January 5, 2020
[redacted]

Objection Reviewing Officer
USDA Forest Service
Northern Region
26 Fort Missoula Road
Missoula, Montana 59804

Subject: Hungry Ridge Objection

Dear Sirs:

Attached are my objections to the Final Environmental Impact Statement and Draft Record of Decision for the Hungry Ridge Restoration Project on the Nez Perce / Clearwater National Forests. Overall, I thought that preferred Alternative Two (173 million board feet) was very excessive, given the past history of timber harvest in the South Fork of the Clearwater drainage and the proposed End of the World project (144 million board feet) which is immediately adjacent to the project proposal. Alternative Two conducts harvest in watersheds not meeting Forest Plan standards, within existing old growth stands, in existing roadless areas adjacent to the Gospel Hump Wilderness area and displays little regard for other resource values. Regeneration harvest unit sizes are very large (several are over 300 acres in size and at least two units exceed 400 acres – FEIS Appendix B, Table B5). My specific objections follow:

Objection 1 – Selective Reporting of Cobble Embeddedness Data

There are nine Forest Plan watersheds in the project area and two of those streams (Merton, Trout Creek) are not meeting Forest Plan standards for sedimentation and cobble embeddedness according to the FEIS fisheries report (Table 1). According to the FEIS fisheries report, a third stream (American Creek) is not meeting 1998 Forest Plan Biological Opinion Riparian Management Objectives for cobble embeddedness, but does meet Forest Plan requirements. This is a change from the Draft EIS, which indicated that both American Creek and Deer Creek were also not meeting Forest Plan standards due to cobble embeddedness and that Upper Mill Creek was not meeting 1998 Forest Plan Biological Opinion Riparian Management Objectives for cobble embeddedness. According to the FEIS, new field surveys in 2017 and 2018 were the primary reason for this change.

Table 1 – Cobble Embeddedness and Sediment Yield (FEIS Fisheries Analysis)

Stream	Forest Plan Objective	Management Indicator Species	Forest Plan CE[2] (Espinosa 1992)	Biological Opinion[2]	DEIS[3] Weighted Mean	FEIS[4] Weighted Mean
Big Canyon	80	Steelhead	<30-34	<30	20	20
Lower Mill	80	Steelhead	<30-34	<30	15	25
Upper Mill	80[1]	Steelhead	<30-34	<30	31	17
Merton	80[1]	Steelhead	<30-34	<30	45	45
Lower Johns	90	Steelhead	<25-29	<30	21	19
Middle Johns	90	Steelhead	<25-29	<30	21	7
Deer	70	Cutthroat	<35-39	<30	75	20
American	80[1]	Steelhead	<30-34	<30	56	34
Trout	80[1]	Steelhead	<30-34	<30	45	45

1 – Updated from Forest Plan Appendix A due to the presence of steelhead

2 – Based on B/C channel type and fish species of concern – Espinosa 1992

3 – Measured instream values 2011, 2012 and 2013

4 - Measured instream values 2011, 2012, 2013, 2017 and 2018

In order to better understand the rather significant changes in cobble embeddedness between the DEIS and the FEIS, I reviewed the data in the project file by individual year (Table 2). I was also interested in the data trends over the eight-year period, since streams that are not meeting fisheries objectives as outlined in the Forest Plan, will require upward trend analysis before logging can proceed. According to the Forest Plan, "Timber management can occur in these watersheds, concurrent with improvement efforts, as long as a positive, upward trend in habitat carrying capacity is indicated for of those streams".

In both the Draft EIS and the FEIS fisheries report all data regarding cobble embeddedness has been compiled into a single weighted mean value. This made it very difficult to examine the trend over time and look at the influence of new surveys on cobble embeddedness. After much searching in the project file, I was able to compile the information displayed in Table 2. The format of this information gives the reader a much better picture of the trend in cobble embeddedness over time and how newer surveys are influencing the weighted averages.

First, the examination of the Deer Creek data was very interesting. Deer Creek was actually only surveyed in two years. In 2012, cobble embeddedness was surveyed at three different locations and 44 cobble embeddedness samples were taken. Overall the results of that data were that existing cobble embeddedness was 75%. These results were accurately portrayed in the DEIS. In 2018, existing cobble embeddedness was only examined at one site and 13 cobble embeddedness samples were taken. The results of that investigation suggested that cobble embeddedness was 20%, which was a significant change over the more extensive data collected in 2012. The FEIS fisheries report appears to report the 20% value as the weighted average and exclude the results of the more extensive 2012 survey.

It is unclear why there would be such a dramatic difference in the two survey years. Perhaps in can be attributed to differences in examiners, methodology or just the fact only that a single site was surveyed in 2018. The FEIS fisheries report (page 15) does suggest cobble embeddedness measurements were taken in stream riffles. Cobble embeddedness measurements that apply to the Forest Plan are supposed to be taken in likely spawning areas. Fish spawning most commonly occurs in pool tail-outs and generally most fish do not spawn in riffle locations. This may be a possible explanation, if the 2012 examiners took their samples in likely spawning locations and the 2018 examiners took their samples in a riffle area. Whatever the reason, the existing data does not support the conclusion that Deer Creek is currently meeting Forest Plan fisheries habitat objectives of 70% of potential habitat capability.

The results for American Creek are similar to those in Deer Creek, but differences in cobble embeddedness results are not as dramatic. American Creek was also only surveyed in two years. In 2012, cobble embeddedness was surveyed at four different locations and 55 cobble embeddedness samples were taken. Overall the results of that data were that existing cobble embeddedness was 56%. These results were accurately portrayed in the DEIS. In 2018, existing cobble embeddedness was examined at two sites and 20 cobble embeddedness samples were

taken. The results of that investigation suggested that cobble embeddedness was 32%, which was a significant change over the more extensive data collected in 2012. The FEIS fisheries reports the weighted value as 34%, and again appears to exclude the results of the more extensive 2012 survey. Once again calling into question if fisheries objectives are being achieved in American Creek.

Table 2 – Cobble Embeddedness and Sediment Yield

Stream	CE 2011	# Sites[1]	CE 2012	# Sites1	CE 2013	# Sites1	CE 2017	# Sites[1]	CE 2018	# Sites1
Big Canyon	20	1	-	-	-	-	-	-	-	-
Lower Mill	11	3	-	-	26	1	14	3	21	2
Upper Mill	32	3	-	-	41	6	10	2	-	-
Merton	-	-	45	3	-	-	-	-	-	-
Lower Johns	-	-	-	-	21	2	7	1	19	1
Middle Johns	-	-	-	-	21	1	-	-	-	-
Deer	-	-	75	3	-	-	-	-	20	1
American	-	-	56	4	-	-	-	-	32	2
Trout	-	-	45	4	-	-	-	-	-	-

1 – Fifteen cobble embeddedness samples are usually taken at each sampling site.

Upper Mill Creek has had the most intensive sampling of cobble embeddedness of all project area streams. This stream was examined in three years (2011, 2013 and 2017). Three sites were examined in 2011 and, 41 cobble embeddedness samples were taken. The average cobble embeddedness was reported at 32% in 2011. In 2013, 6 sites were examined and 86 cobble embeddedness measurements were taken. The average cobble embeddedness in 2013 was 41%. The DEIS only reports an average cobble embeddedness of 31% which appears to agree with the 2011 value, but not with the more extensive 2013 measurements.

Upper Mill Creek surveys in 2017 were conducted at two locations near Adams Creek, but it is difficult to determine which stream reach those two locations are associated with in the data. In 2017, data was identified only as being collected in Mill Creek. Based on the map of 2017 sampling locations, I assumed reaches 1-3 were in Lower Mill Creek and reach four and five were in Upper Mill Creek. Fifteen cobble embeddedness samples were collected at each of the Mill Creek sampling sites, suggesting that 30 samples would have been taken in Upper Mill Creek in 2017. Reach four and five had an average cobble embeddedness of 10%. Again, this data does not appear to agree with the 17% cobble embeddedness weighted average reported in the FEIS, and explain why the 2017 figures are so much different that numbers reported in 2011 and 2013. The data suggests that Upper Mill Creek is also not meeting Forest Plan Objectives.

It is also reported that "A flood/debris torrent event in 2008 scoured out Big Canyon Creek and delivered large amounts of material to mainstem Mill Creek, resulting in areas of aggradation downstream of this event. It also delivered large amounts of woody debris. A channel restoration project was completed in 2011." Cobble embeddedness was measured in 2011 at one site and 15 cobble embeddedness samples were taken. The average cobble embeddedness was 20% and it is unclear if these samples were taken before or after the restoration project. Based on the picture on the front cover of the watershed report of the 2008 flood event, it is very hard to believe this stream is currently meeting fisheries habitat objectives.

In summary, it appears that six streams in the project area are not meeting fisheries objectives based on existing cobble embeddedness or recent flood events. These streams are Merton, Trout, Deer, American, Upper Mill and Big Canyon Creek. Data in the project file is not in agreement with the FEIS conclusion, that only two streams (Merton and Deer Creek) are not meeting Forest Plan standards. An upward trend analysis needs to be completed for all six of these streams based on the existing data.

Objection 2 – Failure to reduce activity levels in five drainages not meeting Forest Plan standards due to high existing levels of sedimentation or within the highly unstable Big Canyon drainage and the erroneous conclusion that Forest Plan sedimentation objectives are being achieved based on NEZSED modeling

Information in the FEIS watershed report suggests that all nine Forest Plan watersheds are currently meeting Forest Plan sediment standards as predicted by the NEZSED model (Table 3). However, actual instream measurements of cobble embeddedness suggest that five steams (Merton, Trout, Deer, American, and Upper Mill Creek) do not meet sediment objectives due to high levels of existing instream sedimentation. One other stream (Big Canyon Creek) has had a recent flood event that has significantly altered instream condition and stream stability.

According to the FEIS watershed report, sediment yields will increase significantly (9 to 38 percent over base) in the five watersheds currently not meeting Forest Plan standards for cobble embeddedness and 15% over base in Big Canyon Creek. NEZSED modeling appears to be the

primary justification for moving forward with the large amount of timber harvest and road construction that is proposed on the Hungry Ridge project. Existing instream condition does not appear to have influenced thinking that activity levels should be reduced in the five drainages where existing cobble embeddedness is high or in Big Canyon Creek where a 2008 debris torrent pretty much devastated the stream channel.

The Forest Plan requires an actual improvement in sedimentation trend before new activities can be pursued in streams currently not meeting Forest Plan standards. Such trends have not been established in the six streams in question. Modeling results only predict that a significant amount of new sediment will be introduced into project area streams as a result of the proposal. The results do not suggest that Forest Plan sediment objectives are being achieved.

Table 3 –Sediment Yield as predicted by the NEZSED model

Stream	Forest Plan Sediment Yield – Percent Over Baseline (POB)	Existing Condition (POB)	Alternative 2 – (POB)
Big Canyon	35	10	25
Lower Mill*	35	10	20
Upper Mill	45	7	16
Merton	45	4	24
Lower Johns*	30	0.1	2
Middle Johns*	30	1	5
Deer	60	8	46
American	45	5	33
Trout	45	1	23
SF Face 01	70	3	11

Objection 3 – 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 Hungry Ridge 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 4 summarizes the information from the Hungry Ridge Watershed report in regard to ECA changes from the existing condition to those that will occur as a result of implementation of proposed Alternative 2. There are nine Forest Plan watersheds and a face drainage that drains directly into the South Fork of the Clearwater River, the existing ECA is Good in nine drainages, and Poor in Lower Mill Creek according to guidance in the NMFS Matrix (1998). With implementation of Alternative 2, one watershed (Big Canyon) will move from the Good to Moderate Condition, two watersheds (Deer and American) will move from Good condition to Poor condition, and Lower Mill Creek remains in Poor Condition (Table 3).

Patten and Jones (2005) indicate that "The potential risk for channel alteration in 3rd to 5th order drainages increases when peak flow increases are 15 to 20 percent of average annual flows. This level of change in average annual flow is typically observed when 20% or more of a forested watershed has a clearcut vegetation treatment". The project proposal includes large increases in equivalent clearcut acres (ECAs) and in four drainages (Lower Mill, Deer Creek, Big Canyon Creek and American Creek) these increases will exceed or approach the 20% ECA threshold recommended by Patten and Jones (2005).

Table 4 – Forest Plan Stream ECA from the Hungry Ridge Watershed Report

Stream	Area (ac)	Existing ECA %	Existing Rating	Alternative 2 ECA %	Alternative 2 Rating
Big Canyon	2,575	3	GOOD	19	MODERATE
Upper Mill	13,070	6	GOOD	12	GOOD
Lower Mill*	5,879	21	POOR	29	POOR
Merton Creek	1,699	3	GOOD	5	GOOD
Lower Johns*	2,124	5	GOOD	10	GOOD
Middle Johns*	6,519	1	GOOD	4	GOOD
Deer Creek	1,291	3	GOOD	24	POOR
American	5,609	3	GOOD	25	POOR
Trout	4,286	2	GOOD	6	GOOD
S, Fork Clearwater Face	3,783	9	GOOD	13	GOOD

Objection 4 – The FEIS suggests that 24.7 miles of road decommissioning is planned, but there are no assurances that this work will get done. There are also 16 miles of existing road within PACFISH buffers, but the project proposal only includes 1.3 miles of road obliteration within RHCAs. Given the existing condition, why isn't more attention being given to removing roads in RHCAs?

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. Road decommissioning will reduce 24.7 miles of road in the project area (Table 5). This improvement will be offset by 2.7 miles of new road construction and 14.7 miles of temporary road construction. Road densities are currently identified as low-quality in Deer Creek (4.4 miles/square mile) and Big Canyon Creek (3.3 miles/square mile). Other project area streams currently have moderate or high-quality road densities.

Alternative 2 will decommission 3.2 miles in Deer Creek and 3.8 miles in Big Canyon Creek and move these drainages back into the moderate category. I agree that the obliteration work will be helpful, but as the FEIS is currently written there are no assurances that the work will actually get done. It appears the work is primarily dependent on BPA funding which is not to be used to offset the impacts of new road construction and timber harvest. Please don't count on road obliteration to reduce road density or establish an upward trend in your analysis unless funding can be assured and an actual positive trend can be demonstrated with instream cobble embeddedness data.

I don't understand why more work is not being done to relocate roads out of existing riparian habitat conservation areas given the fact that fisheries objectives are not being achieved in several drainages? Estimates from the FEIS suggest there are 16 miles of existing road in RHCAs, but proposed Alternative 2 is only going to decommission 1.3 miles of existing road in RHCAs.

Table 5 – Existing Road mileage in project area watersheds and changes in road mileage with Alternative Two

Stream	Area (ac)	Exist Road (mi)	Decommission - Alt. 2	New	Existing RHCA Road miles	RHCA Decommission Alt. 2
Big Canyon	2,575	13.2	3.8	0.1	3.4	0.2
Upper Mill	13,070	48.9	4.7	0	3.0	0
Lower Mill*	5,879	16.5	0.6	0.6	0.1	0.1
Merton Creek	1,699	5.6	0.4	0	1.1	0.2
Lower Johns*	2,124	4.0	1.5	0	0.1	0.1
Middle Johns*	6,519	0	0	0	0	0
Deer Creek	1,291	8.8	3.2	0.3	1.5	0.1
American	5,609	24.0	6.4	1.7	1.1	0.2
Trout	4,286	10.8	1.6	0	0.3	0.1
S, Fork Clearwater Face	3,783	12.0	2.5	0	5.4	0.3
Total		143.8	24.7	2.7	16.0	1.3

Table 6 – Road densities from the Hungry Ridge Watershed Report

Stream	Area (ac)	Existing Road Density	Existing Rating	Alternative 2 - Road Density	Alternative 2 Rating
Big Canyon	2,575	3.3	LOW	2.4	MODERATE
Upper Mill	13,070	2.4	MODERATE	2.2	MODERATE
Lower Mill*	5,879	1.8	MODERATE	1.8	MODERATE
Merton Creek	1,699	2.1	MODERATE	1.9	MODERATE
Lower Johns*	2,124	1.2	MODERATE	0.8	HIGH
Middle Johns*	6,519	0.0	HIGH	0.0	HIGH
Deer Creek	1,291	4.4	LOW	2.8	MODERATE
American	5,609	2.7	MODERATE	2.0	MODERATE
Trout	4,286	1.6	MODERATE	1.4	MODERATE
S, Fork Clearwater Face	3,783	2.0	MODERATE	1.6	MODERATE

Objection 5 – Failure to complete an Upper Trend Analysis for Upper Mill Creek and Big Canyon Creek

The existing cobble embeddedness data (see previous discussion) does not support the FEIS conclusion that Upper Mill Creek is meeting Forest Plan objectives. Examination of the existing

cobble embeddedness data suggests that 2017 sampling was only conducted at two locations in the Upper Mill Creek watershed and that data is suspect when compared to more extensive sampling collected 2011 and 2013. Sampling in both of those years exceeded Forest Plan fisheries objectives and is in agreement with the following statement that was previously included in the DEIS. This statement appears to have been removed from the FEIS

"Field reconnaissance conducted from 1990 through 2013 shows undesirable bank stability measurements for Upper Mill Creek, Corral Creek, Camp Creek, and Hepner Creek. Upper Mill, Camp, and Hepner Creeks exhibit degradation. Observations in the Upper Mill prescription watershed included riprap and damage to banks due to cattle grazing.

Substrate data was also collected in 2011 through 2013 for Upper Mill Creek, Corral Creek, Camp Creek, and Hepner Creek. Cobble embeddedness measurements are departed from desired conditions (<20%), indicative of long-term fine sediment deposition. Field observations suggest that the cause of high sedimentation is streamside livestock use. Upper Mill Creek is characteristic of shallow stream gradients, and therefore more vulnerable to sediment deposition.

Upper Mill Creek and its tributaries are currently listed in the IDEQ's current 303(d)/305(b) Integrated Report (DEQ 2012) under section 4a: "Waterbodies with approved TMDLs" due to exceedances in water temperature (Table 3-50). In conclusion, Upper Mill Creek is not currently meeting desired water quality conditions." Please complete the required upward trend analysis for Upper Mill Creek.

Big Canyon Creek is a highly destabilized stream due to the 2008 flood/debris torrent that occurred in the watershed. Despite the fact that cobble embeddedness was 20% in 2011 at one location, the stream is still highly unstable and not meeting Forest Plan fisheries objectives. New activities in this drainage should be very carefully planned and executed. It is very questionable that additional timber harvest and road construction will not have significant negative impacts given the existing situation. Please complete an upward trend analysis as required by the Forest Plan.

Objection 6 - Inadequate Upward trend analysis in Merton, Trout, American and Deer Creeks

An upward trend analysis has been reported for four project streams that are currently not meeting Forest Plan standards. However, the analysis does not provide any evidence to suggest that the streams are actually improving. Assertions of the "improving trend" are generally based on model projections and future actions that are proposed with the project. There is no data on historical levels of cobble embeddedness on which to establish a trend, and model projections actually predict increasing levels of cobble embeddedness on all action alternatives in all four drainages. The only instream data provided on which to base a trend is 1) # of Pieces of large

woody debris, 2), Width to depth ratio, and 3) bank stability. There are only two data points (1990 and 2012) associated with this information.

Even with only two data points this information does not support and improving trend. In two streams (Merton and American Creek) the number of pieces of large woody debris actually declined between 1990 and 2012. In three streams (Merton, Trout and American Creek) width to depth ratios actually increased (indicating a declining trend). Bank stability did not change in Deer and Trout Creek, but in Merton and American Creeks bank stability was found to improve. Merton Creek showed the largest improvement in bank stability (85-100%) according to the FEIS, but this is very hard to believe given the picture of Merton Creek Meadows provided in Figure 3-23 of the DEIS. This photo appears to have been removed in the FEIS. Bank stability in American Creek improved from 75% to 80%.

Generally, it is asserted that an improving trend will result from road obliteration, road reconstruction, culvert removal, and meadow restoration projects that are proposed in the project. None of this work has been accomplished and the project proposal does not assure any funding for such work. Recently, most of this type of work (except for road reconstruction) on the Nez Perce – Clearwater National Forest has been accomplished by the Nez Perce tribe 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.

The FEIS provides no new sources of funding for road decommissioning, meadow restoration or culvert removal, other than the possible use of Knutson-Vandenberg (KV) dollars which are likely to be used up with mandatory reforestation and slash disposal costs. There are no requirements to complete any of the water quality improvement projects prior to implementation of the timber sale. There is no reason why road decommissioning by the Nez Perce tribe or road decommissioning with Forest Service appropriated dollars could not continue within the project area without the proposed timber sale. When an improving trend can actually be demonstrated perhaps some timber harvest could be approved.

Objection 7 – Assumptions that PACFISH buffers will prevent sedimentation

The FEIS appears to assume that PACFISH buffers will prevent all sedimentation from harvest units and includes the following statement (Page 55). "Timber harvest was not considered as an issue indicator as monitoring indicates that the retention of PACFISH Riparian Habitat Conservation Areas (RHCAs) are adequate to prevent harvest-related sediment from reaching streams.

PACFISH buffers do not stop sedimentation once it gets into the stream. Eighty-two percent (5,878 acres) of the proposed logging and fuel treatment will be conducted with ground based heavy equipment. Use of such equipment will create skid trails and temporary roads that will link directly to existing roads and road ditches. These in turn are linked to small streams that can

carry sediment to larger fisheries streams. Exposed areas of mineral soil will be created, particularly in areas that are subject to machine piling. The potential for sedimentation is high despite PACFISH buffers. Please adjust your sediment analysis to account for timber harvest and units that will be tractor logged or treated with mechanical fuel treatments.

Objection 8 – Inaccurate conclusion that the existing forest vegetation is the result of fire suppression and that species conversion to western larch and ponderosa pine is the desired condition for most of the project area

The project level analysis uses four VRU (Vegetation Response Units) to discuss vegetative conditions. Region One forest habitat type groupings for Idaho and Western Montana are also displayed for each VRUs discussed in the FEIS silviculture report. Four main habitat type groupings are displayed for the project area (Moderately Warm and Dry DF and GF (3,907 acres -13%), Moderately Cool and Moderately Dry GF (8,496 acres - 28%), Moderately Warm Moist GF (13,509 acres - 45%) and Cool Moderately Dry SAF (3,153 acres – 11%).

I believe it would have been more appropriate to use these existing habitat type groupings (Cooper et al. 1991) as the basis of your vegetative analysis. Although VRUs may give you some idea where particular forest types are located, I believe your VRU groupings are less appropriate to predict vegetative response. For example, vegetative response may be completely different on different aspects of stream breaklands (VRU 3) or within different elevation zones of the convex slope VRU (VRU 1). The wide array of habitat groups you display in individual VRUs in silviculture report really demonstrates the variability of your VRU groupings.

Habitat types are generally determined in forest stand examinations and successional pathways are outlined by Cooper et al. (1991) for each habitat type. The moderately warm and dry habitats (Habitat group 2) would likely occur on south facing stream breaklands (VRU 3) and ponderosa pine and Douglas fir stands would have been common in this area. Treatments that favor ponderosa pine like you describe in the FEIS would likely be appropriate here and are supported by descriptions in Cooper et al. (1992).

The Moderately Cool and Moderately Dry habitat types (Habitat group 3) might be best represented by the grand fir/bear grass habitat type. Cooper et al. (1992) indicate that Douglas fir is the primary tree seral tree species with lesser amounts of western larch and lodgepole pine. These stands might be found on mid-elevation convex slopes (VRU 1).

The Moderately Warm Moist habitat grouping (which is the most common type in the project area) might be best represented by the grand fir/queencup beadlily habitat type which Cooper et al. (1992) indicate that grand fir "in addition to being the climax dominant, is a major and most consistent dominate of seral stages, even following clearcutting or severe wildfire." They also indicate that Douglas fir is the only consistently important seral species in the grand fir/queencup beadlily habitat type. This habitat grouping would be most common in VRU 4 (The rolling hills).

The cool moderately dry SAF habitats (Habitat group 9) would be found in higher elevations and might be represented by the subalpine fir/beargrass habitat. Cooper et al. (1992) report lodgepole is considered an important seral component in most phases of this habitat type. Spruce and subalpine fir are also well represented here according to information provided by Cooper et al. (1992).

The FEIS suggests the following desired condition for the project area: "Forest Cover Types (timber species): The indicator of desirable forest composition is the percent of the total forest cover type dominated by the long-lived shade-intolerant early seral species (western larch and Ponderosa pine), compared to the area dominated by shade-tolerant species (grand fir, subalpine fir, Engelmann spruce, and Douglas fir)."

Based on the information from Cooper et al. (1991) these ideas are only applicable to a small portion of the project area (Habitat type group 2). Grand fir and Douglas fir would have been common historically in most of the mid-elevation areas (Habitat groups 3 and 4). Higher elevations (Habitat group 9) would have supported Engelmann spruce, subalpine fir and lodgepole pine. Larch would likely have been present in scattered amounts in most stands, but it would not have been considered a dominant forest type. Stands dominated by Ponderosa pine would have been found in lower elevation breakland areas on moderately warm and Douglas fir and Grand fir habitat types (Habitat group type 2).

There is a good reason why 66% existing forest types in the project are composed of grand fir and Douglas fir and that lodge pole pine is common (13% of the project area) in upper elevations. Species composition is consistent with the habitat type groups found in the area and has not been significantly influenced by fire suppression as alleged in the FEIS. A wholesale conversion to western larch and ponderosa pine is not consistent with existing ecological conditions.

With the possible exception of stands in habitat type group two; I do not believe existing stand classes are the result of fire suppression. Stand replacing lethal fires are the norm in most of the project area and the fire return interval is infrequent. Understory fire generally doesn't play a major except possibly in lower elevation habitat type group two. Fire return intervals are debatable, but it would not be unreasonable assume that they occur at 150-200 years. FEIS assertions that return intervals of 75-150 years are the norm for the area seems highly unlikely given the difficulty of getting such young stands to burn in all but the most extreme conditions. Green et al. (1992) reported old growth stands in the grand fir/yew habitat type group (Similar to VRU 7) averaged 205 years, with a range from 195 to 209 years. Similarly, average old growth age was 210 years in with a range of 160 to 264 in old growth type 4A which includes the warm moist grand fir habitat grouping (the most common habitat type group in the project area).

According to the silviculture report most of the area burned in two historical fires 1889 (14,717 acres) and 1919 (8,821 acres). Stands from these fires would now be approximately 100-130 years of age. Since 1960 timber harvest has been the major agent of change with approximately 8,567 acres of harvest. This harvest would have impacted 29.1% of the project area. Stands that are the result of the 1889 wildfire are likely starting to exhibit some signs of decadence and decay that are part of normal stand development as they progress toward old growth. I believe the dire predictions of habitat loss and the risk of wildfire have been overstated in the FEIS and that a more reasonable alternative that would be responsive other resource needs could adequately alleviate concerns about wildfire and the loss of trees to insects and disease.

Objection 9 - The Forest Service has not accurately portrayed the amount of existing old growth in the project area and it is very unclear if Forest Plan standards for the retention of old growth are being achieved.

The Hungry Ridge timber sale proposes to harvest a great deal of old growth and near old growth stands according to the information provided in Tables 3-18 and 3-19 of the FEIS Wildlife Report. According to the wildlife report, four types of old growth have been identified: (1) Old growth in Management Area 20, (2) Old growth meeting Nez Perce Forest Plan Definition of old growth, (3) stands meeting the screening criteria for old growth outlined in the publication "Old-growth Forest Types of the Northern Region (Green et al. 1992) and (4) Replacement Old Growth (identified as additional stands between 110-149 years of age).

Acreages for each of these old growth types is displayed in Table 3-17 of the wildlife report and all four types are grouped together to estimate the total amount of old growth in each of the six old growth analysis areas that will be impacted by the proposal. This approach does not follow the guidance of the Nez Perce Forest Plan and is leading to erroneous conclusions that are causing the Forest to move forward with timber harvest in actual old growth.

For example, Management Area 20 consists of stands that are to be managed for old-growth retention over the long-term. According to the Forest Plan, "Approximately half of the area has a timber condition class of overmature sawtimber (150 years or older). The remainder of the area is comprised of immature stands (40-80 years) that will provide for replacement old-growth habitat." According to the FEIS wildlife report, the Forest Service attempted to identify stands in MA-20 that might meet the Forest Plan definition of old growth based on existing stand exam information. However, several stands did not have existing data and it could not be confirmed if these stands are currently meeting the Forest Plan definition of old growth. The Forest Service did not conduct any further investigation to determine which of the MA-20 stands might qualify as old growth.

Appendix N of the Forest Plan requires old growth stands actually meet the characteristics 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 Forest Plan (Appendix N) includes six 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."

The Nez Perce/Clearwater should not be counting stands in MA-20 as old growth unless they have actually investigated the stand using the criteria established in Appendix N. 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).

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. 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 has not conducted the necessary field investigation of old growth stands as outlined in the Iron Honey lawsuit. The biologist appears to 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. Thus, stands identified by the Green et al. (1992) screening criteria should not be considered old growth until the criteria in Appendix N are confirmed.

Neither should the Nez Perce/Clearwater NF 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 as old growth. Immature replacement stands were never considered an option for allowing the harvest of existing old growth stands. According to Appendix N of the Nez Perce Forest Plan replacement old growth was only to be designated if there was not sufficient old growth in a compartment to meet the 5% standard. The exact wording in the Forest Plan is "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." Replacement old growth was to be designated only when the old growth compartment did not meet the 5% standard and in that case the Forest Plan required "An additional 5 percent of the forested acres within each prescription watershed shall be designated as replacement old growth."

According to the information provided in the wildlife report (Table 3-18), 68 acres of old growth would be harvested under preferred Alternative 2 in MA-20. Treatment in MA-20 includes nine acres of regeneration harvest and 59-acres of intermediate treatment that would be designed to remove understory trees. This would require a Forest Plan amendment.

There would be 381-acres of timber harvest in stands meeting the Forest Plan definition of old growth and an additional 220-acres of harvest in stands meeting the Green et al. (1992) screening criteria. Treatments in stands meeting the Forest Plan definition of old growth will largely utilize regeneration harvest on all but 23-acres. In stands meeting the Green et al. 1992 screening criteria, 163-acres will be treated with regeneration harvest and 57-acres will be treated with intermediate harvest.

The FEIS wildlife report also indicates that old growth stands will be fragmented by new roads. "The proposed permanent road into American Creek (Rd 9413 extension) is along a major ridgeline, which is used as major travel corridor by many wildlife species. The construction/addition of the Trout Creek route severs a large old growth patch, including MA20. This road would impair the integrity of the old growth patch. Building these new roads would fragment the travel corridor and could disrupt movement patterns of marten." Given this situation why is the extension of Road 9413 even being proposed?

I have summarized the information from the wildlife report in Table 7 to help me better understand how much actual old growth will remain in the six impacted old growth units after completion of the project. I have only counted stands meeting the current Forest Plan definition of old growth since these are the only stands that count toward the Forest Plan requirements. I have also used the total acreage of National Forest lands within each compartment to be consistent with the direction in the Nez Perce Forest Plan.

Table 7 – Remaining Unharvested Old Growth within the Six Old Growth Units impacted by the Hungry Ridge Restoration Project (Total area = 55,350 acres).

	102	110	112	115	116	118	Total
OGAA (Acres)	6,519	9,981	13,028	7,282	10,303	6,779	53,892
Existing FP[1]	180	637	325	558	165	40	1,905
OG %	2.8%	6.4%	2.5%	7.7%	1.6%	0.5%	3.5%
Alt. 2 – FP OG Harvest	1	158	73	76	45	28	381
Remaining FP Old Growth[2]	179	479	252	482	120	12	1,524
Remaining %	2.7%	4.8%	1.9%	6.6%	1.2%	0.2	2.8%

1- **Information based on Table 3-17 of the FEIS wildlife report (FPOG and stands meeting both FPOG and NIOG)**
2- **Information based on Table 3-19 of the FEIS wildlife report (FPOG and stands meeting both FPOG and NIOG)**

Based on this information, it is very questionable if the 5% standard is being achieved on several of the old growth analysis areas. Only two old growth analysis areas (110 and 115) have enough confirmed old growth based on the Forest Plan definition to meet the 5% standard. While more old growth stands might be confirmed by a more detailed investigation of stands in MA-20 or within stands meeting the Green et al. (1992) screening criteria. This investigation has not been completed and the actual amount of old growth meeting the Forest Plan definition of old growth is unknown

The FEIS wildlife report claims the Nez Perce National Forest is meeting the 10% Forest wide requirement based on a query of FIA data (Bush et al. 2010). This query is based purely on the Green et al. (1992) screening criteria and not the Forest Plan definition of old growth. 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 actual 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.

Old growth stands cannot be field verified using this method since they can't even be identified with this rather course tool. There can be no field verification of the stands as recommended by Green et al. (1992) and the Iron Honey lawsuit. FIA data is collected on ten-year intervals and it often lags behind on the on the impact of recent activity. Recent impacts to a few FIA plots can have significant impacts when the data as it narrowed down to the Forest Level. If the Nez Perce/Clearwater NF really wants to know how much old growth they have, they should conduct a comprehensive inventory that includes field verification. Otherwise, no old growth or near old growth stands should be proposed for timber harvest.

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 is no justification for the regeneration harvest of existing old growth and near old growth stands and intermediate timber harvesting to "improve" old condition is a very questionable need. Please drop all timber harvest and road construction in stands currently meeting the definition of old growth in the Nez Perce Forest Plan.

Objection 10 – Intermediate commercial timber harvest in existing old growth stands and the proposed Forest Plan Amendment to allow timber harvest in Management Area 20

You propose an old growth amendment to the Forest Plan that would allow the harvest of 68 acres of Management Area 20 old growth. You also propose intermediate treatment in 23 acres of stands you have identified as currently meeting the Forest Plan definition of old growth and 57 acres of intermediate treatment in stands meeting the North Idaho screening criteria (Green et al. 1992). It is implied in this amendment and the wildlife report that these are existing old growth ponderosa pine stands with an encroaching understory of grand fir or Douglas fir which you propose to remove. It is not mentioned in the amendment discussion that you would use regeneration harvest on nine acres and thus eliminate this acreage from old growth consideration. I don't think regeneration harvest is "improving" old growth stand condition.

I really question the necessity of your proposed forest plan amendment for 68 acres of "old growth stand improvement". Old growth is more than just large trees and your proposal will remove snags, downed logs, smaller trees, understory plants and forest cover that are important old growth components according to the Forest Plan. 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.

If you really want to "improve" ponderosa pine old growth stands where there has been understory encroachment, perhaps non-commercial hand operations and prescribed burning may

be appropriate. These treatments could be accomplished without a Forest Plan amendment and are likely more appropriate for the conditions you have described. It is very doubtful that commercial and non-commercial manipulation of existing old growth forest stands in other habitat types (cedar, grand fir, Douglas fir, spruce, subalpine fir, lodgepole pine, etc.) will actually improve old growth condition. Please drop your proposal to allow commercial timber harvest in existing old growth and near old growth stands and your Forest Plan amendment for Management Area 20.

Objection 11 - Liberal Interpretation of WUI boundaries and unrealistic conclusions that proposed Alternative Two will reduce fire risk

I question your assentation that approximately 80% of the project area occurs in a Wildland-Urban interface (WUI). This appears to be a rationalization on the part of yourself and Idaho County to collect more funding and justify the project. Two isolated parcels (607 acres) in the lower watershed of an entirely "green" project area that is over 29,000 acres in size does not constitute a significant WUI threat to justify large expenditures of funds and conduct a massive timber harvest of 173 million board feet across the entire project area. Perhaps some work could be done within a mile or so of these private parcels, but I think there are other areas across the country with much greater need than what is going on here. You need to be more "straight forward" in your analysis of the management situation, and let limited WUI funds be available for areas that truly need these expenditures such as California and Arizona.

I am also concerned that all of the proposed activity on this project and the End of the World project will actually increase fire risk and not reduce it. Several researchers (Baker 2015, Rhodes and Baker 2008, Noss et al. 2006, Stone et al. 2004, Brown 2000) have recently found that timber harvest) 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 Two 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.

You have scheduled a great deal of logging in a rather small area and interspersed all of this activity with prescribed fire. Opening of existing stands will increase the amount of sunlight reaching the forest floor and dry out fuels. Until logging slash is treated with prescribed fire or other methods it will represent an additional hazard particularly in stands treated with intermediate harvest prescriptions. Prescribed burning near recently logged areas also presents a very real fire hazard.

Objection 12 - Allowing Detrimental Soil Impacts to exceed the Regional Guidelines in several harvest units

The Detrimental Soil Impact (DSI) has been estimated for all harvest units (Soil Resource Report – Table 7) and only Unit 11 (DSI 27%) has an existing soil disturbance exceeding the Forest Plan standard of <20% DSI. Three additional units (8A, 8B and 10) do not meet the Regional soil standard of <15% DSI. Units 8A and 8B have an existing DSI of 17% and the DSI in Unit 10 is 16% DSI. DSI would remain at 27% in unit 11 due to the incorporation of special management measures. DSI in units 8A and 8B are predicted to increase to 19%, and DSI in Unit 10 is predicted to increase to 18%.

All other units currently meet both the Forest Plan (<20% DSI) and the Regional (<15% DSI) soil standards. Proposed Alternative 2 would cause twenty-seven additional harvest units not to meet the Regional standard of <15%, but the <20% Forest Plan Standard would be achieved in these units (Soil Resource Report – Table 7).

It is unclear why Detrimental Soil Impacts are being allowed to exceed the Regional standard in 27 harvest units that currently do not exceed the Regional Standard. The Forest Plan standard of <20% DSI is outdated and the Forest Service should be able to comply with the Regional Standard for all new harvest units. Given the importance of soil productivity to future management and the advanced harvest techniques available at this time, there is no reason why the Forest cannot achieve the Regional soil standard of less than 15% DSI.

The FEIS it is very unclear in regard to what will happen in Unit 11. On FEIS page 30 it is stared that "In Unit #11, restore soil conditions on approximately 75 acres, based on a field review. Identify actions to improve soil productivity with a net reduction in detrimental soil disturbance and eliminate need for Forest Plan Amendment. Actions could include treatment on Road 76828, Road 76829 or Road 309P1, change logging system to hand or change activity fuel treatment."

Unit 11 should be dropped from timber harvest until restorative actions can be accomplished. More timber harvest will only work to exacerbate the existing condition. Instead of conducting more timber harvest in this highly disturbed area, I think the Forest Service should initiate decompaction of existing skid trails and other restorative actions without more logging. Harvest alternatives are already very excessive and the loss of one unit should not make that much difference to the project.

FEIS Soil Resources Mitigation item #13 suggests that activities be implemented "so no new detrimental soil disturbance will occur in Units 8A, 8B, 10 and 11". Thus, it is unclear why the DSI in units 8A, 8B and 10 show a 2% increase in DSI in Table 7 of the Soils Resource Report. If DSI can be implemented with no increase in these units, why can't the Regional Standard be achieved in the 27 harvest units already below the Regional Standard?

Objection 13 – Allowing prescribed burning in landslide prone areas and permitting timber harvest and burning on soils with severe and very severe erosion hazards

The FEIS soils analysis discloses several red flags regarding the potential for soil erosion. For example, it is disclosed that 1.3 to 2.9 miles of new temporary road are being built on soils with high erosion hazards on Alternative 2. It is also disclosed that 799 acres of timber harvest will occur on landtypes with severe erosion hazard risks and 208 acres of harvest will occur on landtypes with very severe erosion hazard risks. Prescribed burning will occur on 2,344-acres of landtypes with severe erosion hazard risks and 4,963 acres landtypes with very severe erosion hazard risks.

Approximately 375 acres of old landslide deposits are found in the harvest units. These areas have been visited by the project geologist and were found to be stable. According to the FEIS, landslide prone areas have been excluded from timber harvest units, but 3,340-acres of the prescribed burn acreage is thought to occur on landslide prone areas. Given the high landslide risk and the current condition of project area streams, it is very hard to understand why so much prescribed burning is being planned on these steep landslide prone slopes.

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 a large recent landslide along Highway 14 that forms the southern boundary of the project area just a few years ago. There have also been numerous other landslides in the project area as evidenced by the flood/debris torrent that scoured out Big Canyon Creek and delivered large amounts of material to Mill Creek in 2008.

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. 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. Please consider dropping burning in landslide prone areas and areas with severe and very severe erosion hazards.

Objection 14 – I strongly disagree with the conclusion that the existing unroaded lands adjacent to the existing Gospel Hump Wilderness do not resemble wilderness and that inclusion of these lands into the existing wilderness would create irregular wilderness boundaries which would be hard to manage.

The FEIS Recreation, Unroaded and Wilderness Report indicates there are 5,363 roadless acres that adjoin the Gospel Hump Wilderness Area, put fails to report that there are several thousand additional roadless acres that also adjoin the project area and the Gospel Hump Wilderness. This unreported roadless acreage is located in the lower Johns Creek drainage and adjoins both the

project area roadless acreage and the existing Gospel Hump Wilderness Area. The Gospel Hump Wilderness is located in the headwaters of Johns Creek and extends over the hill into the Salmon River drainage. Neither the project area unroaded lands or unroaded lands in the Lower Johns Creek drainage were evaluated in the Idaho Roadless Rule, but should have been since they both meet all of the requirements of roadless. This makes timber harvest on the Hungry Ridge proposal a much bigger concern than what one would consider after reading the information in FEIS Recreation, Unroaded and Wilderness Report.

Both Lower Johns Creek and roadless area in the project area have the potential to be added to the Gospel Hump Wilderness and the proposed project will create an irretrievable loss of this opportunity. Alternative 2 will harvest 1527 roadless acres, build 2.2 miles of system and 1.0 miles of temporary road. Prescribed burning is proposed on an additional 2,688-acres. Road construction of system road 9413 and Intermediate treatment units 42 and 43 create the greatest impact on roadless character and involve activity on a major ridgeline located between American Creek and Trout Creek. Regeneration harvest unit 44 also involves new system and temporary road construction. Units 42, 43 and 44 were eliminated in Alternative 4, but remain in preferred Alternative 2.

Units 42 and 43 are within Management Area 20 (Old growth Management) and Management Area 16 (Big Game Winter Range). A Forest Plan amendment will be required to conduct timber harvest in these units since timber harvest is not currently allowed in Management Area 20.

Most of the other units (45-51) are located along existing roads don't involve new road system road construction, but short segments of temporary road may be required. These units generally extend timber harvest well into the existing unroaded area and move management activity closer to the Gospel Hump wilderness boundary and the existing unroaded lands in Lower Johns Creek. Road improvements associated with the timber sale are likely to increase motorized traffic and this increased activity is bound to decrease solitude and the primitive nature of the conditions within the Gospel Hump and unroaded lands in Lower Johns Creek despite claims to the contrary in the recreation report.

The Recreational report makes two claims that I strongly disagree with. First it is stated that "The unroaded lands where management actions are proposed (timber units and road building) does not resemble Wilderness/Roadless lands nor share similar characteristics. What minimal activity is proposed within the unroaded area will have short term effects and no irreversible effects as it relates to Roadless and Wilderness Characteristics." Second the report states that: "The southern boundary is the Gospel Hump Wilderness. Eastern boundary is Johns Creek. The remaining perimeter is guided by roads and past timber harvests and would be difficult to manage as wilderness due to irregular boundaries.

The existing unroaded areas resemble wilderness in all aspects and once one leaves the existing road and timber harvest behind, it would very be difficult to distinguish a difference in land character just because one has stepped across the current administrative boundary of the Gospel Hump Wilderness.

The boundary displayed for the existing roadless area doesn't look that irregular. Most of the area is on the south side of American Creek and the eastern side of Trout Creek and there has been very little management activity. A short cross-country segment adjacent to the current end of Road 9413 would connect these two areas. As displayed on the current map of roadless in the project file, Road 9410 could serve as another definable boundary if harvest units 47, 48, 49 and 51 were deleted from the project proposal.

In summary, harvest of the existing unroaded portions of the project area is a much more significant impact on roadless character than what is presented in the FEIS. The proposed harvest will require a Forest Plan Amendment in Management Area 20 and impact important ridgetop location that is utilized by multiple species of wildlife. The new harvest will actually increase the irregularity of the existing boundary which is currently largely defined by the eastern side of the Trout Creek drainage. Road 9417 is really the only existing incursion into the existing roadless area at this time and the preferred alternative will only create more incursions into the existing roadless area. Please drop all roadless harvest!

Objection 15 – General concern with the wildlife analysis and failure to set meaningful thresholds of habitat loss (Schultz 2010) for most wildlife species using the project area.

My overall impression is that the Hungry Ridge Restoration project will have negative consequences to most wildlife species using the area. The preferred alternative will remove 173 million board feet and the proposal is adjacent to another large project (End of the World) that will remove an additional 144 million board feet. Regeneration harvest unit sizes are very large (several are over 300 acres in size and at least two units exceed 400 acres – FEIS Appendix B, Table B5). Harvest treatments will remove snags, downed wood, shrubs, understory plants and important hiding cover.

Alternative 2 will construct 2.7 miles of system road and 14.7 miles of temporary road. One of new system roads (Trout Creek – 9413 extension) will divide an old growth stand and traverse a ridge that is thought to be important for martens and several other species. Several other roads (67.1 miles) will be maintained, reconditioned or reconstructed to accommodate log-haul. After obliteration of 24.6 miles of existing road and the construction of 2.7 miles of new road, there will be a total of 96.3 miles of system road in the project area

Even with decommissioning after use, temporary roads will provide travel corridors that may be accessed as user-created routes. This has been observed on many past projects, and it may be difficult to maintain effective closures on these roads due to the lack of funding and inadequate law enforcement. Many "temporary" roads have been observed to be still open in other areas of the Forest (Little Boulder project and others) long after the timber sale that was supposed to close them was completed. The FEIS acknowledges (Page 147) that "there is unknown length of user-created trails".

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. In many instances the analysis underestimates potential habitat and in turn potential impacts to those species. Much of the analysis is based on stand exam database queries and there is a general lack of monitoring data to confirm any of the conclusions of the analysis. Spatial requirements of territorial species have not been considered and no thresholds of management activity have been set for most species. 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. Impacts of the adjacent End of the World project (144.1 MMBF) are not even mentioned in the wildlife analysis.

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 Hungry Ridge Restoration 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 Hungry Ridge Restoration 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 Hungry Ridge Restoration 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 FEIS 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 timber harvest has increased substantially.

I therefore object to the use of the Sampson short-term viability analysis in the FEIS. 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: "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. It is 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, 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. Like has been done in the Hungry Ridge Restoration project for the fisher, pine marten, goshawk, pileated woodpecker and other species, 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 16 – The fisher habitat analysis is disjointed and ignores concerns about the species

As accurately reported in the FEIS Wildlife Report, most studies have found that fishers are reluctant to stray from forest cover and that they prefer more mesic forests (Buskirk and Powell 1994, Olson et al. 2014, Schwartz et al. 2013, Sauder 2014, Sauder and Rachlow 2014, Weir and Corbould 2010). Both Sauder and Rachlow (2014) and Weir and Corbould (2010) predicted the influence of openings on fisher habitat occupancy based on their data. For example, Weir and Corbould (2010) predicted that a 5% increase in forest openings would decrease the likelihood of fisher occupancy by 50%.

Sauder and Rachlow (2014) suggested that an "increase of open area from 5% to 10% reduces the probability of occupation by fishers by 39%. Sauder and Rachlow (2014) reported that the median amount of open area within fisher home ranges was 5.4%. This was consistent with "results from California where fisher home ranges, on average, contained < 5.0% open areas" (Raley et al. 2012).

Sauder and Rachlow (2014) found that radio tracked fishers had an average of 50% mature forest (greater than 82 feet tall) and less than 5% open areas in their home range. According to their work of the arrangement of habitat is very important and they suggest that fishers select home ranges that have forests "arranged in connected, complex shapes with few isolated patches, and open areas comprising <5%..." Concentrated areas of timber harvest like those proposed on this project could significantly influence an individual fisher home range.

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 southeast portion of the project area along the upper reaches of Mill Creek and some lower elevation areas in the northeast portion of the project area along Johns Creek. Presumably, the areas along Johns Creek are steeper and drier areas that would

likely be avoided by the fisher, but it is unclear why areas in Upper Mill Creek have also been excluded.

Likewise, 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).

To evaluate fisher habitat properly, the project area should have been divided into potential or theoretical home ranges based on topography. This approach would be very similar to the designation of the elk analysis areas, but be based on the home range size of a female fisher instead of a female elk as is done in the elk guidelines. 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.

Thus the 29,973-acre project area should support at least two theoretical home ranges based on the average 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 Lower Johns Creek, but intermingled small openings and private land should not be excluded from the 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 FEIS wildlife report suggests that project area mature forest habitat would decline from 76% to 60% and that the amount of opening within the project area would increase from 5 to 26%. According to the Sauder and Rachlow (2014) publication (Figure 2) a landscape with 26% open area would have a relative probability of occupancy of around 6%. 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 from the 100% to 6% after implementation of the project.

You have not even considered the fact that you intend to commercially thin several other mature forest sands in the areas you have identified as fisher habitat. 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 ignores the findings of Sauder and Rachlow (2014).

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 Hungry Ridge project 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, End of the World, etc.). There is also a myriad of other proposed projects in fisher habitat (Smith Ridge, White Pine, Tinker Bugs, Crane Point, Gold Hill etc.). Fisher habitat is clearly at risk as a result of the Hungry project and other proposals being brought forward on the Nez Perce Clearwater National Forests. Like Hungry Ridge, most of these projects target the already heavily logged and roaded front country which provides prime fisher habitat on the Nez Perce/ 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". You must consider the cumulative impact of all of these projects and adjacent large-scale proposals such as the End of the World proposal which you don't even mention in your analysis.

Objection 17 - The black-backed woodpecker habitat analysis dismisses impacts to the black-backed woodpecker by suggesting there is sufficient habitat in other portions of the Nez/Perce Clearwater National Forest to accommodate the species. The analysis fails to consider the cumulative impact of a myriad of other projects that are being conducted in close proximity to the project area and across the Nez Perce/Clearwater National Forest.

The FEIS wildlife report breaks down the project area into primary and secondary black-backed woodpecker habitat based largely on tree species and suggests about 30% of both of these types will be harvested. Lodgepole pine and ponderosa pine are suggested to be primary habitat and other tree species are considered secondary habitat. These conclusions don't appear to agree with the literature. Most investigations, suggest the density of live diseased trees, snags and downed wood are more important than tree species in determining habitat use (Bull et al. 1986, Bonnot et al. 2008 and Tremblay et al. 2010). The FEIS wildlife report also mentions that black-backed woodpeckers prefer smaller snags, which also doesn't agree with the literature. Perhaps this is why a tree size of 5 inches DBH was used in the data base query to define "primary" habitat. Larger trees are generally preferred for foraging in all locations and even in old burns (Hoyt and Hannon 2002, Nappi and Drapeau 2009, Dudley et al. 2012).

The focus of the Hungry Ridge Restoration project is to remove dead and dying trees throughout the project area. It is immediately adjacent to another large project (End of the World) where the focus is also to remove dead and dying trees. Two more projects (Windy Shingle) and (Center-Johnson) are also planned on the Salmon Ranger District with the focus of removing dead and dying trees. There are also numerous other projects on the Nez Perce/Clearwater Forest (Johnson Bar Salvage, Lolo Insects and Disease, Little Boulder Creek, Tinker Bugs, White Pine, Crane Point, Lower Orogrande, French Larch, Clear Creek, Red Moose Divide, Pete King, Gold Hill, etc.) that also focus on the removal of dead and dying trees.

The basic conclusion of the black-backed woodpecker analysis is that a lot of dead and dying trees will be removed, but that there is plenty of habitat on the remainder of the Nez Perce/Clearwater National Forest to make up for these losses. Very little consideration has been given to the fact that there are several other nearby and distant projects that will also remove dead and dying trees and place the species at risk.

Objection 18 – The bat habitat analysis is not based on any quantitative evaluation of habitat changes and is largely a subjective evaluation that enough suitable habitat will remain for bats after completion of the project.

The FEIS wildlife analysis for bats is very subjective and includes no real analysis of impact of the project on the four species of bats that are considered in the analysis. No estimates of the amount of suitable habitat have been reported for any bat species and no estimates of habitat change have been generated.

The preferred alternative will remove significant numbers of snags and older forest stands that are important for the Townsend's big-eared bat, long-eared, long-legged, or fringed myotis. Habitat will be degraded almost entirely within regeneration harvest units (5,205-acres) and snag levels and forest structure will be degraded in intermediate treatment areas (1,959-acres). The adjacent End of the World project will regenerate an additional 1,568 acres and treat 16,340 acres with intermediate harvest.

Despite these habitat losses and no real data to support their claims, the FEIS comes to the conclusion that "No measurable effects to Townsend's big-eared bat, long-eared, long-legged, or fringed myotis populations at the local or regional scale, or alteration of current population trend, are expected from the cumulative effects of Alternatives 2, 3, and 4, based on the amount of suitable habitats remaining inside the project area outside of the harvest units and forestwide. Alternatives 2, 3, and 4 "May impact individuals or habitat, but will not likely result in a trend toward federal listing or reduced viability for the populations or species.""

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. Like most other species, no meaningful thresholds have been identified where habitat loss of bat habitat becomes significant (Schultz 2010) and it is assumed that habitat in other areas can be counted on to maintain the species.

Objection 19 – Failure to maintain elk habitat effectiveness at Forest Plan Standards in the Adams Elk Analysis Area, errors in the actual calculation of elk habitat effectiveness and the use of inappropriately sized elk analysis areas that don't conform to the recommendations of Servheen et al. 1997.

The project area is composed of seven different elk analysis areas (EAAs) and each of these units has a different Forest Plan management objective (Table 8). One unit (Big Canyon) is has a Forest Plan management objective of 25% or potential, five units have a management objective of 50% of potential and one unit (Trout Creek) has a management objective of 75% of potential. In my DEIS comments I questioned why one of these units (Adams EAA) was not being managed to meet Forest Plan Objections. This unit still does not meet Forest Plan Objectives according to the FEIS wildlife report, and I still question why the Nez Perce/Clearwater has not modified activities in the Adams EAA to meet Forest Plan standards.

Table 8 – Elk Habitat Effectiveness as reported in the FEIS Wildlife Report

Elk Analysis Area	Acres*	Forest Plan Objective (%)	Existing	Alternative 2
Adams	7,827	50	40	43
Lower Johns	3,924	50	47	51
American Creek	5,567	50	52	52
Big Canyon	3,043	25	36	36
Lower Mill Creek	6,429	50	50	52
Upper Mill	6,586	50	71	72
Trout Creek	6,564	75	85	89

*Obtained from EAA habitat calculation worksheets.

When I made my comments in the DEIS regarding elk management, I did not have access to the EAA unit acreages and habitat calculations that are now available in the project file. Examination of this additional information has caused concerns regarding the elk habitat analysis and the validity of the elk habitat analysis. My first observation is that the Nez Perce/Clearwater NF should not be using the Leege 1984 guidelines for their elk analysis. These guidelines have been updated (Servheen et al. 1997) and the newer version should be utilized as the best available science (Clearwater NF Travel Plan lawsuit).

Second, I have noticed that no consideration has been given to the amount of hiding cover adjacent to existing and proposed roads as outlined elk habitat model (Servheen et al. 1997). When a regeneration harvest is being proposed along a road, the coefficients along that road should change to account for the loss of adjacent hiding cover. 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.

Third, I don't understand where the Forest Service obtained the coefficients that have been used for the Hungry Ridge elk habitat calculations. The wildlife report mentions a publication (Wisdom et al. 2018), but this publication is associated with disturbance adjacent to trails and different types of recreational activity. There are no coefficients suitable for substitution into the Servheen et al. (1997) guidelines. 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 Hungry Ridge calculation forms do not match the information in the Servheen et al. (1997) guidelines.

Fourth, why are such large areas are being utilized for the elk calculations in at least four of the seven 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…..". The Adams EAA is 7,827 acres, Upper Mill Creek EAA is 6,956-acres, Trout Creek EAA is 6,564-acres and Lower Mill Creek EAA is 6,429-acres.

Finally, it is hard to understand why the analysis gives so much credit for increasing forage production associated with proposed Alternative 2 and detriment to forested areas that do not support existing openings created by timber harvest. According to the Serveheen et al. (1997 guidelines "Elk forage is present in openings and under forest canopies, and quantity is usually not a limiting factor on summer range". Several large deductions to the existing condition have been taken in the model for the size and distribution of forage based on a perceived lack of forage within the EAAs (Big Canyon -10%, Lower Mill Creek -5%, Adams -10%, American Creek -10%, Upper Mill Creek, -10%, Trout Creek -10% and Lower Johns Creek -7%). Such large deductions in habitat quality don't appear to be justified, since older stands in previously unlogged portions of the project likely support adequate forage.

All forage estimates except in the Big Canyon EAA (where there is very little timber harvest) improve with the implementation of proposed Alternative 2 (Big Canyon -10%, Lower Mill Creek -3%, Adams -5%, American Creek -5%, Upper Mill Creek, -8%, Trout Creek -5% and Lower Johns Creek -7%). This is despite the fact that the proposal includes several large cutting units that have areas that are greater than 500-feet from forest cover and intervening cover strips that are often narrow PACFISH buffers. Size and distribution of openings is the primary factor outlined in Table 2 (Page 39) – of the Serveheen et al. (1997) guidelines for habitat deductions related to forage. For example, the guidelines recommend a 5% reduction in the size and distribution of forage areas when greater than 7% of the EAA are more than 500-feet from cover and a 10% reduction when greater than 13% of the EAA are more than 500-feet from cover.

Objection 20 - Inaccurate consideration of the Schrempp 2017 moose study and the importance of older forest stands with a yew understory (VRU-7) to wintering moose.

The FEIS claims that new research (Schrempp 2017) has established that forage may be a limiting factor for moose and that the project proposal would be beneficial for moose because the project proposal will create new sources of forage for moose. While this may be true on summer range, it is still unclear how the project proposal will impact winter habitat use. The Schrempp (2017) study did not evaluate actual winter field conditions with radio marked moose as was done in earlier work (Pierce and Peek 1984). Pierce and Peek (1984) found that wintering moose often selected older forest stands largely based on snow interception and that forage availability while important was a secondary factor. Stands with an older forest overstories and a well-established understory of yew can actually provide easier access to forage than what might occur in an open regeneration harvest unit where snow depth is often much higher.

The Forest Service should not be abandoning the protection of older forest stands with yew understories on the Nez Perce National Forest based on the work of Schrempp (2017). Emphasis

on protecting these rare habitats should be continued with the project proposal. Please drop the 298 acres of timber harvest in VRU 7. This new harvest will likely be detrimental to wintering moose and there will be more than adequate forage production in other harvest units to "improve" moose habitat.

The FEIS moose analysis also mentions the Trout Creek Road (9413 extension) that subdivides and existing old growth stand and is on a ridge which is used as major travel corridor by moose and a variety of other species including elk, fisher and marten. With declining populations of moose in the project area and closure of the hunting season in the project area in 2013, it seems more consideration should have been given to protection of potential wintering areas in VRU 7 and not constructing the Trout Creek Road.

Objection 21 - The goshawk analysis generally dismisses impacts to the species by suggesting sufficient habitat is available in other locations. No thresholds of concern have been identified and the impact of cumulative effects has largely been ignored.

The goshawk analysis relies strictly on data base queries and makes no assessment of meaningful thresholds of habitat loss that would affect the goshawk. The analysis does a very poor job of first identifying suitable nesting habitat and then of addressing the impacts of the project on the species. Only 13,659-acres in the 29,383-acre project area is predicted to be goshawk nesting habitat by the database queries despite the fact that the vegetation analysis (FEIS – Table 3-15) suggests that over 15.5% of the project area (4,554 acres) consists stands with average DBH > 20 inches and 56.6% of the project area (16,635 acres) consists of stands with an average DBH = 15.0-19.9 inches. It is likely that most of these stands provide suitable nesting habitat.

There is no recognition in the wildlife analysis that the goshawk is a territorial species and there is no attempt to address how the proposal might impact known nesting locations or theoretical territories. For example, it is stated in the wildlife report that "the most northern goshawk territory would have a higher percentage of fragmentation around the area surrounding the known nests due to the amount of regeneration harvest in the vicinity of known nest locations", but there is no apparent attempt to protect this "known" nesting location other than to suggest a "40 acre buffer will be maintained around known nesting areas and logging will not be permitted in known post-fledgling areas until after August 15th. The nest location is not identified in the wildlife report or on the map of goshawk nesting and foraging habitat.

Previous work (Reynolds et al. 1992) has outlined approaches that could have been utilized for the goshawk analysis, and I think these approaches would have identified more meaningful results than just running a set of stand exam queries, reporting the results and making the conclusion that "While project activities may reduce some habitat that this species prefers, populations are not likely to be affected at the Forest level or across the range of the species".

Without meaningful thresholds of habitat loss, projects will continue to degrade goshawk habitat across the Nez Perce/Clearwater over time (Schultz 2010, Schultz 2012).

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 over 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 (2007) reported that, home range size was largely related to nesting success and the amount of openings and mature forest within the home range. Birds of both sexes with successful nests generally had smaller home ranges. For example, males with successful nests (N=4) had an average home range size of 9,657 acres and females with successful nests (N=8) had an average home range size of 6,600 acres. Male bird home range size increased as the number of openings in the home range increased and the amount of closed canopy forest decreased, but these factors weren't significant for female birds. Studies in other areas have reported smaller home range sizes in the neighborhood of 5,000-6,000 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.

I believe an analysis should have been conducted in the project area that would have considered the territoriality of the species and the habitat requirements within each territory. For, example the project area is 29,383 acres and includes moist habitats preferred by the goshawk. The species has been documented using the project area (FEIS wildlife report, Page 3-65). Using Moser's numbers for the home range size of a successful nesting female bird suggests that perhaps four to five nesting pairs of goshawks could utilize the project area. The job of the wildlife analysis at the project level, therefore, is to predict how these potential home ranges have been impacted by past actions, the new proposal and any other foreseeable actions.

Reynolds et al. (1992) suggest that at least 180 acres of suitable nesting habitat be maintained in each goshawk home range. This nesting habitat be maintained in uncut blocks of at least 30 acres in size and that at least three suitable nesting areas be maintained in each home range. According to information in the nearby End of the World project, Regional direction based on Clough (2000) suggests the amount of nesting habitat should be increased to at least 240-acres and uncut nesting areas be increased to 40-acres.

When possible, Reynolds et al. (1992) recommend three additional replacement nesting areas. 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.

Reynolds et al. (1992) recommended maintaining post-fledging areas of at least 60% older forests around the uncut nest stands. Moser and Garton (2009) tested this recommendation by experimentally clearcutting mature stands in the post-fledgling area after the nesting season (average harvest unit size 104 acres). When Moser and Garton (2009) experimentally clearcut in the post fledgling area they found goshawks, re-nested when approximately 39% of the post-fledging area (164 acres) remained as mature forest (potential nesting habitat). From their work, Moser and Garton (2009) suggested that the amount of mature forest in the post-fledgling area could potentially be 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.

Based on the following statement from the FEIS wildlife report (Page 66) it appears that the 39% number has been incorrectly assigned to individual stands: "Based on information obtained from the siviculturists, regeneration harvest types (clearcuts, seedtree, shelterwood) would have 30% canopy cover or less remaining post-harvest. This is below the 39% cover threshold observed by Moser (2007)."

As I have previously described, I suggest dividing the project area into four or five non-overlapping theoretical home ranges based on topographical features. This approach would be similar to procedures used to identify the elk analysis areas and it is important that the theoretical home ranges not be overlapping to avoid double counting of potential habitat. Each existing home range should then be classified into potential goshawk nesting habitat based on the guidance of the Hayward and Escano (1998). An analysis should be completed to assure that sufficient old forest is maintained within each of the three potential nest stands to meet the Reynolds et al. (1992) nesting and post-fledging requirements. Thus, each home range should have at least three suitable post-fledging areas at least 420 acres in size with at least 60% old forest surrounding the potential nest stands. Foraging habitat should maintain the diversity of conditions that Reynolds et al. (1992) discusses in his management guidelines. That will likely mean a sufficient component of older forest stands along with some stands in younger age classes.

Thus, the Reynolds et al. (1992) guidelines actually require maintaining more than 180 or 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, and making no provisions for the protection of post-fledgling habitat (as is being done on the Hungry Ridge 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. According to the FEIS silviculture report, timber harvest since 1960 has treated 8,567 acres or 29.1% of the project area. Most of these stands are not suitable for gohawk nesting due to their relatively young age. New harvest on this rather large project includes the harvest of 173 MMBF, 5,205-acres of regeneration harvest and 1,959-acres of intermediate treatment. While there may be some overlap between of harvest units, these totals do not include activity on private land and natural openings in the project area. Such areas would also be unsuitable for goshawk nesting. Coupled with past harvest, this would bring the harvested acreage up to 15,731-acres or approximately 53.5% of the project area.

This level of timber harvest is bound to have a significant impact on goshawks. Most of this harvest is being proposed in old growth and mature forest stands that are likely important to the goshawk for nesting and use during the post-fledgling period. The analysis does not even mention the adjacent 144 million board feet End of the World project and the cumulative impacts of the myriad of other timber sales (Windy Shingle, Center-Johnson, Johnson Bar Salvage, Lolo Insects and Disease, Little Boulder Creek, Tinker Bugs, White Pine, Crane Point, Lower Orogrande, French Larch, Clear Creek, Red Moose Divide, Pete King, Gold Hill etc.) being proposed across the Nez Perce Clearwater National Forest.

Objection 22 - The pileated woodpecker analysis generally dismisses impacts to the species by suggesting sufficient habitat is available in other locations. No thresholds of concern have been identified and the impact of cumulative effects has largely been ignored.

The FEIS wildlife report suggests there are only 1,407 acres of pileated nesting habitat in the 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%. This number appears low, given that the vegetation analysis suggests there are 4,544 acres of forest with an average DBH over 20+ inches and 16,635 acres of forest with an average DBH between 15-19.9 inches within the project area. Some stands with an average DBH between 15-19.9 inches likely include individual snags/trees that exceed the 20-inch diameter size category usually reported as the minimum size for nesting by this species (Bull and Holthausen 1993, McClelland and McClelland 1999). Stand exam information should be utilized to better identify potential nesting habitat before it is lost to timber harvest.

The analysis suggests there are 21,694 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%. Nest stands are also considered suitable for foraging. Presumably, stands with an average DBH of less than

10-inches occur in previously harvested areas that are now in seedling, sapling and pole size classes. These stands could eventually provide suitable foraging or nesting habitat as they mature. Natural openings generally are not considered suitable habitat for this species.

Regardless of the amount of available nesting habitat I object to the reliance on stand exam queries to complete the analysis. The analysis is not spatially explicit and if there is really only 1,407 acres of nesting habitat, then the distribution of potential nesting habitat is critical to this territorial species. If there is actually more nesting habitat, then the potential loss of nesting habitat is much more significant than the numbers reported in the wildlife report. More importantly what does the regeneration harvest of over 5,000 acres of mature forest really mean to the pileated woodpeckers that utilize the project area. How many territories will be rendered unsuitable by this activity and what is the habitat threshold that begins to cause some concern (Schultz 2010).

Again, I believe a more spatially explicit analysis of pileated woodpecker habitat is required. The revised analysis should start by identifying theoretical pileated woodpecker home ranges within the project area. Pileated woodpeckers are reported to have home range sizes of approximately 1005 acres (Bull et al. 1992). Thus, the project area could potentially support approximately 28-29 nesting pairs of pileated woodpeckers. To identify project level impacts, I suggest use of habitat management guidelines developed by Bull and Holthausen (1993). These guidelines have been field tested and home range use in the areas were the guidelines were developed have been tracked for over 30 years (Bull et al 2007).

Bull and Holthausen (1993) 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 bird density did not change in 30 years (despite major infestations of spruce budworm) in home ranges meeting these guidelines, unless extensive regeneration harvesting (like that proposed on the Hungry project) had occurred in the home range. They defined extensive regeneration harvest as 25% of the area. They also examined nesting success and found that birds that successfully produced young had on average 85% of their home range unlogged and 15% unlogged (any type of logging including fuel reductions). Whereas unsuccessful nesters had 62% of the home range unlogged and 38% logged (Bull et al. 2007).

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 Hungry Ridge 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.

Clearly, the best available science does not support the contention that pileated woodpeckers will be unaffected by the Hungry Ridge Restoration proposal. Long-term studies (Bull et al. 2007) suggest that the pileated woodpecker is highly sensitive to regeneration harvest which will be conducted over large areas of the project area. The large harvest blocks (300-400 acres) could totally eliminate pileated woodpecker home ranges in many instances. As previously discussed, past harvest and new cutting associated with the proposal would bring the harvested acreage up to 15,731-acres or approximately 53.5% of the project area. When coupled with activities on the adjacent End of the World project and the myriad of other proposals being pursued on the Forest (Windy Shingle, Center-Johnson, Johnson Bar Salvage, Lolo Insects and Disease, Little Boulder Creek, Tinker Bugs, White Pine, Crane Point, Lower Orogrande, French Larch, Clear Creek, Red Moose Divide, Pete King, Gold Hill etc.), the risk to the species is much greater than suggested in the wildlife analysis.

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.

Objection 23 - Failure to set any meaningful thresholds of habitat loss and consider the effect of habitat fragmentation on the American Pine Marten

The FEIS pine marten analysis relies strictly on data base queries and suggests there are only 3,464 acres of suitable habitat. For the pine marten, suitable habitat is identified in the FEIS as stands that include subalpine fir, Engelmann spruce or lodgepole pine forest types, have an average DBH exceeding 10-inches and a crown closure exceeding 40%. A map is displayed in the project file that is supposed to show the results of this query, but this map displays most of the project area as suitable habitat for the pine marten and doesn't appear to agree with the habitat query.

The literature generally supports the FEIS characterization of marten habitat, but a recent study in Northern Idaho (Wasserman et al. 2012), found that marten also make heavy use of mesic, middle elevation, late seral forests especially when there is a component of western red cedar. They found that an elevation of 4,593-feet (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. Of the tested elevation models, one based on an elevation of 1400 meters and a standard deviation of 400 meters (1312-feet) had the best support as measured by AIC (Akaike Information Criterion).

The findings of Wasserman et al. (2012) should be utilized to update the probable distribution of marten habitat in the project area. Based on the findings of Wasserman, an elevation threshold of perhaps 3,800 feet or expanded species groupings (adding cedar and grand fir) might be more appropriate for identifying potential marten habitat in the project area rather than the tree species groupings currently being utilized in the FEIS. It should be remembered that previously harvested upper elevation locations are potential habitat, but that these areas are not suitable at this time. This is important in evaluating the existing condition of potential habitat. Crown closure and tree size (DBH) could then be utilized to determine the amount of suitable habitat in project area.

The FEIS indicates that 1020-acres or 29% of the suitable habitat will be harvested with proposed Alternative 2. Most of the harvest (979 acres) will consist of regeneration harvest and the remaining acres will be treated with intermediate treatments. No assessment has been made regarding the amount of potential habitat that has been already impacted by past harvest and no meaningful thresholds of habitat loss that would affect the pine marten are considered. 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, numerous 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). For example, Hargis et al. (1999) reported that "Martens were nearly absent from landscapes having >25% non-forest cover, even though forest connectivity was still present." 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). The project proposal will harvest 29% of the identified habitat, suggesting the project area would be unsuitable for marten occupation based on the FEIS evaluation.

The Nez Perce/Clearwater National Forest needs to do a better job of identifying fragmentation impacts on the pine marten on the Hungry Ridge Restoration project. I suggest that suitable

habitat for the pine marten needs to be mapped at the project level. The findings of Wasserman et al. 2012 should prove useful in defining this habitat. 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. Use of spruce/fir forests was less than reported in some other studies such as Koehler and Hornocker (1997).

As I have suggested for several other species, theoretical home ranges should be delineated within the suitable habitat and that fragmentation effects examined. Home range estimates are highly variable for marten (Burskirk 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 number of theoretical home ranges that the project area can support will be dependent on the amount of suitable habitat. Low elevation areas below 3,800 feet elevation are the locations most likely not to provide suitable habitat for the pine marten, but most of the remainder of the project area would likely support the pine marten

For example, if low elevation areas were excluded as marten habitat there could still be 15,000-20,000 acres of suitable marten habitat in the project area. This would provide habitat for 4-6 females and 2-3 males. 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 Hungry Ridge Restoration project. Fourth, "is 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.

Alternative 2 will construct 2.7 miles of system road and 14.7 miles of temporary road. One of new system roads (Trout Creek – 9413 extension) will divide an old growth stand and traverse a ridge that is thought to be important for martens and several other species. Several other miles of road (67.1 miles) will be maintained, reconditioned or reconstructed to accommodate log-haul. After obliteration of 24.6 miles of existing road and the construction of 2.7 miles of new road, there will be a total of 96.3 miles of system road in the project area.

When coupled with activities on the adjacent End of the World project and the myriad of other proposals being pursued on the Forest (Windy Shingle, Center-Johnson, Johnson Bar Salvage, Lolo Insects and Disease, Little Boulder Creek, Tinker Bugs, White Pine, Crane Point, Lower Orogrande, French Larch, Clear Creek, Red Moose Divide, Pete King, Gold Hill etc.), the risk to the species is much greater than suggested in the wildlife analysis.

Sincerely,

/s/ Harry R. Jageman

Harry R. Jageman

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