Swan View Coalition *Nature and Human Nature on the Same Path*

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September 30, 2016

Flathead National Forest
Attention: Forest Plan Revision
650 Wolfpack Way
Kalispell, MT 59901

Re: Amendment 19 and the "3 and 7 Rule"
Submitted via https://cara.ecosystem-management.org/Public//CommentInput?Project=46286

Dear Folks;

We've attached our Objection to the Beaver Creek Restoration Project, which in turn attaches our similar Objection to the Cold Jim Project and a couple documents relevant to what is known as the "3 and 7 Rule." (We did not include the Trail Creek Salvage Objection that was attached to our Beaver Creek Objection because we previously provided that to you with our 9/12/16 planning comment letter).

The Flathead has unlawfully quit applying the Rule to areas of the Forest that have not yet met A19's 19/19/68 standards for OMRD/TMRD/Security Core. This even though it is required in order to provide interim security so a female grizzly can raise a female cub that reaches breeding age in the same habitat area without being displaced by major human activities.

In other words, the Flathead wrongfully thinks it can take as long as it wants or perhaps never reach its 19/19/68 objectives without providing the interim grizzly bear security measures. The attached 9/7/93 Flathead LRMP Implementation Note 12 and 4/13/90 Dale Harms/FWS letter re: Grizzly Bear Guidelines Meeting Summary show that the Rule was adopted as part of Forest Plan implementation and has its basis in the best available science.

We submit this letter and its attachments as another example of how the Flathead is skirting its A19 and other responsibilities prior to Plan revision and how it would wholesale abandon these responsibilities in all DEIS action alternatives.

Thank you for this opportunity to comment.

Sincerely,

Keith

Keith J. Hammer
Chair

Attachments:

SVC-FOWS Objection to the Beaver Creek Restoration Project, 9/30/16

BEFORE THE OFFICE OF THE REGIONAL FORESTER
REGION ONE – USDA FOREST SERVICE
Objection Reviewing Officer

SWAN VIEW COALITION	)	
Objector	)	
	)	NOTICE OF OBJECTION
v.	)	PURSUANT TO
	)	36 CFR 218
CHIP WEBER	)	
FLATHEAD FOREST SUPERVISOR	)	
Responsible Official	)	

DECISION OBJECTED TO:

Draft Decision Notice and Finding of No Significant Impact (DN) for the Beaver Creek Restoration Project, issued with cover letter dated August 16, 2016, and signed by Swan Lake District Ranger Richard Kehr.

OBJECTORS:

Keith J. Hammer
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Arlene Montgomery
Objector
Program Director
Friends of the Wild Swan
PO Box 103
Bigfork, MT 59911
406-886-2011

September 30, 2016

STANDING:

Members of Swan View Coalition (SVC) and Friends of the Wild Swan (FOWS) recreate in and otherwise visit the Project Area.

The groups on 5/1/12 jointly submitted overarching findings relative to Beaver Creek and several other projects in the Swan Valley. They included an annotated bibliography of research forming the foundation of their concerns and recommendations. This letter was supplemented on 6/18/12 with further scientific references. As we recall, SVC also attended a field tour of the Project area in 2012.

SVC on 12/4/13 attended SLRD's meeting in Condon regarding the Project Purpose and Need. SVC followed up with a 12/5/16 letter of comments and concerns.

SVC on 4/13/14 submitted scoping comments on the Project, incorporated by reference the comments and annotated bibliography submitted by FOWS, and attached the groups' Citizen reVision of the Flathead Forest Plan.

SVC on 6/10/14 attended the Southwest Crown Collaborative meeting at Holland Lake, as well as the ensuing field tour of the Project area led by SLRD's John Bassman.

On 10/14/16 SVC attended a public meeting about the Project at the SLRD office in Bigfork.

Unable to attend either the SWCC or SLRD meetings on 1/14/16, SVC circulated a 1/12/16 letter to SWCC members and SLRD staff regarding concerns over the analysis of effects to marten.

On 1/29/16 SVC submitted comments on the Project EA and incorporated by reference the comments submitted by FOWS.

We have reviewed the Forest Service's responses to comments in the draft DN. We find the issues raised earlier still unresolved and inadequately addressed in the draft DN and EA. Additional Objections are being filed under separate cover with Arlene Montgomery/FOWS as Lead Objector.

OBJECTIONS:

We incorporate by reference the objections filed by Friends of the Wild Swan in this matter. We list our additional objections below, using an objection number that keys to the number assigned the agency's response to comment in the draft DN's Appendix 5. For example, Objection E16-22 will describe how the agency's Response to Comment E16-22 is inadequate and fails to resolve the issue.

Objections do not appear in numerical order. We group them, below, into three major sections: A) Amendment 19, TMRD, and the "3 and 7" Rule, B) Fisher, Marten, Other Science, and C) Travel Analysis Planning and Management Areas.

A) Amendment 19, TMRD and the "3 and 7" Rule

Objections E16-11, -12, -13, -16, -21, and -22: The EA and DN fail to acknowledge that the Amended A19 EA defined "reclaimed" to be synonymous with "decommissioned" and required that roads be removed from the "system" in order to not count in calculations of Total Motorized Route Density (TMRD), that the Flathead NF has a bad habit of not treating the full length of reclaimed roads to no longer function as roads or trails, that it takes time for road reclamation treatments to become effective, and that the Flathead must apply the "3 and 7" Rule until such time as a Grizzly Bear Subunit meets

all of A19's 19/19/68 criteria. The Flathead instead claims it need not meet either the numeric criteria or the "3 and 7" rule.

Rather than repeat it all here, we have attached to this Objection our Objection to the Trail Creek Fire Salvage Project. In that project, the Flathead similarly wants to simply "store" roads that are not fully reclaimed for their entire length and not include them in TMRD even though they continue to function as trails and would remain on the "system."

Our Trail Creek Objection provides the factual background about A19, TMRD, Security Core, and reclamation versus decommissioning. It also attaches pertinent A19 documents and provides a number of photographs demonstrating how the Flathead has not adequately reclaimed prior decommissioned roads, has not adequately treated noxious weeds on those roads, and cannot be trusted to adequately reclaim roads in the future - even though the Flathead swears it will comply with A19 in all regards.

Simply promising to treat the whole reclaimed road in the Beaver Creek DN does nothing to inspire faith when the Flathead is saying elsewhere it need only treat the first 200 feet. Beaver Creek tells the same lie about A19 allowing reclaimed roads to stay on the "system" and not be counted in TMRD, even though the long-term intent of Beaver Creek is to retain such roads as roads for future use rather than insure they no longer function as roads or trails per A19.

In the matter of the "3 and 7" Rule, the EA and DN simply claim that such a requirement was dropped from FWS biological opinions (BiOps). This even though we clearly pointed out that no longer discussing a requirement is something entirely different than having formally rescinded it, which FWS has not done.

Similarly, Flathead LRMP Implementation Note 12 (9/7/93, attached) describes how the "3 and 7" Rule is to be applied until LRMP road density standards are achieved. Though A19 changed the methods for calculating road densities, FWS continued to require that the Rule be applied until A19's 19/19/68 standards are fully accomplished.

We've also attached a 4/13/90 FWS memorandum explaining the biological rationale for the Rule. Essentially, the Rule is necessary, in the face of excessive road densities and inadequate Security Core, to insure that a female grizzly bear has the chance to teach a female cub to use its habitat and for that young female to reach breeding age and begin teaching its young to use the same habitats (rather than being displaced from those habitats and breaking the chain of learned behaviors/knowledge).

Rather than repeat it all here, we've also attached our Objection of the Cold Jim Fuels Reduction and Forest Health Project. Our Objection provides the history of the Rule and why it must be applied to Subunits that do not meet the 19/19/68 standards.

Simply put, the Flathead wants to proceed as though it neither needs to meet the 19/19/68 standards nor apply the "3 and 7" Rule until such time as it does meet 19/19/68. In essence, this is an admission that grizzly bears are not being provided the security promised in the Flathead LRMP as amended in part by A19 and as retained in part (including the Rule) per FWS BiOps. NEPA requires that changes to the LRMP be

made through formal amendments that have undergone full public review and comment - which the Flathead has not done in trying to abandon the Rule and to redefine A19 "reclamation" to no longer require "decommissioning" and removal of the road from the "system." Things aren't as the Flathead says they are simply because FWS repeats the same lie.

B) Fisher, Marten, Other Science

Objections E16-4, E14-7, and E18-67: The EA and DN contradict themselves and one-another. They fail to grasp, let alone apply, the best available science provided by Six et al. (2014).

In one response, the DN on page A5-24 states Six is not applicable to the Project:

> . . . primarily because Forest Service treatments are not implemented to stop ongoing mountain pine beetle infestations that are severe and widespread. Rather, the Forest Service's indirect control treatments are implemented prior to severe infestations to enhance tree survival and resilience to multiple disturbances . . .

In another response, the DN on page A5-27 states:

> The stands of lodgepole pine that are being regenerated have been previously or are currently being attacked by mountain pine beetle.

It appears the Flathead wants to log lodgepole pine whether it is infested or not and whether it is likely to become infested or not - under the guise of increasing stand resiliency. On page A5-31, the DN states:

> Because of the need to increase resiliency to perturbation, treatments are necessary that increase tree vigor imparting greater resistance to insect and disease attack as well as reducing the risks of uncharacteristic wildfire that human activities have helped to create.

The whole thrust of Six et al. is that humans don't have the innate ability to select for the most resilient trees as nature does. As a result, even well-intended treatments too often kill the wrong trees and simply add to the overall mortality - rather than add to the resiliency of the forest. The EA and DN simply don't get it or refuse to apply Six et al. because the research calls into question the logic behind curing all problems with a chain saw.

Objections E16-18 and -19: The DN's responses to our comments simply rehash the fisher and marten analyses tucked away in the Project File. They do nothing to correct for the biases in the EA, the DN and the proposed treatments. Not unlike the response (more importantly the lack of response) to Six et al.'s findings, the Flathead goes out of its way to provide pages of text in an attempt to demonstrate it will create marten and fisher habitat with a chain saw better than nature will. Recruiting more large trees per

acre via Plum Creek's prior pre-commercial thinning is not the same thing as conserving marten and fisher habitat by not logging in the first place (see DN at A5-96).

C) Travel Analysis Planning and Management Areas

Objections E16-17 and -21: The EA and DN are at odds with Forest Service and Forest Plan directives and standards to reduce the road system and provide adequate habitat security for threatened, endangered and other fish and wildlife species. They instead dig in the heels to resist the notion that "restoration" should in largest part be about reducing the road system and, where necessary, the suitable timber base in order to arrive at an ecologically and fiscally sustainable landscape. While the Forest Service of course must retain management authority, its belligerence in the matter of decommissioning roads is evidence in refusing to decommission Road 9750 as recommended by the SWCC (DN at A5-120) and many others in order to better secure wildlife habitat and connectivity along the Seeley-Swan divide.

SUMMARY AND LAWS VIOLATED

The inadequacies detailed above and in our comment letters violate the Administrative Procedures Act, Endangered Species Act, National Forest Management Act, the National Environmental Policy Act, the Clean Water Act, and the Administrative Procedures Act in failing to comply with Forest Plan standards, failing to use appropriate standards and other measures to adequately disclose the effects of the action, failing to use the best available science, and failing to comply with numerous BiOps and other requirements written to limit the Project's adverse affects to threatened grizzly bear, threatened lynx, threatened bull trout and other species.

REMEDY

For the above reasons, we ask that the EA and draft DN be deemed inadequate and rescinded. We ask that a concerted project instead be developed to eradicate noxious weeds and better reclaim, re-vegetate and decommission roads in the area to bring all Subunits into full compliance with A19's 19/19/68 standards.

ATTACHMENTS INCLUDED IN THIS PDF

Objection to the Trail Creek Fire Salvage Project, 9/12/16, w/o the DVD.

Objection to the Cold Jim Fuels Reduction and Forest Health Project, 8/18/15, w/o the Chilly James attachments.

Flathead LRMP Implementation Note 12, 9/7/93.

Dale Harms/FWS letter re: Grizzly Bear Guidelines Meeting Summary, 4/13/90

BEFORE THE OFFICE OF THE REGIONAL FORESTER
REGION ONE – USDA FOREST SERVICE
Objection Reviewing Officer

SWAN VIEW COALITION	)	
Objector	)	
	)	NOTICE OF OBJECTION
v.	)	PURSUANT TO
	)	36 CFR 218
CHIP WEBER	)	
FLATHEAD FOREST SUPERVISOR	)	
Responsible Official	)	

DECISION OBJECTED TO:

Draft Decision Notice and Finding of No Significant Impact (DN) for the Cold Jim Fuels Reduction and Forest Health Project, issued with cover letter dated July 3, 2015, and signed by Swan Lake District Ranger Richard Kehr.

OBJECTORS:

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August 18, 2015

STANDING:

Members of Swan View Coalition and Friends of the Wild Swan recreate in and otherwise visit the Project Area. We attended a Project field tour on 1/18/12 and SVC submitted written comments the following day. SVC then submitted supplemental comments in writing on 1/30/12. SVC and FOWS submitted written comments on the initial Project EA on 3/11/14, incorporating each others' comments by reference. We have reviewed the Forest Service's responses to those comments in the draft DN. We find the following issues raised earlier still unresolved and inadequately addressed in the draft DN and Updated EA. Additional Objections are being filed under separate cover with Arlene Montgomery/FOWS as Lead Objector.

OBJECTIONS:

We incorporate by reference the objections filed by Friends of the Wild Swan in this matter. We list and describe our additional objections as follows:

*Note: While Objections A and B contend with inadequate assessments and procedures on the part of both the Forest Service (FS) and Fish and Wildlife Service (FWS), it is ultimately the FS's responsibility to insure its assessments, procedures and projects are in line with its Forest Plan and the law. The FS cannot simply rely on concurrence by FWS, either as a matter of law or as a practical matter - as evidenced by FS's prior reliance on FWS that it need not apply the full force of Amendment 19 in the Glacier Loon or other projects in grizzly bear Subunits that are now greater than 75% FS ownership due to Legacy Land acquisitions. These Objections are intended in large part to avoid another misstep by the FS in its failure to apply the full force of Amendment 19, as ruled by the U.S. District Court in the Glacier Loon litigation, simply because FWS is complicate in the FS's errors or misrepresentations.

Objection A: One of our 3/11/14 comments can be summarized as follows:

> The Cold Jim EA [is] premised on . . . dishonest and unlawful claims [which include that] the Cold Jim Grizzly Bear Management Subunit is not subject to Amendment 19's 19/19/68 standards for OMRD, TMRD and Security Core because it was less than 75% in Forest Service ownership in 1995. With acquisition of Legacy Lands in 2010, some 94% of the Subunit is in Forest Service ownership. The plain language of Amendment 19 and its 19/19/68 standards now apply to Cold Jim, period . . . the EA . . . appears to attempt to exempt commercial logging during the non-denning period via springtime or salvage logging exemptions that simply don't apply to Cold Jim's major commercial logging and road building activities . . .

While the FS and FWS now acknowledge Amendment 19's 19/19/68 standards do apply, they fail to adequately respond to our comment and wholly fail to provide the grizzly bear security required by Amendment 19 as companion to the 19/19/68 standards until such time as the 68% Security Core standard is actually met. The agencies instead claim they need only make progress toward those numeric standards and otherwise continue to apply standards and logging loopholes provided in the Swan Valley Grizzly Bear Conservation Agreement (SVGBCA) rather than the "3 and 7" active/inactive Subunit rules that are companion to the 19/19/68 standards.

1. In its 5/15/85 Biological Opinion (BiOp) on the Flathead Forest Plan, FWS recommended that timber sale activities be restricted to "one entry per decade" with each entry restricted "to no longer than 3 consecutive years."

2. FWS further clarified the biological rational for the "3 and 7" rule in its 7/18/89 BiOp on various Forest Plan Amendments and premised its Incidental Take Statement (ITS) on "full compliance with both the Forest Plan standards and guidelines" (emphasis in original).

3. FWS's 1/6/95 BiOp on the proposed Amendment 19 referenced the earlier BiOps and noted:

> In addition to new Forest objectives and standards related to open and total motorized access and core area, the proposed Amendment does not alter the existing Forest Plan Standards and Guidelines for timber . . . The proposed Amendment also retains the "3 and 7" . . . rules for entry/re-entry into compartments for major activities in MS-1 . . . until core areas are effective.

In other words, FWS found "core areas provide a suitable alternative to the [previous] displacement area standard by providing adequate amounts of relatively secure areas for grizzly bears during periods of timber extraction or other major Forest activities" - provided that a grizzly bear Subunit remains controlled by the "3 and 7" timber sale activity rules until the Subunit is brought up to the 68% Security Core standards required by Amendment 19.

4. The FS instead responds to our concerns by continuing to apply the SVGBCA's more lenient active/inactive guidelines that provide as little as 3 years inactivity instead of the 7 required by Amendment 19 as a companion along the path to reaching 68% Security Core in the affected Subunits. To add insult to injury, the Project utilizes the various loopholes provided by the SVGBCA to allow logging during the "inactive" period during which the Project is scheduled to occur!

5. In its 12/5/95 BiOp on the SVGBCA, FWS noted that Amendment 19's requirement that "Core area will comprise 68 percent of a Subunit" applied to the one Subunit of the 11 in the SVGBC area that was comprised of >75% FS ownership at that time (page 9). Yet it took a lawsuit and a court order against the Glacier Loon Project to get the agencies to admit Amendment 19's requirements indeed apply to all Subunits that now exceed 75% FS ownership due to Legacy Land acquisitions. It is entirely disingenuous for the agencies to now pretend the "3 and 7" activity/inactivity rule that is companion to the 68% Security Core standard does not apply as well.

6. At the outset, the SVGBCA requires that the "Forest Service will utilize existing definitions found in the LRMP, unless definitions in this Agreement are more conservative in regard to the Bear, in which case, definitions found in this Agreement will be utilized." The agencies and the Cold Jim Project must use the definition and requirements of "entry/re-entry" a.k.a. "active/inactive" defined in the Forest Plan and the various BiOps concerning it and Amendment 19. They most certainly cannot argue that allowing logging during a 3-year "inactive" period is more conservative of grizzly bear security than no major activity allowed during a 7-year "inactive" period. More importantly, and at risk of repeating ourselves, they cannot argue that the "3 and 7" rule does not go along with the 19/19/68 standards until such time as the 68% Security Core standard is met. They are simply using the wrong active/inactive standard in these now primarily FS-owned Subunits.

7. The EA, at 3-350 and elsewhere, acknowledges that Security Core in the Cold Jim Subunit is and would remain post-project at 43%, far short of the 68% standard. Until the 68% standard is met, adequate grizzly bear security and displacement habitat is not provided and the "3 and 7" rule must be applied to insure bears are not displaced by major activities for 7 consecutive years out of 10.

Laws Violated: The above violates the Administrative Procedures Act (APA), Endangered Species Act (ESA), National Forest Management Act (NFMA), and the National Environmental Policy Act (NEPA) in failing to comply with Forest Plan standards, failing to use appropriate standards and other measures to adequately disclose the effects of the action, and failure to properly consult on and adequately limit the Project's adverse affects to threatened grizzly bear.

Remedy: Recognize that the SVGBCA in largest part no longer applies to the Cold Jim and other Swan Valley Subunits that are now more than 75% in FS ownership and that Amendment 19's more conservative standards for such Subunits are the controlling standards - including the "3 and 7" active/inactive Subunit standard that is companion to the 68% Security Core standard. Apply these standards to the Cold Jim NEPA process to more adequately measure the effects of the agency action and reduce adverse effects to grizzly bear before approving the Cold Jim Project. Re-consult formally with FWS in this regard.

Objection B: Our related 3/11/14 comment can be summarized as follows: "

> Moreover, both Open Road Density and Total Road Density would be increased during the life of the project, in violation of Amendment 19's and the SVGBCA's prohibition against increasing them without offsetting the increase nearby so there is no net increase. The EA is wrong in its attempt to define "net" as meaning before and after the project rather than during the project/at all times.

The FS and FWS claim their definition of "net" is correct, then proceed to use their definition as though it excuses them from accounting for the adverse effects to grizzly bears caused by displacement from logging activity and temporary increases in road densities. Even if we agreed with the agencies' definition of "net," they nonetheless violate the law by failing to account for impacts associated with impacts during the life of the Project, especially from logging and increased road densities.

1. The Updated EA, at Appendix 5-243, claims:

> The Cold Jim Project . . . clearly explains effects of project activities on ORD and TRD in the context of no "net" increase . . . The USFWS reviewed this analysis, concurred with the determination . . . and found the project consistent with Amendment 19 direction including correct application of "net" for Amendment 19's no net ORD or TRD increase standard.

2. FWS, in its 6/23/15 BiOp on Cold Jim, states:

> Upon review of the amended biological assessment for the proposed action and the 1995 and 2014 programmatic biological opinions, it is our opinion that the existing access conditions and the road use associated with this project would not impart any adverse effects to grizzly bears in addition to those analyzed in the 1995 and 2014 programmatic biological opinions and that the proposed action is in compliance with the incidental take statements of these opinions.

3. FWS's 1995 and 2014 BiOps and their Incidental Take Statements, however, account only for the continued impacts of the substandard baseline measured against the 19/19/68 standards. Neither BiOp mentions Cold Jim, let alone the "temporary" adverse effects to grizzly bears resulting from logging and increases in road densities during that logging. FWS is simply wrong to claim there are no adverse effects from the Cold Jim Project in addition to those analyzed in 1995 and 2014.

The 2014 BiOp does mention the Glacier Loon Project, concluding it "would cause temporary increases in OMAD and TMAD, resulting in displacement of individuals [bears] in areas where activity is occurring." Moreover, FWS's 10/25/05 BiOp on the implementation of Amendment 19 more generally concludes "displacement is expected in areas where active timber harvest and restricted roads are used for hauling." Again, neither BiOp mentions Cold Jim or its additional adverse effects on bears.

4. Like Glacier Loon and other logging projects, Cold Jim will cause adverse impacts to grizzly bears through displacement by logging activities and increases in road densities. Yet both agencies refuse to include this admitted displacement in their determination of adverse effects and instead blame all adverse affects solely on the existing substandard baseline (e.g. Updated EA at Appendix 5-246).

5. Defining "net" as a before-and-after project comparison, rather than a during-project offset does not relieve either agency of the duty to truthfully account for during-project displacement and its adverse effects to grizzly bear.

6. The Updated EA, at 3-350, attempts to dismiss the effects of grizzly bear displacement by logging and hauling activities, in part by finding "No activities would occur in security core, providing a large area free from effects of displacement." Neither agency, however, acknowledges that a Subunit with only 43% Security Core, such as Cold Jim, provides inadequate security to offset displacement and hence is not yet exempt from the Forest Plan requirement that major activities like logging projects can only occur for 3 consecutive years out of 10, with 7 years of no such activity required to allow female bears to teach their young to utilize their home range habitats during periods free of major displacement.

7. Both agencies have created an unlawful loophole by which logging and temporary increases in road densities can be increased by any degree and simply be dismissed because those impacts eventually cease - as though they have no adverse effects to grizzly bear. This is arbitrary, capricious, at odds with Forest Plan standards, various BiOps and the scientific literature, and is an abuse of both agencies' discretion.

<u>Laws Violated</u>: The above violates the APA, ESA, the NFMA, and the NEPA in failing to comply with Forest Plan standards, failing to use appropriate standards and other measures to adequately disclose the effects of the action, and failure to properly consult on and adequately limit the Project's adverse affects to threatened grizzly bear.

<u>Remedy</u>: Define "net" to disallow during-project increases in road densities or decreases in Security Core - as the agencies use in projects and consultations in the Greater Yellowstone Grizzly Bear Ecosystem - by providing increased security adjacent to projects to offset any temporary decreases in security in the project area. Fully account for displacement of grizzly bears by major activities such as logging and log

hauling, recognizing them as adverse effects to bears above and beyond the background/baseline effects. Formally re-consult with FWS in this regard. Fully apply the "3 and 7" rule, as discussed in Object #1, as a partial means to more fully account and mitigate for grizzly bear displacement by major activities before approving the Cold Jim Project.

Objection C: Our comments regarding roads, culverts, travel management, fisheries, and hydrology are found throughout our 3/11/15 letter and can be summarized in part as follows:

a. Because the Cold Jim and Chilly James NEPA processes are intended to help complete the Travel Analysis, they must include NEPA alternatives that define and describe how to arrive at the "minimum road system" required by the Travel Planning regulations.

b. The Cold Jim, Chilly James and Chilly James/Cold Jim Travel Analysis all use the same analysis area. They are "cumulative and connected actions that must be assessed in an environmental impact statement (EIS) for Cold Jim and in subsequent analyses including Chilly James."

c. "You must prepare environmental documents in which the layperson can clearly understand what the agency must do to arrive at a fiscally and environmentally responsible minimum road system and what role Cold Jim and Chilly James would play in that."

The FS response is to either refute needing to do the above or to claim it has done so adequately elsewhere. The Updated EA and Project File also provides conflicting information preventing us from understanding the extent and results of assessments that have been done. In the end, Cold Jim and Chilly James will leave the Project area without adequate BMPs applied to all roads that appear to remain a part of the minimum road system, without adequate inspections of all stream-crossing structures in the Project area, and without all problem stream-crossing structures identified and either removed or remedied.

1. The Chilly James Restoration Project EA, at 80, states that 248 road/stream crossings exist in the Chilly James Project Area, which is identical to the Cold Jim Project Area - and that 192 of those crossings are in the Cold and Jim Creek watersheds. Cold Jim Project File document N-8 provides inspection reports for 92 culverts under "2012 Culvert Inventories in Jim and Cold Creek." We cannot discern from the sum of the Chilly James and Cold Jim documents how many stream-crossing structures were inspected, let alone how many of those were culverts, nor how many roads and stream-crossing structures were not inspected. Page 76 of the Chilly James EA simply concludes:

> Roads were inventoried in 2011 and 2012 but some roads on the valley floor and headwater spurs were missed. Given that most roads inventoried were "functional" and to err on the side of caution, we assumed the skipped roads midway between "functional" and "at risk."

Such incomplete inventories and uninformed assumptions hardly qualify as the "hard look" required by NEPA, especially in an area subject to two projects, one of which is specifically intended to address road-related watershed and fisheries problems.

2. We provided comments on the Chilly James EA that are relevant to this Objection to Cold Jim. Rather than repeat those comments here, our 6/9/15 and 6/15/15 comments are attached and incorporated in full into this Objection. In pertinent part, the FS has failed to respond substantively to our prior comments by failing to include in its EAs and Travel Analysis the identification of a minimum road system that would be environmentally and economically sustainable, let alone at least one NEPA alternative that would demonstrate what would be necessary to arrive at the minimum road system.

3. Instead, the Travel Analysis simply reflects the two Projects and their shortcomings as the FS continues to chase its tail in an endless pursuit of timber sales it says are necessary to fund road maintenance and BMP work - after robbing the majority of road maintenance appropriations to instead fund timber sale planning. A telling example of this tail chasing is the conclusion on page 3-381 of the Updated EA:

> Based on the premise that timely completion of BMPs would maximize benefits to water quality, the alternatives with the most miles of haul routes would provide the greatest benefits.

4. In other words, the FS continues to pursue projects that pit one resource against another, rather than the coordinated pursuit of a sustainable minimum road system. The more log hauling routes in use to authorize the application of BMPs, the greater the displacement of grizzly bears and other wildlife and the greater risk of spreading noxious weeds. Even when its timber sale (Cold Jim) is essentially paired with a companion road restoration project (Chilly James), the FS comes up far short of what is necessary to arrive at a sustainable minimum road system - or to even identify that minimum road system and at least one alternative way to arrive at it during the NEPA process.

Laws Violated: The above violates the APA, ESA, the NFMA, the NEPA, and the Clean Water Act in failing to comply with Forest Plan standards, failing to use appropriate standards and other measures to adequately disclose the effects of the action, failure to properly consult on and adequately limit the Project's adverse affects to threatened grizzly bear and bull trout, and failure to adequately accomplish the application of BMPs to all roads.

Remedy: Identify an economically sustainable minimum road system on the Flathead National Forest that complies with full implementation of Amendment 19 and all other Forest Plan standards. Identify as an integral part of the Cold Jim Purpose and Need the identification of the minimum road system and steps to achieve it. Fully develop at least one NEPA alternative in Cold Jim, preferably in an EIS, that would fully accomplish the minimum road system and hence illuminate all other NEPA alternatives in relation to it.

Our 6/9/15 and 6/15/15 letters commenting on the Chilly James Restoration Project EA are hereby attached and incorporated by reference as a part of this Objection.

Swan View Coalition *Nature and Human Nature on the Same Path*

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June 9, 2014

Rich Kehr - District Ranger, SLRD
200 Ranger Station Road
Bigfork, MT 59911

Re: Comments on Chilly James Restoration Project EA
As PDF via email to comments-northern-flathead-swan-lake@fs.fed.us

Dear Ranger Kehr;

Please accept these comments on the Chilly James Restoration Project EA into the public record. We incorporate by reference our prior comments on this project. We also incorporate by reference the comments submitted by Friends of the Wild Swan in this matter.

As expressed in our previous comments, we greatly appreciate you are undertaking a project to help restore the Cold Jim/Chilly James area that includes road work ranging from application of BMPs to full re-contouring of unneeded roads. We also appreciate the EA acknowledges that A-19's 19/19/68 standards apply. As we will detail, however, the EA makes it difficult to determine the adequacy of your proposal and retains conflicting definitions that cast a shadow on the proposal's good intentions.

Stream Crossings and Roads "Functioning at Risk"

Page 80 of the EA indicates there are 248 stream crossings in the Project Area, with 192 of those in the Jim Creek and Cold Creek drainages. Page 74 then indicates the 2012 survey "recorded measurements and pictures of 90 culverts" in the same area, but "No data was recorded at bridges or locations where culverts were previously removed." Are we to conclude 102 of the stream crossings are bridges or where culverts were removed - which seems quite unlikely - or simply that not all stream crossings were surveyed?

The EA needs to provide a simple cross-walk or spreadsheet indicating which stream crossings have been surveyed, what the summary findings are for each crossing and what treatment is proposed for each crossing. We asked Beth Gardner on May 29, 2015, for such a spreadsheet or other documents that link the survey results to the proposed treatments. She responded she could not provide a spreadsheet or documents linking the survey results to the proposed treatments (email thread included in this PDF).

One cannot reasonably work backwards from the information provided in the EA to determine, among other things, which stream crossings have not been surveyed and, among those that have, what risk and other survey indicators led to what treatments or failed to lead to needed treatments. This does not meet NEPA's requirements for full disclosure and "hard look" at environmental consequences.

Page 76 of the EA, for example, concludes vaguely: "Roads were inventoried in 2011 and 2012 but some roads on the valley floor and headwaters spurs were missed. Given that most roads inventoried were 'functional' and to err on the side of caution, we assumed the skipped roads were midway between 'functional' and 'at risk'." The breadth of that assumption casts a long shadow over the whole process.

Pages 95-96 of the EA provide similarly sketchy conclusions. A portion but not all of the "impaired roads" in Jim Creek will be treated and a non-specific portion of the roads rated as "functioning at risk" will be treated. An even smaller portion of the "impaired roads" in Cold Creek will be treated, along with an undisclosed portion of the roads "functioning at risk." Nowhere is it made clear why all impaired roads or those functioning at risk are not being treated. Nowhere does the EA contain a clear listing of each road in the project area, an indication of whether it was surveyed or not, the ranking or risk it was assigned if surveyed, what treatment it is or is not assigned and why or why not.

Similarly, page 66 of the EA states that the "proposed action would either remove (with decommission or ISS) or replace (with BMP) 15 out of 20 culverts identified being at risk of failure. Page 95 states that "five culverts with a score of high or have evidence of past flooding, ponding, or overflow in the Cold Creek watershed where no restoration activities are being proposed. Two are on private roads and three on system roads. These culverts could impact a localized section of several unnamed tributaries to Cold Creek but not to the point where it would impact the overall channel stability of the system." So high-risk culverts are just being left to plug and/or fail? How much sediment will that send downstream, as if the impacts to channel stability are acceptable in the first place?

Whether regarding culverts, stream channel stability or hillslope hydrology, the EA is wholly inadequate, failing to disclose in an adequate and easily traceable manner what the situation is on the ground, what is being done about it via Chilly James project, what is being done about it via Cold Jim project, what is not being done about it at this time, and what remaining work needs to be done and when it will be done.

NEPA is Where the Rubber Meets the Road

The Flathead is insistent that its Travel Analysis Reports and Travel Analysis Projects are not "NEPA" projects or documents and that NEPA will be implemented in this regard at the project level. The EA for this Chilly James project must then include a clear tracking of what was found in the various TARs and TAPs for each road, what was recommended in those TARs and TAPs for each road, what the Chilly James project intends for each of those roads, what will be done to each of those roads via Cold Jim and other foreseeable projects, and what will remain to be done to each of those roads.

We requested such a tracking in our March 11, 2014 letter on Chilly James but we find nothing in the EA. As mentioned above, Beth Gardner was unable to provide us with such a tracking when we asked. We asked for a copy of the Chilly James TAP on June 3, but have received nothing as of June 9. We doubt the Chilly James TAP provides the necessary tracking of each road to the Chilly James project and, even if it does, it belongs in the EA NEPA document where it can be reviewed and commented on, not in a Project File subject to a formal Freedom of Information Act delay to review it.

Moreover, the EA does not contain an adequate map or reference one on the Flathead's web site by which the reader can understand what is being proposed. The EA also omits what we must assume are entire paragraphs on pages 87, 92 and 93 - which it appears were intended to detail what is being proposed.

Inconsistent Definitions

The EA also contains inconsistent definitions and conflicting statements that leave the reader wondering what is being proposed and how things such as grizzly bear security are being calculated. Pages 8 and 14 of the EA, for example, states that active decommissioning "may include" removing bridges and culverts - while Amendment 19 requires that all stream-bearing culverts and bridges <u>must</u> be removed. And, while we want to believe that all roads being "passively decommissioned" have "no culverts and there is not risk of future drainage issues," as described on page 8 of the EA, we can't confirm this due to a lack of traceable survey results in the EA.

Concerning grizzly bear security and Total Motorized Route Density, the EA contains at least two conflicting statements. Page 183 states "ISS would continue to be counted in total road density." Page 224 states "ISS roads are no longer counted in A19 open route density, total route density, or security CORE calculations." Mark Ruby, in the attached email thread, writes that page 183 is correct and page 224 is incorrect.

Our discussions with SLRD concerning the Beaver Creek project and with the Supervisor's office in a Forest-wide context, however, indicate the Forest's position is best described on page 224 - though we strongly disagree with the notion "stored" roads can be omitted from calculations of TMRD. In this regard, we attach to this letter our June 4, 2015 paper "Only Decommissioned Roads Removed from the Forest Development Road System May be Omitted from Calculations of Total Motorized Route Density on the Flathead National Forest." In this paper we examine the history and administrative record for A19, Interagency Grizzly Bear Committee definitions and protocols, and prior attempts by the Flathead to not fully decommission roads and yet omit them from calculations of TMRD.

Simply put, the EA leaves us not knowing what to believe and wondering whether the EA and Chilly James project depart from Forest policy or whether that policy has been changed. As mentioned at the outset of this letter, this casts a very long shadow over the good intentions of this project.

Appendix D to the EA - FWS's Roads BiOp

The EA's Appendix D includes "Table 51 [which] includes select design criteria taken from the April 29 2008 'Biological Opinion of the Effect to Bull Trout critical habitat from Road Management Activities on National Forest system lands and Bureau of Land Management Lands in Western Montana" (hereafter Roads BiOp). Though the 2008 Roads BiOp has been updated by one released April 15, 2015, it appears the following design criteria standards remain unchanged as Appendix E to the 2015 Roads BiOp:

For roads closed with gates: "Annually check pipes and ditches to assure they remain free from blockage."

For roads closed with guardrail, concrete, earth barrier, or re-contoured intersection: "Annually inspect and maintain each stream-crossing structure left in place. If annual inspection and maintenance is not feasible, remove all stream crossings structures when the road is closed."

For all other "stored" or "decommissioned" roads: "All stream-crossing structures would be removed at the time of closure."

The problem is that the EA's Appendix D omits these very important road closure standards entirely from its Table 51 "select design criteria." This, along with the EA's failure to inspect and adequately report on every road, bridge and culvert, casts an even longer shadow over the project's good intentions. Had the Flathead been monitoring every stream-crossing structure in bull trout watersheds, as required by both Road BiOps, it would have a full survey and inventory from which to work.

Similarly, A-19's Fisheries Biological Evaluation requires that, should the Forest leave blocked roads in grizzly bear Security Core rather than decommission them as preferred to remove all stream-crossing structures, the Forest must develop and implement "a monitoring plan to detect any erosion or culvert blockage problems" (see our attached TMRD paper for more detail). We find no mention of this requirement in the EA, let alone a discussion or listing of the results of this A19 monitoring plan.

Conclusion

The upshot is that the Flathead receives little more than 40% of the budget it needs to adequately maintain its road system, yet has set forth no plan to bring its road system down to a size it can afford to maintain. Nor does its Forest Plan revision Proposed Action intend to do this either.

For all its good intentions, the Chilly James project and EA fail to adequately describe the big picture, what needs to be done, and how the project will and will not meet those ends. Chilly James will do some good, but it is entirely impossible to tell from the EA how much good work will be done compared to how much needed restoration still needs to be done - and when and how that will get done.

Instead, and unfortunately, Chilly James will treat only a portion of the roads "functioning at risk," will leave some know high-risk culverts to blow out, and will leave an undetermined number of bridges and culverts on closed roads to go largely uninspected in spite of requirements they be surveyed annually. This in two watersheds prized for bull trout, westslope cutthroat trout and other sensitive aquatic life.

Epilogue

The Forest Service has put in a lot of hard work in planning the Chilly James project and is proposing numerous steps in the right direction. However, hard work that likely includes tracking roads and stream-crossing structures from on-the-ground surveys to proposed treatments or deferred treatments cannot be appreciated by the public if it is not included in the EA in a readily traceable format.

We've spent many hours reviewing the EA, emailing questions to staff, and requesting documents not included in the EA. As explained above, the public simply cannot work backwards from the narrative in the EA to track the decisions made for each road and stream-crossing structure - nor should it have to. Chilly James is the project level at which the Flathead says the Travel Analyses get fine tuned and implemented via NEPA. Therefore, full and transparent information belongs in the EA, not just a TAP that must then be cross-reference with the narrative of the EA.

We urge the Forest Service to take credit for the work it has invested in Chilly James by making that work absolutely transparent and easily accessible in the EA. If the information is not well suited to the EA format and/or is more useful as an electronic spreadsheet or other document, then reference it in the EA with a link to its location on the Forest or Project web site.

Chilly James should be a well-documented step in the restoration of these watersheds. We encourage you to either include adequate information and maps in the EA or provide web site links to them in the EA, THEN invite the public to a 30-day review of the EA and its readily accessible supplemental information.

Sincerely,

Keith

Keith J. Hammer
Chair

Enclosures: Email thread with Beth Gardner
Email thread with Mark Ruby
Keith Hammer's June 4, 2015, TMRD paper

"Gardner, Beth -FS" <bgardner@fs.fed.us> June 1, 2015 5:17 PM
To: Keith Hammer <keith@swanview.org>
RE: Chilly James Culverts

3 Attachments, 7 KB

Hi Keith. No, I do not have a simple spreadsheet of the culvert surveys. Project File N-6 is a hard copy of each culvert survey and each road Soil & Water Condition index. It does not link to the treatment proposed since it is just the survey data.

Do you wish to FOIA this particular project file?

Beth Gardner
Aquatics Program Manager

Forest Service
Flathead National Forest, Swan Lake Ranger District & Tally Lake Ranger District

p: 406-837-7508
bgardner@fs.fed.us

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Bigfork, MT 59911
www.fs.fed.us

Caring for the land and serving people

From: Keith Hammer [mailto:keith@swanview.org]
Sent: Friday, May 29, 2015 11:43 AM
To: Gardner, Beth -FS
Subject: Chilly James Culverts

Beth;

I'm struggling in the Chilly James EA to track which culverts have been surveyed, which culverts have been rated at risk or critical, and which culverts will or will not receive what kind of treatment, removal or replacement.

Do you have a spreadsheet I could have that would help me figure this out? Or some other documents that may or may not be in the Project File?

I see on page 84 of the EA that Project File Exhibit N-6 contains the details of the 2012 culvert survey. Is that a spreadsheet and, if so, could I get it electronically so I can sort and query it? If not, what form is it in?

And I assume that Exhibit N-6 does not likely include what sort of treatment is being done for each of the surveyed culverts? Again, is there some other document, spreadsheet or database that does so?

Thanks in advance for your continued help in this. The hard copy EA is helpful and I appreciate you providing it.

Keith

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"Nature and human nature on the same path."

"Ruby, Mark D -FS" <mdruby@fs.fed.us>
To: Keith Hammer <keith@swanview.org>
RE: Chill James

June 2, 2015 1:48 PM

4 Attachments, 13 KB

Hi Keith,

The draft EA states that stored roads in the Chilly James project would continue to count towards total motorized route density (EA Chapter 3 pg. 183 under "Amendment 19 and the Chilly James Project") and not affect the percentages for security core.

Unfortunately, there is an error in the Road management/Transportation section that incorrectly states ISS roads are no longer counted in total route density or security core calculations.

Thanks,

Mark Ruby
Wildlife Biologist

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Caring for the land and serving people

From: Keith Hammer [mailto:keith@swanview.org]
Sent: Thursday, May 28, 2015 10:59 AM
To: Ruby, Mark D -FS
Subject: Chill James

Mark;

I'm reading the Chilly James EA and have read the portions relative to grizzly bear and Amendment 19 standards.

While it makes clear that road decommissioning reduces road densities and increases security core, I cannot find where it details whether road "storage" such as ISS reduces road densities and/or increases security core.

Can you point me to where in the EA this is detailed and, if not in the EA, please answer the question of whether road storage does so in an email reply?

Thanks,

Keith

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"Nature and human nature on the same path."

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Only Decommissioned Roads Removed from the Forest Development Road System May be Omitted from Calculations of Total Motorized Route Density On the Flathead National Forest

Keith Hammer
June 4, 2015

Executive Summary

This paper is written in response to attempts by the Flathead National Forest and the Draft NCDE Grizzly Bear Conservation Strategy to omit from calculations of Total Motorized Route Density (TMRD) roads that may be impassable to motorized vehicles but have not been adequately decommissioned and removed from the Forest Development Road System (System).

The administrative record and the plain language of Flathead Forest Plan Amendment 19 (A19) show that a road must be reclaimed/obliterated/decommissioned (hereafter "Reclaimed") and removed from the System before it is no longer considered a road that must be included in calculations of TMRD.

TMRD standards require road reclamation and removal of the road from the System, while Security Core standards do not. Road reclamation is A19's preferred method of increasing Grizzly Bear Security Core because it simultaneously protects water quality and fish through required culvert removals and other hydrologic stabilization work. Reclamation of roads is not absolutely required in Security Core and roads restricted by berms, boulders or dense vegetation may suffice, provided "a monitoring plan to detect any erosion or culvert blockage problems" is implemented.

The A19 administrative record does not support the notion that a road can remain in the System as a road and yet not be counted as a road in calculations of TMRD. As long as the road remains in the System, even if placed in Intermittent Stored Service (ISS) or any other "storage" or "impassable" category, it is considered a road and must be included in the calculation of total road miles and TMRD.

Current and past attempts to exclude System roads from calculations of TMRD appear to arise from interpretations like those guided by the ill-fated and short-lived Implementation Note #13 in 1999 - which ran counter to the A19 administrative record. Rather, implementation must be guided by the plain language of Amendment 19, as clarified by its Appendix D definitions and the administrative record discussed below.

Amended EA for Amendment 19

The essential question of whether open and restricted roads need to be reclaimed and removed from the System in order to meet TMRD and other A19 standards was resolved, according to the Flathead National Forest, in the Amended A19 Environmental Assessment and its Appendix D. This Appendix was also issued as Appendix D to A19 and as Flathead Forest Plan Unbound Appendix TT. In the Amended EA's Response to Public Comments, the Flathead responds:

> Total motorized access density objectives must be met after including open and restricted motorized roads and trails, except for those that have been reclaimed . . . In response to comments that the definitions of restricted and reclaimed roads and core areas did not adequately express our intent, additional text . . . has been included as Appendix D [and] would be incorporated into the Forest Plan as Unbound Appendix TT.

(Forest Plan Amendment 19 Amended Environmental Assessment. February 1995. Page 107.) The Amended EA continues in its Response to Public Comments:

> Comment(s): The preferred alternative should make clear that meeting the Total Motorized Access Density (TMAD) objective will require reclaiming open and restricted roads.
>
> Response: Chapter III of the EA describes the miles of road reclamation and road restrictions estimated to result from implementation of each alternative. In addition, Appendix D has been added to the EA. This Appendix defines in detail "reclaimed road" and "restricted road."

(Forest Plan Amendment 19 Amended Environmental Assessment. February 1995. Page 133.) Indeed Chapter III of the Amended EA, in describing the chosen Alternative 3C, concludes:

> To meet the standards and short-term objectives in MS-1 and MS-2 areas, approximately 350 miles of open roads and 125 miles of currently restricted roads would need to be reclaimed in the short term (5 years). To meet long term (10 years) standards and objectives, another 175 miles of already-restricted roads would need to be reclaimed.

(Forest Plan Amendment 19 Amended Environmental Assessment. February 1995. Page 95.)

Also, apparently in response to public comments including ours, the Amended A19 EA reworked Figures 22 and 23 to reflect the reclamation of Chapter III's estimated 475 miles of road and their removal from the road System to meet the 5-year A19 standards. Figure 23 shows no category for "stored" or "impassable" System roads that would not be counted in calculating TMRD. Reclaimed roads are accounted for in the reduction of total road miles in the System.

In other words, if it remains a System road, it gets counted as a road. That this common sense understanding predated A19 is confirmed by Figure 22's notation of 420 miles of roads that were in 1990 "obliterated and removed from the forest inventory."

Amendment 19 and Interagency Grizzly Bear Committee Definitions

The A19 process and the Interagency Grizzly Bear Committee (IGBC) process on which it is based include the same three classifications of roads: Open, Restricted, and Reclaimed. Neither includes a category for "stored" or "impassable" roads that remain on the System yet would not be counted as roads in calculations of TMRD.

In part the definitions of Restricted and Reclaimed roads are as follows, first from A19:

> RESTRICTED ROAD . . .
>
> A road on which motorized vehicle use is restricted during the entire non-denning period. The road requires physical obstruction and motorized vehicle use in the non-denning period is legally restricted by order . . .
>
> Outside of security core areas, motorized administrative use is acceptable at low intensity levels . . .
>
> All restricted roads will be included in calculating total motorized access route density . . .
>
> RECLAIMED ROAD . . .
>
> A reclaimed road has been treated in such a manner so as to no longer function as a road or trail and has a legal closure order until reclamation is effective. This can be accomplished through one or a combination of treatments including: recontouring to original slope, placement of natural debris, or revegetation with shrubs or trees . . .
>
> Administrative use of reclaimed roads may not occur . . .
>
> The entire road will receive treatment such that maintenance or entries to maintain "road drainage" is not needed. This will require removal of culverts or other water passage structures that are aligned with stream channels. In most cases this will also require that road related sediment sources be repaired and the road reworked to eliminate ditch water flow without the aid of cross drain culverts . . .
>
> Reclaimed roads that fully satisfy the definition of a reclaimed road will not be included in calculations of open road density, total motorized access density, or security core area. Roads that have been treated, but that do not yet fully satisfy the definition of a reclaimed road will be included in calculations for total motorized access route density . . .

> The acceptable lag time for the treatment to become effective and the expected persistence of people to continue to use a road should dictate the amount and type of initial, and perhaps follow-up, treatment required . . .

(Flathead Forest Plan Appendix TT; a.k.a. Appendix D to Amendment 19.)

Now, according to the IGBC:

> Reclaimed/Obliterated Road -- a route which is managed <u>with the long term intent for no motorized use</u>, and has been treated in such a manner so as to no longer function as a road. An effective means to accomplish this is through one or a combination of several means including: recontouring to original slope, placement of logging, or forest debris, planting of shrubs or trees, etc. . .
>
> Total Motorized Route Density calculations will include open roads, restricted roads, roads not meeting all restricted or obliterated criteria, and all motorized trails.

(Interagency Grizzly Bear Committee Task Force Report: Grizzly Bear/Motorized Access Management; Interagency Grizzly Bear Committee; July 29, 1998; emphasis added.)

Protocol Papers for Amendment 19 and the IGBC Task Force Report

Protocol Papers prepared for both A19 and the IGBC Task Force over the years consistently document the use of only the initial three classifications of roads: Open, Restricted, and Reclaimed. None include a category for roads to remain in the System yet not be counted in calculations of TMRD:

> . . . each road was classified as open, restricted, or reclaimed.

(Kathy Ake and Nancy Warren. 9/1/94 updated 2/17/95.) In 2001, the Protocol Paper provides a bit more specific definition of road, as follows, but repeats the three allowed classifications of roads:

> Definitions are based upon the IGBC Motorized Access Management report with verbal clarification from individual committee members (see Amendment 19 project file) . . .
>
> ROAD . . . All created or evolved routes that are >500 feet long (minimum inventory standard for the Forest Service INFRA data base), which are <u>or were</u> reasonably and prudently drivable with a conventional passenger car or pickup. Within the three classes below . . . OPEN ROAD . . . RESTRICTED ROAD . . . RECLAIMED/OBLITERATED ROAD.

(Protocol paper. Kathy Ake; 11/20/01; emphasis added).

Even the 2013 draft Protocol Paper Kathy Ake prepared as Appendix 5 to the Draft NCDE Grizzly Bear Conservation Strategy starts off on the right foot by clarifying that:

> Sometimes referred to as a reclaimed or obliterated road, a historical road has been treated in such a manner so as to no longer function as a road or trail, and the road is no longer considered part of the agency's road system.

When the 2013 Protocol Paper begins discussing the Draft Grizzly Bear Conservation Strategy, however, it introduces a new and fourth classification of roads as "Closed Yearlong Impassable" (hereafter "Impassable"):

> Similar to historical roads, roads that are naturally revegetated, have the entrance obliterated for >0.1 miles, or have the bridge or large >4ft culvert removed are also not included in the analyses, i.e. they do not count in OMRD or TMRD, nor are they buffered in the Secure Core analysis. These roads are impassable by any vehicle (passenger car, truck, 4WD vehicle, ATV, motorcycle, etcetera). These roads are still on the system. Revegetated roads defined as so grown-in that they are no longer drivable. The vegetation is such that it is easier to walk on the side-hill as opposed to down the center of the road bed.

(Protocol Paper for Motorized Access Analyses Application Rule. Draft NCDE Grizzly Bear Conservation Strategy Appendix 5. Kathy Ake. February 2013.)

This new, fourth classification of roads is introduced to the public for the first time in the 2013 draft Grizzly Bear Conservation Strategy while simultaneously stating it "Has been incorporated this way since IGBC motorized access or Flathead NF's A19 started." This interpretation is not supported by the administrative record.

In an 8/18/94 letter to the A19 Interdisciplinary Team Leader, Flathead Forest Wildlife Biologist Nancy Warren documented her clarification on this very issue with members of the IGBC Motorized Access Task Force:

> Is it correct to classify all bermed, barricaded, tank-trapped, or overgrown (to just a path) roads as restricted roads, even though they may not be "reasonably and prudently driveable with a conventional passenger or pickup", even though use by all-terrain vehicles may not be restricted?
>
> Tom Puchlerz [IGBC Task Force Chair] indicated that the intent was to classify as "restricted" roads that could easily be re-opened by removing a barricade or tank trap. If the road was so overgrown or rough that reconstruction would be needed [and] if there were no access, then it would be <u>classified as reclaimed/ obliterated</u>. Tom Wittinger and Chris Servheen agreed with this interpretation.

(Nancy Warren to Jim Morrison; letter dated 8/18/94; emphasis added).

The IGBC Task Force did not suggest a new, fourth classification of road. Nancy Warren instead reports that, if the road is so overgrown and rough as to require reconstruction to become passable again, it should be classified as Reclaimed. The Flathead's A19, however, requires among other things that all stream-bearing culverts

be removed from that road and that it be removed from the System in order to be fully Reclaimed.

Moreover, as detailed above and summarized below, the A19 administrative record does not support use of a fourth classification of Impassable road. In response to public comment, the Amended A19 EA estimates the miles of open road that will need to be closed to motor vehicles and the miles of open and already restricted roads that will need to be reclaimed to meet A19 standards. Nowhere does it mention that roads can be simply rendered "impassable" and retained as part of the System while not being counted in calculations of TMRD.

Nor do any of the Protocol Papers prior to 2013 highlight that "impassable" roads can simply be omitted from calculations of TMRD. Nor does either the 1994 or 1998 IGBC Task Force Report say or allow this. Indeed, they make it clear that a road must meet all of the criteria for a Reclaimed road to not be counted in calculations of TMRD. Simply put, under A19, an Impassable road that remains on the road System is a Restricted road and must be counted in calculations of TMRD until it has all of its stream-bearing culverts and bridges removed, fully meets all other Reclaimed road criteria, and is removed from the System.

Road Treatments Required by the Amendment 19 Fisheries Biological Evaluation

A19 reluctantly allows stream-bearing culverts and bridges to remain behind berms, concrete and boulder barriers on Restricted roads in Security Core, provided "a monitoring plan to detect any erosion or culvert blockage problems" is implemented. However, A19 expressly requires that all those stream crossing structures be removed from Reclaimed roads that will no longer be included in calculations of TMRD. This is due in large part to the Fisheries Biological Evaluation for A19:

> Implementation of the preferred alternative would result in the following: . . .
>
> Direction for reclaiming/obliterating roads including removal of culverts which greatly reduces the risk of future sedimentation problems resulting from culvert failure on reclaimed roads.
>
> Direction for restricted roads in core habitat areas to implement road drainage treatments similar to reclaimed roads, or to develop and implement a monitoring plan to detect any erosion or culvert blockage problems . . .
>
> The determination [of effects on fish] assumes incorporation of the proposed definitions and minimum treatment requirements for reclaimed and restricted roads.

(Biological Evaluation for Bull Trout, Cutthroat Trout, and Shorthead Sculpin: Potential Effects from Implementing Amendment 19, Alternative 3 to the Forest Plan. Donald E. Hair. 2/4/95.)

The Fisheries Biological Evaluation, like all the other A19 and IGBC documents, contends with the effects of Open roads, Restricted roads, and Reclaimed roads. It does not mention a fourth classification of Impassable roads, let alone say that they are considered separate from Restricted roads. Nor does it say Impassable roads can be excluded from calculations of TMRD while leaving stream-bearing culverts to blow out behind an obliterated entrance, the first already blown-out or otherwise removed >4ft culvert, or in a roadbed grown thick with vegetation but still harboring stream-bearing culverts.

Indeed, this fourth classification of Impassable roads appears to have all the trappings of an under-the-radar, end-run around the clear language and requirements of A19. We don't doubt the Flathead has done this. We simply disagree that this is allowed by A19 - for all the reasons provided above.

Implementation Note #13

On May 6, 1999 the Flathead issued Implementation Note #13 under the guise of clarifying A19's Appendix D definitions. It in fact contradicted them, in part by allowing stream-bearing culverts to remain in Reclaimed roads in violation of the conditions of the Fisheries Biological Assessment and the plain language of A19.

Swan View Coalition and Friends of the Wild Swan on September 23, 1999 filed a 60-day notice of intent to file suit under the Endangered Species Act and the Forest Supervisor rescinded Implementation Note #13 on November 19, 1999. Flathead Forest spokesman Allen Rowley was quoted in the November 24, 1999 Missoulian: "We talked it over with our attorneys and we decided they (conservation groups) were right."

So here we are in 2014 with the Flathead claiming it can simply render or find a road impassable, keep it on its road System, not remove all stream-bearing culverts, and yet not count it in calculations of TMRD either. (Personal communication with Kathy Ake 10/15/14 and Kathy Ake's Appendix 5 to the draft Grizzly Bear Conservation Strategy.) Indeed, connected Roads #10753 and #10754 in the Flathead's Canyon Creek drainage have seven washed out culverts, have never been adequately repaired or reclaimed, and yet are not included in the Flathead's calculation of TMRD. (Terms and Conditions Monitoring Report: Bull Trout Biological Opinions for Post-fire Salvage Operations, Flathead National Forest, 2007-2009; Craig Kendall; October 28, 2009; Appendix A Summary of Road and Culvert Surveys - checked against "Impassable" road data files provided by Kathy Ake 1/27/15). A19 certainly did not intend for the Flathead to allow culverts to blow out and to then take credit for the reduction in TMRD as though the blown-out roads had been properly reclaimed!

Leaving culverts to potentially blow out in roads not counted in TMRD would have been allowed by Implementation Note #13. It appears the Flathead formally rescinded Note #13, then went ahead and implemented portions of its intent anyway - in clear violation of the plain language of A19 and in spite of assurances by the Forest Supervisor that the plain language of Flathead Forest Plan Appendix TT/A19 Appendix D would be implemented:

> . . . I have reviewed the language of LRMP Implementation Note #13 and the existing Forest Plan Appendix TT and have determined to rescind Implementation Note #13 to avoid any confusion or misunderstanding with the implementation of Appendix TT . . . The definitions and direction contained in Appendix TT will be used by the Flathead National Forest unless and until the Forest Plan is subsequently amended or revised and any consultation obligations are satisfied with the U.S. Fish and Wildlife Service.

(Letter of Supervisor Cathy Barbouletos to attorney Dan Rohlf. 11/19/99.)

No such amendments or revisions have taken place and Appendix TT/D remains the law of A19. A19's requirements to protect fish are not at odds with its requirements to protect grizzly bear. A19's requirements to remove stream-bearing culverts from Reclaimed roads and to regularly inspect and clean culverts on Restricted roads are indeed common sense measures required by Fish and Wildlife Service in numerous biological opinions regarding bull trout. Rather than graciously comply with the multiple-species requirements of A19, it appears the Flathead has instead employed a shrouded classification of Impassable road to reportedly benefit bears while ducking corresponding requirements to protect water quality, bull trout and other aquatic life.

The Flathead's Road Decommissioning Spreadsheet

The Flathead's Road Decommissioning Spreadsheet lists "Road Decommissioning Projects" since A19 was first issued in 1995. It tracks five categories of Reclaimed roads:

Category 1 - System roads reclaimed and moved to Historic but still monitor for A19

Category 2 - System roads reclaimed and moved to Historic = revegetated - no monitoring

Category 3 - Roads reclaimed and left as System roads, still monitor for A19

Category 4 - Moved to Historic, naturally revegetated, no contract work needed, no monitoring

The fifth category is "Only Has Decision," meaning reclamation plans have yet to be implemented on those miles of road.

This spreadsheet shows clearly that the goal is to remove Reclaimed Roads from the System as the reclamation treatments become effective. Interestingly, all roads from Category 3 were shifted to other categories in 1999, the same year as the short-lived Implementation Note #13, and it has remained at zero road miles ever since.

A19 allows only three classifications of roads. Open and Restricted roads must be included in calculations of TMRD and only Reclaimed roads are excused from those calculations. Like all the other documents in the A19 administrative record, the spreadsheet does not contain a classification or category for Impassable roads excused from calculations of TMRD while remaining on the System.

According to A19 and Appendix TT/D, the only roads excused from calculations of TMRD should be included in this spreadsheet of Reclaimed roads. But they aren't all included because a shrouded classification of Impassable roads exists, though contrary to A19. (Personal communication with Kathy Ake 10/15/14; Kathy Ake's Appendix 5 to the draft Grizzly Bear Conservation Strategy; and "Impassable" road data files provided by Kathy Ake 1/27/15.)

Conclusion

At every turn, A19 NEPA documents and the Flathead National Forest have pointed to Forest Plan Appendix TT/A19 Appendix D as the guiding light and requirements of A19. Appendix TT/D provides for only three classifications of roads: Open, Restricted, and Reclaimed. It provides no classification for Impassable roads. Under A19, if a road is rendered impassable by either an act of nature or by human intervention, it remains an Open or Restricted road until it meets all criteria for a Reclaimed road and is removed from the road System.

This interpretation describes the publicly observable practice of implementing A19. This interpretation has been the Forest Service's direct response to public comments raising these very questions since 1995. This interpretation is consistent with the Forest Service itself asking these very questions of the IGBC Motorized Access Task Force. This is also the only interpretation of Appendix TT/D supported by the A19 administrative record.

The public discovery of the Flathead's shrouded category of Impassable roads that need not be included in calculations of TMRD came about only due to its disclosure in Appendix 5 of the 2013 Draft NCDE Grizzly Bear Conservation Strategy. Even then, its disclosure is largely obscured by footnotes attempting to detail the differences in motorized access management between the Flathead and the four other Forests in the NCDE - partly because the other Forests apparently do not require all stream-bearing culverts and bridges to be removed from Reclaimed roads.

Simply put, and for the reasons provided above, the Flathead must consider its Impassable roads to be Restricted or Open roads, include them in calculations of TMRD, and set about either repairing or reclaiming these roads to adequately protect water quality, fisheries and wildlife. It violates A19 and a wide variety of conservation laws for the Flathead to retain what at this juncture appears to be a "junk pile" of unattended old roads. It adds insult to injury to suggest that these roads are environmentally benign by implying they have been managed according to A19's standards for protecting water quality, fish and wildlife.

Swan View Coalition *Nature and Human Nature on the Same Path*

3165 Foothill Road, Kalispell, MT 59901 swanview.org & swanrange.org ph/fax 406-755-1379

June 15, 2015

Rich Kehr - District Ranger, SLRD
200 Ranger Station Road
Bigfork, MT 59911

Re: Comment Letter #2 on Chilly James Restoration Project EA
As PDF via email to comments-northern-flathead-swan-lake@fs.fed.us

Dear Ranger Kehr;

Please accept these comments on the Chilly James Restoration Project EA. We've now read the Chilly James/Cold Jim Travel Analysis 2014/2015 report (CJ TAR) and offer these comments to supplement our letter of June 6, 2015 in this matter.

The new CJ TAR does little to correct the inadequacies of the prior Cold Jim TAR, which we detailed in our 3/11/14 letter on the Cold Jim EA. While the new CJ TAR acknowledges that the area must meet Amendment 19's 19/19/68 standards, it then proceeds as though it doesn't. We incorporate our Cold Jim letter by reference and have included it in this PDF.

The new CJ TAR fails to recommend a minimum road system that complies with A19 and instead allows logging access to Management Area 15 to virtually trump all other concerns. Indeed, page 7 indicates the recommendations in the TAR will do little to move toward compliance with the 19/19/68 standards.

The Chilly James EA is similarly at fault, both in its inadequate Purpose and Need and its too-narrow range of alternatives. As the NEPA documents intended to implement the TAR(s), Chilly James and Cold Jim must include as a part of their Purpose and Need the implementation of an adequate TAR that arrives at a minimum road system that meets all Forest Plan standards and is both economically and environmentally sustainable. Neither do so.

It is impossible to adequately assess the effects of the Chilly James proposed action without comparing it to an alternative that would fully implement all Forest Plan standards to arrive at a sustainable minimum road system. The Chilly James EA contains only the No Action and the Proposed Action. It does not include an alternative that would fully implement A19's 19/19/68 standards, among other Forest Plan requirements, nor does it include the restoration of wildlife security as a part of its Purpose and Need.

We've previously made the case that the Forest-wide TAR must also outline recommendations that fully implement all Forest Plan standards, but that the Flathead has failed to do so. We incorporate by reference our two letters commenting on the Flathead's Forest-wide draft TAR and we will email them as separate emails to keep file sizes to a minimum and to see that they get into the administrative record for Chilly James. These 2014 letters (dated incorrectly 2012) are also on our web site at: http://www.swanview.org/reports/SVC_on_FNF_dTAR_140711.pdf and http://www.swanview.org/reports/SVC_on_FNF_dTAR_140728.pdf

Rather than having Forest-wide and area-wide TARs that truly inform projects, the Cold Jim and Chilly James TARs instead appear to be informed by the projects. The TARs recommend no more than what those projects propose doing, which defeats the whole purpose of conducting travel planning at levels and scales that objectively recommend an adequate and sustainable minimum road system.

As with the prior Cold Jim TAR, the new CJ TAR fails to include in its Appendix C or D spreadsheets columns which then indicate which recommended treatments will or will not be implemented by either Chilly James, Cold Jim or some other future project necessary to arrive at an adequate and sustainable minimum road system. We spent several hours trying to compare the necessary half-dozen charts and tables and still have low confidence that we are able to understand what TAR recommendations are being implemented, which have been changed from one type of treatment to another, and which have simply been ignored, overlooked or intentionally dismissed.

All this work is for naught, however, because the TARs do not recommend an adequate and sustainable minimum road system to begin with. What the TARs do make clear, however, is that MA-15 logging rules the roost and that fish and wildlife can damn well take a back seat. And the new CJ TAR, Appendix D provides further examples of the state of disarray that exists and will continue to exist in the Forest's road system.

Page 2 of Appendix D, for example, notes that Road #9792 "has an old rusted 18" CMP that has been pulled and is still sitting in channel." Really, how can a culvert have been adequately pulled and yet still be sitting in the stream channel? Would that look something like the blown culvert in Road #9569 that we provided a photo of with our 3/11/14 comments on the Cold Jim EA (attached) - and is that culvert still sitting there?

Also on Page 2 of Appendix D, it is recommended that Road #9798 be retained for access to MA -15 even though it has an "undersized culvert on Jim Creek side channel" for which no treatment is prescribed. And Road #9599 is to be retained oven though it is "noted as 'problematic' in bull trout baseline. Chronic erosion problems even with new BMPs." Just throw more money, gravel and BMPs at it - so it says.

While Chilly James proposes to do some good, it remains wholly inadequate alongside the various TARs and fails to be part of a well-charted process for arriving at an adequate and sustainable minimum road system. It instead stands alongside Cold Jim and other logging projects as the runt of the litter, expected to make apologies for the voracious appetites of its timber sale siblings and the bloated road system needed to continuously feed them.

Sincerely,

Keith

Keith J. Hammer
Chair

Enclosures: March 11, 2014 comments of SVC on the Cold Jim EA

Via separate emails: July 11, 2014 comments of SVC on Flathead NF draft TAR
July 28, 2014 comments of SVC on Flathead NF draft TAR

Swan View Coalition *Nature and Human Nature on the Same Path*

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March 11, 2014

Rich Kehr - District Ranger, SLRD
200 Ranger Station Road
Bigfork, MT 59911

Re: Comments on Cold Jim Fuels Reduction and Forest Health Project EA
As PDF via email to comments-northern-flathead-swan-lake@fs.fed.us

Dear Ranger Kehr;

Please accept these comments on the Cold Jim EA into the public record. We incorporate by reference our prior comments on this project, dated 1/19/12 and 1/30/12. We also incorporate by inclusion in this PDF the comments of Friends of the Wild Swan in this matter and the bibliography of scientific references we ask that you use in making your decision.

Road and Travel Management

These comments are made after reviewing the Cold Jim EA (hereafter EA), your 2/14/14 Chilly James Restoration Project proposed action (hereafter Chilly James), and the 2011/2012 Cold Jim Travel Analysis Report (hereafter TAR). All three use an identical Cold Jim analysis area and the TAR is intended to inform the Cold Jim EA and any subsequent projects in the area.

The TAR, at pages 1 and 4, states that the Cold Jim project will begin the NEPA process and complete the Travel Analysis. Cold Jim, however, would only decommission 1.9 miles of road, while Chilly James claims to decommission or "store" all roads but those "considered necessary for short term or long term resource management (page 3).

Chilly James, however, makes no mention of the TAR nor its recommendations on which roads should be decommissioned or retained as part of the National Forest Road System (NFSR). The Cold Jim EA mentions the TAR only briefly in its Transportation Section and no other. Moreover, the Cold Jim EA never mentions Chilly James even once. Nor does Chilly James mention Cold Jim.

Yet these two projects and three analyses all utilize the same analysis area and contemplate if not propose ground-disturbing activities there. These are cumulative and connected actions that must be assessed in an environmental impact statement (EIS) for Cold Jim and in subsequent analyses including Chilly James. Moreover, these two

projects are both intended to move the area "towards a future minimum road system" (EA at 3-371) and remove or store all unneeded roads (Chilly James at 3). Both projects must include this movement towards a minimum road system as a part of their respective Purpose and Need statements.

Nowhere, however, does the Cold Jim EA, the TAR, or Chilly James adequately describe how a fiscally and environmentally responsible minimum road system will be arrived at. The TAR, at 10, acknowledges that funding "has not been adequate to accomplish much of the continuing backlog of deferred maintenance and annual maintenance need to meet minimum safety and water quality standards." This failure to meet minimum standards is a violation of policy and law.

Similarly, the Western Montana Planning Zone's 3/2/04 "Analysis of the Management Situation" for Forest Plan revision (pertinent pages attached) found the Flathead's "Current funding levels are not adequate to maintain existing road to applicable standards" and concluded an annual road maintenance budget of $6.2 million was needed while $957,000 was expected. More current information being used for Flathead Forest Plan revision finds that "budgets for repairs and maintenance are expected to continue to decrease" (FNF's 2/25/14 "Access Information for Desired Condition Discussion" attached).

The TAR makes it clear that Maintenance Level 1 roads still need regular maintenance that can cost up to $1,000 per mile per year, if not more for gated closed roads (page 20). Chilly James makes it clear that "Rather than investing in BMPs now, it is more cost-efficient to remove any potential impact it has to aquatic resources up front. . . Stream culverts will be removed and water bars installed so the road has no potential to erode, gather water or affect stream channels (page 2). The TAR similarly suggests that "Maintenance level 1 roads that are closed for more than one year and not subject to annual maintenance should be considered for placement in ISS to reduce risks that a road template may have in the absence of regular maintenance (page 14). We disagree, however, when the TAR does not require the removal of stream bearing culverts when roads are either decommissioned or placed in ISS (pages 14 and 26-27) - as is required for decommissioned roads by Amendment 19 and for both decommissioned and ISS roads by the Chilly James proposal.

Even though it is cheaper to decommission or "store" a road than to continually maintain it, the TAR does not recommend the road system be trimmed to one that can be maintained by current budgets. It instead recommends retaining so many problem (high risk; H/H) roads in its "minimum road system" that 27% of them would be a "priority for Capital Investment" funding (TAR at App. C). This as though the American taxpayer is made from gold and can come up with the cash for road Capital Investments when it can't come up with enough for road maintenance?

You must prepare environmental documents in which the layperson can clearly understand what the agency must do to arrive at a fiscally and environmentally responsible minimum road system and what role Cold Jim and Chilly James would play in that. As it is, the TAR does not even summarize the mileages of roads it recommends for retention, decommissioning, or Intermittent Stored Service (other than

for Legacy Land roads, though it does not separate decommissioning from ISS). Nor does Chilly James indicate how its proposal squares with the TAR.

Dishonest and Unlawful Claims

The Cold Jim EA, TAR and Chilly James are all three premised on several dishonest and unlawful claims:

1. That the Cold Jim Grizzly Bear Management Subunit is not subject to Amendment 19's 19/19/68 standards for OMRD, TMRD and Security Core because it was less than 75% in Forest Service ownership in 1995.

With acquisition of Legacy Lands in 2010, some 94% of the Subunit is in Forest Service ownership. The plain language of Amendment 19 and its 19/19/68 standards now apply to Cold Jim, period.

2. "After the 10-year [Fiber Supply Agreement on Legacy Lands] has ended, the decision is to keep the Cold Jim subunit with their current no net increase in OMRD or TMRD, and no net decrease in CORE due to Forest Service actions." (TAR at 8).

No such decision has been made, at least not in full view of the public and via the public process required by the NFMA, NEPA, ESA, and other laws!

3. The vast majority of Legacy Lands are now considered Flathead National Forest Management Area 15 lands (see Cold Jim and TAR maps). Again, no Flathead Forest Plan amendment has been conducted to place the Legacy Lands under any particular management prescription or MA, in violation of the NFMA, NEPA, ESA and other laws. As discussed in our earlier letters commenting on Cold Jim, the assumption that these lands are best suited to MA-15 flies in the face of needing to provide better wildlife security, restore water quality and fisheries, and to protect, restore and reconnect old growth and mature forests.

Grizzly Bear and Other Wildlife

The above dishonest assumptions and de-facto decisions would allow the Forest Service to continue managing vast portions of the Swan Valley as industrial zones first plundered by Plum Creek and others, rather than put the area on the path to recovery by significantly reducing road densities and increasing grizzly bear Security Core per the full force of Amendment 19.

The attached "Swan Valley Grizzly Bear Research and Monitoring" summary report (circa 2007) found that, of the 24 marked bears then using the Swan Valley, 42% of them had already died, along with 3 unmarked grizzly bears (page 38). The monitoring also shows grizzly bear survival was best in areas with low road densities and adequate hiding cover; meaning areas not chock full of roads, clear-cuts, overly-thinned forests, and other human developments (page 36). Though it goes without saying, Fish and

Wildlife Service indeed calls this level of mortality "unsustainable." (See the attached December 24, 2007 Missoulian news article).

Similarly, Mace and Waller (1997) found in their South Fork Grizzly Bear Study that the Swan Valley is functioning as a population sink, draining bears from the northern Swan Range "source" at a rate causing the population to decline at over 2% per year, enough to halve the population in about 30 years.

Cold Jim will make matters worse by building temporary roads that will remain at risk of continued human use even after decommissioning (EA at 3-336). Indeed, the TAR (at 10-11) and Cold Jim EA find there are already other user-created or old logging routes in the analysis area that continue to receive use - but both then fail to identify, map, or describe what is being done to put an end to this use.

Cold Jim would also reduce hiding cover in the 95% of the forest stands that would be logged and currently provide cover, reducing the amount of hiding cover "across the Cold Jim Grizzly Bear Subunit" (EA at 3-333). Moreover, both Open Road Density and Total Road Density would be increased during the life of the project, in violation of Amendment 19's and the SVGBCA's prohibition against increasing them without offsetting the increase nearby so there is no net increase. The EA is wrong in its attempt to define "net" as meaning before and after the project rather than during the project/at all times.

While the EA argues Cold Jim is subject to the SVGBCA, it then fails to comply with its requirements to protect "inactive" subunits from major activities including commercial uses like logging and road construction during the non-denning period. Cold Jim proposes commercial logging and road building and most of it would have to occur during the Cold Jim Subunit's "inactive" period from 2015-2020 (EA at 3-335). While the EA exempts some winter denning period logging units from this restriction on page 3-335, it then appears to attempt to exempt commercial logging during the non-denning period via springtime or salvage logging exemptions that simply don't apply to Cold Jim's major commercial logging and road building activities (EA at 3-330 and 3-335).

Moreover, the EA does not adequately describe the effects of winter logging on lynx, wolverine, elk and other non-denning wildlife species during this already stressful season.

In sum, FWS has found in numerous biological opinions on Amendment 19, including the latest 1/31/14 BiOp, that "harm" is done to grizzly bears when the 19/19/68 standards are not met. The Cold Jim proposal to let the Subunit languish and continue to significantly harm bears in its measly 18/56/43 state is pathetic. Cold Jim fails to favor the grizzly bear in its MS-1 habitat and it does not comply with Forest Plan standards or the Interagency Grizzly Bear Guidelines.

Watersheds and Hydrology

The Cold Jim EA notes that both the Cold Creek and Jim Creek watersheds are "Functioning at Risk" per the Watershed Condition Framework (EA at 3-188). Then it

notes that neither will be upgraded because simply too little reduction in road miles and other watershed restoration is proposed in Cold Jim (EA at 3-192).

Part of the reason these watersheds are ranked poorly is due to high open road densities, deferred road maintenance, and roads located near streams - and yet Cold Jim does little to correct the problems. This, even though 55% of the Flathead's road operations and management budget "is reserved for timber sale engineering support and planning, the remaining 45% is available for all road inventory, monitoring, analysis, contract administration, construction, operations, and maintenance." (See the Access Information for Desired Condition Discussion previously attached).

One would think, then, that timber sales would do a lot more to restore watersheds by removing and improving roads, rather than simply skimming off the road maintenance funding and applying a few BMPs - but apparently not. Similar to the situation with the TAR outlined at the beginning of this letter, Cold Jim is a cumulative and connected action in either improving or making worse watershed conditions under the WCF. Environmental documents must fully assesses the role that Cold Jim, the WCF, Chilly James, and other necessary actions will play in getting these watersheds restored and upgraded. This again emphasizes the need to fully disclose how much money is needed to maintain existing roads, how much funding can be reasonably expected, and how many roads must be decommissioned so the twain shall meet.

Fisheries

We disagree with the repeated statement in the Fisheries Section of the Cold Jim EA that "catastrophic culvert failures are uncommon." Indeed the Fisheries Section itself describes at least two culvert failures in the analysis area. We've attached a photo of a culvert failure on Red Butte Road #9569 a bit further south. We've also attached our December 2000 Counting Culverts report that includes a partial summary of culvert failures on the Flathead National Forest beginning on page 3.

Invasive Plants

Page 3-75 of the Cold Jim EA states clearly that the desired condition inferred from various executive orders, the Forest Service Manual, and the Flathead's 2001 Weed Control EA "is the prevention of new infestations . . ." Page 3-88 finds, however, "With more roads built and harvesting equipment used in this project and future projects, infestations would continue to spread into adjacent natural areas." Logging and road building that spread and create new infestations of invasive plants violate the desired future condition, along with the various executive orders, Forest Service Manual, programs, laws, and regulations intended to stop the spread of them - as is the case with Cold Jim.

Maybe that 55% of the road operations and maintenance budget that is going to timber sales to spread weeds should instead be going into treating weeds along essential roads and removing non-essential roads that tend to spread weeds.

Economics

The Cold Jim EA's treatment of economics in skewed and inadequate. Page 3-387 in fact makes it clear that it is limited to economic effects to the timber industry, even though "recreation and tourism, wildlife, and aesthetic values [have] substantial economic value on a regional, national, and international scale."

Robert Wolf (1920-2005) was a professional forester and a forest policy analyst in Washington, D.C. whose career spanned 45 years with the USDA Forest Service, the Bureau of Land Management, the Bureau of the Budget, the U.S. Senate, and the Congressional Research Service. He in 2002 did an analysis of the Forest Service Budget and found that the Flathead National Forest loses $121.79 for each MBF in timber sales. (See the attached 2003 "Economic Analysis of the Northern Rockies Ecosystem Protection Act" by economist Michael Garrity.)

As noted above, perhaps it is high time the Flathead National Forest and the Forest Service as a whole begin providing sound economic analyses to show the true costs of timber sales to the American taxpayer and the varied natural resource values that are harmed and rendered less valuable by logging and road building. In this regard, Cold Jim, the TAR, and Chilly James use the terms "economical" or "cost-effective" in regards to desirable road systems and logging when they should be striving for "fiscally responsible" road systems and logging. The former appear "economical" only if one firstly discounts the costs of road capital investment, maintenance, deferred maintenance backlogs, the enormous costs of needed weed treatments, etc..

As noted above, the Flathead receives less than one-sixth of the budget it needs to maintain its road system. Yet projects like Cold Jim and the overarching TAR would dig the hole deeper rather than remove enough roads to then be able to properly maintain the remainder.

Conclusion

The Flathead National Forest should view Amendment 19 as a godsend and as a template for reducing its road system to manageable and affordable levels. It should not need the grizzly bear or any other fish and wildlife species to blame its road closures on when it is in fact closing roads largely because it can no longer afford to maintain them as open roads (e.g. TAR at 13).

Any person with a modicum of common sense and/or an ounce of compassion for the landscape, should not be able to look at a map of the Swan Valley, Tally Lake Ranger District, or the Island Unit and say that the 19/19/68 standards of Amendment 19 should not be applied there in order to reduce the amount of both open and closed roads. (See our attached Flathead National Forest Public Access map which shows roads and trails per Flathead National Forest's Google Earth kml files. Better yet, use the Flathead's kml files to view the mess directly on Google Earth).

Flathead National Forest is squandering golden opportunities to reprioritize its funding and management priorities to plan for and arrive at a minimum road system that is truly environmentally and fiscally responsible - and Cold Jim is just another sad chapter in failed opportunities. As FWS concludes in its 1/31/14 grizzly bear BiOp on Amendment 19, "Additionally, low road densities would also benefit other wildlife and public resources. Low road densities may result in lower maintenance costs that free up funding for other resource needs."

Sincerely,

Keith

Keith J. Hammer
Chair

Bitterroot, Flathead, and Lolo
National Forests

Analysis of the Management Situation

Western Montana Planning Zone

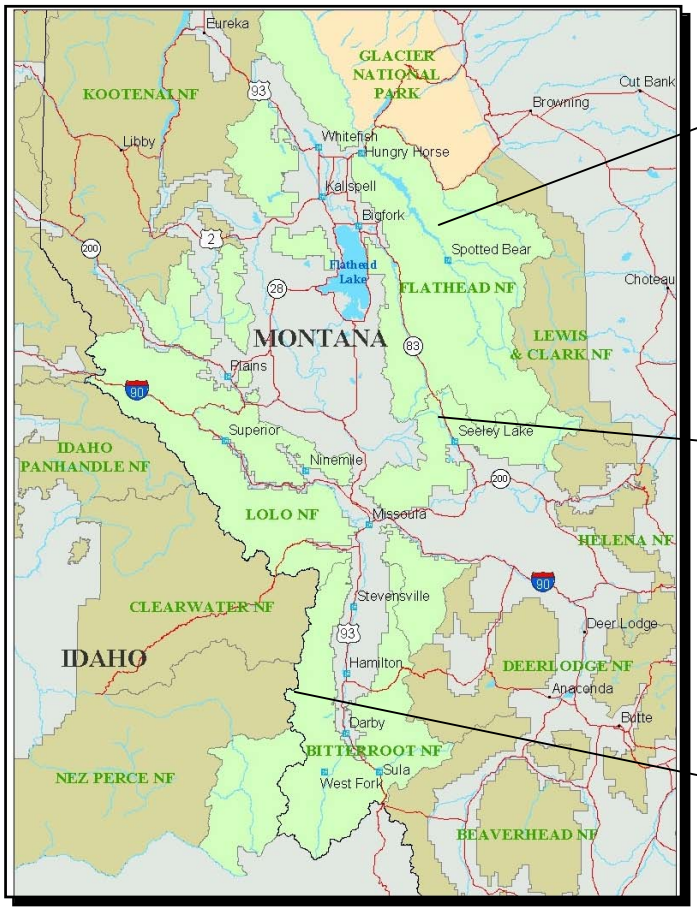

Table 2: Closure status[1/] in miles[”]

Forest	Open	Not Open	Seasonal restriction
Bitterroot NF	1,062	908	638
Flathead NF	1,200	1,920	384
Lolo NF	2,235	2,628	1,462

1/ For conventional vehicles, does not include OHV use.
2/ From INFRA Roads database

The existing road system on NFS lands was largely constructed during the last 50 years to develop areas for timber harvesting. We are currently managing a road network that was built for timber harvesting and is now being used more for recreation that will continue to increase as the population increases. At the present time, there are over 12,460 miles of road across the planning zone. Table 3 provides a summary of road miles by maintenance level. Road maintenance level descriptions are provided in the Glossary.

Table 3: Road miles by maintenance level.

Forest	Total Miles	ML-1	ML-2	ML-3	ML-4	ML-5
Bitterroot NF	2,618	1,080	690	810	17	21
Flathead NF	3,504	1,824	649	828	174	29
Lolo NF	6,340	2,571	1,785	1,763	170	51
Total	12,462	5,475	3,124	3,401	361	101

1/ From INFRA Roads database

Maintenance and Budget Limitations

Current funding levels are not adequate to maintain existing roads to applicable standards. Road standards minimize ecological impacts, and allow efficient and safe use. Table 4 provides a summary of the maintenance workload and backlog in relation to estimated current budgets.

Table 4: Road maintenance workload, backlog and budget levels.

Forest	Average Annual Maintenance (miles)	Current Backlog (miles)	Annual Budget for Maintenance and Backlog	Estimated Current Budget
Bitterroot	470	2,540	$2,907,000	$662,000
Flathead	1,245	3,547	$6,200,000	$957,000
Lolo	388	5,909	$4,200,000	$544,000

The trail system on National Forest lands is comprised of non-motorized and motorized trails. There are limited opportunities to do motorized recreation on system trails throughout the three forests. Two-wheeled motorized use has more opportunity on system trails than do 4-wheeled motorized use. Table 5 provides the number of miles of each type of trail throughout the planning zone that currently exists on the forest road system. Decommissioned roads are not shown.

1. Trails

There are about 2,260 miles of trails on the Forest in the national infrastructure database which is the official database for the Forest Service. A spatial analysis was conducted to determine how many trails are within each geographic area. This analysis determined that there are 2,095 miles of trails. This difference of 165 miles is likely due to the database not being sufficiently geo-referenced and aligned in the database.

There are 1,091 miles outside of wilderness and 1,169 miles within designated wilderness. In the last 5 years, the Forest maintained about 1,000 miles of trails per year, and improved/reconstructed an average of 30 miles of trails. Trail maintenance and reconstruction are highly dependent on budgets and partnerships with outside groups. Trails can have multiple types of use on them and the following table displays the different types of allowable uses by geographic area.

Table 1. Allowed Summer Trail Use in miles by Geographical Area on the Flathead NF

Allowed Use	Hungry Horse	Middle Fork	North Fork	Salish Mtn	South Fork	Swan Valley	Outside Area*
Bicycles	122	51	184	144	86	140	5
Hiking	157	397	184	150	856	217	13
Pack & Saddle	125	397	184	144	856	208	13
Summer Motorized	50	8	10	103	0	48	2

* Trail may go off forest or through private land easement

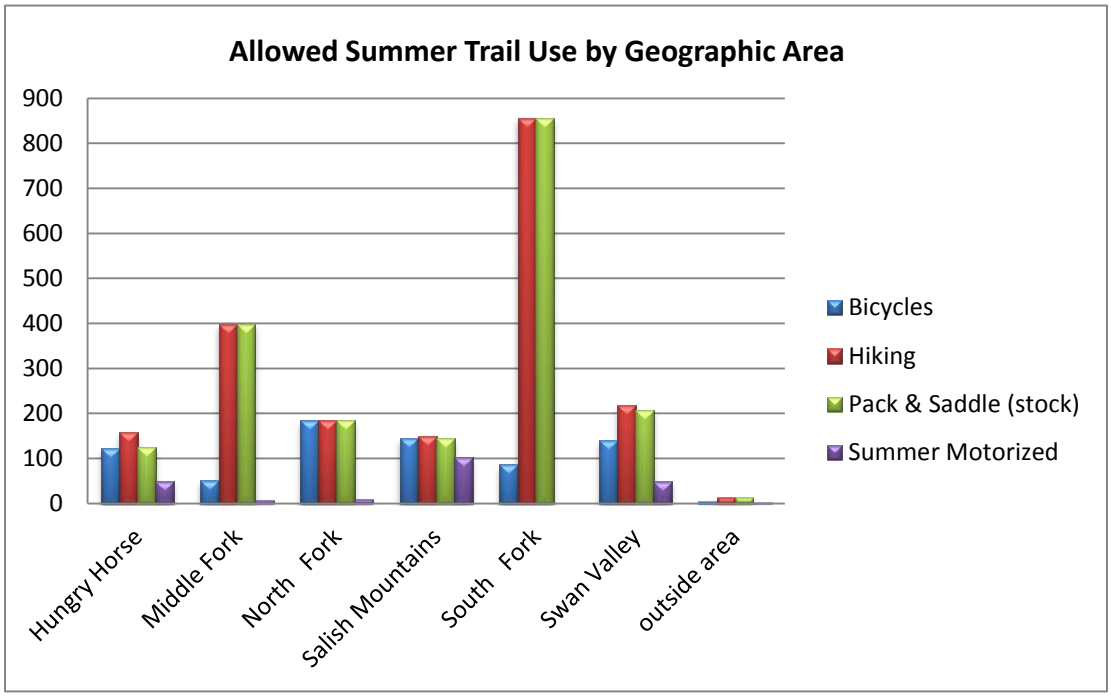

Figure 1. Allowed Trail Use in miles by Geographical Area on the Flathead NF

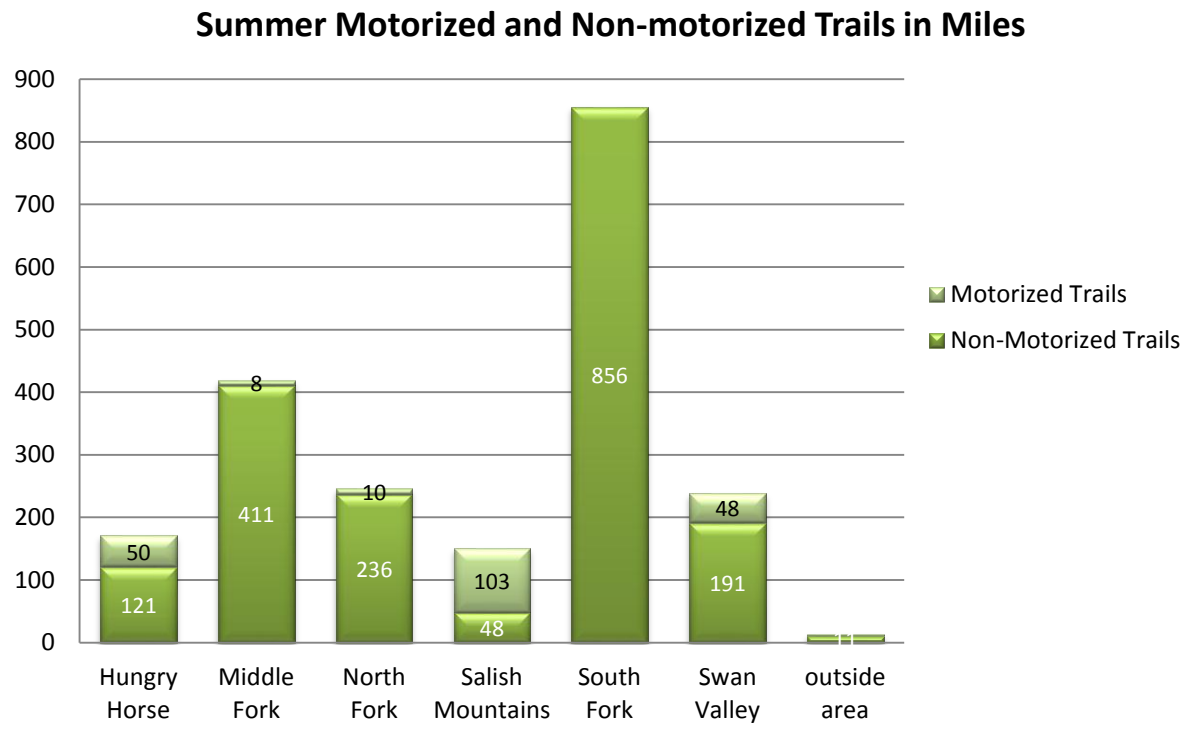

Figure 2. Miles of summer motorized and non-motorized trail on the Flathead NF

Please note that non-motorized trails do not necessarily allow all types of non-motorized traffic, and may have various restrictions by type and season of non-motorized traffic. Motorized trails do not necessarily allow all types of motorized traffic, and may have various restrictions by type and season of motorized traffic.

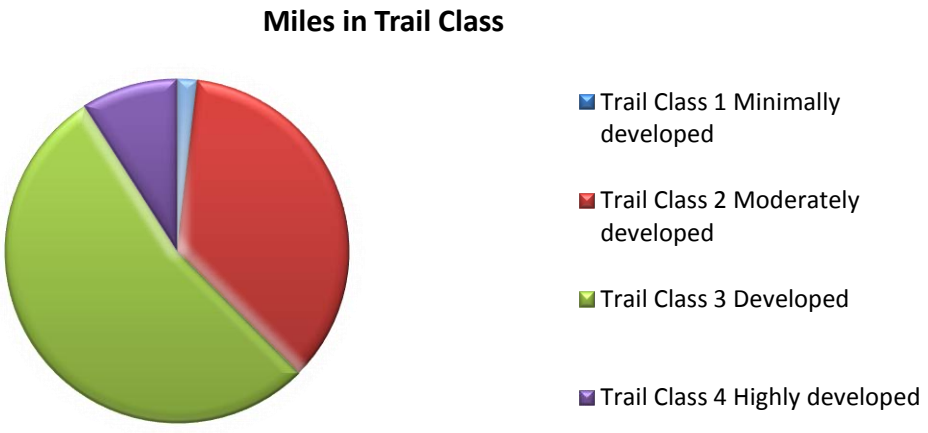

Figure 3. Miles in trail class on the Flathead NF

Over-snow Motorized Use

Over-snow motorized vehicle recreation is generally allowed from December 1 to March 31. As shown in the maps, extended spring use is allowed in the following four areas:

- Groomed routes in Canyon Creek until April 14;
- 3,100 acres at Sixmile until April 30;
- 17,500 acres in Challenge/Skyland area until May 14, and
- 31,800 acres in Lost Johnny area until May 31.

Roads open year round to motorized use may accommodate over-snow vehicles as conditions allow, unless passable to conventional vehicles. Exceptions are:

- Trail Creek Road past Tuchuck Campground, and
- Whale Creek Road 318 west of the junction with Road 10832.

Over-snow vehicles would be prohibited on those two sections of road otherwise open year round.

For safety reasons the following road on the Tally Lake Ranger District is closed to snowmobile traffic year-round unless otherwise permitted or for performance of an official duty such as an organized rescue:

- Road 9790 (Taylor Creek) at the junction with the groomed Taylor Creek snowmobile trail to the permit boundary of Big Mountain.

This decision also includes additional restriction of motorized over-snow vehicles within and adjacent to the Big Mountain Ski Resort Area to improve protection of facilities and public safety. These measures are displayed on the decision map for Tally Lake ranger District.

http://www.fs.usda.gov/main/flathead/maps-pubs scroll to Flathead National Forest District Over -snow Vehicle Use Maps, click on the map you want to download.

Table 2. Acres of Areas where Over-snow Use is Allowed and Not Allowed on the FNF

	Hungry Horse	Middle Fork	North Fork	Salish Mnt	South Fork	Swan Valley	Outside area	Total
Over snow use not allowed	146,100	354,300	342,600	596,200	758,200	361,500		2,558,900
Over-snow use allowed	185,700	20,600	47,100	240,500	32,500	170.300	294	697,000

Infra data 2/5/2014

Trail Maintenance and Budget

Trail maintenance schedules are based on trail class shown in figure 3. Fifty-three percent of the forest trails are in trail class 3 which means these trails are typically scheduled for maintenance every 3 to 5 years. Trail maintenance is accomplished by Forest Service employees, volunteers and partners such as outfitters and guide. Trail class also indicates the potential appropriateness of each of the trail classes for the managed uses of trails. For example, trail class 1 includes the least developed and most challenging NFS trails. Trails in this category are typically very rugged and steep, with little or no defined tread or

clearing and many or continuous obstacles. Hiker/pedestrian and bicycle are potential appropriate for trail class 1 and not appropriate for pack and saddle (but they may be allowed). Click here for the complete matrix of the potential appropriateness of each of the trail classes for the managed uses.

Table 3. Trails Maintained on the Flathead National Forest 2009 to 2013

Year	Trails Maintained	Miles of trail Improved*	% of Trails Maintained
2013	865	23	39%
2012	1,611	43	73%
2011	1,281	39	59%
2010	700	28	33%
2009	566	19	27%

* Heavy maintenance or reconstruction of the trail

Table 4. Annual Trail Budget for FNF 2009 to 2013

Fiscal Year	Annual Trail Budget
2013	$548,600
2012	$737,800
2011	$774,000
2010	$684,000
2009	$710,500

Conflicts with other trail users

The majority of the trails on the forest, outside of designated and recommended wilderness and specially designated areas such as Jewel Basin Hiking Area, allow for multiple uses such as stock, bicycle and/or hikers. The forest is beginning to see conflicts on trails where some mountain bike users would like challenge features (such as jumps) available on trails that are also open to hikers and/or stock.

Trends in trail access

Our current trail system is trending towards not sustainable with current and projected budgets. Maintenance has decreased as budgets decrease with some trails being maintained less frequently or at a lesser standard such as logging out a trail early in the season. This has increased deferred maintenance on system trails which may lead to degradation of the trail, increase erosion/sedimentation and increased negative experiences for users.

2. Roads

Roads are an important aspect to recreational use – they provide a method to access recreational facilities such as trails, camping opportunities as well as provide recreational experience such as driving for pleasure, viewing scenery, OHV riding. The forest has 1,424 miles (41%) of open roads (i.e. allow highway legal vehicles) to provide and access recreational opportunities. Conversely, the forest has about 2,068 miles (59%) of roads that are closed to motorized use. These generally provide non-motorized experience but some closed roads may allow for motorized trail use.

Forest-wide, 59% (2,068 miles) of the roads are in custodial care (closed to motorized use); open to motorized use are 41% (1,424 miles miles) with 14% are open for high clearance vehicles and 27% are open for passenger car.

Table 5. Miles of roads open to the public by maintenance level and geographic area on the Flathead NF

Operational Maintenance Level	Hungry Horse	Middle Fork	North Fork	Salish Mountains	South Fork	Swan Valley	Total Miles
Basic Custodial Care (closed)	0	0	0	2	0	0	2
High Clearance Vehicles	55	17	93	264	12	30	471
Passenger Car	170	21	144	345	46	225	951
TOTAL MILES	**225**	**38**	**237**	**611**	**58**	**255**	**1,424**

Compiled from INFRA 12/2/13

Table 6. Miles of roads closed to the public by maintenance level and geographic area on the Flathead NF

Operational Maintenance Level	Hungry Horse	Middle Fork	North Fork	Salish Mnt	South Fork	Swan Valley	Outside Area*	Total Miles
Basic Custodial Care (closed)	316	39	260	607	74	768	1	**2,065**
High Clearance Vehicles	12	0	6	6	0	4		**29**
Passenger Car	1		0		0	0		**2**
TOTAL MILES	**329**	**39**	**266**	**613**	**74**	**772**	**1**	**2,094**

* Roads may go off forest or through private land easement

ML 3-5 roads are collectively maintained for travel by a prudent driver in a standard passenger car. These roads fall under the requirements of the National Highway Safety Act and the Manual of Uniform Traffic Control Devices. Warning signs and traffic control devices are provided to alert motorists of situations that may violate expectations.

Tables 7. Percentage of total roads by maintenance categories on the Flathead National Forest

Geographic Area	Basic custodial care	High Clearance vehicles	Passenger Car
Hungry Horse	57%	12%	31%
Middle Fork	51%	22%	27%
North Fork	52%	20%	29%
South Fork	56%	9%	35%
Salish Mountain	50%	22%	28%
Swan Valley	75%	3%	21%

Compiled from INFRA 12/2/13

The total number of National Forest System Roads (NFSR) on the Flathead has steadily been decreasing since 1995. A total of about 887 miles of road have been decommissioned during this time. Most of this decommissioning has taken place in grizzly bear recovery areas. However, there were additions to the National Forest road system. These additions included constructing new local roads for vegetation management, acquisition related to Cooperative Road right-of-way agreements with the Montana Department of Natural Resource Conservation and Plum Creek Timber Company, database cleanup, and mostly from the acquisition of previously Plum Creek Timber Company lands located in the Swan Valley (411 miles). As a result of these additions and deletions, the total system road mileage on the Flathead National Forest has gone from 3,842 miles to 3,384 miles since 1995.

3. Transportation System and Road Density

On the Flathead National Forest, timber harvest, fuel reduction and recreation are the primary land management activities and they are supported by an extensive network of roads. Timber harvest has declined since 1995. At that time, the forest began a road decommissioning program as directed by Forest Plan Amendment #19, resulting in approximately 887 miles of road being decommissioned.

Streams may be affected directly by timber harvest and roads, especially when these activities are in close proximity. Indirect effects may occur due to changes in streamflow and/or sediment delivery processes. In addition, wildfire is major disturbance mechanism that changes short term and long term hydrologic patterns, aquatic habitat, and water quality.

Transportation development can have effects on watershed process and function and roads are a likely sediment source. The general effects of roads include soil erosion and the extension of channel networks via interception and routing of water. This effect increases with proximity to aquatic habitats. Road density by Geographic Area varies greatly across the Flathead National Forest (Table 7)

Table 8. Geographic area road density values

Geographic Area	NFSR Miles	FNF MI^2	Road Density
Salish Mountains	1186.99	412.76	2.88
Swan Valley	1061.19	568.00	1.87
Hungry Horse	573.72	447.59	1.28
North Fork	523.49	499.61	1.05
Middle Fork	113.25	246.96	0.46
South Fork	133.83	340.49	0.39

4. Road Budget and Maintenance

The Forest receives annual funding for the operation and maintenance (O&M) of NFSRs. The last two years the road O&M budget averaged $895,000. The three years prior averaged $1,599,000. That is an approximate 56% reduction in O&M funding over the last 5 years. Of this, approximately 55% of this amount is reserved for timber sale engineering support and planning, the remaining 45% is available for all road inventory, monitoring, analysis, contract administration, construction, operations, and maintenance.

Table 9. Miles of NFSR Receiving Maintenance, Percentage of Passenger Car System and Non-Passenger Car System Receiving Maintenance, and annual Road O&M Budget on the Flathead NF for the last five years.

Year	Miles of NFSR Receiving Maintenance	% of Passenger Car System Receiving Maintenance	% of Non-Passenger Car System Receiving Maintenance	NFSR O&M Budget
2013	690	62%	4%	$858,900
2012	691	62%	2%	$932,000
2011	1446	99%	22%	$1,340,000
2010	1454	99%	20%	$1,528,200
2009	1359	99%	17%	$1,930,300

The overall trend affecting the Forest transportation system is that budgets for repairs and maintenance are expected to continue to decrease while national requirements and efforts for planning and maintenance continue to increase. During the past two decades, appropriated funding for roads construction and maintenance has decreased while the forest is spending more funding to meet safety standards, implement resource protection measures, and complete agency-required planning efforts.

In the last 10 years, the amount of decommissioning each year has decreased as the backlog of decommissioning is reduced and the A19 commitments under project level planning have been largely accomplished

Table 10. Miles of Road Decommissioned from 2003 to 2013 on the FNF

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Miles Decommissioned	37	42	28	47	42	48	22	55	12	13	4

Due to the annual nature of federal budgets, the forest is unable to accomplish larger scale road maintenance or construction projects such as resurfacing a paved road or replacing a bridge with the annual operations and maintenance funding. Some funds are reserved at the regional or national level for projects of this nature, and are awarded on a competitive basis. These funding sources are unpredictable. Though this competitive funding helps accomplish road maintenance projects on the Forest, it still falls short of the amount needed to adequately maintain the system.

5. Aviation

Table 11. Airstrips on the Flathead NF by Geographic Area

Geographic Area	Site Name	Remarks
Middle Fork	Schafer	Wilderness; maintained by USFS, open to public
South Fork	Meadow Creek	Front country; maintained by USFS, open to public
South Fork	Spotted Bear	Front country; maintained by USFS, open to public
Swan Valley	Condon	Front country; maintained by USFS, open to public

Table 12. Existing private airstrips within the Geographical Areas

Geographic Area	Site Name
Hungry Horse	Ryan Field
Middle Fork	none
North Fork	Moose City; Langston
South Fork	None
Swan Valley	Ferndale; Masonry Field
Salish Mountains	Wounded Buck Ranch, Abel Ranch, Flathead Lake Sky Ranch, Sanders, Braidwater Farm, Kalispell City, Weaver, Hoener, Glacier Park International, Whitefish, Rahn, Bates, Hanson, Cabin Creek Landing, Lone Hawk

Source: Montana Pilots Association, retrieved 1/9/2014

In the state of Montana, in 2011 there were 258 total airstrips: 121 are open for public use, 15 are commercial service airports and 134 are private airstrips (FAA US Civil Airman Statistics).

Date: Sun, 27 Jan 2008 11:36:07 -0700
To: "hammer, keith" <keith@swanview.org>
From: Keith Hammer <keith@swanview.org>
Subject: Swan Griz mortality

Study sheds light on grizzlies

By JOHN CRAMER of the Missoulian
December 24, 2007

It's not the bruin superhighway, but the Swan Valley's grizzly bears often use four corridors to travel back and forth between the surrounding Swan and Mission mountains, an ongoing study shows.

Twelve of the valley's estimated 30 bears were tracked over the past five years, providing a glimpse into how they live and die in the Swan.

A collaboration between federal and state agencies and Plum Creek Timber Co., the study has been limited by a lack of funding, but the bears' high death rate has already prompted a number of management changes.

Among them are a $10,000 reward for turning in grizzly poachers, more bear-awareness public education efforts and a decision by Plum Creek to only sell its lands in grizzly linkage zones to buyers who won't develop them.

Chris Servheen, grizzly bear recovery coordinator for the U.S. Fish and Wildlife Service, said the bears' 33 percent mortality rate in the Swan was unsustainable and directly linked to humans' presence in habitat where the grizzly was once king of the forest.

The causes of death couldn't be determined, but poaching, poison, traffic injuries and other human causes were suspected.

"It's the road to ruin unless we can find a way for these bears and people to live together," Servheen said.

The Swan Valley is a perfect natural laboratory to monitor the effectiveness of bear-awareness efforts because of its combination of good habitat and busy roads, intensive logging, and growing residential and commercial development.

The study highlights the need to preserve areas where grizzlies can safely travel between valleys and mountain forests and to find new ways for people and bears to live together, Servheen said.

The findings highlight grizzlies' vulnerability and the need for more funding to better understand the endangered species as it continues to repopulate its old habitat across the northern Rockies.

"We need to preserve these safe passageways," said Henning Stabins, a wildlife biologist for Plum Creek, which owns more than one million acres in western Montana. "We want a healthy grizzly bear population like everyone else" so it can be removed from the endangered species list.

The Swan Valley study, which started in 2000, is part of the Swan Valley grizzly bear conservation agreement signed by major landowners and government agencies in 1995.

The study had no dedicated funding or personnel, but was carried out by researchers who tackled the work as part of their regular job duties.

Using global positioning system collars, researchers followed 12 grizzlies that live in the checkerboard of public and private land in the Swan Valley. The valley's population of about 600 residents is expected to grow as timberland gives way to residential development.

The study followed the bears for months at a time, tracking their movements hourly inside and outside the valley during the spring, summer and fall.

The bears crossed the valley most often in four areas that had fewer roads, fewer homes and businesses, and more forest cover for hiding.

Researchers were surprised to learn some bears spent most of their time in the valley bottom rather than moving to higher elevations,

while other bears covered unexpectedly large territories of hundreds of miles before returning to the Swan.

"That was completely astounding," Servheen said.

The bears were most active at night. Some male grizzlies changed their territories from year to year, while one female bear lived very close to homes, businesses, roads and hiking trails and never encountered people.

Some bears never left the valley. Others never crossed Highway 83, the main road through the valley, while others crossed repeatedly.

As a result of the grizzly conservation agreement and monitoring study, Plum Creek and the Forest Service have agreed to help protect the bear's habitat by building fewer roads, banning motorized recreation on their existing roads and protecting more streamside areas.

Plum Creek, the largest private landowner in the United States, and the Forest Service also are cutting less timber, and only in areas and at times when it will not affect bears.

Plum Creek, which is selling much of its property in western Montana for residential development, has agreed to sell its lands in the grizzly corridors only to the Forest Service or to private buyers who adopt conservation agreements that prohibit development.

The company also agreed to sell its land between the bear linkage zones only to private developers who sign deed restrictions that prohibit fruit trees, outdoor barbecue pits, gardens without electric fences and other food sources that attract grizzlies.

The agreement's partners also state that its employees and contractors won't carry firearms in grizzly territory. Studies show bear spray is more effective than bullets in deterring a charging grizzly.

The study includes FWS, the Montana Department of Natural Resources and Conservation, the U.S. Forest Service, the Montana Department of Fish, Wildlife and Parks and Plum Creek.

The agreement coordinates activities among landowners and requires special management practices for logging and other forest uses.

The goal was to maintain grizzlies' ability to travel safely between the Bob Marshall and Mission wilderness areas, and to come up with a conservation plan that helped landowners to continue to live and work their lands.

The project's partners agreed to further bear-awareness efforts, such as containing fruit trees, birdseed, pet food and other food that attracts bears, and to try to better understand the grizzlies' movements and causes of death.

The conservation area covers 369,000 acres, or 6 percent of the Northern Continental Divide Ecosystem, which is one of several grizzly recovery zones in the Lower 48 states.

In the Swan Valley, Plum Creek recently put 7,200 acres into a conservation agreement with state and federal agencies, while agreeing to sell another 1,700 acres to the state.

Stabins said the company tries to balance its business goals with the need to protect imperiled species.
"There are trade-offs, but environmental stewardship makes good business sense," he said.

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"Nature and human nature on the same path."

December 2000

prepared for
Friends of the Wild Swan

PO Box 5103
Swan Lake, MT 59911

Counting Culverts:

An Assessment of Integrated Road and Culvert Management On the Flathead National Forest

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Executive Summary

Flathead Forest Plan Amendment 19 is an integral part of the Flathead's program for reclaiming roads for the benefit of water quality, fish, and wildlife habitat security. Since 1995, it has benefited water quality and fish by requiring that stream-bearing culverts be removed during road reclamation necessary to achieve grizzly bear habitat security objectives. Watershed improvement funds financed 70% of the Flathead's road reclamation from 1995-1999, 80% of which occurred in grizzly bear habitat. Wildlife funds financed less than 1% of the road reclamation, while volunteer services provided the equivalent of 3% and new national road reclamation initiatives financed 26%.

An analysis of the Flathead's road reclamation program reveals the Flathead has failed to seize opportunities to promote its road reclamation program and prioritize funding for it. As national Forest Service initiatives have provided increased emphasis and funding for road reclamation, the Flathead has instead worked at cross-purposes to rescind Amendment 19's road reclamation and culvert removal requirements. As a result of inadequate priorities, funding, planning and implementation, the Flathead has failed to meet Amendment 19's mandatory 5-year objectives for road reclamation. This report looks at why this has occurred and suggests ways in which the situation can be corrected.

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Introduction

The reclamation of roads has been identified on many National Forests as a primary means to protect and restore water quality, fisheries and wildlife habitat security. On the Flathead National Forest, all stream-bearing culverts in roads to be reclaimed to provide security for grizzly bear must be removed to protect water quality and fish from the inevitable failure of the culverts. This integrated program is found in large part in Amendment 19 to the Flathead Forest Plan. Information provided by the Flathead, however, shows that it has been unable to either adequately maintain its roads and culverts or provide for their timely removal. This report will look at why this is and suggest what can be done about it.

Inventories and Monitoring

While the Flathead reports publicly that it has 3,761 miles of roads, it reports to Fish and Wildlife Service that it has 5,025 miles of roads. [1] The Flathead has inventoried some 287 bridges, 55 culverts larger than 7' diameter, and some 5,500 smaller culverts. It has not tracked which of the smaller culverts either bear streams or drain water and sediment from road ditches (which collect and sometimes redirect sediment-laden water towards streams). Moreover, an undisclosed number of the smaller culverts remain uninventoried. [2] It appears that only about 5,555 large and small culverts out of an estimated 80,000 are accounted for in the Flathead's inventories. [3]

Keith Hammer photo

Culverts stockpiled for 45 installations in 2.5 miles of new road near Emery Creek, Flathead National Forest.

The Forest Service Manual requires a systematic monitoring of the Flathead's bridges in order to minimize bridge failures. However, the Flathead has no systematic monitoring program for inspection of its culverts. [4]

While it is not uncommon for culverts to fail and roads to wash out on the Flathead, it keeps no central inventory of such events. Such damages are generally only compiled in a central location following specific weather events, such as rain-on-snow, which cause enough immediate damage in a geographic area to perhaps qualify for emergency repair funds. For example, an April 4, 1990, Flathead report documents the damage caused largely by undersized culverts in the face of a November, 1989, rain-on-snow event that resulted in the need for $391,000 in repairs to failed roads, culverts and bridges. [5]

Such rain-on-snow events are not uncommon, however, and blowouts of undersized culverts are a persistent problem often resulting from short-term cost-saving decisions at the time of their installation. The most recent such failure on the Flathead was during rain-on-snow in November, 1999, with a 54" diameter culvert washing out and sending 1,000 cubic yards of road downstream towards the bull trout spawning beds of Trail Creek. This culvert has since been replaced

with a 72" diameter culvert designed to withstand a 100-year rainfall event. [6]

Montana Department of Fish, Wildlife and Parks' sediment source surveys of South Fork Flathead River tributary streams supporting bull trout spawning and rearing indicate that nearly half of the surveyed road segments received a high priority ranking; meaning culverts were either partially plugged or had failed, or that the roads were delivering sediment to live streams. These surveys found 52 culverts partially plugged or undermined and 13 culverts that had failed in these bull trout streams. [7] Such surveys, however, are not conducted on the Flathead in a routine manner, nor are they timely monitoring in terms of preventing culvert failures. Scattered records indicate that culverts that have failed may be left un-repaired for years, with additional road washing into the stream each year. [8]

Nokio Creek, Flathead National Forest — Fish and Wildlife Service photo

Unable to fit through a 54" culvert, Nokio Creek washes out Road #114 on November 13, 1999.

Nokio Creek, Flathead National Forest — Forest Service photo

The aftermath: Over 1,000 cubic yards of road and sediment were washed down Nokio Creek.

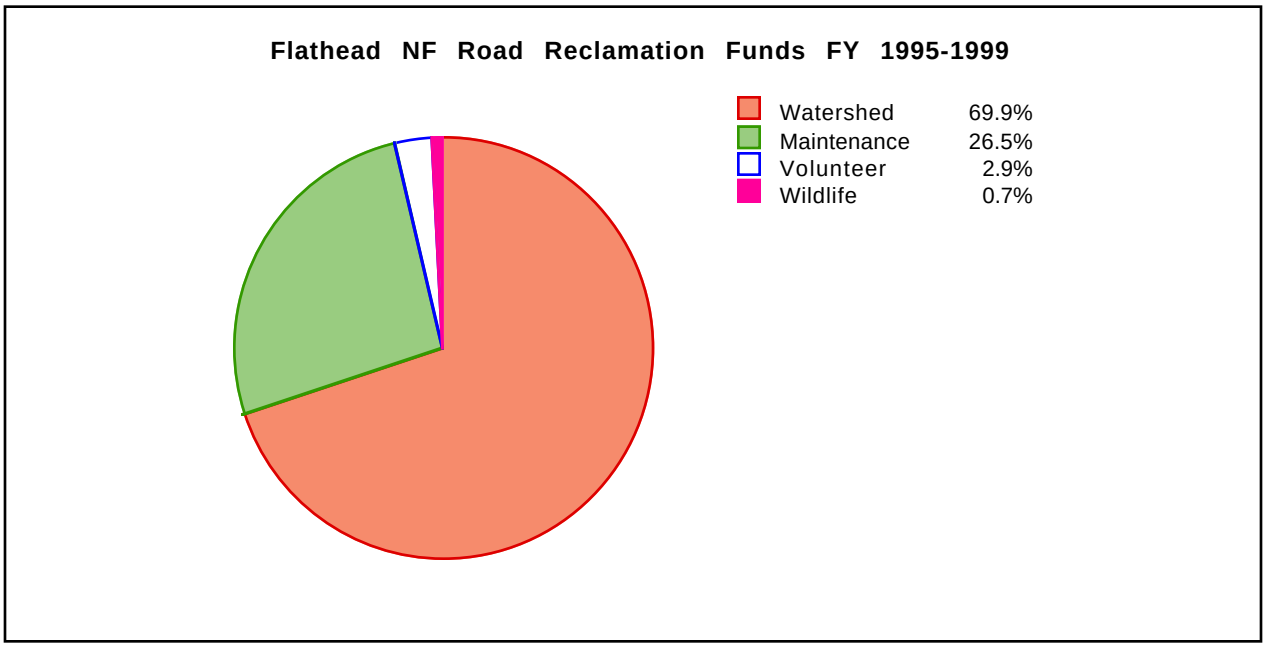
Funding

Nationally, the Forest Service has an $8.4 billion backlog in maintaining its roads, bridges and culverts. Because it receives less that 20% of the funding necessary to maintain its 386,000 miles of inventoried roads, this backlog grows each year. An estimated 60,000 miles of additional, uninventoried roads exist nation-wide. [9] The Flathead National Forest reported in 1998 it has been able to properly maintain only 40% of its existing road system. [10]

According to federal agencies: "Lack of road maintenance can result in elevated sediment delivery to streams as compared to existing baseline levels, primarily from high levels of sediment delivery due to culvert failures, fill slope failures, ditch failures, and surface erosion." [11] Also, the Forest Service recognizes that road reclamation is cheaper in the long run than road maintenance. [12] As a result of these circumstances and an increasing awareness of the environmental costs of building and maintaining roads, the Forest Service has proposed to limit new road construction and reclaim some of its existing roads so it can better maintain the roads it keeps. [13]

With this shift in road management emphasis, road maintenance funds earmarked specifically for road reclamation (also known as obliteration or decommissioning) have been allocated to individual National Forests for the first time. On the Flathead National Forest, $107,000 was allocated expressly for road reclamation work in Fiscal Year 1999 and $78,511 was allocated in FY 2000. [14] These earmarked funds have proven inadequate on the Flathead, however, and their use is being hamstrung by a lack of companion funds for the planning of the road reclamation work. [15]

For FY 1995-1999, the specially earmarked road maintenance funds account for 26% of the total $404,500 in road reclamation costs, with watershed improvement funds providing 70%, volunteer services providing the equivalent of 3%, and wildlife funds providing less than 1%. [16] This dearth of wildlife funding is notable, given these fiscal years represent the first five years of implementation of Flathead Forest Plan Amendment 19's road reclamation to meet grizzly bear security objectives.



Amendment 19

In addition to Forest Plan requirements to maintain and improve water quality and habitat for fisheries, the Flathead in 1995 adopted Amendment 19 to its Forest Plan in order to secure grizzly bear habitat via road closures and road reclamation. Amendment 19 was established as an integrated program that would also benefit water quality and fisheries by requiring that all stream-bearing culverts be removed from all reclaimed roads. [17] Amendment 19 further requires that measurable road density and grizzly bear security objectives be met on a 5- and 10-year implementation schedule clearly divorced from the Flathead's timber sale program. [18]

Prior to Amendment 19, the Flathead Forest Plan had no clear requirement for road reclamation to benefit grizzly bear or other wildlife and contained less restrictive standards for limiting open road densities with gates. It contained no limit on total road densities, nor any clear timetable by which open road density standards would be met. [19] The Flathead essentially proceeded to implement its open road density standard in areas where it was planning timber sales, thus allowing other areas of the Forest to retain persistently excessive open road densities. In response to several lawsuits filed by conservation groups and a resulting court order, the Flathead issued Amendment 19. It is in the "terms and conditions" of Fish and Wildlife Service's biological opinion on Amendment 19 that legally-binding time limits are set for the accomplishment of the amendment's road density and grizzly bear security objectives, without regard for the timber sale program. [20]

In the first five years of Amendment 19 implementation, the Flathead actively reclaimed 184 miles of road and declared another 89 miles as being reclaimed naturally. Of these 273 miles of road, 20% was reclaimed primarily for the benefit of watersheds and fish, in habitat deemed unoccupied by grizzly bear. [21] Conversely, prior to the receipt of road maintenance funds earmarked specifically for road reclamation in FY 1999, watershed improvement funds provided 95% of all road reclamation financing on the Flathead. [22]

Rock Creek, Flathead National Forest Keith Hammer photo

Properly removing a culvert before it fails returns the road to the contour of the land, rather than washing it downstream, and reestablishes a broad streambed that minimizes erosion.

While on the one hand taking credit for benefiting bull trout by removing culverts in roads reclaimed to benefit grizzly bear, the Flathead has on the other hand attempted to rescind its Forest Plan requirement that these culverts be removed at all. This was done in May 1999, when the Flathead Forest Supervisor issued Implementation Note #13, directing that "[d]rainage structures on streams may be left in place if [f]unding to fully reclaim the road is unavailable, and it is desirable to consider the road reclaimed for grizzly bear security." [23]

Similarly, the Interagency Grizzly Bear Committee is attempting to rewrite its road management guidelines to allow Forests like the Flathead to greatly reduce their road reclamation programs in favor of a return to the use of gates, which are of limited benefit to

wildlife and generally do nothing to benefit water quality and fish. [24] The IGBC proposal would reduce Amendment 19 road reclamation by some 80% and replace the essentially permanent grizzly bear security core areas secured by road reclamation with moveable "seasonally secure areas" temporarily protected by gates. [25] In other words, concerted attempts have been made to eviscerate Amendment 19's road reclamation and culvert removal requirements.

Ironically, these efforts to abandon road reclamation come at a time when presidential initiatives have been launched to reduce the road system on the National Forests to a size that can be adequately maintained in order to restore ecosystem integrity. Although previously allowed to spend up to 5% of its road maintenance budget on road reclamation, the Flathead allocated no maintenance dollars for reclamation prior to being awarded funds earmarked specifically for that purpose under the new national initiatives in fiscal year 1999. [26] As mentioned earlier, watershed improvement funds carried 95% of the Flathead's road reclamation program prior to FY 1999.

While the Flathead has issued decisions to reclaim another 344 miles of road, the work has yet to be accomplished. [27] As a result of inadequate priorities, planning, funding and implementation, the Flathead has fallen far short of its mandatory Amendment 19 5-year implementation objectives and has asked Fish and Wildlife Service for more time to accomplish those objectives. [28]

The Problem

While numerous problems contribute to the Flathead's failure to meet its road reclamation and culvert removal objectives, it is due in large part to the fact the Flathead has failed to seize opportunities to consolidate its road reclamation and culvert removal programs and has instead worked at cross-purposes to such an integrated program. As discussed previously, Amendment 19's grizzly bear security program requires the removal of stream-bearing culverts from reclaimed roads. This not only benefits watersheds and fish, but allows the Flathead to utilize these funds in grizzly bear habitat when wildlife funds are scarce.

> *"The information indicates a stable [road reclamation] program, but at a rate which would have to increase to meet Forest Plan five and ten year objectives."*
>
> Flathead Forest Plan
> Monitoring Report 1993-1997

Similarly, in terms of benefits to multiple resources, the Flathead was legally required by Fish and Wildlife Service to develop and implement along with Amendment 19 "a public information program on the positive effects of road closures for fish and wildlife, water quality, and other Forest resources." [29] In spite of written and binding assurances to FWS that it would develop a fact sheet describing the benefits of road closures and obliteration, the Flathead has never done so. [30] Rather than proactively demonstrating to the public the benefits of a road management program that is integrated to benefit multiple species and resources, the Flathead has instead placed

itself in a defensive position and has worked alongside the Interagency Grizzly Bear Committee to eviscerate such a program.

In several major respects, the Flathead has simply failed to place highest priority on meeting the legally required 5- and 10-year road reclamation objectives of Amendment 19. In its 1995 requests for carry-over funds, the Flathead placed a higher priority on securing funding to grant Plum Creek Timber Company road access through grizzly bear habitat than on securing the funding necessary to implement the then-fledgling Amendment 19 road reclamation program. Plum Creek's access requests were prioritized as "critical," and the implementation of Amendment 19 as "not critical," to implementation of the Flathead Forest Plan. [31] Similarly, in its 1998 review of implementation of Amendment 19, the Flathead found the "information indicates a stable recent program, but at a rate which would have to increase to meet Forest Plan five and ten year objectives." Astoundingly, however, it recommended the Forest "continue on present course," rather than pick up the tempo. [32]

In the end, the Ranger District on the Flathead with the least grizzly bear habitat to manage, Tally Lake, is the only district to formulate a road reclamation work plan during the implementation of Amendment 19. [33] With limited exceptions, road reclamation work has been directed to areas where the expenditure of watershed improvement funds can be justified or where concerns for grizzly bear security can be addressed during the National Environmental Policy Act (NEPA) planning process for pending timber sales. Flathead officials point out that this latter phenomenon is due to the fact that, while they may receive funding for conducting road reclamation, it is most often not accompanied by funds to conduct the NEPA planning that must precede the reclamation work. [34]

Hence, these officials argue, they are predisposed to conserve their timber sale and/or NEPA planning money by planning road reclamation only in conjunction with and in areas where they are planning timber sales. This, of course, has inappropriately re-wed the road management and timber sales programs in a way that Amendment 19 intended to divorce them. As a result, road reclamation has often been planned and conducted at a pace and in areas where timber sales are desired, rather than in places where road reclamation is needed the most in terms of securing wildlife habitat, restoring watershed integrity, and meeting legally binding road reclamation objectives.

Road #2902, Flathead National Forest Forest Service photo

Culverts are removed to prevent the road from washing down the creek, as happended here.

Moreover, the implementation of road closures and reclamation have often relied upon timber sale generation of Knutson-Vandenberg funds, which are dependent upon the bid price of the sale but are not fully included in the calculation of the minimum acceptable bid. Thus, the K-V funds generated are often inadequate to accomplish the promised road closure and obliteration work.

Sadly, the incentives to wed road reclamation and watershed rehabilitation to timber sales is not limited to the Flathead. Across the western United States, hydrologists and

other specialists are watching funding for vegetative treatments and timber sales skyrocket as a means to theoretically reduce watershed damage due to wildfire. Meanwhile, programs to make these watersheds more resilient via proven road reclamation go begging and agency specialists are often assigned to mitigating the adverse effects of timber sales rather than being allowed to focus on conducting proactive watershed restoration. It is of little comfort to find that the Forest Service's most recent Cohesive Strategy for watershed "restoration" uses fire-related vegetative conditions to prioritize which watersheds receive vegetative treatments first, rather than which watersheds contain the most roads in need of reclamation. [35]

The Solution

An integrated restoration program can no longer be defined as one in which vegetative treatments and logging take priority over road reclamation and other watershed restoration measures. This bias is persistent and clearly evident in the agency's myopic focus on attempting to return forests to pre-settlement vegetative conditions while completely ignoring the fact that pre-settlement conditions included no roads whatsoever. This bias flies in the face of an increasing body of scientific and agency literature finding that roads have the single most adverse and lasting impact on watersheds and ecosystem integrity. [36]

The tendency to link all other restoration activities on the National Forests to timber sales and vegetative treatments has become heavily institutionalized in both the Forest Service and the Congress. It equates quite literally to a failure to see the problems in the forests for the trees. This link must be broken if road reclamation programs which fully integrate protection for multiple species and forest resources are to receive adequate independent funding and timely implementation.

In the case of the Flathead, Washington and Regional offices of the Forest Service have neither supplied, nor has the Flathead apparently requested of them, the funds necessary to fully implement its Amendment 19 integrated road reclamation program. As already noted, the special funds the Washington and Regional offices have supplied the Flathead to conduct road reclamation work have apparently not been accompanied by funds to firstly plan the road reclamation work. Rather than attempting to piggy-back its road reclamation program on increased funding for timber sales and vegetative "restoration" treatments, the Flathead needs to request and receive adequate funding for both the planning and the execution of an integrated road reclamation program that can be focused on watersheds and habitats most in need of road reclamation.

Shortcuts and End-Runs

The Flathead is only one of many National Forests to attempt short-cuts in its road reclamation programs. It is in good company in learning the hard way that these short-cuts are not ecologically acceptable. Following the Summer 2000 wildfires on the Bitterroot and Lolo National Forests, for example, agency experts are reexamining their former practice of assuming revegetated roads to be reclaimed without firstly returning the road prism to the contours of the land. With the vegetation removed by fire, the means by which these long-forgotten roads continue to accumulate and re-channel water has been exemplified in the resulting magnification of soil erosion and mud flows.

The Flathead has also dropped from its road inventories and considered reclaimed scores of roads that have naturally revegetated in the absence of use. As noted earlier, 89 miles of inventoried road have been designated naturally reclaimed under Amendment 19.

Even on the roads actively reclaimed under Amendment 19, however, the Flathead has seldom, if ever, returned the entire road prism to the contour of the land. Generally, recontouring occurs only immediately adjacent to streams where Amendment 19 has required removal of the culverts. The majority of the remaining road prism, and increasingly the ditch-relief culverts, are left to continue accumulating and re-channelling water and sediment in the watershed, even though Amendment 19 requires that ditch-relief culverts be removed in "most cases."[37] While this practice may stretch limited road reclamation dollars, it limits the overall effectiveness of such watershed restoration efforts both in the short term and in the face of inevitable long-term events such as wildfire.

As noted briefly earlier, the Flathead attempted to further stretch its road reclamation dollars and to fend off public criticism of road reclamation by attempting to ignore the Amendment 19 requirement that all stream-bearing culverts be removed during reclamation. Upon the advice of its own fisheries biologists and attorneys, however, the Flathead abandoned this end-run in the face of a threatened lawsuit. [38]

And, most recently, the Flathead and IGBC's attempted end-run of Amendment 19 has been faulted by the scientists providing independent peer review of its proposal to replace essentially permanent grizzly bear security core areas secured by road reclamation with constantly moving "seasonally secure areas" temporarily protected by gates. The Peer Review found "the simplicity of A19 and its ability to permanently secure areas for grizzly bears makes it a powerful tool in the conservation of the grizzly bear in the NCDE." Conversely, the Peer Review found that the newly proposed approach relies too heavily on the use of gates and seasonally secure areas that change from season to season, concluding the "proposed approach's added complexity unfortunately necessitated several additional assumptions, some of which are tenuous." [39]

The Flathead and IGBC, however, have yet to abandon their attempt to eviscerate Amendment 19's road reclamation requirements. [40] In summary, the primary means by which the agencies firstly developed and have since attempted to end-run Amendment 19's road reclamation requirements, rather than fully implement them, are illustrated by the following chronology.

Chronology of Flathead Forest Plan Road Reclamation Requirements

1986 Flathead Forest Plan: No road reclamation requirements specific to grizzly bear security.

1995 Forest Plan Amendment 19: Requires that an estimated 650 miles of road be reclaimed in grizzly bear habitat, from which all stream-bearing culverts and most ditch-relief culverts must be removed.

1999 Implementation Note 13: "Drainage structures on streams may be left in place if [f]unding to fully reclaim the road is unavailable, and it is desirable to consider the road reclaimed for grizzly bear security." (Approved 5/99 and rescinded 11/99).

1999 IGBC proposal: Would reduce the amount of road reclamation required by Amendment 19 some 80% by replacing essentially permanent grizzly bear security core areas secured by road reclamation with moveable "seasonally secure areas" temporarily protected by gates.

Conclusion

A number of employees on the Flathead have made honest attempts to meet and implement Amendment 19 and other Forest Plan requirements for the management and reclamation of roads and culverts. No one Flathead employee, however, has as his or her sole responsibility these tasks alone. Nor has the Flathead developed a clear work plan by which these responsibilities are shared in a manner that insures the timely implementation of Amendment 19 and other Forest Plan requirements.

Citizen groups have hired watershed restoration consultants to provide the Flathead with expertise on proper road reclamation and culvert removal. These groups have also offered to provide consultants and training to the Flathead on the revegetation of reclaimed sites, but the Flathead has declined the offer. [41] While some citizen groups and Flathead employees have attempted to insure that road reclamation is done properly and is presented in a proactive manner, leadership on the Flathead and in the IGBC has failed completely to produce even the most rudimentary fact sheet for public distribution, listing the numerous benefits of road reclamation.

This is all the more unacceptable given the Forest Service's acknowledgment that it has too many miles of roads to adequately maintain. Hence, the Forest Service acknowledges, it must reduce the size of its road system not only for environmental reasons, but because it is cheaper in the long run to reclaim a road than to maintain it. In other words, the money saved through road reclamation is needed to better maintain the roads retained as a part of the long-term transportation system.

Ultimately, it is a lack of support to planning and field personnel that has resulted in the Flathead's failure to meet its Amendment 19 and other road reclamation objectives. This lack of support is most obvious in the failure of the Flathead to prioritize and secure the funds necessary to develop an adequate work plan and to assign the necessary tasks and funding to planning and field personnel. This situation is bound to continue until the Flathead places a higher priority on the timely accomplishment of Amendment 19 and other Forest Plan road and culvert management objectives than on efforts to end-run them.

Flathead National Forest — Forest Service photo

Road #114 deposited downstream from the Nokio Creek culvert failure.

Notes

1. Flathead Forest Plan Monitoring and Evaluation Report 1993-1997, dated September 1998. Programmatic Biological Assessment for Road Maintenance: Bull Trout . . . Western Montana; Montana Level I Team of Forest Service and Bureau of Land Management; 4/16/99.

2. Flathead NF 11/24/99 and 10/26/00 responses to FOIA requests.*

3. Using the recent 2.5 miles of new road construction in the Flathead's Emery Creek as an example, there were 45 culverts installed, for an average of 18 culverts per mile (personal communication with Al Sorenson; Flathead NF; 11/21/00). Using the 3,761 and 5,025 miles of road reported to exist on the Flathead (see Note 1), an estimate of a total 67,698 to 90,450 culverts is derived.

4. Flathead NF 10/26/00 response to FOIA requests.*

5. Flathead NF Flood Damage report to the Regional Forester; 4/4/90.

6. Fisheries Biological Assessment for Nokio Creek Culvert Replacement. Pat Van Eimeren; Flathead NF; 6/20/00.

7. Montana Dept. of Fish, Wildlfie and Parks survey report to Flathead NF; Tom Weaver; 12/18/95.

8. Swan Lake Ranger District photo report on failed culvert on Road 9569 in Kraft Creek; 10/18/99; included in Flathead NF 2/28/00 response to FOIA requests.*

9. Forest Service Roadless Area Conservation FEIS; Volume 1; 11/00. News Release; Washington Office Forest Service; 1/22/98.

10. Flathead NF press release; 11/16/98.

11. See Note 1, second reference.

12. Missoulian new article by Michael Jamison; 11/20/98. Allen Rowley, of the Flathead NF, is reported as stating that, while road reclamation may cost some $5,000 per mile, maintaining an open road may cost $6,000 per mile.

13. See Note 9. See also National Forest System Road Management Strategy Draft EA; Washington Office USFS; 2/16/00.

14. Obliteration Miles and Funds; Flathead NF; 9/26/00; included in Flathead NF 10/26/00 response to FOIA requests.* Transaction Register Budget Authority; Flathead NF; 5/19/00.

15. Personal communication with Debbie Manley and Terry Chute; Flathead NF; 10/11/00 and 11/9/00, respectively. Both claim that road maintenance funds specially earmarked for road reclamation can only be used for the actual reclamation, not for the NEPA planning of the reclamation.

16. See Note 14, first reference.

17. Flathead Forest Plan Amendment 19 Amended EA and Decision Notice; Flathead National Forest; 3/95.

18. Amended Biological Opinion on Flathead Forest Plan Amendment 19; Kemper McMaster, Fish and Wildlife Service; 2/17/95.

19. Land and Resource Management Plan and EIS for the Flathead NF; James Overbay; 1/22/86.

20. Friends of the Wild Swan was a co-plaintiff in all three lawsuits. In pertinent part, *Resources Limited v Robertson* alleged that the Flathead Forest Plan violated the Endangered Species Act by failing to insure it would not jeopardize the continued existence of the threatened grizzly bear, largely because its allowable timber sale quantity could not be implemented without violating the Plan's grizzly bear management standards. The Ninth Circuit Court of Appeals ruled in favor of the plaintiffs on 11/1/93, essentially ordering the Flathead to Amend its Forest Plan and re-consult with Fish and Wildlife Service to insure that it would not jeopardize grizzly bears.

Simultaneously, *Swan View Coalition v Turner* alleged that the excessive open road densities that were persisting on the Flathead were resulting in an illegal "taking" of threatened grizzly bear through the adverse modification of their feeding, breeding and sheltering habits. It further alleged that FWS's biological opinion approving the Flathead Forest Plan did not contain an adequate "incidental take statement" allowing for such a level of taking to occur legally. The District Court on 12/7/92 found the incidental take statement to indeed be inadequate and ordered the case to trial in order to determine if the taking could be traced to excessive open road densities.

Also simultaneously, *Swan View Coalition v US Forest Service* alleged that the Forest Service and FWS violated the ESA by failing to use the best available scientific data in planning and approving the Flathead's Lost Silver timber sale, which was to be located in Montana Department of Fish, Wildlife and Park's South Fork Grizzly Bear Study area. The South Fork Study investigated, in part, the effects of both open and closed roads on grizzly bear. It concluded that grizzly bears continue to avoid roads closed by gates and recommended that road reclamation would be required in order to provide adequate secure areas for grizzly bear.

By issuing Amendment 19 in 1995, the Flathead responded to the court's order in *Resources Limited* by reducing its allowable timber sale quantity from 100 million board feet per year to 54 and by issuing new grizzly bear management standards, particularly in regards to limiting both open and total road densities and providing adequate security core areas. These new standards were based on data collected by the South Fork Study. Through formal consultation, FWS issued a biological opinion which included an incidental take statement whose legally-binding terms and conditions required that the Flathead meet certain road density and security core objectives at the end of the fifth and tenth years of Amendment 19 implementation. It also required the Flathead to implement "a public information program on the positive effects of road closures for fish and wildlife, water quality, and other Forest resources," starting in the first year. These measures rendered the two *Swan View* lawsuits moot and they were dismissed.

21. Reclamation Projects spreadsheet; John Ganiere; Flathead NF; 6/12/00.

22. See Note 14, first reference.

23. Flathead NF's Top Ten Proposals for Road Projects Related to Bull Trout; Cathy Barbouletos; 1/11/99. Flathead LRMP Implementation Note #13; Cathy Barbouletos; 5/6/99.

24. Rationale and Choices Made in the Review and Development of an Access Direction Proposal for the NCDE Grizzly Bear Ecosystem; Ake, Carney, Dolan, Godtel, Gore, Harris, Mace, Madel, Servheen, Soukkala, Vandehey, Waller and Wittinger; NCDE Access Task Group of the Interagency Grizzly Bear Committee; 10/98 Draft.

25. Summary of Questions and Results for NCDE Access Management "Test Subunit Analysis"; NCDE Subcommittee of the Interagency Grizzly Bear Committee; 4/27/99. In a computer-modeled test of 9 grizzly bear management subunits, Amendment 19 would require the reclamation of 64 miles of road to meet total road density limits, while the new proposal would require only 12 miles of road reclamation.

26. See Note 14, first reference.

27. See Note 21.

28. Flathead NF letter to Fish and Wildlife Service; Cathy Barbouletos; 5/12/00; with Flathead NF 1999 LRMP Amendment 19 Monitoring Report enclosed.

29. See Note 18.

30. Flathead NF letter to Fish and Wildlife Service; Rodd Richardson; 11/27/96. Personal communication with Allen Rowley, Flathead NF; 11/29/00.

31. Carryover Request; Flathead NF; 11/17/95.

32. See Note 1, first reference.

33. Flathead NF 11/24/99 and 10/26/00 response to FOIA requests.* Tally Lake Ranger District is the only district on the Flathead which prepares work plans for the expenditure of watershed improvement funds.

34. See Note 15.

35. Protecting People and Sustaining Resources in Fire-Adapted Ecosystems, A Cohesive Strategy: The Forest Service Management Response to the General Accounting Office Report GAO/RCED-99-65; October 13, 2000. See Assumptions in Appendix D.

36. See Notes 9 and 13. See also generally the various scientific and NEPA documents prepared for the Interior Columbia River Basin Ecosystem Management Project. Swan View Coalition and Friends of the Wild Swan have also summarized these findings and compiled a lengthy bibliography in this regard in their 7/11/00 comments on the Roadless Area Conservation DEIS.

37. See Note 17.

38. Fisheries Biological Evaluation for Amendment 19; Donald Hair, Flathead NF Fisheries Biologist; 2/4/95. Directive rescinding Implementation Note #13; Cathy Barbouletos, Flathead Forest Supervisor; 11/19/99. Missoulian news article by Michael Jamison; 11/24/99. Presented with the requirements mandated by its fisheries biologist, the plain language of Amendment 19, and a 60-day notice of intent by Friends of the Wild Swan and Swan View Coalition to sue on behalf of threatened grizzly bear and bull trout, the Flathead withdrew its Implementation Note #13, stating it had talked it over with its attorneys and decided the conservation groups "were right."

39. Peer Review of the Motorized Access Management Strategies for Grizzly Bear Habitat in the Northern Continental Divide Ecosystem; Dr. Bruce McLellan, Dr. M. A. Sanjayan and Dr. Nova Silvy; 9/19/00.

40. Personal communication with Cathy Barbouletos, Flathead NF, and Ann Vandehey, FWS; NCDE Interagency Grizzly Bear Committee subcommittee meeting; 11/29/00.

41. Friends of the Wild Swan, Swan View Coalition and Wildlands CPR paid for and hosted a 3-day workshop presented by Pacific Watershed Associates on the Flathead NF May 31-June 2, 1996. By letter of 7/20/98, Glacier View Acting District Ranger Debbie Manley refused Swan View Coalition's offer to provide the services of Bitterroot Restoration in conducting a hands-on workshop in revegetating sites where culverts have been removed.

*The Freedom of Information Act (FOIA) requests referenced in these notes refer to those made of the Flathead NF in the matter of road and culvert management by Swan View Coalition and Friends of the Wild Swan on 8/10/99 and 6/13/00.

ECONOMIC ANALYSIS

OF THE

NORTHERN ROCKIES ECOSYSTEM PROTECTION ACT

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Economist

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Executive Summary

The proposed Northern Rockies Ecosystem Protection Act (NREPA) will save a least **$245 million** dollars over ten years and is the most cost-effective means of protecting endangered species in the northern Rockies. In addition to restoring watersheds and saving the taxpayers money, NREPA creates more than 2300 high paying jobs for the region.

NREPA saves taxpayers money by prohibiting road building and logging in roadless areas designated as wilderness. Logging areas NREPA would protect at levels desired by the U.S. Forest Service would result in a net loss to U.S. taxpayers of approximately **$375 million** over the ten-year period of 2003-2013 (see Tables I-V). Furthermore, this figure understates the loss because it does not include the millions of dollars in maintenance expenses that logging roads incur. In central Idaho alone, the federal government spent $10 million repairing roads damaged by landslides in 1996. The Forest Service estimated that logging caused eighty- percent of these slides.

NREPA produces more jobs because of the habitat restoration work associated with the wildland recovery areas. The costs of this work will be approximately $130 million over ten years (see Table VI). This cost is $245 million less than the $375 million net projected loss for logging these areas. Removing the roads and restoring the recovery areas will save the federal government tens of millions of dollars in reduced road maintenance expenses which would help reduce the $8 billion back log of road maintenance needs in our National Forests. The Forest Service in a 2000 report titled *Water and the Forest Service* found that water originating from lands that NREPA would protect has a value of at least $1 billion. It makes no economic sense to lose hundreds of millions of dollars on logging that harms the most valuable commodity our forests produce, water.

Since the total savings associated with this alternative are much greater than the total costs, a conservative estimate of the net savings would be at least $**245 million** (see Table VII). NREPA saves taxpayers millions of dollars, creates 900 more jobs, provides maximum protection for grizzly bear and other endangered species habitat, shortens the total time frame for endangered species recovery and improves the economic viability of the northern Rockies states.

The Northern Rockies Ecosystem Protection Act (NREPA) creates jobs. People live and work in the Northern Rockies because of its natural beauty. The question of jobs versus the environment is a false one. These states would actually end up with more jobs if these lands were left in their natural state. It will directly create 2338 jobs by obliterating environmentally destructive roads. Only 1400 jobs will be lost in the wood products industry when these unique wildlands are preserved. NREPA will indirectly create thousands of more jobs by preserving a pristine environment, the economic base of the Northern Rockies' states.

These states' current economic vitality is dependent on their high quality natural environment, not declining extractive industries. Further damage to these pristine areas will threaten the economic future of these states.

Using Forest Service data, Professor Thomas Power, Chairman of the Economics Department at the University of Montana, estimated 1400 jobs would be lost if we preserve these roadless lands as wilderness. If we log all of this land today 1400 people would be employed for one year. But the loss of 1400 jobs could be made up in less than three weeks with normal job growth (Power). The job loss is small because most of these roadless lands are not suited for timber production. The trees are too small and too few. Moreover, the number of timber jobs will continue to decline with technological advancement and the diminishing supply of trees. Capital intensive technology is the main cause of the fall in timber related employment, not lack of trees. Employment in the wood products industry in Montana peaked in 1979 when 11,606 employees cut and milled 1 billion board feet of timber. In 1989, the timber industry harvested a record amount of timber, almost 1.3 billion

board feet, but only 9,315 people were employed. The data the Forest Service used in projecting job loss is from 1972. They estimate that for every one million board feet of timber cut 9 jobs will be created for one year. If current data is used only 1.5 to 2 jobs will be created for every million board feet logged. The number varies depending on how the wood is processed. Fewer jobs are created now than 30 years ago because of advances in technology. One person can cut in an hour what a two-person crew could cut in a day twenty years ago. With today's technology only 560 timber industry jobs would be lost if we preserve these lands as wilderness. If we cut all of these lands today 560 people would be employed for one year. We can expect further technological advancements in the future. Employment in the timber industry will continue to decline.

NREPA proposes nearly one million acres as National Recovery areas. 6,556 miles of roads would be closed and restored and fish and wildlife returned. These activities would employ people. The Forest Service estimates it costs an average of $10,000 to totally obliterate a mile of road in the Northern Rockies. Obliterating 10,000 miles of roads would create approximately 625 jobs for heavy equipment operators. And these are good jobs that could be spread out well into the 21st century. Heavy equipment operators earn approximately $25 per hour. The employment created by this method will greatly ease the transition from a timber-based economy. The money to pay for this could come from ending timber subsidies. In the last ten years, the Forest Service has lost over $2 billion on its timber program. The justification for this corporate welfare is job creation. NREPA can produce more quality jobs and do so without destroying the west's major resource.

It is also argued that when we build roads we create something economically valuable but when we destroy roads we only make the mountains beautiful. In actuality, when we build roads we create a liability. Ninety per cent of the increase in silt from logging comes from roads. Roads contribute sedimentation to streams for an indefinite period. The road cut creates soil conditions that do not stabilize over time (Richard Hauer, PhD Flathead Lake Biological Station, personal interview). "Instream sedimentation

deposited in the stream bottom decreases the success rate of egg hatching and fry development by impeding water flow through the gravels in which the eggs undergo early development" (Final Report, Montana Environmental Quality Council, December 1988).

The bull trout was recently listed as an endangered species. Logging harms these fish as well. Sediment originating from logging and logging roads can reduce embryo survival of bull trout and westslope cutthroat trout and decrease the available pools used for rearing bull trout. Bull trout are selective in the streams they choose. They only spawn in twenty-eight streams of the hundreds available in the Flathead Lake water basin (Weaver, Fraley).

In central Idaho erosion rate along roads was 750 times greater than in undisturbed areas. The silt fills spawning pools and has led to population declines in fish such as bull trout, salmon and westslope cutthroat trout (Noss). Salmon population supports 60,000 jobs and a billion dollar industry. The federal government is spending millions of dollars trying to save these fish. It would be more cost effective to deal with one of the sources of the problem which is logging.

The Forest Service closes many roads after logging in an area has ended. But the simple closing of these roads does not mean an end to their maintenance costs. The Forest Service spends between $300 and $500 per mile for minimum road maintenance. The Forest Service estimates that it is more cost efficient to obliterate a road if it is not going to be used for the next 20 years. By obliterating these roads up to $5 million in normal annual maintenance cost would be saved. The minimum maintenance does not take into account floods. Flood damage to roads runs in excess of a million dollars a decade per ranger district. This is due to maintenance costs alone. It does not take into account the tremendous environmental damage roads cause.

Elk population directly declines with road density. Two miles of roads per square mile leads to a 50 percent reduction in the elk population and six miles of roads per square mile eradicates virtually all elk in that area (Noss). The hunting of elk brings in a billion

dollars a year into Montana every year and creates more jobs than logging according to the Montana Department of Fish Wildlife and Parks. The continued destruction of these lands will directly harm the hunting industry. Roads also increase poaching. The majority of poaching occurs from roads because they offer easy access into previously remote areas. Grizzly bears avoid roads by an average distance of one half mile (Noss). This leads to a tremendous reduction in their habitat.

But costs are more than just what the market measures. We can not replace animals when they become extinct. Professor John Craighead believes additional road construction will mean the end of the grizzly bear in the continental United States. This is not a jobs versus the environment scenario. NREPA will protect the environment, create jobs, and save the taxpayers money. The trade-off is between permanently damaging the environment for the sake of a few hundred temporary jobs in the timber industry at the expense of destroying the Northern Rockies economic base, its natural landscape, and the thousands of jobs it attracts to the region every year.

Table I

Northern Rockies Ecosystem protect Act
Savings from reduction in timber harvest
Region I $81,347,230

Region I National Forests	Avg. loss per thousand board feet (MBF)	Amount allowed to sell per decade in million board feet (MMBF)	% of ASQ from lands NREPA would protect	Regeneration costs	Savings from reduced logging under NREPA first decade
Beaverhead	$143.64	173	8.1%	$64,407	$2,077,234
Bitterroot	$186.32	100	28.3%	$243,699	$5,516,555
Clearwater	$86.66	550	7.5%	$325,322	$3,900,047
Deerlodge	$143.64	230	10.9%	$472,801	$2,038,477
Flathead	$121.79	536	12.5%	$390,955	$8,550,885
Gallatin	$183.93	100	67%	$496,412	$12,819,722
Helena	$136.50	150	9.3%	$51,433	$1,955,608
Idaho Panhandle	$50.81	800	10%	$1,200,841	$5,265,641
Kootenai	$71.67	1200	1.5%	$180,682	$1,470,742
Lewis and Clark	$81.79	121	4.4%	$70,842	$506,292
Lolo	$86.66	1070	1.9%	$104,869	$1,766,643
Nez Perce	$83.26	1380	30%	$1,009,744	$35,479,384
Total Savings from Region I					_____ **$81,347,230**

Table II

Northern Rockies Ecosystem protect Act
Savings from reduction in timber harvest
Region II $4,335,434

Region II National Forests	Avg. loss per thousand board feet (MBF)	Amount allowed to sell per decade in million board feet (MMBF)	% of ASQ from lands NREPA would protect	Regeneration costs	Savings from reduced logging under NREPA first decade
Bighorn	$89.42	149	15.4%	$197,844	$2,249,675
Shoshone	$83.28	105	21.9%	$170,736	$2,085,759
Total Savings from Region II					_____ **$4,335,434 ========**

Table III

Northern Rockies Ecosystem protect Act
Savings from reduction in timber harvest
Region IV $87,389,020

Region IV National Forests	Avg. loss per thousand board feet (MBF)	Amount allowed to sell per decade in million board feet (MMBF)	% of ASQ from lands NREPA would protect	Regeneration costs	Savings from reduced logging under NREPA first decade
Boise	$100.93	850	24%	$16,944,316	$37,534,036
Bridger-Teton	$81.56	117	45.3%	$396,754	$4,719,516
Caribou	$69.67	107	41%	$359,093	$3,415,516
Challis-Salmon	$120	262	9.5%	$294,553	$3,281,353
Payette	$69.30	809	30%	$1,480,155	$8,299,265
Sawtooth	$50.42	75	9.9%	$252,757	$767,532
Targee	$69.67	660	40%	$978,922	$19,371,802
Total Savings from Region IV					_____ **$87,389,020** =========

Table IV

Northern Rockies Ecosystem protect Act
Savings from reduction in timber harvest
Region VI $201,942,834

Region VI National Forests	Avg. loss per thousand board feet (MBF)	Amount allowed to sell per decade in million board feet (MMBF)	% of ASQ from lands NREPA would protect	Regeneration costs	Savings from reduced logging under NREPA first decade
Colvilee	$115.61	1707	24%	$1,261,104	$48,624,209
Malheur	$171.12	2330	15%	$3,635,299	$63,441,739
Umatilla	$104.03	3282	19%	$1,869,578	$66,740,605
Walowa-Whtm	$136.50	1440	11%	$1,514,681	$23,136,281
Total Savings from Region VI					_____ **$201,942,834** =========

Table V

Total savings to U.S. Treasury from not logging in areas protected by NREPA
(First Decade)

Region I	$ 81,347,230
Region II	$ 4,335,434
Region IV	$ 87,389,020
Region VI	$201,942,834
Total	**$375,014,518**

Table VI

Jobs Created By Northern Rockies Ecosystem Protect Act
Wildland Recovery Work

Jobs	Total Cost	Number of Jobs	Miles of Road Obliterated
Road Obliteration	$40,442,178	364	6566
Road Reclamation Jobs	$6,839,680	83	
Forest Reclamation Jobs	$82,523,880	1891	
Total	**$129,805,738**	**2338 Jobs**	

Table VII

Northern Rockies Ecosystem Protect Act
Fiscal Impact

		Jobs	Miles of Road Obliterated
Savings from reduction in logging See Table V	$375,014,518	Number of Jobs lost due to reduction in logging <1400>	
Cost of Wildland Recovery Work	<$129,805,738 > _____	Jobs created 2338	6566
Net Savings	$245,208,781	Net Jobs Created 938	

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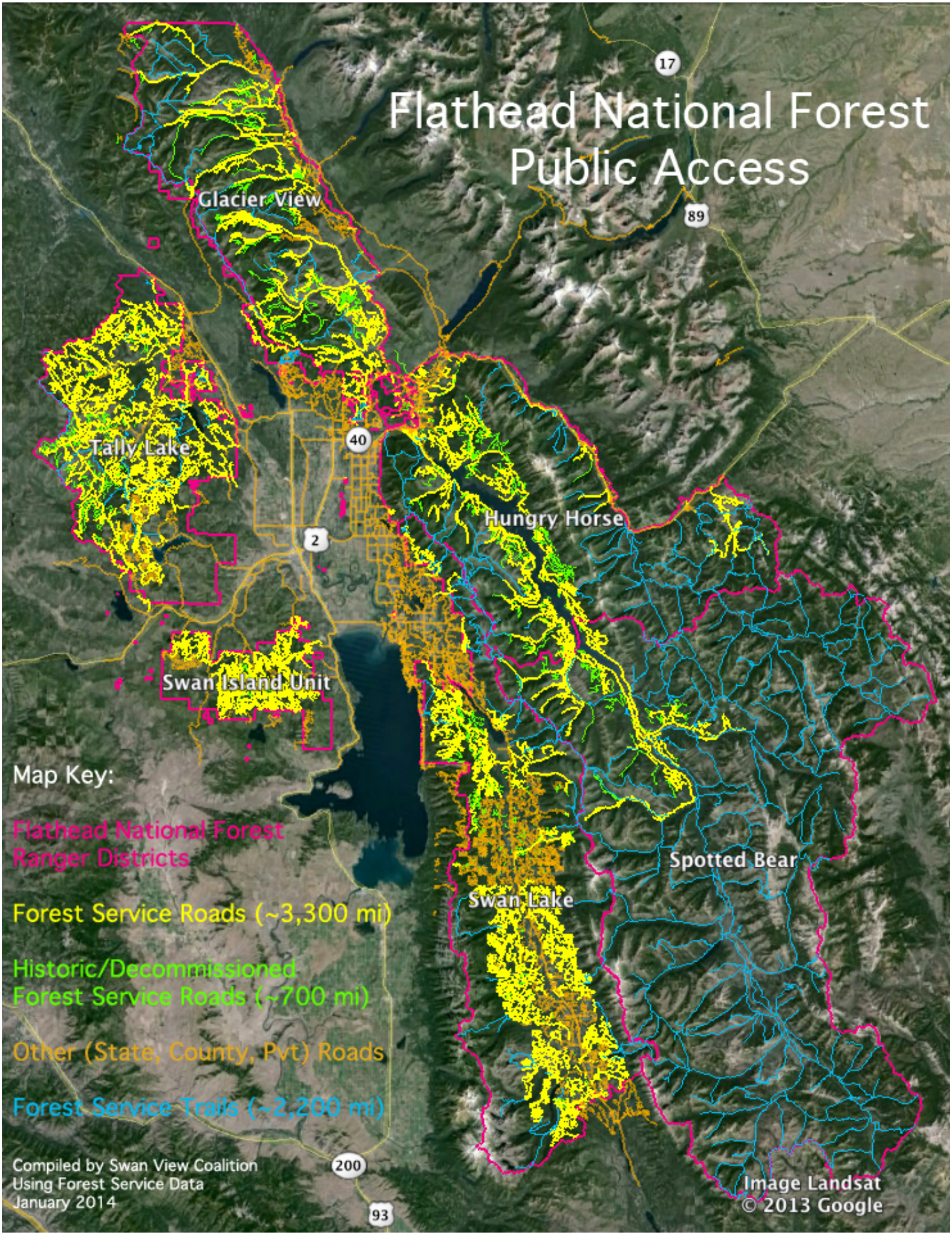
Flathead National Forest
Public Access
Glacier View
Tally Lake
Hungry Horse
Swan Island Unit
Spotted Bear
Swan Lake
17
89
40
2
200
93
Map Key:
Flathead National Forest
Ranger Districts
Forest Service Roads (~3,300 mi)
Historic/Decommissioned
Forest Service Roads (~700 mi)
Other (State, County, Pvt) Roads
Forest Service Trails (~2,200 mi)
Compiled by Swan View Coalition
Using Forest Service Data
January 2014
Image Landsat
© 2013 Google

Friends of the Wild Swan
P.O. Box 103
Bigfork, MT 59911

March 11, 2014

Swan Lake Ranger District
200 Ranger Station Road
Bigfork, MT 59911
Attn: Rich Kehr, District Ranger
Via e-mail to: FS-comments-northern-flathead-swan-lake

Dear Rich,

Please accept the following comments on the Cold Jim Fuels Reduction and Forest Health Project Environmental Assessment (Cold Jim) on behalf of Friends of the Wild Swan. We incorporate the comments submitted by Swan View Coalition in an attachment to this document. We are also attaching a bibliography of scientific references that should be used to inform your decision.

Cumulative Effects
The National Environmental Policy Act requires that direct, indirect and cumulative effects as well as connected actions be analyzed in the environmental assessment. The cumulative effects analysis in the Cold Jim EA is inadequate.

• The EA fails to analyze the cumulative effects of the Chilly James Restoration Project. The Chilly James Project is in the Cold and Jim Creek watersheds. The Cold Jim Project area overlaps with Chilly James in the lower elevation and some roads targeted for decommissioning are in or near Cold Jim units.

The Chilly James purpose is to:

• Restore fish habitat and water quality by reducing sedimentation from roads that are deposited in aquatic habitats; reducing indirect effect of roads on stream channel morphology or wetlands; and improving aquatic habitat resiliency by minimizing risks associated with roads.

• Maintain a cost-efficient road network for long term resource management.

• Reduce spread of invasive plants by controlling weeds on roads in a cost-efficient manner, primarily through utilizing herbicides sprayed from a truck or OHV. This will be accomplished by applying BMPs, placing roads in storage, passively and actively decommissioning roads, recontouring decommissioned roads and road realignment.

While the long-term goal of Chilly James is restoration, there are still impacts from the road work and weed spraying that should have been analyzed in the Cold Jim EA. It is a

reasonably foreseeable and connected action – the Forest Service requested public involvement on Chilly James in May 2013, there was a public meeting on June 24, 2013 and the scoping period for Chilly James is running concurrent with the Cold Jim EA comment period. (Cold Jim comments are due March 11, 2014 and Chilly James comments are due on March 21, 2014.)

The Cold Jim EA does not even mention Chilly James nor does it analyze the cumulative impacts of both projects occurring simultaneously in same watersheds that are critical habitat for bull trout and lynx and in MS1 grizzly bear habitat. The Flathead must prepare an Environmental Impact Statement to analyze these cumulative impacts.

• The Cold Jim EA fails to analyze the impacts from The Nature Conservancy's (TNC) ten projects that are occurring in the Cold and Jim Creek watersheds until December 31, 2014. The Cold Jim Mechanical, Cold Jake, Cold Creek Zoo, Maria's Soggy Bottom, Cold Pizza, Mike's Sharpie, Yew-Ville, Good Friday, Old Peg and Big Easy timber sales are currently or have recently been logged. TNC does not have to comply with INFISH and uses the Montana Streamside Management Zone law. These sales log in riparian areas yet there is no analysis for these impacts in the fisheries and hydrology sections of the EA. Overstory canopy will be removed reducing thermal cover and wildlife connectivity. Logging will occur adjacent to wetlands. These are now Forest Service lands and the effects of TNC's logging must be analyzed as if they were Forest Service projects.

• Including the wilderness in the project area dilutes the effects of this timber sale. The vegetation and wildlife analysis are skewed because the Mission Mountain Wilderness is used to offset effects in the heavily logged and roaded non-wilderness. The EA must also include the impacts within a reasonable project boundary so that the effects are adequately analyzed on different spatial scales. That doesn't mean that effects can't be analyzed within a bear management subunit, but logging wildlife habitat in the lower elevations is not mitigated by the Wilderness at higher elevations.

Vegetation and Old-Growth Forest Habitat

• We appreciate that this project does not log in old-growth forest habitat. However, there is very little old growth in the non-wilderness part of the project area and it is in fragmented patches. The EA did not disclose what the 75% range around the median of historical variability is in the project or cumulative effects area. How much old growth does that equate to? How is this project moving the Flathead towards or away from the goal to maintain and recruit old growth forests? Historically old-growth habitat was 15% to 60% on the Flathead (source Amendment #21). Current old-growth average is 6.9% in the Swan (source 1999 – 2007 Forest Plan Monitoring Report). This project does not move towards compliance with the Forest Plan.

• The Flathead has no plan for how it is going to maintain, recruit and connect old-growth forest habitat. There are approximately 29 units adjacent to existing old growth yet there is no analysis of how logging these units will affect the old-growth forest.

• The vegetation analysis does not distinguish between the forest condition in the wilderness and non-wilderness. There is no description of the forest stands slated for logging, what species composition is in the different units, age classes in the units and why they need to be treated. The vegetation section does not analyze the current condition or effects to old growth forests.

• This project will negatively impact old-growth associated species due to high contrast edge effects, displacement, logging recruitment old growth, and temporary roads on the edge of old growth stands. Six miles of high contrast edge currently exists along verified old growth, Alternative B will create another .8 miles of edge that will last for 30 years. No alternative was developed that favored wildlife. Alternative C makes a few adjustments but retains most of the units from Alternative B.

• Research indicates that some old growth associated species such as the pine marten need old growth in stand sizes of 250 to 500 acres to be effective. Pileated woodpeckers, another old growth associated species, require 100-250 acre stands. Goshawks, another old growth associated species, require an average nesting stand size of 40 acres in west-central Montana, plus additional acres for postfledgling habitat. The verified old growth stands in the Project range from 5 acres to 154 acres with the average being 50 acres. An average old growth stand size of 50 acres is insufficient for all of these old growth associated species.

Wildlife

• Using the Bear Management Subunit, that includes the Mission Mountain Wilderness, as the project area will dilute the effects in the actual project area. The forest condition in the Wilderness is pristine, the forest condition outside the wilderness is heavily roaded and logged. The effects of this project are watered down because the wilderness is part of the project area. That doesn't mean that effects can't be analyzed within a bear management subunit, but logging wildlife habitat in the lower elevations is not mitigated by the Wilderness at higher elevations. For example, there may be ample old-growth forest habitat in the Wilderness but in the lower elevations of the project area old growth is scarce and fragmented. The Wilderness is higher elevation so it may not be suitable habitat for some species. You must reanalyze the impacts in an EIS using various spatial scales.

• The Forest Plan has designated some of the project area as MA15, however, the Forest Plan is long overdue for revision. Lynx and bull trout critical habitat have been designated since the MA15 designation. The EA failed to resolve conflicts between MA15 and lynx critical habitat. Furthermore, the Flathead has apparently designated former Plum Creek lands as MA15 without undergoing any analysis.

• The EA discloses that carnivore surveys, track surveys and DNA surveys failed to detect fisher in the Cold Jim area. Fisher have not been detected through surveys on the Swan Lake, Seeley Lake and Lincoln Ranger Districts. Yet the Forest Service still believes that populations are secure. This project will decrease fisher habitat by 805 acres

(Alternative B). The EA concludes that the project "may impact individuals or habitat, will not likely contribute to a trend towards Federal listing or loss of viability to the population or species."

How can the Flathead possibly make this determination when the Forest Service doesn't even know what the baseline population is, what the current population is and what the population trend for this species is in the project area?

Without this key information the Flathead cannot determine whether it is currently maintaining viable populations of fisher and whether this project or past projects has negatively impacted the fisher. The lack of fisher in the project area and on the Flathead NF calls into question the Forest Service's use of the "proxy on proxy" approach which assumes sufficient habitat will remain for MIS like fisher and wolverine.

Research is showing that female fishers select habitat at two scales: a stand scale as indicated by stands that have large mean and maximum DBH trees (as well as a large variation in tree size) and a landscape scale as indicated by the preference for landscapes with a high proportion of large trees. Thus, it appears that while fishers can be detected in riparian stringers that bisect open landscapes, this habitat may not be sufficient for persistence. The converse is also likely true. Landscapes that do not have variation in large trees, snags, and cavities, and drier landscapes (i.e., landscapes with ponderosa and lodgepole pine) are probably not sufficient for fisher persistence either. Forest activities that promote the growth of multi-stage stands with ample structure and variation in tree widths and ages will provide the best habitat for fishers. Retaining trees that have decadence, disease, or defects will help provide some of this habitat. (Schwartz et al. 2013)

Fishers showed strong selection for where they established home ranges within the landscape, avoiding establishing home ranges in areas with high densities of open areas. Being that fishers establish home ranges only where there is a sufficient concentration of suitable habitat, our observation that fishers excluded wetland ecosystems and recently logged stands from their home range may be linked to the low densities of resources found in these areas. Wetlands and recently logged areas typically have little overhead cover, which likely exposes fishers to greater risk from aerial predators. Further more, escape cover, such as trees for climbing, is farther apart in these environments, making fishers further susceptible to terrestrial predators. (Weir and Corbould, 2010)

The relationship between the extent of open areas and probability of home range occupancy suggests that past and proposed forest harvesting can strongly affect the ability of the landscape to support fishers, especially in landscapes in which wetland ecosystems are common. Landscapes with previous widespread and intensive forest harvesting may lose their ability to support fishers until these harvested areas regenerate sufficiently. Depending on the residual density of fishers in the harvested landscape, fishers need to disperse from adjacent areas with less forest harvesting for these landscapes to support resident fishers again. Intensive forest harvesting in the future may exacerbate the already diminished ability of modified landscapes to support fishers,

particularly in forests that are slated for salvage harvest of diseased or damaged trees. (Id.)

The Cold Jim Project will result in loss of canopy cover and hiding cover, insufficient large trees, snags and down woody material and more fragmentation. The current fragmented landscape outside of the Wilderness is likely already impacting fisher since they cannot be found in the project area or in the upper Swan, this project cumulatively adds to this problem and reduces the likelihood of fisher persisting in this area. If you can't find fishers than how can the impacts be minimal as the EA concludes?

The Forest Plan requires monitoring the distribution of fishers and the change in population status, ensuring projects do not contribute to the loss of viability of fisher, avoiding adverse impacts to fisher or their habitats whenever possible and preparing a fisher management plan or conservation strategy to prevent the loss of population viability. The Flathead has not completed a conservation strategy for fisher. This project does not avoid adverse impacts to fisher and their habitats but instead increases them.

• This project will result in a decrease of 485 acres of lynx foraging habitat for at least 20 years, (Alternative B). Precommercial thinning has been shown to reduce hare numbers by as much as 2- and 3-fold due to reduced densities of sapling and shrub stems and decreased availability of browse. Researchers believe that the practice of precommercial thinning could significantly reduce snowshoe hares across the range of lynx. (LCAS 2013)

Winter mature multi-story foraging habitat is important and currently limiting for lynx. Removal of larger trees from mature multi-story forest stands to reduce competition and increase tree growth or resistance to forest insects may reduce the horizontal cover (e.g., boughs on snow), thus degrading the quality of winter habitat for lynx. Similarly, removing understory trees from mature multi-story forest stands reduces the dense horizontal cover selected by snowshoe hares, and thus reduces winter habitat for lynx. (Id.)

The EA cannot rely on habitat in the Wilderness to offset damage to habitat outside the Wilderness. How much foraging habitat is there outside of the Wilderness?

The EA does not disclose how much foraging habitat there should be in a LAU so how do you determine whether it is enough?

The EA does not disclose the determination for lynx or lynx critical habitat nor was a BA available to review.

Cumulative effects from Highway 83, utility corridors, private land development, trapping and snaring, hound hunting, predation and starvation, high kitten mortality, and logging on other ownerships should be evaluated.

The Lynx Direction and the first tier biological opinion/incidental take statement for the

Lynx Direction do not provide protections for key winter lynx habitat. The habitat proxy used to assess take in the first tier biological opinion is an exemption from the Lynx Direction for all lands located in the wildland urban interface on National Forest lands. Formally, the documents state that there is an exemption for 6% of National Forest lands, but in reality the wildland urban interface represents 6% of National Forest lands, thus the exemption allows all projects in the wildland urban interface to violate the Lynx Direction regardless of their individual importance to local lynx population.

Scientific studies by the Forest Service's own lynx expert research scientist show that the lynx population in this landscape is already declining. At the time of the first tier biological opinion, there was no lynx critical habitat designated on National Forest lands, thus the opinion does not address lynx critical habitat on National Forest lands. Since the promulgation of that first tier biological opinion in 2007, in 2009 FWS has designated lynx critical habitat on National Forest lands. Projects in lynx critical habitat should not proceed until reconsultation on the NRLMD is completed.

• The Cold Jim Project contains extensive winter logging since the grizzly bear subunit will be closed. The EA fails to analyze how this will affect other wildlife such as wolverine and lynx that remain active during the winter.

• This project does not favor the needs of the grizzly bear in violation of the Forest Plan.

• The EA does not disclose the existing thermal and hiding cover OUTSIDE of wilderness or how the project will affect thermal cover for big game. The EA discloses that thermal cover is below Forest Plan standards, yet this project does not do anything to improve the situation.

The Forest's 2008-2010 monitoring report documents a significant increase in logging on the Forest between 2000-2010, most of which was clearcutting. Since 1967, elk have declined on the Forest, as have two other big game management indicator species associated with denser forests: moose and mule deer. The Forest Service used the entire Glacier Loon Project area as the analysis area for elk, despite the requirement from the best available science to use an elk herd home range as the level of analysis for elk. An average elk herd home range in Montana is 18,200 acres for an entire year, and about 4,225 acres during the rut. The Cold Jim Project area is 33,289 acres, much larger than an average elk herd home range.

Although the Environmental Assessment references the best available science on elk security, Hillis et al (1991), it does not actually apply the definition of elk security area (250 acre continuous blocks at least 0.5 miles from a road) and provide a map of elk security before, during, and after the Project. It does not demonstrate that 30% of each elk herd home range will be retained in security blocks as defined by Hillis et al (1991).

The Environmental Assessment does not address or apply the best available science on elk habitat effectiveness: Christensen et al (1993). This research requires computation of linear road density, and sets thresholds for different areas depending on the management

focus. This research does not allow the Forest Service to ignore administrative or contractor use on logging roads during a timber sale, and it does not allow the Forest Service to ignore roads on private lands.

The Forest Service's 2008-2010 monitoring report represents that the agency has not calculated habitat effectiveness for elk since 1993. The Forest Plan requires that the Forest Service maintain open road density at less than 1.0 mile/square mile or less in moist sites in elk summer habitat. The Environmental Assessment did not address this requirement or demonstrate compliance with it.

• Moose are declining the mountain west, yet there is no analysis of how this project will impact moose and the riparian, wetland habitat that they depend upon.

Fisheries and Hydrology

• The effects determination for bull trout was "No Effect". However, there was no analysis of TNC's 10 logging projects in Cold and Jim Creek except to discuss some of the road work that they will do on a few of the projects. TNC only uses the Montana SMZ law, not INFISH so the buffers are only 50 feet – the 50 feet is an equipment exclusion zone, not a no cut buffer. Moreover, 50 feet is not adequate to protect water quality or fish habitat. There will also be short-term sediment from some of the road work associated with the Cold Jim project. And units 29 and 30 will not have 300 foot RHCAs. Any possible effect, no matter how small, and no matter whether the effect is beneficial or adverse, requires a "may affect" conclusion. The no effect determination is not appropriate for this project and the cumulative impacts.

• There was no determination for whether this project will adversely modify critical habitat for bull trout.

• In alternative C the EA discloses on page 2-16 that "units 29 and 30 were modified so the first 100 feet from the stream into the unit will be designated as a 'No Harvest RHCA Buffer' to provide for riparian corridors for interior forest habitat. An additional forest buffer (feather of 100 feet) along the riparian zone will be retained for connectivity between old growth stands to the north and south of these units resulting in a total of 200' corridor zone on each side of the stream." It was not disclosed how wide the stream buffer will be under Alternative B. Also a temporary road will be constructed on the southeast side of Unit 29 which appears to be within the stream buffer. The fisheries section, however, states that INFISH buffers of 300 feet will be used, apparently this is not the case and warrants re-analysis.

• Both Cold and Jim Creeks are functioning at risk as determined by the Watershed Condition Framework. After the project is completed those streams will still be FAR. Projects in FAR and WQLS watersheds should improve the stream condition, not maintain a deficient status quo.

• The EA does not disclose what the existing water yield is nor does it disclose how much increased water yield the watersheds can handle.

Cold Jim/Chilly James projects overlap
The Cold Jim and Chilly James projects overlap with each other, not just in spatial scale but in actual project activities. Following are roads that have treatments in both project areas:

- Road 11651 – goes through Cold Jim unit 203, is proposed for passive decommissioning in Chilly James
- Temporary road to Unit 13
- Road 90573 – active decommissioning in Chilly James
- Road 90568 – storage in Chilly James
- Road 90571 – BMPs in Chilly James
- Road 90549 – active decommissioning in Chilly James
- Road 90552 – storage in Chilly James
- Road 90554 – BMPs in Chilly James
- Road 90548 – BMPs in Chilly James
- Road 11613 – goes through Cold Jim unit 113, is proposed for passive decommissioning in Chilly James
- Road 9599 – resource enhancement in Cold Jim
- Road 9511 – decommission in Cold Jim
- Road 9015 – passive decommissioning in Chilly James
- Road 9014 – passive decommissioning in Chilly James
- Road 903C – decommission in Cold Jim
- Road 903B – decommission in Cold Jim
- Road 9767Y – passive decommissioning in Chilly James
- Road 91363 – active decommissioning in Chilly James
- Road 9785A – decommission and road re-route in Cold Jim
- Temporary road constructed off 888C in Cold Jim
- Road 11617 – road decommission in Cold Jim
- Road 11616 – road decommission in Cold Jim
- Road 9767Z – road decommission in Cold Jim

The EA had no analysis for the Chilly James project even though they will occur in the same place at the same time.

Other Issues
• The EA does not disclose whether homeowners in the Glacier Loon Project area have taken action to reduce fuels on their property and near their residences and why the Forest Service must compensate if landowners are not maintaining their own defensible space.

• The EA fails to evaluate a range of alternatives, both action alternatives are very similar.

• The Purpose and Need for this project is solely to prop up the timber industry at the expense of wildlife, fish and water quality.

An EIS should be prepared to full evaluate the cumulative impacts and address other

concerns raised in these comments.

Sincerely,
/s/Arlene Montgomery
Program Director

Scientific Literature Review

Scientific Findings on Roads and Roadless Lands

Virtually without exception, science is finding that ecological integrity remains highest in areas that remain unroaded and unmanaged and is lowest in areas that have been roaded and managed. As the density of roads increases, aquatic integrity and wildlife security decreases, while the risk of catastrophic wildfire and the occurrence of exotic weeds increases. The simplest and most cost-effective thing the Forest Service can do to maintain and restore aquatic and ecosystem integrity is to stop building roads and to obliterate in an environmentally sound manner as many roads as possible. This conclusion is supported by the following:

"Areas that are more highly roaded actually have a higher potential for catastrophic wildfires than inventoried roadless areas. Other national assessments have arrived at the same conclusions. [] The fire occurrence data revealed the following key points:

- Nationally, the average size of a large wildfire is greater on NFS lands outside of an inventoried roadless area;

- Nationally, the average size of a large wildland fire started by humans is greater on land outside of inventoried roadless areas;

- Regardless of the cause, a wildland fire ignition was nearly 2 times as likely to occur outside of an inventoried roadless area;

- A human ignited wildland fire is nearly 4 times as likely to occur outside of an inventoried roadless area." (Forest Service Roadless Area Conservation DEIS, page 3-157; hereafter USFS 2000).

"The U.S. Fish and Wildlife Service [] found that bull trout are exceptionally sensitive to the direct, indirect, and cumulative effects of roads. Dunham and Rieman [] demonstrated that disturbance from roads was associated with reduced bull trout occurrence. They concluded that conservation of bull trout should involve protection of larger, less fragmented, and less disturbed (lower road density) habitats to maintain important strongholds and sources for naturally recolonizing areas where populations have been lost." (USFS 2000, page 3-82, parenthesis in original).

"Hitt and Frissell [] showed that over 65% of waters that were rated as having high aquatic biological integrity were found within wilderness-containing subwatersheds. [] Trombulak and Frissell [] concluded that [] the presence of roads in an area is associated with negative effects for both terrestrial and aquatic ecosystems including changes in species composition and population size." (USFS 2000, pages 3-80-81).

"High integrity [forests] contain the greatest proportion of high forest, aquatic, and hydrologic integrity of all [] are dominated by wilderness and roadless areas [and] are the least altered by management. [] Low integrity [forests have] likely been altered by

past management [] are extensively roaded and have little wilderness." (USFS 1996a, pages 108, 115 and 116).

"Much of this [overly dense forest] condition occurs in areas of high road density where the large, shade-intolerant, insect-, disease- and fire-resistant species have been harvested over the past 20 to 30 years. [] Fires in unroaded areas are not as severe as in the roaded areas because of less surface fuel, and after fires at least some of the large trees survive to produce seed that regenerates the area. Many of the fires in the unroaded areas produce a forest structure that is consistent with the fire regime, while the fires in the roaded areas commonly produce a forest structure that is not in sync with the fire regime. [] In general, the effects of wildfires in these areas are much lower and do not result in the chronic sediment delivery hazards exhibited in areas that have been roaded." (USFS 1997a, pages 281-282).

"Increasing road density is correlated with declining aquatic habitat conditions and aquatic integrity [] An intensive review of the literature concludes that increases in sedimentation [of streams] are unavoidable even using the most cautious roading methods." (USFS 1996b, page 105).

"This study suggests the general trend for the entire Columbia River basin is toward a loss in pool habitat on managed lands and stable or improving conditions on unmanaged lands." (McIntosh et al 1994).

"The data suggest that unmanaged systems may be more structurally intact (i.e., coarse woody debris, habitat diversity, riparian vegetation), allowing a positive interaction with the stream processes (i.e., peak flows, sediment routing) that shape and maintain high-quality fish habitat over time." (McIntosh et al 1994).

"Although precise, quantifiable relationships between long-term trends in fish abundance and land-use practices are difficult to obtain (Bisson et al. 1992), the body of literature concludes that land-use practices cause the simplification of fish habitat []." (McIntosh et al 1994).

"Land management activities that contributed to the forest health problem (i.e., selective harvest and fire suppression) have had an equal or greater effect on aquatic ecosystems. If we are to restore and maintain high quality fish habitat, then protecting and restoring aquatic and terrestrial ecosystems is essential." (McIntosh et al 1994).

"Native fishes are most typically extirpated from waters that have been heavily modified by human activity, where native fish assemblages have already been depleted, disrupted, or stressed []." (Moyle et al 1996).

"Restoration should be focused where minimal investment can maintain the greatest area of high-quality habitat and diverse aquatic biota. Few completely roadless, large watersheds remain in the Pacific Northwest, but those that continue relatively undisturbed are critical in sustaining sensitive native species and important ecosystem processes (Sedell, et. al 1990; Moyle and Sato 1991; Williams 1991; McIntosh et al. 1994; Frissell and Bayles 1996). With few exceptions, even the least disturbed basins have a

road network and history of logging or other human disturbance that greatly magnifies the risk of deteriorating riverine habitats in the watershed." (Frissell undated).

"[A]llocate all unroaded areas greater than 1,000 acres as Strongholds for the production of clean water, aquatic and riparian-dependent species. Many unroaded areas are isolated, relatively small, and most are not protected from road construction and subsequent timber harvest, even in steep areas. Thus, immediate protection through allocation of the unroaded areas to the production of clean water, aquatic and riparian-dependent resources is necessary to prevent degradation of this high quality habitat and should not be postponed." (USFWS et al 1995).

"Because of fire suppression, timber harvest, roads, and white pine blister rust, the moist forest PVG has experienced great changes since settlement of the project area by Euroamericans. Vast amounts of old forest have converted to mid seral stages." (USFS/BLM 2000, page 4-58).

"Old forests have declined substantially in the dry forest PVG []. In general, forests showing the most change are those that have been roaded and harvested. Large trees, snags, and coarse woody debris are all below historical levels in these areas." (USFS/BLM 2000, page 4-65).

"High road densities and their locations within watersheds are typically correlated with areas of higher watershed sensitivity to erosion and sediment transport to streams. Road density also is correlated with the distribution and spread of exotic annual grasses, noxious weeds, and other exotic plants. Furthermore, high road densities are correlated with areas that have few large snags and few large trees that are resistant to both fire and infestation of insects and disease. Lastly, high road densities are correlated with areas that have relatively high risk of fire occurrence (from human caused fires), high hazard ground fuels, and high tree mortality." (USFS 1996b, page 85, parenthesis in original).

In simpler terms, the Forest Service has found that there is no way to build an environmentally benign road and that roads and logging have caused greater damage to forest ecosystems than has the suppression of wildfire alone. These findings indicate that roadless areas in general will take adequate care of themselves if left alone and unmanaged, and that concerted reductions in road densities in already roaded areas are absolutely necessary.

Indeed, other studies conducted by the Forest Service indicate that efforts to "manage" our way out of the problem are likely to make things worse. By "expanding our efforts in timber harvests to minimize the risks of large fire, we risk expanding what are well established negative effects on streams and native salmonids. [] The perpetuation or expansion of existing road networks and other activities might well erode the ability of [fish] populations to respond to the effects of large scale storms and other disturbances that we clearly cannot change." (Reiman et al 1997).

The following quotes demonstrate that trying to restore lower severity fire regimes and forests through logging and other management activities may make the situation worse, compared to allowing nature to reestablish its own equilibrium. These statements are

found in "An Assessment of Ecosystem Components in the Interior Columbia Basin and Portions of the Klamath and Great Basins, Volume 3 (ICBEMP):

"Since past timber harvest activities have contributed to degradation in aquatic ecosystems, emphasis on timber harvest and thinning to restore more natural forests and fire regimes represent risks of extending the problems of the past." (ICBEMP page 1340).

"Proposed efforts to reduce fuel loads and stand densities often involve mechanical treatment and the use of prescribed fire. Such activities are not without their own drawbacks -- long-term negative effects of timber harvest activities on aquatic ecosystems are well documented (see this chapter; Henjum and others 1994; Meehan 1991; Salo and Cundy 1987)." (ICBEMP page 1340).

"Species like bull trout that are associated with cold, high elevation forests have probably persisted in landscapes that were strongly influenced by low frequency, high severity fire regimes. In an evolutionary sense, many native fishes are likely well acquainted with large, stand-replacing fires." (ICBEMP page 1341).

"Attempts to minimize the risk of large fires by expanding timber harvest risks expanding the well-established negative effects on aquatic systems as well. The perpetuation or expansion of existing road networks and other activities might well erode the ability of populations to respond to the effects of fire and large storms and other disturbances that we cannot predict or control (National Research Council 1996). (ICBEMP page 1342).

"Watersheds that support healthy populations may be at greater risk through disruption of watershed processes and degradation of habitats caused by intensive management than through the effects of fire." (ICBMP page 1342).

"Timber harvest, through its effects on forest structure, local microclimate, and fuels accumulation, has increased fire severity more than any other recent human activity. If not accompanied by adequate reduction of fuels, logging (including salvage of dead and dying trees) increases fire hazard by increasing surface dead fuels and changing the local microclimate. Fire intensity and expected fire spread rates thus increase locally and in areas adjacent to harvest". (USFS 1996c, pages 4-61-72).

"Logged areas generally showed a strong association with increased rate of spread and flame length, thereby suggesting that tree harvesting could affect the potential fire behavior within landscapes...As a by-product of clearcutting, thinning, and other tree-removal activities, activity fuels create both short- and long-term fire hazards to ecosystems. Even though these hazards diminish over time, their influence on fire behavior can linger for up to 30 years in dry forest ecosystems of eastern Oregon and Washington". (Huff et al 1995).

The answer, therefore, is not to try managing our way out of this situation with more roads and timber harvest/management. In summary:

• Roads have adverse effects on aquatic ecosystems. They facilitate timber sales which can reduce riparian cover, increase water temperatures, decrease recruitment of coarse woody debris, and disrupt the hydrologic regime of watersheds by changing the timing and quantity of runoff. Roads themselves disrupt hydrologic processes by intercepting and diverting flow and contributing fine sediment into the stream channels which clogs spawning gravels. High water temperatures and fine sediment degrade native fish spawning habitat.

According to the U.S. Forest Service 82% of all bull trout populations and stream segments range-wide are threatened by degraded habitat conditions. Roads and forest management are a major factor in the decline of native fish species on public lands in the Northern Rockies and Pacific Northwest.

• An open road density (ORD) of one mile per square mile of land reduces elk habitat effectiveness to only 60% of potential. When ORD increases to six miles per square mile, habitat effectiveness for elk decreases to less than 20%. (Lyon 1984).

• Black bears in southern Appalachia begin avoiding Forest Service roads when the density exceeds 0.8 miles per square mile. (Brody 1984). Grizzly bears use habitats less than expected when ORD exceeds one mile per square mile and total road density (TRD) exceeds two miles per square mile. (Mace and Manley 1993). Open roads contribute to grizzly bear mortality by poaching and, especially during the black bear hunting season, by mistaken killing. (Holland 1985).

• Roads have a similar, devastating effect on wolves. Studies show that wolves fail to survive in areas where ORD exceeds 0.93 miles per square mile. (Thiel 1985).

• Sediment from roads, both open and closed, damages the environment. In northwest Montana, for instance, 80-90% of the sediment produced by logging and road construction generally is attributable to the road (USFS 1985). The Flathead National Forest estimates that, on one of its most pervasive and sensitive land types, one mile of road produces 98 tons of sediment, 80% of which reaches the stream bed (USFS undated).

In addition, the Forest Service estimates that only a 10% increase in fine sediment deposition in spawning gravel decreases the spawning success of bull trout by 50%. (USFS 1986). A road cut across a hillside intercepts subsurface water flow and runs it down ditches and through culverts. There it is joined by sediment-laden runoff from the roadbed and cut banks before running into a stream. Hence, subsurface water which would have once welled up from below a stream to clean bull trout spawning gravels now carries sediment from the road and land surface and deposits it onto the spawning gravels, where it smothers the eggs and fry.

"Rehabilitation of road-miles cannot be accomplished alone by gating, berming, or otherwise blocking the entrance to a road permanently or temporarily, or seasonally closing roads, but will require obliteration, recontouring, and revegetating." (U.S. Fish and Wildlife Service Regions 1 and 6. 1998a).

"Reduction of total miles of forest roads is an important component of watershed restoration. . . Many miles of roads must be 'put to bed', by pulling culverts, resloping road beds, pulling fill and replanting." (U.S. Fish and Wildlife Service. 1998b).

“Recontoured and abandoned sites displayed similar aboveground properties but exhibited notable differences in belowground properties, including soil hydraulic conductivity, organic matter, total carbon, and total nitrogen, among others. Our findings suggest that recontouring can dramatically accelerate recovery of above- and belowground properties so they resemble never-roaded reference conditions. In contrast, abandoning roads generates above- and belowground properties that follow a different path to recovery.” (Lloyd et al 2013).

“Roots on A30 [abandoned] roads were constrained to the upper 15 cm (10 ± 0.45 cm). In contrast, never-roaded sites and recontoured roads had rooting depths that extended below the limits of soil pit excavations (>60–75 cm).” (Lloyd et al 2013).

“The simulated time to runoff generation after a 1-hour storm event was significantly different between treatments, with runoff occurring in the first 0.2 hours of the storm on A30 [abandoned] roads and never on R10 [recontoured] roads.” (Lloyd et al 2013).

“In our study, the trajectory of plant succession on abandoned roads and recontoured roads followed similar trends to other research conducted on passively restored roads (Madej 2001; Foltz et al. 2009), although our data suggest that vegetation succession to shrubs and trees may be slower on abandoned roads as compared with recontoured roads. However, ecosystem recovery belowground differed markedly from that aboveground. The strong differences in belowground properties following road abandonment result in an effective decoupling of the recovery trajectories of above- and belowground ecohydrological properties (Figure 3). Together, these findings support the prediction that recontouring accelerates the rehabilitation of key ecohydrologic properties toward reference dynamics.” (Lloyd 2013).

“After treatment, we conservatively estimate soil TC [carbon] storage increased sixfold, to 6.5 x107 g C per road kilometer (to 25-cm depth). The same trends are seen for soil N [nitrogen]. Abandoned roads have approximately 6.96 x 105 g N per road kilometer, and this amount increases by an order of magnitude to 7.16 x 106 g N (to 25-cm depth). These major differences in soil C and N storagexhave potentially important implications for climate-changexmitigation.” (Lloyd et al 2013).

“Although more expensive as compared with road abandonment, recontouring may be the only way to restore both above- and belowground ecosystem processes, accelerating the recovery of these forest ecosystems by decades to millennia. . . Restoration techniques that fail to restore above- and belowground properties and processes may lead to an altered ecosystem with different functional processes and potential (Kardol and Wardle 2010).” (Lloyd et al 2013).

Comprehensive Management of Human Access

The following citations show that all human access to fish and wildlife habitat has negative impacts, including the existence of roads and trails regardless of use levels. The magnitude of impacts from human use generally occurs in descending order from motorized use of roads and trails to use by bicycles and finally foot or horse use. While many of these citations contend with research and opinions on Flathead Forest Plan Amendment 19, similar methods of quantifying the impacts of motorized and high levels of non-motorized use have been applied to other National Forests via guidance from the Interagency Grizzly Bear Committee.

"We have . . . created technologies that make virtually every place on this planet accessible to us. With our curiosity, money, leisure time, and motorized contraptions, we can invade any corner of the earth with impunity. . . That we can alter human behavior to protect wildland ecosystems and wild animals is reason for hope." (Salwasser 1997).

"The simplicity of A19 [Flathead Forest Plan Amendment 19] and its ability to permanently secure areas for grizzly bears makes it a powerful tool in the conservation of the grizzly bear in the NCDE." (McLellan et al 2000, page 11).

"Private roads were excluded from road density calculations and, if federal land was <75% of the sub-unit, 'no net loss' rather than the numerical guideline values was used. These, and other rules that relaxed road density guidelines were established in sub-units with private lands even when it was shown that a bear's level of risk was 30.27 times as great in rural areas as in backcountry areas. It would appear that in sub-units with private holdings that stricter, not reduced, access controls would be necessary to offset higher levels of mortality." (McLellan et al 2000, page 11).

"Based on the best information available, the current and planned distribution of roads and core area, large portions of roadless areas, and known grizzly bear distribution within the recovery zone portion of the [Flathead National] Forest reveal a pattern and trend in access management that is improving, is based on ecosystem-specific information, and will be conducive to supporting grizzly bears at numbers that promote recovery." (USFWS 2005, page 132).

"The Service believes that grizzly bears in the NCDE would benefit from continued application of the [Flathead National] Forest's access management strategy, as proposed. Efforts to reduce open road density, especially in seasonally important resource areas, and reducing roads to provide core habitat in subunits with high road densities should be pursued and included in all project planning." (USFWS 2005, page 139).

"As human population centers expand and increased dispersed human activity and development ensues, risks to grizzly bears may increase. Public lands will remain important to the recovery and sustainability of the NCDE grizzly bear population." (USFWS 2005, page 140).

The northern Swan Range population of grizzly bear is likely decreasing at over 2% per year, enough to halve the population in about 30 years. (Mace and Waller 1997, errata to page 112).

"[The northern Swan Range] population was semi-isolated because of human development including hydroelectric development. . . until effective management programs are developed on private lands, federal lands should be considered invaluable source areas and managed to reduce man-caused mortality. This would be accomplished by establishing effective areas of high security that transcend seasonal habitats, and where access is regulated." (Mace and Waller 1997, Chapter 9).

"Additional road restrictions and reductions required by A19 [Flathead Forest Plan Amendment 19] are important to reduce displacement (and indirect mortality) and ensure adequate habitat available for continued reproduction and population growth over the long term." (USFWS 2005, page 145).

"It is the Service's biological judgment that 'harm' of grizzly bears is likely to occur in the following conditions: 1. The precise open motorized access densities exceeds 1 mile per square mile in over 19 percent of a subunit. . . 2. The precise total motorized access density exceeds 2 miles per square mile in over 19 percent of a subunit. . . 3. Security core is less than 68% of a subunit." (USFWS 2005, page 150).

"Security core area . . . is at least 0.3 miles from open roads and high-intensity, non-motorized trails. . . The number of restricted roads in security core should be minimized . . . and may not receive high levels of non-motorized use . . . defined as receiving 20 or greater parties per week . . . reclamation of roads [is] the preferred treatment. (USFS 1995).

"Habitat security conditions cannot be defined entirely by motorized access route density. . . heavily used non-motorized trails and areas of high levels of dispersed human use will also influence the effectiveness of area in regards to habitat security." (IGBC 1998).

"[W]e determined that grizzly bears were significantly further than expected from [hiking only] trails, and from lakes with camp-sites during spring, summer, and autumn. . . Therefore, while in the JBHA [Jewel Basin Hiking Area], grizzly bears minimized their interaction with recreationists by spatially avoiding high use areas." (Mace and Waller 1997, Chapter 7.2).

"Direction [is] for reclaiming/obliterating roads including removal of culverts which greatly reduces the risk of future sedimentation problems resulting from culvert failures on reclaimed roads. . . the long term effect of implementing this direction should be beneficial to fish [due] to reduced sediment and routing of surface water once reclaimed and restricted roads have stabilized, and greatly reduced risk of future impacts from culverts left in place and inadequate treatment of closed or reclaimed roads." (Hair 1995).

"The Forest Service estimates a $10 billion backlog in needed road reconstruction and maintenance. . . Fewer roads will be built and those that are built will minimize

environmental impacts. Roads that are no longer needed or that cause significant environmental damage will be removed. (Dombeck 1998).

"[T]his points to a smaller road system than our current one . . ." (Holtrop 2010).

"The Flathead National Forest needs $6.2 million each year to maintain its road system, but receives less than $1 million." (USFS 2004).

"Roads that are not maintained can become an environmental liability on the watershed. . . It's not a matter of if a culvert is going to fail, it's a matter of when. . . It is cheaper to reclaim a road than to maintain it." (Rowley 1998a and 1998b).

"Reduction of total miles of forest roads is an important component of watershed restoration [but] cannot be accomplished by gating, berming, or otherwise blocking the entrance to a road. . . Many miles of roads must be 'put to bed' by pulling culverts, resloping road beds, pulling fill and replanting." (USFWS 1998a and 1998b).

"The management of roads is the most powerful tool available to balance the needs of bears and all other wildlife with the activities of humans. . . Roads closed to public use through the use of only signs or gates are often not effective. . . The optimum situation to maintain grizzly bear habitat effectiveness and minimize mortality risk is to obliterate the road." (USFWS 1993).

"Roads are the single biggest problem on the landscape for elk. It's well documented, and everything else pales in comparison. . . The more roads you have, the less elk you have." (Stouder 2002).

"Elk travel time [displacement] was highest during ATV exposure, followed by exposure to mountain biking, hiking, and horseback riding. . . A comprehensive approach for managing human activities to meet elk objectives should include careful management of off-road recreational activities, particularly ATV riding and mountain biking, which caused the largest reductions in feeding time and increases in travel time." (Naylor et el. 2009).

Old Growth Forests

Old-growth forest habitat is a diminishing resource on public lands due to many factors. Maintaining existing old-growth stands and providing for recruitment of future old growth is necessary to provide for the viability of old-growth associated wildlife species. While not perfect, the Old-Growth Forest Types of the Northern Region (Green et al, 1992) is probably the best reference available for these forests and should be used as a guide to determine old-growth forest habitat.

We strongly caution though that the minimum characteristics in Green et al, are not the recommended standards, but merely the starting point by which to determine whether a stand is classified as old growth. It is NOT to be used to "manage" old growth down to these minimum characteristics. Also, it is important to note that old-growth

attributes such as decadence, large trees, old trees, snags, canopy structure, coarse woody debris, etc. are critical components of old-growth forest habitat. Stands that may not have the minimum number of large trees but contain these other important attributes should be considered "recruitment" or future old-growth and allowed to progress towards meeting the Green et al definition.

Old-growth stands function best as habitat when they are connected to other stands. Connectivity can be achieved by corridors of actual old growth or by suitable closed-canopy or mature condition of the matrix between old-growth stands (Thomas, et al. 1990, Bennett, 1999). Stands designated as future old growth that are presently mature may be suitable (Pfister, et al 2000). Linkages, should whenever possible, contain a large fraction of interior forest (i.e., 100 meters from a high contrast edge, Bennett 1999).

Interior old growth habitat (>100 meters from edge of an opening or stand of lesser age or a road) is the most important component of old-growth habitat (Baker and Knight 2000). In general larger stands are more effective as habitat than smaller stands (Pfister 2000). Fragmentation of existing patches of old growth by roads, timber harvesting or other created openings will decrease effectiveness of the patch as habitat due to the reduction in amount of interior old-growth conditions (Baker and Knight 2000).

Stands that met the Green et al definition of old growth but are burned in a forest fire do not cease to provide a valuable function to wildlife and the forest ecosystem and should not be salvage logged. This burned old growth may function differently but it is still important habitat because burned snags stand much longer than beetle-killed trees, and the fact that it burned does not change its age and age is a primary factor in old growth habitat (Pers. comm. R. McClelland).

Management Recommendations to Protect Old Growth

To protect remaining old growth, provide for recruitment of future old growth, and link these currently small and isolated patches, we suggest the following management standards.

• Use the Old-Growth Forest Types of the Northern Region as a first step in identifying old growth stands.

• All existing old growth must be preserved. Historically old-growth habitat was 15% to 60% (source Amendment #21). Current old growth averages 11.6% across the Forest and ranges between 6.9% to 12.7% (source 1999 – 2007 Forest Plan Monitoring Report). Old-growth forest habitat must be increased to the historical range by allowing mature stands to develop old growth characteristics (snags, down woody material, decadence and age). The Forest Service must calculate how much old growth there is on a watershed (i.e., approximately 10,000 acres) and forest-wide basis. Recruitment old growth must be identified on a watershed and forest-wide basis. Recruitment old growth is subject to the same protections as designated current old growth.

• Designate the existing old growth and future old growth, map it and connect these stands with linkages as described above.

• Place longer-rotation or less intensive uses adjacent to designated old growth, so that a lower-intensity managed zone serves as a buffer for the old-growth system (Noss and Cooperrider 1994). Avoid placing high intensity land uses (e.g. clearcuts, roads) next to designated old growth (Pfister 2000).

• Integrate future recruitment old growth into the network. Where otherwise equivalent replacement stands exist, choose those adjacent to designated old growth as future old growth.

• No logging should take place in old growth stands. Under limited and extraordinary circumstances some thinning of sapling and pole-sized timber less than 6 inches in diameter may be appropriate but only in ponderosa pine habitat type, without using heavy equipment, and when there are no adverse effects to old-growth dependent, management indicator, sensitive, threatened or endangered species.

Native Fish and Water Quality

The best available scientific information on bull trout supports the following specific, numeric and measurable standards for protection of the Primary Constituent Elements of bull trout habitat. Protecting these PCEs in all watersheds will provide benefits for westslope cutthroat trout and other native aquatic species.

Clean- The bull trout is virtually synonymous with water quality. Bull trout require very clean water and favor streams with upwelling groundwater for spawning (Fraley & Shepard 1989; Baxter & Hauer 2000). Of the many threatened and endangered fish species, bull trout are the most sensitive to changes in water quality, particularly from fine sediments generated by logging and grazing activities. Fine sediments can smother spawning beds and degrade other habitat components. A key determinant is the level of fine sediment ≤ 6.35 mm (Weaver & Fraley 1991) and protecting upwelling groundwater. Protection of critical habitat includes standards to maintain and improve water quality and control lethal sediments. For example, fine sediments < 6.4 mm in diameter must be limited to less than 20% in spawning habitat (Espinosa 1996) and standards must be developed to maintain groundwater.

Cold- Bull trout also require colder water than other native fish. Rieman & McIntyre (1993) reported that researchers recognize temperature more consistently than any other factor influencing bull trout distribution (see also, Pratt 1992). Habitat protection efforts must seek to maintain or reacquire natural cold water conditions. Specifically, stream temperatures in current and historic spawning, rearing and migratory corridor habitats should not exceed 6-8 C for spawning, with the optimum for incubation from 2-4 C (McPhail & Murray 1979); 10-12 C for rearing habitat, with 7-8 C being optimal (Goetz 1989); migratory stream corridors should be 12 C or less.

Complex- Critical habitat for bull trout isn't just a set of places, but rather a complex arrangement of environmental conditions. Noting that "watersheds must have specific physical characteristics to provide habitat requirements for bull trout to successfully

spawn and rear," in its 1998 listing rule the Service listed the habitat components: "water temperature, cover, channel form and stability, valley form, spawning and rearing substrates, and migratory corridors." Implicit in this list of habitat requirements is the understanding that habitat critical to bull trout viability consists of a specific set of physical conditions in addition to particular places. For example, the Service explained that "[m]aintaining bull trout habitat requires stream channel and flow stability." And further explained that "[a]ll life history stages of bull trout are associated with complex forms of cover, including large woody debris, undercut banks, boulders and pools." Bull trout not only need clean, cold water, they need places to rest, hide, feed and travel.

Intact forests, which provide bank stability, shade and woody debris for formation and maintenance of pool habitat, are essential. Climate change will have implications for species such as bull trout because they require cold, clean water. Isaak et al (2010) state: "Riparian vegetation, for example, strongly affects near stream microclimates and minimizing near-stream disturbances associated with grazing, roadbuilding and timber harvest, or facilitating rapid vegetative recovery after these disturbances, could help buffer many streams from additional warming."

Climate change will also increase rain on snow events resulting in stream scour. Shelburg et al's (2010) study of bull trout redd scour emphasized the importance of habitat heterogeneity and refugia availability in sustaining salmonid populations at multiple spatial scales. Loss of complex fluvial spawning habitat such as large woody debris contributes to redd scour after rain on snow events. They conclude: "Processes that form complex habitat in association with LWD may partially mitigate against unfavorable discharge regimes, water and sediment yield alterations due to land-use, or future climate change."

Espinosa (1996) recommends that all streams should average ≥ 90% bank stability and that cobble embeddedness in summer rearing habitat should be < 30% and < 25% in winter rearing habitats. Additional indices include channel morphology including large woody debris, pool frequency, volume and residual pool volumes.

The Flathead Lake Biological Station has been studying the aquatic environment in the Crown of the Continent ecosystem for decades. Hauer et al (2007) found that:

> "Streams of watersheds with logging have increased nutrient loading, first as SRP and NO3, which is rapidly taken up by stream periphyton. This leads to increased algal growth that is directly correlated with the quantity of logging within the watershed. The increased periphyton increases particulate organic matter in transport as the algal biomass is sloughed into the stream. We observed this as increased TP and TN in logged watershed streams. Other studies in the CCE have shown that increased sediment loading and an incorporation of fines into spawning gravel, especially during the summer and fall base flow period, has a dramatic effect on the success of spawning by bull trout (Salvelinus confluentus). Experiments have shown that as the percentage of fines increases from 20% to 40% there is >80% decrease in successful fry emergence."

Hauer, et al. (1999) also found that bull trout streams in wilderness habitats had consistent ratios of large to small and attached to unattached large woody debris.

However, bull trout streams in watersheds with logging activity had substantial variation in these ratios. They identified logging as creating the most substantive change in stream habitats.

> "The implications of this study for forest managers are twofold: (i) with riparian logging comes increased unpredictability in the frequency of size, attachment, and stability of the LWD and (ii) maintaining the appropriate ratios of size frequency, orientation, and bank attachment, as well as rate of delivery, storage, and transport of LWD to streams, is essential to maintaining historic LWD characteristics and dynamics. Our data suggest that exclusion of logging from riparian zones may be necessary to maintain natural stream morphology and habitat features. Likewise, careful upland management is also necessary to prevent cumulative effects that result in altered water flow regimes and sediment delivery regimes. While not specifically evaluated in this study, in general, it appears that patterns of upland logging space and time may have cumulative effects that could additionally alter the balance of LWD delivery, storage, and transport in fluvial systems. These issues will be critical for forest managers attempting to prevent future detrimental environmental change or setting restoration goals for degraded bull trout spawning streams."

Wherever possible, critical habitat protection should extend to the entire hydrologic watershed. Frissell (1999) reported complex interactions between near-surface groundwater and surface waters in bull trout streams, suggesting a more comprehensive approach to watershed protection. Baxter and Hauer (2000) reported that geomorphology and hyporheic groundwater exchange have a strong influence on bull trout redd locations.

Connected- The sciences of conservation biology and conservation genetics show that bull trout have naturally occurred throughout the Northern Rockies and Pacific Northwest in a system of connected watersheds comprising migratory meta-populations of bull trout (Rieman & McIntyre 1993). Blockages to historic migration routes, both physical and thermal, must be addressed to provide access to spawning streams and protect the genetic integrity of the bull trout. Historically occupied, but currently unoccupied habitat must be protected and reoccupied to reconnect bull trout populations throughout their range.

In addition to these standards, roadless and low road density watersheds deserve special protection measures. Numerous scientific studies and reviews have consistently reported that bull trout strong populations, presence and biomass are inversely related to road densities (Huntington 1995; Quigley, et al. 1996; Rieman, et al. 1997). Bader (2000) found that 78% of bull trout "strong populations" were in roadless area with most of the remainder directly downstream from roadless area. Quigley, et al. (1996) reported that roadless and wilderness areas can provide "strong anchors" for salmonid recovery. In recognition of this strong body of scientific evidence, the U.S. Fish & Wildlife Service (1998) recommended that remaining roadless areas within bull trout range be maintained in roadless condition.

Muhlfeld, et al. (2009) evaluated the association of local habitat features (width, gradient, and elevation), watershed characteristics (mean and maximum summer water

temperatures, the number of road crossings, and road density), and biotic factors (the distance to the source of hybridization and trout density) with the spread of hybridization between native westslope cutthroat trout *Oncorhynchus clarkii lewisi* and introduced rainbow trout *O. mykiss* in the upper Flathead River system in Montana and British Columbia.

They found that hybridization was positively associated with mean summer water temperature and the number of upstream road crossings and negatively associated with the distance to the main source of hybridization. Their results suggest that hybridization is more likely to occur and spread in streams with warm water temperatures, increased land use disturbance, and proximity to the main source of hybridization.

Lynx

The Fish and Wildlife Service designated critical habitat for lynx that includes the Flathead National Forest. They determined the physical and biological features that are the primary constituent elements (PCEs) or, in other words, the elements of physical or biological features that, when laid out in the appropriate quantity and spatial arrangement to provide for a species' life-history processes, are essential to the conservation of the species. They determined that the PCE specific to lynx in the contiguous United States is:

1) Boreal forest landscapes supporting a mosaic of differing successional forest stages and containing:

(a) Presence of snowshoe hares and their preferred habitat conditions, which include dense understories of young trees, shrubs or overhanging boughs that protrude above the snow, and mature multistoried stands with conifer boughs touching the snow surface;

(b) Winter conditions that provide and maintain deep fluffy snow for extended periods of time;

(c) Sites for denning that have abundant coarse woody debris, such as downed trees and root wads; and

(d) Matrix habitat (e.g., hardwood forest, dry forest, non-forest, or other habitat types that do not support snowshoe hares) that occurs between patches of boreal forest in close juxtaposition (at the scale of a lynx home range) such that lynx are likely to travel through such habitat while accessing patches of boreal forest within a home range.

Lynx in the Rocky Mountains of Montana selected mature, multistoried forests composed of large-diameter trees with high horizontal cover[1] during winter. These

[1] Horizontal cover is low hanging conifer boughs that touch the snow, small trees that are tall enough to protrude through the snow and herbaceous vegetation in the understory.

forests were composed of mixed conifers that included lodgepole pine, Douglas-fir, and western larch, but predominately consisted of Englemann spruce and subalpine fir in the overstory and midstory. (Squires et al. 2010)

Squires et al. (2010) studied den selection in western Montana. They found that lynx denned in preexisting sheltered spaces created by downed logs (62%), root-wads from wind-thrown trees (19%), boulder fields (10%), slash piles (6%) and live trees (4%). Lynx overwhelmingly prefer preexisting sheltered spaces created by downed logs in mature forests.

Squires also found that lynx generally denned in mature spruce-fir forests with high horizontal cover and abundant coarse woody debris. Eighty percent of dens were in mature forest stands and 13% in mid seral regenerating stands; young regenerating (5%) and thinned (either naturally sparse or mechanically thinned) stands with discontinuous canopies (2%) were seldom used.

Maintaining mature and mid-seral regenerating spruce-fir forests with high horizontal cover and abundant woody debris would be most valuable for denning when located in drainages or in concave, drainage-like basins. Management actions that alter spruce-fir forests to a condition that is sparsely stocked (e.g. mechanically thinned) and with low canopy closure (<50%) would create forest conditions that are poorly suitable for denning.

Squires et al. (2006) results also indicate that lynx preferentially forage in spruce-fir forests with high horizontal cover, abundant hares, deep snow, and large-diameter trees during winter. The high horizontal cover found in multistory forest stands is a major factor affecting winter hare densities. Lynx tend to avoid sparse, open forests and forest stands dominated by small-diameter trees during the winter.

They also sampled vegetative characteristics at kill sites and compared these to other locations along lynx travel routes. Lynx killed prey in areas of even higher horizontal cover than they generally encountered along their snow-tracks.

During winter, lynx preferentially foraged in mature, multilayer forests with Engelmann spruce (Picea engelmannii) and subalpine fir (Abies lasiocarpa) in the overstory and midstory, but these forests also included lodgepole pine, Douglas-fir, and western larch. Forests used during winter were composed of larger diameter trees with higher horizontal cover, more abundant snowshoe hares (Lepus americanus), and deeper snow compared to random availability; multilayer, spruce–fir forests provided high horizontal cover with tree branching that touched the snow surface. During winter, lynx killed prey at sites with higher horizontal cover than that along foraging paths. Lynx were insensitive to snow depth or penetrability in determining where they killed prey.

During summer, lynx broadened their resource use to select younger forests with high horizontal cover, abundant total shrubs, abundant small-diameter trees, and dense saplings, especially spruce–fir saplings. Based on multivariate logistic-regression models, resource selection occurred primarily at a fine spatial scale as was consistent with a sight-hunting predator in dense forests. However, univariate comparisons of

patch-level metrics indicated that lynx selected homogenous spruce–fir patches, and avoided recent clear-cuts or other open patches. Given that lynx in Montana exhibit seasonal differences in resource selection, we encourage managers to maintain habitat mosaics. Because winter habitat may be most limiting for lynx, these mosaics should include abundant multistory, mature spruce–fir forests with high horizontal cover that are spatially well-distributed.

Montana is near the southern extent of the lynx's current North American distribution. Here, boreal forests are fragmented into patches of suitable habitat at higher elevations, separated by valleys of open grasslands and dry forest types. Southern lynx populations tend to be small and relatively isolated. Therefore, movement and connectivity among groups is particularly important to maintain persistent populations and to recolonize unoccupied habitat.

Research by Dr. John Squires et al. (2012) modeled movements that indicated lynx selected home ranges at mid-elevations with low surface roughness, high canopy cover and little open grassland vegetation. They found that connectivity between lynx habitat in Canada and the conterminous U.S. is facilitated by only a few putative corridors that extend south from the international border.

They identified a primary lynx corridor from Canada that extends from the Whitefish Range, along the western front of the Swan Range ending near Seeley Lake. And a second corridor along the east side of Glacier National Park to the Bob Marshall Wilderness Complex.

Snowmobile trails may facilitate coyote movements into areas with deeper snow during the winter. (Gese et al. 2013) While direct impacts of snowmobiles on lynx were not documented, the potential impacts of a main competitor, the coyote, are worth mentioning. Due to their use of snowmobile trails, coyotes have the potential to access areas of habitat that might normally be too energetically difficult to access in deep snow. Lynx, with their superior body mass to footload, can access habitats containing deep snow that coyotes might typically avoid. In addition, expansion of current winter recreation use areas may create persistent travel corridors that could be utilized by coyotes. Since coyote use of snowmobile trails was related to how much was available, coyote movements could possibly be altered by limiting snow compaction. Researchers suggest the use of snowmobiles may result in consistent compacted trails within lynx conservation areas which may be detrimental to local lynx populations in the Intermountain West. (Id.)

Threats to lynx and their habitat
Excerpts from the 2013 Lynx Conservation Assessment and Strategy

Climate Change

Several possible effects of climate change on lynx can reasonably be anticipated. These include:
1) potential upward shifts in elevation or latitudinal distribution of lynx and their prey;

2) changes in the periodicity or loss of snowshoe hare cycles in the north;

3) reductions in the amount of lynx habitat and associated lynx population size due to changes in precipitation, particularly snow suitability and persistence, and changes in the frequency and pattern of disturbance events (e.g., fire, hurricanes, insect outbreaks);

4) changes in demographic rates, such as survival and reproduction; and

5) changes in predator-prey relationships. In addition, it is possible that interactions between these variables may intensify their effects.

Timber Harvest

Commercial timber management of conifer forests traditionally has been designed to: reduce tree density and promote tree growth (e.g., precommercial thinning), especially in young regenerating forests; improve growth and vigor of mature trees (e.g., commercial thinning, thinning from below); reduce the vulnerability of commercially-valuable trees to insects and disease (e.g., commercial thinning, group selection); and harvest forest products (e.g., regeneration harvest). Timber management practices may mimic natural disturbance processes but often are not an exact ecological substitute. Some practices, such as use of herbicides to suppress hardwood regeneration, do not have an historical analogue. Timber harvest may differ from natural disturbances by:

• Removing most standing biomass from the site, especially larger size classes of trees, and down logs, which alters microsite conditions and nutrient cycling;

• Creating smaller, more dispersed patches and concentrating harvest at lower elevations in mountainous regions and on more nutrient rich soils, resulting in habitat fragmentation;

• Causing soil disturbance and compaction by heavy equipment, which may result in increased water runoff and slower tree growth at the site; or

• Giving a competitive advantage to commercially-valuable tree species and reducing the structural complexity of the forest through the application of harvest, planting, thinning, and herbicide treatments.

Precommercial thinning has been shown to reduce hare numbers by as much as 2- and 3-fold due to reduced densities of sapling and shrub stems and decreased availability of browse. Researchers believe that the practice of precommercial thinning could significantly reduce snowshoe hares across the range of lynx.

There are anecdotal examples of precommercially thinned stands that subsequently "filled in" with understory trees. Some have suggested this could be a technique to extend the time that understory trees and low limbs provide the dense horizontal cover that constitutes snowshoe hare habitat. At this time, no other data are available to quantify the re-establishment of snowshoe hare habitat and over what time period, or the response by snowshoe hares, as compared with sites that were not precommercially thinned, so this remains an unproven management technique.

Uneven-aged management (single tree and small group selection) practices can be employed in stands where there is a poorly developed understory, but have the potential to produce dense horizontal cover for snowshoe hares. Removal of select large trees can create openings in the canopy that mimic gap dynamics and help to maintain and encourage multi-story attributes within the stand.

If removal of large trees opens the canopy to the extent that the patch functions as an opening, this may discourage use by lynx. Removal of larger trees from mature multi-story forest stands to reduce competition and increase tree growth or resistance to forest insects may reduce the horizontal cover (e.g., boughs on snow), thus degrading the quality of winter habitat for lynx. Similarly, removing understory trees from mature multi-story forest stands reduces the dense horizontal cover selected by snowshoe hares, and thus reduces winter habitat for lynx.

Lynx habitats in higher-elevation spruce-fir forests have been less affected by past fire suppression and are mostly within the historical range of variability.

In much of the Rocky Mountains, the fire regime was more variable in lynx habitat, with both frequent (35–100 years) stand-replacing or mixed-severity fires, and infrequent (200+ years) stand-replacement fires (Hardy et al. 1998).

Fragmentation

Fragmentation of the naturally patchy pattern of lynx habitat in the contiguous United States can affect lynx by reducing their prey base and increasing the energetic costs of using habitat within their home ranges. Direct effects of fragmentation on lynx include creation of openings that potentially increase access by competing carnivores, increasing the edge between early-successional habitat and other habitats, and changes in the structural complexities and amounts of seral forests within the landscape. At some point, landscape-scale fragmentation can make patches of foraging habitat too small and too distant from each other to be effectively accessed by lynx as part of their home range. Maintaining preferred habitat patches for lynx and hares within a mosaic of young to old stands in patterns that are representative of natural ecological processes and disturbance regimes would be conducive to long-term conservation.

Recommendations

• Increase the amount of old growth and mature multi-story habitat on the Flathead. Historically old-growth habitat was 15% to 60% (source Amendment #21). Current old-growth averages 11.6% across the Forest and ranges between 6.9% to 12.7% (source 1999 – 2007 Forest Plan Monitoring Report). Old-growth forest habitat must be increased to the historical range. Winter habitat may be most limiting for lynx, so maintaining and recruiting abundant multistory, mature forests with high horizontal cover is especially important.

• Reduce fragmentation of mature multi-story habitat. Forest patch size in late successional forest structure has been significantly reduced from historical levels. Horizontal cover is especially important for snowshoe hare habitat and winter lynx habitat.

• Pay special attention to maintaining or recruiting high horizontal cover and mature stands in the corridors identified by Dr. Squires that extend from Canada through the Whitefish Range, along the western front of the Swan Range ending near Seeley Lake. And the second corridor along the east side of Glacier National Park to the Bob Marshall Wilderness Complex.

Fisher

New research shows that the Rocky Mountain Fisher selects for large, old trees, snags and dense overhead cover more than had been previously thought. Research also shows that Fisher do not select and use riparian areas as much as biologists had hypothesized. Retention and recruitment of connected old-growth forest habitats is very important to maintain viability of fisher; relying on riparian buffer zones is not adequate.

From: Meta-analysis of habitat selction at resting sites by fishers in the pacific coastal states and provinces (Aubry et al. 2013)

Thus, throughout their Pacific coastal range, fishers exhibited clear and remarkably consistent selection for resting sites that had steeper slopes; cooler microclimates; denser overhead cover; greater volume of logs; greater basal area of large conifers, hardwoods, and snags; and larger diameter conifers and hardwoods than were generally available.

That is, fishers appear to be selective of relatively dense overhead cover and large forest structures at resting sites simply because they use relatively large trees, snags, and logs for resting, and the forest conditions around such structures differ from those that occur randomly in the forest.

Even with this sampling design, however, they were able to demonstrate selection of denser canopy cover and larger trees and snags at resting sites than were generally available, indicating that fishers are actively selecting specific environmental conditions around resting structures.

From Conservation of Fishers (Martes pennanti) in South-Central British Columbia, Western Washington, Western Oregon, and California–Volume III: Threat Assessment (Naney et al. 2012)

All known fisher reproductive dens are in cavities in live trees or snags. Reproductive dens are typically in the oldest and largest trees available. These den trees require extensive time periods to develop, because of size and time for ecological processes to occur that create cavities (Volume I, Chapters 7 and 8). Structural elements (e.g., large trees with cavities and platforms) are also used extensively by males and females for resting (Volume I, Chapter 7). There are no reported empirical thresholds at which reduction of structural elements may begin to negatively affect fishers.

Moderate to dense canopy closure provides key habitat features, and overstory trees provide one of the key components of this cover. They also contribute to the structural

diversity of forested environments. Overstory trees also contribute to current and future structural elements and prey species abundance and diversity. One of the most consistent predictors of fishers appears to be expanses of forest with moderate to high canopy cover (Volume I, Chapter 7).

Evaluating the effects of fragmentation on any species is a function of several interacting factors: 1) the scale of fragmentation in relation to the scales at which an animal interacts with its environment, 2) the pattern and extent of fragmentation within a given scale, and 3) the degree of contrast between the focal habitat and the surrounding areas (Franklin et al. 2002b). Fishers have relatively large home ranges, use habitat at multiple spatial scales, and typically avoid areas with little or no contiguous cover (Volume I, Chapter 7). Fragmented landscapes may affect landscape permeability, either permanently through vegetation type conversion or temporarily until vegetation recovery occurs (Green et al. 2008). Anthropogenic (e.g., urban development) and natural features (e.g., large rivers; Wisely et al. 2004) can also act as filters to fisher movements. We concluded that fragmentation can affect fishers' use of the landscape because moderate to high amounts of contiguous cover are a consistent predictor of fisher occurrence at large spatial scales (Volume I, Chapter 7).

From Biology and conservation of martens, sables, and fishers: a new synthesis (Raley et al. 2012)

However, available evidence indicates that the incidence of heartwood decay and cavity development is more important to fishers for denning than is the tree species. Other characteristics, such as the size and height of the cavity opening and the interior dimensions of the cavity, may also influence females' choice of natal and pre-weaning den structures. The cavity must be large enough to accommodate an adult female and 1–4 growing kits, and have a relatively small opening (just large enough for a female to fit through) high off the ground (15–26 m on average; e.g., Aubry and Raley 2006; Weir and Corbould 2008; Thompson et al. 2010). These characteristics may be important for excluding potential predators and aggressive male fishers.

Presumably, the cavity must also have adequate thermal properties to protect kits from weather extremes. Compared with ambient temperatures, tree cavities provide stable microclimates with narrow temperature fluctuations (Sedgeley 2001; Weir and Corbould 2008; Coombs et al. 2010). Most (75%) of the dens used by reproductive female fishers were in live trees. Cavities in relatively large live trees appear to have more stable temperatures during the day, and stay warmer at night, than those in relatively small snags (Wiebe 2001; Coombs et al. 2010). Other factors, such as the orientation of the cavity and exposure to sunlight (i.e., amount of canopy cover), may also influence the thermal properties of cavities, but quantitative evidence is lacking.

Fisher resting habitat in western North America is also strongly tied to forest structure. Fishers typically rest in large deformed or deteriorating live trees, snags, and logs, and forest conditions around the rest structures (i.e., the rest site) frequently include structural elements characteristic of late-seral forests.

Fishers rested primarily in deformed or deteriorating live trees (54–83% of all rest structures identified in individual studies), and secondarily in snags (6–26%) and logs

(3–20%; e.g., Weir and Harestad 2003; Zielinski et al. 2004b; Aubry and Raley 2006; Purcell et al. 2009). The species of trees and logs used for resting appeared to be less important than the presence of cavities, platforms, and other microstructures. In live trees, fishers rested primarily in rust brooms in more northern study areas (Weir and Harestad 2003; Weir and Corbould 2008; Davis 2009) and mistletoe brooms or other platforms elsewhere (e.g., Self and Kerns 2001; Yaeger 2005; Aubry and Raley 2006). In contrast, fishers primarily used cavities when resting in snags (e.g., Self and Kerns 2001; Zielinski et al. 2004b; Purcell et al. 2009). Fishers used hollow portions of logs or subnivean spaces beneath logs more frequently in regions with cold winters (e.g., Weir and Harestad 2003; Aubry and Raley 2006; Davis 2009) than those with milder winters (e.g., Yaeger 2005; Purcell et al. 2009; Thompson et al. 2010). These results suggest that fishers use structures associated with subnivean spaces to minimize heat loss during cold weather (Weir et al. 2004; Weir and Corbould 2008).

When engaged in active behaviors (e.g., foraging, traveling), fishers in western North America were frequently associated with complex forest structure. In general, active fishers were associated with the presence, abundance, or a greater size of ³ 1 of the following characteristics: logs, snags, live hardwood trees, and shrubs (e.g., Carroll et al. 1999; Slauson and Zielinski 2003; Weir and Harestad 2003; Campbell 2004).

Fisher habitat in western North America is intricately linked to a complex web of ecological processes that include natural disturbances (e.g., wind, fire), tree pathogens, and other organisms (e.g., primary excavators) that create and influence the distribution and abundance of microstructures (e.g., cavities, mistletoe brooms) in live trees, snags, and logs. Because female fishers rely exclusively on tree cavities for reproduction, we conclude that heartwood decay by heart-rot fungi, the process by which most reproductive den cavities are created, is an essential component of fisher denning habitat in western North America. This ecological process is also important for creating the microstructures that fishers use for resting (cavities in live trees and snags, and hollows in logs).

In western North America, a moderate to dense forest canopy is one of the strongest and most consistent predictors of fisher distribution and habitat use or selection at all spatial scales. The association of fishers with high amounts of canopy cover is further demonstrated by their avoidance of open environments.

Similarly, fisher occurrence in the Rocky Mountain region was positively correlated with canopy cover up to an apparent threshold of 60% (Carroll et al. 2001).

Previously, it was thought that fishers in western North America may favor riparian forests (Buskirk and Powell 1994; Powell and Zielinski 1994); however, results from recent studies do not support this hypothesis. Although riparian forests were important to fishers in some locales (e.g., black cottonwood [Populus balsamifera trichocarpa] forests provided denning habitat in British Columbia; Weir and Corbould 2008), consistent use or selection for riparian forests has not been demonstrated.

From Stand- and landscape-scale selection of large trees by fishers in the Rocky Mountains of Montana and Idaho (Schwartz et al. 2013)

Perhaps the most compelling result from this study was the consistent selection by female fishers for large trees at both stand and landscape scales

Thus, we recommend that silvicultural treatments of stands consider not only the retention of large trees, but consider the larger landscape when managing for fishers.

These results are similar to Jones and Garton (1994) who found fishers selecting mature and old growth forests during the summer in Idaho. Yet, during the winter, they found fishers using a wider array of habitats, although still selecting for the larger diameter trees compared to random (Jones and Garton, 1994). Zielinski et al. (2004) studied West Coast fisher habitat selection at resting locations in the Coastal Mountains and Sierra Nevada of California. They found that standing trees of California black oak and Douglas-fir of the largest diameter available were used in each area, respectively. In their Sierra study area their resource selection function showed that fishers selected sites nearby water, on steeper slopes, with larger maximum DBH trees at sites with more variable tree DBH than random. They interpreted these results to suggest that managers can maintain fisher resting habitat by retaining large trees and using forest management practices that aid in the recruitment of trees that achieve the largest sizes. They also recommend increasing structural diversity at these sites. We concur with these forest management recommendations in reference to NRM fishers as well.

Fishers likely avoid the ponderosa pine stands as they reflect the drier environments in the study area and generally have less understory cover to offer protection (Graham and Jain, 2005; Keeling et al., 2006). Avoidance of lodgepole pine is likely related to the relatively small diameter of even the oldest trees (i.e., mature sizes of lodgepoles in the Northern US Rocky Mountains is between 18 and 33 cm DBH; Burns and Honkala, 1990). This is consistent with evidence for fisher's selection for western red cedar stands, a species with large DBH and associated with wetter, more structure filled environments.

We recommend retention of large decadent trees and snags in areas with large trees to provide denning habitat for female fishers. While we identified univariate patterns of selection for variables that indicate structure, we also found avoidance of variables such as landscapes with a high proportion of grass, suggesting the corollary – avoidance of open areas - is also true. This is similar to results from Weir and Corbould (2010), where fishers avoided open areas, non-forested ecosystems, and areas with recent logging.

In this study, we found that females are indeed selecting habitat at two scales: a stand scale as indicated by stands that have large mean and maximum DBH trees (as well as a large variation in tree size) and a landscape scale as indicated by the preference for landscapes with a high proportion of large trees. Thus, it appears that while fishers can be detected in riparian stringers that bisect open landscapes, this habitat may not be sufficient for persistence. The converse is also likely true. Landscapes that do not have variation in large trees, snags, and cavities, and drier landscapes (i.e., landscapes with ponderosa and lodgepole pine) are probably not sufficient for fisher persistence either. Forest activities that promote the growth of multi-stage stands with ample structure and variation in tree widths and ages will provide the best habitat for fishers. Retaining trees that have decadence, disease, or defects will help provide some of this habitat.

From Factors affecting landscape occupancy by fishers in north-central British Columbia (Weir and Corbould, 2010)

Fishers showed strong selection for where they established home ranges within the landscape, avoiding establishing home ranges in areas with high densities of open areas. Being that fishers establish home ranges only where there is a sufficient concentration of suitable habitat (Powell 1994), our observation that fishers excluded wetland ecosystems and recently logged stands from their home range may be linked to the low densities of resources found in these areas. Wetlands and recently logged areas typically have little overhead cover, which likely exposes fishers to greater risk from aerial predators (Powell and Zielinski 1994). Further more, escape cover, such as trees for climbing, is farther apart in these environments, making fishers further susceptible to terrestrial predators.

The relationship between the extent of open areas and probability of home range occupancy suggests that past and proposed forest harvesting can strongly affect the ability of the landscape to support fishers, especially in landscapes in which wetland ecosystems are common. Landscapes with previous widespread and intensive forest harvesting may lose their ability to support fishers until these harvested areas regenerate sufficiently. Depending on the residual density of fishers in the harvested landscape, fishers need to disperse from adjacent areas with less forest harvesting for these landscapes to support resident fishers again. Intensive forest harvesting in the future may exacerbate the already diminished ability of modified landscapes to support fishers, particularly in forests that are slated for salvage harvest of diseased or damaged trees.

Because salvage harvest of beetle-killed trees typically involves clear cut harvesting, whereby all tree species (including spruce and fir) and secondary structure within the harvest unit are felled or cleared, our results suggest that this expedited harvest will gravely affect the ability of these landscapes to be occupied by fishers.

Soils

Soils are the foundation of terrestrial life. Forest productivity is directly tied to soil conditions. Soil takes thousands of years to develop and is not 'renewable' on a human time scale. Soil is an ecosystem in itself that must be healthy in order to provide for healthy forests, grasslands, and aquatic systems. Actions impacting such complex systems are prone to unintended consequences. Given the life-support role soils play, special care and prudence are essential.

The National Forest Management Act (NFMA) prohibits "irreversible damage" to soils as well as "substantial and permanent impairment of productivity of land". Loss of soil (erosion) and displacement clearly cause "irreversible damage" and "permanent impairment of productivity of land". Loss of coarse woody debris causes soil damage that can last a century or more. Soil compaction negatively impacts soil productivity, overland flow, erosion, stream sedimentation, and late season flows. Soil compaction

from logging can persist 50 – 80 years. (ICBEMP, Assessment of Ecosystem Components, 1997)

Avoiding soil damage is the only option; full restoration of soil damage is not generally possible. Compacted soils are not completely mechanically restorable. Mechanized decompaction is only partially effective at decompacting and can compound problems by mixing rock and mineral soil with topsoil resulting in long term reduced productivity. Replacing eroded or displaced soil is problematic. Artificial coarse woody debris replacement is not practical over large areas such as burned clearcuts.

Timber harvest practices including road building, log skidding and slash disposal have caused most soil damage on forest lands.

Nutrient recycling is a critical function of soils that historically has been damaged by treatments that negatively affect the amounts, types, and distribution of organic matter retained on site. (Graham, R. T., 1990) Many years of piling and windrowing of slash using dozer blades has removed not only the litter plus duff layers but also the thin layer of organic rich mineral soil (A horizon) from large acreages of forested lands. (McBride, personal communication) Guidelines for retaining adequate coarse woody debris should be developed based on the site potential and be within the historic range of variability for the fire regime of the site. Coarse woody debris needs to be maintained at natural levels in the interface zone, with exception granted immediately around structures and residences. (Harvey, 1987).

Control of livestock concentration, especially in sensitive riparian areas is essential to maintaining soil porosity and bulk density. The moist soils in these areas become compacted by concentrations of cattle in only a few days. (Warren, S.D., 1986; BNF soil monitoring reports) Gentle upland ridge tops and swales are other "gathering places" for cattle that require special efforts to control their distribution to protect soils from detrimental compaction.

The process of nutrient cycling on the forest lands is primarily effected through fire; this recycling is key to forest and grassland ecosystem health. Therefore, the use of fire when treating vegetation should be in accordance with the natural fire regime for the site, and organic matter left on site should be within the natural historic range of variability for the site type. (Fischer, W. C., 1987)

Mycorrhizal fungi are an essential component of productive soil. (Amaranthus, M. P., 1996) Most regeneration failures may be due to problems with mycorrhizae. Monitoring mycorrhizae needs to be part of soil condition assessments. Mycorrhizae are very temperature sensitive, so soil temperatures need to be monitored.

Monitoring of detrimental soil disturbances needs to include: compaction, displacement, rutting, severe burning, erosion, loss of surface organic matter (especially coarse woody debris), soil mass movement, soil temperature, and damage to micro-biological components of soil (especially mycorrhizal fungi).

Given that monitoring has demonstrated an extensive legacy of soil damage, it is time to include that information in watershed health assessments. There needs to be an

inventory of where these highly damaged soils occur and the extent to which they are damaged. The Forest Plan needs to quantify the acreages by watershed and do cumulative effects analysis, including the road systems to understand the full impact management has had on watershed health.

Elk

Elk and other big game require secure habitat, low road densities, winter and summer thermal cover and special features such as wet sites, riparian habitat, licks, and movement corridors.

From Defining Elk Security: The Hillis Paradigm. 1991 Proceedings of a Symposium on Elk Vulnerability, Montana Chapter of the Wildlife Society (Hillis et al. 1991)

• Guidelines for elk security are a minimum of 250 acres for providing security under favorable conditions; under less favorable conditions the minimum must be >250 acres. Effective security areas may consist of several cover-types of the block is relatively unfragmented. Among security areas of the same size, one with the least amount of edge and the greatest width generally will be the most effective. Wallows, springs and saddles may require more cover than other habitats.

• Generally, security areas become more effective the farther they are from an open road. The minimum distance between a security area and an open road should be one half mile. The function of this ≥ one half mile "buffer" is to reduce and disperse hunting pressure and harvest that is concentrated along open roads. Failure to accomplish this function will reduce the effective size of the security area and may render it ineffective. When cover is poor and terrain is gentle, it may require > one half mile from open roads before security is effective.

• Roads may be closed to motorized travel to provide security and a buffer between security areas and open roads. However, the minimum distance between open roads and security areas increases as closed-road densities increase within both the security area and buffer.

• To be biologically meaningful, analysis unit boundaries should be defined by the elk herd home-range, and more specifically by the local herd home-range during hunting season. Elk vulnerability increases when less than 30% of analysis unit is comprised of security area.

• These guidelines represent minimums and do not necessarily justify reducing security to meet these levels (i.e., if 50% of an analysis unit is security, do not assume that 20% of the unit is excess security).

Hillis, J. Michael, Michael J. Thompson, Jodie E. Canfield, L. Jack Lyn, C. Les Marcum, Patricia M. Dolan, David W. McCleerey; Defining Elk Security: The Hillis Paradigm. 1991 Proceedings of a Symposium on Elk Vulnerability, Montana Chapter of the Wildlife Society.

From Elk Management in the Northern Region: Considerations in Forest Plan Updates or Revisions (Christensen et al. 1993)

• Considerations for Forest Plans Related to Habitat Effectiveness

- Roads: density (miles/square mile), construction standards, seasons of use, method of closure. Roads are undoubtedly the most significant consideration on elk summer range. Any motorized vehicle use on roads will reduce habitat effectiveness (including administrative use).
- Special features: wet sites, riparian habitat, licks, movement corridors. These sites are highly desirable for forage, water, temperature regulation, movement or a combination. Such sites should be recognized and protected; avoid damaging these features where elk are a benefiting resource.
- Cover: extent, shape, size, connectiveness. Cover analysis includes maintenance of security, landscape management of coniferous cover and monitoring elk use. Cover unit size, patterns on a landscape basis, connectiveness with other cover, the amount of cover available to elk and know use patterns by elk should be considered in prescriptions.
- Scale of analysis: site specific, herd unit, habitat analysis unit
- Spatial relationships: intermingled ownerships, adjacent administrative units, district or forest "averaging"
- Domestic livestock: forage and spatial competition.

• Levels of habitat effectiveness:

a. For areas intended to benefit elk summer range and retain high use, habitat effectiveness should be 70% or greater.

b. For areas where elk are one of the primary resource considerations habitat effectiveness should be 50% or greater.

c. Areas where habitat effectiveness is retained at lower than 50% must be recognized as making only minor contributions to elk management goals.

d. Reducing habitat effectiveness should never be considered as a means of controlling elk populations.

• Considerations for Forest Plans Related to Elk Vulnerability

- Roads: season of use, density.
- Security areas: distance from roads, size, cover characteristics, closures (area), topographic characteristics.
- Cover management: description, connectiveness, scale, terrain relationships.
- Mortality models: demonstrated predictors of elk mortality based on habitat quality, hunter density, or other factors.

Wildfire And Salvage Logging

Salvage logging after wildfires has significant detrimental impacts to soils, wildlife habitat, birds, water quality and fish.

From Wildfire and salvage logging: Recommendations for ecologically-sound post-fire salvage management and other post-fire treatments on federal lands in the West (Beschta et al 1995):

POST-FIRE PRINCIPLES

We recommend that management of post-fire landscapes should be consistent with the following principles:

1) Allow natural recovery and recognize the temporal scales involved with ecosystem evolution.

Human intervention on the post-fire landscape may substantially or completely delay recovery, remove the elements of recovery, or accentuate the damage. In this light there is little reason to believe that post-fire salvage logging has any positive ecological benefits, particularly for aquatic ecosystems. There is considerable evidence that persistent, significant adverse environmental impacts are likely to result from salvage logging, based on many past cases of salvage projects, plus our growing knowledge of ecosystem functions and land-aquatic linkages. These impacts include soil compaction and erosion, loss of habitat for cavity nesting species, loss of structurally and functionally important large woody debris. Human intervention should not be permitted unless and until it is determined that natural recovery processes are not occurring.

2) No management activity should be undertaken which does not protect soil integrity.

Soil loss and soil compaction are associated with both substantial loss of site productivity and with off-site degradation. Decreased infiltration, increased overland flow, and excess sedimentation all directly contribute to the degradation of forest soils and the off-site degradation of aquatic systems and reduced survival of aquatic species, including salmonids. Reduction of soil loss is associated with maintaining the litter layer. Although post-burn soil conditions may vary depending upon fire severity, steepness of slopes, inherent erodibility, and others, soils are particularly vulnerable in a burned landscape. Soil and soil productivity are irreplaceable in human timescales; therefore, post-burn management activities that accelerate erosion or create soil compaction must be prohibited.

3) Preserve species' capability to naturally regenerate.

From an ecological perspective, there is frequently no need for artificial regeneration. Artificial reintroduction of species will circumvent natural successional changes, are often unsuccessful and will have unanticipated side effects even if successful. If native species are failing to reestablish naturally, that failure will frequently be associated with other reasons than the absence of seed sources or colonists. If warranted, artificial regeneration should use only species and seed sources native to the site, and should be done in such a way that recovery of native plants or animals is unhampered.

4) Do not impede the natural recovery of disturbed systems.

Delays in recovery may increase the likelihood of extirpation of stressed populations, or may alter the pathway of recovery altogether. As a practical example, areas that have experienced the effects of a severe burn and are likely to exhibit high erosion should not be subjected to additional management activities likely to contribute to yet more sedimentation. Efforts should focus on reducing erosion and sedimentation from existing human-caused disturbances, e.g., roads, grazing, salvage logging.

RECOMMENDATIONS ON POST-FIRE PRACTICES

1) Salvage logging should be prohibited in sensitive areas.

Logging of sensitive areas is often associated with accelerated erosion and soil compaction (Marston and Haire 1990), and inherently involves the removal of large wood which in itself has multiple roles in recovery. Salvage logging may decrease plant regeneration, by mechanical damage and change in micro-climate. Finally, logging is likely to have unanticipated consequences concerning micro-habitat for species that are associated with recovery, e.g., soil microbes. Salvage logging by any method must be prohibited on sensitive sites, including:

- in severely burned areas (areas with litter destruction),
- on erosive sites,
- on fragile soils,
- in roadless areas,
- in riparian areas,
- on steep slopes,
- any site where accelerated erosion is possible.

2) On portions of the post-fire landscape determined to be suitable for salvage logging, limitations aimed at maintaining species and natural recovery processes should apply.

Dead trees (particularly large dead trees) have multiple ecological roles in the recovering landscape including providing habitat for a variety of species, and functioning as an important element in biological and physical processes (Thomas 1979). In view of these roles, salvage logging must:

- leave at least 50% of standing dead trees in each diameter class;
- leave all trees greater than 20 inches dbh or older than 150 years;
- generally, leave all live trees.

Because of soil compaction and erosion concerns, conventional types of ground-based yarding systems (tractors and skidders) should be generally prohibited. . .

3) Building new roads in the burned landscape should be prohibited. . .

4) Structural post-fire restoration is generally to be discouraged.

Frequently, post-fire restoration efforts involve the installation of hard structures including sediment traps, fish habitat alterations, bank stabilization, hay bales, weirs, check dams, and gabions. Such hard structures are generally not modeled or sited on the basis of natural processes, and their ability to function predictably may be particularly low in dynamic post-fire landscapes. Hard structures have high rates of both failure and unanticipated side effects. Therefore, structures are generally an undesirable and unsuccessful method for controlling adverse environmental impacts. . .

5) Post-fire management requires reassessment of existing management.

For example, the condition of a transportation system (i.e., pre-existing roads and landings) should be reassessed after a fire. By increasing runoff, erosion, and sedimentation, fires may increase the risks posed by existing roads. Therefore, post-fire analysis is recommended to determine the need for undertaking road maintenance, improvement, or obliteration.

6) Continued research efforts are needed to help address ecological and operational issues.

There is a need to research certain questions in order to guide post-fire management decisions. For example, some argue that salvage logging is needed because of the perceived increased likelihood that an area may reburn. It is the fine fuels that carry fire, not the large dead woody material. We are aware of no evidence supporting the contention that leaving large dead woody material significantly increases the probability of reburn." (Beschta et al 1995)

From Forest Service report PNW-GTR-486 "Environmental Effects of Postfire Logging: Literature Review and Annotated Bibliography" (USFS 2000) which reviewed the literature on salvage logging after fire focusing on environmental effects of logging and removal of large woody structure. Following are some of the references used and conclusions drawn:

a) Working on the Entiat burn of 1970 (Wenatchee National Forest), Klock (1975) and Helvey and others (1985) compared five different log retrieval systems (after hand felling) with respect to soil disturbance and erosion: tractor skidding over bare ground (<30 percent slope), tractor skidding over snow (<40 percent), cable skidding over bare ground, skyline (Wyssen skycrane), and helicopter. Klock (1975) found that tractor skidding over bare ground caused the greatest percentage of area of severe soil disturbance (36 percent), followed by cable skidding (32 percent), tractor skidding over snow (9.9 percent), skyline (2.8 percent), and helicopter (0.7 percent).

b) Evidence that logging can affect vegetative production in the absence of significant ground disturbance was collected by Sexton (1994) in a study in central Oregon in postfire ponderosa pine stands, logged over snow. Sexton found that biomass of vegetation produced 1 and 2 years after postfire logging was 38 percent and 27 percent of that produced in postfire unlogged stands. He also found that postfire logging decreased canopy cover, increased exotic plant species, increased graminoid cover, and

reduced overall plant species richness. Pine seedlings grew 17 percent taller on unlogged sites in this short-term study.

c) Postfire logging normally removes a great percentage of large dead woody structure and thus has the potential for significantly changing postfire habitat for wildlife (Lindenmayer and Possingham 1995, 1996). These changes include "structural" effects, such as removal of existing and future snags and large woody material, and "functional" effects, such as reduction in insect populations that serve as food for various wildlife species (Blake 1982, Saab and Dudley 1998, Sallabanks and McIver 1998).

d) In four recent independent studies conducted in the intermountain West, postfire logging caused significant changes in abundance and nest density of cavity-nesting birds, although the effect differed somewhat by location (Caton 1996, Hejl and McFadzen 1998, Hitchcox 1996, Saab and Dudley 1998). Most cavity-nesters showed consistent patterns of decrease after logging, including the mountain bluebird and the black-backed, hairy, and three-toed woodpeckers; abundance of the Lewis' woodpecker increased after logging.

e) No studies have specifically looked at how postfire logging alters the size distribution of fuel and the concomitant changes in future fire risk. Work examining fuels on harvested green tree stands suggests that postfire logging may increase short-term fuel loads and fire risk, owing to increased fine activity fuels, but reduce intermediate and long-term fire risk through removal of larger dead structure (Brown 1980).

f) Proper recovery and rehabilitation techniques by managers may be capable of mitigating soil loss and erosion problems associated with postfire logging (Simon and others 1994). For example, ground disturbance caused by postfire logging could disrupt water-repellent layers, increase infiltration, and thus decrease overland flow and sediment transport to streams, which could be a benefit during severe hydrological events. This hypothesis, however, has not been tested experimentally.

From Toward Meaningful Snag-Management Guidelines for Postfire Salvage Logging in North American Conifer Forests (Hutto 2006):

a) Birds in burned forests have very different snag-retention needs from those cavity nesting bird species that have served as the focus for the development of existing snag-management guidelines. Specifically, many postfire specialists use standing dead trees not only for nesting purposes but for feeding purposes as well. Woodpeckers, in particular, specialize on wood-boring beetle larvae that are superabundant in fire-killed trees for several years following severe fire. Species such as the Black-backed Woodpecker (Picoides arcticus) are nearly restricted in their habitat distribution to severely burned forests. Moreover, existing postfire salvage-logging studies reveal that most postfire specialist species are completely absent from burned forests that have been (even partially) salvage logged. I call for the long-overdue development and use of more meaningful snag-retention guidelines for postfire specialists, and I note that the biology of the most fire-dependent bird species suggests that even a cursory attempt to meet their snag needs would preclude postfire salvage logging in those severely burned

conifer forests wherein the maintenance of biological diversity is deemed important.

b) The ecological cost of salvage logging speaks for itself, and the message is powerful. I am hard pressed to find any other example in wildlife biology where the effect of a particular land-use activity is as close to 100% negative as the typical postfire salvage-logging operation tends to be.

c) Existing science-based data suggest that there is little or no biological or ecological justification for salvage logging. McIver and Starr (2000) note that because of this, the justification for salvage logging has begun to shift toward arguments related to rehabilitation or restoration, but those sorts of justifications also reflect a lack of appreciation that severe fires are themselves restorative events and that rehabilitation occurs naturally as part of plant succession (Lindenmayer et al. 2004). Interference with the natural process of plant succession by planting or spraying to speed the process of succession toward narrow timber-producing or old-growth goals, as some suggest (e.g., Sessions et al. 2004), is also incompatible with a holistic public-land-management goal of working within the constraints of a natural system. All things that characterize a severe disturbance event, including soil erosion and sometimes insufferably slow plant recovery, are precisely the things that constitute "rehabilitation" for those organisms that need those aspects of disturbance events at infrequent intervals to sustain their populations.

d) The profound failure of many decision makers to appreciate the ecological value of burned forests stems from their taking too narrow a view of what forests provide. The general belief that "dead and dying timber ought to be harvested and put to use" (Schwennesen 1992) prevailed prior to the infamous salvage rider of 1995 (U.S. Congress 1995), and it apparently still prevails today in many management circles. Land managers, politicians, and the public-at-large need to gain a better appreciation of the unique nature of burned forests as ecological communities, how sensitive the process of succession is to conditions immediately following the disturbance event (Platt & Connell 2003), and how important the legacy of standing deadwood is to the natural development of forests (Franklin et al. 2000). Nowhere are soils, special plants, or wildlife more sensitive to the proposition of tree harvesting than in a burned forest. And nowhere is the consideration of ecology more blatantly absent than in decisions to salvage log.

From Wildlife and Native Fish: Issues of Forest Health and Conservation of Sensitive Species (Rieman and Clayton 1997):

a) Although wildfires may create important changes in watershed processes often considered harmful for fish or fish habitats, the spatial and temporal nature of disturbance is important. Fire and the associated hydrologic effects can be characterized as "pulsed" disturbances (*sensu* Yount and Niemi 1990) as opposed to the more chronic or "press" effects linked to permanent road networks. Species such as bull trout and redband trout appear to have been well adapted to such pulsed disturbance. The population characteristics that provide for resilience in the face of such events, however, likely depend on large, well-connected, and spatially complex habitats that can be lost through chronic effects of other management. Critical elements to resilience and

persistence of many populations for these and similar species will be maintaining and restoring complex habitats across a network of streams and watersheds. Intensive land management could make that a difficult job.

From Reducing Fire Risks to Save Fish – A Question of Identifying Risk. A position Paper by the Western Montana Level I Bull Trout Team (Riggers et al 2001):

a) Habitat conditions are another factor that has changed significantly. In general, fish habitat quality is much less diverse and complex than historic, and native fish populations are therefore less fit and less resilient to watershed disturbances. Roads, more than any other factor, are responsible for the majority of stream habitat degradation on National Forest Lands in this area (USDA 1997). Historically roads were not present in watersheds and did not affect hydrologic or erosional patterns. Now, however, extensive road networks in many of our watersheds contribute chronic sediment inputs to stream systems and these effects are exacerbated when fires remove the vegetation that filters road runoff.

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

c) Salvage of burned trees is often proposed to reduce future fuel loading. While salvage can be accomplished with minimal impacts in some areas, many burned areas are already extremely sensitive to ground disturbance due to the loss of vegetation. Further disturbance can result in increased erosion, compacted soils and a loss of nutrients from these areas (USDA 2000, Beschta et al. 1995).

d) …we believe, in most cases, proposed projects that involve large-scale thinning, construction of large fuel breaks, or salvage logging as tools to reduce fuel loadings with the intent of reducing negative effects to watersheds and the aquatic ecosystem are largely unsubstantiated. Post-fire activities such as these that increase the probability of chronic sediment inputs to aquatic systems pose far greater threats to both salmonid and amphibian populations and aquatic ecosystem integrity than do fires and other natural events that may be associated with undesired forest stand condition (Frissell and Bayles 1996).

From Factors Influencing Occupancy of Nest Cavities in Recently Burned Forests (Saab et al 2004).

a) Recently burned forests in western North America provide nesting habitat for many species of cavity-nesting birds. Year after fire had the greatest influence on occupancy of

nest cavities for both groups, while site of the burn was secondarily important in predicting occupancy by strong excavators and less important for weak excavators. Predicted probability of cavity occupancy was highest during the early years (1–4) after fire, declined over time (5–7 years after fire), and varied by site, with a faster decline in the smaller burned site with a greater mosaic of unburned forest.

From Postfire Management on Forested Public Lands of the Western United States (Beschta et al 2004):

a) Scientific assessments of the current condition of forested systems in the western United States consistently yield the same broad conclusions: a century or more of road building, logging, grazing, mining, fire suppression, and water withdrawals, in conjunction with the loss of key species and the introduction of exotic species have degraded watersheds, modified streamflows and water quality, altered ecosystem processes and decreased biological diversity. Past and present actions limit the capacity for ecosystem recovery and reduce the range and abundance of many native species. Although postfire landscapes are often portrayed as "disasters" in human terms, from an ecological perspective they are the result of vital disturbance processes in forests.

b) Following a wildland fire, a common assumption is that immediate actions are needed to rehabilitate or restore the "fire-damaged" landscape. Yet abundant scientific evidence suggests that commonly applied postfire treatments may compound ecological stresses. Perhaps the most critical step in undertaking ecological restoration in the postfire environment is to forgo those activities and land uses that either cause additional damage or prevent reestablishment of native species, ecosystem processes, or plant succession.

c) To protect aquatic ecosystems in areas with moderate to high-severity burns, postfire management should not increase soil erosion or reduce soil productivity. Furthermore, onsite impacts to early successional native plant species during postfire logging, where such species are nitrogen fixers, can significantly affect a major pathway of nutrient replenishment in the postfire environment. Evidence continues to mount of a direct relationship between mechanical disturbance to the postfire environment and accelerated erosion. Soil compaction can persist for 50-80 years in many forest soils.

d) Postfire salvage logging has sometimes been justified on the assumption that >50% crown scorch results in tree mortality. However, trees within low and mid-elevation forests of the western United States possess a suite of adaptations that facilitate fire survival. Stephens and Finney (2000) found that the probability of conifer mortality is low when the percentage of the crown scorch was <60%. For trees greater than or equal to 50 cm dbh, they determined that the probability of mortality of ponderosa pine, incense cedar and white fir was <40% when crown scorch was as high as 80%. The multiple ecological roles of large trees and their high probability of survival supports the need to retain them in burned areas. Postfire salvage logging, based primarily on economic values, typically removes only the largest trees and…

e) Both ground-based yarding systems (tractors and skidders) and, to a lesser degree, cable systems can cause significant soil disturbance and compaction. Such practices

should be prohibited in burned areas whenever they are likely to accelerate onsite erosion.

f) Accelerated surface erosion from roads is typically greatest within the first years following construction, although in most situations sediment production remains elevated over the life of a road. Thus, even "temporary" roads can have enduring effects on aquatic systems. Similarly, major reconstruction of unused roads can increase erosion for several years and potentially reverse reductions in sediment yields that occurred with disuse.

g) It is perhaps widely accepted that "best management practices" (BMPs) can reduce damage to aquatic environments from roads. Time trends in aquatic habitat indicators indicate, however, that BMPs fail to protect salmonid habitats from cumulative degradation by roads and logging. Ziemer and Lisle (1993) note a lack of reliable data showing that BMPs are cumulatively effective in protecting aquatic resources from damage.

From other sources, as noted:

"[S]everely burned forest conditions have probably occurred naturally across a broad range of forest types for millennia. These findings highlight the fact that severe fire provides an important ecological backdrop for fire specialists like the Black-backed Woodpecker, and that the presence and importance of severe fire may be much broader than commonly appreciated." (Hutto 2008).

"Whether forests that have been 'restored' through nontraditional harvest methods still retain the characteristics needed by Black-backed Woodpeckers after they burn severely under extreme weather conditions is currently unknown.

The second reason why we cannot assume that suitable postfire habitat will always be ample is that, even though severely burned forests will always be plentiful, postfire logging (a common postfire management practice) also reduces the suitability of burned forests to fire specialists like the Black-backed Woodpecker (Kotliar et al. 2002, Hutto 2006, Hutto and Gallo 2006, Koivula and Schmiegelow 2007, Saab et al. 2007)." (Hutto 2008).

"In contrast, the patterns of distribution and abundance for several other bird species (black-backed woodpecker [Picoides arcticus], buff-breasted flycatcher [Empidonax fulvifrons], Lewis' woodpecker [Melanerpes lewis], northern hawk owl [Surnia ulula], and Kirtland's warbler [Dendroica kirtlandii]) suggest that severe fire has been an important component of the fire regimes with which they evolved. Patterns of habitat use by the latter species indicate that severe fires are important components not only of higher-elevation and high-latitude conifer forest types, which are known to be dominated by such fires, but also of mid-elevation and even low-elevation conifer forest types that are not normally assumed to have had high-severity fire as an integral part of their natural fire regimes. . .

The ecology of selected species (in the present case, fire-dependent species) should be

used to understand and embrace the natural processes that prehistorically produced conditions necessary for their maintenance, and not be used to devise artificial means to circumvent those natural processes." (Hutto et al 2008).

"An appreciation of the biological uniqueness of severely burned forests is important because if we value and want to maintain the full variety of organisms with which we share this Earth, we must begin to recognize the healthy nature of severely burned forests. We must also begin to recognize that those are the very forests targeted for post-fire logging activity. Unfortunately, post-fire logging removes the very element — dense stands of dead trees — upon which many fire-dependent species depend for nest sites and food resources.

With respect to birds, the effects of post-fire salvage harvesting are uniformly negative. In fact, most timber-drilling and timber-gleaning bird species disappear altogether if a forest is salvage-logged. Therefore, such places are arguably the last places we should be going for our wood." (Hutto 2013).

"Although the Black-backed Woodpecker is the most extreme species in terms of its restriction to, and evolutionary history with, burned forests, many additional bird species reach their greatest abundance in burned forests (15 of 87 species detected in burned forests, as I noted above). These include the Three-toed Woodpecker, Hairy Woodpecker, Olive-sided Flycatcher, Clark's Nutcracker, Mountain Bluebird, American Robin, Townsend's Solitaire, Cassin's Finch, Dark-eyed Junco, Chipping Sparrow, and Red Crossbill." (Hutto 2011).

"One of the most common management activities following forest fires is salvage logging (Figure 8). Perhaps we need to change our thinking when it comes to logging after forest fires. With respect to birds, no species that is relatively restricted to burned-forest conditions has ever been shown to benefit from salvage harvesting. In fact, most timber-drilling and timber-gleaning bird species disappear altogether if a forest is salvage-logged. Therefore, if we want our land-use decisions to be based, at least in part, on whether a proposed activity affects the ecological integrity of our forest systems, burned forests should be the LAST, rather than the first places we should be going for our wood.

For birds, standing dead trees are one of the most special biological attributes of burned forests. They house equally unique beetle larvae that become abundant because they feast on the wood beneath the bark of trees that have died and are, therefore, defenseless against attack. If we value and want to maintain the full variety of organisms with which we share this Earth, we must not only recognize that burned forests are quite "healthy," but must also begin to recognize that post-fire logging removes the very element — standing dead trees — upon which each of those special bird species depend for nest sites and food resources. "(Hutto 2011).

"Patches of high-intensity fire (where most or all trees are killed) support the highest levels of native biodiversity of any forest type in western U.S. conifer forests, including many rare and imperiled species that live only in high-intensity patches. Even Spotted Owls depend upon significant patches of high-intensity fire in their territories in order to maintain habitat for their small mammal prey base. These areas are ecological

treasures." (Hanson 2010).

Beetle-Killed Trees

Beetle killed trees are a natural part of forest ecosystems and promote development of habitat attributes necessary for many other species.

"'But beetle kill is very different. Change induced by beetles is less abrupt, and, unless beetle-killed trees are cut, they remain part of the overstory for years.' Both of these traits have important implications for how a stand regenerates and how watersheds respond." (USFS 2012, quoting Research Biogeochemist Chuck Rhoades).

"'But the sick and dead trees are also losing needles that fall to the ground and help retain soil moisture. And, as trees decay, they release nutrients back into the system.'" (Id., quoting Research Biogeochemist Chuck Rhoades).

"[R]esearchers are already finding that beetles may impart a characteristic critically lacking in many pine forests today: structural complexity and species diversity." (Id.)

"As these infested trees die their diminutive competitors respond vibrantly. Healthy understory plants stand poised, like a carpet of dry sponges, ready to soak up the water, sun, and fertility liberated by the assault around them. Uptake by the surviving understory strongly dampens runoff and nutrient input into waterways downslope." (Id.)

"[T]otal understory plant cover declined in treated sites compared to those where no cutting took place. The difference was apparently driven by the negative responses of several key native species to mechanical harvest. 'Species in the genus Vaccinium declined markedly in our clearcut sites,' she said. 'That genus includes shrubs related to blueberries that are important to some wildlife. They generally suffer in response to disturbance and copious direct sunlight.'" (Id., quoting researcher Paula Fornwalt).

Aside from promoting mixed age structure and helping to maintain native understory communities, retention of the dead [lodgepole] overstory favors a shift in tree species composition. . . 'Those include lodgepole pine, subalpine fir, and aspen, with subalpine fir as the most abundant species of new recruit. (Id., quoting researcher Paula Fornwalt).

Although an increase in subalpine fir may elevate fire risk in forests recovering from beetle infestation, untreated beetle-killed stands may be of great benefit to non-human forest inhabitants. The prevalence of fir following beetle outbreaks could be a boon for wildlife species that rely on the complex vertical structure that is generally lacking in lodgepole pine-dominated stands. The same low fir limbs that can carry fire into the canopy provide food, thermal cover, and protection from predators for a host of wildlife including snowshoe hare, favorite prey for the Canada lynx. Species of conservation concern ranging from Mexican spotted owls to the Canada lynx could respond positively to the structural complexity induced by mountain pine beetles. By

driving these shifts at a huge spatial scale, beetles might even be viewed as a biological mechanism for creating the habitats that now limit some of the species we care most about. (Id.)

"[T]he most informative and striking lesson thus far may be the response that occurs in our absence. Apparently without posing serious threats to water quality or long-term ecosystem viability, mountain pine beetles may increase the structural complexity and species diversity of high elevation forests. These characteristics could have substantial benefits in the near term and, perhaps more importantly, they are the keys to improved resilience in our future forests." (Id.)

"A model of nitrate release from Colorado watersheds calibrated with field data indicates that stimulation of nitrate uptake by vegetation components unaffected by beetles accounts for significant nitrate retention in beetle-infested watersheds." (Rhoades et al 2013).

"The lack of a large streamwater nitrate response after extensive canopy mortality caused by bark beetles may be explained by some combination of two factors. Heterogeneous mortality (spatial and temporal) would be expected to reduce the amount of nitrate loss at any given time over the progression of infestation. In addition, compensatory responses by residual live vegetation are likely to respond to the increased resources available following overstory mortality. . . A second step in adaptation of the model is to assume that beetle-induced mortality, although killing much or most of the original canopy, does not disturb beetle-resistant overstory trees and the understory vegetation that would be lost or damaged during tree harvest." (Id.)

"While research is ongoing and important questions remain unresolved, to date most available evidence indicates that bark beetle outbreaks do not substantially increase the risk of active crown fire in lodgepole pine (Pinus contorta) and spruce (Picea engelmannii)- fir (Abies spp.) forests under most conditions. Instead, active crown fires in these forest types are primarily contingent on dry conditions rather than variations in stand structure, such as those brought about by outbreaks. Preemptive thinning may reduce susceptibility to small outbreaks but is unlikely to reduce susceptibility to large, landscape-scale epidemics. Once beetle populations reach widespread epidemic levels, silvicultural strategies aimed at stopping them are not likely to reduce forest susceptibility to outbreaks. Furthermore, such silvicultural treatments could have substantial, unintended short- and long-term ecological costs associated with road access and an overall degradation of natural areas." Black et al 2013.

Post-disturbance harvest is common practice on forest lands and is designed to remove trees or other biomass in order to produce timber or other resources. This type of resource extraction has the potential to inadvertently lead to heightened insect activity (Nebeker 1989; Hughes and Drever 2001; Romme et al. 2006). In particular, snags and fallen logs contribute to the protection of soils and water quality and provide habitat for numerous cavity and snag-dependent species (Romme et al. 2006), many of which prey on bark beetles and other economically destructive insects. Therefore, outbreaks could be prolonged because of a reduction in the beetle's natural enemies (Nebeker 1989), including both insects and bird species that feed on mountain pine beetles (Koplin and Baldwin 1970; Shook and Baldwin 1970; Otvos 1979). Furthermore, post-disturbance

harvest can damage soil and roots by compacting them (Lindenmayer et al. 2008) leading to greater water stress in trees, which may reduce conifer regeneration by increasing sapling mortality (Donato et al. 2006) and, in general, may cause more damage to forests than that caused by natural disturbance events (DellaSala et al. 2006). (Id.)

"Ton for ton, dead trees ('snags') are far more important ecologically than live trees, and there are too few large snags and logs to support native wildlife in most areas. Recent anecdotal reports of forest 'destroyed' by beetles are wildly misleading and inaccurate." (Hanson 2010)

Helicopters

Helicopter logging can negatively affect grizzly bears and other wildlife.

"Activities Generally Resulting in a 'Likely to Adversely Affect' Determination: The available scientific literature suggests that high frequency helicopter use, particularly at low altitudes, in habitat occupied by grizzly bears can negatively affect the bears . . . These effects may include disturbance resulting in behavioral changes, such as fleeing from the disturbance; physiological changes, such as increased heart rate; displacement to lower quality habitat; and increased energetic demands." (Summerfield et al 2006).

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September 7, 1993
LRMP Implementation Note #12

SUBJECT: **CRITERIA FOR ANALYSIS OF AND COMPLIANCE WITH ACTIVITY TIMING STANDARDS FOR GRIZZLY BEAR**

ISSUE: What are the definitions and Forest direction for complying with Forest-wide standards on page II-31, Unbound Appendix OO (IGBG), and the recommendations in the Biological Opinion on the Forest Plan (May 23, 1985 as revised July 18, 1989) regarding activity timing?

FOREST DIRECTION: Apply consistent criteria to all resource analyses within grizzly bear habitat in Management Situations 1 and 2. The following definitions apply:

Activity Duration: The length of time that elapses from the date the activity is initiated, until it is completed. Short intervals (e.g., a week or two) when activities are shut down generally are not deducted, since grizzly bears would be expected to continue to avoid the area.

Bear Management Area: Areas used for analysis that are subdivisions of Bear Management Units, as mapped in the GIS layer **BMA. BMAs are delineated on a drainage basis, and encompass primarily managed forest lands.

Bear Use Period: Non-denning period, March 15 through November 15.

Closed Road: Any constructed or evolved route previously used by motorized four wheel vehicles, which is closed to public use by gates or other methods.

Major Activity: Human activity that would be expected to cause displacement of grizzly bears out of the BMA. The timing, location, duration, noise level, and amount of area affected are all factors involved in classifying an activity as minor versus major. The activity duration of a major activity is generally more than 30 days. Examples of major activities include road construction, cutting and decking of trees, and tractor piling.

Minor Activity: Activities not expected to cause displacement of grizzly bears out of the BMA. The timing, location, duration, noise level, and amount of area affected are all factors involved in classifying an activity as minor versus major. Activities usually considered to be minor include road maintenance, broadcast burning, planting, precommercial thinning, stand exams, and tree inspections.

Management Situation: A designation of land based on grizzly bear habitat quality and use, to which management direction is applied. Refer to the GIS layer **GBSIT for Management Situation delineations.

Track and evaluate past activities by Bear Management Area (BMA). BMA activity datatables were created in 1992 for each Ranger District, and most of the adjacent State and corporate lands. District personnel are responsible for maintaining accurate BMA activity records.

Consult with the U.S. Fish and Wildlife Service (USFWS) when determining whether to classify an activity as major or minor. The judgement must be documented.

Twenty-two of 134 BMAs on the Swan Lake, Hungry Horse, Spotted Bear and Glacier View Ranger Districts include more than one Management Situation designation. Since the USFWS conservation recommendation is intended to apply to an area of 5,000 to 15,000 acres, do not subdivide BMAs on the basis of Management Situation, but rather use the most limiting category for the entire BMA.

If a major project extends over more than one year, it will be considered a major activity during all of those years. The inactive period will commence the following year. Multiple minor activities that occur within **a single year** may cumulatively be equivalent to a major activity.

BACKGROUND DISCUSSION:

The Forest Plan standards at issue are:

<u>Timber Management, Management Situations 1 and 2:</u> (LRMP page II-31)

"(2) Coordinate timber sale activities in time and space so that activities occur at a time when the area has least biological importance to the bear. Strive to concentrate activities within the shortest time period.

(5) Clearcutting of stands should not occur until adjacent harvest units qualify as summer hiding cover. Sales should be planned so that repeated entries over short periods are avoided."

In the Biological Opinion for the Flathead National Forest Land and Resource Management Plan of May 23, 1985 (page 7), the U.S. Fish and Wildlife Service offered conservation recommendations with respect to duration of activities, timing of re-entry, and definition of security areas (quoted below). These recommendations were further clarified in the amended Biological Opinion of July 18, 1989, by indicating that scheduling for activity duration and re-entry frequency should be done on an analysis area of approximately 5,000 to 15,000 acres (page 30).

Recommendations from the U.S. Fish and Wildlife Service, May 23, 1985, page 7:

"The following criteria are presented to assist in scheduling timber sales in time and space for the 10-year timber sale schedule. The criteria were developed to apply more specific direction with respect to (1) duration of activities, (2) timing of re-entry, and (3) definition of security areas. The criteria, if applied, will help prevent the timber program from coming into direct conflict with grizzly recovery objectives requiring major modifications in the scheduling of sales and adjustments in timber volume

targets. The CEA model when available, will help validate the level of harvest scheduled or show where adjustments can be made.

Criteria for:

1. Duration of activity
   A. In MS1-- restrict sale activities to no longer than 3 consecutive years
   B. In MS2-- restrict sale activities to no longer than 5 consecutive years

2. Re-entry
   A. In MS1-- one entry per decade
   B. In MS2-- (a) a minimum of 2 years inactivity following 1-3 years of consecutive activity, (b) a minimum of 5 years of inactivity following 4-5 years of consecutive activity
   C. For both MS1 and 2, re-entry should not occur unless 40% or more of the drainage can be maintained in cover (20% hiding, 20% thermal, 10+% in either hiding or thermal cover) distributed evenly throughout the area ...."

Only BMAs that are classified as "available" after considering the activity record should be placed on the five-year timber sale schedule, with the following exceptions:

1. Winter logging when all major activities can be completed during the denning period;

2. If the open road density can be held to less than 1.0 mile/square mile. The draft revised Recovery Plan (6/92, page 170-172) states that "The open road density standards of less than 1.0 mile/square mile should not be exceeded in compartments or analysis areas (5,000 to 15,000 acre units) during major activities. In some instances, the standard may be exceeded during a major activity, however access should be limited to administrative use and such use should occur behind closed gates. If the standard is exceeded, then the active period should be no longer than 3 consecutive years in duration and will be followed by 7 consecutive years of no major activities within that compartment. For each compartment within which a major activity is taking place, it is required that an adjacent security compartment is present in which no major activity is taking place." This implies that applying the open road density standard and "3 in 7" activity timing is an either or situation. This change to the Recovery Plan is still in draft, and differences in interpretation seem to exist. Therefore, it would be prudent to consult with the U.S. Fish and Wildlife Service regarding any situations of this type.

Following are questions related to implementation of direction in the Forest Plan and the Biological Opinion.

1. How should the record of activities within a BMA be tracked?

As part of the Timber Availability Study, a BMA activity schedule datatable was constructed for each District, combining the information for National Forest, corporate, and State lands. The result is a consolidated report classifying

each BMA as available or not available during the non-denning seasons in FY 1993 - 1996. Because information on activity beginning and ending dates was incomplete, timber volume was also used as a means to estimate activity effects. District personnel are responsible for maintaining and updating the BMA activity schedule datatable.

2. To what extent can we rely on the 30-day or 1-MMBF criteria to categorize activities?

The U.S. Fish and Wildlife Service was consulted on the protocol used for the Timber Availability Study. For site-specific planning, Districts should not rely on the 1 MMBF criterion. The USFWS has agreed to use the 30-day criterion as a rule-of-thumb. Various other factors, such as acres affected and activity type and intensity must be considered in order to assess how likely the activity is to cause displacement of grizzly bears. The USFWS should be consulted when determining whether to classify an activity as major or minor, and the analysis must be documented in the Biological Assessment or the project file.

3. How should we deal with activity in a BMA that encompasses more than one Management Situation?

Twenty-two of 134 BMAs on the Swan Lake, Hungry Horse, Spotted Bear and Glacier View Ranger Districts include more than one Management Situation. On a number of these, the Management Situation designation differs on the basis of land ownership. The allowable time periods for consecutive activity and the length of time for the inactive period differ by Management Situation. Since the USFWS conservation recommendation is intended to apply to an area of 5,000 to 15,000 acres, do not subdivide BMAs on the basis of Management Situation, but rather use the most limiting category for the entire BMA.

4. If a large timber sale extends over more than 1 year, should the activity be separately classed as "major" or "minor" in each year?

This can become important in determining the final year of the activity and the subsequent ending point of the inactive period. The USFWS intent in defining "minor" activities was to be able to distinguish activities such as broadcast burning, planting, and small salvage sales from large projects. In the case of a final year of a major timber sale where a proportionately small amount of volume is cut, the activity level could still be expected to be relatively high because of activities such as site preparation. If one major timber sale project extends over more than one year, it will be considered a major activity during all of those years. The inactive period will commence the following year.

5. Is there a point when a series of minor activities occurring for several years in a row in MS-1 should eventually be considered a major activity requiring an inactive period?

Normally a minor activity may occur at any time without requiring an inactive period, provided that all standards and guidelines are met. Note that multiple minor activities that occur within **a single year** in a BMA may cumulatively be equivalent to a major activity.

6. How should we deal with lack of information on seasonal timing of Plum Creek Timber Co. activities in the years 1985 and 1986?

In these years, volume was recorded only by year for each timber sale. A conservative approach was taken, with all activity assumed to occur in the non-denning season.

7. Should road construction or reconstruction activities on open, high-use roads count as a "major" activity for the BMA?

For example, the Soldier Creek bridge on the west side of Hungry Horse reservoir was washed out during a flood event in 1989 and subsequently replaced. The intent of the USFWS recommendation was to include significant road construction and reconstruction as major activities; however, on-going maintenance was not intended to be considered a major activity. Districts should carefully review and document whether such road work projects are classified a major or minor activity in terms of causing displacement of grizzly bears.

8. Does log hauling through a BMA count as a major activity?

Log hauling on open roads through BMAs adjacent to the active BMA normally does not constitute a major activity. If the normal amount of use on the road would change significantly, if an otherwise closed road were to be opened, or if the road traverses habitat of unique importance, the effects of log hauling should be analyzed and documented.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Fish and Wildlife Enhancement
Federal Bldg., U.S. Courthouse
301 South Park
P.O. Box 10023
Helena, Montana 59626

IN REPLY REFER TO:
1230

April 13, 1990

MEMORANDUM

To: Participant, Grizzly Bear Guidelines Meeting on February 22 and 23, 1990

From: Dale Harms, Montana State Office, Fish and Wildlife Enhancement, FWS, Helena, MT

Subject: Meeting Summary Report

Attached is the final report summarizing our meeting on February 22 and 23, 1990. I hope the Summary Report and our discussions will help in integrating timber harvesting with grizzly bear management in a consistent manner. Managers have expressed concern that guidelines tend to become "etched in stone", removing management flexibility. When applying the standards and guidelines, it is important to focus on their intent and on the management direction for management situations 1, 2 and 3 found in the Interagency Grizzly Bear Guidelines. Analysis of the site specific situation will determine what flexibility exists and should be documented in the biological evaluation/assessment prepared for the project.

Thank you for your participation.

Dale Harms

Attachment

DRHARMS/clh

"Take Pride in America"

Identical Memorandum Sent To:

Bob Summerfield, Kootenai NF
Tom Wittinger, Flathead NF
Mike Hillis, Lolo NF
Kathy Bulchis, Helena NF
Don Godtel, Lewis & Clark NF
Marion Cherry, Gallatin NF
Jim Claar, USFS RO, Missoula
Rodd Richardson, USFS RO, Missoula
Lorin Hicks, Plum Creek Timber

Shawn Riley, MDFWP, Kalispell
Kurt Alt, MDFWP, Bozeman
Jerry Brown, MDFWP, Libby
Chris Servheen, GBRC, FWS, Missoula
Larry Lockard, FWE, FWS, Kalispell
Rob Hazlewood, FWE, FWS, Helena
Scott Jackson, FWE, FWS, Helena
Dale Harms, FWE, FWS, Helena
Jay Gore, USFWS, Boise

SUMMARY OF THE INTERAGENCY BIOLOGIST MEETING OF FEBRUARY 22, 1990

GRIZZLY BEAR STANDARDS AND GUIDELINES

Introduction

On February 22 and 23, 1990 a group of interagency biologists met to discuss Forest Plan and Forestry Division, Department of State Lands grizzly bear standards and guidelines (attendance list attached). The meeting provided an opportunity to discuss the intent of the standards and guidelines, their biological rationale, and problems in their interpretation and application in project planning and evaluation. The communication between biologists was helpful in understanding differences that exist in guidelines and their application between Forests and agencies.

Objectives for Standards and Guidelines

The group discussed what the objectives were for developing and applying standards and guidelines. Once objectives are generally defined, they may be better quantified over time. Monitoring results of applying the standards and guidelines should then indicate whether management objectives for grizzly bears are being achieved. The following objectives were listed:

1) Provide adequate space to meet the spatial requirements of a recovered grizzly bear population;

2) Manage for an adequate distribution of bears across the ecosystem;

3) Manage for an acceptable level of mortality risk;

4) Maintain/improve habitat suitability with respect to bear food production;

5) Meet the management direction outlined in the Interagency Grizzly Bear Guidelines (51 Federal Register 42863) for management situations 1, 2, and 3.

The group then reviewed parameters that are being monitored to help document the recovery of bears in the NCDE. These parameters and their targets are being incorporated into the revised Grizzly Bear Recovery Plan and draft Conservation Strategy. They are as follows:

PARAMETERS	TARGET
PRODUCTION - Unduplicated count of females with cubs of the year	22* (12 outside GNP; 10 inside GNP)
OCCUPANCY - Count females with offspring	At least 1 family unit in 20 of 23 BMUs**
MORTALITY - Inventory all	NTE 14 total per year known human-induced or (6) females outside GNP
HABITAT - Maintain Effectiveness Conservation Strategy Plan	As developed, utilize Cumulative Effects Model (CEM)

*Computed as a running three year average
**Computed after three-years of cumulative reports

GNP = Glacier National Park
BMU = Bear Management Unit
NTE = Not to exceed

Standards and Guidelines Discussed

The group then listed the standards and guidelines that were in most need of discussion as follows:

1) Open road density standards;

2) Cover requirements (opening size, leave strips between cutting units);

3) Security areas;

4) Activity duration/Re-entry criteria;

5) Riparian harvest;

6) Seasonal considerations;

7) Cumulative Effects Analysis

ROADS

Open Road Density Standards

There has been no grizzly bear research designed specifically to answer the question of what is an appropriate open road density for grizzly bear recovery and management. There is considerable research, however, that shows that grizzlies (1) avoid roads (i.e., are displaced from roads) and (2) that roads increase grizzly bear mortality risk due primarily to legal and/or illegal harvest from or close to roads.

The intent of road management through year-round or seasonal road closures is to (1) minimize/preclude bear displacement (i.e., maintain an acceptable level of habitat effectiveness) and (2) reduce human-caused mortality.

The group discussed the differences in open road densities being used by the Forests. They are as follows:

Flathead National Forest

Management Situation (MS)-1: 1.00 mi./sq. mi.
MS-2: 2.00 mi./sq. mi.

Kootenai National Forest

MS-1: 0.75 mi./sq. mi.
MS-2: 0.75 mi./sq. mi.

Gallatin National Forest

MS-1: 80% elk habitat effectiveness
MS-2: 60% elk habitat effectiveness

These open road densities were developed through each Forest's planning process and Section 7 consultation on the Forest Plans in the early 1980's.

Considerable time was spent discussing whether it is appropriate to use road densities developed for elk to manage for grizzlies. During the Forest planning process, biologists for the Forests and other agencies recognized the need for road management guidelines in Forest Plans for elk and grizzly management. Biologists were generally recommending a maximum of .75 to 1.0 miles of open road per square mile for elk on summer/fall ranges based on elk-logging studies/guidelines. With regard to the grizzly, the U.S. Fish and Wildlife Service (FWS), through the Section 7 consultation process, maintained that good elk management (with respect to roads, cover/forage ratios and timber sale coordination) equated to good grizzly bear management. This position was shared by many Forest Service and other biologists. Since research had demonstrated that bears react to roads in a manner similar to elk, the range in open road density from .75 to 1.0 was applied.

In the absence of empirical grizzly research data demonstrating a need to change open road density standards currently being used, the group felt that no change in road density standards should be made. Because the grizzly population in the Cabinet/Yaak Ecosystem is seriously threatened and the NCDE population appears to be doing well, the difference in road density standards between the Kootenai (.75 mi./sq. mi.) and the Flathead (1.0 mi./sq. mi.) is logical and has biological merit. However, concern was expressed that open road density standards should be consistently applied throughout the ecosystem. For example, the Kootenai National Forest falls within both the Cabinet/Yaak Ecosystem and NCDE. Their Forest Plan open road density standard of .75 is being applied to both ecosystems. This is inconsistent with the 1.0 mi./sq. mi. being used by the Flathead and the State in the NCDE. The question was raised that it may be appropriate for the Kootenai to amend their Forest Plan so that their open road density standard for their portion of the NCDE is consistent with the rest of the NCDE.

It was agreed that open road densities should be calculated on an analysis area/compartment of 5,000 to 15,000 acres in size.

A significant difference exists between the Kootenai and Flathead National Forests, however, with respect to application of the open road density standard when a compartment/analysis area contains an "active" timber sale. On the Kootenai, every compartment will be in compliance with their open road density standard regardless of whether or not the compartment is active with a timber sale. Whereas, on the Flathead, they are recognizing that when an analysis area is active with a timber sale, open road density will likely exceed their open road density standard. This is mitigated by providing an adjacent "inactive" security area to which bears can displace.

The issue of applying the open road density standards when an unroaded area is roaded was discussed. Concern was expressed that the management direction in the Interagency Grizzly Bear Guidelines (IGBG) for MS-1 (habitat maintenance and improvement and grizzly-human conflict minimization will receive the highest management priority) could not be met when an unroaded area is roaded, even though the road system is managed in accordance with the open road density standard. It was generally agreed that a biological evaluation would conclude a "may affect" in such situations. However, the land use allocation process through the Forest Plan determined whether roadless areas would be accessed. Any roading and subsequent resource extraction must be made compatible with grizzly needs to meet the management direction for MS-1. (Management decisions will favor the needs of the grizzly bear when grizzly habitat and other land use values compete. Land uses which can affect grizzlies and/or their habitat will be made compatible with grizzly needs or such uses will be disallowed or eliminated).

Closed Road versus Open Road

The issue of what is a "closed road" versus an "open road" was discussed at length but no real consensus was reached by the group. Existing lawsuits against the Kootenai and Flathead National Forests and U.S. Fish and Wildlife Service makes it difficult to reach a consensus on this and other issues until the Forests can present their methods of dealing with these issues to the courts and decisions by the courts subsequently rendered.

It was agreed that administrative use (such as that associated with post-harvest treatment activities) or violations of a road closure by the public could reach levels such that the intent and objectives for road closure are no longer being met. As such, that road could no longer be considered closed when calculating open road density. The Flathead National Forest is preparing a Forest Transportation Plan and associated Environmental Impact Statement (EIS) that will propose that the level of incidental use on a closed road be no greater than 5 vehicular trips per week. The new "Unified Cumulative Effects Model" will calculate (take into consideration) the effects that incidental use of "closed roads" will have on bears.

COVER REQUIREMENTS

Results of research on grizzly bears have emphasized the need for and importance of cover to (1) allow movement between key foraging sites, (2) provide security for efficient habitat utilization, and (3) provide for thermal regulation. Research has not adequately defined thermal and hiding cover in qualitative or quantitative terms. This forced biologists to use professional judgement and best available information when making recommendations on size and shape of clearcuts (and other even-aged harvest units), distance to cover, width of leave strips between clearcut units, etc.

Size of Clearcuts - Distance to Cover

Research on grizzlies (with the most definitive data coming from the Yellowstone Ecosystem) indicates that bears select for "edge" or cover/non-cover interfaces (ecotones). This is largely attributed to higher forage values in ecotones and proximity to escape cover. Less bear use occurs in the middle of large openings (as is the case for elk). Therefore, smaller openings mean less "wasted" habitat. Bear use of large openings is tied directly to food values of that opening such as in the case of large open huckleberry fields. Most radio-collared grizzlies in the Yellowstone area that were located in the open were less than 328 feet from forested cover (refer to Grizzly Bear Compendium, page 114-115).

In recognition that grizzlies select for edge, all core teams for the Cumulative Effects Models have incorporated edge coefficients so that habitat values of components next to cover/non-cover are automatically adjusted upwards. In the "Unified Model" edge coefficients are applied to components or portions of components within 150 meters (492 feet) of cover/non-cover interfaces. These coefficients may vary between ecosystems.

The elk literature suggests that elk use of large openings tapers off beyond 600 feet from cover. Lyon reported heavier elk use in 10-40 acre openings as compared to larger ones. Irwin and Peek indicated that 35-50 acre clearcuts were used most by elk (Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho). The Forest Management Act restricts clearcuts on Forest Service lands to 40 acres (with certain exceptions). Based in part on this information, the FWS through Section 7 consultation has recommended that even-aged cutting units be held to 40 acres in size or less, and that no point within the cutting unit should be more than 600 feet from cover (no need to be more restrictive than elk-logging guidelines) . No size restriction on uneven-aged cutting units has currently been recommended as long as cover values (cover that hides 90% of the bear at 200 feet) are retained.

The group generally agreed that shape of a cutting unit (irregular shape to increase edge and to allow no point within the cutting unit more than 600 feet from cover) was more important than its size. No new data were presented or discussed that would suggest changing the "600 foot distance from cover" criteria.

The group discussed the criticism from environmental groups of a perceived conflict between the IGBG (reference is made to 20 acre clearcut size as being optimum for grizzlies) and what is allowed under Forest Plans (40 acre clearcuts with exceptions). The group recommended that the Subcommittee for

the NCDE be made aware of this problem through this report so that they could take appropriate actions.

Distance between Clearcut Units

Adequate cover between cutting units is recognized as essential for bear movement, resting, feeding, security, and possibly for thermal regulation. Retaining leave strips of at least 600 feet wide between cutting units (clearcuts) has been recommended.

Since research has not quantitatively or qualitatively defined cover requirements for bears, biologists have relied on the concepts of "sight distances" and "hiding cover" used in elk management to provide adequate cover. Sight distance is the distance at which 90 percent or more of an animal is hidden. This distance will vary depending on existing vegetative structure. Hiding cover exists when 90 percent or more of the animal is hidden at 200 feet or less. Discussion on this point by the group concluded that the larger of 3 times the sight distance (which is variable) or 600 feet should be left as leave strips.

SECURITY AREAS

Research has shown that bears are displaced from roads and away from motorized activities such as logging, exploratory oil/gas well drilling, seismic investigation, etc. The purpose of providing an adjacent security area is to make undisturbed habitat of similar kind and quality available to bears that may be displaced by the activity and to spatially arrange the resource extraction activities over the landscape so that adjacent drainages/ compartments are not being impacted simultaneously. The security area must meet the open road density standard as well as be "inactive" from other major activities. Thus, the security area guideline helps regulate the cumulative impact of simultaneous activity and will help in maintaining adequate habitat effectiveness across the bear management unit. No new data was presented or discussed that would suggest changing the present definition and size of a security area.

ACTIVITY DURATION/RE-ENTRY CRITERIA

Timber sales are generally recognized as a temporary activity resulting in short-term displacement. However, without guidelines to restrict the duration of activities and to control re-entry frequencies, activities can become long-term and permanently remove habitat from bear and elk use. To address this concern, Forest Plans incorporated grizzly bear/timber management guidelines which state "strive to concentrate activities within the shortest time period" and "sales should be planned so that repeated entries over short periods are avoided". In 1985, agency biologists met to clarify and quantify this guideline so that its intent could be met in Forest planning. The following criteria were recommended:

1. Duration of activity

A. In MS-1 -- restrict sale activities to no longer than 3 consecutive years

B. In MS-2 -- restrict sale activities to no longer than 5 consecutive years

2. Re-entry

A. In MS-1 -- one entry per decade

B. In MS-2 -- (a) a minimum of 2 years inactivity following 1-3 years of consecutive activity, (b) a minimum of 5 years of inactivity following 4-5 years of consecutive activity

C. For both MS-1 and 2, re-entry should not occur unless 40% or more of the drainage can be maintained in cover (20% hiding, 20% thermal, 10+% in either hiding or thermal cover) distributed evenly throughout the area.

The FWS, through Section 7 informal consultation has recommended major construction/disturbance activities (those having the highest likelihood of displacing bears) such as roading, logging, and hauling logs be done in the 3-year consecutive period (active period) and post-harvest treatment activities be conducted in the inactivity period (7-year period).

After discussion of this guideline's intent, the group agreed which sale activities should be confined to the 3-year consecutive period. They are as follows: (1) road construction, (2) cutting and decking of trees, (3) log hauling. Examples of activities discussed that may occur in the following 7 years include: road maintenance, broadcast burning, slash burning, planting, pre-commercial thinning, inspections, etc. Forest biologists should review, however, the activities that occur in the 7-year period following major construction/disturbance activity to consider their nature, magnitude and duration, and if appropriate, time them to occur when the area has the least biological importance to the bear.

The group requested that the FWS review in the written meeting summary the rationale that was used for the "3-year active period, 7-year inactive period". The following is presented to help explain the activity duration/ re-entry criteria.

Research by Mace and Jonkel (1980) showed that grizzlies were displaced from a drainage during the period of active logging. Additional research has shown that bears avoid open roads. If timber harvesting occurs in a drainage for extended periods of time, historical bear use of the area may be lost, particularly to females. Aune et al. (1989) and McLellan (personal communication 1989) showed that female cubs generally establish their home range within or have a significant overlap with their mother's home range, while males generally disperse from their mother's home range. Long-term displacement of a female from a portion of her home range may result in that area being lost to female bears since her offspring have no chance to learn the foraging opportunities in areas no longer used.

The following time-line showing the reproductive cycle of a female grizzly will help illustrate the rationale for the activity duration, re-entry criteria.

Time Line

Offspring - Litter 3								C	Yr1	2	3	4	5B	6C	7			
Offspring - Litter 1	C	Yr1	2															
Adult Female Age	6C	7	8B	9C	10	11B	12C	13	14B	15C	16	17B	18C	19				
Year	1	2	3	4	5	6	7	8	9	10	1	2	3	4				
Offspring - Litter 2				C	Yr1	2	3	4	5B	6C	7	8B	9C					

B = breeds in that year
C = produces young in that year
▒ = 3-year period of major construction/disturbance; displacement occurs

Depending on the age at first breeding, it will take a female grizzly 10 to 12 years to replace herself with a breeding age female. The time-line shows an example of a female breeding at age 5, giving birth to cubs at age 6, and being displaced by logging during years 1, 2, and 3. In this example, the first litter female cub is displaced for 3 years from a portion of her mother's home range while with her mother and hence did not have an opportunity to learn the habitat opportunities that were available in the area displaced from. Hence, she cannot pass this knowledge on to her young. The mother though in year 4 (first year of the 7-year inactive period) produces another set of cubs. The second litter female cub has an opportunity to live in the drainages that were logged, breed and give birth to her cubs before being displaced. Hence she has an opportunity to learn all foraging aspects from her mother that the area has to offer and then pass the learned habitat utilization behavior on to her offspring. The third litter female cub born in year 7 also has an opportunity to learn the habitat features of the area from her mother before being displaced from the area at age 4. Restricting the major construction/disturbance activity to 3 years is an attempt to minimize displacement of a female with young during the time the young are with her. If she is displaced all three years when her young are with her (a worst case scenario), the following inactivity period of 7 years for major construction activities ensures that she can pass on her knowledge of the habitat to at least 2 female cubs before being displaced from the area again. The time-line demonstrates that some flex exists in the 7-year period and still ensure that the female cubs from litters 2 and 3 have opportunity to learn the habitat features from their mother before being displaced. Thus, of the female cubs being born, there are more having the opportunity to learn the habitat features from their mother than those that are being displaced and not having such an opportunity.

Another consideration in setting the "3 year active/7 year inactive" criteria was the 10-year planning period for timber sales in the Forest planning process. The activity duration/re-entry criteria was developed in the consultation on the Gallatin and Flathead National Forest Plans and was provided to assist in scheduling timber sales and setting timber volume targets so that timber volume targets could realistically be met while remaining in compliance with grizzly bear guidelines.

Additionally, discussions with elk researchers indicated that the duration of disturbance in a logged area affects the time it takes for elk to reoccupy the area after disturbance ceases. In several logging sales where activity was no longer than one operating season, elk returned soon after removal of people and machinery. However, in a logging sale which had five consecutive years of disturbance, it took four additional years after complete road closures to get the same amount of elk use as what existed prior to logging (Guideline for Evaluating and Managing Summer Elk Habitat in Northern Idaho).

RIPARIAN HARVEST

Because of the importance of protecting riparian areas in order to protect wildlife, fisheries, and watershed values, etc. each Forest has included in their Forest Plans riparian area management guidelines. Riparian areas are also extremely important to grizzlies as a component producing many bear foods and as serving as movement corridors. The group discussed the point that if riparian areas are managed in accordance with Forest Plans guidelines, their management would not become a grizzly bear issue. If management departs from the guidelines (e.g. allowing 2-sided even-aged cutting units) then their management does become a grizzly issue. The group recognized that silvicultural prescriptions for riparian habitats that enhance/maintain forage values for bears while retaining cover values are compatible with grizzlies. Thus, there is some opportunity to harvest next to live streams using uneven-aged harvest techniques (selective cutting, overstory removal, etc.).

SEASONAL CONSIDERATIONS

Due to the limited and restrictive nature of spring range and its importance to the bear, the group supported spring seasonal restrictions on spring ranges. The difficulty in predicting where bear use will occur in summer and fall seasons was discussed. Because foraging opportunities are greater during these seasons and are spread out over the landscape, the need for seasonal restrictions during summer and fall may not be as important as during the spring. It was recognized however that bears may be concentrating in certain areas during specific time periods to take advantage of a concentrated food source (e.g. highly productive huckleberry fields, insect concentrations, spawning fish, etc.). Where these situations are known or can be predicted, seasonal restrictions may be appropriate.

CUMULATIVE EFFECTS ANALYSIS

The process for conducting cumulative effects, once the "Unified Model" is up and operational was reviewed:

1. The grizzly bear ecosystem is divided into Bear Management Units (BMUs)

2. Each BMU may be divided into Subunits

3. Each Subunit is further divided into 5,000 to 15,000 acres size compartments/analysis areas for the purpose of project level design and evaluation

   a. open road densities

   b. cover/forage requirements

   c. security areas

   d. applying activity duration/re-entry criteria

4. The CEM is run on a BMU or Subunit basis to calculate habitat effectiveness and mortality risk.

Once the Unified Model is operational and has undergone the appropriate testing and validation, thresholds for habitat effectiveness and mortality risk can be pursued. At this point the computerized models that are operational are those for the NCDE-East Side, Cabinet/Yaak (Cabinet portions of the Ecosystem) and the Yellowstone Ecosystem. The Kootenai and other Forests in the Cabinet/Yaak Ecosystem are applying a manual model (Cumulative Effects Analysis Process for the Kootenai National Forest) that has a threshold of 70% fully available space. Until a CEM becomes available for the NCDE-West Side, cumulative effects may be analyzed manually by considering the effects of past, present, and proposed activities when evaluating open road densities, cover/forage requirements, security areas, etc. The area of review would by necessity have to include the compartment/analysis area in which the proposed activity would occur and all adjacent compartments/analysis areas.

SUMMARY AND RECOMMENDATIONS

The group recognized that any changes to standards and guidelines that are incorporated into approved Forest Plans would require an amendment to the affected Forest Plan and the appropriate administrative process followed. Due to the fact that grizzly research has not been designed to specifically answer the questions/issues being addressed by many of the standards and guidelines, the group recognized that the use of best available information, biological judgement, and consensus of opinion largely forms the basis for existing standards and guidelines. Existing lawsuits against the Kootenai and Flathead National Forests and the Fish and Wildlife Service makes it difficult, if not impossible at this time, to make changes in implementation methodologies in order to add consistency between Forests. The group felt,

however, that certain issues/concerns should be brought to the attention of the NCDE Subcommittee for their consideration.

1. No changes are recommended in the open-road density standards that are being applied. However, within an ecosystem the density standard may need to be consistent throughout the ecosystem. It is recommended that when the Kootenai amends their Forest Plan, that an amendment providing for an open road density consistent with the rest of the NCDE be used in that portion of the NCDE on the Kootenai National Forest.

2. There is a difference between Forests with regard to application of the open road density standard within a compartment/analysis area when that compartment or analysis area is active with a major timber sale. On the Kootenai, current direction is to ensure that a compartment will meet the open road density standard regardless of whether or not it is active with a timber sale. On the Flathead, the Transportation Plan EIS will recognize that the open road density in an active analysis area may exceed the open road density standard as long as there is an adjacent security area. No action is recommended until the courts review the Upper Yaak Final EIS and render a decision on the Yaak Timber sale injunction and the Flathead completes their Forest Transportation Plan and associated EIS and the court renders a decision on the lawsuit against the Forest Plan and Fish and Wildlife Service biological opinion.

3. Environmental groups perceive that there is a conflict between the Interagency Grizzly Bear Guidelines (IGBG) and Forest Plan standards and guidelines (e.g., the size of clearcuts and silvicultural prescriptions that should be used in grizzly habitat). The relationship between the IGBG and Forest Plan standards and guidelines is unclear to outside groups and often misunderstood. It is recommended that the NCDE Subcommittee request that the Interagency Grizzly Bear Committee (IGBC) appoint a Task Force to review this issue and prepare a Position Statement for clarification.