September 26, 2026

Swamped Project

Libby Ranger District

12557 MT Hwy 37

Libby, MT 59923

To Whom It May Concern,

Please accept these comments from me on behalf of the Alliance for the Wild Rockies, Council on Wildlife and Fish, Center for Biological Diversity and Native Ecosystems Council (hear after Alliance) on the Swamped Project EA.

Alliance submits the following comments to guide the development of the environmental analysis for the proposal. The Forest Service must complete a full environmental impact statement (EIS) for this Project because the scope of the Project will likely have a significant individual and cumulative impact on the environment. Alliance has reviewed the statutory and regulatory requirements governing National Forest Management projects, as well as the relevant case law, and compiled a check-list of issues that must be included in the EIS for the Project in order for the Forest Service's analysis to comply with the law. Following the list of necessary elements, Alliance has also included a general narrative discussion on possible impacts of the Project, with accompanying citations to the relevant scientific literature. We believe that the Forest Service should write an EIS for the Project.

I. NECESSARY ELEMENTS FOR PROJECT EIS or that need to be answered in the EA if you refuse to write an EIS:

A. Disclose all Kootenai National Forest's Forest Plan requirements for logging/burning projects and explain how the Project complies with them including the desired future contains of the forest in the Forest Plan;

B. B. Will this project comply with forest plan big game hiding cover standards and the eastside assessment?

C. C. Disclose the acreages of past, current, and reasonably foreseeable logging, grazing, mining, and road building ativities within the Project area;

D. Solicit and disclose comments from the Montana Department of Fish, Wildlife, and Parks regarding the impact of the Project on wildlife habitat;

E. Solicit and disclose comments from the Montana Department of Environmental Quality regarding the impact of the Project on water quality and the municipal watershed;

F. Disclose the biological assessment for the candidate, threatened, or endangered species with potential and/or actual habitat in the Project area;

G. Disclose the biological evaluation for the sensitive and management indicator species with potential and/or actual habitat in the Project area;

H. Disclose the snag densities in the Project area, and the method used to determine those densities;

I. Disclose the current, during-project, and post-project road densities in the Project area;

J. Disclose the Kootenai National Forest's (KNF) record of compliance with state best management practices regarding

stream sedimentation from ground-disturbing management activities;

K. Disclose the KNF's record of compliance with its monitoring requirements as set forth in its Forest Plan;

L. Disclose the KNF's record of compliance with the additional monitoring requirements set forth in previous DN/FONSIs and RODs on the KNF;

M. Disclose the results of the field surveys for threatened, endangered, sensitive, and rare plants in each of the proposed units;

N. Please formally consult with the US FWS on the impacts of this project on candidate, threatened, or endangered species and plants;

O. Please consult with the US FWS on the impacts of this project on lynx critical habitat and potential lynx critical habitat;

P. Will this Project exacerbate existing noxious weed infestations and start new infestations?

Q. Do unlogged old growth forest store more carbon than the wood products that would be removed from the same forest in a logging operation?

R. What is the cumulative effect of National Forest logging on U.S. carbon stores? How many acres of National Forest lands are logged every year? How much carbon is lost by that logging?

S. Is this Project consistent with "research recommendations (Krankina and Harmon 2006) for protecting carbon gains against the potential impacts of future climate change? That study recommends "[i]ncreasing or maintaining the forest area by avoiding deforestation," and states that "protecting forest from logging or clearing offer immediate benefits via prevented emissions." That study also

states that "[w]hen the initial condition of land is a productive old-growth forest, the conversion to forest plantations with a short harvest rotation can have the opposite effect lasting for many decades . . . ." The study does state that thinning may have a beneficial effect to stabilize the forest and avoid stand- replacing wildfire, but the study never defines thinning. In this Project, where much of the logging is clear-cutting and includes removing large trees without any diameter limit, and where the removal of small diameter surface and ladder fuels is an unfunded mandate to the tune of over $3 million dollars, it is dubious whether the prescriptions are the same type of "thinning" envisioned in Krankina and Harmon (2006).

T. Please list each visual quality standard that applies to each unit and disclose whether each unit meets its respective visual quality standard. A failure to comply with visual quality Forest Plan standards violates NFMA.

U. For the visual quality standard analysis please define "ground vegetation," i.e. what age are the trees, "reestablishes," "short term," "longer term," and "revegetate."

V. Please disclose whether you have conducted surveys in the Project area for this Project for wolverines, pine martins, northern goshawk and lynx as required by the Forest Plan.

W. Please disclose how often the Project area has been surveyed for wolverines, pine martins, northern goshawks, monarch butterflies, grizzly bears, whitebark pine and lynx.

X. Is it impossible for a wolverines, pine martins, monarch butterflies, northern goshawks, grizzly bears, whitebark pine and lynx to inhabit the Project area?

Y. Would the habitat be better for wolverines, monarch butterflies, pine martins, northern goshawks, grizzly bears,

whitebark pine and lynx if roads were removed in the Project area?

Z. What is the U.S. FWS position on the impacts of this Project on wolverines, pine martins, monarch butterflies, northern goshawks, grizzly bears, whitebark pine and lynx? Have you conducted ESA consultation?

AA. Please provide us with the full BA for the wolverines, monarch butterflies, pine martins, northern goshawks, grizzly bears, whitebark pine and lynx.

BB. What is wrong with uniform forest conditions?

CC. Has the beetle kill contributed to a diverse landscape?

DD. Why are you trying to exclude stand replacement fires when these fires help aspen and whitebark pine?

EE. Please disclose what is the best available science for restoration of whitebark pine and disclose to the public what the proposed treatment are for whitebark pine and if

the treatments proposed for whitebark pine regeneration are likely to fail according to the agency's only long term research study on the effects of cutting and burning treatments on whitebark pine regeneration;

FF. Disclose the level of current noxious weed infestations in the Project area and the cause of those infestations;

GG. Disclose the impact of the Project on noxious weed infestations and native plant communities;

HH. Disclose the amount of detrimental soil disturbance that currently exists in each proposed unit from previous logging and grazing activities;

II. Disclose the expected amount of detrimental soil disturbance in each unit after ground disturbance and prior to any proposed mitigation/remediation;

JJ. Disclose the expected amount of detrimental soil disturbance in each unit after proposed mitigation/remediation;

KK. Disclose the analytical data that supports proposed soil mitigation/ remediation measures;

LL. Disclose the timeline for implementation;

MM. Disclose the funding source for non-commercial activities proposed;

NN. Disclose the current level of old growth forest in each third order drainage in the Project area;

OO. Disclose the method used to quantify old growth forest acreages and its rate of error based upon field review of its predictions;

PP. Disclose the historic levels of mature and old growth forest in the Project area;

QQ. Disclose the level of mature and old growth forest necessary to sustain viable populations of dependent wildlife species in the area;

RR. Disclose the amount of mature and old growth forest that will remain after implementation;

SS. Disclose the amount of current habitat for old growth and mature forest dependent species in the Project area;

TT. Disclose the amount of habitat for old growth and mature forest dependent species that will remain after Project implementation;

UU. Disclose the method used to model old growth and mature forest dependent wildlife habitat acreages and its rate of error based upon field review of its predictions;

VV. Disclose the amount of big game (moose and elk) hiding cover, winter range, habitat effectiveness, and security currently available in the Project area:

WW. Disclose the amount of big game (moose and elk) hiding cover, winter range, and security during Project implementation;

XX. Disclose the amount of big game (moose and elk) hiding cover, winter range, habitat effectiveness, and security after implementation;

YY. Disclose the method used to determine big game hiding cover, winter range, and security, and its rate of error as determined by field review;

ZZ. Disclose and address the concerns expressed by the ID Team in the draft Five-Year Review of the Forest Plan regarding the failure to monitor population trends of MIS, the inadequacy of the Forest Plan old growth standard, and the failure to compile data to establish a reliable inventory of sensitive species on the Forest;

AAA. Disclose the actions being taken to reduce fuels on private lands adjacent to the Project area and how those activities/or lack thereof will impact the efficacy of the activities proposed for this Project;

BBB. Disclose the efficacy of the proposed activities at reducing wildfire risk and severity in the Project area in the future, including a two-year, five-year, ten-year, and 20-year projection;

CCC. Disclose when and how the KNF made the decision to suppress natural wildfire in the Project area and replace natural fire with logging and prescribed burning;

DDD. Disclose the cumulative impacts on the Forest-wide level of the KNF's policy decision to replace natural fire with logging and prescribed burning;

EEE. Please demonstrate that the project complies with the Roadless Rule;

FFF. Disclose the impact of climate change on the efficacy of the proposed treatments;

GGG. Disclose the impact of the proposed project on the carbon storage potential of the area;

HHH. Disclose the baseline condition, and expected sedimentation during and after activities, for all streams in the area;

III. Disclose maps of the area that show the following elements:

1. Past, current, and reasonably foreseeable logging units in the Project area;

2. Past, current, and reasonably foreseeable grazing allotments in the Project area;

3. Density of human residences within 1.5 miles from the Project unit boundaries;

4. Hiding cover in the Project area according to the Forest Plan definition;

5. Old growth forest in the Project area;

6. Big game security areas;

7. Moose winter range;

The best available science, Christensen et al (1993), recommends elk habitat effectiveness of 70% in summer range and at least 50% in all other areas where elk are one of the primary resource considerations. According to Figure 1 in Christensen et al (1993), this equates to a maximum road density of approximately 0.7 mi/sq mi. in summer range and approximately 1.7 mi/sq mi. in all other areas.

Do any of the 6th Code watersheds in the Project area meet either of these road density thresholds? It appears the Project area as a whole also far exceeds these thresholds. Please disclose this type of Project level or watershed analysis on road density.

Christensen et al (1993) state that if an area is not meeting the 50% effectiveness threshold of 1.7 mi/sq mi, the agency should admit that the area is not being managed for elk:

“Areas where habitat effectiveness is retained at lower than 50 percent must be recognized as making only minor contributions to elk management goals. If habitat effectiveness is not important, don't fake it. Just admit up front that elk are not a consideration.”

Please include a complete cost benefit analysis for the project.

Please consult with the Montana State Historic Preservation Office to ensure the project complies with the National Historic Preservation Act.

Since the EA is using conditions based management, i.e., you are violating NEPA but not telling the public where, when and how you are going to log and bulldoze roads, please explain how the project is complying with the Historic Preservation Act.

Crucial to the preservation of the historical and cultural foundations of the nation, Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations, 36 C.F.R. Part 800 (PDF) (revised August 5, 2004) require Federal agencies to consider the effects of projects they carry out, approve, or fund on historic properties. Additionally, Federal agencies must provide the Advisory Council on Historic Preservation (ACHP) opportunity to comment on such projects prior to the agency's final decision.

A Federal project that requires review under Section 106 is defined as an "undertaking." An undertaking means a project, activity or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license, or approval.

Section 110 of the NHPA

Added to the NHPA in 1992, Section 110 requires Federal agencies to emphasize the preservation and enhancement of cultural resources. Section 110 directs agencies to initiate measures necessary to direct their policies, plans, and programs in such a way that federally-owned sites, structures, and objects of historical architectural or archaeological significance are preserved, restored, and maintained for the inspiration and benefit of the public. The agencies are also encouraged to institute (in consultation with the ACHP) procedures to assure Federal plans and programs contribute to the preservation and enhancement of non-Federally owned sites, structures, and objects of historical, architectural, and archaeological significance. Has the MT SHPO received this survey? The cultural surveys need to be done before the NEPA and NHPA process can be completed, which has not occurred. The project must be approved by

the SHPO and the public needs to given a chance to comment on this.

Page 64 of the EA states:

Wildlife
Protection measures needed for endangered, threatened, and sensitive wildlife species as well asother species of concern will be included in the contract to provide for the protection of theseanimals found during implementation. Provide protection to active den or nest sites of species of concern or other specialized habitats discovered during project implementation through timing restrictions or distance buffers around the site, or both. The district biologist will be notified and coordination with Montana Fish, Wildlife, and Parks biologists will occur if needed.

The Montana District Court ruled in the South Plateau order:

The Forest Service avowing that future activities will comply with NFMA falls far short of showing that those activities do so. "Under NFMA, the Forest Service calculations need not be perfect. However, [courts] must still be able to reasonably ascertain from the record that the Forest Service is in compliance with the [Forest] Plan standard[s]." Native Ecosystems Council v. U.S. Forest Serv., 418 F.3d 953, 963 (9th Cir. 2005).

That is not possible here.

The Swamped Project violates the 2012 Planning Rule, NEPA, NFMA, ESA, APA, and the Forest Plan because the Forest Service is not demonstrating that the Swamped project complies with the KNF's Forest Plan which has lots of requires to protect riparian areas, fish and wildlife that require the KNF to "avoid/minimize disturbance. The KNF did not do any monitoring to look for active nests and dens.

Conditions based management

Conditions based analysis relies heavily on design features to minimize the detrimental effects of project actions on soils, streams, ecological resources, bull trout, lynx, white bark pine, elk, rare plants, and all other flora and fauna in the project area. Design features are mentioned 54 times in the DEA alone. How will BNF guarantee that these design features will be followed? Are any of these design features dependent on future funding? What will be the consequences for not fulfilling the necessary design features to minimize effects to the forest?

The agency needs to identify all existing old growth stands in the South Plateau Project Area, and define their individual patch size, and map their locations across the project area. The agency also needs to identify what the proposed logging and/or burning treatment is for each of these old

growth stands, is required by the NEPA for project decisions.

There is no map of the big game winter range in the South Plateau Project area, or any information of where remaining thermal cover exists, or where it will be removed with this project. The current condition of thermal cover in this project area is important information to the public, as it demonstrates how the agency is implementing the forest plan.

There are no maps provided of where existing or planned security areas will be in the South Plateau project area, in violation of the NEPA. There is also no analysis of how only 15% security (at best) is affecting elk displacement to private lands, given a minimum of 30% security is recommended by the current best science. The agency claims there is no impact of this lack of security based on the current best science. It is not clear how there can be a huge increase in the number of motorized routes in the South Plateau Project Area, as well, and still maintain what is the current level of big game security.

The project's use of conditions based management is a violation of NEPA, NFMA, the Clearwater Act, the APA and the ESA based on the Federal Court ruling on a Forest Service logging project in the Tongass N.F.

Please see the following article by the American bar Association about the use of Condition-Based Management.

May 10, 2021

The U.S. Forest Service's Expanding Use of Condition-Based Management: Functional and Legal Problems from Short-Circuiting the Project-Planning and Environmental Impact Statement Process

Andrew Cliburn, Paul Quackenbush, Madison Prokott, Jim Murphy, and Mason Overstreet

https://www.americanbar.org/groups/environment_energy_resources/publications/fr/20210510-the-us-forest-services-expanding-use-of-condition-based-management/

Condition-based management (CBM) is a management approach that the U.S. Forest Service has increasingly used to authorize timber harvests purportedly to increase flexibility, discretion, and efficiency in project planning, analysis, and implementation. The agency believes it needs this flexible approach because sometimes conditions on the ground can change more quickly than decisions can be implemented. In practice, however, CBM operates to circumvent the National Environmental Policy Act (NEPA) review framework by postponing site-specific analysis until the Forest Service implements the project, which effectively excludes the public from site-specific decisions, reduces transparency, and removes incentives for the agency to avoid harming localized resources. The practice should be curtailed by the Biden administration

NEPA requires federal agencies including the Forest Service to provide the public with "notice and an opportunity to be heard" in the analysis of "specific area[s] in which logging will take place and the harvesting methods to be used." Ohio Forestry Ass'n v. Sierra Club, 523 U.S. 726, 729–30 (1998). Site-specific public involvement can significantly improve projects because the agency may be unaware of harmful impacts or resource concerns until the public flags them during the environmental analysis process. Nationally, the Forest Service drops about one out of every five acres it proposes for timber harvest based on information or concerns presented during the NEPA process, often due to public comments regarding site-specific information. Public Lands Advocacy Coalition, Comments on Proposed Rule, National Environmental Policy Act (NEPA) Compliance (June 13, 2019) (analyzing 68 projects that relied on environmental assessments).

The Forest Service appears to be abandoning the site-specific analysis model in favor of CBM. CBM projects use an overarching set of "goal variables"—predetermined management criteria that guide implementation—that Forest Service staff apply to on-the-ground natural resource "conditions" encountered during the course of project implementation, a period that can span years or even decades: essentially, when the Forest Service finds X resource condition on the ground, it applies Y timber harvest prescription. However, basic information regarding the project's details—such as unit location, timing, road-building, harvesting methods, and site-specific environ-

mental effects—is not provided at the time the Forest Service conducts its NEPA environmental review (when the public can weigh in), nor when it gives its final approval to a project (when the public can seek administrative review). Instead, site-level disclosures are made after NEPA environmental and administrative review is complete, depriving the public of opportunities to comment and influence the decision based on localized conditions.

While CBM is not a new management tool, the Forest Service has employed it for over a decade and it was used sparingly during the Obama administration. However, its use accelerated during the Trump administration and shows no sign of slowing. To date, dozens of Forest Service projects across the country have used CBM. See, e.g., ***Red Pine Thinning Project****, Ottawa National Forest;* ***Medicine Bow Landscape Vegetation Analysis****, Medicine Bow-Routt National Forest;* ***Sage Hen Integrated Restoration Project****, Boise National Forest.*

As the Forest Service's use of CBM continues, questions remain about its legality. Public-lands advocates argue that CBM violates NEPA's mandate that agencies take a hard look at the consequences of their actions before a project commences. This "look before you leap" approach was the primary purpose of NEPA and remains the statute's greatest strength. NEPA works by requiring an agency to consider alternatives and publicly vet its analysis whenever its proposal may have "significant" environmental consequences, 42 U.S.C. § 4332(2)(C), or implicates "unresolved conflicts" about how the agency

should best accomplish its objective. Id. at § 4332(2)(E). However, CBM allows the Forest Service to circumvent the effects analysis process when exercising discretion about where and how to log decisions that often may have "significant" environmental consequences.

Only two federal cases have addressed CBM's legality. In WildEarth Guardians v. Connor, 920 F.3d 1245 (10th Cir. 2019), the Tenth Circuit approved a CBM approach for a logging project in southern Colorado in Canada lynx habitat. The environmental assessment utilized CBM and analyzed three different alternatives, one of which was a worst-case scenario. For the worst-case scenario, the Forest Service assumed that the entire lynx habitat in the project area would be clear-cut. The Forest Service "took the conservative approach" because it "did not know precisely" where it would log in the lynx habitat areas. WildEarth Guardians, 920 F.3d at 1255. Based on this conservative approach, coupled with a comprehensive, region-wide lynx management agreement and its associated environmental impact statement, the court agreed with the Forest Service that its future site-specific choices were "not material" to the effects on lynx—i.e., that no matter where logging occurred, "there would not be a negative effect on the lynx." Id. at 1258–59.

However, a second case addressing CBM found that site-specific analysis was needed to satisfy NEPA's "hard-look" standard. In Southeast Alaska Conservation Council v. U.S. Forest Service, 443 F. Supp. 3d 995 (D. Ak. 2020), the court held that the Forest Service's Prince of

Wales Landscape Level Analysis Project—a 15-year logging project on Prince of Wales Island in the Tongass National Forest—violated NEPA. The project would have authorized the logging of more than 40,000 acres, including nearly 24,000 acres of old growth, along with 643 miles of new and temporary road construction, but it "d[id] not include a determination—or even an estimate—of when and where the harvest activities or road construction . . . w[ould] actually occur." Id. at 1009. The court found that this analysis was not "specific enough" without information about harvest locations, methods, and localized impacts. Id. at 1009–10. The court further held that a worst-case analysis could not save the project, because site-specific differences were consequential. Id. at 1013.

The Forest Service's widespread use of CBM also creates compliance challenges under the Endangered Species Act (ESA). Section 7(a)(2) of the ESA requires federal agencies to consult with the Fish and Wildlife Service and/or National Marine Fisheries Service whenever a proposed action "may affect" listed species or destroy or adversely modify its critical habitat to ensure that the action is "not likely to jeopardize" these species. 16 U.S.C. § 1536. CBM conflicts with that statutory requirement because it does not allow agencies to properly determine whether an action "may affect" or is "likely to jeopardize" a listed species when the consulting agencies do not know the specifics of when or where the action will be implemented, or what the site-specific impacts of the action may be.

For some projects, the Forest Service has tried to avoid this tension by conducting section 7 consultation prior to each phase of a CBM project, but this approach has run headlong into the general rule against segmenting project consultation duties under the ESA. See, e.g., Conner v. Burford, 848 F.2d 1441, 1457 (9th Cir. 1988). With few exceptions, section 7 consultation must cover the overall effects of the entire project at the initial stage before the project can commence. Thus, regardless of whether agencies choose to consult up front or to consult in stages, the Forest Service is likely to face significant legal hurdles when its CBM project "may affect" listed species.

CBM is not only legally dubious, but also unnecessary. The Forest Service already has NEPA-compliant methods to deal with situations that require a nimble response to the needs of a dynamic landscape. In these cases, the Forest Service can complete a single "programmatic" analysis to which future site-specific decisions will be tiered. This programmatic approach allows the Forest Service to speed the consideration and implementation of site-specific, step-down proposals. Unlike CBM, this approach allows for public review of site-specific decision-making and administrative review of those decisions.

Surveying the regulatory horizon, the future of CBM in the Forest Service system is uncertain. The national forests face a host of complex challenges including climate-related crises, insect and forest pestilence, protecting and restoring biodiversity, and wildfire management. These challenges are made worse by budget and staff re-

strictions. Without adequate funding, the Forest Service must rely on imperfect tools like commercial logging, which can cause more harm than good in the wrong places.

But this is not the time to shortchange the most consequential decisions that the agency must make: determining where and how to act. During the final two years of the Trump administration, the Forest Service attempted to explicitly codify CBM provisions in revisions to its NEPA regulations, although those provisions were dropped from the final rule. Simultaneously, other federal land-management agencies like the Bureau of Land Management have started to use CBM analogues in their NEPA-related planning documents. Although it is still early, the Biden administration's newly appointed Council on Environmental Quality team has yet to weigh in on CBM. If use of CBM continues in a manner that undermines public participation and NEPA's "hard look" standard, some of our riskiest land management projects may not receive proper environmental oversight.

his is a violation of NEPA to not identifying specific areas where logging would have occurred and where roads and how many roads will be built.

Please see the article below about a similar timber sale in Alaska which a federal district court ruled was illegal.

Federal court blocks timber sale in Alaska's Tongass National Forest

https://www.adn.com/alaska-news/2020/06/25/federal-court-blocks-timber-sale-in- alaskas-tongass-national-forest/

JUNEAU — A federal judge has blocked what would have been the largest timber sale in Alaska's Tongass National Forest in decades.

Wednesday's ruling ends the U.S. Forest Service's plan to open 37.5 square miles of old- growth forest on Prince of Wales Island to commercial logging, CoastAlaska reported.

The ruling by Judge Sharon L. Gleason also stops road construction for the planned 15- year project.

Conservationists had already successfully blocked the federal government's attempt to clear large amounts of timber for sale without identifying specific areas where logging would have occurred.

Gleason allowed the forest service to argue in favor of correcting deficiencies in its re- view and moving forward without throwing out the entire project, but ultimately ruled against the agency.

Gleason's ruling said the economic harm of invalidating the timber sales did not outweigh "the seriousness of the errors" in the agency's handling of the project.

The method used in the Prince of Wales Landscape Level Analysis was the first time the agency used it for environmental review on an Alaska timber sale.

The forest service, which can appeal the decision, did not return calls seeking comment.

Gleason's decision affects the Prince of Wales Island project and the Central Tongass Project near Petersburg and Wrangell.

The ruling triggers a new environmental review under the National Environmental Policy Act, said Meredith Trainor, executive director of the Southeast Alaska Conservation Council.

The ruling in the lawsuit brought by the council includes a requirement for public input on specific areas proposed for logging, Trainor said.

Tessa Axelson, executive director of the Alaska Forest Association, said in a statement that the ruling "threatens the viability of Southeast Alaska's timber industry."

The project is in violation of NEPA, NFMA, the Clean Water Act, the APA and the ESA.

ILLEGITIMATE PURPOSE AND NEED OF THIS PROJECT

The EA claims there is a need to "Promote resilient vegetation conditions by managing towards Forest Plan desired conditions for species composition, landscape-level vegetation patterns, structure, and patch size"

First, the EA doesn't demonstrate insect and disease or fire activity in the project area is in any way unusual or uncharacteristic of the forests in this ecosystem.

"Resiliency" tends to be a black box or red herring used by the FS to claim the forest isn't healthy in the absence of data or analysis to back up such claims. The FS doesn't disclose the metrics the agency uses to measure resiliency, so that objective measures of resiliency can be applied to the Swamped project area by a scientist or any rational person now, immediately after the project is completed, and/or at later intervals.

Ecological resilience, which the FS implies it is creating through this project, is not the absence of natural disturbances like wildfire or beetle kill, rather it is the opposite (DellaSala and Hanson, 2015, Chapter 1, pp. 12-13). What the FS promotes is the human control of the forest ecosystem through mechanical and other heavy-handed means to maintain unnatural stasis by eliminating, suppressing or altering natural disturbances such as wildfire, to facilitate the extraction of commercial resources for human use. This is the antithesis of ecological resilience and conservation of native biodiversity. Ecological resilience is the ability to ultimately return to predisturbance vegetation types after a natural disturbance, including higher-severity fire. This sort of dynamic equilibrium, where a varied spectrum of suc-

cession stages is present across the larger landscape, tends to maintain the full complement of native biodiversity on the landscape. (Thompson et al., 2009).

The FS's view of ecosystems is inconsistent with a holistic ecosystem management approach, which would acknowledge the forest's capability of operating in a self-regulatory manner. For example, Harvey et al., 1994 state:

Although usually viewed as pests at the tree and stand scale, insects and disease organisms perform functions on a broader scale.

...Pests are a part of even the healthiest eastside ecosystems. Pest roles—such as the removal of poorly adapted individuals, accelerated decomposition, and reduced stand density—may be critical to rapid ecosystem adjustment.

...In some areas of the eastside and Blue Mountain forests, at least, the ecosystem has been altered, setting the stage for high pest activity (Gast and others, 1991). This increased activity does not mean that the ecosystem is broken or dying; rather, it is demonstrating functionality, as programmed during its developmental (evolutionary) history.

Castello et al. (1995) state:

Pathogens help decompose and release elements sequestered within trees, facilitate succession, and maintain genetic, species and age diversity. Intensive control measures, such as thinning, salvage, selective logging, and buffer clearcuts around affected trees remove crucial structural features. Such activities also remove commercially valu-

able, disease-resistant trees, thereby contributing to reduced genetic vigor of populations.

In dozens of places the EA uses the word “resilient” or “resilience” in terms of how the project increases it, or how it’s chasing Forest Plan DCs by increasing the “resilience” of the ecosystem or some aspect of it. The Forest Plan defines “resilience” as: “The ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change.” The Forest Plan defines “restoration” in part, as “the process of assisting the recovery of resilience.” And the Forest Plan defines Forest Health as “An ecological perspective that looks at the resiliency of an ecosystem and its ability to be sustainable.”

However, the Swamped EA provides absolutely no operational definition of resilience that would allow anybody to actually measure the resilience of the ecosystem as it stands now, or measure the change in resilience following project activities. An essential component of an operational definition is measurement. A simple and accurate definition of measurement is the assignment of numbers to a variable in which we are interested. In this case, the variable in which we are interested is resilience, and how the FS measures it in these ecosystems.

Resilience is a scientific term that may be used to characterize forest ecosystems. However, mostly what we read about resilience from the EA and Forest Plan is that it’s what happens when the forest is managed (i.e., mostly

logged or prescribe burned), and the more the forest is logged and burned, the more resilient it becomes. Also we read that nothing that happens naturally, without management, will increase resilience. In other words, from the FS's perspective, resilience can only be manufactured, engineered, or imposed by management. So the term "resilience" as used by the FS is invalid, rendering much of the analyses confusing and misleading.

There is a need to "Improve big game winter range conditions and promote forage opportunities"[3] but such a need is not validated. It is merely thinly veiled justification for logging.

Fire, insects & disease are endemic to western forests and are natural processes resulting in the forest self-thinning. This provides for greater diversity of plant and animal habitat than logging can achieve. In areas that have been historically and logged there are less diversity of native plants, more invasive species, and less animal diversity. Six et al., 2014 and 2021 (attached) documented that logging to prevent or contain insect and disease has not been empirically proven to work, and because of lack of monitoring the FS can't content this method is viable for containing insect outbreaks.

Wales, et al. 2007 modeled various potential outcomes of fire and fuel management scenarios on the structure of forested habitats in northeast Oregon. They projected that the natural disturbance scenario resulted in the highest

amounts of all types of medium and large tree forests combined and best emulated the Natural Range of Variability for medium and large tree forests by potential vegetation type after several decades. Restoring the natural disturbances regimes and processes is the key to restoring forest structure and functionality similar to historical conditions. The FS fails to reconcile this science with the premises behind the Swamped proposal.

Other scientific information contradicts some of the premises upon which the EA is based. Bradley, et al. 2016 "found forests with higher levels of protection had lower severity values even though they are generally identified as having the highest overall levels of biomass and fuel loading." Among the major findings were that areas undisturbed by logging experienced significantly less intensive fire compared with areas that have been logged. From a news release announcing the results of the study (http://www.biologicaldiversity.org/publications/papers/):

"We were surprised to see how significant the differences were between protected areas managed for biodiversity and unprotected areas, which our data show burned more severely," said lead author Curtis Bradley, with the Center for Biological Diversity.

The study focused on forests with relatively frequent fire regimes, ponderosa pine and mixed-conifer forest types; used multiple statistical models; and accounted for effects of climate, topography and regional differences to ensure the findings were robust.

“The belief that restrictions on logging have increased fire severity did not bear out in the study,” said Dr. Chad Hanson, an ecologist with the John Muir Project. “In fact, the findings suggest the opposite. The most intense fires are occurring on private forest lands, while lands with little to no logging experience fires with relatively lower intensity.”

“Our findings demonstrate that increased logging may actually increase fire severity,” said Dr. Dominick A. DellaSala, chief scientist of Geos Institute. “Instead, decision-makers concerned about fire should target proven fire-risk reduction measures nearest homes and keep firefighters out of harm’s way by focusing fire suppression actions near towns, not in the back country.”

Elsewhere we explain there is no need to “Maintain or improve old growth character within existing old growth” nor is there scientific support for this agenda.

The EA claims there is a need to “Promote early seral tree species” but if this were true, there is no explanation why the FS doesn’t manage consistently with Forest Plan direction to accept natural processes and respond to the EA’s expressed need to “Encourage fire’s ecological function” which would do the job if the FS wasn’t continuously suppressing fire and other natural processes.

The EA also fails to provide a rational explanation of the alleged need to conduct logging with “treatments ...consistent with the patch size and pattern” that would naturally occur anyway. Churchill, 2011 points out:

Over time, stand development processes and biophysical variation, along with low and mixed-severity disturbances, break up these large patches into a finer quilt of patch types. These new patterns then constrain future fires. Landscape pattern is thus generated from a blend of finer scale, feedback loops of vegetation and disturbance and broad scale events that are driven by extreme climatic events.

(Emphases added.) Churchill describes above the ongoing natural processes that will alleviate the need to "Diversify successional stages" alleged in the EA—without expensive and ecologically risky logging and road building. Since no proper spatial analysis of the landscape pattern's departure has been completed, the EA has no scientifically defensible logging solution.

The definition of Wildland Urban Interface does not conform to any rational criteria, in regards to the alleged need to reduce fire risk in the project area. Please follow the plan language of the Healthy Forest Restoration Act.

INVENTORIED AREAS AND OTHER UNROADED AREAS

Does the project comply with the roadless rule?

The Forest Plan lacks direction to update roadless area boundaries utilizing a transparent public procedures in order to evaluate unroaded areas contiguous with Inventoried Roadless Areas (IRAs) and Wilderness.

The FS is required to discuss a project's impacts on areas of "sufficient size" for future wilderness designation. *Lands Council*, 529 F.3d at 1231, citing 16 U.S.C. § 1131(c).

The Kootenai National Forest's Lower Yaak, O'Brien, Sheep Draft Environmental Impact Statement explains the concept of Roadless Expanse as explained in USDA Forest Service, 2010e:

Northern Region (Region 1) Direction for Roadless Area Analysis Region 1 provides additional guidance for roadless area analysis in a draft document titled "Our Approach to Roadless Area Analysis of Unroaded Lands Contiguous to Roadless Areas" (12/2/10). In summary this paper is based on court history regarding the Roadless Area Conservation Rule. The "Our Approach" document states that "projects on lands contiguous to roadless areas must analyze the environmental consequences, including irreversible and irretrievable commitment of resources on roadless area attributes, and the effects for potential designation as wilderness under the Wilderness Act of 1964. **This analysis must consider the effects to the entire roadless expanse; that is both the roadless area and the unroaded lands contiguous to the roadless area**.

The FS must analyze and disclose impacts on the Roadless Characteristics and Wilderness Attributes of the Roadless Expanse. The public must be able to understand if the project would cause irreversible and irretrievable impacts on the suitability of any portion of Roadless Expanse for future consideration for Recommended Wilderness or for Wilderness designation under forest planning.

The FS doesn't recognize best scientific information that indicates the high ecological integrity and functioning of roadless and unmanaged areas. Management activities have damaged the streams and other natural features found in the project area watersheds. The FS has yet to demonstrate it can extract resources in a sustainable manner in roaded areas.

Unroaded areas greater than about 1,000 acres, whether they have been inventoried or not, provide valuable natural resource attributes that are better left protected from logging and other management activities. Scientific research on roadless area size and relative importance is ongoing. Such research acknowledges variables based upon localized ecosystem types, naturally occurring geographical and watershed boundaries, and the overall conditions within surrounding ecosystems. In areas such as the Swamped project area, where considerable past logging and management alterations have occurred, protecting relatively ecologically intact roadless areas even as small as 500 - 1,000 acres has been shown to be of significant ecological importance. These valuable and increasingly rare roadless area attributes include: water quality; healthy soils; fish and wildlife refugia; centers for dispersal, recolonization, and restoration of adjacent disturbed sites; reference sites for research; non-motorized, low-impact recreation; carbon sequestration; refugia that are relatively less at-risk from noxious weeds and other invasive non- native species, and many other significant values. (See Forest Service Roadless Area Conservation FEIS, November 2000.)

See the report by Friends of the Clearwater, "The Roadless Report: Analyzing the Impacts of Two Roadless Rules on Forested Wildlands" for an observation on how roadless rules are being exploited to downgrade the wilderness values and roadless characteristics of IRAs. The Forest Service responded:

The Swamped EA and FONSI don't demonstrate that the project complies with the access amendment to the Forest Plan or that 250 acres is big enough to provide secure habitat for grizzly bears,

The Swamped project will not maintaining and enhancing secure grizzly habitat and will increase the potential for grizzly-human conflicts in violation of NFMA, NEPA, the APA and the ESA.

The Forest does not have a good track record of keeping closed roads closed. The Forest Service does not disclose the road mileage behind these ineffective closures; therefore it is unclear how many miles of additional open and total roads must be added to the existing condition calculations as a result of these ineffective closures.

In a meeting after the Draft Ripley Decision between myself, Steve Kelly, Ranger Gassman and Supervisor Chad Benson, Supervisor Benson stated people have been violating road closures in the Kootenai National Forest for 100 years and they will be violating road closures for the next 100 years.

In a recent Ninth Circuit Opinion, the court found that the Forest Service had failed to establish whether similar "undetermined" roads of unknown origin caused an increase above the Tobacco BORZ baseline:

The error cannot be treated as harmless in light of the ambiguity in the record as to whether the "undetermined" roads at issue were, in fact, included in the Access Amendments baseline calculation.

There are at least three problems with the KNF's record of amount of roads. First, because "undetermined" is a sub-category of "unauthorized" roads, it is possible that the particular undetermined roads at issue in this case were created—without authorization from the Forest Service—in the interim between the measurement of the Access Amendments baseline and the Forest Service's survey of existing roads for the Project.

All. for the Wild Rockies v. Savage, 897 F.3d 1025, 1036, n.18 (9th Cir. 2018). In light of these circumstances that (1) road closures/barriers are regularly breached but the Forest Service conducts no systematic monitoring to determine how many miles of illegal road use are occurring behind barriers each year, and (2) the Forest Service simply ignores illegal "undetermined" roads and does not include them in its calculations for open or total roads in the annual monitoring reports, the open and total road numbers in the monitoring reports are not accurately reflecting the conditions on the ground. It is therefore reasonable to assume that the baselines in the project area regularly exceeded because the reported conditions hover at or near the baseline.

Chronic recurring road closure breaches cannot reasonably be construed as "temporary;" and illegal road use does not fall within the scope of Access Amendment "temporary" roads.

The Forest Service and FWS have acknowledge that road closure breaches (and resulting illegal road use) are not ad-

dressed in the Access Amendment. Nonetheless, the agencies argue that all road closure breaches regardless of whether they are chronically recurring and regardless of how long they last on the landscape must be construed as "temporary" road increases. Onto this premise, the agencies then bootstrap an additional argument that because certain specific types of temporary roads were addressed in the Access Amendment, that discussion must also apply to "temporary" road increases from illegal road use.

First, it is not reasonable to construe recurring illegal road use as "temporary" road density increases. The monitoring reports indicate that public users may repeatedly breach the same closure year after year. See, e.g., AR42:000059-62 (noting that boulders placed in 2015 have been removed and unauthorized users are again circumventing gate on Road 2236). Moreover, the Forest Service may take years to act on known violations. See, e.g., AR42:000061 ("The Clatter Creek gate (268) was included on the 2015 gate repair contract but after the bids came in the Clatter Creek gate was dropped due to repair costs for all gate repairs exceeding available funding. In BY2016 the gate remained damaged and ineffective."); see also AR43:000081-82 (note 2)(during planning for the Hanna Flats logging project, the Forest Service found illegal motorized use on 15.7 miles of road that were not included in the baseline but the agency postponed remedial action until implementation of the logging project; in the 2018 monitoring report, the agency concedes it has still not yet eliminated this illegal

use); see also AR232:000767 (finding that four barriers did not effectively prevent motorized use but deferring any action to fix the problems).

Thus, while the Forest Service insists that all breaches are temporary, those same breaches may be recurring or may have lasted for many years prior to discovery and remedial action, resulting in a chronic situation. The situation with the BORZ is a good illustration of this problem S although the Forest Service insists that it fixes all breaches as soon as possible, nonetheless at least four out of seven BORZ areas chronically fail to meet both the open and total road baseline conditions from the Access Amendment, as shown above in the table in Section B.

Second, even assuming that illegal road use could be construed as "temporary," it still does not have the same effect as lawful temporary road use. A breach of a closure device that results in public motorized use in effect results in an open road. The Access Amendment severely restricts temporary increases in open roads: "immediately following completion of all mechanized harvest and post- harvest slash activities requiring use of the road, to allow motorized public use during the bear summer season prior to the fall bear hunt (i.e., June 16 - August 31) for activities such as personal firewood collection. This public access would only be provided in cases where the mechanized harvest and/or post-harvest slash activities occurred during the same active bear year."

Thus, temporary increases in open roads are limited to a June 16-August 31 window, and may only occur in the same year in which logging activities have already occurred and used that particular road, presumably because grizzlies would have already been displaced from those areas. In contrast, illegal motorized use behind road closure breaches is not limited to a June 16-August 31 window, and is not limited to a single year entry on a road along and on which logging activities have already been occurring.

Moreover, illegal road use would also constitute an increase in total roads. However, temporary increases in total roads are only permitted if the roads are "effectively" gated to prevent public use during a project, (2) after project use, the roads are treated so as to "effectively prevent[] motorized access" and require no motorized access for maintenance for at least 10 years, and (3) upon project completion, the area is "returned to or below the baseline levels contained in Table 16" of the Access Amendment ROD. Obviously a road that has illegal road use is not "effectively" gated to prevent public use.

Thus, illegal road use does not comply with the restrictions set for lawful increases in temporary roads neither open nor closed in the Access Amendment and therefore cannot possibly have the same effects. It is simply implausible that unlimited illegal road use occurring at any time in any location would have the same effect on grizzly bears as Access Amendment temporary roads that are significantly restricted in both timing and location. Indeed, illegal road use is

illegal precisely because the Forest Service has already closed these specific roads to protect grizzly bears. If illegal motorized use occurs on these roads that were closed to protect grizzly bears, it may displace grizzly bears from areas that they would otherwise not be displaced from.

2017 DNA sampling identified only 44 individual bears. 1 Specifically, the recent sampling identified 20 females and 24 males, with 23 bears in the Cabinets and 21 bears in the Yaak portion of the ecosystem.

Recognizing that the grizzly bear population in the Cabinets portion of the ecosystem is likely much smaller than the estimated population for the entire ecosystem, we are likely looking at a much larger percentage of the population being seriously impacted during the life because of this project.

Because of the serious impacts to grizzly bears, please demonstrate compliance with Forest Plan standards relevant to grizzly bears, and analyze the direct, indirect, and cumulative impacts to grizzly bears.

The Forest Service must comply with National Forest Management Act ("NFMA") and its implementing regulations. NFMA requires the Forest Service to ensure that site-specific management projects are consistent with the applicable forest plan. 16 U.S.C. § 1604(i). Thus, the Forest Service must ensure that all aspects of the proposed action comply with the Kootenai Panhandle National Forests Land Management Plan.

The Grizzly Bear Access Amendment set standards for open motorized route density ("OMRD"), total motorized route density ("TMRD"), and retention of core grizzly bear habitat within the Cabinet-Yaak and Selkirk Recovery Zones bear management units. This Amendment is incorporated as a standard (FW-STD-WL-02) in the Kootenai National Forest Plan at Appendix B. The Forest Service must comply with the Access Amendment TMRD standards during and after project implementation, it not the project directly violates NFMA.

Dr. David Mattson makes the following points for our Knotty Pine objection and they also apply for the Swamped project.

The assessment of prospective effects of the this project on grizzly bears in the is premised on several critical assumptions. First, status of the Cabinet-Yaak grizzly bear population is assumed to have improved since 2012. Second, and related, the KNF assumes that some erosion of security for grizzly bears is therefore permissible, conditioned on a related assumption that security and road access standards employed by the Kootenai National Forest (NF) are sufficient for recovery of grizzly bears in this ecosystem.

All of these assumptions are unwarranted.

Briefly:

- ***The weight of available evidence does not support concluding that population status has improved. For***

one, the methods used to estimate trend and current population size are beset with a host of problems. For another, the information able to be distilled from demographic data suggests that any improvement has stalled since 2014.

- ***Variations in population size and trajectory between 1999 and 2010 are more likely attributable to variations in abundance of natural foods—berries in particular—that affect exposure of bears to humans rather than to any increased mitigations. During years of scant berries, bears likely forage more widely and more often end up in conflict situations or exposed to malicious killing.***

- ***The population of grizzly bears in the Yaak is far smaller than even the smallest size posited to be viable by any researcher. Related, the population remains acutely vulnerable to even the smallest increases in bear mortality that are predictably more likely to occur with any increase in road access and associated human activity.***

The Knotty Pine project will not maintaining and enhancing grizzly habitat and will increase the potential for grizzly-human conflicts in violation of NFMA, NEPA, the APA and the ESA.

The Forest does not have a good track record of keeping closed roads closed. The Forest Service does not disclose the road mileage behind these ineffective closures; therefore it is unclear how many miles of additional open and total roads must be added to the existing condition calculations as a result of these ineffective closures.

In a recent Ninth Circuit Opinion, the court found that the Forest Service had failed to establish whether similar "undetermined" roads of unknown origin caused an increase above the Tobacco BORZ baseline:

The error cannot be treated as harmless in light of the ambiguity in the record as to whether the "undetermined" roads at issue were, in fact, included in the Access Amendments baseline calculation.

There are at least three problems with the KNF's record of amount of roads. First, because "undetermined" is a sub-category of "unauthorized" roads, it is possible that the particular undetermined roads at issue in this case were created—without authorization from the Forest Service—in the interim between the measurement of the Access Amendments baseline and the Forest Service's survey of existing roads for the Project.

All. for the Wild Rockies v. Savage, 897 F.3d 1025, 1036, n.18 (9th Cir. 2018). In light of these circumstances that (1) road closures/barriers are regularly breached but the Forest Service conducts no systematic monitoring to determine how many miles of illegal road use are occurring

behind barriers each year, and (2) the Forest Service simply ignores illegal "undetermined" roads and does not include them in its calculations for open or total roads in the annual monitoring reports, the open and total road numbers in the monitoring reports are not accurately reflecting the conditions on the ground. It is therefore reasonable to assume that the baselines in the project area regularly exceeded because the reported conditions hover at or near the baseline.

Chronic recurring road closure breaches cannot reasonably be construed as "temporary;" and illegal road use does not fall within the scope of Access Amendment "temporary" roads.

The Forest Service and FWS have acknowledge that road closure breaches (and resulting illegal road use) are not addressed in the Access Amendment. Nonetheless, the agencies argue that all road closure breaches regardless of whether they are chronically recurring and regardless of how long they last on the landscape must be construed as "temporary" road increases. Onto this premise, the agencies then bootstrap an additional argument that because certain specific types of temporary roads were addressed in the Access Amendment, that discussion must also apply to "temporary" road increases from illegal road use.

First, it is not reasonable to construe recurring illegal road use as "temporary" road density increases. The

monitoring reports indicate that public users may repeatedly breach the same closure year after year. See, e.g., AR42:000059-62 (noting that boulders placed in 2015 have been removed and unauthorized users are again circumventing gate on Road 2236). Moreover, the Forest Service may take years to act on known violations. See, e.g., AR42:000061 ("The Clatter Creek gate (268) was included on the 2015 gate repair contract but after the bids came in the Clatter Creek gate was dropped due to repair costs for all gate repairs exceeding available funding. In BY2016 the gate remained damaged and ineffective."); see also AR43:000081-82 (note 2)(during planning for the Hanna Flats logging project, the Forest Service found illegal motorized use on 15.7 miles of road that were not included in the baseline but the agency postponed remedial action until implementation of the logging project; in the 2018 monitoring report, the agency concedes it has still not yet eliminated this illegal use); see also AR232:000767 (finding that four barriers did not effectively prevent motorized use but deferring any action to fix the problems).

Thus, while the Forest Service insists that all breaches are temporary, those same breaches may be recurring or may have lasted for many years prior to discovery and remedial action, resulting in a chronic situation. The situation with the BORZ is a good illustration of this problem S although the Forest Service insists that it fixes all breaches as soon as possible, nonetheless at least four out

of seven BORZ areas chronically fail to meet both the open and total road baseline conditions from the Access Amendment, as shown above in the table in Section B.

Second, even assuming that illegal road use could be construed as "temporary," it still does not have the same effect as lawful temporary road use. A breach of a closure device that results in public motorized use in effect results in an open road. The Access Amendment severely restricts temporary increases in open roads: "immediately following completion of all mechanized harvest and post- harvest slash activities requiring use of the road, to allow motorized public use during the bear summer season prior to the fall bear hunt (i.e., June 16 - August 31) for activities such as personal firewood collection. This public access would only be provided in cases where the mechanized harvest and/or post-harvest slash activities occurred during the same active bear year."

Thus, temporary increases in open roads are limited to a June 16-August 31 window, and may only occur in the same year in which logging activities have already occurred and used that particular road, presumably because grizzlies would have already been displaced from those areas. In contrast, illegal motorized use behind road closure breaches is not limited to a June 16-August 31 window, and is not limited to a single year entry on a road

along and on which logging activities have already been occurring.

Moreover, illegal road use would also constitute an increase in total roads. However, temporary increases in total roads are only permitted if the roads are "effectively" gated to prevent public use during a project, (2) after project use, the roads are treated so as to "effectively prevent[] motorized access" and require no motorized access for maintenance for at least 10 years, and (3) upon project completion, the area is "returned to or below the baseline levels contained in Table 16" of the Access Amendment ROD. Obviously a road that has illegal road use is not "effectively" gated to prevent public use.

Thus, illegal road use does not comply with the restrictions set for lawful increases in temporary roads neither open nor closed in the Access Amendment and therefore cannot possibly have the same effects. It is simply implausible that unlimited illegal road use occurring at any time in any location would have the same effect on grizzly bears as Access Amendment temporary roads that are significantly restricted in both timing and location. Indeed, illegal road use is illegal precisely because the Forest Service has already closed these specific roads to protect grizzly bears. If illegal motorized use occurs on these roads that were closed to protect grizzly bears, it may displace grizzly bears from areas that they would otherwise not be displaced from.

2017 DNA sampling identified only 44 individual bears. 1 Specifically, the recent sampling identified 20 females and 24 males, with 23 bears in the Cabinets and 21 bears in the Yaak portion of the ecosystem.

Recognizing that the grizzly bear population in the Cabinets portion of the ecosystem is likely much smaller than the estimated population for the entire ecosystem, we are likely looking at a much larger percentage of the population being seriously impacted during the life because of this project.

Because of the serious impacts to grizzly bears, please demonstrate compliance with Forest Plan standards relevant to grizzly bears, and analyze the direct, indirect, and cumulative impacts to grizzly bears.

The Forest Service must comply with National Forest Management Act ("NFMA") and its implementing regulations. NFMA requires the Forest Service to ensure that site-specific management projects are consistent with the applicable forest plan. 16 U.S.C. § 1604(i). Thus, the Forest Service must ensure that all aspects of the proposed action comply with the Kootenai Panhandle National Forests Land Management Plan.

The Grizzly Bear Access Amendment set standards for open motorized route density ("OMRD"), total motorized route density ("TMRD"), and retention of core grizzly

bear habitat within the Cabinet-Yaak and Selkirk Recovery Zones bear management units. This Amendment is incorporated as a standard (FW-STD-WL-02) in the Kootenai National Forest Plan at Appendix B. The Forest Service must comply with the Access Amendment TMRD standards during and after project implementation, it not the project directly violates NFMA.

The assessment of prospective effects of the this project on grizzly bears in the is premised on several critical assumptions. First, status of the Cabinet-Yaak grizzly bear population is assumed to have improved since 2012. Second, and related, the KNF assumes that some erosion of security for grizzly bears is therefore permissible, conditioned on a related assumption that security and road access standards employed by the Kootenai National Forest (NF) are sufficient for recovery of grizzly bears in this ecosystem.

All of these assumptions are unwarranted.

Briefly:

- ***The weight of available evidence does not support concluding that population status has improved. For one, the methods used to estimate trend and current population size are beset with a host of problems. For another, the information able to be distilled from demographic data suggests that any improvement has stalled since 2014.***

- ***Variations in population size and trajectory between 1999 and 2010 are more likely attributable to variations in abundance of natural foods—berries in particular—that affect exposure of bears to humans rather than to any increased mitigations. During years of scant berries, bears likely forage more widely and more often end up in conflict situations or exposed to malicious killing.***

- ***The population of grizzly bears in the Yaak is far smaller than even the smallest size posited to be viable by any researcher. Related, the population remains acutely vulnerable to even the smallest increases in bear mortality that are predictably more likely to occur with any increase in road access and associated human activity.***

In May 2019, the United Nations released a report finding that the current rate of species extinction "is already at least tens to hundreds of times higher than it has averaged over the past 10 million years."[1] The mountain caribou in the lower 48 states went extinct just a few months ago. Like the Cabinet-Yaak grizzly bear, the mountain caribou lived primarily on National Forest land, had a population of less than 50 individuals, and was threatened by logging and roads.

[1]https://www.ipbes.net/sites/default/files/downloads/spm_unedited_advance_f or_posting_htn.pdf

Alliance reiterates this point here because the agencies issued similar assurances regarding the mountain caribou that they now issue for the Cabinet-Yaak grizzly bear. For example, in litigation to protect the mountain caribou in this Court, the agencies represented that they would "meet caribou needs" by using the best available science and applying forest plan protections, and not approving logging projects unless they concluded that the project was "not likely to adversely affect" the mountain caribou. Jayne v. Sherman, 706 F.3d 994, 1001 (9th Cir.2013)(quoting FWS Biological Opinion).

In Jayne, these statements were accepted as adequate protections for the mountain caribou. Now the mountain caribou is extinct. It is not too late to avoid the same fate for the Cabinet-Yaak grizzly bear. As members of Congress stated when they passed the ESA: "The agencies of Government can no longer plead that they can do nothing about [the grizzly bear]. They can, and they must. The law is clear." Tennessee Valley Auth. v. Hill, 437 U.S. 153, 184 (1978) (quoting Congressional Record).

The preservation of endangered species takes "priority over the 'primary missions' of federal agencies." Accordingly, courts must "afford[] endangered species the highest of priorities," and act with "institutionalized caution" when reviewing ESA cases. Cottonwood Envtl. Law Ctr. v. USFS, 789 F.3d 1075, 1091 (9th Cir.2015). This Court holds that the "fundamental principle [of institutionalized caution] remains intact and will continue to guide district courts when confronted with requests for injunctive relief in ESA cases." Id. Although the district court did not apply this fundamental principle in this case, this Court may now remedy that error by issuing a temporary injunction pending appeal to preserve the status quo until a final decision is issued on the merits.

The FS should be identifying key habitat components for grizzly bears for prioritizing road density reductions (Proctor, et al., 2020) so populations can recover.

Mattson state Proctor et al. (2017) (attached) "is highly relevant to judging the trade-off between proposed forest treatments and habitat security for grizzlies, especially vis-à-vis any prospective increase in huckleberry production and hazards associated with road access" and list "relevant recommendations from Proctor et al. (2017)."

There is no analysis in the EA regarding existing road densities located outside of and between BMUs, both at present and during project implementation. The forest plan BO states, "In BORZ, we anticipate that high linear miles of road are likely causing adverse effects on grizzly bears."

Moreover, the questionable definition of decommissioning used in this EA also makes it impossible to tell if roads will be effectively closed or otherwise prevent public use. Even roads with berms allow public access over and above completely obliterated roads.

The Forest Plan allows "temporary" reductions in Core and "temporary" increases in road density as if the BMUs will then get reprieve from such "temporary" adverse effects. However, the Forest Plan has no genuine limitations on how much, how often and for how long these "temporary" adverse effects will occur or persist. The FS basically takes the position that upon completion of project-related activity, amount of road will be consistent with the Access Amendment. The question is, *when*? **When** will this ever be realized, if there is continuous, temporally and spatially overlapping road building and logging activities? And for how long?

So the numbers for Open Motorized Roads and Total Motorized Roads in Tables are disingenuous, misleading at best.

The FS is aware of the best Plan direction it has adopted to date, including the access amendment. It established Open Motorized Route Density (OMRD)/Total Motorized Route Density (TMRD)/ Security Core indices. These are based upon the scientific information concerning security from roads and road density requirements for grizzly bears as found in Mace and Manley, 1993 and Mace et al., 1996. Also see McLellan, et al., 1988.

The EA does not demonstrate that project implementation is consistent with the best available science, so EA and Draft DN violate the ESA, NFMA, the 2012 Planning Rule and NEPA.

According to the Cabinet-Yaak Grizzly Bear Recovery Area 2011 Research and Monitoring Progress Report (Kasworm, W.F. et al, 2012): In 2011 there were 5 known mortalities, 3 (60%) of which occurred on USFS lands; in 2010 there were 4 known mortalities, 2 (50%) which occurred on USFS lands; in 2009 there were 4 known mortalities, 3 (75%) which occurred on USFS lands; in 2008 there were 4 known mortalities, none of which occurred on USFS lands; in 2007 the 1 known mortality occurred on USFS lands (100%); in 2006, 2005, and 2004 there were 8 known mortalities, none of which occurred on USFS lands; in 2002 there were 7 known mortalities, 2 (29%) of which occurred on USFS lands; in 2001 there were 4 known mortalities, 1 (25%) of which occurred on USFS lands. Thus the trend has been an increase in grizzly bear mortalities on USFS lands. This should have been disclosed and considered in the Black Ram grizzly bear analysis.

The Forest Plan Biological Opinion (BO) states:
The Revised Plan also incorporates the Guidelines of the IGBC (USFS 1986, entire). The IGBC Guidelines are applied across the grizzly bear Management Situations (MS) (1 through 5) as delineated throughout the two recovery zones in the KNF. All of the lands within each recovery zone have been delineated into one of the management situations. As information and science related to grizzly bears evolved, the USFS began managing MS1 and MS2 essentially the same on NFS lands, according to direction for MS1. Management focuses on grizzly bear habitat maintenance, improvement and minimization of grizzly- human conflict. **Management decisions will favor the needs of the grizzly bear when grizzly habitat and other land use values compete.**

(Emphasis added.) Black Ram project impacts would not consistent with the requirement to prioritize the needs of the grizzly bear for the applicable Management Situations.

Additional direction in the Interagency Grizzly Bear Guidelines (IGBG) (1986) for MS 1 habitat included the following for timber management:

Logging and/or fire management activities which will adversely affect grizzly bear populations and/or their habitat will not be permitted; adverse population effects are population reductions and/or grizzly positive conditions; adverse habitat effects are reduction in habitat quantity and/or quality.

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

- Declined the opportunity to select an Access Amendment alternative that would have provided a higher level of habitat protections for grizzly bears and for a whole host of other wildlife species;

- Continued to neglect its duty to identify the forestwide minimum road system under the Travel Management Rule Subpart A;

- Recommended a minimum of the inventoried roadless areas in the CYE Recovery Zone (RZ) for Wilderness in the RFP; and

- Approved more major timber sales and mining in the CYE RZ.
  Such actions reveal a practice and pattern of failing to prioritize the needs of the grizzly bear. The FS must undertake a full cumulative effects analysis that considers all management activities (public and private) in the CYE.
  We also incorporate into these comments Louisa Willcox's commentary entitled "The Future of the Cabinet-Yaak Grizzlies" (https://www.counterpunch.org/2017/09/08/95644/).
  Grizzly bears are winter-sleepers rather than true hibernators. If high density motorized routes are known to disturb, displace, habituate, and raise mortalities among grizzlies in spring, summer, and fall, there's no logical, or scientific reason to believe they don't do the same to sleeping bears in winter. The BO states:
  In the CYE and NCDE, incidental take may occur where late season snowmobiling overlaps with grizzly bear post-denning habitat. The incidental take is expected to be in the form of harassment to individual female grizzly bears and/or cubs caused by premature den emergence or premature displacement from the den site area, resulting in reduced fitness of females and cubs. We expect the amount and extent of take would be very low.
  Cumulative incidental take under the revised forest plan has not been low.
  The BO also states:
  The Revised Plan's desired condition for patches which includes a range of larger opening sizes may result in adverse effects if lack of cover leads to under use of foraging habitat or increased risk of human-grizzly bear conflicts causing mortality of a grizzly bear. Openings created by timber harvest, depending on site conditions, may retain features that interrupt the line of sight and provide cover for bears (J. An-

derson 03/12/2012 pers. comm.).

The FS does not show that the openings to be newly created by the project don't exceed levels of allowed incidental take. The FS's July 18, 2019 "Request to Exceed 40-Acre Opening Limitation for the Black Ram Project" indicates the FS is proposing to use "even-aged silviculture" to create "21 even-aged regeneration opening made of 36 proposed harvest units totaling approximately 2,016 acres." From smallest to largest, openings would be 41, 44, 44, 48, 50, 53, 53, 60, 66, 81, 85, 94, 96, 104, 121, 123, 152, 169, 240, and 292 acres.[10] These 40+ acre clearcuts would comprise 3.15 square miles with no cover, essentially lethality zones for grizzly bears. Together with the smaller Black Ram timber project clearcuts, this would be almost 4 square miles.

As explained elsewhere in this Objection, the EA makes no meaningful distinction between the types of "regeneration" logging methods to be utilized. Although commonly known that clearcuts leave fewer trees that seed tree cuts, and seed tree cuts leave fewer trees than shelterwood cuts, this EA and DN do not require the FS to meet any measurable, numerical

[10] The FS's "Request..." document actually lists 20—not 21 openings. 63

criteria or distinctions for such cuts during implementation. The best the EA does is provide blurry forest stand pizza diagrams as copied here via screenshot:

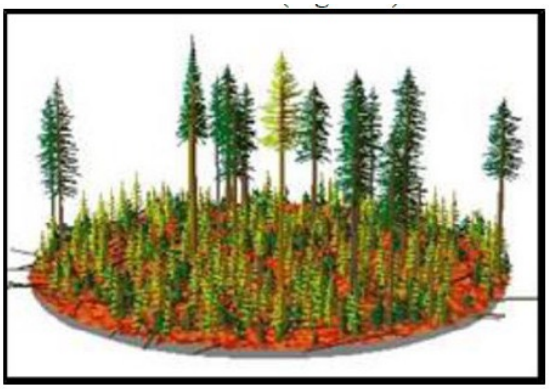


Figure 3. Simulation of a shelterwood cut.

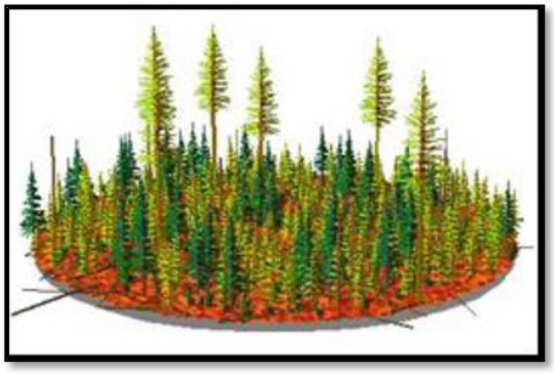


Figure 4. Simulation of a seed-tree cut

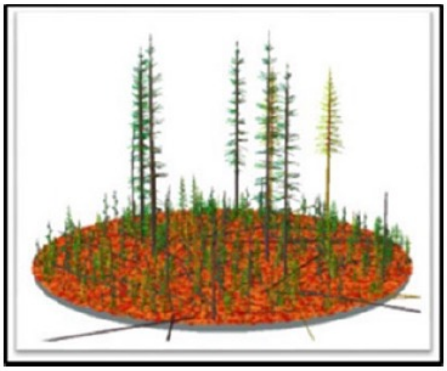


Figure 5. Simulation of a clearcut with reserves

And the pizza diagram of “Improvement Cut” isn’t much different than that of Shelterwood:

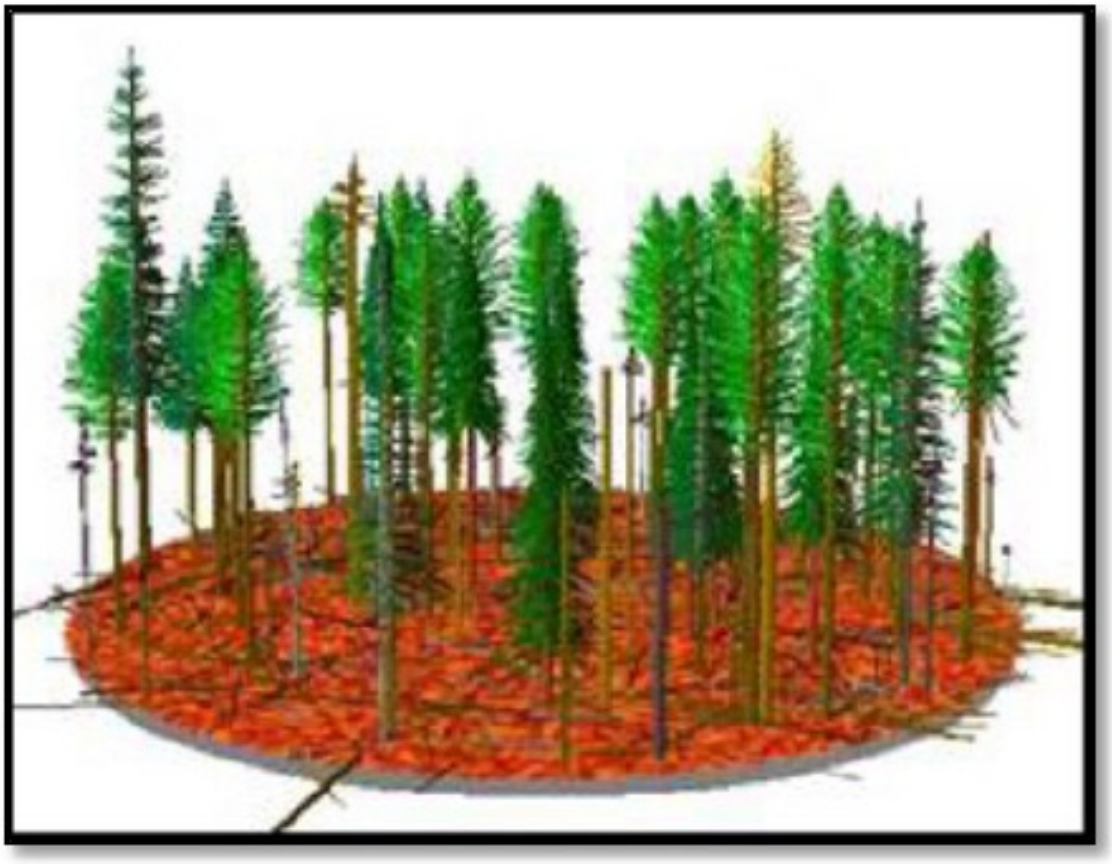


Figure 1. Simulation of an Improvement Cut

At best these diagrams represent the logged areas a number of years after cutting since they don't show the slash, burned vegetation, damage to leave trees and raw earth from machine impacts—

and this assumes overcoming regeneration challenges that increase every year due to climate change. To provide a clearer perspective, below are post-monitoring photographs of shelterwood cuts implemented for the Orogrande Community Protection Project in the Nez Perce-Clearwater National Forest:







The conditions shown immediately above better represent the lack of cover grizzly bears would face for at least 4 square miles than do the EA diagrams. And this doesn't even include the 1,262 acres of "Improvement Cuts" with poorly specified retention criteria.

In the CYE, the population size is far below the recovery goal of 100 bears (Kendall et al. 2016), with human-caused mortality being the primary factor keeping the population in peril. Any conclusion that the CYE population is stable or increasing is not based in good science.

The effects to grizzly bears from the project include potential disturbance or displacement due to human presence, road construction and use, motorized use and other mechanized equipment. The presence of these activities and the presence of roads leads grizzly bears to avoid otherwise suitable habitat.

The EA doesn't adequately analyze and disclose cumulative impacts on land of other ownerships due to their unknown duration, location, and intensity.

The FS still has not provided solid scientific basis for its assumption that an isolated small core habitat of a few acres are considered just as useful to grizzly bears as the acres in a 10,000-acre block of core.

The EA inadequately analyzes the effectiveness of road closures, for the purpose of eliminating human access. Again, we refer to AWR's Amended Complaint for case CV-18-67-DWM for the purposes of explaining how roads affect wildlife, how pervasive are ineffective closures on national forest land, and also for forest plan consultation requirements.

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

- ***Alternative D Modified would convert the most roads and consequently would provide the highest degree of habitat security and a lower mortality risk to the Canada lynx. (P. 70.)***

- ***Alternative D Modified would provide a higher degree of habitat security (for gray wolves) than Alternative E Updated... (P. 74.)***

- ***Alternative D Modified ... could contribute to a cumulative increase in habitat security for black-backed woodpeckers (and pileated woodpeckers) because timber sales or other ground disturbing or vegetation management activities would be less likely to occur in Core Areas. Newly dead trees that support wood boring beetle populations would be less likely to be removed during vegetation management activities or by woodcutters. Alternative D Modified could provide slightly more secure habitat than Alternative***

E Updated. (P. 84, 112.)

- *Alternative D Modified ... could contribute to a cumulative increase in habitat security because timber sales or other ground disturbing or vegetation management activities would be less likely to occur in Core Areas. Snags would be less likely to be removed during vegetation management activities or by woodcutters. Alternative D Modified could provide slightly more secure habitat(for Townsend's big-eared bats, flammulated owls, fringed myotis bats) than Alternative E Updated. (Pp. 85, 86, 95.)*

- *Alternative D Modified and Alternative E Updated provide different levels of habitat security (for peregrine falcon, fisher, wolverine) based on the relative amount of wheeled motorized vehicle access. (Pp. 87, 89, 91.)*

- *Alternative D Modified, which closes the most miles of road in suitable habitat, would be the preferred alternative for the western toad. (P. 101.)*

- *Alternative D Modified closes the most miles of road in suitable habitat and would provide the greatest benefits for the goshawk. (P. 103.)*

- ***Alternative D Modified, which closes the most miles of road in suitable habitat, would be the best Alternative for elk. (P. 104.)***

- ***Alternative E Updated would provide some security and reduced vulnerability (for moose), but not as much as Alternative D Modified. (P. 104.)***

- ***Although Alternative D Modified and Alternative E Updated would benefit mountain goats, Alternative D Modified would improve security and reduce the risk of displacement more than Alternative E Updated. (P. 109.)***

- ***Alternative D Modified would improve security (for pine marten) more than Alternative E Updated. (P. 110.)***

  Great Bear Foundation et al., 2009 discusses in great detail how the Access Amendment Alternative eventually selected leads to a significant deterioration in an already unacceptable baseline condition for grizzly bears. The scientific discussions in Great Bear Foundation et al. 2009, as well as AWR comments on the Access Amendment DSEIS refute the FS's claim to be utilizing the best available science for the grizzly bear.

  The FS fails to recognize that Bear Management Units (BMUs) do not protect enough habitat to satis-

fy most individual grizzly bears' needs in the CYE. "Our analysis shows that grizzly bears have little or no opportunity to select home ranges with lower road density or higher percentages of core... Because grizzly bears could not have selected home ranges having more core area and lower road densities, and there has been no growth in the population, there is no basis to conclude the proposed access standards are sufficient to insure the recovery of the Cabinet-Yaak and Selkirk grizzly bear populations" (Merrill 2003). The FS has no plan to provide scientifically defensible habitat protections outside the CYE that would allow for a larger protected zone and/or natural augmentation from outside the CYE. The FS has no cogent methodology that provides scientifically defensible habitat protections inside the CYE that would facilitate functional connectivity between and among BMUs. The Forest Plan fails to provide any scientific basis that baseline road densities outside the CYE can support grizzly bear population natural augmentation or recovery.

Schwartz et al. (2010) noted that management for grizzly bears requires not only the provision of security area, but control of open road densities between security areas. Otherwise, grizzly bear mortality risks will be high as bears attempt to move across highly roaded landscapes to another security area. The forest plan lacks direction regarding road densities located outside of and between security areas. The Forest Plan is not consistent with best available sci-

ence on road density in grizzly bear habitat outside of Bear Management Units.

Please find Dr. Mattson's comments on the Black Ram project attached because the same issues apply here.

The project is in violation of NEPA, NFMA, the access amendment to the Forest Plan, the APA and the ESA for the reasons we mentioned above.

On November 28, 2011 the FS issued the Record of Decision for the Revised Forest Plan Amendments for Motorized Access Management within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones on the Kootenai, Idaho Panhandle and Lolo National Forests (aka "Access Amendments"). Alliance fully participated in the public process during the development of the Access Amendments, and incorporates its comments and appeal of that Decision within this objection. The Swamped project is in violation of the Revised Forest Plan Amendments for Motorized Access Management within the Selkirk and Cabinet-Yaak Grizzly Bear Recovery Zones on the Kootenai, Idaho Panhandle and Lolo National Forests (aka "Access Amendments").

Please find attached some relevant studies on the secure habitat needs for grizzly bears (pertaining to a certain distance from motorized routes and patch size) Mattson 1993, Gibeau 2002, Proctor 2017, Proctor 2018, Proctor 2018a, and Schwartz 2010.

Please also find attached the 1994 and 1998 IGCB grizzly reports and the 2011 ROD for Forest Plan Amendment for Motorized Access in the Selkirk/Cabinet-Yaak ecosystem.

Please also find attached Dr. David Mattson's declaration about the 10 acre secure grizzly habitat not being big enough for grizzlies and therefore apply to the Swamped project since it is using 250 acre secure grizzly habitat.

Mattson concluded:
14.1. It is my expert opinion that the US Forest Service analysis of the SPLAT project is not a valid

basis for supporting its conclusions regarding how and to what extent individual grizzly bears, as wellas the grizzly bear population in the contiguous U.S., will likely be affected because: (1) the grizzly bear population is not yet genetically and evolutionarily viable, despite Recovery Criteria having been met within the Greater Yellowstone PCA; (2) the 1998 baseline used to assess levels of habitat security within the PCA is premised on invalid assumptions; (3) the methods used to calculate habitat security produce inflated – if not altogether meaningless – estimates of true habitat security for grizzly bears; (4) the assessment of connectivity issues related to the project and achievement of population viability was arbitrary and capricious; and (5) the analysis of impacts on grizzly bear habitat quality and security within project boundaries was deficient for numerous reasons.

14.2. Given the facts of this declaration, it is my expert opinion that the following conclusion reported in the SPLAT Wildlife Report and EA understates the magnitude and duration of more local impacts on grizzly bears: "...secure habitat would be temporarily reduced below the already degraded secure habitat baseline in the Madison #2 and Henry's Lake #2 Subunits, the Proposed Action may affect, and is likely to adversely affect the grizzly bear."

14.3. Given the facts of this declaration, it is my expert opinion that the following conclusion reported in the SPLAT Wildlife Report as a basis for the Finding of No Significant Impact is not valid, defensible, or precautionary: "The effects described...do not represent a significant adverse effect on this species because they would largely be temporary, would provide for diverse food resources and forest structure in the long term, and would meet all Forest Plan standards related to grizzly bear and their habitat."

15. As currently proposed, it is my expert opinion that the South Plateau Landscape Area Treatment Project will not only harm numerous individual grizzly bears, but also adversely affect recovery and ultimate long-term viability of grizzly bears, not only in the Greater Yellowstone Ecosystem, but also the contiguous United States.

The Forest Service is also not counting logging roads as open. The 1998 baseline is old and based on outdated science in violation of NEPA, NFMA, the APA and the ESA as Dr. Mattson points out

The project will increase road density which causes grizzlies to leave the area.

Bears leave if there is more than one mile per square mile. The Swamped Project is in violation of NEPA, NFMA, the APA, and the ESA. The Revised Forest Plan's direction for grizzly bears is in violation of NEPA because it is so compacted that the public can not understand it. The Judith Springs project is in violation of the ESA because it does not protect grizzly bear habitat.

Is the project in compliance with the Forest Plan old growth

standards? What definition of old growth are you using?

What definition of old growth does the Forest Plan use?

Page 36 of the EA states:
Grizzly Bear
Cumulatively, Grizzly bears in the Fisher BORZ and Libby GBAU would experience mostly short-term, minor, and localized disturbances from ongoing and proposed timber and road management activities. These short-term effects include temporary disturbance from active work areas, brief loss of screening cover, and slightly increased human presence along roads during project activities.

Please formally consult with the U.S. FWS on the effect of the project on Wolverines, Grizzlies, Canada lynx, Yellow-billed cuckoo, Spalding's catchfly, Bull Trout, Kootenai River white sturgeon, whitebark pine, Suckley's cuckoo bumblebee and Monarch Butterfly.

Elk Security

Page 78 of the SEA states: "The project would maintain the existing amount of elk security in each analysis unit because there would be no change to any motorized routes open during the firearms hunting season. As such, there would be no impact to elk security as it is defined in the 2015 Forest Plan."

The best available science, Christensen et al (1993),recommends elk habitat effectiveness of 70% in summer range and at least 50% in all other areas where elk are one of the primary resource considerations. According to Figure 1 in Christensen et al (1993), this equates to a maximum road

density of approximately 0.7 mi/sq mi. in summer range and approximately 1.7 mi/sq mi. in all other areas.

Do any of the 6th Code watersheds in the Project area meet either of these road density thresholds? It appears the Project area as a whole also far exceeds these thresholds. Please disclose this type of Project level or watershed analysis on road density.

Christensen et al (1993) state that if an area is not meeting the 50% effectiveness threshold of 1.7 mi/sq mi, the agency should admit that the area is not being managed for elk: "Areas where habitat effectiveness is retained at lower than 50 percent must be recognized as making only minor contributions to elk management goals. If habitat effectiveness is not important, don't fake it. Just admit up front that elk are not a consideration." The Project EIS does not make this admission.

The Forest Service should provide an analysis of how much of the Project area, Project area watersheds, affected landscape areas, or affected Hunting Districts provide "elk security area[s]" as defined by the best available science, Christensen et al (1993) and Hillis et al (1991), to be com-

prised of contiguous 250 acre blocks of forested habitat 0.5 miles or more from open roads with these blocks encompassing 30% or more of the area.

Please provide a rational justification for the deviation from the Hillis security definition and numeric threshold that represent the best available science on elk security areas.

Are all roads called for being closed under the Travel management Plans closed? If not how many miles of roads are still open that the Travel management Plan Decision authorize to be closed.

How many road closure violations have there been in the Libby Ranger District of the Kootenai National Forest in the last 5 years?

Does the elk habitat effectiveness and security areas calculations take into account ineffective road closures?

Does the elk habitat effectiveness and security areas calculations take into account roads that are still open that the Travel Plan says are closed?

The purpose and need of the project is to “Promote resilient vegetation conditions by managing for landscape-level

vegetation patterns, structure, patch size, fuel loading, and species composition."

In dozens of places the EA uses the word "resilient" or "resilience" in terms of how the project increases it, or how it's chasing Forest Plan DCs by increasing the "resilience" of the ecosystem or some aspect of it. The Forest Plan defines "resilience" as: "The ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change." The Forest Plan defines "restoration" in part, as "the process of assisting the recovery of resilience." And the Forest Plan defines Forest Health as "An ecological perspective that looks at the resiliency of an ecosystem and its ability to be sustainable."

However, the Swamped EA provides absolutely no operational definition of resilience that would allow anybody to actually measure the resilience of the ecosystem as it stands now, or measure the change in resilience following project activities. An essential component of an operational definition is measurement. A simple and accurate definition of measurement is the assignment of numbers to a variable in which we are interested. In this case, the variable in which we are interested is resilience, and how the FS measures it in these ecosystems.

What is your definition of resilience?

How can you measure if the project area is more resilient when the project is done?

Resilience is a scientific term that may be used to characterize forest ecosystems. However, mostly what we read about resilience from the EA and Forest Plan is that it's what happens when the forest is managed (i.e., mostly logged or prescribe burned), and the more the forest is logged and burned, the more resilient it becomes. Also we read that nothing that happens naturally, without management, will increase resilience. In other words, from the FS's perspective, resilience can only be manufactured, engineered, or imposed by management. So the term "resilience" as used by the FS is invalid, rendering much of the analyses confusing and misleading.

The fact that, "the entire Kootenai National Forest" was designated by the FS as "insect and disease threats" (KNF's Cover Letter for the Purple Marten Proposed Action) further illustrates the illegitimacy of the FS's entire management approach. The KNF has been claiming for decades that its timber sales are managing to prevent excessive insect and disease impacts, so if anything, this forest wide designation stands as the agency's own admission of its failure.

There is a need to "Improve big game winter range conditions and promote forage opportunities" but such a need is not validated. It is merely thinly veiled justification for logging.

Openings greater than 40 acres.

Table 6 on pages 18-19 of the EA states there will be 2113 acres of clearcuts with 17 clearcuts bigger than 40 acres.

When are you going to ask people to comment on the openings great than 40 acres? The Forest Service is required to open a 60 day comment period on openings greater than 40 acres.

The EA fails to show that the openings to be newly created by the project don't exceed levels of current incidental take.

The current management strategy allows "temporary" reductions in Core and "temporary" increases in road density as if the habitat would then get reprieve from such "temporary" adverse effects. However, the FS recognizes no genuine limitations on how much, how often and for how long these "temporary" current protections by allowing such harmful activities in Security Core as the opening of roads to public motorized uses like firewood gathering, unlimited amounts of non-motorized trails and human activity, and logging projects that reduce Security Core for half a decade.

Moreover, excusing logging roads from limits on Total Motorized Route Density even though they have not been decommissioned, have not been removed from the road system, and are instead being "stored" for future logging—which also makes them more vulnerable to continued use as trails.

The analysis of large openings includes no actual analysis as to why large openings will not significantly disrupt wildlife habitat, including elk and MIS. There was also no analysis as to where these large openings will be created as per suitable and unsuitable timberlands. What would resource benefits be for large openings on unsuitable timberlands?

What would fish and wildlife benefits be for large openings on unsuitable timberlands?

What would fish and wildlife benefits be for large openings on unsuitable timberlands?

The project is in violation of NFMA, the Forest Plan, NEPA, and the APA for not getting approval from the Regional Office for openings larger than 40 acres.

CANADA LYNX VIABILITY

The Wildlife report states on pager 35 that the project may affect likely to adversely affect Canada Lynx. The EA and FONI are in violation of the ESA, NEPA, NFMA, the Forest Plan and the APA.

Please find attached “Correlates of Canada Lynx Reproductive Success in Northwestern Montana” by Megan K. Kosterman and “Understanding and predicting habitat for wildlife conservation: the case of Canada lynx at the range periphery” by HOLBROOK et al which confirms Kosterman’s findings.

Does the action alternative comply with Kosterman and Holbrook’s recommendations?

1) USFS needs to take a hard look at impacts to lynx under NEPA, apply the lynx conservation measures and standards of the NRLMD, and consult on lynx via section 7 of the ESA b/c the best available science -- including recent tracking surveys conducted by WTU -- confirm lynx's presence and use of the area;

(3) USFS has failed to survey for lynx as required by the

Biological Opinion on the Northern Rockies Lynx Management Direction (NRLMD).

In order to meet the requirements of the FS/USFWS Conservation Agreement, the FS agreed to insure that all project activities are consistent with the Lynx Conservation Assessment and Strategy (LCAS).

LCAS requirements include:

Project planning—standards.
1. Within each LAU, map lynx habitat. Identify potential denning habitat and foraging habitat (primarily snowshoe hare habitat, but also habitat for important alternate prey such as red squirrels), and topographic features that may be important for lynx movement (major ridge systems, prominent saddles, and riparian corridors). Also identify non-forest vegetation (meadows), shrub-grassland communities, etc.) adjacent to and intermixed with forested lynx habitat that may provide habitat for alternate lynx prey species.

2. Within a LAU, maintain denning habitat in patches generally larger than 5 acres, comprising at least 10 percent of lynx habitat. Where less than 10 percent denning habitat is currently present within a LAU, defer any management actions that would delay development of denning habitat structure.

3. Maintain habitat connectivity within and between LAUs.

Programmatic planning-standards.

1. Conservation measures will generally apply only to lynx habitat on federal lands within LAUs.

2. Lynx habitat will be mapped using criteria specific to each geographic area to identify appropriate vegetation and environmental conditions. Primary vegetation includes those types necessary to support lynx reproduction and survival. It is recognized that other vegetation types that are intermixed with the primary vegetation will be used by lynx, but are considered to contribute to lynx habitat only where associated with the primary vegetation. Refer to glossary and description for each geographic area.

3. To facilitate project planning, delineate LAUs. To allow for assessment of the potential effects on an individual lynx, LAUs should be at least the size of area used by a resident lynx and contain sufficient year-round habitat.
4. To be effective for the intended purposes of planning and monitoring, LAU boundaries will not be adjusted for individual projects, but must remain constant.
5. Prepare a broad-scale assessment of landscape patterns that compares historical and current ecological processes and vegetation patterns, such as age-class distributions and patch size characteristics. In the absence of guidance developed from such an assessment, limit disturbance within each as follows: if more than 30 percent of lynx habitat within an LAU is currently in unsuitable condition, no further reduction of suitable conditions shall occur as a result o vegetation management activities by federal agencies.

Project planning-standards.
1. Management actions (e.g., timber sales, salvage sales)

shall not change more than 15 percent of lynx habitat within a LAU to an unsuitable condition within a 10- year period.

Programmatic planning-standards.
1. Identify key linkage areas that may be important in providing landscape connectivity within and between geographic areas, across all ownerships.
2. Develop and implement a plan to protect key linkage areas on federal lands from activities that would create barriers to movement. Barriers could result from an accumulation of incremental projects, as opposed to any one project.

Please demonstrate that project activities are consistent with above and all other applicable programmatic and project requirements.

The U.S. Court of Appeals for the Ninth Circuit hold that "[o]nce an agency is aware that an endangered species may be present in the area of its proposed action, the ESA requires it to prepare a biological assessment . . . ." Thomas v. Peterson, 753 F. 2d 754, 763 (9thCir. 1985). If the biological assessment concludes that the proposed action "may affect" but will "not adversely affect" a threatened or endangered species, the action agency must consult informally with the appropriate expert agency. 50 C.F.R. §§ 402.14 (b)(1), 402.12(k)(1).

Canada lynx are listed under the ESA.

Canada lynx may be present in the project area and the proposed project may affect lynx and lynx critical habitat

by temporarily increasing road density, removing vegetative cover, and engaging in mechanized activities that could displace lynx.

Please complete a biological assessment for lynx and formally consult with USFWS regarding the project's potential impacts on lynx and lynx critical habitat.

Grizzly Bears

In May 2019, the United Nations released a report finding that the current rate of species extinction "is already at least tens to hundreds of times higher than it has averaged over the past 10 million years."[1] The mountain caribou in the lower 48 states went extinct just a few months ago. Like the Cabinet-Yaak grizzly bear, the mountain caribou lived primarily on National Forest land, had a population of less than 50 individuals, and was threatened by logging and roads.

Alliance reiterates this point here because the agencies issued similar assurances regarding the mountain caribou that they now issue for the Cabinet-Yaak grizzly bear. For example, in litigation to protect the mountain caribou in this Court, the agencies represented that they would "meet caribou needs" by using the best available science and applying forest plan protections, and not approving logging projects unless they concluded that the project was "not likely to adversely affect" the mountain caribou. Jayne v. Sherman, 706 F.3d 994, 1001 (9th Cir.2013)(quoting FWS Biological Opinion).

In Jayne, these statements were accepted as adequate protections for the mountain caribou. Now the mountain caribou is extinct. It is not too late to avoid the same fate for the Cabinet-Yaak grizzly bear. As members of Congress stated when

[1]https://www.ipbes.net/sites/default/files/downloads/spm_unedited_advance_f or_posting_htn.pdf

they passed the ESA: "The agencies of Government can no longer plead that they can do nothing about [the grizzly bear]. They can, and they must. The law is clear." Tennessee Valley Auth. v. Hill, 437 U.S. 153, 184 (1978) (quoting Congressional Record).

The preservation of endangered species takes "priority over the 'primary missions' of federal agencies." Accordingly, courts must "afford[] endangered species the highest of priorities," and act with "institutionalized caution" when reviewing ESA cases. Cottonwood Envtl. Law Ctr. v. USFS, 789 F.3d 1075, 1091 (9th Cir.2015). This Court holds that the "fundamental principle [of institutionalized caution] remains intact and will continue to guide district courts when confronted with requests for injunctive relief in ESA cases." Id. Although the district court did not apply this fundamental principle in this case, this Court may now remedy that error by issuing a temporary injunction pending appeal to preserve the status quo until a final decision is issued on the merits.

The Wildlife report states on pager 5 that the project may affect likely to adversely affect grizzly bears.

The action area lies within the Fisher Bears Outside Recovery Zone (BORZ) polygon of the Cabinet-Yaak Ecosystem (CYE) and the Libby Grizzly Bear Analysis Unit (GBAU). Presence of transient bears is suspected to occur within or adjacent to the project area. Temporary disturbance may occur if a bear is present in the immediate vicinity while project activities are ongoing.

Page 6 of the Wildlife Report states:

Access management activities have been identified for all roads used for the project, except yearlong open roads, to limit the amount of open road available to public motorized use during and post-project. However, project activities may cause temporary disturbance and avoidance of the affected areas for the next 10-25 years. Increased motorized use in an area with a low amount secure habitat may contribute to short-term adverse effects to female grizzly bears that may be using the Fisher BORZ and Libby GBAU. Although the project will see an overall increase in secure habitat acres with the expansion of an existing blocks of secure habitat and the creation of new blocks of secure habitat, proposed road status changes will permanently affect some existing blocks of secure habitat. Temporary decreases in secure habitat may contribute to short-term adverse effects to female grizzly bears that may be using the Fisher BORZ and Libby GBAU. Therefore, implementation of the Swamped

Project's proposed activities would result in a determination of may affect, likely to adversely affect to grizzly bears. The potential for adverse effects would be to individuals and not the species.

10-25 years is not short term. Grizzlies teach their cubs what habitat to avoid. Over 10-25 years, multiple generations of grizzlies could be aught to avoid the BOTZ in the project area

The Access Amendment is the product of years of public interest litigation on behalf of the imperiled Cabinet-Yaak grizzly bear. The well-established scientific consensus is that roads pose the most imminent risk to this grizzly population. Ninety percent of this population's Recovery Zone habitat is located on public National Forest lands. Thus, the federal government has the power to limit road density for grizzly bear protection on the vast majority of its habitat and thereby prevent the extinction of this grizzly population. Ostensibly, this is the purpose of the Access Amendment.

However, since the Access Amendment was approved in 2011, the U.S. Forest Service has prepared multiple years of monitoring reports regarding its implementation of road closures in grizzly habitat. These monitoring reports establish that these road closures are routinely violated and therefore ineffective: members of the public regularly ignore signs, drive around gates or earthen berms, remove

obstructions such as boulders or logs, or simply create their own new motorized routes.

Although these monitoring reports are only required for the Recovery Zone, there are incidental observations in these reports regarding closure violations found in grizzly habitat outside of the Recovery Zone, in the government-designated "Bears Outside Recovery Zone" or "BORZ" areas.

In 2017, Alliance hired its own investigators to determine whether there were road closure violations in these areas.

Due to time and funding constraints, this initial investigation was limited in scope to the Tobacco and Clark Fork "Bears Outside Recovery Zone" areas. As a result of one visit to each required closure device in these two areas, the investigatorsdiscovered numerous failed closure devices, roads that were categorized as closed but were open upon inspection, and illegal user-created roads that were simply unaccounted for in the Forest Service road databases. Thus, the independent investigation confirms the fact that these road closures are routinely violated both inside and outside the Recovery Zone.

The recurring problem of road closure failures undermines the foundation of the Access Amendment management regime, which relies on these road closures to achieve certain densities of open and total roads both inside and outside the Recovery Zone. The agencies must address this

problem and its impacts in an updated ESA consultation for the Access Amendment. The agencies must also address this problem and its impact in an updated ESA consultation and in the Knotty Pine project and is another reason that an EIS should be written for the Knotty Pine Project.

The EA states that you are proposing to build 1.2 miles of temporary roads. When the KNF can not ensure that close roads remain closed, will this project just increase the miles of motorized roads in grizzly bear habitat?

How does the FP complies with the "best available science" on grizzly recovery, or the 2012 Planning Rule that required Forest to emphasize "Connectivity?"

The majority of the Cabinet-Yaak Grizzly Bear Ecosystem – 90% – is National Forest land, managed by the Forest Service. 64 Fed. Reg. 26725, 26728 (May 17,1999). In terms of all of the human uses that affect grizzly bears, "[r]oads probablypose the most imminent threat to grizzly habitat today []. The management of roads is one of the most powerful tools available to balance the needs of people with the needs of bears." Accordingly, the U.S. Fish & Wildlife Service (FWS) states: "It is strongly recommended that road management be given the highest priority within all recovery zones." Roads pose a threat to grizzly bears because roads provide humans with access into grizzly bear habitat, which leads to direct bear mortality from accidental shootings and intentional poachings.

Human access also leads to indirect bear mortality by creating circumstances in which bears become habituated to human food and are later killed by wildlife managers. Human access also results in indirect mortality by displacing grizzly bears from good habitat into areas that provide suboptimal habitat conditions.

Displacement may have long term effects: “Females who have learned to avoid roads may also teach their cubs to avoid roads. In this way, learned avoidance behavior can persist for several generations of bears before they again utilize habitat associated with closed roads.” Both open and closed roads displace grizzly bears: “grizzlies avoided roaded areas even where existing roads were officially closed to public use []. Females with cubs remained primarily in high, rocky, marginal habitat far from roads. Avoidance behavior by bears of illegal vehicular traffic, foot traffic, and/or authorized use behind road closures may account for the lack of use of areas near roads by female grizzly bears in this area.

This research demonstrated that a significant portion of the habitat in the study area apparently remained unused by female grizzlies for several years. Since adult females are the most important segment of the population, this lack of use of both open-roaded and closed-roaded areas is significant to the population.” In addition to having a significant impact on female grizzly bears, displacement may also negatively impact the survival rates of grizzly cubs: “survivorship of the offspring of females that lived in unroaded,

high elevation habitat was lower than that recorded in other study areas in the [Northern Continental Divide Ecosystem].

The majority of this mortality was due to natural factors related to the dangers of living in steep, rocky habitats. This is important in that the effects of road avoidance may result not only in higher mortality along roads and in avoidance of and lack of use of the resources along roads, but in the survival of young when their mothers are forced to live in less favorable areas away from roads."

Current peer-reviewed science still finds that roads have the most significant impact on grizzly bear survival: "[o]f all the covariates we examined, the amount of secure habitat and the density of roads in nonsecure habitat on public lands had thegreatest effect on grizzly bear survival."

In 1999, FWS found that the Cabinet-Yaak grizzly population was "in danger of extinction" due in part to the habitat alteration and human intrusion related to the cumulative impacts of timber harvest and its associated road construction. 64 Fed. Reg. 26732. Today, twenty years later, the Cabinet-Yaak grizzly population is still facing the same threats and still warranted for uplisting from "threatened" to"endangered." All. for the Wild Rockies v. Zinke, 265 F.-Supp.3d 1161, 1182 (D. Mont. 2017).

Roads, even if nominally "temporary," can still have long-lasting generational displacement effects on grizzly bears because females teach their cubs to avoid these areas.

These roads can therefore result in direct mortality, indirect mortality, and reduced cub survival. When applied to an extremely small, endangered[2] population of fewer than 50 individuals that is already experiencing high mortality rates, failing recovery targets, and hovering at less than half the numbers needed for viability, these harms are amplified and create a great cause for concern for Alliance's members. Neither the "imminent harm" posed by roads nor the dire status of this population are acknowledged by the agencies.

It is misleading to state that this population is merely "threatened." The District of Montana vacated FWS's rule finding that endangered status was not warranted and "reinstate[d] the FWS's November 2013 warranted but precluded finding." All. for the Wild Rockies v. Zinke, 265 F. Supp. 3d 1161, 1181 (D. Mont. 2017). Thus, the population is currently warranted for listing as an endangered species, but it is still on the waiting list.

Page 303 of the Black Ram EA states: On NFS lands, the objectives of land management within grizzly bear habitat "are to maintain and enhance habitat and to minimize potential for grizzly-human conflicts" (Interagency Grizzly Bear Committee Taskforce, Mealey, U.S. Department of Interior, U.S. National park Service, & U.S. Bureau of land Management, 1986). Nearly all of BMU 14, over 99 percent, is classified as MS-1. The Garver BMU is about 86 percent MS-1 and 14 percent MS-3. The MS-3 portion reflects human settlement and occupation in and around the community of Yaak.

The Swamped project will not maintaining and enhancing grizzly habitat and will increase the potential for grizzly-human conflicts in violation of NFMA, NEPA, the APA and the ESA.

The Forest does not have a good track record of keeping closed roads closed. The Forest Service does not disclose the road mileage behind these ineffective closures; therefore it is unclear how many miles of additional open and total roads must be added to the existing condition calculations as a result of these ineffective closures.

In a recent Ninth Circuit Opinion, the court found that the Forest Service had failed to establish whether similar "undetermined" roads of unknown origin caused an increase above the Tobacco BORZ baseline:

The error cannot be treated as harmless in light of the ambiguity in the record as to whether the "undetermined" roads at issue were, in fact, included in the Access Amendments baseline calculation.

There are at least three problems with the KNF's record of amount of roads. First, because "undetermined" is a subcategory of "unauthorized" roads, it is possible that the particular undetermined roads at issue in this case were created—without authorization from the Forest Service—in the interim between the measurement of the Access Amendments baseline and the Forest Service's survey of existing roads for the Project.

All. for the Wild Rockies v. Savage, 897 F.3d 1025, 1036, n.18 (9th Cir. 2018). In light of these circumstances that (1) road closures/barriers are regularly breached but the Forest Service conducts no systematic monitoring to determine how many miles of illegal road use are occurring behind barriers each year, and (2) the Forest Service simply ignores illegal "undetermined" roads and does not include them in its calculations for open or total roads in the annual monitoring reports, the open and total road numbers in the monitoring reports are not accurately reflecting the conditions on the ground. It is therefore reasonable to assume that the baselines in the project area regularly exceeded because the reported conditions hover at or near the baseline.

Chronic recurring road closure breaches cannot reasonably be construed as "temporary;" and illegal road use does not fall within the scope of Access Amendment "temporary" roads.

The Forest Service and FWS have acknowledge that road closure breaches (and resulting illegal road use) are not addressed in the Access Amendment. Nonetheless, the agencies argue that all road closure breaches regardless of whether they are chronically recurring and regardless of how long they last on the landscape must be construed as "temporary" road increases. Onto this premise, the agencies then bootstrap an additional argument that because certain specific types of temporary roads were addressed in the Access Amendment, that discussion must also apply to "temporary" road increases from illegal road use.

First, it is not reasonable to construe recurring illegal road use as "temporary" road density increases. The monitoring reports indicate that public users may repeatedly breach the same closure year after year. See, e.g., AR42:000059-62 (noting that boulders placed in 2015 have been removed and unauthorized users are again circumventing gate on Road 2236). Moreover, the Forest Service may take years to act on known violations. See, e.g., AR42:000061 ("The Clatter Creek gate (268) was included on the 2015 gate repair contract but after the bids came in the Clatter Creek gate was dropped due to repair costs for all gate repairs exceeding available funding. In BY2016 the gate remained damaged and ineffective."); see also AR43:000081-82 (note 2)(during planning for the Hanna Flats logging project, the Forest Service found illegal motorized use on 15.7 miles of road that were not included in the baseline but the agency postponed remedial action until implementation of the logging project; in the 2018 monitoring report, the agency concedes it has still not yet eliminated this illegal use); see also AR232:000767 (finding that four barriers did not effectively prevent motorized use but deferring any action to fix the problems).

Thus, while the Forest Service insists that all breaches are temporary, those same breaches may be recurring or may have lasted for many years prior to discovery and remedial action, resulting in a chronic situation. The situation with the BORZ is a good illustration of this problem S although the Forest Service insists that it fixes all breaches as soon

as possible, nonetheless at least four out of seven BORZ areas chronically fail to meet both the open and total road baseline conditions from the Access Amendment, as shown above in the table in Section B.

Second, even assuming that illegal road use could be construed as "temporary," it still does not have the same effect as lawful temporary road use. A breach of a closure device that results in public motorized use in effect results in an open road. The Access Amendment severely restricts temporary increases in open roads: "immediately following completion of all mechanized harvest and post- harvest slash activities requiring use of the road, to allow motorized public use during the bear summer season prior to the fall bear hunt (i.e., June 16 - August 31) for activities such as personal firewood collection. This public access would only be provided in cases where the mechanized harvest and/or post-harvest slash activities occurred during the same active bear year."

Thus, temporary increases in open roads are limited to a June 16-August 31 window, and may only occur in the same year in which logging activities have already occurred and used that particular road, presumably because grizzlies would have already been displaced from those areas. In contrast, illegal motorized use behind road closure breaches is not limited to a June 16-August 31 window, and is not

limited to a single year entry on a road along and on which logging activities have already been occurring.

Moreover, illegal road use would also constitute an increase in total roads. However, temporary increases in total roads are only permitted if the roads are "effectively" gated to prevent public use during a project, (2) after project use, the roads are treated so as to "effectively prevent[] motorized access" and require no motorized access for maintenance for at least 10 years, and (3) upon project completion, the area is "returned to or below the baseline levels contained in Table 16" of the Access Amendment ROD. Obviously a road that has illegal road use is not "effectively" gated to prevent public use.

Thus, illegal road use does not comply with the restrictions set for lawful increases in temporary roads neither open nor closed in the Access Amendment and therefore cannot possibly have the same effects. It is simply implausible that unlimited illegal road use occurring at any time in any location would have the same effect on grizzly bears as Access Amendment temporary roads that are significantly restricted in both timing and location. Indeed, illegal road use is illegal precisely because the Forest Service has already closed these specific roads to protect grizzly bears. If illegal motorized use occurs on these roads that were closed to protect grizzly bears, it may displace grizzly bears from areas that they would otherwise not be displaced from.

2017 DNA sampling identified only 44 individual bears. 1 Specifically, the recent sampling identified 20 females and 24 males, with 23 bears in the Cabinets and 21 bears in the Yaak portion of the ecosystem.

Recognizing that the grizzly bear population in the Cabinets portion of the ecosystem is likely much smaller than the estimated population for the entire ecosystem, we are likely looking at a much larger percentage of the population being seriously impacted during the life because of this project.

Becasue od the serious impacts to grizzly bears, please demonstrate compliance with Forest Plan standards relevant to grizzly bears, and analyze the direct, indirect, and cumulative impacts to grizzly bears from the Ripley logging project and state and private logging and the Swamped project. The Forest Service should write an one EIS for the Ripley - Swamped logging project.

The Forest Service must comply with National Forest Management Act ("NFMA") and its implementing regulations. NFMA requires the Forest Service to ensure that site-specific management projects are consistent with the applicable forest plan. 16 U.S.C. § 1604(i). Thus, the Forest Service must ensure that all aspects of the proposed action comply with the Kootenai Panhandle National Forests Land Management Plan.

The Grizzly Bear Access Amendment set standards for open motorized route density ("OMRD"), total motorized route density ("TMRD"), and retention of core grizzly bear habitat within the Cabinet-Yaak and Selkirk Recovery Zones bear management units. This Amendment is incorporated as a standard (FW-STD-WL-02) in the Kootenai National Forest Plan at Appendix B. The Forest Service must comply with the Access Amendment TMRD standards during and after project implementation, it not the project directly violates NFMA.

Dr. David Mattson makes the following points.

The assessment of prospective effects of the this project on grizzly bears in the is premised on several critical assumptions. First, status of the Cabinet-Yaak grizzly bear population is assumed to have improved since 2012. Second, and related, the KNF assumes that some erosion of security for grizzly bears is therefore permissible, conditioned on a related assumption that security and road access standards employed by the Kootenai National Forest (NF) are sufficient for recovery of grizzly bears in this ecosystem.

All of these assumptions are unwarranted.

Briefly:

- ***The weight of available evidence does not support concluding that population status has improved. For***

one, the methods used to estimate trend and current population size are beset with a host of problems. For another, the information able to be distilled from demographic data suggests that any improvement has stalled since 2014.

- ***Variations in population size and trajectory between 1999 and 2010 are more likely attributable to variations in abundance of natural foods—berries in particular—that affect exposure of bears to humans rather than to any increased mitigations. During years of scant berries, bears likely forage more widely and more often end up in conflict situations or exposed to malicious killing.***

- ***The population of grizzly bears in the Yaak/Yahk is far smaller than even the smallest size posited to be viable by any researcher. Related, the population remains acutely vulnerable to even the smallest increases in bear mortality that are predictably more likely to occur with any increase in road access and associated human activity.***



1

- ***Malicious and other unjustified killing by humans remains the dominant cause of death for grizzly bears in the Cabinet-Yaak Ecosystem. These kinds of killings are predictably associated with roads. As a result, levels of road access need to be substantially reduced and related levels of habitat security substantially increased rather than the opposite, as is being proposed for the Knotty Pine Project.***

- ***Road density and habitat security standards used by the Kootenai NF are patently deficient, partly because they are based on research that conflates behavioral phenomena such as avoidance and displacement with demographic phenomena, notably survival. The scale is wrong as well, given that exposure to mortality hazards logically accrues over years as a consequence of cumulative annual movements***

of bears vis-à-vis hazardous environs. As a corollary, the fact that standards on the Kootenai NF are more lax than standards on the Flathead NF is self- evidently nonsensical given that grizzly bears in the Cabinet-Yaak Ecosystem remain in a much more precarious status compared to grizzly bears in the Northern Continental Divide Ecosystem.

- ***There is little or no evidence that food abundance is a significantly limiting factor for grizzly bears in the Cabinet-Yaak Ecosystem—especially as manifest in reproduction. On the other hand, there is ample evidence that human-caused mortality had governed and continues to govern the fate of this population, with food effects manifest primarily in the extent to which grizzly bears are exposed to human-related hazards during years when berries are in shorter supply.***

- ***Compounding prospective problems with the project, proposed activities are concentrated in an area that is vital for facilitating movement of grizzly bears between core habitats. Project activities will diminish rather than enhance security needed not only to facilitate transit of bears, but also increase odds that exposed bears will survive.***
  In short, the Knotty Pine project promises to harm grizzly bears in the Cabinet-Yaak Ecosystem.

A. Weight of Evidence Does Not Support Concluding that Status of the Cabinet-Yaak Population has Improved Since 2012

A.1. The 2.1% Per Annum Growth Rate for the Cabinet-Yaak Population is Not Justified or Applicable

Use of a 2.1% per annum growth rate to project total size of the Cabinet-Yaak population from the Kendall et al. (2016) 2012 point estimate, as was done by Kasworm et al (2018), is not defensible. Such use is, moreover, guaranteed to produce spurious results that cannot legitimately be used to reach conclusions of management relevance. There are several unambiguous reasons.

A.1.a. The growth rate is not representative of the total population

First, the estimated 2.1% per annum growth rate only applies to an unknown fraction of the total Cabinet-Yaak grizzly bear population. Vital rates used to estimate this growth rate were based solely on "native" or "natural" research-trapped bears, and expressly excluded bears captured because of conflicts or part of the augmentation program (Kasworm et al. 2018: 10). The growth rate, moreover, applies almost exclusively to the Yaak portion of the population given that 95% of the data used to estimate survival rates and 85% of the data used to estimate reproductive rates came from this subpopulation (ibid:

36)—protestations by the authors notwithstanding (ibid: 36). On top of this, the 2.1% per annum rate was estimated only for the female portion of this high-grade (ibid: 10), which is of consequence even though female survival is disproportionately important in determining growth rate, as such.

In other words, the 2.1% per annum growth rate can only be legitimately applied to females residing in the Yaak subpopulation that were not trapped and marked as a result of conflicts nor part of the augmentation program. Put another way, management-trapped bears, augmentation bears, and males would need to be represented in a modeling framework if any estimated population growth rate were to be prima facie representative of the total population. Moreover, if the fates of all such bears were to be considered, estimated population growth rate would almost certainly be lower given that survival rates of males, augmentation bears, and management bears are substantially less than survival rates of the females used to estimate the 2.1% per annum growth rate (ibid: 33-35).

If a growth rate were to be used to project a total population estimate, comparable to the Kendall et al. 2012 point estimate of 49 bears (95% CI = 44-62), then such a growth rate would need to represent birth and death rates of the total population, and apply specifically to the period of interest (e.g., 2012-2017) rather than a longer period of time that masks the relevant trajectory (see my point below).

A.1.b. The growth rate does not represent 2012-2017

The 2.1% per annum growth rate used by Kasworm et al to project 2017 population size was calculated using data that span 1983-2017 and so, therefore, axiomatically represent a generalized growth rate for Yaak females during this lengthy 35-year period. Put another way, the 2.1% per annum growth is not an estimate of growth for the period 2012-2017. For it to be so, the rate would have necessarily been estimated only using data from the approximate 2012-2017 period.

More to the point, estimates of growth for the Yaak female population are increasing back-weighted by inclusion of data that are, on average, increasingly old. Figure 1 (herein) shows the approximate average age of data used to calculate vital rates with the passage of time (from ibid: Table 17, 40-42). Notice that average age has increased from around 6-7 years in 1998 to nearer 15 years in 2017. In other words, with the progression of time estimates of population growth for the female segment of the Yaak population have become increasingly irrelevant to judging current population trajectory.

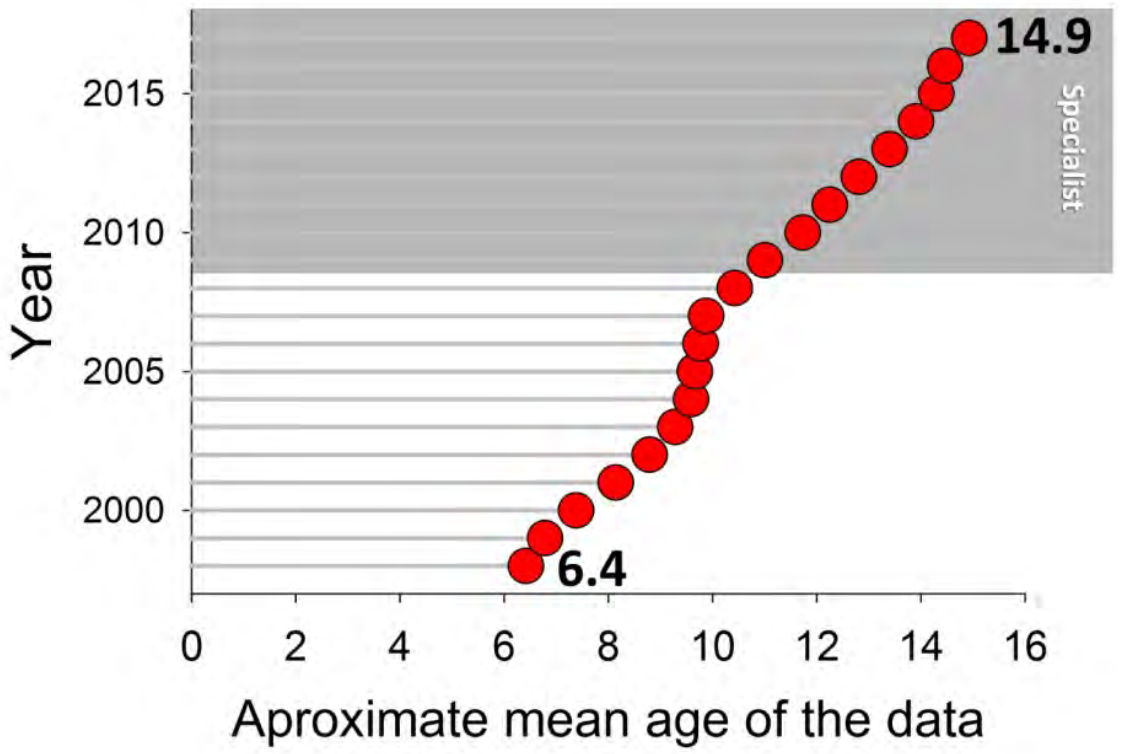
The Government retort to these contentions would probably be that the data from such a short period of time would be so sparse as to preclude a usefully accurate estimate. That is almost certainly the case, and a commentary in its own right on the profound limitations imposed by intrinsically small sample sizes. Nonetheless, this does not negate the point that the 2.1% per annum growth rate for 1983-2017 is spurious when applied to the 2012-2017

period. As Figure 11 clearly suggests (ibid: 37), population growth rate has almost certainly varied over time, albeit in largely indeterminate ways (see my following point).

Figure 1. Trend in mean age of data used to calculate vital rates of Cabinet-Yaak grizzly bears with passage of years from 1998 to 2017. Mean age has more than doubled, with trend towards increased aging accelerating since deployment of a conflict management specialist in the ecosystem. Increasing age renders estimated vital rates increasingly irrelevant to current conditions.

A.1.c. Uncertainty of the growth rate as currently (or even ideally) calculated debars use

Small sample sizes impose very real constraints on the precision and accuracy of all demographic rates being used by Cabinet-Yaak researchers and managers. These constraints follow ineluctably from the small size of the Cabinet-Yaak grizzly bear population, which is a non-negotiable feature of this ecosystem.



As a practical upshot, all of the population growth rates calculated to date have uncertainty intervals (e.g., 95% confidence intervals) that not only substantially overlap zero (i.e., no growth) but also, over time, each other. More specifically, despite purporting to show trend in cumulative growth rate over time, the confidence intervals shown in Figure 10 (ibid: 37) all overlap—most almost completely (see also Figure 2A herein). Because of this, there is little or no basis for concluding that growth rate has varied with time. Likewise, taking a precautionary approach, there is little or no justifiable basis for concluding that growth rate is currently positive, despite statements in Kasworm el al. such as "The probability that the population was stable or increasing was 73%" (ibid: 36), especially in light of the fact that the point estimate of 2.1%

per annum is a cumulative rate spanning 1983-2016 with little or no known relationship to current rate of population increase or decline.

Moreover, when the totality of point estimates and uncertainty is taken into consideration for the period 1998-2017, there is a cumulative 62% probability that the population was declining during these 19 years, consistent with the 2017 estimate of population size for Yaak females still being around 52% less than the estimate of population size for 1998 (Figure 2A and 2B herein).

The implications of uncertainty are thrown into relief by examining the specifics of projecting population size forward in time from 1983 to 2017 using the 1.021 (95% CI = 0.949-1.087) growth rate, noting up front that uncertainty in annual growth rate magnifies exponentially over time when manifest in population size. For example, after back-casting to obtain a plausible 1983 population starting point, deterministic projections of population size using the upper and lower confidence intervals of growth allow for a current population (2017) of anywhere between 3 and 256. Stochastic projections, e.g., using the software RISKMAN, generate a similar and not particularly useful range of 4 to 154 individuals.

The point here is that the raw cumulative uncertainty is huge, especially when dealing with a time period as long as 1983-2017. It is also important to note that this exercise takes the 1.021 estimate of lambda at face value, which, as per my previous points, is unwarranted.

Related to this last point, the current basis for modeling population growth rate using Booter (ibid: 10- 11) is egregiously simplistic given the self-evident structural complexity of grizzly bear population demography in the Cabinet-Yaak Ecosystem. For any estimate of growth rate to be realistic, explanatory, relevant, and accurate, all of the main structure needs to be accommodated. More specifically, a relevant demographic model would ideally include source-sink structures accounting for management- trapped versus research-trapped bears, bears in the Yaak area versus the Cabinet Mountains, augmentation bears versus in situ bears—in addition to accounting for the male segment as well as inter-annual variation attributable to variation in key food resources (see later). The model described in Kasworm et al. does none of this.

Again, the probable retort would be that sample sizes are too small to support estimating the many rates required for such a model. But that is, indeed, the point. And no amount of hand-waving or protest will make it otherwise nor redeem the deficiencies in current estimates of demographic rates. The uncertainty is real and unavoidable, and should be acknowledged in management decision-making.

A.2. Even taking estimated growth rate at face value, current population status is problematic

Even taking the population growth rate estimated by Kasworm et al. at face value, the most defensible conclu-

sions would be, first, that status of the population has worsened during 2014-2017 compared to 2006-2013, and, second, that numbers are still substantially less than the presumed peak reached around 1998. These conclusions are based on trend in population growth rate over time (as per ibid: 37), and trend in population size estimated by projections using year-specific cumulative population growth rates (e.g., projecting population size for 1998 using the 1983-1998 growth rate estimate, and then doing the same for each successive year, with 1983 the starting year throughout).

Figure 2 (herein) shows seminal results. In Figure 2A I've identified three periods typified by trends in population growth: rapid decline of 2% per annum during 1998-2006, coincident with the berry famine (see below); a nearly as rapid 1.1% rate of improvement during 2006-2014; followed by stalling in the rate of improvement to around 0.2% per annum since 2014—an 82% decline in rate of change— coincident with population growth rate finally reaching positive territory. Importantly, this refers to the per annum rate of deterioration or improvement in population trajectory, which is perhaps the most relevant information to be gleaned from the estimates of population growth rate presented by Kasworm et al.

Finally, Figure 2B (herein) shows trend in estimated size of the Yaak female population, both as a central tendency (dark green line) as well as bounding uncertainty (light green band, based on projections using the upper and

lower confidence intervals for each cumulative estimate of growth rate). Parenthetically, I transformed the values to a natural log scale in Figure 2B to visually emphasize trends given that the bounds of uncertainty explode with projections increasingly farther forward in time. The take-away point is that, according to these values, population size peaked during 1998, reached a nadir during the height of the berry famine in 2006, increased through 2014, and then stalled during 2015-2017 at a size that was still around 52% less than peak numbers reached during 1998.

The key points here are that improvement in status of the female segment of the Yaak population stalled beginning in 2014 at numbers that were still approximately 52% less than the peak reached during 1998. Having said this, both of these conclusions remain severely compromised by the intrinsic uncertainties, lack of relevance, and bias of methods used by Kasworm et al.

A.3. Conclusion

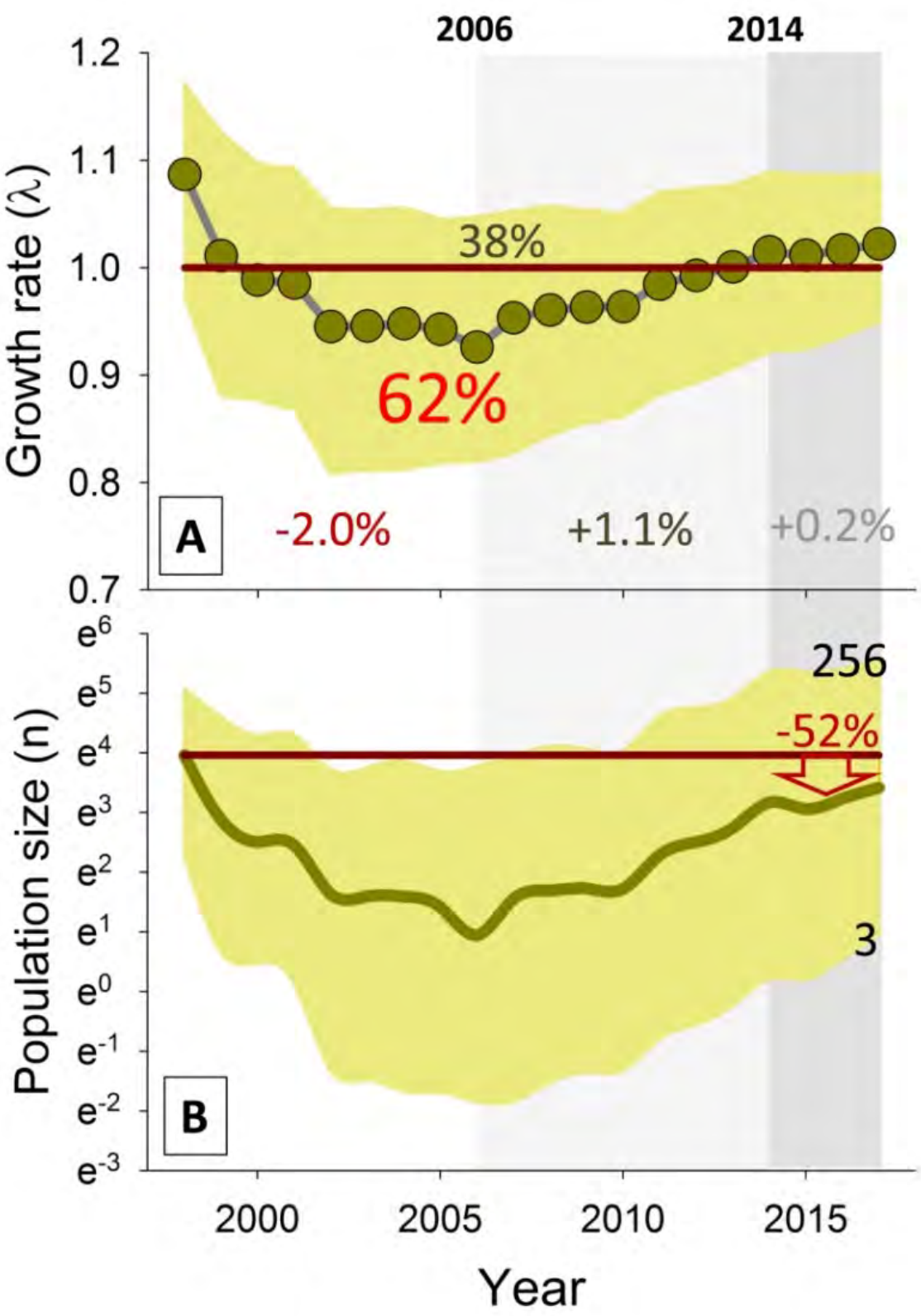
The upshot of all this is that there is no legitimate basis for estimating current population size (e.g., 55- 60) by applying a biased 1983-2017 growth rate—based on high-graded data representing only a fraction of the population—to a point population estimate made during 2012. Moreover, even taken at face value, the current cumulative population growth rate shows stalled improvement in population status and a population still substantially less than peak numbers reached during 1998.

The best that can be perhaps be invoked is a contrast between the presumed minimum estimate of 35 bears during 2014-2017 (ibid: 27) and the 2012 estimate of 49 (44-62) bears reported by Kendall et al.

(2016). The estimate of 35 for 2014-2016 is self-evidently less than the lower bound of the 2012 confidence interval, more consistent with a static or even declining population than with an increasing one. Of greater relevance to the draft EIS, this general conclusion also holds for comparisons specific to the Cabinet population (a current minimum of 13 bears compared to lower confidence intervals of around 20 reported by Kendall et al. for 2012).

Figure 2. Trend in estimated population growth rate (A) and related estimated total population size (B) for Cabinet-Yaak grizzly bears, with the notable proviso that both sets of estimates are based almost wholly on data obtained from female grizzly bears in the Yaak population. Dark green dots or lines denote central tendencies, large green bands bounds of uncertainty. The horizontal dark red line in (A) denotes no growth, with any values above leading to increase and any values below leading to decline. The red line in (B) corresponds with estimated population size in 1998. In (A) I also show the cumulative weight of evidence for population declines versus increases for 1998-2017 along with average annual rates of change in lambda during three periods characterized by non-stationary shifts in dynamics. The numbers at right in (B) correspond to the range in estimated population size given

uncertainties in growth rate (3-256), as well as the deviance in current estimated population size from the 1998 benchmark.


2006
2014
1.2
1.1
1.0
0.9
0.8
0.7
Growth rate (λ)
38%
62%
A
-2.0%
+1.1%
+0.2%
e6
e5
e4
e3
e2
e1
e0
e-1
e-2
e-3
Population size (n)
256
-52%
3
B
2000
2005
2010
2015
Year

B. Comparison of Pooled Survival Rates in Kasworm et al. (2018) is Not Legitimate

As ancillary support for the proposition that size of the Cabinet-Yaak population has increased between 1999-2006 and 2007-2017, Kasworm et al state that "Grizzly bear survival of all sex and age classes decreased from 0.899 during 1983–1998 to 0.792 during 1999–2006 and then rose to 0.934" (ibid: 34), and then summarize these same numbers in Table 13 (ibid: 34).

Most of the problems and associated bias noted above applies to this comparison. Note, first, that the 95% confidence intervals reported in Table 13 for pooled estimates from all three time periods overlap, which precludes confidently concluding there is any difference in mean rates. Moreover, note the restriction to "native" bears, which excludes any consideration of conflict-trapped or augmentation bears, which were very much a component of the 2012 point estimate of population size.

The other problematic aspect of this comparison is that data from all bear sex and age-classes were pooled, without any apparent attempt to determine whether this collapse of data preserves representation of the population at large. Are males over- or under-represented?...likewise subadults versus adults? Some sort of weighting scheme reflective of current or even stable population structure could provide some remedy, but without compensating for other biases.

The other interesting aspect of this data-pooling is the extent to which it is at odds with other results and commentary in Kasworm et al. More specifically, this aggregation of data ignores the disproportionate importance of subadult females to population dynamics. This importance is evident in the near 85% variance in estimated population trend attributed to survival of subadult and adult female bears in Booter calculations (but with 60% attributable to subadult female survival, Table 15; ibid: 37), as well as the different contextual emphasis placed by the authors on female survival on Pages 32 ("...it is important to consider the rate of female mortality") and 37.

The implication of all this is that the comparison of survival rates estimated from pooled data presented by Kasworm et al on Pages 33 and 34 does not mitigate the many fatal problems with their estimates of population growth rate.

C. Comparison of Annual Average Deaths in Kasworm et al. (2018) is Uninformative

Kasworm et al. (2018) present information on grizzly bear deaths in the Cabinet-Yaak Ecosystem in terms of numerous contrasts and adjustments presumably designed to be of relevance to various management deliberations. On pages 15-16 a running average of annual mortalities is related to recovery criteria; on pages 16-18 a full list of deaths with ancillary details is provided; and on pages 31-33 mortality is summarized in multiple ways presumably relative to different management considerations. Throughout, the parsing, categories, and nomenclature

are confusing, obfuscated, and confounded. As a result, I needed to reconstruct much of the analysis of mortalities presented by

Kasworm from the raw data on pages 16-18. The contrast among time periods presented in Table 11 (ibid: 33) was a particular focus.

C.1. Table 11 in Kasworm et al. (2018) is a Tangled Mess

The totals in the column farthest right in Table 11 of Kasworm et al. (2018) include all mortalities— human-caused, natural, within 16-km of the Recovery Area boundary, in the US as well as Canada—plus the estimated unrecorded human-caused mortalities. For some inexplicable reason, and unlike in the NCDE and GYE, natural mortalities and mortalities of unknown cause were not accounted for in estimations of unrecorded mortalities.

The upshot is that the row totals in Table 11 represent a mishmash of natural, human-caused, and estimated unrecorded human-caused mortalities, without any straightforward connection to judging overall population status. In fact, the inattention and even outright dismissal in this context of natural mortality as a factor in judging population status is mystifying given that a dead bear, for whatever reasons, matters in assessing the toll taken by mortality.

C.2. Comparison of 'rates' between 1999-2006 and 2007-2017 is Uninformative

By contrast, the comparison of annually-averaged human-caused mortality between 1999-2006 and 2007-2017 on Page 32 of Kasworm et al. only considers human-caused mortality, but without including any of the estimated unrecorded human-caused mortality included in Table 11—and without any cogent explanation. The confusion implicit to this inexplicable parsing is compounded by use of the term 'rate' in reference to an annual average, in context of 'rate' being used elsewhere in reference to survival and reproductive rates referenced to fates of individual bears. On top of this, a typo was made in reference to the 2007-2017 'rate,' which should be 2.2, not 2.1. This error amplified the potential for confusion arising from comparing '2.1' with '2.25' and calling the first value an increase over the second.

Reducing this chaos to something comprehensible: the annually averaged number of known and probable human-caused deaths during 1999-2006 was 2.13. Using all currently available data, for 2007- 2018 the average was 2.08. When the estimate of unreported human-caused deaths is included, the average for 1999-2006 was 2.75 (95% CI 1.6-3.9). For 2007-2018 it was 3.2 (95% CI 2.2-4.2). Considering total known-probable mortality plus estimated unreported human-caused mortality—but without any correction for unreported natural deaths—the annual averages for 1999-2006 and 2007-2018 were virtually identical: 3.9 and 3.8.

The important point is, here again, that rote statistical uncertainty debars any conclusion about increase, stasis, or decrease in numbers of human-caused deaths. The confidence intervals of annual averages overlap substantially, which is not surprising given the small sample of years and dead bears. This statistical uncertainty is amplified by uncertainty attached to detecting any bear death other than that of an actively radio-monitored animal. Considering only human-caused deaths, this certainly holds for poached bears, deaths 'under investigation,' and deaths from unknown (but human-related) causes. A back-of-the-envelope calculation suggests that such deaths need to be increased by around 70 to 120% in year-end tallies.

In the face of such irrefutable uncertainty, Kasworm et al resort to focusing on and then emphasizing female mortality, which reduces the absolute values of calculated averages even further. When an estimate of unreported human-caused female mortalities is added to known mortalities (using the long- term proportion of F:M deaths=0.4), the result is an annual average of 1.75 (95% CI 0.83-2.67) female deaths for 1999-2006 and 0.80 (95% CI 0.34-1.54) female deaths for 2007-2018. All of the reported differences in mean values are so far within the range of statistical uncertainty as to render these comparisons a bit absurd.

C.3. Conclusion

Again, researchers and managers in this ecosystem might argue that small samples prevent any degree of certainty about conclusions, but this does not obviate the obligation to acknowledge uncertainty. Nor does it eliminate the practical consequences of small sample sizes and the compromising effects of chance processes—highlighted recently by a jump in recorded deaths from 1 in 2017 to 3 in 2018, a tripling in just one year. More certainly, it recommends humility and precaution in the face of such statistical ambiguities.

But all of this still leaves open the question of why natural mortalities as well as mortalities that cannot be definitively ascribed to human causes are not accounted for in assessing population status. This question is especially relevant given that Kasworm et al comment in several places on the extent to which variation in abundance of key natural foods likely drives population dynamics, often through the 'natural' death of dependent young (see below). Or, even, why, when considering only human-caused mortality, adjustments to account for unrecorded deaths were not included. This is all a bit mystifying as well as prima facie unjustified.

D. Status of the Cabinet-Yaak Population Remains Highly Precarious

The current vulnerability of the Cabinet-Yaak population can be illustrated through a simple exercise, even without accounting for spatial structure of the Cabinet and Yaak subpopulations. I input vital rates into a commonly-used risk management program named RISKMAN (currently

being proposed for management of grizzly bear mortality in the NCDE). Using the stochastic function, I was able to reconstruct the c. 2.1% growth rate reported by Kasworm et al (2018) for 1983-2017. More specifically, the cumulative geometric mean growth rate (lambda) varied from a maximum of 1.035 to a minimum of 1.008. Accounting for variation in vital rates, the median ending population size at year 34 was 43, although the upper and lower 95% percentiles of simulated trajectories produced ending populations as small as 4 and as large as 154.

I then simulated what would have happened if just one additional female died each year. In this scenario, the geometric cumulative mean growth rate dropped from 0.952 (already much less than 1) to an astounding 0.202 at year 34 of the simulation (Figure 3 herein). Median total population size had reached 0 by year 23, with an upper 95th percentile of only 11 animals at the end of simulations. Results were not much improved when an additional 1 female was lost only once every 2 or 3 years. This is not presented as any definitive modeling result, but rather illustrative of how little the margin of error is, and how vulnerable this population is to even the smallest increased increments of mortality (e.g., Kendall et al. 2016). This point is especially germane given that one adult female was killed by humans each of the last two years, during 2018 and 2019. And this does not account for adult females that died and were not documented.

Figure 3. Results of RISKMAN projections for the Cabinet-Yaak population using vital rates reported by Kas-

worm et al. (2018), but introducing the death of an additional female grizzly bear once every 2 years. The thick green line represents the median trend of projections; the dusky green band above and below the variability of projections.

E. Weight of Available Evidence Emphasizes the Continued Importance of Malicious Killing

The extent to which poaching, malicious killing, or other suspect circumstances are associated with human-caused deaths is also instructive regarding the overall effectiveness of conflict mitigation efforts during 1999-2017 to offset the problematic effects of road-access and poaching. By its nature, malicious killing/poaching is a criminal act undertaken by criminals. Such behavior is rooted in attitudes and outlooks that are notoriously unresponsive to education and 'outreach'. The phenomenon is about willful malfeasance. As such, limitations on road access coupled with improved law enforcement and successful prosecutions are logically the most appropriate redress—not, for example, conflict mitigation by a specialist who is not tasked primarily with law enforcement.

Before pursuing this any farther, some clarification of obfuscations in the dead bear database is needed. During 1999-2017 a number of deaths were ascribed to 'Undetermined' human causes, 'Poaching' or listed as 'Under investigation'. The first and last categories are not explicit, but nonetheless strongly suggestive. Certainly, 'Under investigation' suggests that the death occurred under sus-

picious circumstances warranting investigation—with a strong likelihood of either poaching or other



unwarranted lethal action by the involved people. Such suspicions are rarely definitively resolved. 'Undetermined' is also more suggestive of malfeasance rather than innocence on the part of the involved people. Given the alternatives, such deaths are more defensibly allocated to causes more resistant than not to mitigation.

With all of this as context, there were a total of 7 known-probable deaths during 1999-2006 attributed to either poaching or undetermined causes, representing 58% of total human-caused deaths. During 2007-2018 there were

a total of 13 deaths either under investigation or ascribed to poaching, representing a nearly identical 59% of the total known-probable human-caused deaths. These are major fractions in their own right, but leave estimated numbers of unreported deaths unaccounted for. As Kasworm et al make clear (ibid: 33), their estimate of 'unreported' deaths did not apply to bears that were radio-collared or removed by managers, which leaves this unreported estimate levied almost entirely against malicious or otherwise suspect causes. When these unreported estimates are added to the known-probable toll taken by poaching, unknown causes, or suspicious circumstances, the percentage increases to around 70% during 1999-2006 and approximately 77% during 2007-2016.

Taken together, these figures support concluding that (1) malicious or otherwise suspect causes account for a large portion—if not majority—of grizzly bear deaths in the Cabinet-Yaak Ecosystem; (2) the fraction and even total numbers of deaths attributable to such causes did not decrease from 1999-2006 to 2007-2018; and (3) that aggressive limitations to road access by the USFS are needed, especially in areas with concentrations of productive habitat (Proctor et al. 2015, 2017).

F. Access Management is Critical to Limiting Malicious & Other Unjustified Killing

The consensus of relevant research is unambiguous about the link between road access and grizzly bear mortality. The more access, the more dead bears there are, with disproportionate concentrations near roads (Brannon et al.

1988; Benn & Herrero 2002; Nielsen et al. 2004; Wakkinen & Kasworm 2004; Boulanger & Stenhouse 2014; McLellan 2015; Proctor et al. 2017, 2018). Dead bears tend to be concentrated within 100 to 500 m of roads, averaging around 300 m (± 195 m) among studies where distance was noted.

Unfortunately, there is a common conflation of the extent to which radio-marked grizzly bears spatially avoid roads with the geospatial configuration of mortality risk and, even more important, decrements in survival and population growth. These parameters are not synonymous. Even though a bear might underuse habitats within a certain distance of roads, this does not translate into a 1:1 correlation with exposure to risk of human-related mortality during a bear's lifetime. Conflation of avoidance with mortality risk has led to the unstated assumption that the former can be used to set standards for the latter. Such is the case for road density and habitat security standards set by the Kootenai National Forest based on the results of Wakkinen & Kasworm (1997).

Taking 300 m as a ballpark figure, road densities of roughly 0.6 km/km^2 translate into areas remote from where human-caused mortality is concentrated that amount to only 84 ha (208 acres), which is trivially small for a grizzly bear. This sort of geospatial buffer still means that grizzly bears are frequently exposed to hazards of human-caused death to the predictable extent that they must and will move from one presumably secure area to another—even assuming that these bears exhibit "av-

erage" avoidance of human features such as roads. In other words, the level of buffering from human-caused mortality offered by road density and related security standards invoked in the KNF is guaranteed to be inadequate.

The inadequacy and inappropriateness of road density and security standards used by the Kootenai National Forest in application to the Knotty Pine Project are highlighted in contrast to standards applied in the Northern Continental Divide Ecosystem (NCDE), as well as in contrast to trajectories of populations in the NCDE and Greater Yellowstone Ecosystem. The populations of already relatively numerous grizzly bears in the NCDE and GYE have increased substantially since the early 1990s to 2000s, in contrast to in the Cabinet-Yaak where precariously few bears have fared poorly (see my Points A-D, herein). Tellingly, Wilderness Areas and Inventoried Roadless Areas where road access is not allowed comprise around 56% of the NCDE and GYE. In the Cabinet-Yaak Ecosystem this figure is less than half as much, nearer 21%. This difference alone can explain much of the corresponding difference in fates of grizzly bear populations.

Despite these telling differences in fates and trajectories of grizzly bear populations, the road density and habitat security standards applied by the Kootenai National Forest are more lax, not less, than those applied on the Flathead National Forest. On the Kootenai, areas allowed with >1 mile/mile2 of roads are 1.7-times greater; areas with >2 miles/mile2 of roads are 1.4-times greater; and

extents of secure habitat nearly 20% less compared to what is ostensibly allowed on the Flathead NF. These disparities are perverse and not able to be explained on the basis of differences in the extent of movements by grizzly bears. If anything, bears range more widely in the Cabinet-Yaak Ecosystem compared to the NCDE (Kasworm et al. 2018).

As a bottom line, existing and proposed access management in the KNF has jeopardized and will continue to jeopardize grizzly bears.

G. More Grizzly Bear Deaths Are Occurring On USFS Jurisdictions Now Compared to During 1999-2006

The argument for more aggressive management to prevent human-caused grizzly bear mortality on USFS jurisdictions is given greater weight by differences in locations of bear deaths between 1999-2006 and 2007-2018. Data from Kasworm et al. (2018) and Kasworm (2018)show an increase in the proportion of grizzly bear deaths on USFS lands from 25% (95% CI = 0.5-49.5%) during 1999-2006 to 56.5% (36.3-76.8%) during 2007-2018. Although sample sizes are small, confidence intervals large, and overlap of the intervals non-trivial (17%), these results do not support concluding that hazards for grizzly bears have remained constant or declined on USFS lands. Rather, by weight of evidence, the better supported conclusion is that hazards have increased and, because of that, imperatives to control mortality on public lands have likewise increased. As per my point F, above, the most efficacious means available to the USFS for addressing this impera-

tive is through providing increased rather than diminished habitat security, axiomatically through reducing road access in the Project area.

Activities of the KNF Are Problematic in a Larger Geospatial Context

Please examine the cumulative effects of this project.

Please evaluate the impacts of proposed activities on grizzly bears in a larger geospatial context. Mattson & Merrill (2004) and Proctor et al. (2015) are perhaps most relevant to such an evaluation. The former research mapped existing core habitat as well as higher-probability source habitats in the Cabinet-Yaak

Moreover, with the Cabinet-Yaak Recovery Area as a logical unit of analysis, any assessment of cumulative effects needs to account for other on- going and planned human activities associated with forest treatments and harvest in this Ecosystem, as well as foreseeable impacts associated with the proposed Rock Creek and Montanore Mines; as well as on-going and foreseeable impacts associated with the human transportation infrastructure (e.g., railways and associated highways that already fragment grizzly bear distribution in this Ecosystem, Mattson et al. [2019b]), all with the potential to amplify impacts arising from the Project.

K. A Devil's Bargain Will Not Rescue This Small Population

K.1. The Cabinet-Yaak Population is Not Viable and Remains Acutely Vulnerable to Increased Mortality

The Cabinet-Yaak grizzly bear population is smaller than the smallest census population size ever posited as being viable. The Yaak/Yahk subpopulation has limited connectivity with grizzly bear populations elsewhere, and the Cabinet Mountains subpopulation is more isolated yet (Apps et al. 2016; Kendall et al. 2016; Proctor et al. 2012, 2015). Such isolation is well-known to magnify risk. The degree of this risk is evident in the fact that fates of populations as small of that of the Cabinet-Yaak grizzlies can be dictated solely by chance variation in birth and death rates, known as demographic variation. Yet demographic variation is a relatively minor stressor compared to environmental variation, catastrophes, negative deterministic trends, and loss of genetic diversity—all of which are documented or potential factors in the Cabinet-Yaak. The contemporary consensus of researchers is that populations of large mammals such as grizzly bears need to consist of thousands of animals to withstand all of these stochastic and deterministic threats over meaningful periods of time.

The Yaak and Cabinet grizzly bear populations remain acutely vulnerable to even small changes in levels of mortality. Under such circumstances, a precautionary approach to managing spatial hazards and habitat security is not only advisable, but mandatory. Unfortunately, there

is no evidence of caution or even meaningful recognition of threats to the Cabinet population.

K.2. Variation in Population Trajectory Has Likely Been Driven by Exposure to Humans

As a hypothetical, it is worth taking claims regarding an improvement in status of the Cabinet-Yaak grizzly bear population between 1999-2006 and 2007-2018 at face value. Again, the emphasis here is on the hypothetical given all of the compromising or even fatal flaws in analyses and conclusions reported in Kasworm et al. More specifically, if an improvement did occur, what was (were) the likely driver(s)?

Causation is notoriously hard to establish with any reliability or confidence. Nonetheless, even taking comments in Kasworm et al (again) at face value, one can establish how these authors ascribed causation based on the balance of their comments. The relevant quotes include:

"The increase in total known mortality beginning in 1999 may be linked to poor food production during 1998-2004 (Fig. 9). Huckleberry production during these years was about half the long term average...Poor nutrition may not allow females to produce cubs in the following year and cause females to travel further for food, exposing young to greater risk of mortality from conflicts with humans, predators, or accidental deaths." (emphasized in Figure 10; ibid: 32; see Fig. 6, herein).

"Some of this decrease [in survival] in the 1999-2006 period could be attributed to an increase in natural mortali-

ty probably related to poor berry production during 1998-2004. Mortalities on private lands within the U.S. increased during this period, suggesting that bears were searching more widely for foods to replace the low berry crop." (ibid: 34).

In reference to a probable increase in size of the Cabinet Mountains subpopulation from around <15 (possibly 5-10) in 1988 to around 22-24 in 2012: "These data indicate the Cabinet Mountains population has increased 2-4 times since 1988, but this increase is largely a product of the augmentation effort with reproduction from that segment." (ibid: 36).

L. Conclusion

Reiterating my conclusion in the Introduction to these comments, the Project as described in the scoping notice promises to harm grizzly bears in the Cabinet-Yaak Ecosystem. The Forest Service could unequivocally benefit grizzly bears in this area by the closure and retirement of roads.

Benn, B., & Herrero, S. (2002). Grizzly bear mortality and human access in Banff and Yoho National Parks, 1971-98. Ursus, 13, 213-221.

Boulanger, J., & Stenhouse, G. B. (2014). The impact of roads on the demography of grizzly bears in Alberta. PloS One, 9(12), e115535.

Brannon, R. D., Mace, R. D., & Dood, A. R. (1988). Grizzly bear mortality in the northern Continental Divide ecosystem, Montana. Wildlife Society Bulletin, 16(3), 262-269.

Eberhardt, L. L., Blanchard, B. M., & Knight, R. R. (1994). Population trend of the Yellowstone grizzly bear as estimated from reproductive and survival rates. Canadian Journal of Zoology, 72(2), 360-363.

Garshelis, D. L., Gibeau, M. L., & Herrero, S. (2005). Grizzly bear demographics in and around Banff National Park and Kananaskis country, Alberta. The Journal of Wildlife Management, 69(1), 277-297.

Harris, R. B., Schwartz, C. C., Haroldson, M. A., & White, G. C. (2006). Trajectory of the Yellowstone grizzly bear population under alternative survival rates. Wildlife Monographs, (161), 44-55.

Hovey, F. W., & McLellan, B. N. (1996). Estimating population growth of grizzly bears from the Flathead River drainage using computer simulations of reproduction and survival rates. Canadian Journal of Zoology, 74(8), 1409-1416.

Kasworm , W. F., Radant, T. G., Tesiberg, J. E., Welander, A., Proctor, M., & Cooley, H. (2018). Cabinet- Yaak Recovery Area 2017 research and monitoring progress report. US Fish & Wildlife Service, Missoula, Montana.

Kasworm, W. (2018). Selkirk/Cabinet-Yaak IGBC Subcommittee, meeting notes: 2018 research/monitoring up-

date. http://igbconline.org/wp- content/uploads/ 2018/11/181108_SCYE_Mtg_Summary.pdf

Kendall, K. C., Macleod, A. C., Boyd, K. L., Boulanger, J., Royle, J. A., Kasworm, W. F., ... & Graves, T. A. (2016). Density, distribution, and genetic structure of grizzly bears in the Cabinet-Yaak Ecosystem. The Journal of Wildlife Management, 80(2), 314-331.

Ladle, A., Avgar, T., Wheatley, M., Stenhouse, G. B., Nielsen, S. E., & Boyce, M. S. (2018). Grizzly bear response to spatio-temporal variability in human recreational activity. Journal of Applied Ecology.

Mace, R. D., Carney, D. W., Chilton-Radandt, T., Courville, S. A., Haroldson, M. A., Harris, R. B., ... & Schwartz, C. C. (2012). Grizzly bear population vital rates and trend in the Northern Continental Divide Ecosystem, Montana. The Journal of Wildlife Management, 76(1), 119-128.

21

Mattson, D. J. (2019a). Effects of pedestrians on grizzly bears: An evaluation of the effects of hikers, hunters, photographers, campers, and watchers with reference to the proposed Pacific Northwest Trail. Grizzly Bear Recovery Project, Report GBRP-2019-3.

Mattson, D. J. (2019b). Effects of trains and railways on grizzly bears: An evaluation of the effects of increased train traffic on the Burlington Northern Santa Fe and

Montana Rail-Link Railways, Montana- Idaho. Grizzly Bear Recovery Project, Report GBRP-2019-1.

Mattson, D. J., & Merrill, T. (2004). A model-based appraisal of habitat conditions for grizzly bears in the Cabinet–Yaak region of Montana and Idaho. Ursus, 15(1), 76-90.

McCall, B. S., Mitchell, M. S., Schwartz, M. K., Hayden, J., Cushman, S. A., Zager, P., & Kasworm, W. F. (2013). Combined use of mark-recapture and genetic analyses reveals response of a black bear population to changes in food productivity. The Journal of Wildlife Management, 77(8), 1572-1582.

McLellan, B. N., & Hovey, F. W. (2001). Habitats selected by grizzly bears in a multiple use landscape. The Journal of Wildlife Management, 65(1), 92-99.

McLellan, B. N. (2015). Some mechanisms underlying variation in vital rates of grizzly bears on a multiple use landscape. The Journal of Wildlife Management, 79(5), 749-765.

Proctor, M. F., Paetkau, D., Mclellan, B. N., Stenhouse, G. B., Kendall, K. C., Mace, R. D., ... & Wakkinen, W. L. (2012). Population fragmentation and inter-ecosystem movements of grizzly bears in western Canada and the northern United States. Wildlife Monographs, 180(1), 1-46.

Proctor, M. F., Nielsen, S. E., Kasworm, W. F., Servheen, C., Radandt, T. G., Machutchon, A. G., & Boyce, M. S.

(2015). Grizzly bear connectivity mapping in the Canada–United States trans-border region. The Journal of Wildlife Management, 79(4), 544-558.

Proctor, M. F., Lamb, C. T., & MacHutchon, A. G. (2017). The grizzly dance between berries and bullets: relationships among bottom-up food resources and top-down mortality risk on grizzly bear populations in southeast British Columbia. Trans-border Grizzly Bear Project, Kaslo, British Columbia, Canada, http://transbordergrizzlybearproject.ca/research/publications.html.

Proctor, M. F., McLellan, B. N., Stenhouse, G. B., Mowat, G., Lamb, C. T., & Boyce, M. S. (2018). Resources roads and grizzly be4ars in British Columbia and Alberta, Canada. Trans-border Grizzly Bear Project, Kaslo, British Columbia, Canada, http://transbordergrizzlybearproject.-ca/research/publications.html.

Wakkinen, W. L., & Kasworm, W. (1997). Grizzly bear and road density relationships in the Selkirk and Cabinet-Yaak recovery zones. US Fish and Wildlife Service, Kalispell, Montana.

Wakkinen, W. L., & Kasworm, W. F. (2004). Demographics and population trends of grizzly bears in the Cabinet–Yaak and Selkirk Ecosystems of British Columbia, Idaho, Montana, and Washington. Ursus, 15(1), 65-76.

Waller, J. S., & Mace, R. D. (1997). Grizzly bear habitat selection in the Swan Mountains, Montana. The Journal of Wildlife Management, 61(4), 1032-1039.

1. Will the Forest Service be considering binding legal standards for noxious weeds in its Land Management Plan?

2. Has the State Historic Preservation Office signed off that this project complies with the Historic Preservation Act? The project is involution of the National Historic Preservation Act if this is not done.

5. How effective has the Forest Service been at stopping (i.e. preventing) new weed infestations from starting during logging and road building operations?

6. Is it true that new roads are the main cause of new noxious weed infestations?

7. Is it true that noxious weeds are one of the top threats to biodiversity on public lands?

8. How can the Forest Service be complying with NFMA's requirement to maintain biodiversity if it has

no legal standards that address noxious weeds?

9. How will the decreased elk security affect wolverines?

Wolverines generally scavenge for ungulates along valley bottoms and forage and den in remote, high-elevation areas (Hornocker and Hash 1981; Morgan and Copeland 1998). Thus if mangers wished to provide habitat for wolverines, they could pay particular attention in the planning process to ungulates winter range and other aspects of habitat quality for ungulates to provide a consistent supply of carcasses for wolverine to scavenge. In addition, wolverines generally avoid areas of human activity. To limit the threat of human-caused disturbance or mortality, managers could restrict access to portions of the landscape where wolverines are most likely to occur.

In order to meet this viability mandate, the 1982 NFMA planning regulations require that the Forest Service select "management indicator species" whose "population changes are believed to indicate the effects of management activities." 36 C.F.R. § 219.19 (1) (2000). 253.

The 1982 NFMA planning regulations require the Forest Service to monitor the population trends of these species and to state and evaluate land management alternatives

"in terms of both amount and quality of habitat and of animal population trends of the management indicator species." 36 C.F.R. § 219.19 (2),(6) (2000).

The wolverine was recently determined to be warranted for listing under the ESA. 75 Fed. Reg.78030 (Dec. 14, 2010). It is currently a proposed species, waiting for work to be completed on other species before it is officially listed. The USFWS found that "[s]ources of human disturbance to wolverines include . . . road corridors, and extractive industry such as logging . . .." .The Forest Service admits that the wolverine and/or its habitat are present within the project area and would be impacted by the project. The Forest Service must go through ESA consultation for the wolverine for this project.

10. How will the project affect Monarch butterflies?

Please prepare a Biological Assessment and formally consult with the U.S. Fish and Wildlife Service on the impact of the project on Monarch butterflies. The western monarch population is facing a dire situation and could blink into extinction without significant action. Once numbering over one million, there were only 1,914 monarchs across 246 sites according to a recent count.

THE AGENCIES MUST COMPLETE A BIOLOGICAL ASSESSMENT, BIOLOGICAL OPINION, INCIDENTAL TAKE STATEMENT, AND MANAGEMENT DIRECTION AMENDMENT FOR THE
RMP FOR THE MONARCH BUTTERFLY.

The agencies do not have in place any forest plan biological assessment, biological opinion, incidental take statement,

and management direction amendment for the Monarch Butterfly.

Did the Forest Service survey for Monarch Butterfly in the project area? Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area.

11. How will the project affect Whitebark pine?

Please prepare a Biological Assessment and formally consult with the USFWS as required by law.

THE AGENCIES MUST COMPLETE A BIOLOGICAL ASSESSMENT, BIOLOGICAL OPINION, INCIDENTAL TAKE STATEMENT, AND MANAGEMENT DIRECTION AMENDMENT FOR THE
RMP FOR THE Whitebark Pine.

The agencies do not have in place any forest plan biological assessment, biological opinion, incidental take statement, and management direction amendment for whitebark pine.

THE AGENCIES MUST CONDUCT ESA CONSULTATION FOR THE
WHITEBARK PINE.

Whitebark may be present in the Project area. The agencies' failure to conduct ESA consultation for a species that may be present and may be affected by the Project violates the ESA. Whitebark Pine are currently proposed for listing under the ESA.

Did the Forest Service survey for whitebark pine in the project area? Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area.

The EA fails to analyze and disclose how climate change is already, and is expected to be even more in the future, influence forest ecology. This has vast ramifications as to whether or not the

forest in the project area will respond as the FS assumes. As the forest plan FEIS states, "Forest Plan management strategies may affect the composition, structure, and landscape pattern of forests. This could influence the susceptibility and resiliency of the forests to significant disturbance agents such as large intense wildfires, insect and disease epidemics, weather events, and climate change." One of the needs for forest plan revision revolves around "concerns that the forest composition, structure, and pattern had shifted away from historical conditions to the extent that ecosystems, and the goods and services that it provided, may not be sustainable, especially in light of potential impacts from climate change." (Id.) It also states:

The 1987 Forest Plan does not contain direction on moving towards historic conditions or to improve resistance and resiliency in the light of climate change. Continued deviation from historic conditions would lead to changes in disturbance and succession processes, making it difficult to provide for a sustainable ecosystem.

The EA fails to
to water stress, competing vegetation, and repeat fires that burn young stands," which will likely lead to a dramatic increase in non-forest land acres. (Johnson, et al., 2016.)

acknowledge the likelihood that "...high seedling and sapling mortality rates due

The District Court of Montana ruled in Case 4:17-cv-00030-BMM that the Federal government was required to evaluate the climate change impacts of the federal government coal program.

In March 2019, U.S. District Judge Rudolph Contreras in Washington, D.C., ruled that when the U.S. Bureau of Land Management (BLM) auctions public lands for oil and gas leasing, officials must

consider emissions from past, present and foreseeable future oil and gas leases nationwide. The case was brought by WildEarth Guardians.

In March of 2018 the Federal District Court of Montana found the Miles City (Montana) and Buffalo (Wyoming) Field Office's Resource Management Plans unlawfully overlooked climate impacts of coal mining and oil and gas drilling. The case was brought by Western Organization of Resource Councils, Montana Environmental Information Center, Powder River Basin Resource Council, Northern Plains Resource Council, the Sierra Club, and the Natural Resources Defense Council.

In the recent revised Forest Plan Draft EIS for the Custer-Gallatin National Forest, the FS states, "Climate change is expected to continue and have profound effects on the Earth's ecosystems in the coming decades (IPCC 2007)." As alarming as that might sound, perhaps the Ripley-Swamped IDT members should familiarize themselves with the most recent report from the Intergovernmental Panel on Climate Change, which makes that 2007 report seem optimistic.

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

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

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

The authors found that if greenhouse gas emissions continue at the current rate, the atmosphere will warm up by as much as 2.7 degrees Fahrenheit (1.5 degrees Celsius) above preindustrial levels by 2040, inundating coastlines and intensifying droughts and poverty. Previous work had focused on estimating the damage if average temperatures were to rise by a larger number, 3.6 degrees Fahrenheit (2 degrees Celsius), because that was the threshold scientists previously considered for the most severe effects of climate change.

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

Past conditions will not predict the future in the wake of climate change. The Montana Climate Assessment (MCA) (Found at http://montanaclimate.org/) is an effort to synthesize, evaluate, and share credible and relevant scientific information about climate change in Montana. It must be considered in development of the revised forest plan. Following are key messages and conclusions:

KEY MESSAGES

- Annual average temperatures, including daily minimums, maximums, and averages, have
  risen across the state between 1950 and 2015. The increases range between 2.0-3.0°F (1.1-1.7°C) during this period. [high agreement, robust evidence]

- Winter and spring in Montana have experienced the most warming. Average temperatures during these seasons have risen by 3.9°F (2.2°C) between 1950 and 2015. [high agreement, robust evidence]

- Montana's growing season length is increasing due to the earlier onset of spring and more extended summers; we are also experiencing more warm days and fewer cool nights. From 1951-2010, the growing season increased by 12 days. In addition, the annual number of warm days has increased by 2.0% and the annual number of cool nights has decreased by 4.6% over this period. [high agreement, robust evidence]

- Despite no historical changes in average annual precipitation between 1950 and 2015, there have been changes in average seasonal precipitation over the same period. Average winter precipitation has decreased by 0.9 inches (2.3 cm), which can mostly be attributed to natural variability and an increase in El Niño events, especially in the western and central parts of the state. A significant increase in spring precipitation (1.3-2.0 inches [3.3-5.1 cm]) has also occurred during this period for the eastern portion of the state. [moderate agreement, robust evidence]

- The state of Montana is projected to continue to warm in all geographic locations, seasons, and under all emission scenarios throughout the 21st century. By mid century, Montana temperatures are projected to increase by approximately 4.5-6.0°F (2.5-3.3°C) depending on the emission scenario. By the end-of-century, Montana temperatures are projected to increase 5.6-9.8°F (3.1-5.4°C) depending on the emission sce-

nario. These state-level changes are larger than the average changes projected globally and nationally. [high agreement, robust evidence]

- The number of days in a year when daily temperature exceeds 90°F (32°C) and the number of frost-free days are expected to increase across the state and in both emission scenarios studied. Increases in the number of days above 90°F (32°C) are expected to be greatest in the eastern part of the state. Increases in the number of frost-free days are expected to be greatest in the western part of the state. [high agreement, robust evidence]

- Across the state, precipitation is projected to increase in winter, spring, and fall; precipitation is projected to decrease in summer. The largest increases are expected to occur during spring in the southern part of the state. The largest decreases are expected to

occur during summer in the central and southern parts of the state. [moderate agreement, moderate evidence]

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

new scientific information on all kinds of changes away from historic conditions.

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

The FS (in USDA Forest Service, 2017b) discusses some effects of climate change on forests, including "In many areas, it will no longer be possible to maintain vegetation within the historical range of variability. Land management approaches based on current or historical conditions will need to be adjusted." The Ripley and Swamped EAs has no scientific basis for its claims that proposed vegetation "treatments" will result in sustainable vegetation conditions under likely climate change scenarios. It also fails to provide a definition of "increasing resilience" that includes metrics for valid and reliable measurement of resilience. The scientific literature even debates if the same tree species mix that has historically inhabited sites can persist after disturbances, including the types of disturbances proposed under project action alternatives.

The and Swamped EAs ignores scientific opinion on forest management's negative effects on carbon sequestration. The forest plan FEIS states, "Carbon sequestration is the process by which atmospheric carbon dioxide is taken up by vegetation through photosynthesis and stored as carbon in biomass (trunks, branches, foliage,

and roots) and soils." Best available science supports the proposition that forest policies must shift away from logging if a priority is carbon sequestration. Forests should be preserved indefinitely for their carbon storage value.

We incorporate the following article from the *Missoulian* (" 2019):

March 11,

Fire study shows landscapes such as

Bitterroot's Sapphire Range too hot, dry to restore trees") written by Rob Chaney (

Burned landscapes like this drainage in the Sapphire Mountains hasn't been able to grow new trees since the Valley Complex fire of 2000, due to lack of soil moisture, humidity and seed trees, as well as excess heat during the growing season. University of Montana students Erika Berglund and Lacey Hankin helped gather samples for a study showing tree stands are getting replaced by grass and shrubs after fire across the western United States due to climate change.



Courtesy Kim Davis



Fire-scarred forests like the Sapphire Range of the Bitterroot Valley may become grasslands because the growing seasons have become too hot and dry, according to new research from the University of Montana.

“The drier aspects aren’t coming back, especially on north-facing slopes,” said Kim Davis, a UM landscape ecologist and lead investigator on the study. “It’s not soil sterilization.

Other vegetation like grasses are re-sprouting. It’s too warm. There’s not enough moisture for the trees.”

Davis worked with landscape ecologist Solomon Dobrowski, fire paleoecologist Philip Higuera, biologist Anna Sala and geoscientist Marco Maneta at UM along with colleagues at the U.S. Forest Service and University of Colorado-Boulder to produce the study, which was released Monday in the Proceedings of the National Academy of Sciences journal.

“What’s striking is if you asked scientists two decades ago how climate warming would play out, this is what they expected we’d see,” Higuera said. “And now we’re starting to see those predictions on the impact to ecosystems play out.”

The study concentrated on regrowth of Ponderosa pine and Douglas fir seedlings in Montana, Idaho, Colorado, New Mexico, Arizona and northern California. Field workers collected trees from 90 sites, including 40 in the northern Rocky Mountains, scattered within 33 wildfires that had occurred within the past 20 years.

“We did over 4,000 miles of road-tripping across the West, as well as lots of miles hiking and backpacking,” Davis said. The survey crews brought back everything from dead seedlings to 4-inch-diameter tree rings; nearly 3,000 samples in total. Then they analyzed how long each tree had been growing and what conditions had been when it sprouted.

Before the 1990s, the test sites had enough soil moisture, humidity and other factors to recruit new seedlings after forest fires, Dobrowski said.

“There used to be enough variability in seasonal conditions that seedlings could make it across these fixed thresholds,” Dobrowski said. “After the mid-‘90s, those windows have been closing more often. We’re worried we’ll lose these low-elevation forests to shrubs or grasslands. That’s what the evidence points to.”

After a fire, all kinds of grasses, shrubs and trees have a blank slate to recover. But trees, especially low-elevation species, need more soil moisture and humidity than their smaller plant cousins. Before the mid-90s, those good growing seasons rolled around every three to five years. The study shows such conditions have evaporated on virtually all sites since 2000.

“The six sites we looked at in the Bitterroots haven’t been above the summer humidity threshold since 1997,” Higuera said. “Soil moisture hasn’t crossed the threshold since 2009.”

The study overturns some common assumptions of post-fire recovery. Many historic analyses of mountain forests show the hillsides used to hold far fewer trees a century ago, and have become overstocked due to the efforts humans put at controlling fire in the woods. Higuera explained that some higher elevation forests are returning to their more sparse historical look due to increased fires.

“But at the lower fringes, those burn areas may transition to non-forest types,” Higuera said, “especially where climate conditions at the end of this century are different than what we had in the early 20th Century.”

The study also found that soil sterilization wasn't a factor in tree regrowth, even in the most severely burned areas. For example, the 2000 Sula Complex of fires stripped forest cover in the southern end of the Bitterroot Valley. While the lodgepole pine stands near

Lost Trail Pass have recovered, the lower- elevation Ponderosa pine and Douglas firs haven' t.

Another factor driving regeneration is the availability of surviving seed trees that can repopulate a burn zone. If one remains within 100 meters of the burned landscape, the area can at least start the process of reseeding. Unfortunately, the trend toward high-severity fires has reduced the once-common mosaic patterns that left some undamaged groves mixed into the burned areas.

Higuera said he hoped land managers could use small or prescribed fires to make landscapes more resilient, as well as restructure tree-planting efforts to boost the chances of heavily burned places.

The Resources Planning Act of 1974 (RPA) and National Forest Management Act of 1976 (NFMA) mandate long-range planning which impose numerous limitations on timber extraction practices and the amount of timber sold annually. These long range plans are based on assumptions, which are based on data, expert opinion, public participation and other factors which mostly view from a historical perspective. So it's time to peer into the future to examine closely (NEPA: "take a hard look at") those assumptions.

Clearly, the FS is not considering best available science on this topic.

The EA and Forest Plan FEIS fail to reexamine the assumptions relating to timber suitability, resilience and sustainability as a result of recent fires, past regeneration success/failures, and climate-risk science.

Conventional wisdom dictates that forests regenerate and recover from wildfire. If that's true, then it's logical to conclude that forests can regenerate and recover from logging. And these days, "resilience" is a core tenant of Forest Service planning. Unfortunately, assumptions of the EA and Forest Plan FEIS relating to desired conditions are incorrect. NEPA requires a "hard look" at the best available science relating to future concentrations of greenhouse gases and gathering climate risk as we move forward into an increasingly uncertain and uncharted climate future. This has not been done. The Forest Plan and and Swamped EA do not include a legitimate climate-risk analysis.

Scientific research indicates that increasing CO_2 and other greenhouse gas concentrations may preclude maintaining and attaining the anticipated forest conditions in the project area and across the KNF. The agency downplays the implications across the entire Northern Rockies bioregion and beyond, seeming unaware of the likelihood that its desired conditions are at great risk.

No amount of logging, thinning and prescribes burning will cure the cumulative effects (irretrievable loss) already baked into the foreseeably impending climate chaos. "Treatments" must be acknowledged for what they are: adverse cumulative environmental effects. Logging can neither mitigate, nor prevent, the effects of wildfire or logging. Both cause disturbance to forests that cannot be restored or retrieved—the resilience assumed no longer exists. It is way too late in the game to pretend to ignore the elephant in the room.

The Forest Service ignores best available science indicating prescribed fire, thinning and logging are actually cumulative with the dominant forces of increased heat, drought, and wildfire.

NEPA requires analysis of an alternative that reflects our common understanding of climate risk. A considerable amount of data and

scientific research repeatedly confirms that we may be looking in the wrong direction (back into history, e.g., "natural range of variability") for answers to better understand our forest future.

The Forest Service fails to analyze an alternative projecting climate science into the forest's future. It fails to adequately consider that the effects of climate risk represent a significant and eminent loss of forest resilience already, and growing risk into the "foreseeable future."

Funk et al., 2014 indicate that at least five common tree species, including aspens and four conifers, are at great risk unless atmospheric greenhouse gases and associated temperatures can be contained at today's levels of concentration in the atmosphere. It is indeed time to speak honestly about unrealistic expectations relating to desired conditions.

And according to scientific literature it seems highly unlikely that greenhouse gas concentrations and the heat they trap in the atmosphere will be held at current levels.

The Forest Service fails to analyze and disclose conditions we can realistically expect as heat trapped by increasing greenhouse gas concentrations steadily tightens its grip—and impacts on forests accrue locally, regionally, nationally, and globally.

The EA fails to assess and disclose all risks associated with vegetative-manipulation as proposed.

NEPA requires disclosure of impact on "the human environment." Climate risk presents overarching adverse impacts on cultural, economic, environmental, and social aspects of the human environment—people, jobs, and the economy—adjacent to and near the Forests. Challenges in predicting responses of individual tree species to climate are a result of species competing under a never-

before-seen climate regime that we have not seen before—one forests may not have experienced before either.

Golladay et al., 2016 state, "In an uncertain future of rapid change and abrupt, unforeseen transitions, adjustments in management approaches will be necessary and some actions will fail. However, **it is increasingly evident that the greatest risk is posed by continuing to implement strategies inconsistent with and not informed by current understanding of our novel future**... (Emphasis added).

In the face of increasing climate risk, growing impacts of wildfire and insect activity, plus scientific research findings, the Forest Service must disclose the significant trend in post-fire regeneration failure. The EA fails to do so. The national forests have already experienced considerable difficulty restocking on areas that have been subjected to clear-cut logging, post- fire salvage logging and other even-aged management "systems." NFMA (1982) regulation 36CFR 219.27(c)(3) implements the NFMA statute, and requires restocking in five years.

The EA doesn't address the question of how lands were determined to be suitable for the type of management ongoing or proposed. It does not cite the specific documentation which determined that the specific areas proposed for logging in this proposal are suitable for timber production.

It's time to analyze and disclose the fact that the KNF can no longer "insure that timber will be harvested from the National Forest system lands only where...there is assurance that such lands can be restocked within five years of harvest." [NFMA §6(g)(3)(E)(ii)].

Davis et al., 2019 state: "

At dry sites across our study region, seasonal to annual climate

conditions over the past 20 years have crossed these thresholds, such that conditions have

become increasingly unsuitable for regeneration. High fire severity and low seed availability

further reduced the probability of postfire regeneration. Together, our results demonstrate that

climate change combined with high severity fire is leading to increasingly fewer opportunities

for seedlings to establish after wildfires and may lead to ecosystem transitions in low-elevation

ponderosa pine and Douglas-fir forests across the western United States."

Forests are already experiencing emissions-driven deforestation, on both the post-fire and post- logging acreage.

The EA does not disclose restocking monitoring data and analysis.

Stevens-Rumann, et al., (2018) state: "In the US Rocky Mountains, we documented a significant trend of post-fire tree regeneration, even over the relatively short period of 23 years covered in this analysis. Our findings are consistent with the expectation of **reduced resilience of forest ecosystems to the combined impacts of climate warming and wildfire activity**. Our results suggest that predicted **shifts from forest to non-forested vegetation**. (Emphases added.)

The FS must finally accept scientific research and opinion that recognizes the critical challenge posed by climate change to global ecosystems and the KNF. The statement in the 2010 KIPZ Climate Change Report, "Harvested wood products increase the net seques-

tration on these forests by an undetermined amount" is unsubstantiated by cited scientific research or information. The statement frames the position of denial that FS officials adopt as policy.

The Forest Plan and Swamped EA are based on assumptions largely drawn from the past. These assumptions must be rejected where overwhelming evidence demonstrates a change of course is critical. It is time to take a step back, assess the future and make the necessary adjustments, all in full public disclosure to the Congress and the public.

The EA fails to analyze how proposed management actions would be affected by likely climate change scenarios. The EA fails to quantify all human-caused CO_2 emissions for all project activities or quantify carbon sequestration for each alternative. The EA doesn't disclose how climate change has affected ecological conditions in the project area, and include an analysis of these conditions under climate change scenarios.

Some politicians, bureaucrats, and industry profiteers pretend there's nothing to do about climate change because it isn't real. The FS acknowledges it's real, pretends it can do nothing, provides but a limited focus on its symptoms and—like those politicians and profiteers—ignores and distracts from the causes of climate change they enable.

Global climate change is a massive, unprecedented threat to humanity and forests. Climate change is caused by excess CO_2 and other greenhouse gases transferred to the atmosphere from other pools. All temperate and tropical forests, including those in this project area, are an important part of the global carbon cycle. There is significant new information reinforcing the need to conserve all existing large stores of carbon in forests, in order to keep carbon out of the atmosphere and mitigate climate change. The agency must do its part by managing forests to maintain and increase car-

bon storage. Logging would add to cumulative total carbon emissions so is clearly part of the problem, so it must be minimized and mitigated. Logging would not only transfer carbon from storage to the atmosphere but future regrowth is unlikely to ever make up for the effects of logging, because carbon storage in logged forests lags far behind carbon storage in unlogged forests for decades or centuries. And before recovery, the agency plans even more activities causing greenhouse gas emissions.

Clearly, the management of the planet's forests is a nexus for addressing the largest crisis ever facing humanity. This is an issue as serious as nuclear annihilation (although at least with the latter we're not already pressing the button).

There is no cumulative effects analysis of KNF carbon sequestration over time.

Respected experts say that the atmosphere might be able to safely hold 350 ppm of CO_2.[5] So when the atmosphere was at pre-industrial levels of about 280 ppm, there was a cushion of about 70 ppm which represents millions of tons of greenhouse gas emissions. Well, now that cushion is completely gone. The atmosphere is now over 400 ppm CO_2 and rising. Therefore the safe level of additional emissions (from logging or any other activity) is negative. There is no safe level of additional emissions that our earth systems can tolerate. We need to be removing carbon from the atmosphere—not adding to it.[6] How? By allowing forest to grow. Logging moves us away from our objective while conservation moves us toward our objective.

Pecl, et al. 2017 "review the consequences of climate-driven species redistribution for economic development and the provision of ecosystem services, including livelihoods, food security, and

[5] http://www.350.org/about/science.

[6] "To get back to 350 ppm, we'll have to run the whole carbon-spewing machine backwards, sucking carbon out of the atmosphere and storing it somewhere safely. ... By growing more forests, growing more trees, and better managing all our forests..." (http://blog.cleanenergy.org/2013/11/26/exploringbiocarbon-tools/comment-page-1/#comment-375371)

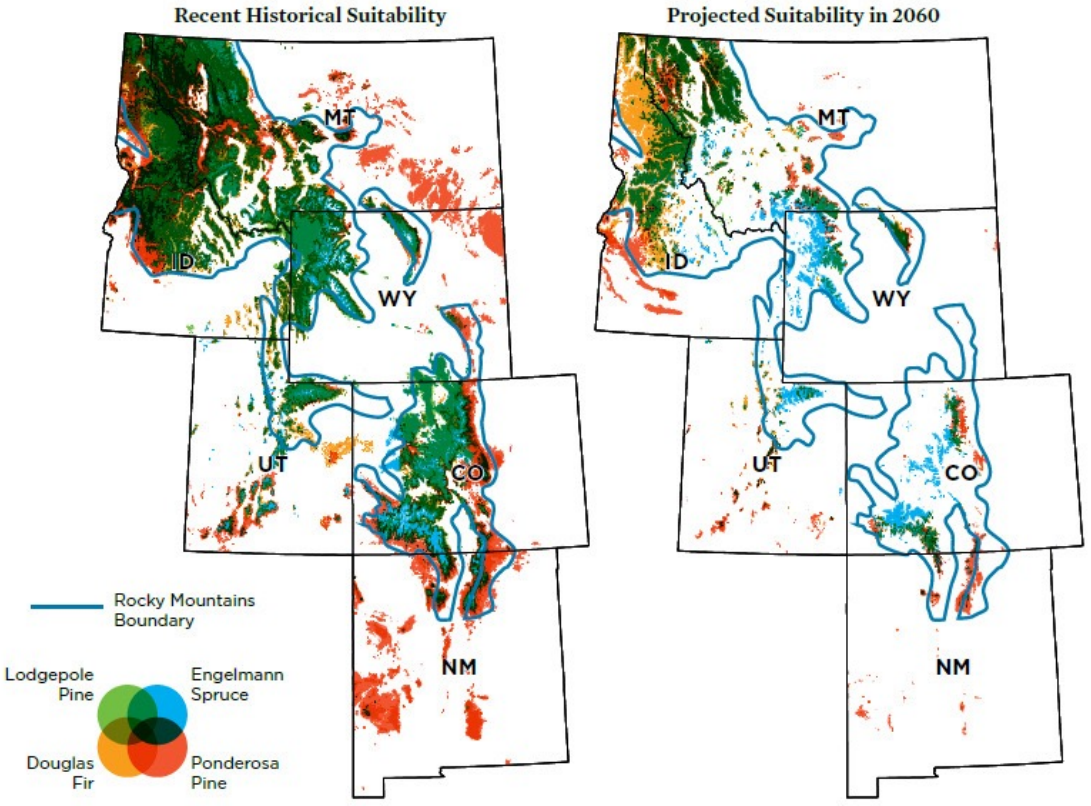
culture, as well as for feedbacks on the climate itself." They state, "Despite mounting evidence for the pervasive and substantial impacts of a climate-driven redistribution of Earth's species, current global goals, policies, and international agreements fail to account for these effects. ... To date, all key international discussions and agreements regarding climate change have focused on the direct socioeconomic implications of emissions reduction and on funding mechanisms; **shifting natural ecosystems have not yet been considered in detail**." (Emphasis added.)

From a report by the Union of Concerned Scientists & Rocky Mountain Climate Organization (Funk et al., 2014):

The caption under Funk et al.'s Figure 5 and Table 1 states:
Much of the current range of these four widespread Rocky Mountain conifer species is projected to become climatically unsuitable for them by 2060 if emissions of heat-trapping gases continue to rise. The map on the left shows areas projected to be climatically suitable for these tree species under the recent historical (1961–1990) climate; the map on the right depicts conditions projected for 2060 given medium-high levels of heat-trapping emissions. Areas in color have at least a 50 percent likelihood of being climatically suitable according to the models, which did not address other factors that affect where species occur (e.g., soil types). Emissions levels reflect the A2 scenario of the Intergovernmental Panel on Climate Change. For more about this methodology, see www.ucsusa.org/forestannex.

Pecl, et al. 2017 conclude:

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



Species	Current	2060		
	Recent Historical Suitability (acres)	Projected Suitability (acres)	Net Change in Suitability (acres)	Percent Net Change
Lodgepole Pine	60,474,000	6,065,000	-54,409,000	-90%
Ponderosa Pine	39,842,000	7,771,000	-32,071,000	-80%
Engelmann Spruce	64,651,000	21,999,000	-42,652,000	-66%
Douglas Fir	53,620,000	22,606,000	-31,014,000	-58%

25

The breadth and complexity of the issues associated with the global redistribution of species driven by changing climate are creating profound challenges, with species movements already affecting societies and regional economies from the tropics to polar regions. Despite mounting evidence for these impacts, current global goals, policies, and international agreements do not sufficiently consider species range shifts in their formulation or targets. Enhanced

awareness, supported by appropriate governance, will provide the best chance of minimizing negative consequences while maximizing opportunities arising from species movements—movements that, with or without effective emission reduction, will continue for the foreseeable future, owing to the inertia in the climate system.

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

Global climate change is caused by excess CO_2 and other greenhouse gases transferred to the atmosphere from other pools. Human activities, including combustion of fossil fuels and bioenergy, forest loss and degradation, other land use changes, and industrial processes, have contributed to increasing atmospheric CO_2, the largest contributor to global warming, which will cause temperatures to rise and stay high into the next millennium or longer.

The most recent measurements show the level of atmospheric carbon dioxide has reached 400 parts per million and will likely to remain at that level for millennia to come. Even if all fossil fuel emissions were to cease and all other heat-trapping gases were no longer emitted to the atmosphere, temperatures close to those achieved at the emissions peak would persist for the next millennium or longer.

Meeting the goals of the Paris Agreement now requires the implementation of strategies that result in negative emissions, i.e., extraction of carbon dioxide from the atmosphere. In other words, we need to annually remove more carbon dioxide from the atmosphere than we are emitting and store it long-term. Forests and soils are the only proven techniques that can pull vast amounts of carbon dioxide out of the atmosphere and store it at the scale necessary to meet the Paris goal. Failure to reduce biospheric emissions and to

restore Earth's natural climate stabilization systems will doom any attempt to meet the Paris (COP21) global temperature stabilization goals.

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

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

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

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

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

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

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

118% in the next century (*12*), and similar increases seem likely for the western United States.

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

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

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

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

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

The KNF Forest Plan draft EIS defines carbon sequestration: "The process by which atmospheric carbon dioxide is taken up by trees,

grasses, and other plants through photosynthesis and stored as carbon in biomass (trunks, branches, foliage, and roots) and soils."

The analysis fails to quantify CO_2 and other greenhouse gas emissions from other common human activities related to forest management and recreational uses. These include emissions associated with machines used for logging and associated activities, vehicle use for administrative actions, recreational motor vehicles, and emissions associated with livestock grazing. The FS is simply ignoring the climate impacts of these management and other authorized or allowed activities.

Kassar and Spitler, 2008 provide an analysis of the carbon footprint of off-road vehicles in California. They determined that:

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

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

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

Also, Sylvester, 2014 provides data on the amount of fossil fuel being consumed by snowmobiles in Montana, from which one can calculate the carbon footprint. The study finds that resident snowmobilers burn 3.3 million gallons of gas in their snowmobiles each year and a similar amount of fuel to transport themselves and their snowmobiles to and from their destination. Non-residents annually burn one million gallons of gas in snowmobiles and about twice that in related transportation. So that adds up to 9.6 million gallons of fuel consumed in the pursuit of snowmobiling each year in Montana alone. Multiply that by 20 pounds of carbon dioxide per gallon of gas (diesel pickups spew 22 pounds per gallon) and snowmobiling releases 192 million pounds (96 thousand tons) of climate-warming CO_2 per year into the atmosphere. Can we really afford this?

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

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

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

al., 1990; Homann et al., 2005; Law, 2014; Solomon et al., 2007; Turner et al., 1995; Turner et al., 1997; Woodbury et al., 2007.)

Kutsch et al., 2010 provide an integrated view of the current and emerging methods and concepts applied in soil carbon research. They use a standardized protocol for measuring soil CO_2 efflux, designed to improve future assessments of regional and global patterns of soil carbon dynamics:

Excluding carbonate rocks, soils represent the largest terrestrial stock of carbon, holding approximately 1,500 Pg (1015 g) C in the top metre. This is approximately twice the amount held in the atmosphere and thrice the amount held in terrestrial vegetation. Soils, and soil organic carbon in particular, currently receive much attention in terms of the role they can play in mitigating the effects of elevated atmospheric carbon dioxide (CO_2) and associated global warming. Protecting soil carbon stocks and the process of soil carbon sequestration, or flux of carbon into the soil, have become integral parts of managing the global carbon balance. This has been mainly because many of the factors affecting the flow of carbon into and out of the soil are affected directly by **land-management practices**. (Emphasis added.)

Moomaw and Smith, 2017 state:
Multiple studies warn that carbon emissions from soil due to logging are significant, yet under-reported. One study found that logging or clear-cutting a forest can cause carbon emissions from soil disturbance for up to fifty years. Ongoing research by an N.C. State University scientist studying soil emissions from logging on Weyerhaeuser land in North Carolina suggests that “logging, whether for biofuels or lumber, is eating away at the carbon stored beneath the forest floor.”

Moomaw and Smith, 2017 examined the scientific evidence implicating forest biomass removal as contributing to climate change:

All plant material releases slightly more carbon per unit of heat produced than coal. Because plants produce heat at a lower temperature than coal, wood used to produce electricity produces up to 50 percent more carbon than coal per unit of electricity.

Trees are harvested, dried, and transported using fossil fuels. These emissions add about 20 percent or more to the carbon dioxide emissions associated with combustion.

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

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

Van der Werf, et al. 2009 discuss the effects of land-management practices and state:
(T)he maximum reduction in CO_2 emissions from avoiding deforestation and forest degradation is probably about 12% of current total anthropogenic emissions (or 15% if peat degradation is included) - and that is assuming, unrealistically, that emissions from

deforestation, forest degradation and peat degradation can be completely eliminated.

...reducing fossil fuel emissions remains the key element for stabilizing atmospheric CO_2 concentrations.

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

Keith et al., 2009 state:
Both net primary production and net ecosystem production in many old forest stands have been found to be positive; they were lower than the carbon fluxes in young and mature stands, but not significantly different from them. Northern Hemisphere forests up to 800 years old have been found to still function as a carbon sink. Carbon stocks can continue to accumulate in multi-aged and mixed species stands because stem respiration rates decrease with increasing tree size, and continual turnover of leaves, roots, and woody material contribute to stable components of soil organic matter. There is a growing body of evidence that forest ecosystems do not necessarily reach an equilibrium between assimilation and respiration, but can continue to accumulate carbon in living biomass, coarse woody debris, and soils, and therefore may act as net carbon sinks for long periods. Hence, process-based models of forest growth and carbon cycling based on an assumption that stands are even- aged and carbon exchange reaches an equilibrium may underestimate productivity and carbon accumulation in some forest types. Conserving forests with large stocks of biomass from deforestation and degradation avoids significant carbon emissions to the atmosphere. Our insights into forest types and forest conditions that result in high biomass carbon density can be used to help identify priority areas for conservation and restoration.

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

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

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

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

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

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

torical functionality to fire-suppressed ecosystems, we found little credible evidence that such efforts have the added benefit of increasing terrestrial C stocks.

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

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

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

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

None of this means that longstanding values such as conservation of old-growth forests are no longer important. Under increasing heat and its consequences, we're likely to get unfamiliar understory and canopy comprised of a different mix of species. This new assortment of plant species will plausibly entail a new mix of trees,

because some familiar tree species on the (KNF) may not be viable—or as viable—under emerging climate conditions.

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

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

Heat, a long-established topic of physics, plays an equally important role at the level of plant and animal physiology—every organism only survives and thrives within thermal limits. For example, Pörtner et al. (2008) point out, "All organisms live within a limited range of body temperatures... Direct effects of climatic warming can be understood through fatal decrements in an organism's performance in growth, reproduction, foraging, immune competence, behaviors and competitiveness." The authors further explain, "Performance in animals is supported by aerobic scope, the increase in oxygen consumption rate from resting to maximal." In other words, rising heat has the same effect on animals as reducing the oxygen supply, and creates the same difficulties in breathing. But breathing difficulties brought on by heat can have important consequences even at sub-lethal levels. In the case of grizzly bears, increased demand for oxygen under increasing heat has implications

for vigorous (aerobically demanding) activity including digging, running in pursuit of prey, mating, and the play of cubs.

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

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

Some FS scientists recognize this changing situation, for instance Johnson, 2016:
Forests are changing in ways they’ve never experienced before because today’s growing conditions are different from anything in the past. The climate is changing at an unprecedented rate, exotic diseases and pests are present, and landscapes are fragmented by human activity often occurring at the same time and place.

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

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

“This may no longer be the case.”

The issue of forest response to climate change is also of course an issue of broad importance to community vitality and economic sustainability. Raising a question about persistence of forest stands also raises questions about hopes—and community economic planning—for the sustainability of forest-dependent jobs. Allen et al., 2015 state:

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

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

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

These high-confidence drivers, in concert with research supporting greater vulnerability perspectives, support an overall viewpoint of greater forest vulnerability globally. We surmise that mortality vul-

nerability is being discounted in part due to difficulties in predicting threshold responses to extreme climate events. Given the profound ecological and societal implications of underestimating global vulnerability to hotter drought, we highlight urgent challenges for research, management, and policy-making communities.

Moomaw and Smith, 2017 conclude:
With the serious adverse consequences of a changing climate already occurring, it is important to broaden our view of sustainable forestry to see forests ...as complex ecosystems that provide valuable, multiple life-supporting services like clean water, air, flood control, and carbon storage. We have ample policy mechanisms, resources, and funding to support conservation and protection if we prioritize correctly.

...We must commit to a profound transformation, rebuilding forested landscapes that sequester carbon in long-lived trees and permanent soils. Forests that protect the climate also allow a multitude of species to thrive, manage water quality and quantity and protect our most vulnerable communities from the harshest effects of a changing climate.

Protecting and expanding forests is not an “offset” for fossil fuel emissions. To avoid serious climate disruption, it is essential that we simultaneously reduce emissions of carbon dioxide from burning fossil fuels and bioenergy along with other heat trapping gases and accelerate the removal of carbon dioxide from the atmosphere by protecting and expanding forests. It is not one or the other. It is both!

Achieving the scale of forest protection and restoration needed over the coming decades may be a challenging concept to embrace politically; however, forests are the only option that can operate at the necessary scale and within the necessary time frame to keep the world from going over the climate precipice. Unlike the fossil fuel

companies, whose industry must be replaced, the wood products industry will still have an important role to play in providing the wood products that we need while working together to keep more forests standing for their climate, water, storm protection, and biodiversity benefits.

It may be asking a lot to "rethink the forest economy" and to "invest in forest stewardship," but tabulating the multiple benefits of doing so will demonstrate that often a forest is worth much more standing than logged. Instead of subsidizing the logging of forests for lumber, paper and fuel, society should pay for the multiple benefits of standing forests. It is time to value U.S. forests differently in the twenty-first century. We have a long way to go, but there is not a lot of time to get there.

The FS doesn't consider that the "desired" vegetation conditions may not be achievable or sustainable, nor conduct an analysis as to how realistic and achievable Forest Plan desired conditions are in the context of a rapidly changing climate, along an unpredictable but changing trajectory.

Global warming and its consequences are effectively *irreversible* which implicates certain legal consequences under NEPA and NFMA and ESA (e.g., 40 CFR § 1502.16; 16 USC §1604(g); 36 CFR §219.12; ESA Section 7; 50 CFR §§402.9, 402.14). All net carbon emissions from logging represent "irretrievable and irreversible commitments of resources."

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

Harmon, 2009 is the written record of "Testimony Before the Subcommittee on National Parks, Forests, and Public Lands of the Committee of Natural Resources for an oversight hearing on The Role of Federal Lands in Combating Climate Change." The author "reviews, in terms as simple as possible, how the forest system stores carbon, the issues that need to be addressed when assessing any proposed action, and some common misconceptions that need to be avoided." His testimony begins, "I am here to ...offer my expertise to the subcommittee. I am a professional scientist, having worked in the area of forest carbon for nearly three decades. During that time I have conducted numerous studies on many aspects of this problem, have published extensively, and provided instruction to numerous students, forest managers, and the general public."

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

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

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

Remedy: Choose the No Action Alternative. Revise the Forest Plan to take a hard look at the science of climate change. Alternatively, revise the EA for this project if the FS still wants to pursue it, which includes an analysis that examines climate change in the context of project activities and Desired Conditions. Better yet, it's time to prepare an EIS on the whole bag of U.S. Government climate policies.

TRAVEL MANAGEMENT

AWR's August 2019 comments raised the issue of travel and access management at page 4. This relates directly to the issue of access management we discuss throughout our comments concerning habitat security for grizzly bears. Also, issues regarding the minimum road system were raised in our Objection to the revised forest plan (OBJECTION STATEMENT: Inadequate direction to designate the minimum road system).

Consistent with genuine restoration, we support implementation of FS policy to **right-size the road network** to achieve the ecologically sustainable **minimum road system** necessary. Annual maintenance must be affordable, leaving no significant chronic unmet needs which tend to cause long-term ecosystem stressors. We believe that the Transportation Analysis Process is something in which the agency should be inviting the public to collaboratively participate, and indeed provisions in the forest plan require this be addressed in all project planning.

We incorporate the documents in the folder titled "WildEarth Guardians-TAP" which are letters to the KNF regarding the Travel Analysis Process.

The 2003 Analysis of the Management Situation Technical Report presented information on the financial liabilities of the KNF's National Forest System Roads:

For the KNF, the annual maintenance budget would need to be approximately $28.8 million dollars and the cost to bring all roads up to their assigned maintenance level is estimated at $515 million dollars.

(AMS Technical Report, 115.) It is important to note that the $28.8 million estimated annual maintenance costs far exceed all published estimates of road maintenance funding the KNF has received annually at least since the AMS was published. And although the FS never likes to conduct an analysis of—nor disclose the forest-wide ecological impacts of—its road maintenance funding shortfalls, projecting from discussion in Gucinski et al. 2001 (cited in the AMS) helps for imagining the scale of the impacts.

Table 1-28: Summary of Road Miles and Estimated Maintenance Costs by Objective Maintenance Levels

FOREST	Total Miles	Estimated Annual Maintenance Costs	Estimated Deferred Maintenance Costs
Idaho Panhandle			
Objective Maint. Level 5	99	$206,415	$99,000
Objective Maint. Level 4	258	$894,228	$1,291,290
Objective Maint. Level 3	1,965	$3,075,225	$44,275,380
Objective Maint. Level 2	2,452	$1,500,624	$96,008,060
Objective Maint. Level 1	6,819	$988,755	$378,454,500
TOTAL	**11,593**	**$6,665,247**	**$520,128,230**
Kootenai			
Objective Maint. Level 5	98	$576,534	$76,815,242
Objective Maint. Level 4	121	$3,477,540	$91,161,521
Objective Maint. Level 3	1,526	$7,347,690	$190,441,748
Objective Maint. Level 2	1,759	$3,410,701	$34,173,852
Objective Maint. Level 1	4,419	$14,043,582	$122,927,742
TOTAL	**7,923**	**$28,856,047**	**$515,520,105**

Source: USFS Infra database

Note: Approx. 28 miles of road on the IPNFs has unassigned Objective. Maint. Levels.
Approx. 31 miles of road on the KNF has unassigned Objective. Maint. Levels

It is also important to recognize the ongoing ecological damage of roads—regardless of the adequacy of maintenance funding:

Undesirable consequences include adverse effects on hydrology and geomorphic features (such as debris slides and sedimentation), habitat fragmentation, predation, road kill, invasion by exotic species, dispersal of pathogens, degraded water quality and chemical contamination, degraded aquatic habitat, use conflicts, destructive human actions (for example, trash dumping, illegal hunting, fires), lost solitude, depressed local economies, loss of soil productivity, and decline in biodiversity. (Gucinski et al., 2001)

The EA fails to demonstrate compliance with FW-OBJ-AR-03: "The outcome is:
• Annually, meet maintenance level requirements on 20 to 30 percent of Operational Maintenance Level 3, 4, and 5 roads (roads that are drivable by passenger vehicles and provide primary access to many recreation opportunities).
• Annually, meet maintenance level requirements on 10 to 20 percent of Operational Maintenance Level 2 roads (roads that are drivable by high clearance vehicles and provide additional access to recreation opportunities)."

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

INFISH Forest Plan Standard #RF-2 requires development and implementation of a Road Management Plan or a Transportation management Plan, which must address, among other items, 'Criteria that govern road ...maintenance and management.' Project area criteria were not disclosed in the EA analysis. The EA also fails to

address “Requirements for pre-, during, and post storm inspection and maintenances.”

The EA doesn’t disclose how the project would be consistent with the Travel Management Rule 36 CFR Part 212, Subparts A, B, and C, which are regulations that affect the project area.

The EA doesn’t provide an analysis demonstrating consistency with the Road Management Objectives for each road in the project area.

The EA doesn’t the annual expenditures for road maintenance in the project area, nor the level of maintenance deferred due to insufficient funding.

The EA doesn’t disclose ongoing soil and water impacts from roads not being adequately maintained. Please disclose the impacts of roads that are not maintained because they are unauthorized or non-system.

The EA doesn’t provide documentation of surveys of conditions on all roads (system, non- system, undetermined, etc.) conducted in the project area.

To address its unsustainable and deteriorating road system, the FS promulgated the

Roads Rule (referred to as “subpart A”) in 2001. The rule directs each national forest to conduct “a science-based roads analysis,” generally referred to as the “travel analysis process.” The Forest Service Washington Office, through a series of directive memoranda, instructed forests to use the Subpart A process to “maintain an appropriately sized and environmentally sustainable road system that is responsive to ecological, economic, and social concerns.” These memoranda also outline core elements that must be included in each Travel Analysis Report.

The Washington Office memorandum dated March 29, 2012 (USDA Forest Service, 2012d) directed the following:

• A TAP must analyze all roads (maintenance levels 1 through 5);
• The Travel Analysis Report must include a map displaying roads that will inform the Minimum Road System pursuant to 36 C.F.R. § 212.5(b), and an explanation of the underlying analysis;
• The TAP and Watershed Condition Framework process should inform one another so that they can be integrated and updated with new information or where conditions change.

The December 17, 2013 Washington Office memorandum (USDA Forest Service, 2013b) clarifies that by the September 30, 2015 deadline each forest must:

• Produce a Travel Analysis Report summarizing the travel analysis;
• Produce a list of roads *likely not needed for future use*; and
• Synthesize the results in a map displaying roads that are *likely needed* and *likely not needed in the future* that conforms to the provided template.

The Subpart A analysis is intended to account for benefits and risks of each road, and especially to account for affordability. The TAP must account for the cost of maintaining roads to standard, including costs required to comply with Best Management Practices related to road maintenance.

The Travel Management Regulations at 36 CFR § 212.5 state:
(b) Road system—(1) *Identification of road system*. For each national forest, national grassland, experimental forest, and any other units of the National Forest System (§ 212.1), the responsible official must identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands. In determining the minimum road

system, the responsible official must incorporate a science-based roads analysis at the appropriate scale and, to the degree practicable, involve a broad spectrum of interested and affected citizens, other state and federal agencies, and tribal governments. The minimum system is the road system determined to be needed to meet resource and other management objectives adopted in the relevant land and resource management plan (36 CFR part 219), to meet applicable statutory and regulatory requirements, to reflect long-term funding expectations, to ensure that the identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance.

Early in the forest plan revision process, the FS recognized the opportunity the process provided for addressing the excessive road system on the Forest. This was indicated in statements made in the AMS:

The revised Forest Plans need to be in compliance with new laws, regulations, and management direction. Forest Plans also need to incorporate new research and science that has been developed. The new strategies have been developed to aid in the sustainability of all native and desired non-native species.

In January of 2001, a new Forest Roads Rule and Policy was issued which revised regulations concerning the management, use, and maintenance of the National Forest Transportation System. Forest Plan Revision provides the opportunity to incorporate this direction into the Forest Plans (USDA 2001b).

Possible Strategies in Revising Management Direction for Access and Recreation:

• Provide management direction for Access and Travel Management Planning, including criteria for developing access strategies by appropriate modes and season of use.

On the verge of taking bold, necessary strides towards reforming its roads and access management into something ecologically sustainable, the FS issued the revised Forest Plan and FEIS which failed to analyzed or address the problem, and then followed that up with a sham Region 1-directed Travel Analysis Process that failed to follow the Travel Management Rule Subpart A requirements for involving the public in a science-based effort to identify the forestwide minimum road system. The FS is obligated to disclose the project area road system's long-term financial liabilities, and the associated ecological impacts due to inadequate maintenance funding.

Huge bibliographies of scientific information indicate the highly significant nature of departures from historic conditions that are the impacts on forest ecosystems caused by motorized travel routes and infrastructure. That there are no road density standards in the forest plan suggests the biased and arbitrary manner of the FS's use of its own "best available science." From the Wisdom et al. (2000) Abstract:

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

Carnefix and Frissell, 2009 make a very strong scientific rationale for including ecologically- based road density standards:

Roads have well-documented, significant and widespread ecological impacts across multiple scales, often far beyond the area of the road "footprint". Such impacts often create large and extensive departures from the natural conditions to which organisms are adapted, which increase with the extent and/or density of the road network. Road density is a useful metric or indicator of human impact at all scales broader than a single local site because it integrates impacts of human disturbance from activities that are associated with roads and their use (e.g., timber harvest, mining, human wildfire ignitions, invasive species introduction and spread, etc.) with direct road impacts. Multiple, convergent lines of empirical evidence summarized herein support two robust conclusions: 1) no truly "safe" threshold road density exists, but rather negative impacts begin to accrue and be expressed with incursion of the very first road segment; and 2) **highly significant impacts (e.g., threat of extirpation of sensitive species) are already apparent at road densities on the order of 0.6 km per square km (1 mile per square mile) or less.** Therefore, restoration strategies prioritized to reduce road densities in areas of high aquatic resource value from low-to-moderately-low levels to zero-to-low densities (e.g., <1 mile per square mile, lower if attainable) are likely to be most efficient and effective in terms of both economic cost and ecological benefit. By strong inference from these empirical studies of systems and species sensitive to humans' environmental impact, with limited exceptions**, investments that only reduce high road density to moderate road density are unlikely to produce any but small incremental improvements in abundance, and will not result in robust populations of sensitive species.**

(Emphases added.) Wisdom et al., 2000, which was cited heavily in the forest plan FEIS and is thus considered to be "Best Available Science" by the FS, state in their Abstract:

Our analysis also indicated **that >70 percent of the 91 species are affected negatively by one or more factors associated with roads.** Moreover, maps of the abundance of source habitats in relation to classes of road density suggested that road-associated factors hypothetically may reduce the potential to support persistent populations of terrestrial carnivores in many subbasins. Management implications of our summarized road effects include the potential to mitigate a diverse set of negative factors associated with roads. **Comprehensive mitigation of road-associated factors would require a substantial reduction in the density of existing roads as well as effective control of road access in relation to management of livestock, timber, recreation, hunting, trapping, mineral development, and other human activities.** (Emphases added.)

The heavy bias toward identifying habitat manipulation options (i.e., logging and other active management activities) in the forest plan—which lacks Wisdom et al. (2000) implications for road management—has led to a forest plan that is a recipe for failure.

The EA does not reduce ecological damage the way it intends for vegetative historical range of variability (HRV). Other factors that have been heavily influenced by management along with their historical range of variability include:

FACTOR HRV Road density zero Noxious weed occurrence zero Milesoflong-termstreamchanneldegradation("press"disturbance) zero Culverts zero Human-induced detrimental soil conditions <1% Maximum daily decibel level of motorized devices zero Acres of significantly below HRV snag levels for many decades zero

Roadless extent 100% Extent of veg. communities affected by exotic grazers (livestock) rare Extent of veg. communities affected by fire suppression zero

The Swamped project would not "move" those factors anywhere close to the HRV, and thus the adverse legacy impacts would continue.

TheSwamoed EA does not demonstrate the project area is being managed consistent with Travel Management Regulations at 36 CFR 212 (Subparts, A, B, and C) and the Executive Orders related to Subpart B. Subpart A requires the FS to involve the public in a scientifically based process which designates the Minimum Road System both in the analysis area and forestwide, so that unnecessary or ecologically damaging roads are targeted for decommissioning and the economic liabilities of roads are minimized.

The Swamped EA does not disclose compliance with motorized route restrictions, and if violations exist, perform an analysis of the resultant harm to wildlife habitat, soil, and water.

We ask the FS disclose the following information concerning the project area:

- The deferred road maintenance backlog
- The annual road maintenance funding needs
- The annual road maintenance budget
- The capital improvement needs for existing roads

- The road density in the project area

- The number of miles of project area roads that fail to meet BMP standards or design
  standards
  The Forest Plan makes a **Decision** prioritizing vast but unspecified acreage of the KNF for motorized recreation, in the absence of the travel planning required by the Travel Management Regulations.
  The Forest Plan makes **Decisions** designating unspecified mileages of the KNF for motorized recreation, in the absence of the travel planning required by Travel Management Regulations and completed by 2015.
  The EA states, "Both storage and decommissioning would be primarily passive; that is, there is no on-the ground watershed or other stabilization needed." It's clear that the FS is making it standard practice to re-use such abandoned road templates—and even roads actively decommissioned—not including them on the official road inventory therefore constantly avoiding responsibilities, regulations, and forest plan requirements for roads.
  Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the analytical and scientific issues identified above.

WILDLIFE AND DIVERSITY

AWR's comments raised wildlife and biological diversity issues. Also, issues regarding old growth and associated wildlife were raised in our Objection to the revised forest plan (pp. 4-5, 7-11, 31-40, 71-72).

Because the EA fails to adequately specify the amount of large live and dead tree structure to be retained in treated areas, and since most of the EA's wildlife analyses pretend or assume to know otherwise, the analyses of impacts on most wildlife are base upon insufficient analysis, in violation of NEPA.

AWR objected to the use of "Landbird Assemblage" in the revised forest plan. The EA provides inadequate analyses for the Forest Plan MIS landbird assemblage (olive-sided flycatcher, dusky flycatcher, Hammond's flycatcher, chipping sparrow, and hairy woodpecker). Little or nothing is presented on the specific habitat needs of all of these bird species, nor any analysis of cumulative impacts. The Forest Plan and FEIS do not include scientific justification for the adoption of the MIS Landbird Assemblage as MIS representing other wildlife (including old-growth associated wildlife species) on the KNF. In fact the FEIS contains an explicit assumption that its implementation cannot possibly affect viability of its chosen indicator species: "These MIS, elk and insectivores, were not proposed because of a viability concern." The EA fails to their current population abundance, so that a baseline is established for later comparisons to determine population trends.

The FS has not disclosed the connection between population monitoring, management activities, and habitat condition for the landbird assemblage species. The FS has not provided reasoning as to why these species are responsive to forest activities, nor explained the monitoring objectives for those MIS.

There is no accuracy assessment including confidence intervals in the Forest Plan EIS wildlife analyses.

The FS has not disclosed statistically robust estimates of population trends for all Sensitive species. There isn't a sound scientifically-based explanation for any species' apparent absence from the project area. The EA doesn't disclose whether or not surveys for

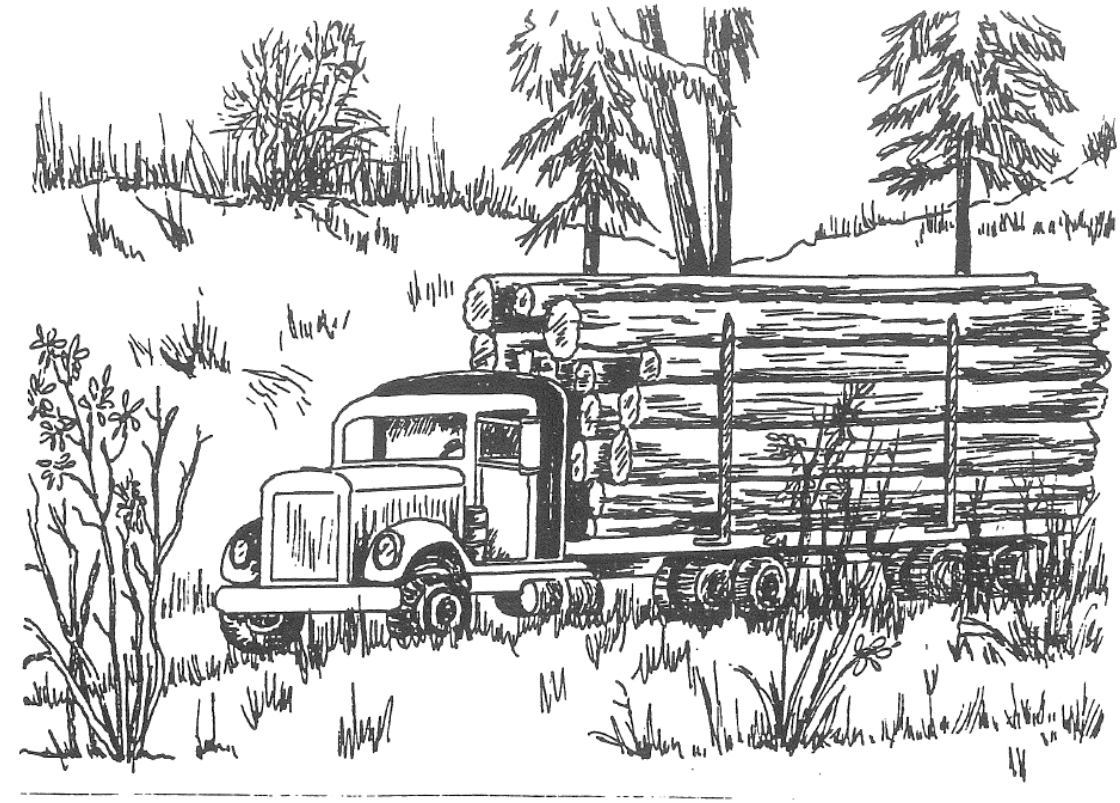
wildlife, or their dens or nests, have been conducted in the project area. It doesn't disclose the intensity of surveys for Sensitive species that have been conducted in the project area.

The Forest Plan does not cite the scientific basis for the minimum amounts of coarse woody debris to be retained.

The use of vegetation habitat proxy is invalid for insuring viable populations of wildlife.

The EA doesn't disclose the cumulative effects of recreational activities and motorized/mechanic access on wildlife populations.

Old Growth



Logging is the chief systematic pressure affecting old-growth communities.

The Kootenai National Forest's own analysis (Gautreaux, 1999) indicates 22% old growth is at the lower limit for "reference conditions" on the KNF, and the present forestwide situation is far below 22%. Also: "We recognize that historical conditions probably provided a higher level of old forest habitat through time than what is provided by the Forest Plan direction (a mean of 27.7% as opposed to 10%)." (Dueker and Sullivan, 2001.)

Gautreaux, 1999 states:
...research in Idaho (Lesica 1995) of stands in Fire Group 4, estimated that over 37% of the dry Douglas-fir type was in an old growth structural stage (>200 years) prior to European settlement, approximately the mid 1800's.

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

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

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

(USDA Forest Service, 1987d)

Lesica found an estimated 18% of the cool lodgepole pine sites was in an old growth structural stage (>200 years) prior to Eu-

ropean settlement, approximately the mid 1800's. ... This same research in Fire Group 8 in drier, lower subalpine types of Montana had over 25% of the stands in an old growth structural stage during the same historical period.

We notice the FS has no qualms about speculating on the amounts of various other categories of forest on the KNF and in the project area based upon Forest Plan Desired Conditions, and basing the goals of projects such as Ripley and Swamped projects on such speculation. In essence the FS admits it doesn't know the amount of old-growth habitat historically needed to maintain viability of its 1987 forest plan old-growth Management Indicator Species and other old-growth associated wildlife. The FS refuses to discuss the issue because the amount of old growth on the KNF is far below amounts estimated by best available science—and its own experts.

USDA Forest Service, 1987a states:
Richness in habitat translates into richness in wildlife. **Roughly 58 wildlife species on the Kootenai (about 20 percent of the total) find optimum breeding or feeding conditions in the "old" successional stage,** while other species select old growth stands to meet specific needs (e.g., thermal cover). Of this total, **five species are believed to have a strong preference for old growth and may even be dependent upon it for their long- term survival**. While individual members or old growth associated species may be able to feed or reproduce outside of old growth stands, **biologists are concerned that viable populations of these species may not be maintained without an adequate amount of old growth habitat.**

Wildlife richness is only a part of the story. Floral species richness is also high, particularly for arboreal lichens, saprophytes, and various forms of fungus and rots**. Old growth stands are genetic**

reservoirs for some of these species, the value of which has probably yet to be determined. (Bold emphases added.)

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

The FS relies upon the rather vague promise of the concept of "recruitment old growth" or "recruitment potential old growth" as some sort of supplement to the Forest Plan's weak conservation of old-growth habitat. The EA doesn't explain the criteria used for designation of "recruitment potential" old growth other than vaguely stating, "These stands have the potential to develop into old growth within 40 years."

Recruitment potential old growth is defined in the forest plan as forest stands that do not meet the definition of old growth currently but that are being managed with the goal of meeting that definition in the future. This is another erratic characteristic of the Forest Plan; although its Glossary mentions some "goal" of meeting the old growth definition in the future, the Forest Plan actually contains no such goal. The FS also doesn't disclose the best available science the KNF uses to manage recruitment potential old growth stands. There is no official decision document designating recruitment/potential old growth in the project area. The KNF has no formal, official process for documenting this forestwide old-growth recruitment policy.

The EA doesn't indicate if any stands in the Swamoed project area were previously identified and designated in the past as old growth, since switched to recruitment old growth, or potential old growth.

The EA also does not engender confidence in the FS's estimates of either project area or forestwide old growth amounts, based vaguely on "KNF Old Growth Layer File" for forestwide and vaguely "updated as of March 2019[8]" for the project area.

The Forest Plan FEIS includes a "Large/Very Large" size class (20"+ dbh). Yet the EA does not utilize such a metric in the EA—probably to avoid any analysis that would assist the public in seeing through the smokescreen and understanding the FS's old growth inventory problem.

Page 19 of the EA states"

Treatment of Existing Old Growth Stands

Approximately 173 acres of harvest and 49 acres of other vegetation treatments are proposed within existing old growth. As well as approximately 20 acres of harvest within recruitment potential old growth and 24 acres of other vegetation treatments within recruitment potential old growth. Less than 1 mile of proposed new and temporary roads are in or adjacent to these old growth treatment areas.

The EA doesn't indicate how old the FIA data is, which the old growth analysis (forestwide and project level) relies upon. It doesn't say how many FIA plots fall within the project area, and how many of those are classified as old growth.

The FS Region 1 report Bollenbacher, et al., 2009 (cited in the EA) states concerning the FIA inventory: "All northern Idaho plots uti-

lized a primary sample unit (PSU) composed of four fixed radius plots with trees 5 – 20.9 inches tallied on a 1/24th acre plot and trees 21.0 inches DBH and larger tallied on a 1⁄4 acre plot." We assume the methodology was similar for the KNF. Also, Czaplewski, 2004 states, "Each FIA sample location is currently a cluster of field sub-plots that collectively cover an area that is nominally one acre in size, and FIA measures a probability sub-sample of trees at each sub-plot within this cluster." In addition, Bollenbacher and Hahn, 2008 under "Defining Old Growth" state: "There are no specific criteria for minimum patch size for OG in the Northern Region definitions" but recognize "There are, however, some Forest Land Management Plans that may include guidance for a minimum map unit for OG stands." Despite that, Bollenbacher and Hahn, 2008 try to make a case for smaller minimum stand sizes, saying "The regional vegetation minimum map unit of 5 acres for a stand polygon would be a reasonable lower limit for all vegetation classes of forest vegetation including OG stands." Clearly, whether the FS is using a 1⁄4-acre, one-acre, or five-acre minimum map unit, none conform to the Forest Plan old-growth minimum stand size criteria. Furthermore, it would be ludicrous to propose that any old-growth associated MIS, Sensitive, or ESA-listed species could survive on even a five-acre old-growth stand—there is no scientific evidence to support such a premise.

The EA explains that the Forest Plan allows logging of virtually all old growth found outside of Wilderness on the KNF:

(T)he 2015 Forest Plan deliberately includes language within two components (FW-DC- VEG-03, FW-GDL-VEG-01) that would allow vegetation management activities to occur within old growth stands **if** the activities were designed to increase the resistance and resiliency of the stands to disturbances or stressors, **and** if the activities would maintain the criteria for age and number of trees and

basal area for the specific old growth type as described in Green et al., 1992. (Emphases in the original.)

As the footnote explains, though: "the terms resilience as well as resistence (see 2015 Forest Plan glossary...) are used **in the context of forest ecosystems** and the desire to increase the resistance

resilience to disturbances. Alternatives 2 and 3 propose to treat 922 and 780 acres in old growth and 441 and 435 acres in recruitment potential old growth to increase their resistance and resilience by modifying their structure and species composition. They are designed not to modify the characteristics beyond meeting Green et al., the definition of old growth. Therefore, the Black Ram project was designed in accordance with this guideline.

and resiliency of the forest vegetation to disturbances and stressors..." (Emphasis added.) In other words, the FS is conflating a landscape level attribute (which has no numerical measurement attached to it) with stand level attributes. This leaves the Green et al., 1992 criteria as the only criteria, as EA describes: "age and number of trees and basal area for the specific old growth type". This is an extremely narrow, and scientifically undefensible definition of old growth.

Furthermore, the EA itself nullifies the FS's claim to be helping old growth by logging it. It cites model results the FS apparently believe, indicating "a dramatic increase in old growth-like stands ...despite a substantial amount of predicted wildfire, root disease, bark beetle and defoliator caused disturbances ...**if no active management (except for fire suppression) were to occur on the Forest for the next 50 years** and the future climate scenario of a warmer/drier climate is assumed" resulting in "78 percent over current amounts." (Emphasis added.) So where's the scientific support for the risky, likely destructive proposed logging of old growth? And the "need" to conduct "intermediate" logging of old growth? They don't exist.

The EA attempts to justify this using the results of the Forest Vegetation Simulator showing how fire burning through old growth would leave fewer live large trees under treatment scenarios vs. no action. Yet the accuracy of such modeling isn't disclosed. Nor does the EA say the duration of such claimed benefits—a few years, 5 years, 10, 20? Who knows? Regardless, the EA already says old growth would increase "dramatically" over the next 50 years, without such Project-proposed meddling in old growth.

The EA does not identify the old growth type for each stand the FS would log, nor does it state in any quantitative terms what would be left of the logged old growth.

The EA doesn't even cite the results of the compliance or success of past logging in old growth, merely assuming all results of this heavy-handed logging will be fine.

The Forest Plan contains no minimum acreage or distribution requirements for maintaining old growth, ignoring 36 CFR 219.19 viability provisions that would prevent large areas of the KNF becoming devoid of old growth or old-growth associated wildlife. The FS has not analyzed the wildlife viability implications of managing the KNF well outside the HRV for old growth, based upon the best available scientific information.

The FS has not compared patch size of old-growth areas to scientific information on minimum size needed for utilization by old-growth associated wildlife.

The KNF failed to monitor populations of old-growth associated wildlife, in favor of striving towards DCs for habitat (vegetation) in project planning. The Committee of Scientists (1999) state:

Habitat alone cannot be used to predict wildlife populations...The presence of suitable habitat does not ensure that any particular species will be present or will reproduce. Therefore, **populations**

of species must also be assessed and continually monitored. (Emphasis added.)

In USDA Forest Service, 1987a the KNF considers smaller patches of old growth to be of lesser value for old-growth associated wildlife:

A unit of 1000 acres would probably meet the needs of all old growth related species (Munther, et al., 1978) but does not represent a realistic size unit in conjunction with most other forest management activities. On the other hand, units of 50-100 acres are the smallest acceptable size in view of the nesting needs of pileated woodpeckers, a primary cavity excavator and an old growth related species (McClelland, 1979). However, **managing for a minimum size of 50 acres will preclude the existence of species which have larger territory requirements**. In fact, Munther, et al. (1978), report that **units of 80 acres will meet the needs of only about 79 percent of the old growth dependent species** (see Figure 1). Therefore, while units of a minimum of 50 acres may be acceptable in some circumstances, 50 acres should be the exception rather than the rule. Efforts should be made to provide old growth habitat in blocks of 100 acres or larger. ...**Isolated blocks of old growth which are less than 50 acres and surrounded by young stands contribute very little to the long-term maintenance of most old growth dependent species**. (Bold emphasis added.)

Since old growth is below the historic range for the Forest and project area, then viability for old- growth associated species cannot be assured—especially in the context of more proposed logging of mature/old forest and large trees.

The defining characteristics of old growth, discounted by the Forest Plan, are acknowledged by Green et al., 1992:

Old growth forests encompass the late stages of stand development and are distinguished by old trees and related structural attributes. These attributes, such as tree size, canopy layers, snags, and down trees generally define forests that are in and old growth condition.

Definition
Old growth forests are ecosystems distinguished by old trees and related structural attributes. Old growth encompasses the later stages of stand development that typically differ from earlier stages in a variety of characteristics which may include tree size, accumulations of large dead woody material, number of canopy layers, species composition, and ecosystem function.

(O)ld growth is typically distinguished from younger growth by several of the following attributes:

1. Large trees for species and site.
2. Wide variation in tree sizes and spacing.
3. Accumulations of large-size dead standing and fallen trees that are high relative to earlier stages.
4. Decadence in the form of broken or deformed tops or bole and root decay.
5. Multiple canopy layers
6. Canopy gaps and understory patchiness.

Green et al., 1992 also recognize that "Rates of change in composition and structure are slow relative to younger forests."

In preparing and adopting Green et al. 1992 old-growth guidelines, the FS did not use an independent scientific peer review process, as discussed by Yanishevsky, 1994:

As a result of Washington Office directives, Region 1 established an Old-Growth Committee. In April 1992, Region 1 issued a document entitled "Old-Growth Forest Types of the Northern Region," which presented Old-Growth Screening Criteria for specific zones

on Western Montana, Eastern Montana, and North Idaho (U.S.D.A. Forest Service 1992). This was an attempt to standardize criteria for classifying the variety of old-growth types across the Region. ...The committee, however, executed this task without the benefit of outside scientific peer review or public input, either during or after the process (Yanishevsky 1990, Shultz 1992b). Moreover, the methodology used by the committee was unscientific and did not even include gathering field data to verify the characteristics of old-growth stands as a basis for the definition (*id*.). A former member of the Region 1 Old- Growth Committee described a "definition process" that relied heavily upon the Committee members' pre-conceived notions of the quantifiable characteristics of old-growth forests (Schultz 1992b).

The old-growth definition in its present state, without field verification of assumptions, and without addressing the issue of quality, is inadequate to scientifically describe, define, delineate, or inventory old-growth ecosystems.

(*id*.) Not only did the Committee fail to obtain new field data on old-growth forest characteristics, it failed even to use existing field data on old-growth definition and classification previously collected for Region 1 (Pfister 1987). Quality of old growth was not addressed during the definition process. The Committee did not take into account the legacy of logging that has already destroyed much of the best old growth. This approach skewed the characteristics that describe old-growth forests toward poorer remaining examples. ...It's premature for the Forest Service to base management decisions with long- term environmental effects on its Region 1 old-growth criteria, until these criteria are validated by the larger scientific community.

Yanishevsky (1994) also points out the scientific inadequacy of maintaining merely "minimum" amounts of old-growth habitat and its components such as snags.

The FS wants to make the definition of old growth to be a simplistic numbers and database analysis game, devoid of biologically vital data gathered in the field which might document what is unique about old growth—not just a few large trees left over after logging, but decadence, rot, snags, down logs, patchy irregular canopy layers—things that can't be created by the agency's version of "restoration" and which would be depleted by such management actions.

The IPNF's 1987 Forest Plan included standards for protection of old growth and associated wildlife (USDA Forest Service 1987c). The IPNF's 1987 Forest Plan Appendix 27 (USDA Forest Service, 1987d) provided other direction and biological information concerning old growth and old-growth associated wildlife species. The FS has never explained what it is about the IPNF's 1987 Forest Plan's old growth standards, and its Appendix 27 that is *inconsistent with the best available science*.

Likewise the Kootenai National Forest's 1987 Forest Plan included standards for protection of old growth and associated wildlife, along with Appendix 17 (USDA Forest Service 1987a, USDA Forest Service 1987b). The FS has never explained what it is about the KNF's 1987 Forest Plan old growth standards and its Forest Plan Appendix 17 that is *inconsistent with the best available science*.

After forest plan revision the KNF has greatly weakened protections for old growth, and in fact the Forest Plan provides direction for logging old growth that lacks scientific support. We incorporate USDA Forest Service, 1987a as well as USDA Forest Service, 1987b which contains a list of "species ...(which) find optimum habitat in the "old" successional stage..." We also incorporate the KNF document ("Old Growth validation") which states that "we've recognized its (old growth) importance for vegetative diversity and the maintenance of some wildlife species that depend on it for all or part of their habitat." USDA Forest Service 1987a,

and USDA Forest Service 1987b also provides biological information concerning old growth and old-growth associated wildlife species.

The KNF has conducted no research or monitoring comparing pre- and post-logging old growth occupancy by or abundance of the wildlife species with strong biological association with habitat components found in old growth. Biologically speaking, the FS refuses to check in with the real experts to see if logged old growth is still functioning for their survival.

The KNF has failed to cite any evidence that its managing for old growth habitat (i.e., logging and burning old growth) strategy will improve old-growth wildlife species' habitats over the short-term or long-term. In regards to this theory often offered by the FS, Pfister et al., 2000 state:

(T)here is the question of the appropriateness of management manipulation of old-growth stands... Opinions of well-qualified experts vary in this regard. As long term results from active management lie in the future – likely quite far in the future – considering such manipulation as appropriate and relatively certain to yield anticipated results is an informed guess at best and, therefore, encompasses some unknown level of risk. **In other** words, producing "old-growth" habitat through active management is an untested hypothesis. (Pp. 11, 15 emphasis added).

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

Relative abundances of only a few bird species changed significantly as a result of restoration treatments, and these changes were characterized largely by **declines in the abundances of a few species associated with more mesic, dense-forest conditions,**

and not by increases in the abundances of species associated with more xeric, old-growth reference stand conditions. (Emphasis added.)

The Swamped project would log over one hundred of acres of this mesic, dense forest old growth.

Forest Plan allows active mechanical treatments in old growth but as or plan objection asserts, this ignores scientific information indicating such active management is the very antithesis of old growth. The Forest Plan cites no scientific research or monitoring results from the KNF that demonstrate management manipulations will create net ecological benefit rather than harm old growth and old-growth associated wildlife.

Viability

Schultz (2010) provides a critique of FS wildlife analyses the most prominent being they are based on habitat availability, which alone is insufficient for understanding the status of populations (Noon et al. 2003, Mills 2007). Schultz (2010) recommendations generally call for more peer review of large-scale assessments and project level management guidelines, and to adopt more robust scientifically sound monitoring and measurable objectives and thresholds if maintaining viable populations of all native and desirable non-native wildlife species is to be accomplished.

Traill et al., 2010 and Reed et al., 2003 are published, peer-reviewed scientific articles addressing what a true "minimum viable population" would be, and how that number is typically drastically underestimated. The FS has not identified the best available science that provides scientifically sound, minimum viable populations of any Sensitive species or MIS on the KNF.

Considering potential difficulties of using population viability analysis at the project analysis area level (Ruggiero, et. al., 1994a),

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

In the absence of meaningful thresholds of habitat loss and no monitoring of wildlife populations at the Forest level, projects will continue to degrade wildlife habitat across the KNF over time.

(See also Schultz 2012.). The FS would never be able to detect the likelihood of complete extirpation of any wildlife species from the KNF, using such methodology.

The EA provides no analysis for the RFP MIS "Landbird Assemblage." Nothing about the analysis considers the specific habitat needs of any of those bird species, nor does it analyze impacts. Population trend monitoring—a key part of MIS under the NFMA regulations—is also neglected by the forest plan and Swamped EA.

The FS has still not sufficiently dealt with the issue of fragmentation, road effects, and past logging on old-growth species' habitat. The Forest Plan lacks meaningful direction maintaining Landscape Connectivity for wildlife. Lehmkuhl, et al. (1991) state:

Competition between interior and edge species may occur when edge species that colonize the early successional habitats and forest edges created by logging (Anderson 1979; Askins and others 1987; Lehmkuhl and others, this volume; Rosenberg and Raphael 1986)

also use the interior of remaining forest (Kendeigh 1944, Reese and Ratti 1988, Wilcove and others 1986, Yahner 1989). Competition may ultimately reduce the viability of interior species' populations.

Microclimatic changes along patch edges alter the conditions for interior plant and animal species and usually result in drier conditions with more available light (Bond 1957, Harris 1984, Ranney and others 1981).

Fragmentation also breaks the population into small subunits, each with dynamics different from the original contiguous population and each with a greater chance than the whole of local extinction from stochastic factors. Such fragmented populations are metapopulations, in which the subunits are interconnected through patterns of gene flow, extinction, and recolonization (Gill 1978, Lande and Barrowclough 1987, Levins 1970).

In terms of "quality of habitat" the continued fragmentation of the KNF is a major ongoing concern. It is documented that edge effects occur 10-30 meters into a forest tract (Wilcove et al., 1986). The size of blocks of interior forest that existed historically before management (including fire suppression) was initiated must be compared to the present condition. USDA Forest Service, 2004a states:

Forested connections between old growth patches ...(widths) are important because effective corridors should be wide enough to "contain a band of habitat unscathed by edge effects" relevant to species that rarely venture out of their preferred habitats (Lidicker and Koenig 1996 and Exhibit Q-17).

Timber harvest patterns across the Interior Columbia River basin of eastern Washington and Oregon, Idaho, and western Montana have caused an increase in fragmentation of forested lands and a

loss of connectivity within and between blocks of habitat. This has isolated some wildlife habitats and reduced the ability of some wildlife populations to move across the landscape, resulting in long-term loss of genetic interchange (Lesica 1996, U.S. Forest Service and Bureau of Land Management 1996 and 1997).

Harvest or burning in stands immediately adjacent to old growth mostly has negative effects on old growth, but may have some positive effects. Harvesting or burning adjacent to old growth can remove the edge buffer, reducing the effective size of old growth stands by altering interior habitats (Russell and Jones 2001). Weather-related effects have been found to penetrate over 165 feet into a stand; the invasion of exotic plants and penetration by predators and nest parasites may extend 1500 feet or more (Lidicker and Koenig 1996). On the other hand, adjacent management can accelerate regeneration and sometimes increase the diversity of future buffering canopy.

The occurrence of roads can cause substantial edge effects on forested stands, sometimes more than the harvest areas they access (Reed, et al. 1996; Bate and Wisdom, in prep.). Open roads expose many important wildlife habitat features in old growth and other forested stands to losses through firewood gathering and increased fire risk.

Effects of disturbance also vary at the landscape level. Conversion from one stand condition to another can be detrimental to some old growth associated species if amounts of their preferred habitat are at or near threshold levels or dominated by linear patch shapes and limited interconnectedness (Keller and Anderson 1992). Reducing the block sizes of many later-seral/structural stage patches can further fragment existing and future old growth habitat (Richards et al. 2002). Depending on landscape position and extent, harvest or

fire can remove forested cover that provides habitat linkages that appear to be "key components in metapopulation functioning" for numerous species (Lidicker and Koenig 1996, Witmer et al. 1998). Harvest or underburning of some late and mid seral/structural stage stands could accelerate the eventual creation of old growth in some areas (Camp, et al. 1996). The benefit of this approach depends on the degree of risk from natural disturbances if left untreated.

Effects on old growth habitat and old growth associated species relate directly to ... "Landscape dynamics—Connectivity"; and ... "Landscape dynamics—Seral/structural stage patch size and shapes."

The FS relies upon unpublished reports by Samson alleged to prove viability is being maintained for various wildlife species of concern on the KNF. However, those reports have not been subject to scientific peer review and thus fail to meet the best available science standard. The Samson reports rely upon the databases of outdated, unreliable information as its quantitative source.

The Forest Plan omits old-growth Management Indicator Species (MIS), which means there would be no monitoring of wildlife whose special habitat needs are best found in old growth. The Forest Plan's failure to designate MIS according to the requirements of the 1982 planning regulations violates NFMA.

The Committee of Scientists (1999) report stresses the importance of monitoring as a necessary step for the FS's overarching mission of sustainability: "Monitoring is the means to continue to update the baseline information and **to determine the degree of success in achieving ecological sustainability.**" (Emphasis added.) The Committee of Scientists (1999) provide still more emphases on the importance of monitoring:

The proposal is that the Forest Service monitor those species whose status allows inference to the status of other species, are indicative of the soundness of key ecological processes, or provide insights to the integrity of the overall ecosystem. This procedure is a necessary shortcut because monitoring and managing for all aspects of biodiversity is impossible.

No single species is adequate to assess compliance to biological sustainability at the scale of the national forests. Thus, several species will need to be monitored. The goal is to select a small number of focal species whose individual status and trends will collectively allow an assessment of ecological integrity. That is, the individual species are chosen to provide complementary information and to be responsive to specific conservation issues. Thus, the Committee proposed for consideration a broad list of species categories reflecting the diversity of ecosystems and management issues within the NFS.

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

In 2005, the Regional Office produced a Conservation Assessment of the Northern goshawk, black-backed woodpecker, flammulated owl, and pileated woodpecker in the Northern Region (Samson 2005). This analysis also calculated the amount of habitat available for these species, but was based on forest inventory and analysis (FIA) data. FIA data is consistent across the Region and the state, but **it was not developed to address site- specific stand conditions for a project area.** In some cases, these two assessments vary widely in the amount of habitat present for a specific species. (P. 116, emphasis added.)

The FS relies upon Region-wide database analyses by Samson to conclude that species viability is assured, although the FS does not

address the age and reliability of the data. The EA fails to consider Samson's conclusions for any wildlife species over the long term, which is very uncertain.

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

There are several problems with such an approach and the risk to the species would be extremely high if any of the species ever reached these levels in the Northern Region. Surely, all six species would be listed as endangered if this was to occur and the probabilities for their continued existence would be very low. There is also no way 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 man-

age for the minimum number of individuals that could persist on this planet. Scientifically, the problem is that we simply cannot correctly determine a single minimum number of individuals that will be viable for the long term, because of inherent uncertainty in nature and management..."

Samson also admits that "Methods to estimate canopy closure, forest structure, and dominant forest type may differ among the studies referred to in this assessment and from those used by the FS 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 likely mostly out-of-date.

Habitat fragmentation and connectivity

Assuring viability also means addressing the issue of fragmentation, road effects, and past logging on wildlife species' habitat. Viability is only assured if individuals of a species can survive migration and dispersal for genetic diversity. The Forest Plan lacks meaningful direction maintaining landscape connectivity for wildlife. Lehmkuhl, et al. (1991) state:

Competition between interior and edge species may occur when edge species that colonize the early successional habitats and forest edges created by logging (Anderson 1979; Askins and others 1987; Lehmkuhl and others, this volume; Rosenberg and Raphael 1986) also use the interior of remaining forest (Kendeigh 1944, Reese and Ratti 1988, Wilcove and others 1986, Yahner 1989). Competition may ultimately reduce the viability of interior species' populations.

Microclimatic changes along patch edges alter the conditions for interior plant and animal species and usually result in drier conditions with more available light (Bond 1957, Harris 1984, Ranney and others 1981).

Fragmentation also breaks the population into small subunits, each with dynamics different from the original contiguous population and each with a greater chance than the whole of local extinction from stochastic factors. Such fragmented populations are metapopulations, in which the subunits are interconnected through patterns of gene flow, extinction, and recolonization (Gill 1978, Lande and Barrowclough 1987, Levins 1970).

The EA doesn't disclose the natural historic range vs. current conditions regarding patch size, edge effect, and amount of interior forest old growth in the project area and forestwide.

Harrison and Voller, 1998 assert "connectivity should be maintained at the landscape level." They adopt a definition of landscape connectivity as "the degree to which the landscape facilitates or impedes movement among resource patches." Also:

Connectivity objectives should be set for each landscape unit. ...Connectivity objectives need to account for all habitat disturbances within the landscape unit. The objectives must consider the duration and extent to which different disturbances will alienate habitats. ... In all cases, the objectives must acknowledge that the mechanisms used to maintain connectivity will be required for decades or centuries.

(Id., internal citations omitted.) Harrison and Voller, 1998 further discuss these mechanisms: Linkages are mechanisms by which the principles of connectivity can be achieved. Although the definitions of linkages vary, all imply that there are connections or movement among habitat patches. Corridor is another term com-

monly used to refer to a tool for maintaining connectivity. ...the successful functioning of a corridor or linkage should be judged in terms of the connectivity among subpopulations and the maintenance of potential metapopulation processes. (Internal citations omitted.)

Harris, 1984 discusses connectivity and effective interior habitat of old-growth patches:
Three factors that determine the effective size of an old-growth habitat island are (1) actual size; (2) distance from a similar old-growth island; and (3) degree of habitat difference of the intervening matrix. ...(I)n order to achieve the same effective island size a stand of old- growth habitat that is surrounded by clearcut and regeneration stands should be perhaps ten times as large as an old-growth habitat island surrounded by a buffer zone of mature timber.

Harris, 1984 discusses habitat effectiveness of fragmented old growth:
(A) 200-acre (80 ha) circular old-growth stand would consist of nearly 75% buffer area and only 25% equilibrium area. ...A circular stand would need to be about 7,000 acres (2,850 ha) in order to reduce the 600-foot buffer strip to 10% of the total area. It is important to note, however, that the surrounding buffer stand does not have to be old growth, but only tall enough and dense enough to prevent wind and light from entering below the canopy of the old-growth stand.

Harris, 1984 believes that “biotic diversity will be maintained on public forest lands only if conservation planning is integrated with development planning; and site-specific protection areas must be designed so they function as an integrated landscape system.” Harris, 1984 also states:

Because of our lack of knowledge about intricate old-growth ecosystem relations (see Franklin et al. 1981), and the notion that oceanic island never achieve the same level of richness as continental shelf islands, a major commitment must be made to set aside representative old-growth ecosystems. This is further justified because of the lack of sufficient acreage in the 100- to 200-year age class to serve as replacement islands in the immediate future. ...(A) way to moderate both the demands for and the stresses placed upon the old-growth ecosystem, and to enhance each island's effective area is to surround each with a long-rotation management area.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the analytical and scientific issues identified above. Display the KNF inventory of forestwide and project area "recruitment potential old growth" on a map and provide links on the Forest website to the forestwide spreadsheet of stands which are designated or otherwise considered to be "recruitment potential old growth." Do the same for old growth the KNF alleges meets sufficient criteria to be considered effective old growth.

BIG GAME SPECIES

Road density and habitat were discussed in AWR's comments. Also, issues regarding the elk were raised in our Objection to the revised forest plan (pp. 31, 32, 42, 46, 77).

The EA claims there is a need to "Improve big game winter range conditions and promote forage opportunities." This EA fails to cite any data supporting this alleged "need" of the project area. What does Montana Fish, Wildlife and Parks say about the population trends of big game species here? Below objective levels. What are their concerns about factors affecting these populations?

The EA says all the newly accessible roads and routes to be created for logging access would not be "open during the firearms hunting

season" so there would be no impacts to elk security. The biologically insufficient definition in the Forest Plan is highlighted here. The analysis is not credible given the FS's inability to effectively prevent motorized traffic behind roads, as discussed in the grizzly bear section of this objection. Moreover, it's not just hunters in season— it's poachers during every season. Also, this ignores the fact that lawful hunters find easier travel on newly accessible routes. Although this is usually by walking, it is also increasingly by bicycle—even eBikes not considered in the Forest Plan EIS.

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

Also, the EA fails to provide a meaningful analysis of cumulative impacts of recreational activities on elk. Wintertime is an especially critical time for elk, and stress from avoiding motorized activities takes its toll on elk and populations.

The EA doesn't demonstrate consistency with Forest Plan requirements for these medium priority Planning Subunits, probably because of its false assumptions noted above.

Scientific information recognizes the importance of thermal cover, including Lyon et al, 1985. Christensen et al., 1993 also emphasize "maintenance of security, landscape management of coniferous cover, and monitoring elk use..." This USFS Region 1 document also states, "management of winter range to improve thermal cover and prevent harassment may be as important as anything done to change forage quantity or quality."

And Black et al. (1976) provide definitions of elk cover, including "Thermal cover is defined as a stand of coniferous trees 12 m (40

ft) or more tall, with average crown exceeding 70 percent. Such stands were most heavily used for thermal cover by radio-collared elk on a summer range study area in eastern Oregon (R.J. Pedersen, Oregon Department of Fish and Wildlife—personal communication)." Black et al. (1976) also state:

Optimum size for thermal cover on summer and spring-fall range is 12 to 24 ha (30 to 60 acres). Areas less than 12 ha (30 acres) are below the size required to provide necessary internal stand conditions and to accommodate the herd behavior of elk.
...Cover requirements on winter ranges must be considered separately and more carefully. Animals distributed over thousands of square miles in spring, summer and fall are forced by increasing snow depths at higher elevations to concentrate into much restricted, lower- elevation areas in mid- to late-winter. Winter range, because of its scarcity and intensity of use, is more sensitive to land management decisions.

Regarding Black et al. (1976) conclusions, Thomas et al., 1988a state, "We concur. New research on elk use of habitat on summer and winter ranges has become available, however (Leckenby 1984). Land-use planning requirements indicate that a model of elk winter-range habitat effectiveness is required."

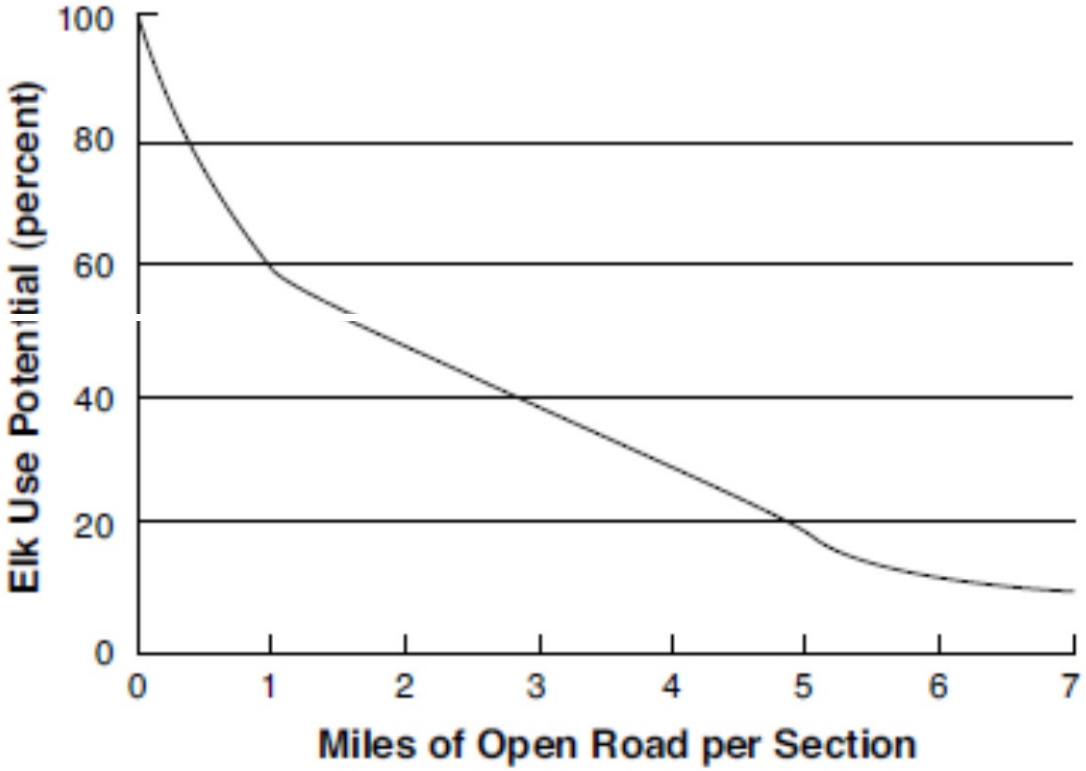
Thomas et al., 1988a also state:
Thomas and others (1979, p. 104-127) defined two types of cover: thermal and hiding. Thermal cover was "any stand of coniferous trees 12 meters (40 ft) or more tall, with an average canopy closure exceeding 70 percent" (p. 114). Disproportionate use of such cover by elk was thought to be related to thermoregulation. Whether such thermoregulatory activity occurs or is significant has been argued (Geist 1982,Peek and others 1982). In the context of the model presented here, arguing about why elk show preference for such stands is pointless. They do exhibit a preference (Leckenby 1984; see Thomas 1979 for a review). As this habitat model is based on

expressed preferences of elk, we continue to use that criterion as a tested habitat attribute. We cannot demonstrate that the observed preference is an expression of need, but we predict energy exchange advantages of such cover to elk (Parker and Robbins 1984). We consider it prudent to assume that preferred kinds of cover provide an advantage to the elk over nonpreferred or less preferred options.

The EA acknowledges that noxious weeds are an issue, so where is the analysis of how weed populations and trends are affecting and will affect the forage the FS claims will be improved by the project?

Christensen, et al. (1993) is a Region One publication on elk habitat effectiveness. Meeting a minimum of 70% translates to about 0.75 miles/sq. mi. in key elk habitat, as shown in their graph:

5. Levels of habitat effectiveness:



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

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the analytical and scientific issues identified above.

GRIZZLY BEAR

Issues regarding the grizzly bear were raised in our incorporated Objection to the revised forest plan (OBJECTION STATEMENT: Landscape Connectivity, OBJECTION STATEMENT: FW-OBJ-AR-04, OBJECTION STATEMENT: Road Density, pp. 51-52, 56, 59-60, 64, 67, OBJECTION STATEMENT: Monitoring Question MON-FLS-01). We fully incorporate all of those previous submissions. Road density was raised in our comments. Grizzly bears will be reised in our forthcoming 60 day notice.

The EA states"Grizzly bears and a portion of their home ranges are documented within the project area" and "may affect, is likely to adversely affectgrizzly bears." There is no Biological Assessment (BA) published on the project website, nor a Biological Opinion (BO), so we are unable to see results of U.S. Fish & Wildlife Service consultation, including terms and conditions to regulate "take." The BA and BO must be made available to the public before a draft Decision is published in order for the public to be properly informed at this final step of public involvement—the objection stage.

The veracity of the FS's inventory of system and nonsystem ("undetermined" or "unauthorized") roads is at issue here also. This is partly because the FS basically turns a blind eye to the situation with insufficient commitment to monitoring, and also because violations are not always remedied in a timely manner.

The project area is not within a BMU or and grizzly bear presence here is a recent occurrence, with documentation by three male grizzly bears over the past 5-7 years. (EA p. 123.)

By law if there is documention of 3 or more grizzly bears the area shall be included in a BORZ. The BORZ has not been created therefore the project is in violation of the NFMA, NEPA, the Kootenai Forest Plan, the APA and the ESA.

The Swamped project would violate the Forest Plan/Access Amendment standards, a violation of NFMA.

The EA does not disclose how many years the existing core ares have provided the habitat benefits assumed under the Forest Plan. As pointed out, some has been lost (due to "private infrastructure development") and we're not told of other likely and forseeable reductions.

Since we are awaiting the results of updated ESA consultation on the Forest Plan, the issuance of the Swamped EA and FONSI are premature and subverts NEPA and the ESA.

Furthermore, this population is currently warranted for uplisting to Endangered, in recognition of its biological and legal status.

Part of the problem is the lack of connectivity between the Cabinet and Yaak portions of the Cabinet-Yaak Ecosystem (CYE), creating virtual isolation between portions the recovery area.

Also, the FS's population estimates of grizzly bears in the CYE ("improvements") are not scientifically defensible. The FS therefore assumes increased impacts with this timber sale are acceptable.

Also, the EA assumes that abundance of huckleberries are demographically limiting for grizzly bears in this region, and further assumes that Project treatments will substantially enhance abundance of huckleberries to an extent sufficient to offset any losses of habitat security.

There is little or no evidence that food abundance is a significantly limiting factor for grizzly bears in the Cabinet-Yaak Ecosystem—especially as manifest in reproduction. On the other hand, there is ample evidence that human-caused mortality had governed and continues to govern the fate of this population, with food effects manifest primarily in the extent to which grizzly bears are exposed to human-related hazards during years when berries are in shorter supply.

The FS should be identifying key habitat components for grizzly bears for prioritizing road density reductions (Proctor, et al., 2020) so populations can recover.

The project area is not within a BMU or BORZ and grizzly bear presence here is a recent occurrence, with documentation by three male grizzly bears over the past 5-7 years

Dr. David Mattson makes the following points.

The assessment of prospective effects of the this project on grizzly bears in the is premised on several critical assumptions.

First, status of the Cabinet-Yaak grizzly bear population is assumed to have improved since 2012. Second, and related, the

KNF assumes that some erosion of security for grizzly bears is therefore permissible, conditioned on a related assumption that security and road access standards employed by the Kootenai National Forest (NF) are sufficient for recovery of grizzly bears in this ecosystem.

All of these assumptions are unwarranted.

Briefly:

• The weight of available evidence does not support concluding that population status has improved. For one, the methods used to estimate trend and current population size are

beset with a host of problems. For another, the information able to be distilled from demographic data suggests that any improvement has stalled since 2014.

• Variations in population size and trajectory between 1999 and 2010 are more likely attributable to variations in abundance of natural foods—berries in particular—that affect exposure of bears to humans rather than to any increased mitigations. During years of scant berries, bears likely forage more widely and more often end up in conflict situations or exposed to malicious killing.

• The population of grizzly bears in the Yaak/Yahk is far smaller than even the smallest size posited to be viable by any researcher. Related, the population remains acutely vulnerable to even the smallest increases in bear mortality that are predictably more likely to occur with any increase in road access and associated human activity.

• Malicious and other unjustified killing by humans remains

the dominant cause of death for grizzly bears in the Cabinet-Yaak Ecosystem. These kinds of killings are predictably associated with roads. As a result, levels of road access need to be substantially reduced and related levels of habitat security substantially increased rather than the opposite,

as is being proposed for the Swamped Access Project.

• Road density and habitat security standards used by the Kootenai NF are patently deficient, partly because they are based on research that conflates behavioral phenomena such as avoidance and displacement with demographic phenomena, notably survival. The scale is wrong as well, given that exposure to mortality hazards logically accrues

over years as a consequence of cumulative annual movements of bears vis-à-vis hazardous environs. As a corollary,

the fact that standards on the Kootenai NF are more lax than standards on the Flathead NF is self- evidently nonsensical given that grizzly bears in the Cabinet-Yaak

Ecosystem remain in a much more precarious status compared to grizzly bears in the Northern Continental Divide Ecosystem.

• There is little or no evidence that food abundance is a significantly limiting factor for grizzly bears in the Cabinet-Yaak Ecosystem—especially as manifest in reproduction.

On the other hand, there is ample evidence that human-caused mortality had governed and continues to govern the

fate of this population, with food effects manifest primarily in the extent to which grizzly bears are exposed to human-related hazards during years when berries are in shorter supply.

• Compounding prospective problems with the project, pro-

posed activities are concentrated in an area that is vital for

facilitating movement of grizzly bears between core habitats. Project activities will diminish rather than enhance security needed not only to facilitate transit of bears, but also increase odds that exposed bears will survive.

In short, the Swamped Access project promises to harm grizzly bears in the Cabinet-Yaak Ecosystem.

A. Weight of Evidence Does Not Support Concluding that Status of the Cabinet-Yaak Population has Improved Since 2012

A.1. The 2.1% Per Annum Growth Rate for the Cabinet-Yaak Population is Not Justified or Applicable

Use of a 2.1% per annum growth rate to project total size of the Cabinet-Yaak population from the Kendall et al. (2016) 2012

point estimate, as was done by Kasworm et al (2018), is not defensible. Such use is, moreover, guaranteed to produce spurious results that cannot legitimately be used to reach conclusions of management relevance. There are several unambiguous reasons.

A.1.a. The growth rate is not representative of the total population

First, the estimated 2.1% per annum growth rate only applies to

an unknown fraction of the total Cabinet-Yaak grizzly bear population. Vital rates used to estimate this growth rate were based solely on "native" or "natural" research-trapped bears, and expressly excluded bears captured because of conflicts or part of the augmentation program (Kasworm et al. 2018: 10). The growth rate, moreover, applies almost exclusively to the Yaak

portion of the population given that 95% of the data used to estimate survival rates and 85% of the data used to estimate reproductive rates came from this subpopulation (ibid: 36)—protestations by the authors notwithstanding (ibid: 36). On top of this, the 2.1% per annum rate was estimated only for the female portion of this high-grade (ibid: 10), which is of consequence even though female survival is disproportionately important in determining growth rate, as such.

In other words, the 2.1% per annum growth rate can only be legitimately applied to females residing in the Yaak subpopulation that were not trapped and marked as a result of conflicts nor part of the augmentation program. Put another way, management-trapped bears, augmentation bears, and males would need to be represented in a modeling framework if any estimated population growth rate were to be prima facie representative of the total population. Moreover, if the fates of all such bears were to be considered, estimated population growth rate would almost certainly be lower given that survival rates of males, augmentation bears, and management bears are substantially less than survival rates of the females used to estimate the 2.1% per annum growth rate (ibid: 33-35).

If a growth rate were to be used to project a total population estimate, comparable to the Kendall et al. 2012 point estimate of 49 bears (95% CI = 44-62), then such a growth rate would need to represent birth and death rates of the total population, and apply specifically to the period of interest (e.g., 2012-2017) rather than a longer period of time that masks the relevant trajectory

(see my point below).

A.1.b. The growth rate does not represent 2012-2017

The 2.1% per annum growth rate used by Kasworm et al to project 2017 population size was calculated using data that span

1983-2017 and so, therefore, axiomatically represent a generalized growth rate for Yaak females during this lengthy 35-year

period. Put another way, the 2.1% per annum growth is not an estimate of growth for the period 2012-2017. For it to be so, the rate would have necessarily been estimated only using data from the approximate 2012-2017 period.

More to the point, estimates of growth for the Yaak female population are increasing back-weighted by inclusion of data that

are, on average, increasingly old. Figure 1 (herein) shows the approximate average age of data used to calculate vital rates with the passage of time (from ibid: Table 17, 40-42). Notice that average age has increased from around 6-7 years in 1998 to nearer 15 years in 2017. In other words, with the progression of

time estimates of population growth for the female segment of the Yaak population have become increasingly irrelevant to judging current population trajectory.

The Government retort to these contentions would probably be that the data from such a short period of time would be so sparse as to preclude a usefully accurate estimate. That is almost certainly the case, and a commentary in its own right on the profound limitations imposed by intrinsically small sample sizes.

Nonetheless, this does not negate the point that the 2.1% per annum growth rate for 1983-2017 is spurious when applied to the 2012-2017 period. As Figure 11 clearly suggests (ibid: 37), population growth rate has almost certainly varied over time, albeit in largely indeterminate ways (see my following point).

Figure 1. Trend in mean age of data used to calculate vital rates of Cabinet-Yaak grizzly bears with passage of years from 1998 to 2017. Mean age has more than doubled, with trend towards increased aging accelerating since deployment of a conflict

management specialist in the ecosystem. Increasing age renders estimated vital rates increasingly irrelevant to current conditions.

A.1.c. Uncertainty of the growth rate as currently (or even ideally) calculated debars use

Small sample sizes impose very real constraints on the precision

and accuracy of all demographic rates being used by Cabinet-Yaak researchers and managers. These constraints follow ineluctably from the small size of the Cabinet-Yaak grizzly bear

population, which is a non-negotiable feature of this ecosystem.

As a practical upshot, all of the population growth rates calculated to date have uncertainty intervals (e.g., 95% confidence intervals) that not only substantially overlap zero (i.e., no growth)

but also, over time, each other. More specifically, despite purporting to show trend in cumulative growth rate over time, the

confidence intervals shown in Figure 10 (ibid: 37) all overlap—most almost completely (see also Figure 2A herein). Because of this, there is little or no basis for concluding that growth rate has varied with time. Likewise, taking a precautionary approach, there is little or no justifiable basis for concluding that growth rate is currently positive, despite statements in Kasworm el al.

such as "The probability that the population was stable or increasing was 73%" (ibid: 36), especially in light of the fact that

the point estimate of 2.1% per annum is a cumulative rate spanning 1983-2016 with little or no known relationship to current

rate of population increase or decline.

Moreover, when the totality of point estimates and uncertainty is

taken into consideration for the period 1998-2017, there is a cumulative 62% probability that the population was declining during these 19 years, consistent with the 2017 estimate of population size for Yaak females still being around 52% less than the estimate of population size for 1998 (Figure 2A and 2B herein).

The implications of uncertainty are thrown into relief by examining the specifics of projecting population size forward in time from 1983 to 2017 using the 1.021 (95% CI = 0.949-1.087) growth rate, noting up front that uncertainty in annual growth

rate magnifies exponentially over time when manifest in population size. For example, after back-casting to obtain a plausible

1983 population starting point, deterministic projections of population size using the upper and lower confidence intervals of

growth allow for a current population (2017) of anywhere between 3 and 256. Stochastic projections, e.g., using the software

RISKMAN, generate a similar and not particularly useful range of 4 to 154 individuals.

The point here is that the raw cumulative uncertainty is huge, especially when dealing with a time period as long as 1983-2017. It is also important to note that this exercise takes

the 1.021 estimate of lambda at face value, which, as per my previous points, is unwarranted.

Related to this last point, the current basis for modeling population growth rate using Booter (ibid: 10- 11) is egregiously simplistic given the self-evident structural complexity of grizzly

bear population demography in the Cabinet-Yaak Ecosystem.

For any estimate of growth rate to be realistic, explanatory, relevant, and accurate, all of the main structure needs to be accommodated. More specifically, a relevant demographic model

would ideally include source-sink structures accounting for management- trapped versus research-trapped bears, bears in the Yaak area versus the Cabinet Mountains, augmentation bears versus in situ bears—in addition to accounting for the male segment as well as inter-annual variation attributable to variation

in key food resources (see later). The model described in Kasworm et al. does none of this.

Again, the probable retort would be that sample sizes are too small to support estimating the many rates required for such a

model. But that is, indeed, the point. And no amount of hand-waving or protest will make it otherwise nor redeem the deficiencies in current estimates of demographic rates. The uncertainty is real and unavoidable, and should be acknowledged in management decision-making.

A.2. Even taking estimated growth rate at face value, current population status is problematic

Even taking the population growth rate estimated by Kasworm et al. at face value, the most defensible conclusions would be, first, that status of the population has worsened during 2014-2017 compared to 2006-2013, and, second, that numbers are still substantially less than the presumed peak reached around 1998. These conclusions are based on trend in population growth rate over time (as per ibid: 37), and trend in population size estimated by projections using year-specific cumulative population growth rates (e.g., projecting population size for

1998 using the 1983-1998 growth rate estimate, and then doing the same for each successive year, with 1983 the starting year throughout).

Figure 2 (herein) shows seminal results. In Figure 2A I've identified three periods typified by trends in population growth:

rapid decline of 2% per annum during 1998-2006, coincident with the berry famine (see below); a nearly as rapid 1.1% rate of improvement during 2006-2014; followed by stalling in the rate of improvement to around 0.2% per annum since 2014—an 82% decline in rate of change— coincident with population growth rate finally reaching positive territory. Importantly, this refers to the per annum rate of deterioration or improvement in population trajectory, which is perhaps the most relevant information to be gleaned from the estimates of population growth rate presented by Kasworm et al.

Finally, Figure 2B (herein) shows trend in estimated size of the Yaak female population, both as a central tendency (dark green line) as well as bounding uncertainty (light green band, based on

projections using the upper and lower confidence intervals for each cumulative estimate of growth rate). Parenthetically, I

transformed the values to a natural log scale in Figure 2B to visually emphasize trends given that the bounds of uncertainty explode with projections increasingly farther forward in time. The

take-away point is that, according to these values, population size peaked during 1998, reached a nadir during the height of the berry famine in 2006, increased through 2014, and then stalled during 2015-2017 at a size that was still around 52% less than peak numbers reached during 1998.

The key points here are that improvement in status of the female segment of the Yaak population stalled beginning in 2014 at numbers that were still approximately 52% less than the peak reached during 1998. Having said this, both of these conclusions remain severely compromised by the intrinsic uncertainties, lack of relevance, and bias of methods used by Kasworm et al.

A.3. Conclusion

The upshot of all this is that there is no legitimate basis for estimating current population size (e.g., 55- 60) by applying a biased 1983-2017 growth rate—based on high-graded data representing only a fraction of the population—to a point population

estimate made during 2012. Moreover, even taken at face value,

the current cumulative population growth rate shows stalled improvement in population status and a population still substantially less than peak numbers reached during 1998.

The best that can be perhaps be invoked is a contrast between the presumed minimum estimate of 35 bears during 2014-2017

(ibid: 27) and the 2012 estimate of 49 (44-62) bears reported by Kendall et al.

(2016). The estimate of 35 for 2014-2016 is self-evidently less

than the lower bound of the 2012 confidence interval, more consistent with a static or even declining population than with an

increasing one. Of greater relevance to the draft EIS, this general conclusion also holds for comparisons specific to the Cabinet population (a current minimum of 13 bears compared to lower confidence intervals of around 20 reported by Kendall et al. for 2012).

Figure 2. Trend in estimated population growth rate (A) and related estimated total population size (B) for Cabinet-Yaak grizzly bears, with the notable proviso that both sets of estimates are based almost wholly on data obtained from female grizzly bears in the Yaak population. Dark green dots or lines denote central tendencies, large green bands bounds of uncertainty. The horizontal dark red line in (A) denotes no growth, with any values above leading to increase and any values below leading to decline. The red line in (B) corresponds with estimated population size in 1998. In (A) I also show the cumulative weight of evi-

dence for population declines versus increases for 1998-2017

along with average annual rates of change in lambda during three periods characterized by non-stationary shifts in dynamics. The numbers at right in (B) correspond to the range in estimated population size given uncertainties in growth rate (3-256), as well as the deviance in current estimated population size from the 1998 benchmark.

B. Comparison of Pooled Survival Rates in Kasworm et al. (2018) is Not Legitimate

As ancillary support for the proposition that size of the Cabinet-Yaak population has increased between 1999-2006 and

2007-2017, Kasworm et al state that "Grizzly bear survival of all sex and age classes decreased from 0.899 during 1983–1998 to 0.792 during 1999–2006 and then rose to 0.934" (ibid: 34), and then summarize these same numbers in Table 13 (ibid: 34). Most of the problems and associated bias noted above applies to this comparison. Note, first, that the 95% confidence intervals

reported in Table 13 for pooled estimates from all three time periods overlap, which precludes confidently concluding there is

any difference in mean rates. Moreover, note the restriction to "native" bears, which excludes any consideration of conflict-trapped or augmentation bears, which were very much a component of the 2012 point estimate of population size.

The other problematic aspect of this comparison is that data

from all bear sex and age-classes were pooled, without any apparent attempt to determine whether this collapse of data preserves representation of the population at large. Are males over- or under-represented?...likewise subadults versus adults? Some

sort of weighting scheme reflective of current or even stable population structure could provide some remedy, but without compensating for other biases.

The other interesting aspect of this data-pooling is the extent to which it is at odds with other results and commentary in Kas-

worm et al. More specifically, this aggregation of data ignores

the disproportionate importance of subadult females to population dynamics. This importance is evident in the near 85% variance in estimated population trend attributed to survival of

subadult and adult female bears in Booter calculations (but with 60% attributable to subadult female survival, Table 15; ibid: 37),

as well as the different contextual emphasis placed by the authors on female survival on Pages 32 ("...it is important to consider the rate of female mortality") and 37.

The implication of all this is that the comparison of survival rates estimated from pooled data presented by Kasworm et al on Pages 33 and 34 does not mitigate the many fatal problems with their estimates of population growth rate.

C. Comparison of Annual Average Deaths in Kasworm et al. (2018) is Uninformative

Kasworm et al. (2018) present information on grizzly bear deaths in the Cabinet-Yaak Ecosystem in terms of numerous

contrasts and adjustments presumably designed to be of relevance to various management deliberations. On pages 15-16 a running average of annual mortalities is related to recovery criteria; on pages 16-18 a full list of deaths with ancillary details is provided; and on pages 31- 33 mortality is summarized in multiple ways presumably relative to different management considerations. Throughout, the parsing, categories, and nomenclature are confusing, obfuscated, and confounded. As a result, I needed to reconstruct much of the analysis of mortalities presented by

Kasworm from the raw data on pages 16-18. The contrast among time periods presented in Table 11 (ibid: 33) was a particular focus.

C.1. Table 11 in Kasworm et al. (2018) is a Tangled Mess

The totals in the column farthest right in Table 11 of Kasworm et

al. (2018) include all mortalities— human-caused, natural, within 16-km of the Recovery Area boundary, in the US as well as

Canada—plus the estimated unrecorded human-caused mortalities. For some inexplicable reason, and unlike in the NCDE and

GYE, natural mortalities and mortalities of unknown cause were not accounted for in estimations of unrecorded mortalities.

The upshot is that the row totals in Table 11 represent a mish-mash of natural, human-caused, and estimated unrecorded human-caused mortalities, without any straight-forward connection

to judging overall population status. In fact, the inattention and even outright dismissal in this context of natural mortality as a factor in judging population status is mystifying given that a dead bear, for whatever reasons, matters in assessing the toll taken by mortality.

C.2. Comparison of 'rates' between 1999-2006 and 2007-2017 is Uninformative

By contrast, the comparison of annually-averaged human-caused mortality between 1999-2006 and 2007-2017 on Page 32 of Kasworm et al. only considers human-caused mortality, but

without including any of the estimated unrecorded human-caused mortality included in Table 11—and without any cogent explanation. The confusion implicit to this inexplicable parsing is compounded by use of the term 'rate' in reference to an annual average, in context of 'rate' being used elsewhere in reference to survival and reproductive rates referenced to fates of individual bears. On top of this, a typo was made in reference to the

2007-2017 'rate,' which should be 2.2, not 2.1. This error amplified the potential for confusion arising from comparing '2.1' with '2.25' and calling the first value an increase over the second.

Reducing this chaos to something comprehensible: the annually averaged number of known and probable human-caused deaths during 1999-2006 was 2.13. Using all currently available data,

for 2007- 2018 the average was 2.08. When the estimate of unreported human-caused deaths is included, the average for 1999-2006 was 2.75 (95% CI 1.6-3.9). For 2007-2018 it was 3.2 (95%

CI 2.2-4.2). Considering total known-probable mortality plus estimated unreported human-caused mortality—but without any correction for unreported natural deaths—the annual averages for 1999-2006 and 2007-2018 were virtually identical: 3.9 and 3.8.

The important point is, here again, that rote statistical uncertainty debars any conclusion about increase, stasis, or decrease in

numbers of human-caused deaths. The confidence intervals of annual averages overlap substantially, which is not surprising given the small sample of years and dead bears. This statistical uncertainty is amplified by uncertainty attached to detecting any bear death other than that of an actively radio-monitored animal. Considering only human-caused deaths, this certainly holds for

poached bears, deaths 'under investigation,' and deaths from unknown (but human-related) causes. A back-of-the-envelope cal-

culation suggests that such deaths need to be increased by around 70 to 120% in year-end tallies.

In the face of such irrefutable uncertainty, Kasworm et al resort to focusing on and then emphasizing female mortality, which reduces the absolute values of calculated averages even further.

When an estimate of unreported human-caused female mortalities is added to known mortalities (using the long- term proportion of F:M deaths=0.4), the result is an annual average of 1.75 (95% CI 0.83-2.67) female deaths for 1999-2006 and 0.80 (95% CI 0.34-1.54) female deaths for 2007-2018. All of the reported differences in mean values are so far within the range of statistical uncertainty as to render these comparisons a bit absurd.

C.3. Conclusion

Again, researchers and managers in this ecosystem might argue

that small samples prevent any degree of certainty about conclusions, but this does not obviate the obligation to acknowledge uncertainty. Nor does it eliminate the practical consequences of

small sample sizes and the compromising effects of chance pro-

cesses—highlighted recently by a jump in recorded deaths from 1 in 2017 to 3 in 2018, a tripling in just one year. More certainly, it recommends humility and precaution in the face of such statistical ambiguities.

But all of this still leaves open the question of why natural mortalities as well as mortalities that cannot be definitively ascribed

to human causes are not accounted for in assessing population status. This question is especially relevant given that Kasworm et al comment in several places on the extent to which variation in abundance of key natural foods likely drives population dynamics, often through the 'natural' death of dependent young (see below). Or, even, why, when considering only human-caused mortality, adjustments to account for unrecorded deaths were not included. This is all a bit mystifying as well as prima facie unjustified.

D. Status of the Cabinet-Yaak Population Remains Highly Precarious

The current vulnerability of the Cabinet-Yaak population can be illustrated through a simple exercise, even without accounting for spatial structure of the Cabinet and Yaak subpopulations. I input vital rates into a commonly-used risk management program named RISKMAN (currently being proposed for management of grizzly bear mortality in the NCDE). Using the stochastic function, I was able to reconstruct the c. 2.1% growth rate reported by Kasworm et al (2018) for 1983-2017. More specifically, the cumulative geometric mean growth rate (lambda) varied from a maximum of 1.035 to a minimum of 1.008.

Accounting for variation in vital rates, the median ending population size at year 34 was 43, although the upper and lower 95% percentiles of simulated trajectories produced ending populations as small as 4 and as large as 154. I then simulated what would have happened if just one additional female died each year. In this scenario, the geometric cumulative mean growth rate dropped from 0.952 (already much less

than 1) to an astounding 0.202 at year 34 of the simulation (Figure 3 herein). Median total population size had reached 0 by year 23, with an upper 95th percentile of only 11 animals at the end of simulations. Results were not much improved when an additional 1 female was lost only once every 2 or 3 years. This is not presented as any definitive modeling result, but rather illustrative of how little the margin of error is, and how vulnerable this population is to even the smallest increased increments of mortality (e.g., Kendall et al. 2016). This point is especially germane given that one adult female was killed by humans each of the last two years, during 2018 and 2019. And this does not account for adult females that died and were not documented.

Figure 3. Results of RISKMAN projections for the Cabinet-Yaak population using vital rates reported by Kasworm et al. (2018), but introducing the death of an additional female grizzly

bear once every 2 years. The thick green line represents the median trend of projections; the dusky green band above and below the variability of projections.

E. Weight of Available Evidence Emphasizes the Continued Importance of Malicious Killing

The extent to which poaching, malicious killing, or other suspect circumstances are associated with human-caused deaths is also

instructive regarding the overall effectiveness of conflict mitigation efforts during 1999-2017 to offset the problematic effects of

road-access and poaching. By its nature, malicious killing/ poaching is a criminal act undertaken by criminals. Such behavior is rooted in attitudes and outlooks that are notoriously unresponsive to education and 'outreach'. The phenomenon is about willful malfeasance. As such, limitations on road access coupled with improved law enforcement and successful prosecutions are logically the most appropriate redress—not, for example, conflict mitigation by a specialist who is not tasked primarily with

law enforcement.

Before pursuing this any farther, some clarification of obfuscations in the dead bear database is needed. During 1999-2017 a number of deaths were ascribed to ‘Undetermined’ human causes, ‘Poaching’ or listed as ‘Under investigation’. The first and

last categories are not explicit, but nonetheless strongly suggestive. Certainly, ‘Under investigation’ suggests that the death occurred under suspicious circumstances warranting investigation—with a strong likelihood of either poaching or other unwarranted lethal action by the involved people. Such suspicions are rarely definitively resolved. ‘Undetermined’ is also

more suggestive of malfeasance rather than innocence on the part of the involved people. Given the alternatives, such deaths are more defensibly allocated to causes more resistant than notto mitigation.

With all of this as context, there were a total of 7 known-probable deaths during 1999-2006 attributed to either poaching or un-

determined causes, representing 58% of total human-caused deaths. During 2007-2018 there were a total of 13 deaths either under investigation or ascribed to poaching, representing a nearly identical 59% of the total known-probable human-caused deaths. These are major fractions in their own right, but leave estimated numbers of unreported deaths unaccounted for. As

Kasworm et al make clear (ibid: 33), their estimate of 'unreported' deaths did not apply to bears that were radio-collared or removed by managers, which leaves this unreported estimate

levied almost entirely against malicious or otherwise suspect causes. When these unreported estimates are added to the known-probable toll taken by poaching, unknown causes, or suspicious circumstances, the percentage increases to around 70% during 1999-2006 and approximately 77% during 2007-2016.

Taken together, these figures support concluding that (1) malicious or otherwise suspect causes account for a large portion—if not majority—of grizzly bear deaths in the Cabinet-Yaak

Ecosystem; (2) the fraction and even total numbers of deaths attributable to such causes did not decrease from 1999-2006 to

2007-2018; and (3) that aggressive limitations to road access by the USFS are needed, especially in areas with concentrations of productive habitat (Proctor et al. 2015, 2017).

F. Access Management is Critical to Limiting Malicious & Other Unjustified Killing

The consensus of relevant research is unambiguous about the link between road access and grizzly bear mortality. The more access, the more dead bears there are, with disproportionate concentrations near roads (Brannon et al. 1988; Benn & Herrero 2002; Nielsen et al. 2004; Wakkinen & Kasworm 2004; Boulanger & Stenhouse 2014; McLellan 2015; Proctor et al. 2017, 2018). Dead bears tend to be concentrated within 100 to 500 m of roads, averaging around 300 m (± 195 m) among studies where distance was noted.

Unfortunately, there is a common conflation of the extent to which radio-marked grizzly bears spatially avoid roads with the

geospatial configuration of mortality risk and, even more important, decrements in survival and population growth. These parameters are not synonymous. Even though a bear might underuse

habitats within a certain distance of roads, this does not translate into a 1:1 correlation with exposure to risk of human-related mortality during a bear's lifetime. Conflation of avoidance with mortality risk has led to the unstated assumption that the former can be used to set standards for the latter. Such is the case for road density and habitat security standards set by the Kootenai National Forest based on the results of Wakkinen & Kasworm (1997).

Taking 300 m as a ballpark figure, road densities of roughly 0.6 km/km2 translate into areas remote from where human-caused mortality is concentrated that amount to only 84 ha (208 acres), which is trivially small for a grizzly bear. This sort of geospatial buffer still means that grizzly bears are frequently exposed to hazards of human-caused death to the predictable extent that they must and willmove from one presumably secure area to another—even assuming that these bears exhibit "average" avoidance of human features such as roads. In other words, the level of buffering from human-caused mortality offered by road density and related se-

curity standards invoked in the Swamped Access Project is guaranteed to be inadequate.

The inadequacy and inappropriateness of road density and security standards used by the Kootenai National Forest in application to the Swamped Access Project are highlighted in contrast to standards applied in the Northern Continental Divide Ecosystem (NCDE), as well as in contrast to trajectories of populations in the NCDE and Greater Yellowstone Ecosystem. The populations of already relatively numerous grizzly bears in the NCDE and GYE have increased substantially since the early 1990s to 2000s, in contrast to in the Cabinet-Yaak where precariously few bears have fared poorly (see my Points A-D, herein). Tellingly, Wilderness Areas and Inventoried Roadless Areas where road access is not allowed comprise around 56% of the NCDE and GYE. In the Cabinet-Yaak Ecosystem this figure is less than half as much, nearer 21%. This difference alone can explain much of the corresponding difference in fates of grizzly bear populations.

Despite these telling differences in fates and trajectories of grizzly bear populations, the road density and habitat security stan-

dards applied by the Kootenai National Forest are more lax, not less, than those applied on the Flathead National Forest. On the Kootenai, areas allowed with >1 mile/mile2 of roads are 1.7-times greater; areas with >2 miles/mile2 of roads are 1.4-times greater; and extents of secure habitat nearly 20% less compared

to what is ostensibly allowed on the Flathead NF. These disparities are perverse and not able to be explained on the basis of differences in the extent of movements by grizzly bears. If anything, bears range more widely in the Cabinet-Yaak Ecosystem compared to the NCDE (Kasworm et al. 2018).

As a bottom line, existing and proposed access management inthe Swamped Project Areas has jeopardized and will continue to jeopardize grizzly bears especially considering the logging proposed in the Ripley project.

G. More Grizzly Bear Deaths Are Occurring On USFS Jurisdictions Now Compared to During 1999-2006

The argument for more aggressive management to prevent human-caused grizzly bear mortality on USFS jurisdictions is given greater weight by differences in locations of bear deaths be-

tween 1999-2006 and 2007-2018. Data from Kasworm et al.

(2018) and Kasworm (2018)show an increase in the proportion of grizzly bear deaths on USFS lands from 25% (95% CI = 0.5-49.5%) during 1999-2006 to 56.5% (36.3-76.8%) during 2007-2018. Although sample sizes are small, confidence intervals large, and overlap of the intervals non-trivial (17%), these results do not support concluding that hazards for grizzly bears have remained constant or declined on USFS lands. Rather, by weight of evidence, the better supported conclusion is that hazards have increased and, because of that, imperatives to control mortality on public lands have likewise increased, including on lands part of the Ripley and Swamped Projects. As per my point F, above, the most efficacious means available to the

USFS for addressing this imperative is through providing increased rather than diminished habitat security, axiomatically through reducing road access in the Project area.

Activities of the Swamped Project Are Problematic in a Larger Geospatial Context

Please examine the cumulative effects of this project.

Please evaluate the impacts of proposed activities on grizzly bears in a larger geospatial context. Mattson & Merrill (2004) and Proctor et al. (2015) are perhaps most relevant to such an evaluation. The former research mapped existing core habitat as well as higher-probability source habitats in the Cabinet-Yaak

Moreover, with the Cabinet-Yaak Recovery Area as a logical unit of analysis, any assessment of cumulative effects needs to

account for other on- going and planned human activities associated with forest treatments and harvest in this Ecosystem, as

well as foreseeable impacts associated with the proposed Rock Creek and Montanore Mines; as well as on-going and foreseeable impacts associated with the human transportation infrastructure (e.g., railways and associated highways that already

fragment grizzly bear distribution in this Ecosystem, Mattson et al. [2019b]), all with the potential to amplify impacts arising from the Swamped Project.

K. A Devil's Bargain Will Not Rescue This Small Population

K.1. The Cabinet-Yaak Population is Not Viable and Remains Acutely Vulnerable to Increased Mortality

The Cabinet-Yaak grizzly bear population is smaller than the smallest census population size ever posited as being viable. The Yaak/Yahk subpopulation has limited connectivity with grizzly bear populations elsewhere, and the Cabinet Mountains subpopulation is more isolated yet (Apps et al. 2016; Kendall et al.

2016; Proctor et al. 2012, 2015). Such isolation is well-known to magnify risk. The degree of this risk is evident in the fact that

fates of populations as small of that of the Cabinet-Yaak grizzlies can be dictated solely by chance variation in birth and death rates, known as demographic variation. Yet demographic variation is a relatively minor stressor compared to environmental variation, catastrophes, negative deterministic trends, and loss of genetic diversity—all of which are documented or potential factors in the Cabinet-Yaak. The contemporary consensus of

researchers is that populations of large mammals such as grizzly bears need to consist of thousands of animals to withstand all of these stochastic and deterministic threats over meaningful periods of time.

The Yaak and Cabinet grizzly bear populations remain acutely vulnerable to even small changes in levels of mortality. Under such circumstances, a precautionary approach to managing spatial hazards and habitat security is not only advisable, but mandatory. Unfortunately, there is no evidence of caution or even meaningful recognition of threats to the Cabinet population.

K.2. Variation in Population Trajectory Has Likely Been Driven by Exposure to Humans

As a hypothetical, it is worth taking claims regarding an improvement in status of the Cabinet-Yaak grizzly bear population between 1999-2006 and 2007-2018 at face value. Again, the emphasis here is on the hypothetical given all of the compromising or even fatal flaws in analyses and conclusions reported in

Kasworm et al. More specifically, if an improvement did occur, what was (were) the likely driver(s)?

Causation is notoriously hard to establish with any reliability or confidence. Nonetheless, even taking comments in Kasworm et al (again) at face value, one can establish how these authors ascribed causation based on the balance of their comments. The relevant quotes include:

"The increase in total known mortality beginning in 1999 may be linked to poor food production during 1998-2004 (Fig. 9). Huckleberry production during these years was about half the long term average...Poor nutrition may not allow females to produce cubs in the following year and cause females to travel further for food, exposing young to greater risk of mortality from conflicts with humans, predators, or accidental deaths." (emphasized in Figure 10; ibid: 32; see Fig. 6, herein).

"Some of this decrease [in survival] in the 1999-2006 period could be attributed to an increase in natural mortality probably related to poor berry production during 1998-2004. Mortalities on private lands within the U.S. increased during this period,

suggesting that bears were searching more widely for foods to replace the low berry crop." (ibid: 34).

In reference to a probable increase in size of the Cabinet Mountains subpopulation from around <15 (possibly 5-10) in 1988 to around 22-24 in 2012: "These data indicate the Cabinet Mountains population has increased 2-4 times since 1988, but this increase is largely a product of the augmentation effort with reproduction from that segment." (ibid: 36).

L. Conclusion

Reiterating my conclusion in the Introduction to these comments, the Swamped Project promises to harm grizzly bears in the Cabinet-YaakEcosystem. The Forest Service could unequivocally benefit grizzly bears in this area by the closure and retirement of roads.

Benn, B., & Herrero, S. (2002). Grizzly bear mortality and human access in Banff and Yoho National Parks, 1971-98. Ursus, 13, 213-221.

Boulanger, J., & Stenhouse, G. B. (2014). The impact of roads on the demography of grizzly bears in Alberta. PloS One, 9(12), e115535.

Brannon, R. D., Mace, R. D., & Dood, A. R. (1988). Grizzly bear mortality in the northern Continental Divide ecosystem, Montana. Wildlife Society Bulletin, 16(3), 262-269.

Eberhardt, L. L., Blanchard, B. M., & Knight, R. R. (1994). Population trend of the Yellowstone grizzly bear as estimated from reproductive and survival rates. Canadian Journal of Zoology, 72(2), 360-363.

Garshelis, D. L., Gibeau, M. L., & Herrero, S. (2005). Grizzly bear demographics in and around Banff National Park and

Kananaskis country, Alberta. The Journal of Wildlife Management, 69(1), 277-297.

Harris, R. B., Schwartz, C. C., Haroldson, M. A., & White, G. C. (2006). Trajectory of the Yellowstone grizzly bear population under alternative survival rates. Wildlife Monographs, (161), 44-55.

Hovey, F. W., & McLellan, B. N. (1996). Estimating population growth of grizzly bears from the Flathead River drainage using computer simulations of reproduction and survival rates. Canadian Journal of Zoology, 74(8), 1409-1416.

Kasworm , W. F., Radant, T. G., Tesiberg, J. E., Welander, A., Proctor, M., & Cooley, H. (2018). Cabinet- Yaak Recovery Area 2017 research and monitoring progress report. US Fish & Wildlife Service, Missoula, Montana.

Kasworm, W. (2018). Selkirk/Cabinet-Yaak IGBC Subcommittee, meeting notes: 2018 research/monitoring update. http://igbconline.org/wp- content/uploads/2018/11/181108_SCYE_Mtg_-

Summary.pdf
Kendall, K. C., Macleod, A. C., Boyd, K. L., Boulanger, J.,

Royle, J. A., Kasworm, W. F., ... & Graves, T. A. (2016). Density, distribution, and genetic structure of grizzly bears in the Cabinet-Yaak Ecosystem. The Journal of Wildlife Management,

80(2), 314-331.

Ladle, A., Avgar, T., Wheatley, M., Stenhouse, G. B., Nielsen, S.

E., & Boyce, M. S. (2018). Grizzly bear response to spatio-temporal variability in human recreational activity. Journal of Applied Ecology.

Mace, R. D., Carney, D. W., Chilton-Radandt, T., Courville, S. A., Haroldson, M. A., Harris, R. B., ... & Schwartz, C. C. (2012). Grizzly bear population vital rates and trend in the Northern Continental Divide Ecosystem, Montana. The Journal of Wildlife Management, 76(1), 119-128.

Mattson, D. J. (2019a). Effects of pedestrians on grizzly bears: An evaluation of the effects of hikers, hunters, photographers, campers, and watchers with reference to the proposed Pacific Northwest Trail. Grizzly Bear Recovery Project, Report GBRP-2019-3.

Mattson, D. J. (2019b). Effects of trains and railways on grizzly bears: An evaluation of the effects of increased train traffic on

the Burlington Northern Santa Fe and Montana Rail-Link Rail-

ways, Montana- Idaho. Grizzly Bear Recovery Project, Report GBRP-2019-1.

Mattson, D. J., & Merrill, T. (2004). A model-based appraisal of habitat conditions for grizzly bears in the Cabinet–Yaak region of Montana and Idaho. Ursus, 15(1), 76-90.

McCall, B. S., Mitchell, M. S., Schwartz, M. K., Hayden, J., Cushman, S. A., Zager, P., & Kasworm, W. F. (2013). Combined use of mark-recapture and genetic analyses reveals response of a black bear population to changes in food productivity. The Journal of Wildlife Management, 77(8), 1572-1582.

McLellan, B. N., & Hovey, F. W. (2001). Habitats selected by grizzly bears in a multiple use landscape. The Journal of Wildlife Management, 65(1), 92-99.

McLellan, B. N. (2015). Some mechanisms underlying variation in vital rates of grizzly bears on a multiple use landscape. The Journal of Wildlife Management, 79(5), 749-765.

Proctor, M. F., Paetkau, D., Mclellan, B. N., Stenhouse, G. B.,

Kendall, K. C., Mace, R. D., ... & Wakkinen, W. L. (2012). Population fragmentation and inter-ecosystem movements of grizzly bears in western Canada and the northern United States. Wildlife Monographs, 180(1), 1-46.

Proctor, M. F., Nielsen, S. E., Kasworm, W. F., Servheen, C., Radandt, T. G., Machutchon, A. G., & Boyce, M. S. (2015). Grizzly bear connectivity mapping in the Canada–United States trans-border region. The Journal of Wildlife Management, 79(4), 544-558.

Proctor, M. F., Lamb, C. T., & MacHutchon, A. G. (2017). The grizzly dance between berries and bullets: relationships among bottom-up food resources and top-down mortality risk on grizzly bear populations in southeast British Columbia. Trans-border Grizzly Bear Project, Kaslo, British Columbia, Canada, http://transbordergrizzlybearproject.ca/research/publications.html.

Proctor, M. F., McLellan, B. N., Stenhouse, G. B., Mowat, G., Lamb, C. T., & Boyce, M. S. (2018). Resources roads and grizzly be4ars in British Columbia and Alberta, Canada. Trans-border Grizzly Bear Project, Kaslo, British Columbia, Canada,

http://transbordergrizzlybearproject.ca/research/publication-

s.html.

Wakkinen, W. L., & Kasworm, W. (1997). Grizzly bear and road density relationships in the Selkirk and Cabinet-Yaak recovery zones. US Fish and Wildlife Service, Kalispell, Montana.

Wakkinen, W. L., & Kasworm, W. F. (2004). Demographics and population trends of grizzly bears in the Cabinet–Yaak and Selkirk Ecosystems of British Columbia, Idaho, Montana, and Washington. Ursus, 15(1), 65-76.

Waller, J. S., & Mace, R. D. (1997). Grizzly bear habitat selection in the Swan Mountains, Montana. The Journal of Wildlife

Management, 61(4), 1032-1039.The FS manages most of the habitat in the CYE, but instead of exercising its discretion to increase habitat security via substantial road reductions and minimizing industrial and motorized disturbance, the agency prefers to log, mine, and otherwise manipulate and disrupt the grizzly's habitat to the limits allowed by its already inadequate regulatory mechanisms. Since 2010, the FS:

- Declined the opportunity to select an Access Amendment alternative that would have provided a higher level of habitat protections for grizzly bears and for a whole host of other

wildlife species;

- Continued to neglect its duty to identify the forestwide minimum road system under the Travel Management Rule Subpart A;

- Recommended a minimum of the inventoried roadless areas in the CYE Recovery Zone (RZ) for Wilderness in the RFP; and

- Approved more major timber sales and mining in the CYE RZ.

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

  We also incorporate into these comments Louisa Willcox's commentary entitled "The Future of the Cabinet-Yaak Grizzlies" (https://www.counterpunch.org/2017/09/08/95644/).

  Grizzly bears are winter-sleepers rather than true hibernators. If high density motorized routes are known to disturb, displace, habituate, and raise mortalities among grizzlies in spring, summer, and fall, there's no logical, or scientific reason to believe they don't do the same to sleeping bears in winter. The BO states:

  In the CYE and NCDE, incidental take may occur where late season snowmobiling overlaps with grizzly bear post-denning habitat. The incidental take is expected to be in the form of harassment to individual female grizzly bears and/or cubs

caused by premature den emergence or premature displacement from the den site area, resulting in reduced fitness of females and cubs. We expect the amount and extent of take would be very low.

Cumulative incidental take under the revised forest plan has not been low.

The BO also states:

The Revised Plan's desired condition for patches which includes a range of larger opening sizes may result in adverse effects if lack of cover leads to under use of foraging habitat or increased risk of human-grizzly bear conflicts causing mortality of a grizzly bear. Openings created by timber harvest, depending on site conditions, may retain features that interrupt the line of sight and provide cover for bears (J. Anderson 03/12/2012 pers. comm.).

The FS does not show that the openings to be newly created by the project don't exceed levels of allowed incidental take. The Ripley project will have 22 even-aged regeneration opening bigger than 40 acres. The Swamped project will have 17 clearcuts bigger than 40 acres. The EA makes no meaningful distinction between the types of "regeneration" logging methods to be utilized. Although commonly known that clearcuts leave fewer trees that seed tree cuts, and seed tree cuts leave fewer trees than shelterwood cuts, this EA and DN do not require the FS to meet any measurable, numerical

[10] The FS's "Request..." document actually lists 20—not 21 openings. 63

criteria or distinctions for such cuts during implementation. The best the EA does is provide blurry forest stand pizza diagrams as copied here via screenshot:

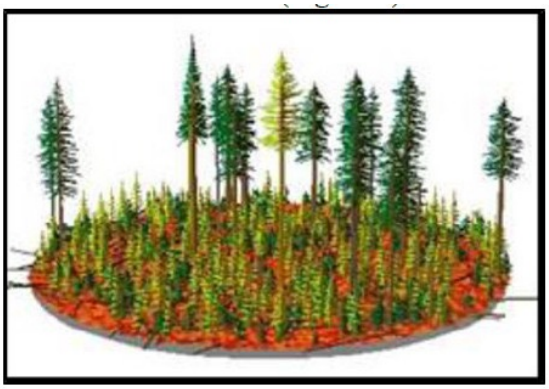


Figure 3. Simulation of a shelterwood cut.

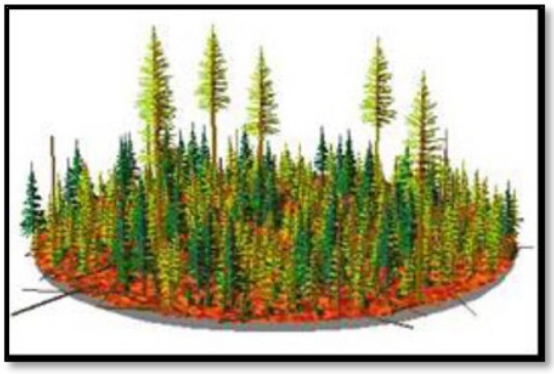


Figure 4. Simulation of a seed-tree cut

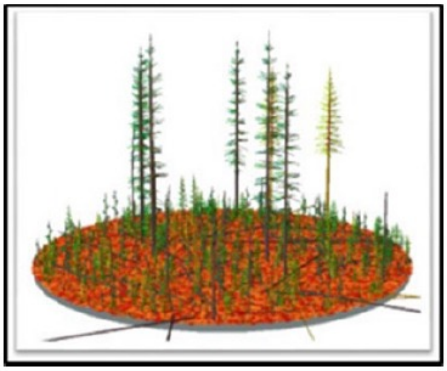


Figure 5. Simulation of a clearcut with reserves

And the pizza diagram of “Improvement Cut” isn’t much different than that of Shelterwood:

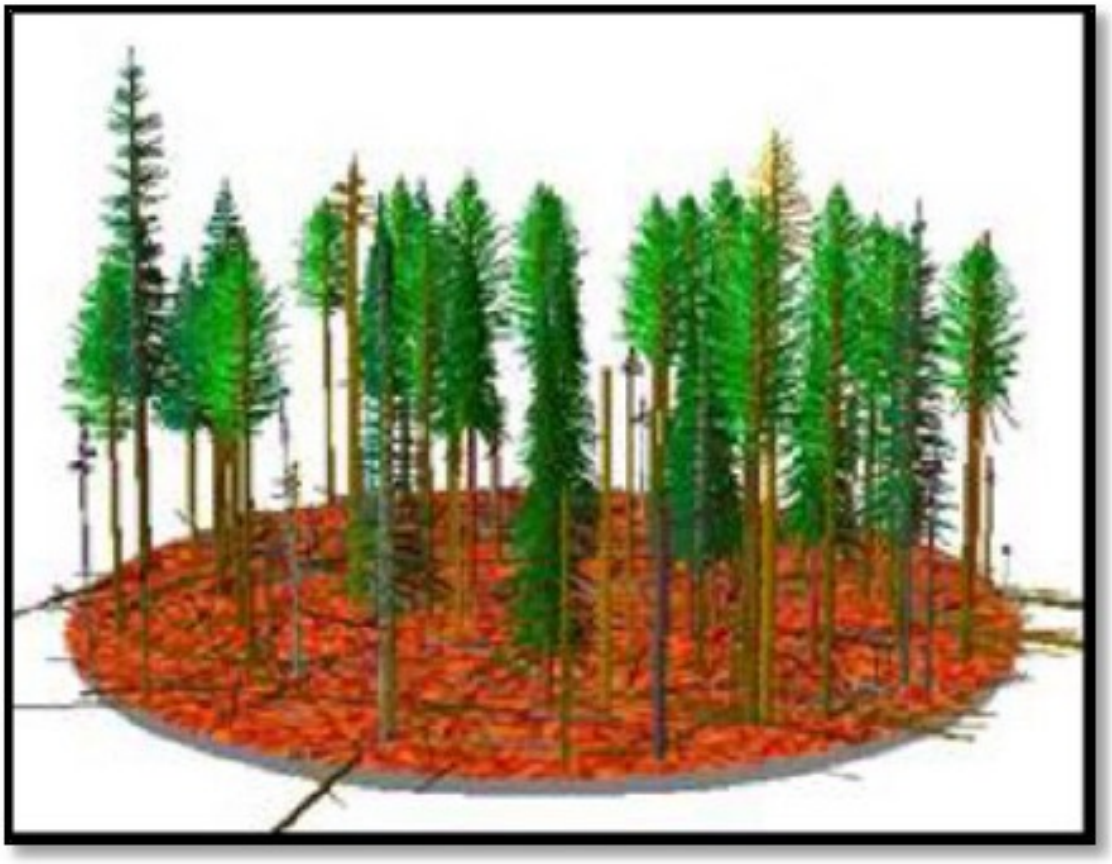


Figure 1. Simulation of an Improvement Cut

At best these diagrams represent the logged areas a number of years after cutting since they don't show the slash, burned vegetation, damage to leave trees and raw earth from machine impacts—

and this assumes overcoming regeneration challenges that increase every year due to climate change. To provide a clearer perspective, below are post-monitoring photographs of shelterwood cuts implemented for the Orogrande Community Protection Project in the Nez Perce-Clearwater National Forest:







The conditions shown immediately above better represent the lack of cover grizzly bears would face for at least 4 square miles than do the EA diagrams. And this doesn't even include the 1,262 acres of "Improvement Cuts" with poorly specified retention criteria.

In the CYE, the population size is far below the recovery goal of 100 bears (Kendall et al. 2016), with human-caused mortality being the primary factor keeping the population in peril. Any conclusion that the CYE population is stable or increasing is not based in good science.

The effects to grizzly bears from the project include potential disturbance or displacement due to human presence, road construction and use, motorized use and other mechanized equipment. The presence of these activities and the presence of roads leads grizzly bears to avoid otherwise suitable habitat.

The EA doesn't adequately analyze and disclose cumulative impacts on land of other ownerships due to their unknown duration, location, and intensity.

The FS still has not provided solid scientific basis for its assumption that an isolated small core habitat of a few acres are considered just as useful to grizzly bears as the acres in a 10,000-acre block of core.

The EA inadequately analyzes the effectiveness of road closures, for the purpose of eliminating human access. Again, we refer to AWR's Amended Complaint for case CV-18-67-DWM for the purposes of explaining how roads affect wildlife, how pervasive are ineffective closures on national forest land, and also for forest plan consultation requirements.

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

- Alternative D Modified would convert the most roads and consequently would provide the highest degree of habitat security and a lower mortality risk to the **Canada lynx**. (P. 70.)

- Alternative D Modified would provide a higher degree of habitat security (for **gray wolves**) than Alternative E Updated... (P. 74.)

- Alternative D Modified ... could contribute to a cumulative increase in habitat security for **black-backed woodpeckers** (and **pileated woodpeckers**) because timber sales or other ground disturbing or vegetation management activities would be less likely to occur in Core Areas. Newly dead trees that support wood boring beetle populations would be less likely to be removed during vegetation management activities or by woodcutters. Alternative D Modified could provide slightly more secure habitat than Alternative E Updated. (P. 84, 112.)

- Alternative D Modified ... could contribute to a cumulative increase in habitat security because timber sales or other

ground disturbing or vegetation management activities would be less likely to occur in Core Areas. Snags would be less likely to be removed during vegetation management activities or by woodcutters. Alternative D Modified could provide slightly more secure habitat(for **Townsend's big-eared bats, flammulated owls, fringed myotis bats**) than Alternative E Updated. (Pp. 85, 86, 95.)

- Alternative D Modified and Alternative E Updated provide different levels of habitat security (for **peregrine falcon, fisher, wolverine**) based on the relative amount of wheeled motorized vehicle access. (Pp. 87, 89, 91.)

- Alternative D Modified, which closes the most miles of road in suitable habitat, would be the preferred alternative for the western toad. (P. 101.)

- Alternative D Modified closes the most miles of road in suitable habitat and would provide the greatest benefits for the **goshawk**. (P. 103.)

- Alternative D Modified, which closes the most miles of road in suitable habitat, would be the best Alternative for **elk**. (P. 104.)

- Alternative E Updated would provide some security and reduced vulnerability (for **moose**), but not as much as Alternative D Modified. (P. 104.)

- Although Alternative D Modified and Alternative E Updated would benefit **mountain goats**, Alternative D Modified would improve security and reduce the risk of displacement more than Alternative E Updated. (P. 109.)

- Alternative D Modified would improve security (for **pine marten**) more than Alternative E Updated. (P. 110.)
  Great Bear Foundation et al., 2009 discusses in great detail how the Access Amendment Alternative eventually selected leads to a significant deterioration in an already unacceptable baseline condition for grizzly bears. The scientific discussions in Great Bear Foundation et al. 2009, as well as AWR comments on the Access Amendment DSEIS refute the FS's claim to be utilizing the best available science for the grizzly bear.
  The FS fails to recognize that Bear Management Units (BMUs) do not protect enough habitat to satisfy most individual grizzly bears' needs in the CYE.
  "Our analysis shows that grizzly bears have little or no opportunity to select home ranges with lower road density or higher percentages of core... Because grizzly bears could not have selected home ranges having more core area and lower road densities, and there has been no growth in the population, there is no basis to conclude the proposed access standards are sufficient to insure the recovery of the Cabinet-Yaak and Selkirk grizzly bear populations" (Merrill 2003).
  The FS has no plan to provide scientifically defensible habitat protections outside the CYE that would allow for a larger protected zone and/or natural augmentation from outside the CYE. The FS has no cogent methodology that provides scientifically defensible habitat protections inside the CYE that would facilitate functional connectivity between and among BMUs. The Forest Plan fails to provide any scientific basis

that baseline road densities outside the CYE can support grizzly bear population natural augmentation or recovery. Schwartz et al. (2010) noted that management for grizzly bears requires not only the provision of security area, but control of open road densities between security areas. Otherwise, grizzly bear mortality risks will be high as bears attempt to move across highly roaded landscapes to another security area. The forest plan lacks direction regarding road densities located outside of and between security areas. The Forest Plan is not consistent with best available science on road density in grizzly bear habitat outside of Bear Management Units.

Because the FS fails to use the best available science and for the reasons stated above, the FS is unable to demonstrate it is managing consistent with Forest Plan standards FW-STD-WL-02 and FW-STD-WL-03, guidelines FW-GDL-WL-01 and FW-GDL-WL-15, the National Environmental Policy Act (NEPA) and the Endangered Species Act.

Remedy: Select the No Action alternative, or prepare an EIS that remedies the deficiencies of analyses and habitat protections identified in this section.

WOL VERINE

Issues regarding the wolverine were raised in our Objection to the revised forest plan (OBJECTION STATEMENT: Management Indicator Species, OBJECTION STATEMENT: Sensitive species, OBJECTION STATEMENT: NFMA requirements for viability, OBJECTION STATEMENT: Old Growth Management Indicator Species).

The wolverine is proposed for listing as a threatened species under the ESA. The proposed rule was issued in 2013. 78 Fed. Reg. 7864 (February 4, 2013). FWS withdrew the rule on August 13, 2014, and the withdrawal of the rule was deemed unlawful and vacated in 2016. *Defenders of Wildlife v. Jewell*, 176 F.Supp.3d 975 (D. Mont. 2016). Thus, the wolverine is currently proposed for listing under the ESA.1 81 Fed. Reg. 71670 (October 18, 2016). The FS must undergo formal consultation with the U.S. Fish & Wildlife Service.

Logging and road activities may affect wolverines; published, peer-reviewed research finds: "Roaded and recently logged areas were negatively associated with female wolverines in summer." Fisher et al., 2013. The "analysis suggests wolverines were negatively responding to human disturbance within occupied habitat. The population consequences of these functional habitat relationships will require additional focused research." Id.

There has been no project formal or informal consultation regarding the wolverine. The FS didn't include its Biological Assessment (the document submitted to the U.S. Fish & Wildlife Service in consultation or concurrence stages) on the project website. The project is in violation of the Endangered Species Act.

Wolverines use habitats ranging from Douglas-fir and lodgepole pine forest to subalpine whitebark pine forest (Copeland et al., 2007). Lofroth (1997) in a study in British Columbia, found that wolverines use habitats as diverse as tundra and old-growth forest. Wolverines are also known to use mid- to low-elevation Douglas-fir forests in the winter (USDA Forest Service, 1993).

Aubry, et al. 2007 note that wolverine range in the U.S. had contracted substantially by the mid- 1900s and that extirpations are likely due to human-caused mortality and low to nonexistent immigration rates.

May et al. (2006) cite: “Increased human development (e.g. houses, cabins, settlements and roads) and activity (e.g. recreation and husbandry) in once remote areas may thus cause reduced ability of wolverines to perform their daily activities unimpeded, making the habitat less optimal or causing wolverines to avoid the disturbed area (Landa & Skogland 1995, Landa et al. 2000a).”

Ruggiero, et al. (2007) state: “Many wolverine populations appear to be relatively small and isolated. Accordingly, empirical information on the landscape features that facilitate or impede immigration and emigration is critical for the conservation of this species.”

Roads result in direct mortality to wolverines by providing access for trappers (Krebs et al., 2007). Trapping was identified as the dominant factor affecting wolverine survival in a Montana study (Squires et al. 2007). Female wolverines avoid roads and recently logged areas, and respond negatively to human activities (Krebs et al., 2007)

Ruggiero et al. (1994b) recognized that “Over most of its distribution, the primary mortality factor for the wolverines is trapping.” Those authors also state, “Transient wolverines likely play a key role in the maintenance of spatial organization and the colonization of vacant habitat. Factors that affect movements by transients may be important to population and distributional dynamics.”

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

Roads and human density are important factors influencing current wolverine distribution (Carroll et al. 2001b); and wolverine habitat selection is negatively correlated with human activity – including roads (Krebs et al. 2007). Wolverine occurrence has shown a negative relationship with road densities greater than 2.8 mi/mi^2 (1.7 km/km^2) (Carroll et al. 2001b).

(T)he presence of roads can be directly implicated in human-caused mortality (trapping) of this species. Trapping was identified as the dominant factor affecting wolverine survival in a Montana study (Squires et al. 2007).

Krebs et al. (2007) state, "Human use, including winter recreation and the presence of roads, reduced habitat value for wolverines in our studies."

Wisdom et al. (2000) state:
Carnivorous mammals such as marten, fisher, lynx, and wolverine are vulnerable to over- trapping (Bailey and others 1986, Banci 1994, Coulter 1966, Fortin and Cantin 1994, Hodgman and others 1994, Hornocker and Hash 1981, Jones 1991, Parker and others 1983, Thompson 1994, Witmer and others 1998), and over-trapping can be facilitated by road access (Bailey and others 1986, Hodgman and others 1994, Terra-Berns and others 1997, Witmer and others 1998).

...Snow-tracking and radio telemetry in Montana indicated that wolverines avoided recent clearcuts and burns (Hornocker and Hash 1981).

Copeland (1996) found that human disturbance near natal denning habitat resulted in immediate den abandonment but not kit abandonment. Disturbances that could affect

wolverine are heli-skiing, snowmobiles, backcountry skiing, logging, hunting, and summer recreation (Copeland 1996, Hornocker and Hash 1981, ICBEMP1996f).

Carroll et al. (2001b) state:
The combination of large area requirements and low reproductive rate make the wolverine vulnerable to human-induced mortality and habitat alteration. Populations probably cannot sustain rates of human-induced mortality greater than 7–8%, lower than that documented in most studies of trapping mortality (Banci 1994, Weaver et al. 1996).

... (T)he present distribution of the wolverine, like that of the grizzly bear, may be more related to regions that escaped human settlement than to vegetation structure.

Wisdom et al. (2000) offered the following strategies:

- Provide large areas with low road density and minimal human disturbance for wolverine
  and lynx, especially where populations are known to occur.
  Manage human activities and
  road access to minimize human disturbance in areas of
  known populations.

- Manage wolverine and lynx in a metapopulation context, and provide adequate links
  among existing populations.

- Reduce human disturbances, particularly in areas with known or high potential for
  wolverine natal den sites (subalpine talus cirques).
  The Forest Plan includes no coherent viability strategy for

wolverine protection. Forest Plan protections for the wolverine revolve entirely around the rather random likelihood of a wolverine den site being detected, so that measures might be taken: "Management activities on NFS lands should avoid/minimize disturbance at known active nesting or denning sites for other sensitive, threatened, or endangered species not covered under other forestwide guidelines." (FW-GDL-WL-25.) The Forest Plan provides no further direction on how motorized activities would be avoided or minimized other than vaguely stating, "Use the best available information to set a timeframe and a distance buffer around active nests or dens." (Id.) What is this best available science? The Forest Plan/FEIS fail to describe the quantity and quality of habitat that is necessary to sustain the viability of the wolverine.

The Analysis of the Management Situation Technical Report for Revision of the Kootenai and Idaho Panhandle Forest Plans states:

Direct mortality (related to access) from trapping, legal hunting, and illegal shooting has impacted all wide-ranging carnivores (e.g. lynx, wolverine, grizzly and black bears, wolves)...

...Wolverine populations may have declined from historic levels, as a result of over- trapping, hunting, habitat changes, and intolerance to human developments. As the amount of winter backcountry recreation increases, wolverine den sites may become more susceptible to human disturbance.

In regards to the 2013 memo from the Regional Office (2013_0305_USDAWolverine Guidance), clearly the district-level wildlife specialists are prohibited from arriving at effects conclusions based upon their own expertise and judgment.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the analytical and scientific issues identified above.

NOXIOUS WEEDS

Noxious weeds were raised in our September 2017 comments. Despite the legacy of heavy-handed management and other anthropogenic activities—actions known to cause the spread of noxious weeds and other invasive plants—the EA fails to disclose the amount of noxious weed infestation in the project area. This is consistent with the its overall failure to analyze cumulative effects of noxious weeds and the factors contributing to their spread in the project area.

Unfortunately, there are no Standards or Forest Plan monitoring items related to noxious weeds. To this day, the behavior of the KNF still seems to be constant denial. The KNF seems to believe that it can disturb all the land it wants and still deal with the consequential noxious weed invasion with later control actions. The EA fails to cite any science or KNF monitoring data that demonstrates the FS can significantly reduce noxious weed occurrence.

The FS is unable to prevent, contain, or control noxious weeds without the use of herbicides as routine practice. The problem only gets worse with each large-scale soil disturbance, such as what is proposed for the Ripley and Swamped projects.

The EA does not disclose the degree to which the productivity of the land been affected in the project area and forestwide due to noxious weed infestations, and how that situation is expected to change in the coming years and decades. The KNF's noxious weed treatment program is mitigation for management activities which exacerbate the spread of noxious weeds. The EA fails to disclose the effectiveness of this mitigation.

Again, the agency had no response showing it can competently get a handle on noxious weed infestations its management actions have caused.

Noxious weeds are the proverbial Pandora's Box loosed on the forest ecosystem—no amount of herbicide use reverses their spread for long. The financial costs of noxious weeds are another part of this elephant in the room. The agency does not account for the economic impacts of increased weed treatments due to projects such as this one, nor of the loss of ecosystem services attributed to noxious weeds being cultivated by project activities.

The impacts of noxious weeds are exacerbated by every action that disturbs soil or otherwise upsets the balance of native vegetation. Weed spread from management activities such as logging and burning and use of mechanized vehicles or equipment are a constant symptom of resource extraction management.

Native plants are the foundation upon which the ecosystems of the Forest are built, providing forage and shelter for all native wildlife, bird and insect species, supporting the natural processes of the landscape, and providing the context within which the public find recreational and spiritual opportunities. All these uses or values of land are hindered or lost by conversion of native vegetation to invasive and noxious plants. The ecological threats posed by noxious weed infestations are so great that a former chief of the Forest Service called the invasion of noxious weeds “devastating” and a “biological disaster.” Despite implementation of Forest Service “best management practices” (BMPs), noxious weed infestation on the Forest is getting worse and noxious weeds will likely overtake native plant populations if introduced into areas that are not yet infested. The Forest Service has recognized that the effects of noxious weed invasions may be irreversible. Even if weeds are eliminated with herbicide treatment, they may be replaced by other weeds, not by native plant species.

Invasive plant species, also called noxious weeds, are one of the greatest modern threats to biodiversity on earth. Noxious weeds cause harm because they displace native plants, resulting in a loss of diversity and a change in the structure of a plant community. By re- moving native vegetative cover, invasive plants like knapweed may increase sediment yield and surface runoff in an ecosystem. As well knapweed may alter organic matter dis- tribution and nutrient through a greater ability to uptake phosphorus over some native species in grasslands. Weed colonization can alter fire behavior by increasing flammability: for example, cheatgrass, a widespread noxious weed on the Forest, cures early and leads to more frequent burning. Weed colonization can also deplete soil nutrients and change the physical structure of soils.

Public Health Malpractice—Herbicides and PFAS

The Kootenai National Forest plans to use herbicides as part of the Swamped Project. This is typical of agency managers who often use massive amounts of herbicides as part of their projects, even extoling their use as an "integral part" of modern forestry practice claiming it increases forest wood volume and even biodiversity.

Ten years after their use, herbicides (typically glyphosate, i.e. Roundup) can still be shown to reduce plant species diversity (Attached) in the understory. But the human health impacts are far more alarming, and are usually dismissed or completely misunderstood by those who make decisions on their use in forestry. In the NEPA documents we could find no acknowledgement whatsoever of any consequences to herbicide use.

As biologic poisons, pesticides (herbicides and insecticides) have always been recognized as a hazard to human health, and their use has been controversial since at least 1962 with the publishing of Rachel Carson's Silent Spring. The idea that widely distributing biological poisons would leave beneficial plants, animals, and humans unharmed never made scientific sense, and in recent decades, a growing body of research confirms they do damage to far more of the biological world than just pests. But now the danger of the use of pesticides is likely exponentially greater.

A second dimension of concern emerged in the 1990s with research that showed many pesticides (including the most commonly used herbicides containing glyphosate) were also endocrine disruptors, i.e. they mimicked or antagonized critical human hormones at extremely low dose exposure, adding an entirely new level of scientific evidence of their harm to human health. Endocrine disruptors have been identified as causing a wide spectrum of harm, especially at the earliest, most critical stages of human development; in utero, infancy, and childhood. Clinical consequences include developmental disorders, reproductive toxicity, multiple cancers, immunosuppression, and damage to the brain and nervous system. Many pesticides degrade into metabolites that have even stronger endocrine disrupting characteristics. (Attached)

Because of this research, in 1996, Congress mandated EPA test all pesticides for endocrine disruption potential. Thirty

years later that still has not happened and EPA's regulatory process largely ignores the issue (Attached). Independent researchers meanwhile have strengthened the evidence of harm from endocrine disruptors. Glyphosate is still the most commonly used herbicide, despite increasing resistance developing in many plant species. It is now recognized as an endocrine disruptor. A detailed case against the use of glyphosate can be found here.

A third dimension of public health harm from pesticides has emerged in the last few years that almost certainly dwarfs the previous two. Scientists from throughout the world are finding PFAS in many of the most commonly used pesticides (Attachment #24). The presence of PFAS can be both intentional and inadvertent, i.e. intentionally incorporated into the active ingredient, as inactive ingredients used to enhance efficacy, or from leaching from storage containers.

Three years ago, the CDC made an unprecedented recommendation that physicians consider testing their patients' blood for PFAS or "forever" chemicals. That they have never made any such recommendation for any other toxic chemicals speaks volumes about the unprecedented danger of these chemicals. In 2022, EPA made stunningly strict drinking water guidelines for forever chemicals; for the two main categories .02 and .004 parts per trillion (ppt). To give that a visual context, that is the equivalent of 1 drop of water in a lake the size of six Rose Bowl stadiums, and one drop of water in a lake the size of 30 Rose Bowl stadiums.



Then in April last year EPA made enforceable, nationwide drinking water standards for these chemicals that are so strict it means EPA essentially believes there is no safe level of PFAS exposure. They made the standard equal to the detection capability of current technology, i.e. 4 ppt (parts per trillion).

Reflecting growing worldwide alarm in the scientific community, a pollution researcher at the UK's Liverpool John Moores University, Patrick Byrne, said PFAS are "probably the greatest chemical threat the human race is facing in the 21st century." Twenty-nine states have adopted at least some laws to protect their residents from PFAS in consumer products and more is being planned.

Global contamination with PFAS now intersects with pesticide use because the evidence is overwhelming there is wholesale contamination of pesticides with PFAS chemicals, and many pesticides break down into still toxic, short

chain PFAS (Attachment #19). type chemicals. Seventy percent of pesticides introduced to the market since 2015 qualify as PFAS compounds. As a former EPA scientist, Kyla Bennett said, "If the intent was to spread PFAS contamination across the globe there would be few more effective methods than lacing pesticides with PFAS."

There is already widespread PFAS pesticide contamination of every component of the global environment, including drinking water and the food supply. (Attachment #19). Nearly 100% of humans carry PFAS in their blood in very disturbing amounts, including newborns, and pesticides are a major reason. Women, fetuses, infants, and children are more susceptible to the health hazards of pesticides and PFAS. European scientists said, "The extent of this contamination is shocking. It is a result of political failure at many levels."

Pesticide use in forested areas is largely unrestrained, and decisions about mass spraying are made by private contractors, lumber companies, and agency employees who have no expertise in the health consequences of the products they are exposing the public to. This lack of oversight or caution is irrational, and it is now wholly unacceptable. There is strong evidence that the mass use of pesticides is now a serious, global public health threat on an unprecedented level because of endocrine disruption and now PFAS contamination. Because these chemicals so environmentally persistent and refractory to thermal destruction, they are likely to also be found in any smoke emitted from

the pile burning and prescribed burns depending on the timing of their use. Pesticides can drift thousands of miles (Attachment #22) from where they are applied, and have been linked to over 50% reductions in wild plant diversity within 500 m of fields. Typically about 25% of sprayed pesticides become airborne and capable of contaminated ecosystems hundreds and even thousands of miles away (Attached).

The Forest Service's own management activities are largely responsible for noxious weed infestations; in particular, logging, pre- scribed burns, and road construction and use create a risk of weed infestations. The introduction of logging equipment into the Forest creates and exacerbates noxious weed infestations. The removal of trees through logging can also facilitate the establishment of noxious weed infestations be- cause of soil dis- turbance and the reduction of canopy closure In general, noxious weeds occur in old clearcuts and forest openings, but are rare in mature and old growth forests. Roads are often the first place new invader weeds are introduced. Vehicle traffic and soil disturbances from road construction and maintenance create ideal establishment conditions for weeds. Roads also provide obvious dispersal corridors. Roadsides throughout the project area are infested with noxious weeds. Once established along roadsides, invasive plants will likely spread into adjacent grass- lands and forest openings.

Please address the ecological, social and ascetic impact of current noxious weed infestations within the project area. Include an analysis of the impact of the actions proposed by

this project on the long and short term spread of current and new noxious weed infestations. What treatment methods will be used to address growing noxious weed problems? What noxious weeds are currently and historically found within the project area? Please include a map of current noxious weed infestations which includes knapweed, Saint Johnswort, cheat grass, bull thistle, Canada thistle, hawk-weed, hound's- tongue, oxeye daisy and all other Category 1, Category 2 and Category 3 weeds classified as noxious in the IDAHO COUNTY NOXIOUS

WEED LIST. State-listed Category 2 noxious weed species yellow and orange hawkweeds are recently established (within the last 5 to 10 years) in Idaho and Montana and are rapidly expand- ing in established areas. They can invade undisturbed areas where native plant communities are in-tact. These species can persist in shaded conditions and of-ten grow under- neath shrubs making eradication very dif-ficult. Their stoloniferous (growing at the surface or below ground) habit can create dense mats that can persist and spread to densities of 3500 plants per square mile (Thomas and Dale 1975). Are yellow and orange hawk- weeds present within the project area?

Please address the cumulative, direct and indirect effects of the proposed project on weed introduction, spread and per-sistence that includes how weed infestations have been and will be influenced by the following management actions: road construction including new permanent and temporary roads and skid trails proposed within this project; opening

and decommissioning of roads represented on forest service maps; ground disturbance and traffic on forest service template roads, min- ing access routes, and private roads; removal of trees through commercial and pre-commercial logging and understory thinning; and prescribed burns. What open, gated, and de-commissioned Forest Service roads within the project area proposed as haul routes have existent noxious weed populations and what methods will be used to assure that noxious weeds are not spread into the proposed action units?

Noxious weeds are not eradicated with single herbicide treatments. A onetime apl cation may kill an individual plant but dormant seeds in the ground can still sprout after herbicide treatment. Thus, herbicides must be used on consistent, repetitive schedules to be effective.

What commitment to a long-term, consistent strategy of application is being proposed for each weed infested area wi- thin the proposed action area? What long term monitoring of weed populations is proposed?

When areas treated with herbicides are re- seeded on national forest land, they are usually reseeded with exotic grasses, not native plant species. What native plant restoration activities will be implemented in areas disturbed by the actions proposed in this project? Will disturbed areas including road corridors, skid trails, and burn units be planted or reseeded with native plant species?

The scientific and managerial consensus is that prevention is the most effective way to manage noxious weeds. The Forest Service concedes that preventing the introduction of weeds into un-infested areas is "the most critical component of a weed man- agement program." The Forest Service's national management strategy for noxious weeds also recommends "develop[ing] and implement[ing] forest plan standards . . . ." and recognizes that the cheapest and most effective solution is prevention. Which units within the project area currently have no noxious weed populations within their boundaries? What minimum standards are in the Kootenai National Forests' Plans to address noxious weed infestations? Please include an alternative in the that includes land management standards that will prevent new weed infestations by addressing the causes of weed infestation. The failure to include preventive standards violates NFMA because the Forest Service is not ensuring the protection of soils and native plant communities. Additionally, the omission of an EIS alternative that includes preventive measures would violate NEPA because the Forest Service would fail to consider a reasonable alternative.

ECONOMIC ANALYSIS

How much is the Swamped project expected to cost taxpayers? We see that the Forest Service estimates that the Ripley project is projected to lose $643,000.

The EA does not disclose a reasonably itemized monetary costs of the project activities. Along with the costs of those specific project actions, the costs of road maintenance pro-

portionately attributable to this project area, and the cumulative financial impacts of carrying out fire suppression policy were not analyzed and disclosed.

Remedy: Select the No Action alternative. Alternatively, prepare an EIS that addresses the analytical and scientific issues identified above.

CUMULATIVE EFFECTS

Cumulative impacts of the proposed Swamped project, in conjunction of past, ongoing, and foreseeable future management actions was an issue raised throughout our comment letters such as the Ripley project and logging on state and private lands in the area.

The EA does not disclose if the FS has performed all of the monitoring and mitigation required or recommended in those NEPA documents, and the results of the monitoring. The FS would be unable to properly analyze and disclose cumulative effects of management plan implementation if it is not adequately informed by past project monitoring and plan-mandated monitoring.

The EA does not provide a description of any monitoring, specified in past project NEPA documents or the original forest plan for proposed project area, which has yet to be gathered and/or reported.

A proper cumulative effects analysis would include:

- A list of all past projects (completed or ongoing) implemented in the proposed project

area watersheds.

- A list of the monitoring commitments made in all previous NEPA documents covering
  the project area.

- The results of all that monitoring.

- A description of any monitoring, specified in those past project NEPA documents or the
  Forest Plan for proposed project area, which has yet to be gathered and/or reported.

- A summary of all monitoring done in the project area as a part of the Forest Plan
  monitoring and evaluation effort.

- A cumulative effects analysis which includes the results from the monitoring required by
  the Forest Plan.
  The EA does not include an analysis of how well past projects met the goals, objectives, desired conditions, etc. stated in their respective NEPA documents, how well the projects conformed to forest plan standards and guidelines. It is informative for the public to know, in the NEPA process, if the impacts of past projects were correctly anticipated by their respective

> NEPA documents, and how well the statements of Purpose and Need in those NEPA documents were served.

Without such items being a part of the NEPA analysis, the validity of analysis statements and assumptions would lack support. If predictions and analyses made in previous NEPA processes were inaccurate, and the agency is making similar decisions, then the process will fail. Also, if there have been problems with meeting past monitoring commitments, the FS must disclose them at this time.

The EA does not disclose results of Forest Plan Chapter 5 Monitoring and Evaluation Requirements related to diversity and wildlife. Such a discussion would properly be integrated into an analysis of the cumulative effects of past management.

The failure of Congress to allocate sufficient funding is a subversion of Forest Planning and results in programs, as exemplified by this Swamped “increasing resiliency” Project, which subvert NFMA. This is explained by Roger Sedjo, member of the Committee of Scientists, who expresses his concerns in Appendix A of their 1999 Report about the discrepancy between forest plans and Congressional allocations, leading to issues not considered in forest plans:

(A)s currently structured there are essentially two independent planning processes in operation for the management of the National Forest System: forest planning as called for in

the legislation; and the Congressional budgeting process, which budgets on a project basis. The major problem is that there are essentially two independent planning processes occurring simultaneously: one involving the creation of individual forest plans and a second that involves congressionally authorized appropriations for the Forest Service. Congressional funding for the Forest Service is on the basis of programs, rather than plans, which bear little or no relation to the forest plans generated by the planning process. There is little evidence that forest plans have been seriously considered in recent years when the budget is being formulated. Also, the total budget appropriated by the Congress is typically less than what is required to finance forest plans. Furthermore, the Forest Service is limited in its ability to reallocate funds within the budget to activities not specifically designated. Thus, the budget process commonly provides fewer resources than anticipated by the forest plan and often also negates the "balance" across activities that have carefully been crafted into forest plans. Balance is a requisite part of any meaningful plan. Finally, as noted by the GAO Report (1997), fundamental problems abound in the implementation of the planning process as an effective decision making instrument. Plans without corresponding budgets cannot be implemented. Thus forest plans are poorly and weakly implemented at best. Major reforms need to be implemented to coordinate and unify the budget process.

The EA does not disclose the impacts of fire suppression on each of the stands in the project area. The EA does not disclose the benefits of wildland fire, which presumably will

continue to be forsaken in favor of protecting your tree farms.

SCIENTIFIC INTEGRITY

The EA does not disclose the limitations of all models the FS relies upon for the Swamped project analyses.

The EA does not disclose the statistical reliability of all data the FS relies upon for the Swamped project analysis. Since "an instrument's data must be reliable if they are valid" (Huck, 2000) this means data input to a model must accurately measure that aspect of the world it is claimed to measure, or else the data is invalid for use by that model. Also, Beck and Suring, 2011 "remind practitioners that if available data are poor quality or fail to adequately describe variables critical to the habitat requirements of a species, then only poor quality outputs will result. Thus, obtaining quality input data is paramount in modeling activities." And Larson et al. 2011 state: "Although the presence of sampling error in habitat attribute data gathered in the field is well known, the measurement error associated with remotely sensed data and other GIS databases may not be as widely appreciated."

The KNF Forest Plan and its wildlife viability methodology rely heavily upon the assumption that the FS knows the Historic Range of Variability (HRV) of a wide enough set of vegetation/habitat parameters, upon which "Desired Conditions" are constructed, and toward which "movement" is most of what's necessary for determining Forest Plan/NFMA compliance. Yet the reliability of the data sources used to construct the HRV is not disclosed. The data sources themselves are not identified or obscure.

Huck, 2000 states:
The basic idea of reliability is summed up by the word consistency.

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

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

During litigation of a timber sale on the Kootenai NF (CV-02-200-M-LBE, Federal Defendants Response to Motion for Preliminary Injunction), the FS criticized a report provided by plaintiffs, stating "(Its) purported 'statistical analysis' reports no confidence intervals, standard deviations or standard errors in association with its conclusions."

As Huck (2000) states, the issue of "standard deviations or standard errors" that the FS raised in the context of that litigation relates to the reliability of the data, which in turn depends upon how well-trained the data-gatherers are with their measuring tools and measuring methodology. In other words, different measurements of the same phenomenon must result in numbers that are very similar to result in small "standard deviations or standard errors" and thus high reliability coefficients, which in turn provide the public and decisionmakers with an idea of how confident they can be in the conclusions drawn from the data.

Also, the document, "USDA-Objectivity of Statistical and Financial Information" is instructional on this topic.

The next level of scientific integrity is the notion of "validity." So even if FS data input to its models are reliable, a question remains of the models' validity. In other words, are the models scientifically appropriate for the uses for which the FS is utilizing them? As

Huck, (2000) explains, the degree of "content validity," or accuracy of the model or methodology is established by utilizing other experts. This, in turn, demonstrates the necessity for utilizing the peer review process.

Model results can be no better than as the data fed into them, which is why data reliability is discussed above. The Ninth Circuit Court of Appeals has declared that the FS must disclose the limitations of its models in order to comply with NEPA. The EA has failed to disclose these limitations. Unfortunately, the FS uses models without any real indication as to how much they truly reflect reality.

In the NPCNF's Clear Creek Integrated Restoration Project FEIS, the FS defines "model" as "a theoretical projection in detail of a possible system of natural resource relationships. A simulation based on an empirical calculation to set potential or outputs of a proposed action or actions." (G-14.) From www.thefreedictionary.-com:

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

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

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

As Huck, (2000) explains, the degree of "content validity," or accuracy of the model or methodology is established by utilizing other experts. This, in turn, demonstrates the necessity for utilizing the peer review process. The validity of the various models utilized in the EA's analyses have, by and large, not been established for how agency utilizes them. No studies are cited which establishes their content validity, and no independent expert peer review process of the models has occurred.

Larson et al. 2011 state:
Habitat models are developed to satisfy a variety of objectives. ...A basic objective of most habitat models is to predict some aspect of a wildlife population (e.g., presence, density, survival), so assessing predictive ability is a critical component of model validation. **This requires wildlife-use data that are independent of those from which the model was developed.** ...It is informative not only to evaluate model predictions with new observations from the original study site but also to evaluate predictions in new geographic areas. (Internal citations omitted, emphasis added.)

USDA Forest Service, 2000c (a FS forest plan monitoring and evaluation report) provides an example of the agency acknowledging the problems of data that are old and incomplete, leading to the limitation of models the FS typically uses for wildlife analyses for old-growth wildlife habitats:

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

In the above case, the FS expert believed the data were unreliable, limiting the usefulness and applicability (validity) of the model. In other places in this objection—particularly regarding old growth—we discuss this staleness of data.

Ruggiero, 2007 (a scientist from the research branch of the FS) recognizes a fundamental need to demonstrate the proper use of scientific information, in order to overcome issues of decisionmaking integrity that arise from bureaucratic inertia and political influence. Ruggiero, 2007 and Sullivan et al., 2006 provide a commentary on the scientific integrity and agency use and misuse of science. And the Committee of Scientists (1999) recommend "independent scientific review of proposed conservation strategies..."

The EA violates NEPA because the FS has not insured the reliability of data input to the models, the FS has not validated the models for the way the EA utilizes them, and the FS has overly narrowed the information it considers to be best available science.

The documents, "USDA-Objectivity of Regulatory Information" and "USDA-Objectivity of Scientific Research Information" are instructional on this topic.

Beck and Suring, 2011 state:
Developers of frameworks have consistently attained scientific credibility through published manuscripts describing the development or applications of models developed within their frameworks, but a major weakness for many frameworks continues to be a lack of validation. Model validation is critical so that models developed within any framework can be used with confidence. Therefore, we recommend that models be validated through independent field study or by reserving some data used in model development.

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

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

A Science Consistency Review is long overdue for the revised Forest Plan (See Guldin et al., 2003, 2003b). The FS prepared Guldin et al. (2003) which:

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

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

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

In a news release accompanying the release of that paper, the lead author states:
In a post-truth world, **qualified scientists are arm's length now have the opportunity and responsibility to scrutinize government wildlife policies and the data underlying them.** Such scrutiny could support transparent, adaptive, and ultimately trustworthy policy that could be generated and defended by governments. (Emphasis added.)

The Committee of Scientists (1999) state:
To ensure the development of scientifically credible conservation strategies, the Committee recommends a process that includes (1) scientific involvement in the selection of focal species, in the development of measures of species viability and ecological integrity, and in the definition of key elements of conservation strategies; (2) independent scientific review of proposed conservation strategies before plans are published; (3) scientific involvement in designing monitoring protocols and adaptive management; and (4) a national scientific committee to advise the Chief of the Forest Service on scientific issues in assessment and planning.

Please demonstrate that the project complies with the 2012 Planning Rule's requirement to use the best available science.

Thank you for your time.

Sincerely yours,

Mike Garrity

Executive Director

Alliance for the Wild Rockies

P.O. Box 505

Helena, MT 59624

And on behalf of:
Sara Johnson
Native Ecosystems Council
P.O. Box 125
Willow Creek, MT 59760

And on behalf of
George Wuerthner
Gallatin Yellowstone Wilderness Alliance
PO Box 5256
Bozeman MT 59717

And for

Steve Kelly

Council on Wildlife and Fish
P.O. Box 4641
Bozeman, MT 59772

And of behalf of

Kristine Akland

Center for Biological Diversity

P.O. Box 7274 Missoula, MT 59807

kakland@biologicaldiversity.org