in previously identified Management Area 20, which the wildlife report indicates will not be harvested under Alternative B. The acreage in MA 20 exceeds the minimum requirement of retention of 5% old growth in each old growth compartment. However, the actual condition of the existing stands in MA 20 is not reported.

According to the wildlife report "Management Area 20 consists of timber in condition classes of overmature sawtimber (150 years or older) or of immature stands (40-80 years) that will provide for replacement old-growth habitat. Goals for this management area are to provide "suitable" habitat (existing and replacement) for old-growth-dependent wildlife species." This suggests that not all of the stands in MA 20 are actually old growth.

In areas outside of MA 20, the District Wildlife Biologist and the District Silviculturist have identified several additional stands that they believe may qualify as old growth. This review is largely based on older stand exam information and review of aerial photography. It does not appear that most of the stands were actually visited in the field by either the Wildlife Biologist or the District Silviculturist.

Based on this review, the wildlife report suggests that there are an additional 327-acres that meet the definition of old growth identified in the Forest Plan and 182-acres that may meet the screening criteria for old growth habitat as identified by Green et al. (1992). The wildlife report also identifies 251-acres of stands that are termed "replacement old growth". According to the wildlife report, these are stands that may meet the Green et al. (1992) screening criteria within 10 to 40 years.

Appendix N of the Forest Plan requires old growth stands actually meet the characteristic of old growth now and not some-time in the future. "Current information indicates that, in order to maintain a viable population of old-growth-dependent species, it is necessary to maintain 10 percent of the total forested acres as old growth with no less than 5 percent of the forested acres maintained as old growth within each prescription watershed or combination of watersheds totaling 5,000 to 10,000 acres. If less than 5 percent old growth exists in a drainage, the additional required acres will be assigned to adjacent drainages where excess old growth is available."

The Nez Perce/Clearwater should not be counting replacement old growth in either the 10% forest total or the 5 percent per drainage requirement. These stands are not old growth at this time and should not be counted. Likewise, the Green et al. (1992) guidelines are screening criteria that were never intended to be used as old growth definitions as is the current practice on the Nez Perce/Clearwater Forest. Consider the following statement from the guidelines: "The minimum criteria in the "tables of old growth type characteristics" are meant to be used as a screening device to select stands that may be suitable for management as old growth, and the associated characteristics are meant to be used as a guideline to evaluate initially selected stands. They are also meant to serve as a common set of terms for old growth inventories. Most stands that meet minimum criteria will be suitable old growth, but there will also be some stands that meet minimum criteria that will not be suitable old growth, and some old growth may be overlooked. Do not accept or reject a stand as old growth based on the numbers alone; use the numbers as a guide" (Green et al. 1992).

Other problems with the old growth analysis are that the District Biologist and District Silviculturist appear to have forgotten the fact that old growth is more than just large diameter trees. Their determinations of old growth condition are generally based on the number of large diameter trees in the stand as obtained from database queries. The Nez Perce Forest Plan (Appendix N) includes five other criteria that are important to the identification of old growth and are part of the definition of old growth. Here is how Appendix N of the Forest Plan describes old growth:

"Old-growth habitat is defined as a community of forest vegetation which has reached a late stage of plant succession characterized by a diverse stand structure and composition along with a significant showing of decadence. The stand structure will have multi-storied crown heights and variable crown densities. There is a variety of tree sizes and ages ranging from small groups of seedlings and saplings to trees of large diameters exhibiting a wide range of defect and breakage both live and dead, standing and down. The time it takes for a forest stand to develop into old-growth condition depends on many local variables such as forest type, habitat type, and climate. Natural chance events involving forces of nature such as weather, insect, disease, fire, and the actions of man also affect the rate of development of old-growth stand conditions.

Old-growth stand refers to a stand of timber that, generally, meets the following criteria:

1. At least 15 trees per acre > 21 inches diameter at breast height (DBH). Providing trees of this size in the lodgepole pine and sub-alpine fir stands may not be possible.
2. Two or more canopy layers.
3. At least .5 snags per acre > 21 inches DBH and at least 40 feet tall.
4. Signs of rot and decadence present.
5. Overstory canopy closure of 10-40 percent; understory canopy closure of at least 40 percent; total canopy closure at least 70percent.

6. Logs on the ground."

According to the Green et al. 1992 the final determination of old growth status is to be made during a field evaluation by a qualified ecologist or wildlife biologist. Strict reliance on data base queries from the timber stand database has been shown to give unreliable results in past court cases (Iron Honey Timber Sale, Idaho Panhandle National Forest – 9th U.S. Circuit Court of Appeals in San Francisco, 2004) and is no substitute for field investigation by qualified professionals.

The District Biologist and District Silviculturist have not conducted the necessary field investigation of old growth stands as outlined in the Iron Honey lawsuit. They have relied almost exclusively on data base queries and aerial photo interpretation. While these are good tools to begin an appropriate old growth inventory, they are no substitute for the field investigations as suggested by Green et al. (1992) and the Iron Honey lawsuit.

The wildlife report suggests, that 5 acres of the identified old growth outside of Management Area 20 will be treated by regeneration harvest, 230 acres by intermediate harvest and 112-acres by prescribed burning. It is unclear how much of the treated acreage will be in old growth stands that meet the Forest Plan criteria or the other categories such as stands identified by the Green et al. (1982) screening criteria or within the replacement category.

Overall, approximately 375-acres of potential old growth or replacement stands would be impacted outside of MA 20. This is 49% of the 759-acres identified outside of MA 20. It is obvious that old growth characteristics will be lost in the stands that will be regenerated, but it is very unclear what is going to occur in stands that will be treated by intermediate timber harvest. Such activities will remove snags, downed logs, smaller trees and forest cover that are important old growth characteristics according to the Forest Plan. By their own omission the District Biologist and Silviculturist have not even visited these stands to assure that such treatments are necessary. Stands that truly meet Forest Plan requirements for old growth don't need logging operations to "improve" them and most people do not equate old growth stands with stumps, skid trails and other evidence man's activity.

Burning operations may be appropriate in ponderosa pine old growth types, but again the stands must be visited to confirm if these operations are necessary. Some stands may require some form of intervention, but others may be perfectly fine without any additional treatment. This can only be determined by field examination.

In regard to the FIA query that estimates the amount of old growth on the Forest exceeds 10%. This query is based purely on the Green et al. (1992) screening criteria and not Forest Plan definitions of old growth. There has been no actual field verification of the stands as recommended by Green et al. (1992) and the Iron Honey lawsuit. Tree numbers were

intentionally set somewhat low in the Green et al. (1992) screening criteria to make sure that most stands with a potential for old growth could be identified. It was expected that further field verification would take place in these stands. For example, the large tree criteria for Old Growth Type 4 which would be common in the project area is only 10 trees per acre over 21-inches DBH.

FIA data was designed to make national estimates of the timber inventory across the country and not as a means of conducting Forest Level inventories of old growth. Because it is such a large-scale inventory, plot numbers are actually fairly low in comparison to forest inventories conducted on National Forests like the Nez Perce/Clearwater. FIA data, cannot predict the location of old growth stands or if stands will have other characteristics usually associated with old growth. Thus, it is not very useful for project level planning and actually determining the impact of project proposals.

In summary, the existing old growth inventory that has been conducted for this project is incomplete and does not identify the actual stands that currently meet Forest Plan old growth definitions. Several stands identified as old growth should not have been assigned the old growth designation and the Nez Perce/Clearwater Forest does not really know if they are meeting the Forest wide standard of 10%. A map of existing old growth across the Forest is not available, even though it has been over 30 years since the Forest Plan was completed. There has been no field examination of existing old growth stands proposed for treatment, and timber harvesting to "improve" old condition is a very questionable need. Please drop all timber harvest in stands currently meeting the definition of old growth in the Nez Perce Forest Plan.

Objection 12 – General wildlife concerns

My overall impression is that the End of the World project will have negative consequences to most wildlife species. Alternative B includes 16,340 acres of intermediate harvest and 1,568 acres of regeneration harvest, there is an additional 6,783 acres if prescribed burning and 357 acres of mechanical fuel treatment. There is 16-mile long fuel break along Road 221 that will have very negative consequences for big game such a deer, elk and moose and other wildlife that may use this corridor. The estimated timber harvest associated with this project is 144.1 million board feet of timber, which is an extraordinary amount of timber harvest when one considers that the Nez/Perce Clearwater has not harvested that much timber on an annual basis for the last 30 years.

Twelve regeneration harvest units exceed 40 acres in size and they will create openings ranging from 44 to 230 acres in size. These large openings will not be attractive to species the deer, elk, fisher and marten who generally like to be closer to cover or avoid openings altogether. Harvest and fuel treatments will remove snags, downed wood which will have negative consequences for bats, black-backed woodpeckers, pileated woodpeckers, goshawks and a variety of other species.

The project will construct 15-miles of temporary road, build one mile of new road and reconstruct another mile of Road 9469. Several miles of road will be reconditioned for log-haul. On a positive note, 28 miles of road may be decommissioned. However, this work is not required and no sources of funding have been identified.

Even with the proposed road decommissioning, road densities will still be very high. Current road density is 3.9 miles per square mile and this will be reduced to 3.7 miles per square mile if the decommissioning actually does occur. Decommissioned existing and temporary roads will still provide travel corridors that may be accessed as user created routes. The Nez Perce / Clearwater National Forest does not have a very good track record on the control of user created routes. The creation of user created routes has been observed on many past projects, and the construction of new temporary roads or the opening of grown over existing roads tends to foster this illegal activity.

The wildlife analysis makes several erroneous conclusions that are not supported by the best available science and fails to answer the "so what" question of what habitat losses associated with the project mean. Spatial requirements of territorial species have largely been ignored, and no thresholds of management activity that might cause concerns for individual species except elk have been identified. With the exception of summer habitat use by elk, the impact of high levels of motorized use has not been considered for any species. The examination of cumulative effects is also very weak for most species.

Schultz (2010) outlined most of these problems in a critique of Forest Service wildlife analysis. Schultz found that the Forest Service often relies on stand exam queries to determine acres of suitable habitat, but then makes no interpretation as to what that loss of habitat means to the species. Similar to what has been done on the End of the World project; they fail to set meaningful thresholds and assume that habitat losses are insignificant. Schultz (2010) concludes that "the lack of management thresholds allows small portions of habitat to be eliminated incrementally without any signal when the loss of habitat might constitute a significant cumulative impact."

Schultz (2010) also examined the Sampson assessment (Sampson 2006a and 2006b) which is the mentioned in the discussion of several project area wildlife species. She states that the Sampson assessment "suffers from several problems, the most prominent being that the analysis is based on habitat availability, which alone is insufficient for understanding the status of populations (Noon et al. 2003, Mills 2007)". Her recommendations generally call for more peer review of large-scale assessments and project level management guidelines. She suggests that we must adopt more robust scientifically sound monitoring and measurable objectives and thresholds if we are to be successful in meeting obligation of maintaining viable populations of all native and desirable non-native wildlife species. This has not been done on the End of the World project.

An interesting observation of the Sampson assessment is that it focuses on short term viability and long-term viability using what is called the 50/500 rule (Bessinger 2002). In fact, all six species considered in Sampson's analysis are all evaluated for short term viability using this "rule of thumb". Sampson did not evaluate long-term viability for the fisher and marten, but he did do if 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 End of the World wildlife analysis does not mention Sampson's long-term viability conclusions, and only focuses in on his short-term projections which are based on maintaining 50 individuals (25 male and 25 female). In his analysis, 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). Some of these numbers have been reported in the Wildlife Report for the various species of concern.

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 that National Forest Management Act (NFMA) and Endangered Species Act (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….."

Sampson 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. Since the Sampson short-term viability analysis was completed, we have seen more wildfires and the level of timber harvest has increased on the Nez Perce – Clearwater National Forest. More sales are being planned at this time (Clear Creek, Lolo Insects and Disease, Center Johnson, Windy Shingle, Hungry Ridge, Tinker Bugs, Red Moose Divide, Pete King, Gold Hill, Smith Ridge, White Pine, etc.) than at any other time in the past twenty years.

I therefore object to the use of the Sampson short-term viability analysis in the wildlife report and EA. The short-term viability analysis is scientifically unsound and it is very doubtful it could sustain scientific peer review. The analysis is clearly out of date and does not reflect recent increases in both logging and wildfire. Schultz (2010) captured this sentiment in her critique of the Sampson report: "some interviewees also thought the work should be peer reviewed, especially if it was conducted by USFS management, and several were skeptical that it would survive such review." I agree with the reviewers.

The analysis assumes the project will not contribute to cumulative habitat losses at the Forest level, when the Nez Perce/Clearwater has no idea what the cumulative impact of numerous past and proposed projects are having on the species of concern. While I am encouraged to see that the Forest has included some project level monitoring for species like the goshawk in this project, I am concerned that it has been over 30 years since the current Forest Plan was signed, yet there is currently no statistically reliable monitoring information on the impacts of Forest Service activities on any wildlife species of concern. With the possible exception of elk (populations monitored by the Idaho Fish and Game) and the North Idaho Elk Guidelines (Servheen et al. 1997), there is no habitat proxy that is being used on the Forest that has any field verification. For example, it has not been confirmed that old growth standards are truly protecting old growth-related species like the fisher, goshawk, pine marten and pileated woodpecker.

The Forest Service is fond of the argument that viability cannot be discussed at the project level, but they then use habitat numbers outside of the project area to defend excessive development within the individual project area. They rationalize that sufficient habitat is available in other areas to make up for losses within the project area. Under this scenario, no project ever creates a significant impact and species are lost by "10,000 cuts" as project after project is allowed to proceed. The Forest Service cannot have it both ways; either they need to have project designs that create minimal impacts to species of concern, or they need to have monitoring information that confirms their habitat proxies are "providing for a diversity of plant and animal communities based on the suitability and capability of the specific land area" as required by the National Forest Management Act.

Objection 13 – Conclusion that intermediate treatments, fuel breaks and prescribed burning would not influence lynx habitat condition

The wildlife report suggests there are 19,954 acres of potential lynx habitat in Lynx Analysis Unit 2090502. This unit extends beyond the project area, with about 10,000 acres of the potential lynx habitat inside of the project area (See Lynx Habitat Map in the Project File). Potential lynx habitat was identified by habitat queries of stands with subalpine fir, Engelmann spruce or lodgepole pine forest cover types or stands of other forest cover types that are located above 4,000 feet elevation. Stands that are considered to have potential for denning are stands with an average DBH of 15 inches and a crown closure of 40%. Denning stands must also be located in areas identified as potential habitat. Acres regenerated in the last 15-years are considered unsuitable habitat. All other stands within potential lynx habitat are considered potential foraging habitat, but densely stocked young stands 15-30 years of age are considered primary foraging habitat because of their preference by snowshoe hares which are the primary prey of the lynx.

According to the wildlife report, there are 10,280 acres of potential denning habitat, 9,183 acres of potential foraging habitat and 490 acres of unsuitable habitat (recently harvested areas) in the project area. Proposed regeneration harvest in Alternative B would remove 320-acres of denning habitat and 220-acres of foraging habitat which the wildlife report suggests would now be considered unsuitable (Table 2). These habitat losses are acknowledged in the wildlife report, and the analysis concludes this level of harvest will meet all of the requirements of the Northern Rockies Lynx Management Direction.

The wildlife report also acknowledges that there will be 2,586 acres of intermediate treatment in denning habitat and 1,721-acres of intermediate treatment in foraging habitat. Fuel treatment along Road 221 would treat 55 acres of denning habitat and 75 acres of foraging habitat. Six acres of currently unsuitable habitat would also be modified in the Road 221 fuel break. There would be an additional 641 acres of prescribed burning in lynx habitat, but the amount of denning and foraging habitat that would be impacted is not identified.

The wildlife report suggests that intermediate treatments, fuel treatments and prescribed burning would not impact lynx habitat, but I find that very hard to believe given what is proposed in these activities. These treatments will remove the understory plants and small trees that are important food sources for snowshoe hares which are the primary prey of the lynx. Hiding cover utilized by hares will also be lost. Use by snowshoe hares would be unlikely following the proposed treatments, and it is unlikely that these areas would be sought out as foraging areas by lynx.

In denning habitat, downed logs and cover that would conceal a potential denning site would be removed. It is very unlikely that a lynx would den in these open stands once the intermediate treatment or the proposed fuel break is completed. Prescribed burning will also open stands and remove understory vegetation and downed wood material. The impact of this activity on lynx habitat will likely be dependent on burn severity.

In summary, I believe potential habitat losses are much higher to lynx than the wildlife report suggests. Intermediate treatments, will impact 2,641-acres of denning habitat and 1796-acres foraging habitat and make these areas functionally unsuitable for lynx use. When combined with proposed regeneration harvest, the proposal harvest treatments will far exceed the 15% harvest recommendation for recent timber harvest in the Northern Rockies Lynx Management Direction. Harvest on Alternative B will increase the amount of unsuitable habitat to 27.4% of the potential habitat and burning adds another 3.2% bringing the total unsuitable habitat to 30.6% which is just above Northern Rockies Lynx Management Direction of 30% unsuitable habitat. It should also be noted that Alternative B treats approximately 5,618 acres or 56% of the lynx habitat in the project area.

Table 2 – Lynx habitat after implementation of Alternative B

	Denning Ac (%)	Foraging Ac (%)	Unsuitable	Harvest Last 10
Existing	10,280 (51.5%)	9,183 (46.0%)	490 (2.5%)	383 (1.9%)
Alternative B – Regeneration Harvest	-320 (1.6%)	-220 (1.1 %)	+540 (2.7%)	+540 (2.7%)
Alternative B – Intermediate Harvest	-2,641 (13.2%)	-1,796 (9%)	+4,437 (22.2%)	+4,437 (22.2%)
Burning	?	?	-641 (3.2%)	
Total	7,319 (36.7%)	7,167 (35.9%)	6,108 (30.6%)	5,360 (26.9%)

Objection 14– The fisher habitat analysis is disjointed and ignores concerns about the species

It is very unclear how the amount of fisher habitat within the project area and the surrounding HUC 12 watersheds was determined. The map that displays existing fisher habitat in the project file excludes most areas in the western portion of the project area along the lower reaches of White Bird Creek and the northeastern portion of the project area along the South Fork of the Clearwater River. Presumably, these are drier areas that would likely be avoided by the fisher.

While it is understandable to remove these drier areas from the analysis area for fisher habitat, it is unclear why private inholdings and other intermingled small areas within the project have been

excluded from the analysis. A fisher utilizing the area identified by the most concentrated habitat would have to navigate the intervening areas to survive and such areas would have been included in the home ranges and habitat recommendations identified by Sauder and Rachlow (2014). As accurately reported in the EA, Sauder and Rachlow (2014) report the average home range size is approximately 12,200 acres and for a female fisher and approximately 24,300 acres for a male fisher. Home ranges generally do not overlap greatly for the individual sexes (21.3% for females and 15.3% for males), but male home ranges can overlap female home ranges.

To evaluate fisher habitat properly, the project area should have been divided into potential or theoretical home ranges based on topography. These theoretical home ranges should average approximately 12,200-acres which is the size of a female fisher's home range. The home ranges should not overlap in order avoid double counting of habitat and the range size of the female is preferred since these home ranges are more directly tied to reproductive success. It is acceptable to exclude large areas of unsuitable habitat like that found in the Lower White Bird drainage. This approach is very similar to the designation of elk analysis areas in the elk habitat analysis.

Sauder and Rachlow's (2014) recommendations should have then been applied to each of these theoretical home ranges to give a more accurate evaluation of potential habitat. Sauder and Rachlow (2014) found that radio-tracked fishers had an average of at least 50% mature forest and less than 5% open areas in their home range. Even now the EA suggests that mature forest habitat would decline from 41% to 38% and that the amount of opening within the project area increase from 12 to 14%. According to the Sauder and Rachlow publication (Figure 2) a landscape with 14% open area would have a relative probability of occupancy of around 20%. Had the evaluation area included private land and other intermingled lands as would have been the case when Sauder and Rachlow developed their recommendations, it is likely that the probability of occupancy would have been even lower.

The conclusion of the FEIS and the biological evaluation are that the "project may impact individual fisher or fisher habitat, but are not likely to result in a trend toward federal listing or reduced viability for the populations or species within the Project Area or range wide". This conclusion seems highly subjective and self-serving given the fact that no comprehensive evaluation of fisher habitat has occurred on the Nez Perce/Clearwater National Forest using the latest scientific literature from publications like Sauder and Rachlow (2014) and the fact that even by your own poorly constructed analysis that the potential for occupancy by fishers will drop to 20% after implementation of the project.

You have not even considered the fact that you intend to commercially thin most of the mature forest in the areas you have identified as fisher habitat. If one overlays the map of existing fisher habitat with a map of Alternative B it is very apparent that most fisher habitat within the project area will be impacted by some form of timber harvest. These activities will remove snags, downed logs and other forest components like forest cover that are important to the fisher and the prey species on which the fisher relies. These impacts should have been given more

consideration in the fisher analysis, which basically says things are already bad, we are going to make the situation worse, but it really doesn't matter.

Sauder (2014) suggested that "almost 80% of the predicted habitat for fishers in the Rocky Mountains of Idaho and Montana occurs on federally owned national forests, and we conclude that successful conservation of fishers in the Rocky Mountains of Idaho and Montana will rely heavily on policy and management decisions made on these landscapes." He estimates that the Nez Perce/Clearwater National Forest contain approximately 22.7% of the probable habitat and 26.3% of the high-quality habitat for this species in Montana and Idaho. Most of this habitat occurs on low elevation areas like the project area and other locations that are considered the "front country" on the two National Forests. One of the most important conclusions of Sauder and Rachlow's work was their conclusion that "wilderness and roadless areas alone are unlikely to provide sufficient habitat or population reserves to ensure persistence of fishers in Idaho and Montana."

Similar conclusions to those presented in the End of the World timber sale have been brought forward on many other recent projects on the Nez Perce/Clearwater National Forest (French Larch, Lower Orogrande, Johnson Bar, Clear Creek, Little Boulder, Dutch Oven, Windy Shingle, Center Johnson, etc.). There is also a myriad of other proposed projects in fisher habitat (Smith Ridge, White Pine, Tinker Bugs, End of the World, Hungry Ridge, Crane Point, etc.). Fisher habitat is clearly at risk as a result of the End of the World project and other proposals being brought forward on the Nez Perce Clearwater National Forests. Like End of the World most of these projects target the already heavily logged and roaded front country which provides prime fisher habitat on the Nez Pearce Clearwater National Forests.

At some point, all of this activity is going to have an impact on the fisher population across the Nez Perce/Clearwater National Forests. The findings of Sauder and Rachlow (2014) cannot continue to be ignored on each and every project, with the same old statement that the "project may impact individual fisher or fisher habitat, but are not likely to result in a trend toward federal listing or reduced viability for the populations or species within the project area or range wide".

Objection 15 - The black-backed woodpecker habitat analysis significantly underestimates suitable habitat and project level impacts

I agree with wildlife report conclusions that the black-backed woodpecker is associated post-fire situations (Hutto 1995, Saab et al. 2007), but disagree with the conclusion of the wildlife report that black-backed woodpeckers will not be significantly impacted by this project and other projects across the Nez Perce / Clearwater National Forest. While black-backed woodpeckers are known to respond positively to recent wildfires, populations are thought to persist at lower levels in unburnt mature and old growth forest stands. An unpublished report (Taylor and Schachtell 2002) by former Idaho Panhandle wildlife biologist Jenny Taylor found considerable use of unburned areas on the Idaho Panhandle National Forest and according to the wildlife

report black-backed woodpeckers have been documented using unburnt stands within the project area on several occasions.

Black-backed woodpeckers are likely being maintained in the project area by dying and recently dead standing trees since there are no recent wildfires. The level of timber harvest is very significant with 1,568 acres of regeneration harvest and 16,340 acres of intermediate treatment. Regeneration harvest will remove habitat potential for the black-backed woodpecker and intermediate treatments are designed to remove diseased trees and insect infested trees. Many existing snags will be lost due to safety concerns associated with the actual logging. These sanitized stands will likely change in stand character so that use by black-backed woodpeckers would be highly unlikely.

There are also numerous other timber harvest proposals on the Forest such as Johnson Bar, Lower Orogrande, Little Slate, Lolo Bugs, French Larch, Little Boulder, Clear Creek, Hungry Ridge, Windy Shingle, Center Johnson, Red Moose Divide, Pete King, Tinker Bugs, etc. Like the End of the World Project all of this activity will significantly reduce the number of insect infested live and recently dead trees across the Nez Perce / Clearwater National Forest.

The Nez Perce/Clearwater Forest has not done an accurate cumulative effects analysis on how all of this activity will impact the black-backed woodpecker. As I have previously mentioned, the conclusions of the Sampson Report (2006 a and b) and (Bush and Lundberg 2008) are now outdated and were of questionable accuracy to begin with.

Objection 16 – The bat habitat analysis is not supported by the best available science and significantly underestimates suitable habitat and project level impacts

The wildlife analysis should have separated the habitat analysis for the fringed myotis and the Townsend's big eared bats from the other bat species. These species generally are found in drier habitats than the long-eared and long-legged myotis (Keinath 2004, Lacki and Baker 2007). The query of suitable habitat should have focused on older Ponderosa Pine and Douglas fir stands (>100 years old and > 12 inches DBH) for the fringed myotis and the Townsend's big eared bat. The query for the long-legged and long-eared myotis should have also focused on older stands (>100 years old and > 12 inches DBH), but should not have been limited by tree species (Lacki et al. 2010).

The End of the World habitat analysis for bats places primarily focuses on old growth and riparian areas. It is assumed that because there is very little harvest in old growth stands and PACFISH buffers, that the impacts to bats will be minimal. Impacts of regeneration harvest and intermediate harvest and then discounted because they are not occurring in these areas.

I think the Forest Service needs to reexamine the habitat analysis for bats in the project area. My review suggests that suitable habitat can be found over a much larger area of the analysis area than what is being considered by the Forest Service. By limiting the analysis to old growth and riparian stands the Forest Service fails to recognize the impact that almost 18,000 acres of timber harvest will have on bats. Habitat will be degraded almost entirely within regeneration harvest units (1,568-acres) and snag levels and forest structure will be degraded in intermediate treatment areas (16,340-acres).

Much like the analysis for other species such as the black-backed woodpecker, the bat habitat analysis rationalizes away the impact of proposed project activities and does not consider the cumulative impact of the myriad of timber harvest projects being conducted across the Nez Perce / Clearwater National Forest.

Objection 17 – Incorrect use of the Reynolds et al. (1992) goshawk management recommendations and the latest scientific literature for evaluating goshawk habitat

The project area is 49,565 acres in size and most of the project area appears to provide the potential to support goshawks except for the lower reaches of White Bird Creek where drier habitats dominate (See existing goshawk habitat map in the project file). According to the wildlife report, the estimated foraging habitat is 36,847-acres and 24,409-acres of this foraging habitat is considered suitable for nesting.

Foraging habitat was identified by database queries, using a stand size class of 10 inches DBH and a crown closure of 25%. Some potential habitat was likely missed by this query since younger stands and stands with less than 25% crown closure would not have been considered foraging habitat at this time. Unlike direr areas along Lower White Bird Creek these areas will eventually mature into forest stands that will be goshawk habitat. Thus, there is probably closer to 40,000-acres of potential goshawk within the project area. The District silviculturist and wildlife biologist need to identify these additional areas based on their knowledge of forest habitat types and forest succession within the project area.

Nesting habitat was identified by selecting stands with a minimum DBH of 15 inches and a minimum crown closure of 40%. I suspect existing nesting habitat may have been overestimated due to the inclusion of open areas between 40-70% crown closure. Moser and Garton (2009) and Hayward and Escano (1989) identified goshawk nesting in Idaho and are the best available sources of scientific information on nesting habitat in this area. Moser and Garton (2009) reported that all goshawk nests examined in their study area were found in stands with an average DBH of overstory trees greater than 12.2 inches and all nest stands had $\geq$ 70% overstory tree canopy. They described their findings as being similar to those described by Hayward and Escano (1989). Hayward and Escano reported that nesting habitat "may be described as mature to overmature conifer forest with a closed canopy (75-85% cover)…." Moser and Garton state

"this classification corresponds with Reynolds et al. (1992) vegetation structural stages four to six". Reynolds et al. (1992) classify VSS-6 as old forest exceeding 24 inches DBH, VSS-5 as mature forest 18-24 inches DBH and VSS-4 as mid-aged forest 12-18 inches DBH.

Moser and Garton 2009 report that successfully nesting female goshawks in Northern Idaho had an average home range size of 6,600-acres (N=8). Studies in other areas have reported smaller home range sizes in the neighborhood of 5,000 acres (Reynolds et al. 1992). Moser's larger home range sizes may be related to the fact that Moser's study was conducted in an industrial forest landscape with a large amount of timber harvest. Other factors may be differences in methodology, use of satellite technology by Moser (2007) or differences prey availability in Northern Idaho.

The End of the World goshawk analysis uses recommendations from Reynolds et al. (1992) and the location of four historical nests to establish theoretical home ranges in the project area. Two of these nests were active in 2018 (Crooked River and South Fork of White Bird Creek), but no activity was observed at the other two nests. The District biologist used these historical nest locations as center points to establish a 5,000-acre circular home ranges (See project file) and evaluated them according to the Reynolds et al. (1992) guidelines and regional direction to maintain at least 240 acres of nesting habitat in each 5,000-acre home range (Clough 2000).

There are major problems with the approach used by the District Biologist. The first problem is that most of the project area is not contained within the four identified home ranges (See project file map). The second problem is that habitat gets double counted because the circular home ranges often overlap (Two of the identified home ranges overlap significantly).

With over 40,000 acres of potential habitat in the project area the District Biologist should have evaluated 7-8 theoretical home ranges. This could have been done by using non-overlapping theoretical home ranges based on topographical features that cover all of the potential goshawk habitat in the project area. This approach is very similar to the elk analysis areas used in the elk habitat analysis. Problems of not covering all of the potential habitat in the project area and double counting of habitat are thereby eliminated. The theoretical home ranges do not need be exact matches of reality, as their main purpose is account for the spatial arrangement of resources across the landscape

Regional direction based on Clough 2000 suggests at least 240 acres of suitable nesting habitat be maintained in each goshawk home range. This nesting habitat is to be maintained in uncut blocks of at least 40 acres in size and six nesting areas (3 suitable and 3 replacement) are to be maintained in each home range. This recommendation fits well with the findings of Moser and Garton (2009) who found that alternate nest sites will be used within the home range if the previous year's nest site is lost for some reason.

The End of the World goshawk analysis appears to have made a mistake in consideration of the management of the post-fledgling areas. The only provision provided in the EA is for the

protection of post-fledgling habitat is that timber harvest cannot occur during the nesting season within active post-fledgling areas, but there is no direction to identify and maintain actual post-fledgling habitat as recommend by Reynolds et al. (1992).

Providing suitable post-fledging areas around identified uncut nesting stands is an important component of the Reynolds et al. 1992 guidelines. Once the 240 acres of nesting habitat is identified in the home range, the biologist needs to assure that the 420-acre area around each identified nesting stand is suitable for use during the post-fledging period. Reynolds et al. 1992 recommend maintaining at least 60% older forests (VSSs 4,5,6) around the uncut nest stands in the 420-acre post-fledging area. Moser and Garton (2009) suggested that this could be potentially reduced to 39%, but this will likely place greater risk on the species (Clough 2000) and I think the more conservative approach suggested by Reynolds is more appropriate for National Forest management.

Since home ranges have not been identified across the project area it is impossible to tell if they are meeting both the nesting stand and post-fledgling area requirements. There is extensive regeneration and intermediate timber harvest planned in the stands that are in the VSSs 4, 5 and 6 size classes. To remain suitable according to the recommendations of Reynolds et al. (1992) and Clough (2000), home ranges should have 240 acres of uncut nesting habitat and the 420-acre area around those nesting stands should contain at least 60% mature forest.

Thus, the Reynolds et al. (1992) guidelines actually require maintaining more than 240 acres of mature forest in each goshawk home range. The exact amount of mature forest to be maintained is dependent on the configuration of the existing nesting habitat and the composition of the surrounding post-fledgling areas. This needs to be determined prior to timber harvest based on the location of identified nesting habitat. Doing otherwise, an making no provisions for the protection of post-fledgling habitat (as is being done on the End of the World project and several other projects across the Forest) and allowing post-fledging areas to be extensively harvested after the active nesting season (Aug 15th) will likely assure that the nesting area will be abandoned in the following year. This approach provides little assurance of long-term protection of goshawk habitat on the Nez Perce/Clearwater National Forest. The goshawk analysis needs to be updated to assure both nesting habitat and the surrounding post-fledgling habitat is being maintained.

Objection 18 – The pileated woodpecker habitat analysis is not supported by the best available science and significantly underestimates suitable habitat and project level impacts

The End of the World Wildlife Report claims there are 1,214 acres of pileated nesting habitat in the 49,56-acre project area. This number is based on a habitat query that identifies stands with an average DBH over 20 inches and an average crown closure greater than 60%. The analysis also suggests there are 36,372 acres of foraging habitat which is based on a habitat query of stands with an average DBH of 10-inches and an average crown closure of 25%. All nesting

habitat is considered foraging habitat in the analysis. There are no estimates of additional potential habitat in younger stands that have not have reached the 10-inch size class or currently do not have a crown closure of 25%. Such stands represent the existing impacted areas for this species.

The vegetation analysis (Silvicultural Report) suggests there are 4,864 acres (9.8 % of the project area) with an average DBH over 20+ inches. This seems to be an apparent discrepancy with the wildlife report which only identifies 1,214-acres in this size class suitable for pileated woodpecker nesting. Unless most of the stands exceeding 20-inches DBH identified in the vegetation analysis do not have crown closures greater than 60%, it is hard to explain why there is not more acreage of nesting habitat in the project area. Given all of the concerns about stand density and the need for forest thinning in the project file, it seems highly unlikely that existing stands would be this open. Examination by the project silviculturist and wildlife biologist appears to be needed.to better understand what is occurring.

The vegetative report also suggests there are 23,773 (48 % of the project area) acres in the medium trees size category of 15-19 inches DBH. Some portion of the stands in this smaller size class likely include individual snags/trees exceeding the 20-inch diameter size and are likely suitable for nesting. While pileated woodpeckers do require individual snags greater than 20 inches DBH for nesting (Bull and Holthausen 1993, McClelland and McClelland 1999) they can successfully nest in mature stands that contain individual nesting snags of suitable size. They do not require that the average tree size exceed 20-inches as you have apparently concluded in your evaluation of suitable nesting habitat. It should be relatively easy to identify stands in the 15-19-inch size class with a component of snags or trees larger than 20 inches DBH based on completed stand examinations or field examinations.

The vegetation analysis and the wildlife analysis seem to agree in regard to the amount of foraging habitat. Stands in the 10 to14.9-inch DBH class (8,734-acres or 17.6% of the project area) would likely only be suitable for pileated foraging habitat. When these acres are combined with 20+ size class (4,864 acres) and the15-19-inch size class (23,733 acres) there would be a total 37,371 acres in size classes exceeding 10 inches DBH. This number is comparable to the 36,372-acres listed as foraging habitat in the wildlife analysis.

Although they are not suitable foraging habitat at this time, seedling, sapling and pole stands less than 10-inches DBH provide an additional 3,497 acres of potential pileated habitat. Thus, the project area supports approximately 40,868 acres of potential pileated woodpecker habitat when all of the forested categories in the vegetative analysis are combined.

I believe a more spatially explicit analysis that includes the representation of potential pileated woodpecker home ranges is required. Bull et al. (1992) found that the average home range size

of pileated woodpeckers is approximately 1,005-acres, which would suggest the project area could support approximately 40 nesting pairs of pileated woodpeckers. To avoid double counting of potential habitat, I suggest that these potential home ranges be defined by topographical features, sub-watersheds or timber sub-compartments similar to what has been done for the elk analysis areas.

The analysis should then utilize the management guidelines available from Bull and Holthausen (1993), these guidelines detail how such home ranges should be managed. They recommend that approximately 25% of the home range be old growth and 50% be mature forest. They suggested that 50% of the area should have stands with greater than 60% canopy closure and at least 40% should remain unlogged (any type of logging).

Follow up work (Bull et al. 2007) found that pileated woodpecker density did not change in 30 years (despite major infestations of spruce budworm) in home ranges meeting these guidelines, unless extensive regeneration harvesting had occurred in the home range. They defined extensive regeneration harvest as 25% of the home range. They also examined nesting success and found that birds that successfully produced young had on average 85% of their home range unlogged and less than 15% logged with any type of logging including fuel reductions. Whereas unsuccessful nesters had 62% of the home range unlogged and 38% logged (Bull et al. 2007).

Using the Bull publications would have given the Nez Perce/Clearwater National Forest a way of evaluating habitat potential and setting cumulative habitat thresholds where habitat loss becomes significant (Schultz 2010). Such an analysis would have been based on the latest scientific information and would display some concern for maintaining management indicator species within the project area. The fact that the Forest Plan includes no guidance on cumulative thresholds for terrestrial wildlife species, does not exclude the Forest Service's responsibility to "provide for a diversity of plant and animal communities based on the suitability and capability of the specific land area" or negate the Forest's obligation to utilize the best available science.

It is ironic that the wildlife report uses the Samson (2006b) short-term viability analysis and the Bush and Lundberg 2008 habitat estimates as a way to show that pileated woodpeckers are being maintained at the Forest level and that the End of the World project will not contribute to cumulative impacts. This simplistic query of FIA data is not spatially explicit and relies on meaningless definition of pileated woodpecker habitat that is not supported by the available literature (Bull and Holthausen 1993, McClelland and McClelland 1999, Mellen et al.1992). Nesting habitat is simply defined as a stand with one dead tree per acre over 15 inches DBH and foraging habitat is defined as a stand with one dead tree per acres over 9 inches DBH. This is not a defensible description of pileated woodpecker habitat and makes the analysis pretty much meaningless. There is no requirement for the snags to be part of a mature stand and 15-inch DBH snags are not suitable for nesting by this species. If methods used in the Sampson report

had been utilized in the project area it is likely that most of the stands in the area would have been classified as nesting habitat.

The End of the World project will add 1,568 acres of regeneration harvest and 16,340-acres of intermediate treatment to an existing situation where 3,497 acres are not suitable for foraging or nesting, bringing the total percentage of recent harvest in the project area to 21,405-acres or 52.4% of potential pileated woodpecker habitat. While we do not know how individual potential home ranges would be impacted since no analysis has been completed, these levels of harvest and fuel treatment would not be consistent with recommendations from Bull and Holtausen (1993).

Clearly, the best available science does not support the contention that pileated woodpeckers will be unaffected by the End of the World proposal. Long-term studies (Bull et al. 2007) suggest that the pileated woodpecker is highly sensitive to regeneration harvest. Fuel treatments and partial cut operations have been shown to negatively influence foraging habitat. "Stands with fuel reduction treatments at Starkey had significantly fewer logs, fewer logs with ants, and less pileated woodpecker foraging" (Bull et al. 2005). Please update your analysis to display the appropriate impacts to this species.

In summary, the pileated woodpecker analysis appears to have significantly underestimated the amount of nesting habitat in the project area and in turn has underestimated the impact of this proposal on the species. There is also little recognition of the impact of intermediate treatments on the pileated woodpecker. The project proposal includes 1,568 acres of regeneration harvest and 16,340-acres of intermediate treatment and there already 3,497-acres of potential habitat that is currently unsuitable for either foraging or nesting. This activity in combination with the existing condition totals 21,405-acres which is 52.4 % of the potential pileated woodpecker habitat in the project area. Bull et al. 2007 found pileated woodpeckers were unsuccessful when more that 38% of their home range was logged with any type of timber harvest.

Objection 19 - Failure to set any meaningful thresholds of habitat loss and consider the effect of habitat fragmentation on the American Pine Marten

The End of the World pine marten analysis relies strictly on data base queries and makes no assessment of meaningful thresholds of habitat loss that would affect the pine marten. Without meaningful thresholds projects will continue to degrade pine marten habitat across the Nez Perce/Clearwater over time (Schultz 2010, Schultz 2012). The analysis is not spatially explicit and fails to recognize more recent literature on the effect that habitat fragmentation on the pine marten. For example, recent studies have found that the species is particularly vulnerable to habitat fragmentation (Webb and Boyce 2009, Hargis et al. 1999, Moriarty et al. 2011, Potvin et al. 2000, Wasserman et al. 2012). Hargis et al. (1999) reported that "Martens were nearly absent

from landscapes having >25% non-forest cover, even though forest connectivity was still present."

I agree with the wildlife report that the marten is associated with mid to high elevation areas, Avoidance of openings is well documented in the literature (Potvin et al. 2000, Koehler and Hornocker 1977, Chapin et al. 1998 and Wasserman et al. 2012). Wasserman et al. 2012 found that and elevation of 4,593 (1400 meters) was the peak elevation for the probability of marten presence and that the probability of marten presence declined as elevation either increased or decreased. Like many other studies they found that marten presence was positively influenced by the amount of mature closed canopy forest and negatively influenced by high road densities, non-stocked clearcuts and habitat fragmentation. They also found that marten make use heavy use of western red cedar stands occurring in these higher elevation areas. Use of spruce/fir forests was less than reported in some other studies such as Koehler and Hornocker (1997).

Like my suggestions for other species, I think theoretical home ranges should be delineated within the suitable habitat and that fragmentation effects examined. Home range estimates are highly variable for marten (Buskirk and McDonald 1989, Powell 1994) and no good estimates are available for Idaho in the literature. I suggest using the findings of Bull and Heater (2001) who found that female home ranges averaged 3,500 acres in nearby Northeastern Oregon. They report that home ranges do not overlap significantly in the same sex, but larger male home ranges (6,700 acres) often overlap female home ranges.

The End of the World wildlife report suggests that there are 21,459 acres of marten habitat in the project area based on a habitat query that selected stands over 10-inches DBH, crown closure over 40%, and elevation over 4,000 feet. A map of this existing habitat is displayed in the project file which displays the same general pattern seen for other species like the goshawk, pileated woodpecker and the fisher. Lower elevation drier habitats in the lower White Bird Creek drainage and along the South Fork of the Clearwater River have generally been excluded. Once again this seems appropriate, but it is still hard to understand why small areas of intermingled habitat have been removed from the analysis in the core area of potential marten occupation. We don't know if these stands are potential habitat that have been recently logged and are now in size classes that are unsuitable for marten or if the just don't meet the crown closure or elevation requirements.

An approach that uses non-overlapping theoretical home ranges would better describe the existing condition for the pine marten since this approach would examine all habitat in areas likely to be utilized by the pine marten. The number of theoretical home ranges that the project area can support will be dependent on the contribution of intermingled areas to the 21,459 acres of suitable habitat which has already been identified. For example, suitable habitat might increase to 25,000-28,000-acres which would support 7 to 8 female home ranges.

Timber harvest should be then limited to actions that do not create extensive open areas in these home ranges. For example, Wasserman et al. (2012) report the probability of marten detection drops from 0.5 to 0.4 when the landscape is composed of 15% non-stocked clearcuts. Hargis et al. (1999) report little use of home ranges (landscapes) that have greater than 25% open habitat. Such an analysis would give a much more scientifically based projection of the impact of the proposed project on marten habitat and more appropriately deal with fragmentation and habitat arrangement impacts that have been ignored in the current analysis.

Wasserman et al. (2012) point out four main management implications of their work that have implications for marten habitat in the project area. First, is "that marten select habitat at multiple spatial scales, selecting home ranges within unfragmented landscapes with high canopy closure and low road density..". Second is "the importance of low fragmentation, middle elevation forests" and third is that timber harvest in northern Idaho National Forest System lands was disproportionately concentrated in high-productivity and highly valuable middle-elevation mesic forest types". These stands are the exact target of actions on the End of the World project. Fourth, "are that marten are highly sensitive to road density and patch density" and that "abandoned and decommissioned roads that do not appear on current travel plan maps still have substantial impact on marten habitat.

Consider what is happening in the project area to marten habitat. First, Alternative B will regenerate at least 1,270 acres of existing marten habitat and 10,148 acres will be treated by intermediate harvest. Some of these intermediate treatments will allow for open gaps that could compose 30% of the stand. All intermediate treatments will remove snags, downed logs and forest cover. Such stands will not be attractive to the pine marten, which are attracted to stands with high densities of downed logs (Buskirk and Powell 1994). High densities of downed logs are thought to be important for winter survival by providing subnivean spaces where marten can regulate body temperature and find prey species (Shirk et al. 2014). Forest cover will be removed along FSR 221 and prescribed fire is proposed on 1,154 acres of existing marten habitat. These activities will impact 61% of the marten habitat identified in the wildlife report, and we know nothing about the existing condition of potential habitat in the project area. How much potential marten habitat is already in an open/fragmented condition that will be unattractive for marten use?

The project will construct 15 miles of temporary road and 1 miles of new system road and reconstruct 1 mile of Road 9469. Several other miles of road will be reconditioned to accommodate log-haul. The project does propose to decommission 28 miles of road, but no sources of funding have been identified and the project area already has high road densities.

In summary, the impacts of the project on pine marten have been significantly underestimated. I am particularly concerned about the amount of intermediate treatment, the shaded fuel break along FSR 221 and habitat fragmentation effects that will result from both regeneration harvest and intermediate harvests. Open thinned stands will not be attractive to marten, which are known to seek out stands with high densities of downed woody cover, particularly in the winter.

Objection 20 - Questionable consideration of Forest Plan goals for establishing elk habitat objectives, errors in the actual calculation of elk habitat effectiveness and the use of inappropriately sized elk analysis units that don't conform to the recommendations of Servheen et al. 1997.

The project area is composed of six different management areas according to the End of the World Silviculture Report (Pages 1-2). Each of these management areas has a different goal for the management of summer elk summer habitat. For example, Management Area 12 which composes 63% of the project area has a goal of managing 21% of the elk habitat units at 75% of elk habitat potential, 58% of the elk units at 50% of elk habitat potential and only 21% of the elk habitat units are to be managed at 25% of potential, Similar goals are found for most of the other management areas in the project area.

How does the Forest Service track the number of elk units meeting Forest Plan goals on the Nez Perce National Forest and are elk habitat potential goals being achieved in all Forest Plan Management Areas across the Forest (Especially the six MAs impacted by this project)? Please clarify if elk habitat effectiveness goals are being achieved across the Forest and where this data can be found. Can you also explain why all management units in the project area are only being managed for 25% habitat effectiveness when the Nez Forest Plan calls for a much higher standard for the majority of elk analysis areas (EAA) in most management areas found in the project area.

I have examined several of the calculations that were completed for the various elk analysis areas and it does not appear that any consideration has been given to the amount of hiding cover adjacent to existing and proposed roads as outlined model (Servheen et al. 1997). When a regeneration harvest unit or a fuel treatment like the one along Road 221 is being proposed, the coefficients along that road should change to account for the loss of adjacent hiding cover. Likewise, if there is an existing opening along a road, the higher coefficients (Table 1 and Form 1) should be utilized. For example, the coefficient for an Open Arterial/Collector road is supposed to go from 0.8 to 1.2 when adjacent hiding cover is removed.

I don't understand the coefficients that have been used for the End of the World elk habitat calculations. The appropriate coefficients are displayed on page 38 of the guidelines (Servheen et al. 1997) and are also displayed on calculation Form 1 from the guidelines. The coefficients

displayed on the End of the World calculation forms do not match the information in the Servheen et al. (1997) guidelines and it is unclear were these numbers have come from.

Why are such large areas are being utilized for the elk calculations in at least four of the eight elk analysis areas? The Servheen et al. (1997) guidelines (Page 29) suggest EAA size should be between 3,800 and 5,000 acres in size and that "EAA's larger than this can dilute the effects of human disturbance on elk summer habitat…..". Pinnacle Ridge EAA is 8,864 acres, Fish Creek EAA is 6,956 acres, Goose Creek EAA is 6,396 and the Goodwin Meadows EAA is 6,139 acres.

Sincerely,

/s/ Harry R. Jageman

Harry R. Jageman

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