APPEAL TO THE REGIONAL FORESTER OF THE NORTHERN REGION
USDA FOREST SERVICE

ALLIANCE FOR THE WILD ROCKIES)
MONTANA ECOSYSTEMS DEFENSE)
COUNCIL, INC.)
NATIVE ECOSYSTEMS
COUNCIL)
)
APPELLANTS)
v.)
)
MARY ERICKSON, FOREST SUPERVISOR)
)
GALLATIN NATIONAL FOREST)
)
RESPONSIBLE OFFICIAL)

DATED THIS _10th___ Day of MAY, 2010

TO: USDA Forest Service, Appeals Deciding Officer (RFO), Northern Region, P.O. Box 7669, Missoula, MT, 59807.

NOTICE OF APPEAL

DECISION APPEALED:

On March 22, 2010, Gallatin National Forest Supervisor Mary Erickson signed a Record of Decision (ROD) approving implementation of the Bozeman Municipal Watershed Fuels Reduction Project, on the Gallatin National Forest. Supervisor Erickson's decision was to implement Alternative 6. This alternative was developed to respond to changed economic conditions between the Draft Environmental Impact Statement (DEIS) and FEIS, and to respond to public comments on the DEIS. Treatment units in Alternative 6 were adapted from and are within the range of the alternatives analyzed in the DEIS.

Pursuant to 36 CFR 215 – 217, notice is hereby given that the Alliance for the Wild Rockies (AWR), Montana Ecosystems Defense Council, Inc. (MEDC) and Native Ecosystems Council (NEC) appeal the Bozeman Municipal Watershed Fuels Reduction Project Final EIS and Record of Decision (ROD), on the Gallatin National Forest. As a result of the ROD, appellants, as well as individuals and members of the Alliance for the Wild Rockies, Montana Ecosystems Defense Council, Inc and Native Ecosystems Council, would be directly and significantly affected by the logging, roadbuilding and burning. Appellants are conservation organizations working to ensure protection of biological diversity and ecosystem in the Wild Rockies bioregion, including the Gallatin National Forest (GNF). Members use the general areas proposed for logging for recreation and other forest related activities.

Implementation of the ROD and the FEIS for the Bozeman Municipal Watershed Fuels Reduction Project fails to comply with the legal requirements of the:

1) National Environmental Policy Act (NEPA), 42 U.S.C. 4321 et seq., and its implementing regulations;

2) National Forest Management Act (NFMA) 16 U.S.C. 1600 et seq., and its implementing regulations;
3) Administrative Procedures Act, (APA) 5 U.S.C. Sec. 706, and its implementing regulations;
4) Multiple-Use Sustained Yield Act (MUSY), and its implementing regulations;
5) Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA) and its implementing regulations;
6) Clean Water Act (CWA), 33 U.S. C. 1251- 1376 et seq., and its implementing regulations; Montana Code, Title 75, Chapter 5 et seq., and water quality regulations (ARM 16.20 et seq.); and the
7) Endangered Species Act
8) Gallatin National Forest Land and Resource Management Plan (Forest Plan).

The Montana Ecosystems Defense Council (MEDC) is a non-profit, grassroots organization headquartered in Kalispell, Montana. As a result of the EIS and ROD, MEDC's members would be directly, indirectly and significantly affected by the logging, thinning, burning, road construction and reconstruction. The Appellant is a conservation organization, established in 1990, working to protect and restore biological diversity, water quality and ecosystem integrity in the Northern Rockies region, which includes the Greater Yellowstone Ecosystem and the Gallatin National Forest.

The groups' members use the general areas that are proposed for logging, thinning, burning and logging-road development for recreation and other forest related activities. These development activities, if implemented, would adversely impact and irreparably harm the natural qualities of the Gallatin National Forest and would further degrade the watersheds, and native fish and wildlife habitat.

STATEMENT OF REASONS

Vegetative Management Practices

The vegetative management practices chosen by the Gallatin National Forest for the Bozeman Municipal Watershed Project are not defined in the Forest Plan, with standards and guidelines, and the reasons for the choices, in violation of NFMA's Regulations at 36 CFR 219.15 and 36 CFR 219.27.

The Vegetative Management Practices implemented in the Preferred Alternative (Alt. #6) outlined in the EIS/ROD are neither "tiered" to, nor consistent with, the current Forest Plan. The specific treatments proposed include:

1. Thinning and partial harvest in mature timber stands;
2. Shaded fuel breaks;
3. Thinning in previously harvested small diameter stands;
4. Prescribed burning in thinned stands; and
5. Prescribed burning

The combination of these practices requires "future treatments (approximately 30-40 years from today)" to maintain "desirable stand structures so control and or intensity of fire is maintained at desirable levels." EIS, p. 3-245. This programmatic vegetative management practice represents a significant departure from the Goals and Objectives and Desired Future Condition envisioned, analyzed, and to date implemented, by the Forest Plan for this area.

The Project area includes Management Areas (MAs) classified in the Forest Plan as "suitable"

and "unsuitable" for timber production. Emphasis added. Forest-wide Management Areas and MA-specific standards and guidelines function similar to city or county zoning regulations. Standards and guidelines regulate activities to protect against environmental degradation, ensure sustainability of the various forest resources, and guard against systematic exploitation and depletion of non-renewable values and irretrievable resources.

MAs 5, 7, 8, and 9 are classified as "suitable" for timber production. Only MA 8, however, gives "regulated timber harvest" priority over all other forest values, within the provisions of the programmatic standards and guidelines of the Forest Plan. MA 5 and 9 both allow timber harvest, and prescribed fire, but only if it maintains or enhances recreation and visual quality. MA 7 is primarily a riparian management zone where limited thinning and burning is allowed to protect soil, water and habitat.

Not one of the MAs classified as "suitable" explicitly mentions timber harvest for the purpose of thinning stands to reduce the severity and extent of potential wildfire in the Bozeman Municipal Watershed, or any other watershed on the Gallatin National Forest. The use of thinning and prescribed burning as described for "suitable" lands in the Project area has never been stated or incorporated into the Goals, Objectives, MAs, Standards and Guidelines, or Monitoring commitments in the Forest Plan.

MAs 12 and 17 are classified "unsuitable" for timber production with emphasis given to maintain and improve wildlife habitat, and grazing lands with important big game habitat. Clearly, meeting the wildlife goals is the focus of these MAs, not manipulating fuel loads to meet entirely new Objectives and Desired Future Conditions not found anywhere in Forest Plan.

BEST AVAILABLE SCIENCE

The analysis for this project is supposed to be based on a consideration of the best available science. Please find attached an article from the Durango Herald News titled, "Money to fight beetles as fire mitigation not productive".

The ROD on page 6 says: "The principal purpose of this project is to reduce the risk of severe and extensive wildfire on National Forest System lands within the Bozeman Municipal Watershed and thereby reduce the risk to life and property in and adjacent to the project area."
The Forest Service has completely disregarded the best available science regarding protecting Bozeman's watershed.

Fire Ecology in Rocky Mountain Landscapes, by William Baker says the Forest Service is over stating the frequency of wildfire. I am including this book as an attachment that I am mailing separately.

Dr. Baker writes that we use to think we could control wildfire with tools such as prescribed burns. He writes the science shows this is not true. All we can do is have the good sense to get our homes and infrastructure protected or out of fire prone settings, as fire will eventually come. This project attempts to tame wildlife, something Dr. Baker says is impossible. This project therefore violates NFMA by not following the best available science and not meeting the purpose and need of the project.

Published scientific reports indicate that prescribed actions proposed by the Forest Service for the Project area will actually increase fire severity, not reduce fire severity.

Because wildfire severity, intensity and spread is the central underlying theme that is critical to support the Project, the Forest Service must disclose, analyze and fully discuss the credible,

published scientific papers that analyze whether commercial logging (large diameter trees) is an effective means of fire suppression. The Forest Service should have discussed published scientific papers, which make findings based on actual scientific studies, not simply rely on computer models and internally produced, unpublished documents written by land managers. Failing to discuss and disclose published scientific papers is a violation of NEPA, NFMA, the APA and the Forest Plan.

At minimum, the Forest Service should have addressed the following issues in detail:

(a) which published scientific studies are applicable to lodgepole pine forests,
(b) whether logging large diameter trees helps or hinders efforts to reduce fire risk,
(c) whether logging without prescribed burning helps or hinders efforts to fire risk, and
(d) whether all small diameter trees must be removed in order to reduce fire risk.

The Forest Service should disclose and discuss the findings of the following studies:

Raymond, Crystal L. & David L. Peterson. 2005. Fuel treatments alter the effects of wildfire in a mixed evergreen forest, Oregon, USA. Canadian Journal of Forestry Research 35: 2981 – 2995; and

Odion, Dennis C., Evan J. Frost, James R Strittholt, Hong Jiang, Dominick A. Dellasala, Max A. Moritz. 2004. Patterns of fire severity and forest conditions in the western Klamath Mountains, California. Conservation Biology 18:4: 927-936.

As stated above, the FEIS is scientifically inaccurate to the extent that it suggests that trees over about 6 or 8 inches in diameter must be removed in order to effectively reduce the potential for severe fire.

The FEIS, in Chapter 1, also inaccurately assumes that, due to decades of fire suppression, stands will necessarily burn predominantly at high severity, due to high "fuel accumulation". The FEIS fails to provide adequate citation to scientific studies to support this assumption in violation of NEPA. Moreover, this assumption has not withstood scientific scrutiny when it has been empirically tested. In fact, areas that have missed the greatest number of fire return intervals do not burn at higher severity levels than areas that have missed few or no fire return intervals. See also: Odion and Hanson 2006; Odion and Hanson 2008; Odion et al. 2009.

The FEIS fails to adequately identify the upper diameter limit of trees that would be removed in the 2,060 acres of "partial harvesting" or the intensity of removal of mature trees. Since there is no upper diameter limit, it is reasonable to assume that many mature trees would be removed.

The scientific data are clear that it is unnecessary to remove mature trees where the project's purpose is to effectively reduce the potential for severe fire, as it is in this project. Recent scientific studies have found that precommercial thinning of sapling and pole-sized trees only (up to about 8 inches in diameter) effectively reduces fire severity. See, for example:

Omi, P.N., and E.J. Martinson. 2002. Effects of fuels treatment on wildfire severity. Final report. Joint Fire Science Program Governing Board, Western Forest Fire Research Center, Colorado State University, Fort Collins, CO. Available from http://www.cnr.colostate.edu/frws/research/westfire/finalreport.pdf (found that precommercial thinning of trees under 8 to 10 inches in diameter reduced potential for severe fire (email communication with the authors confirmed that trees removed were of this small size class)). More specifically, the Omi and Martinson (2002) study, found that precommercial thinning

reduced stand damage (a measure of fire severity generally related to stand mortality) in both of the two thinned study sites, Cerro Grande and Hi Meadow (the authors reported that the Hi Meadow site was marginally significant, $p<.1$, perhaps due to small sample size), each with several plots.

Martinson, E.J., and P.N. Omi. 2003. Performance of fuel treatments subjected to wildfires. USDA Forest Service Proceedings RMRS-P-29 (found that non- commercial thinning of sub merchantable-sized trees, generally followed by slash burning or removal, in several areas across the western U.S. greatly reduced fire severity, and that this result held true regardless of post-thinning basal area density).

Strom, B.A., and P.Z. Fule. 2007. Pre-wildfire fuel treatments affect long-term ponderosa pine forest dynamics. International Journal of Wildland Fire 16: 128- 138 (non-commercial thinning of very small trees under 20 cm dbh (8 inches dbh) in seven different sites dramatically reduced fire severity, resulting in post-fire basal area mortality of only about 28% (low severity) in non-commercially thinned areas versus post-fire basal area mortality of about 86% in untreated areas).

In light of this information, and in full light of the fact that the reduction of fire severity is the only purpose and need in this project, there is no rational connection between the facts, the purpose and need, and the decision to remove many mature trees.

Nor does the FEIS adequately explain why an intensive logging alternative was chosen when Alt. 4 (prescribed burning only) would achieve the same average flame length (2 feet) as Alternative 6 (see Table 2.2 of FEIS). Further, the FEIS does not adequately explain why an (NEPA) alternative was not fully analyzed that would have used a combination of prescribed fire and thinning of only very small diameter trees (e.g., no larger than 6 or 8 inches in diameter).

It appears that there is also an additional purpose, not directly stated in the FEIS, to produce commercial timber. NEPA does not allow agencies to conceal the true purpose of a project.

Additional References:

Odion, D.C., E.J. Frost, J.R. Strittholt, H. Jiang, D.A. DellaSala, and M.A. Moritz. 2004. Patterns of fire severity and forest conditions in the Klamath Mountains, northwestern California. Conservation Biology 18: 927-936.

Odion, D.C., and C.T. Hanson. 2006. Fire severity in conifer forests of the Sierra Nevada, California. Ecosystems 9: 1177-1189.

Odion, D.C., and C.T. Hanson. 2008. Fire severity in the Sierra Nevada revisited: conclusions robust to further analysis. Ecosystems 11: 12-15.

Odion, D. C., M. A. Moritz & D. A. DellaSala, 2009. Alternative community states maintained by fire in the Klamath Mountains, USA. Journal of Ecology, doi: 10.1111/j. 1365-2745.2009.01597.x.

However worthy the intentions of the Forest Service may be, the Project's Purpose and Need, Objectives , Desired Future Condition, and Project-specific actions are not specified in the Forest Plan. The Project is part of a larger, wholesale, programmatic departure from the Plan's guidance. The Project is not consistent with the Plan's programmatic EIS and ROD. A significant Forest

Plan amendment, or revision, is required to fulfill the statutory requirements of NEPA, NFMA, and APA.
The ROD and FEIS fail to deal lucidly with the hazardous fuels issue on the appropriate landscape scale. The EA only discusses fuel conditions in the areas proposed for treatment, yet wildland fire operates beyond artificial ownership or other boundaries. The EA fails to answer a fundamental question: Will the fuel reduction activities be in any way significant, when one of any number of potential fire scenarios plays out on the land in the foreseeable future? One cannot tell, because the fuel conditions in the larger landscape surrounding "treatment units" are not adequately discussed.

Likewise, the appropriate landscape scale for the "forest health" issues is also beyond the treatment units, but not adequately considered.

The ROD FEIS also fail to deal with the fuels issue on the appropriate temporal scale. The EA basically theorizes fire behavior at some short-duration fixed time period following treatment (ignoring the heightened fuel risk due to the logging activities, by the way) but doesn't consider the obvious fact that vegetation response to the proposed activities will be rapid in the understory, and also significant for smaller tree growth in the years following treatment. How those vegetation changes would affect fire behavior when one of any number of possible fire scenarios plays out on the land in the foreseeable future is also glossed over in the FEIS's overly simplistic analyses.

And since this "fuel reduction regime" was not a planning scenario dealt with in sufficient detail (if at all) during Forest Plan development, both the project-level and programmatic ecological and economic costs and impacts go unexplained and undisclosed. The Lewis and Clark NF must disclose to the public just how much of the Forest is considered to be likewise "out of whack" in alleged "forest health" terms and more importantly, disclose how much of the Forest is to be treated for fuel reduction in a manner that emphasizes fuel conditions over native ecological processes.

Hayward, 1994 states:

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

Hayward, 1994 essentially calls into question the entire manipulate and control regime, as represented in the EA. The managed portion of the Lewis and Clark National Forest has been fundamentally changed, as has the climate, so the Forest Service must analyze how much land has been fundamentally changed forest wide compared to historic conditions, and disclose such

information to the public in the context of an EIS by completing the Forest Plan Revision process.

The FS's usual response to our comment that the fire planning issue is indeed programmatic, is that it is "out of the scope" of a project analysis, which is precisely our point: the FS has so far failed to deal with this issue within the appropriate forest wide or landscape level. In the absence of such planning, the public and decision maker for this project proposal is extremely uninformed. So, for example, fire suppression actions are never disclosed, as NEPA requires.

Recently, Huff, et al., 1995 stated:

> (I)ntensive forest management annually produces high fuel loadings associated with logging residues. As a by-product of clearcutting, thinning, and other tree-removal activities, activity fuels create both short- and long-term fire hazards to ecosystems. The potential rate of spread and intensity of fires associated with recently cut logging residues is high (see for example, Anderson 1982, Maxwell and Ward 1976), especially the first year or two as the material decays. High fire-behavior hazards associated with the residues can extend, however, for many years depending on the tree species (Olson and Fahnestock 1955). Even though these hazards diminish, their influence on fire behavior can linger for up to 30 years in the dry forest ecosystems of eastern Washington and Oregon. Disposal of logging residue using prescribed fires, the most common approach, also has an associated high risk of an escaped wildfire (Deeming 1990). The link between slash fires and escaped wildfires has a history of large conflagrations for Washington and Oregon (Agee 1989, Deeming 1990).
>
> Regeneration and seral development patterns can have a profound effect on potential fire behavior within landscapes by enhancing or diminishing its spread (Agee and Huff 1987, Saveland 1987). Spatially continuous fuels associated with thick regeneration in plantations can create high surface-fire potential during early successional stages. This was evident in most of the roughly 275 hectares of 1- to 25-year-old plantations burned in the 3500-hectare 1991 Warner Creek Fire in the Willamette National Forest (USDA 1993). The fire moved swiftly through the openings created by past harvests, killing nearly all the regeneration but usually missing adjacent stands >80 years old.
>
> 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.
>
> In general, rate of spread and flame length were positively correlated with the proportion of area logged in the sample watersheds.
>
> Increased rate of spread means that the perimeter of the fire will grow much faster. Generally, a faster perimeter growth makes a wildfire harder to contain.

Other scientists have doubts about the efficacy of intensive fuels reductions as fire-proofing methods. DellaSala, et al. (1995) state:

> Scientific evidence does not support the hypothesis that intensive salvage, thinning, and other logging activities reduce the risk of catastrophic fires if applied at landscape scales ... At very local scales, the removal of fuels through salvage and thinning may hinder some fires. However, applying such measures at landscape scales removes natural fire breaks such as moist pockets of late-seral and riparian forests that dampen the spread and intensity of fire and has

> little effect on controlling fire spread, particularly during regional droughts. ... Bessie and Johnson (1995) found that surface fire intensity and crown fire initiation were strongly related to weather conditions and only weakly related to fuel loads in subalpine forest in the southern Canadian Rockies. . . . Observations of large forest fires during regional droughts such as the Yellowstone fires in 1988 (Turner, et al. 1994) and the inland northwest fires of 1994 . . . raise serious doubts about the effectiveness of intensive fuel reductions as "fire-proofing" measures.

The Sierra Nevada Ecosystem Project, in its 1996 "Final Report to Congress: Status of the Sierra Nevada" (University of California-Davis, Wildland Resources Center Report No. 36) states:

> More than any other human activity, logging has increased the risk and severity of fires by removing the cooling shade of trees and leaving flammable debris." And, "Timber harvest, through its effects on forest structure, local microclimate, and fuel accumulation, has increased fire severity more than any other recent human activity. ... Although silvicultural treatments can mimic the effects of fire on structural patterns of woody vegetation, virtually no data exist on the ability to mimic ecological functions of natural fire."

DellaSala et al., 1995 state:

> The effectiveness of fuel breaks remains a subject of debate within and outside the fire management community. There are many reasons for this broad range of opinion, among them that objectives can vary widely, fuel break prescriptions (width, amount of fuel reduction, maintenance standards) may also vary, they can be placed in many different fuel conditions, and may be approached by wildland fires under a variety of normal to extreme weather conditions. Furthermore, fuel breaks are never designed to stop fires but to allow suppression forces a higher probability of successfully attacking a wildland fire. The amount of technology directed at the fire, and the requirement for firefighter safety, both affect the efficacy of fuel breaks in the suppression effort
>
> Sustained alteration of fire behavior requires effective and frequent maintenance, so that the effectiveness of any fuel treatment, including fuel breaks, will be not only a function of the initial prescription for creation, but also standards for maintenance that are applied. The efficacy of many past fuel breaks has been largely lost because of inadequate or no maintenance. If a fuel break is to remain effective, permanent cover type must occur.

The FEIS and ROD take a very narrow, simplistic view of the science on fuel reduction and ignores scientific information that argues against its conclusions. The EA must be re-written to acknowledge the controversies, and remove its already-made decision biases.

Graham, et al., 1999a point out that thinning can result in faster fire spread than in the unthinned stand.

> For example, the 20-foot wind speed[1] must exceed 50 miles per hour for midflame wind speeds to reach 5 miles per hour within a dense Stand (0.1 adjustment factor). In contrast, in an open stand (0.3 adjustment factor), the same midflame wind speeds would occur at only a 16-mile-per-hour wind at 20 feet.

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[1] Velocity of the wind 20 feet above the vegetation, in this case tree tops.

> Depending on the type, intensity, and extent of thinning, or other treatment applied, fire behavior can be improved (less severe and intense) or exacerbated." … Fire intensity in thinned stands is greatly reduced if thinning is accompanied by reducing the surface fuels created by the cuttings. Fire has been successfully used to treat fuels and decrease the effects of wildfires especially in climax ponderosa pine forests (Deeming 1990; Wagel and Eakle 1979; Weaver 1955, 1957). In contrast, extensive amounts of untreated logging slash contributed to the devastating fires during the late 1800s and early 1900s in the inland and Pacific Northwest forests.
>
> Depending on intensity, thinning from below and possibly free thinning can most effectively alter fire behavior by reducing crown bulk density, increasing crown base height, and changing species composition to lighter crowned and fire-adapted species. Such intermediate treatments can reduce the severity and intensity of wildfires for a given set of physical and weather variables. But crown and selection thinnings would not reduce crown fire potential.

In regards to ecosystem sustainability and wildland fire, Cohen and Butler (2005) state:

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

It seems that the project is a part of a wider, continuing indiscriminate fire suppression strategy, without consideration of sensible wildland fire use—elevating the odds for the type of extreme events most feared.

Cohen and Butler (2005) made recommendations regarding fuel treatment in an interface zone in the Boulder River canyon on the Gallatin NF, following a two-day field trip. Based upon research, and investigation following other instances of wildland fire, Cohen and Butler (2005) specify the need to focus primarily on the Home Ignition Zone (HIZ). The HIZ is approximately 150 from a home. They state, "(W)e cannot mitigate a highly vulnerable HIZ with fuel reduction activities beyond the HIZ; a highly vulnerable HIZ remains highly vulnerable even when surrounded by a fuel break. …The high intensity wildfire has no direct flame effect on the building ignition potential outside the HIZ."

To the degree that this proposal focuses on dead and dying trees, it is not about reducing crown fires. Cohen and Butler (2005) note that dead trees that have lost their needles pose minimal crown fire risk as compared to trees with canopy intact—live or dead:

> When needles fall from the tree canopy the tree loses the principal crown fire fuel. These needles are now part of the more compact and much less intensively burning surface fuel bed. Thus, the crown fire spread is impeded at this location. Primary attention for removing insect killed trees that retain their needles should occur within the HIZ and in any areas where intense fire behavior will produce a life safety concern (falling dead trees usually do not become a problem until after the needles have dropped.)

None of the so-called cumulative effects discussions adequately discloses the effects of past management activities in a logically-defined analysis area, on land of any ownership, to the issue of how those projects have affected the fuel situation now referred to as "hazardous." How have past and ongoing logging and other management activities across this landscape affected fuel conditions and the "forest health" issues alleged by the EA? We know that old high grade and clearcut-type logging leads directly to vegetative conditions that are not natural and present an elevated (above natural) risk of fire. Yet nowhere does the EA present an intelligent cumulative effects discussion about past management in relation to its "Purpose and Need" in violation of NEPA, NFPA and the APA.

It is time for the Forest Service to be more honest with the public about Fire ecology and move away from trying to prevent and suppress wildfire as one of its primary occupations.

INADEQUATE ANALYSIS OF FUEL REDUCTION, FAILURE TO MEET PURPOSE AND NEED AND FAILURE TO FOLLOW BEST AVAILABLE SCIENCE IN VIOALTION OF NEPA, NFMA AND THE APA.

The EIS indicates that the project's purpose is to reduce hazardous fuels in the wildland urban interface.

The EIS does not disclose how the vegetation patterns that have resulted from past logging and other management actions would influence future fire behavior.

Jack Cohen's paper The Wildland-Urban Interface Fire Problem: A Consequence of the Fire Exclusion Paradigm, which was published in the Fall 2008 issue of Forest History advice's the Forest Service how to protect places like the project area.

Jack Cohen writes, "The evidence from policy documents, fire management operations, and manual directives indicates that wildfire suppression and activities in support of suppression constitute the principal approach for preventing disastrous residential fire destruction. Yet the evidence suggests that reasonable levels of fire suppression cannot prevent WUI fire disasters."

THE FOREST SERVICE DID NOT TAKE A HARD LOOK AT HOW CLIMATE CHANGE AFFECTS AND IS AFFECTED BY THIS PROJECT IN VIOLATION OF NEPA, NFMA, THE FOREST PAN AND THE APA.

Published scientific reports indicate that climate change will be exacerbated by logging, and that climate change will lead to increased wildfire severity (including drier and warmer conditions that may render obsolete the proposed effects of the Project). The former indicates that the Bozeman Municipal Watershed Project may have a significant adverse effect on the environment, and the latter undermines the central underlying purpose of the Project. Therefore, the Forest Service must candidly disclose, consider, and fully discuss the published scientific papers discussing climate change in these two contexts. At least the Forest Service should discuss the following studies:

- Depro, Brooks M., Brian C. Murray, Ralph J. Alig, and Alyssa Shanks. 2008. Public land, timber harvests, and climate mitigation: quantifying carbon sequestration potential on U.S. public timberlands. Forest Ecology and Management 255: 1122-1134.

- Harmon, Mark E. 2001. Carbon sequestration in forests: addressing the scale question. Journal of Forestry 99:4: 24-29.

- Harmon, Mark E, William K. Ferrell, and Jerry F. Franklin. 1990. Effects of carbon storage of conversion of old-growth forest to young forests. Science 247: 4943: 699-702

- Harmon, Mark E, and Barbara Marks. 2002. Effects of silvicultural practices on carbon stores in Douglas-fir – western hemlock forests in the Pacific Northwest, USA: results from a simulation model. Canadian Journal of Forest Research 32: 863-877.

- Homann, Peter S., Mark Harmon, Suzanne Remillard, and Erica A.H. Smithwick. 2005. What the soil reveals: potential total ecosystem C stores of the Pacific Northwest region, USA. Forest Ecology and Management 220: 270-283.

- McKenzie, Donald, Ze'ev Gedalof, David L. Peterson, and Philip Mote. 2004. Climatic change, wildfire, and conservation. Conservation Biology 18:4: 890 -902.

ALTERNATIVES NOT CONSIDERED

The FS refused to study in detail any alternative which would have implemented prescribed fire fuels treatments that did not include removal of commercial wood products because such an alternative would not have met the goal of removing merchantable forest projects in violation of NEPA, NFMA and the APA. The FS also refused to study in detail any alternative consider the impacts of their proposed actions on climate change in violation of NEPA, NFMA, the forest plan and the APA. Eventually, if the FS does not begin considering the long-term cumulative impacts of its industrial logging on climate change, the courts will likely force the FS to consider those impacts. This important consideration could lead land managers and policy makers to the conclusion that National Forest lands are more valuable to the national and global community as carbon sinks than as commercial tree farms.

Minimum Management Requirements

Forest-wide management requirements set forth in the Forest Plan "guide the development, analysis, approval, implementation, monitoring and evaluation of forest plans." 36 CFR 219.27.

Forest-wide standards are designed "to meet the goals of this (Gallatin) Forest Plan." Forest Plan, pps. II-14 – II-29. "Forest-wide management direction included in Chapter II of this Plan applies to all management areas." Forest Plan, p. III-1.

A. Wildlife – Big Game and Elk

1. The Gallatin National Forest failed to maintain and improve habitat for elk and Forest Plan Goal #7 is to provide habitat for viable populations of all indigenous wildlife species and for <u>increasing populations of big game animals.</u> Emphasis added.

To further the purposes of Goal #7, the Forest Plan relied heavily upon forest-wide standards #6 (a)(2) and (4), which directed specific procedures for analyzing elk habitat security as affected by timber harvest and roads.

Elk is an "indicator species," selected to represent (big game) "species groups whose habitat is

most likely to be affected by forest management activities, and to be monitored to determine population change." Forest Plan, p. II-18, 19.

On December, 18, 2006, the Gallatin National Forest Travel Plan Amendment, Amendment #45, removed all prior Forest Plan direction related to access and travel management (roads and trails) based on (January, 2005) revisions to NFMA implementing regulations at 36 CFR 219.

The Gallatin Forest Travel Plan now contains all applicable management direction for access and travel management by amending the 1987 Forest Plan. This wholesale amendment removed the following forest-wide standards for big game and elk:

a. Forest-wide standard 6(a)(2), which states:
> "The recommendations and guidelines found in the publication: "Coordinating Elk and Timber Management", Final Report of the Montana Cooperative Elk-Logging Study, 1970-1985 will be used in evaluating the quality of elk habitat and formulating prescriptions for timber sales and road development projects."

b. Forest-wide standard 6(a)(4), which states:
> "The 1982 Elk Logging Study Annual Report contains procedures for analyzing elk habitat security as it is affected by timber harvest and road construction activities. An "elk effective cover" analysis based on this report will be conducted for timber sales and effective cover ratings of at least 70 percent will be maintained during general hunting season." Forest Plan, pps. II-18, 19.

It should be duly noted that The Gallatin NF repeatedly tried to weaken elk habitat effectiveness standards over decades of Forest Plan implementation. The following Forest Plan Amendments relating to Big Game and Elk "HEI" all preceded Amendment #45:

1990: Amendment #5, Mill/Emigrant ROD "Elk Effective Cover" (HEI) Amendment. The forest-wide standard for "elk effective cover" rating (habitat effectiveness index or HEI) of 70% was changed to 55% within the Wicked/Snowbank portion of the Mill/Emigrant Timber Sales FEIS/ ROD.

1995: Amendment #6, Hyalite HEI/Road Density Amendment. This was the Hyalite Timber Sale decision, which would have reduced the standard for elk effective cover (HEI) for compartment 509 in the Hyalite drainage from 70% to 60%. The decision was overturned by Federal District Court Judge Hatfield in May, 1995.

1992: Proposed Amendment #9 (never completed), "Elk Effective Cover" (HEI) Amendment. This amendment would have changed the Forest Plan standard that required timber sales to maintain an elk effective cover (known as HEI) rating of .70 during the general hunting season. Work ceased in the Fall of 1992 after a meeting where the Forest Service could not obtain the support of the Montana Dept. of Fish, Wildlife and Parks, who adamantly opposed changing this standard. They said that they felt the current standard provided them the only avenue they had to influence Forest Service decisions.

1997: Amendment #22 (Enjoined, 9/4/97), Hyalite II HEI and VQO Amendment. This was the Hyalite II Salvage Timber Sale DN, which changed elk effective cover ratings (HEI) for the Hyalite drainage from 70% to 47%, the actual HEI of the drainage based on the open road and

trail network in place as of March of 1997. The amendment also exempted unit 210 of the Hyalite II Salvage Timber Sale from the VQO standard of "retention". This amendment was enjoined along with the timber sale by Federal District Court Judge Molloy on September 4, 1997.

1998: Amendment #31, Appaloosa Timber Sale "Elk Effective Cover" (HEI) Amendment. This was the Appaloosa Timber Sale Decision Notice (DN), December 18, 1998. This was a temporary project specific amendment to exempt this timber sale project from having to meet the Forest Plan "elk effective cover" (HEI) standard of 70%.

1999: Amendment #34, M/S/T Timber Sale "Elk Effective Cover" (HEI) Amendment.
This was the Moose/Swan/Tamphery Timber Sale Decision Notice (DN), March 15, 1999. This was a temporary project specific amendment to exempt this timber sale project from having to meet the Forest Plan "elk effective cover" (HEI) standard of 70%.

2000: Amendment #38, Taylor Fork Timber Sale "Elk Effective Cover" (HEI) Amendment. This was the Taylor Fork Timber Sale Record of Decision (ROD), October 6, 2000. This was a temporary project specific amendment to exempt the Dead Horse-Albino Lake portion of this timber sale from having to meet the Forest Plan "elk effective cover" (HEI) standard of 70%.

2004: Amendment #43, Darroch-Eagle Creek Timber Sale "Elk Effective Cover" (HEI) Amendment. This was the Darroch-Eagle Creek Timber Sale Decision Notice (DN), April, 2004, which was a temporary project specific amendment to exempt the this timber sale project from having to meet the Forest Plan "elk effective cover" (HEI) standard of 70%.

The 70% HEI Forest Plan standard was summarily removed, and replaced with nothing. Emphasis added. Bozeman Municipal Watershed Project has no pesky big game/elk effective cover standard. No problem? Not so fast.
The Forest Service failed to provide for adequate wildlife habitat to maintain viable elk and big game populations, in violation of NFMA, APA and the Forest Plan.

2. Key Wildlife Habitat Elements

Those key habitat elements are as follows:

(1) moist areas (wallows, etc.);
(2) foraging areas (meadows and parks);
(3) critical hiding cover . . .;
(4) thermal cover;
(5) migration routes; and
(6) staging areas.

3. The Gallatin National Forest Failed to Map, or Adequately Disclose the Impacts to Moist Areas in the Project Area.

The Gallatin Forest Plan requires that the Forest Service map moist areas throughout the Project area. The Forest Service must map all perennial and ephemeral streams, springs, bogs, potholes, wetlands and wallows because they are "moist areas." The Forest Service's failure to map them violates Forest Plan standards, the NFMA and the APA. Moreover, NEPA requires the Forest Service to take a "hard look" at the Project's impact on moist areas.

4. The Gallatin National Forest Failed to Adequately Disclose the Impacts to Wildlife Hiding Cover in the Project Area.

The Forest Plan mandates that two-thirds of wildlife hiding cover associated with all key habitat elements be maintained.

The FEIS and ROD do not accurately account for hiding cover percentages for these entire key habitat elements. By making this critical information unclear, the public cannot determine whether the Forest Service is complying with the Forest Plan, or taking the required "hard look" at the environmental effects of the Project on elk and big game habitat required by NEPA, NFMA, the Forest Plan and the APA. The Forest Service must determine and clearly disclose these numbers to the public. Specifically, the Forest Service must at least disclose the pre-logging and post-logging percentage hiding cover associated with foraging areas and thermal cover.

The Forest Service must also thoroughly analyze and disclose the cumulative impacts of past logging and road-building in the Project area, and the cumulative loss of hiding cover.

5. The Forest Service Failed to Adequately Identify, Map, or Disclose the Impacts to Big Game Migration Routes Within and Throughout the Project Area.

The Forest Plan requires that the Forest Service map elk and big game migration routes through the Project area. This was not done in violation of NEPA, NFMA, the Forest Plan and the APA. There is seasonal elk and big game migration. Migration is concentrated on ridge tops and saddles, where intensive vegetative alterations are planned. The Forest Service violated its Forest Plan by failing to map these routes. This failure violates NFMA because it is a Forest Plan violation. It also violates NEPA and the APA because it fails to take a hard look at the Project's impacts to migration routes.

B. Old Growth Habitat and Old Growth Species

1. The Gallatin National Forest Failed to Maintain and Improve Habitat, and Fails to Maintain Viable Populations for Old Growth Species. NFMA § 6(g)(3)(F)(v), 36 CFR 219.19(a) and 36 CFR 219.27(a)(6).

Forest Plan Goal #7 is to provide habitat for viable populations of all indigenous wildlife species.

Forest Plan Wildlife Objectives purport to commit "vegetative manipulation projects..." to "maintain or improve habitat conditions." "Non-game and small game needs will be enhanced..." Forest Plan, p. II-4.

The FEIS does not analyze old growth habitat. The estimate of old growth amounts in timber compartment numbers 508, 509, and 510 described in the FEIS overestimate the actual acres of old growth habitat in the project area. Current condition estimates of 32% (#508), 28% (#509) and 35% (#510) are based upon (old growth) overmature timber, and "forested acres, not total acres within the Compartment." FEIS, p. 3-249. The 10% minimum old growth standard is measured "in timber compartments containing suitable timber." Forest Plan, p. II-20. This discrepancy is not explained or reconciled in the FEIS or ROD.

The data used to calculate old growth acreage and percentages, allegedly using the Green et al. definition, came from unreliable sources (ArcView, TSMRS and "field exam") that do not measure the minimum criteria required by a proper analysis using accepted Region -1, Green et al. definition and procedures. FEIS, p. 3-212. The FEIS makes no claim to the accuracy or appropriateness of the data, or the qualitative effectiveness of the old growth analysis. The effects of the Project cannot be accurately assessed.

Green et al. is not the definition used for old growth in the Forest Plan. "Overmature Timber" is used to define "Old Growth Timber" in the Forest Plan. Forest Plan, p. VI-24. Old growth, as it applies to habitat for old growth indicator species, and other wildlife, is not defined, and therefore cannot be properly or adequately assessed in the Project.

Guidance for old growth inventory methodology and criteria is found at:

OLD-GROWTH FOREST TYPES OF THE NORTHERN REGION
by P. Green, J. Joy, D. Sirucek, W. Hann, A. Zack, and B. Naumann
DESCRIPTION MINIMUM CRITERIA ASSOCIATED CHARACTERISTICS; *TABLE 3 EASTERN MONTANA ZONE OLD GROWTH TYPE CHARACTERISTICS (02/05 errata edit), p. 10.
USDA FOREST SERVICE, APRIL 1992, R-1 SES 4/92
(errata corrected 02/05,12/07,10/08)

2. The Forest Service Failed to Monitor Habitat and Population Trends of Old Growth Indicator Species.

The scope and intensity of actual field surveys for goshawks, primarily targeting nest locations, has been inadequate. Within the project area only one nest site has been verified (2006-2009), and another located in 1991, was last surveyed in 1994. Two additional potential sites "were detected in 2006, but nesting was not verified." FEIS, p. 3-194.

This hardly meets the monitoring effort required to meet the NFMA, or the purported commitment to "determine population trends of indicator species and relationships to habitat changes" in the Forest Plan. Forest Plan, p. IV-6.

Pine marten monitoring has been virtually non-existent. "Surveys were conducted in the project vicinity each winter between 1999 and 2005... for presence, and evaluating distribution and abundance..." FEIS, p. 3-392. The failure to monitor for management indicator species habitat and population trends is merely the continuation of "business as usual" on the Gallatin National Forest. The Forest Service has failed to meet its monitoring requirements for old growth indicator species, in violation of NFMA § 6(g)(3)(C), 36 CFR 219.12(k) and 36 CFR 219(a)(6).

The Forest Service's failure to provide population monitoring data for its old growth indicator species also violates NEPA for failing to take a "hard look" at the populations of indicator species in the area.

3. The Gallatin National Forest Failed to Comply With Its 10% Old Growth Standard.

At least 10% old growth habitat must be maintained in each timber compartment. The Forest Plan also requires that the Forest Service collect data "on-the-ground" at the project level to validate old growth compliance. Green et al. should be used to designate old growth habitat. Green strongly cautions against exclusively using timber stand data to inventory old growth habitat. Green advises limiting the use of timber stand data to screen for potential old growth, followed by field examination of stands with demonstrated potential.

According to the FEIS, "569 stands in compartments 508, 509, and 510 have been ground truthed with a field exam." FEIS, p. 3-212. However, the FEIS contains no documentation of whether or not Green et al. protocol/procedures were followed to field-verify old growth stands in the Project area.

As noted above, the Forest Service has never properly monitored populations of its old growth indicator species, as required by the Forest Plan.

C. Water Quality and Native Fish

THE BOZEMAN MUNICIPAL WATERSHED PROJECT IN THE GALLATIN NATIONAL FOREST VIOLATES THE CLEAN WATER ACT AND FAILS TO COMPLY WITH MONTANA WATER LAW:

The Clean Water Act requires that federal agencies comply with its provisions. The agency must protect water quality and comply with state water quality standards on National Forest system lands. Marble Mountain Audubon Soc. v. Rice, 914 F.2d 179, 182 (9th Cir. 1990); Oregon Natural Resources Council v. U.S. Forest Service, 834 F.2d 842, 848 (9th Cir. 1987); Northwest Indian Cemetery Protective Ass'n v. Peterson, 794 F.2d 688, 697 (9th Cir. 1987); 33 U.S.C. 1323(a) ("Each department, agency, or instrumentality of the executive [branch] . . . shall be subject to, and comply with, all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water pollution"); 16 U.S.C. 1604(g)(3)(E)(iii) (timber may be harvested only where "protection is provided for streams, streambanks shorelines, lakes, wetlands, and other bodies of water from detrimental changes in water temperatures, blockages of water courses, and deposits of sediment"); 36 C.F.R. 219.23(d) ("Forest Planning shall provide for -- Compliance with requirements of the Clean Water Act, the Safe Drinking Water Act, and all substantive and procedural requirements of Federal, State and local governmental bodies") and 36 C.F.R. 219.27(a)(4) ("All management prescriptions shall . . . Protect streams, streambanks, shorelines, lakes, wetlands and other bodies of water").

Section 303(d) of the CWA (33 USC §1313(d)) requires that states list water quality limited segments of bodies of water within its jurisdiction. The listed segments are not meeting state water quality standards or failing to meet designated uses due to identified reasons. The states are required to develop Total Maximum Daily Loads (TMDL) for these waters (33 USC Sec 1313 (d)(1)(c)). TMDLs are designed to address all sources of pollution limiting the water quality of the public waters and should include point and non-point sources of pollution, such as sediment generated from logging activities. In the absence of a TMDL federal agencies have a duty to avoid further degradation of WQLS stream segments. The Post Fire project as embodied by Alternative 4 modified in the ROD, violates this duty and thereby violates the CWA.

There is concern for the increase in nutrients after a prescribed burn. Hyalite Creek is already listed as WQLS for nutrients. The TMDL assessment for Hyalite has not been completed. The FEIS states that there wont be measureable increases in nutrients in nutrient compromised Hyalite Creek but it asserts no background for this assessment nor delineates why or how the Forest Service came to this conclusion. Increases in nutrients on a nutrient impaired stream before a TMDL assessment has been completed is a violation of the CWA.

TMDL's have not been completed on Hyalite Creek, Bozeman Creek, or Leverich Creek. Both Bozeman Creek and Hyalite Creek are WQLS creeks. The addition of sediment to creeks that are impaired due to sediment overloads before a TMDL assessment has been completed is a violation of the CWA. Sediment, nutrients and other pollutants cause negative impacts to physical, biological and chemical attributes of waterbodies. There are no studies providing guidance on how much sediment or nutrients is too much and at what point the beneficial use is impaired.

Sediment increases over the short-term are still in violation of the CWA – particularly when there is no science to determine how long the sediment will actually persist and the Forest Service simply supposes that the sediment will only be there for 5 years. Logging activities have no positive long-term effect on sedimentation reduction. Addition of sediment to WQLS water

bodies that are already compromised in their water quality does nothing to move toward remedying the water quality violations and adverse affects of attainment of beneficial uses. Specifically, the addition of sediment to WQLS steams from logging activities is a violation of the Clean Water Act (Sierra Club, et al v. Austin, et. al. 2003). It interferes with the attainment of the beneficial use of maintaining healthy fishable populations of native salmonids. The USFS may believe that because the sediment loads will decrease over time that such additional sediment is not an issue under the CWA. This belief is mistaken and is not supported in law or science. Water quality standards under the CWA are a vehicle for attaining beneficial uses: swim able, fishable and/or drinkable water. The impact of the intense sedimentation predicted by the FEIS in Hyalite, Bozeman and Leverich is significant and substantial on fish populations. Fish suffer many effects from increased sedimentation. These effects range from physiological and behavioral, where gills are injured by the passage of a high volume of abrading sediment and foraging habits altered or interfered with due to changes in visibility in the water, to the actual death of fish. Thus, the cold water fishery beneficial use is further damaged and results in a CWA violation.

The FEIS proposes Best Management Practices (BMPs) to mitigate impacts of erosion, sediment overloads, and increase nutrients to comply with the Clean Water Act and state of Montana regulations. The FEIS does not disclose the degree to which FS's reliance on these BMPs, however, is based on observations of the effectiveness of the BMPs on mitigating the effects of logging activities on burned vs. unburned areas, thereby protecting water quality.

The project as described does not adequately account for or mitigate watershed damage resulting from use of haul roads, especially in drainages already suffering from cumulative impacts. This inadequacy is especially troubling in watersheds where streams may be listed on the 303d list as impaired, from whatever cause.

McIver and Starr, (2000) state:

> Of these [factors affecting hydrological problems], road building and continued use of roads are probably the biggest potential contributors to post fire erosion, just as they are in green tree stands (Megahan 1980).
>
> The continued use of even well-constructed gravel roads can contribute substantial amounts of sediment compared to undisturbed areas (Reid and Dunne 1984)."
>
> [E]rosion rates on landings and roads were 100 times those of undisturbed areas. (Swank et al 1989)

Rhodes, (2002) performed a Bitterroot BAR Project field review, and concluded about the post fire logging on the Bitterroot NF: "1) Log haul and other road use has greatly increased sediment delivery in affected streams."

EFFECTIVENESS OF BMP'S IN VIOLATION OF THE FOREST PLAN:

The Gallatin National Forest, Forest Plan (hereinafter Forest Plan) requires the Forest Service to "Monitor the effectiveness of BMP's controlling effects of management induced sediment on beneficial uses of water." Forest Plan, p. IV-5. The monitoring is to be done every five years. There is no discussion in the FEIS regarding past evaluations of monitoring the effects of management induced sediment loads nor does the FEIS evaluate the cumulative effects of repeatedly relying on the untested and unmonitored effectiveness of the BMPs. There is no determination of how the reliance on the unmonitored effectiveness, or lack thereof, of BMP's will impact beneficial uses of the water bodies included in the Project area during Project

implementation. Nor does the FEIS consider the cumulative effects of repeated reliance on untested, unmonitored BMPs throughout the project area.

There is reference in the FEIS and in Scientific Assessments relied on in the creation of the FEIS to the possible impoundment of water in the Bozeman Creek drainage. This project is clearly foreseeable and must be thoroughly considered in evaluating the cumulative effects of the Project on water quality and fisheries in the FEIS. The failure to do so is a violation of NEPA.

VIOLATION OF SEDIMENT STANDARDS IN THE TRAVEL PLAN:

Sediment standards are delineated by the Gallatin Travel Management Plan (hereinafter Travel Plan). The Travel Plan states that the standards for sediment levels for the streams of the forest are listed in table 2-1 of the Travel Plan. The FEIS states that within the analysis units for sediment delivery, the "sedimentary delivery values in table 2-1 will serve as guidelines; however, sediment delivery values in individual 7th code HUCs may temporarily exceed sediment delivery rates denoted in Table 2-1," but only in certain circumstances. The FEIS does not thoroughly evaluate and explain how the project will affect one area in a way that exceeds the standard in the Travel Plan and not exceed it in other areas. Additionally, this "exceeding of standards" cannot occur anywhere in the forest, regardless of circumstance, and allow the Project to remain in compliance with NFMA.

The FEIS clearly states that sediment loads will violate the Travel Plan during and for five years immediately after the project. There is no clearly defined analysis explaining how the Forest Service expects these impacts to abate. Nor do they explain why they think it will only take five years. Regardless, a temporary violation of a Travel Plan is still a violation.

The FEIS states there would be an increase in sediment over pre-project conditions with the implementation of the Project. The FEIS discusses how far over "natural" levels the sediments will go but does not explain how far over the Travel Plan standards the increased sediment will be. Additionally in assessing cumulative impacts the focus is on whether the project is in compliance with the applicable Montana Law but does not address compliance with forest Travel Plan standards.

THE FOREST SERVICE DID NOT MAP ALL MOIST AREAS IN THE PROJECT AREA.

The Gallatin Forest Plan requires that the Forest Service to map moist areas throughout the Project area. The Forest Service determined that there were wetlands present in the area including several small bogs classified as palustrine emergent wetlands. Additionally there was no mapping of the seeps and springs in the FEIS. There are seeps and springs in the area that are classified as riverine, upper perennial wetlands. The seeps and springs in the Project area are perennially saturated. Additionally streamside moist areas are seasonally saturated during snowmelt runoff. The Forest Service does not map these wetland, moist areas. Because perennial streams and bogs are "moist areas," the Forest Service's failure to map them violated NFMA and the APA because it is a Forest Plan violation. It also violated NEPA because it evidences a failure to take a hard look at the Project.

Forest standard requires that all "proposed roads and trails shall not be located in the floodplains of rivers and streams or in wetlands except where necessary to cross rivers or streams or wetlands with appropriate permits. Given that there is no mapping of the wetlands in the area, there is no way to ensure that this Forest Plan standard is being complied with by the Forest Service and to ensure there is no NFMA violation.

The FEIS sates that in the Leverich Canyon drainage "several of the proposed temporary roads would cross the headwater drainages which may or may not be wet." The is not a "hard look" at the impacts of the project and is in violation of the CWA as it is the construction of a road in a wetland area.

THE FOREST SERVICE DID NOT DISCUSS WHY THE PROPOSED COMMERCIAL LOGGING IN RIPARIAN AREAS DOES NOT VIOLATE THE LEGALLY BINDING SETTLEMENT AGREEMENT WITH TROUT UNLIMITED.

The Forest Service entered into a legally binding settlement agreement with Trout Unlimited over the implementation of the Gallatin Forest Plan. The settlement agreement forbids the Forest Service from logging in riparian areas. The Forest Service is permitting commercial logging in riparian areas in this Project in violation of NEPA, NFMA, the Forest Plan, the Clean Water Act and its implementing regulations, Montana water quality regulations, and the APA.

THE PROJECT WILL DEGRADE CRITICAL WESTSLOPE CUTTHROAT TROUT HABITAT.

Westslope cutthroat trout (WCT) are present in Leverich Creek in the project area. WCT are considered a sensitive species and must be proactively managed to prevent declines that will result in listing under the Endangered Species Act. The FEIS states that the goal of the project should be to minimize and avoid impacts on sensitive species and habitat. The FEIS demonstrates that the area only has a localized reach where the WCT are present yet the Forest Service plans to log in the Leverich drainage. To minimize these impacts the Forest Service has proposed two mitigation projects that according to the FEIS, should likely be conducted regardless of the implementation of the project, implying that the areas are already degraded and that improvements may already be necessary to support the WCT population in Leverich Creek. Despite an already degraded environment for the WCT population the logging project plans to increase sediment loads in WCT habitat both during the project and for an indeterminate amount of time after the project.

The WCT is declining in part due to habitat degradation and in part due to roads and timber harvest. The Forest Plan requires that aquatic habitat be managed to maintain WCT and other MIS species in the creeks. MA-7 for the Gallatin Forest is managed for the riparian resource and to protect the water, fish and wildlife that depend on it. In MA-7 the Forest service must provide for optimum water temperatures for cold water fisheries. The FEIS discusses how wildfire temperatures will increase water temperatures if the Project is not implemented. However, the FEIS fails to discuss how prescribed burns will affect water temperatures during the process possibly killing off populations of MIS fish species and WCT in the project area.

Instead of managing this area to maintain or recover this population of WCT – by prohibiting riparian logging or closing roads for example – the Project will exacerbate the habitat degradation. Riparian logging will increase sedimentation into cutthroat habitat and the Forest Service itself recognized that any increase in stream sediment yield from the Project would perpetuate degraded spawning conditions.

Moreover, even though the Forest Service recognized that high road densities have led to cutthroat habitat degradation, the Forest Service failed to effectively assess the amount of sedimentation that could be expected from road implementation, and repeatedly driving log trucks down those roads over the four to five years of Project implementation.

The sedimentation estimates in the FEIS are misleading. The way Alternative 6 keeps down the percent of increased sediment is to simply spread the project out over a longer period so that the 'peak' of sediment discharge isn't too great for the water treatment plant at the base of the creek

to handle. The amount of sediment released by the project was not decreased in Alternative 6. Rather it will just happen more gradually, a situation that for habitat purposes is arguably more problematic in that the degradation occurs over a longer period of time. The total amount of sediment that will occur as a result of the implementation of the project is the same regardless of whether the project is done over a period of three years or six years.

Alterations in substrate composition due to increases in sedimentation in Hyalite, Bozeman, and Leverich Creeks will effect spawning habitat for WCT and for fish MIS in the project area. All streams are considered a class A stream for the purposes of fisheries management. All wild trout are MIS species for the Gallatin National Forest. The Forest Plan requires that habitat is provided for identified MIS species and for sensitive species like WCT. Additionally, the FEIS states that if there is no wildfire under the no-action alternative, habitat will actually improve for fish MIS and for WCT.

WCT viability analysis should focus on the biological population that the Project will effect. Meaning, in determining the viability of this particular population the FEIS should assess the likelihood of individuals mating with each other or with other species. Viability is also assessed considering ecological needs and habitat needs and the ability to persist through environmental and ecological changes. In order to get a clear picture of the effects on WCT the FS should determine a baseline condition of the population pre-project. However, the FEIS states that the FS doesn't know if WCT distribution extends further upstream from the project area. The population is characterized as small and isolated form other possible populations in Hyalite Creek. FEIS p. 3-66. The effects on the populations in the Hyalite Creek drainage were not assessed.

The FEIS states that there will be two mitigation projects done on Leverice Creek to offset impact of sediment of sediment to the Westslope cutthroat trout (WCT) population that resides there. There is no evaluation or assessment demonstrating the impacts of these mitigation projects and nothing demonstrating that they will actually offset damages to WCT and their habitat.

In the Leverich Creek area around the WCT population there are numerous roads, trails, and stream crossings. Additionally there has already been logging in the area. Timber has been removed in two clearcuts that were laid out to the stream's edge. All of these activities have delivered sediment to Leverich Creek impacting the reproductive success of cutthroat trout and aquatic invertebrate reproduction. Small pockets of clean spawning gravel presently exist along the ½ mile reach of occupied habitat." FEIS 3-66. (emphasis added). These small pockets are elemental to the survival of the WCT in this area. There will be an increase of 8.4% to 10.3% over natural levels in Leverich Creek as a result of the Project. There will be a 0.5% increase of sediment in the spawning substrate.

Under the no-action alternative birth rates of WCT are expected to increase if there is no catastrophic wildfire. The FEIS then goes on to discuss how the wildfire that will sweep through the Leverich Canyon will increase water temperatures. But there is no discussion about how prescribed burns will impact water temperature. The FEIS states that "[b]ecause the Leverich Creek cutthroat trout population is no longer connected to nearby westslope cutthroat trout populations, potential wildfire-related impacts associated with changes to water temperature regimes, bedload movement, stream channel stability, stream flow, sediment delivery, could be major."

In conclusion, the Forest Service violated NFMA when it violated its Forest Plan by authorizing a Project that will continue to degrade habitat for the "small and isolated" population of sensitive WCT in the Project area.

THE PROJECT FAILS TO MEET FEDERAL AND STATE WATER QUALITY REQUIREMENTS:

1. The Gallatin National Forest has failed to meet State and federal water quality standards, and Forest Plan water quality goals, objectives and standards.

Hyalite Creek is classified as an A-1 stream because it supplies municipal water to the City of Bozeman. The FEIS makes two, conflicting, statements about whether or not Hyalite Creek is currently meeting State water quality standards:

> a) The 2006 Montana 303(d) database has 2 segments of Hyalite Creek listed. FEIS, p. 3-32; and
>
> b) Water quality in Hyalite Creek is excellent and in compliance with Montana A-1 Classification Water Quality Standards. FEIS, p. 3-33.

Hyalite Creek is listed on the 303(d) impaired waterbodies list, it is not currently meeting State water quality standards. A-1 Classification permits no sediment levels above "natural," however, the FEIS at Table 2-2, p. 3-39 indicates that Hyalite Creek has been constantly operating at 7.9% over natural sediment levels, even before the Project begins. Presumably, this over-natural condition is a result of decades of properly applied BMPs designed to maintain and improve water quality. This is a violation of NEPA to mislead the public.

NFMA regulations require "compliance with the requirements of the Clean Water Act. 36 CFR 219.23(d). The Gallatin National Forest relies on BMP's to "ensure that water related beneficial uses are protected and State water quality standards are met...." Plan, p. C-1. BMP's have failed.

BMP's allow "naturally occurring" degradation after "all reasonable land, soil and water conservation practices have been applied." ARM 16.20.603.(11).

The application of BMP's in the Project area has caused the downward spiral of "natural" degradation, and non-compliance with water quality standards, by redefining stream conditions, regardless of the level of sediment damage, for so long as BMP's are applied. This is clearly in conflict with state and federal policy to "maintain and improve" water quality.

2. Westslope cutthroat trout populations cannot recover, cannot be made "viable," and fish habitat capacity cannot be "maintained ...and improved," when the Project adds more sediment to currently "impaired" habitat.

"Wild trout" is a management indicator species, and a "sensitive species." Waterbodies listed on the 303(d) list of impaired streams are by definition not fully supporting the (trout) beneficial uses. The Project will again apply the same BMP's that perpetuate, and exacerbate, ongoing wild trout habitat degradation.

Westslope cutthroat trout populations are declining throughout its historic range in part due to habitat degradation resulting from decades of road-building, poor road design and maintenance and excessive logging. BMP's implemented for decades in the Project area are not the "mitigation" solution to sediment pollution problems. BMP's have caused the failure to protect beneficial uses, meet water quality standards, and the failure to maintain viable westslope cutthroat trout populations.

Of the primary streams (Hyalite Creek, Bozeman Creek, and Leverich Creek) in the Project area, "Leverich Creek is the only project area stream that contains westslope cutthroat." FIES, p. 3-55. This speculative statement is supported by data ten (10) years old, or older. Id., pps. 55-58.

Data used to analyze fish and fish habitat is outdated. NEPA's "hard look" requires relevant date for analysis, not wild-ass-guessing and ineffective computer models. It is also obvious that the NFMA minimum monitoring requirements for fish and water quality promised in the Plan have not been met. 36 CFR 219.19(a) and 36 CFR 219.27(a)(6). See also: Plan, p. IV-5-IV-6, Monitoring Items #'s 8, 16, and 18.

The Forest Service failed to discuss why Hyalite Creek and Bozeman Creek do not support viable westslope cutthroat populations. If proper monitoring had been followed, the FEIS might be better equipped to make judgments about "population trends of indicator species and relationships to habitat changes." Plan, p. IV-6. The Forest Service summarily concludes that additional fine sediments are not a problem, and no westslope cutthroat trout occupy Bozeman and Hyalite Creeks. No cutthroat, no analysis, no problem.

The Forest Service violated NFMA and failed to follow its Forest Plan by failing to monitor BMP effectiveness and MIS, by authorizing a Project that will maintain "impaired" trout habitat conditions, continue to degrade wild trout habitat, including potential westslope cutthroat trout habitat in the Project area.

The Forest Service violated NEPA's “hard look” requirement by failing to disclose the amount of sedimentation that will result from more road miles and increased road use during and after Project implementation. Cumulative effects on water quality and wild trout were not adequately analyzed.

NEPA/Hard Look:

A. Effects of Commercial Logging

The Forest Service failed to take a hard look at its plan to conduct commercial logging to reduce the risk and intensity of wildfire.

Since the Project’s goals are partly to reduce the probability that fire will destroy municipal and private structures and harm people, the current fuel/fire hazard situation on land of all ownerships within the WUI (at least the WUI that’s relevant to this area) should be mapped and disclosed.

More importantly, the fuel/fire hazard situation post-project on land of all ownerships within the WUI must also be displayed on a map. The FEIS doesn’t accurately disclose the threats to public and private structures and people. It must be readily discernable why some areas are included for treatment and others are not.

The Forest Service does not have a detailed long-term program for maintaining the allegedly safer conditions, including how areas will be treated in the future following proposed treatments, or how areas not needing treatment now will be treated as the need arises.

The public at large, the City of Bozeman, and private landowners, must understand the implications of the long-term (programmatic) efforts, including the amount of funding necessary, and the likelihood based on realistic funding scenarios for such a program to be funded both adequately and in a timely manner. What happens if lack of funding, or a change in management direction, fails to continue the program? Will fire risk increase exponentially, and how long will those elevated risk levels last?

The FEIS mixes, and thus confuses, two separate issues: a) hazardous fuels and b) "forest health."

The FEIS fails to clearly disclose which treatment units are for fuel reduction and which are to deal with the alleged "forest health" problem(s). Clearly, maintaining parts of the Forest in "safer" fuel conditions is not in accord with maintaining natural, ecological processes and biodiversity. "Excessive fuels" from one perspective is cover habitat from the perspective of a pine marten or moose. In many cases, the very processes that caused the alleged "forest health" problems are what create dead tree habitat (snags and large woody debris) for a myriad of native fish and wildlife species. The FS's wants to have it both ways.

The FEIS fails to address the "hazardous fuels/catastrophic fire" issue on the appropriate large-landscape scale. The FEIS only discusses fuel conditions in the areas proposed for treatment, yet wildland fire operates beyond ownership boundaries or Project boundaries.

The FEIS fails to answer the question: Will the fuel reduction activities be in any way significant, when one of any number of potential fire scenarios plays out on the land in the foreseeable future? One cannot tell, because the fuel conditions in the larger landscape surrounding "treatment units" are not adequately discussed. Likewise, the appropriate landscape scale for the "forest health" issues is also beyond the Project's treatment units. The greater landscape was not adequately considered.

The FEIS also fails to deal with the "excessive" fuels issue on an appropriate temporal scale. The FEIS conceptualized (computer models did it) fire behavior at an imaginary, short-duration fixed time period following treatment. What happens next is scarcely mentioned, ignoring the heightened fuels'wildfire risk caused by the proposed logging activities. The FEIS doesn't consider the obvious fact that vegetation response to the proposed activities will be rapid re-growth in the understory, and also significant for smaller tree growth in the years following treatment. How vegetation changes might affect future fire behavior, when one of any number of possible fire scenarios plays out on the land in the foreseeable future, is also glossed over in the FEIS's overly simplistic analyses.

This type of vegetative treatment was not a planning scenario (or alternative) during Forest Plan development. Both the project-level and programmatic ecological and economic costs and impacts remain unexplained and undisclosed.

The Gallatin National Forest must disclose to the public just how much of the Forest is considered outside the range of natural variability in alleged "forest health" terms. It must also disclose how much of the Forest is to be treated for fuel reduction in a similar manner that emphasizes manipulating fuel conditions over natural ecological processes.

The Gallatin National Forest has been fundamentally changed. The climate has changed. The Forest Service must analyze how much the landscape has been fundamentally changed forest-wide, compared to historic conditions, and disclose the results to the public in the form of a programmatic EIS. This means either completing the Forest Plan Revision process, or a significant amendment to the Plan.

B. Cumulative Effects

How have past and ongoing logging and other management activities across this landscape affected fuel conditions and the "forest health" issues alleged by the FEIS?

None of the so-called cumulative effects discussions adequately disclose the effects of past management activities in a logically-defined analysis area. Fire influences multiple-ownerships. How have previous projects affected the fuel situation now referred to as "hazardous?" "High-grading" and clearcut-type logging leads directly to vegetative conditions that are not natural and present an elevated (above natural) risk of fire.

The FEIS fails to account for the Cottonwood fuels reduction project in the adjacent drainage.

The FIES fails to present an intelligent cumulative effects discussion about past, present and furute management in relation to its "Purpose and Need," in violation of NEPA, NFPA and the APA.

Roadless Areas (Inventoried and Uninventoried).

THE ROADLESS RULE

The Bozeman Watershed EIS violates the roadless rule.

The Roadless Rule permits timber cutting only if the logging is limited to "generally small diameter timber" and allows logging only for narrowly defined purposes such as enhancing roadless area characteristics. It provides in pertinent part as follows:

(a) Timber may not be cut, sold, or removed in inventoried roadless areas of the National Forest System, except as provided in paragraph (b) of this section.
(b) Notwithstanding the prohibition in paragraph (a) of this section, timber may be cut, sold or removed in inventoried roadless areas if the Responsible Official determines that one of the following circumstances exist. The cutting, sale, or removal of timber in these areas is expected to be infrequent.
(1) The cutting, sale, or removal of timber of generally small diameter timber is needed for one of the following purposes and will maintain or improve the roadless area characteristics as defined in § 294.11.
(i) To improve threatened, endangered, proposed or sensitive species habitat; or
(ii) To maintain or restore the characteristics of ecosystem composition and structure, such as to reduce the risk of uncharacteristic wildfire effects, within the range of variability that would be expected to occur under natural disturbance regimes of the current climactic period.

36 C.F.R. § 294.13 (emphasis added).

While the Record of Decision notes that "[g]enerally small diameter timber will be removed, with the emphasis on retaining larger trees (ROD 23), the BMW EIS proposes to log more than half of the larger size classes of trees/per acre in multiple cover types. See EIS 3-155 Table 5.5; EIS 3-156 Table 5.6. Furthermore, the agency failed to differentiate between what constitutes large, medium or small diameter trees, or how they determined that the timber to be removed is generally smaller. The ROD is internally inconsistent. It states that the diameter of timber to be harvested is "generally" 10-12 inches or less, however the ROD states that prescriptions for cutting in the IRA specify trees less than 12 inches. Will cutting in the IRA be "generally" limited to trees smaller than 12" DBH, or is this a hard and fast rule—no trees greater than 12"? The EIS was unclear on this point, but the tables say that more than half of the large trees will be logged in some units. It defies logic to say that generally small diameter timber will be cut when more than half of the large trees will also be cut.

Because the chosen alternative would allow intensive removal of mature trees in a roadless area, it violates the Roadless Rule governing management of roadless areas.

This very circumstance was adjudicated in the Sierra Club v. Eubanks case in the Eastern District of California in 2004. The Forest Service may not do an end run around the Roadless Rule, and remove many mature trees, merely by claiming that most of the trees that would be removed are "small".

2) Irreversible and Irretrievable Commitment of Resources.

Commercial logging in an uninventoried and/or inventoried roadless areas is an "irreversible and irretrievable" commitment of resources that "could have serious environmental consequences." Smith v. U.S. Forest Service, 33 F.3d 1072, 1078 (9th Cir. 1994).
The FEIS and ROD failed to adequately address the effects of logging and roading the uninventoried roadless areas on their characteristics vis-à-vis potential for future wilderness or inventoried roadless area designation. The FEIS failed in its discussion of effects to unroaded areas. There was no analysis of the project's impact on the unique values of unroaded areas together with their adjacent inventoried roadless areas. The FEIS fails to meet the "hard look" requirement of NEPA with respect to the environmental impact of logging and roading inventoried and uninventoried roadless areas.

It is well established that logging in an uninventoried and inventoried roadless areas is an irreversible and irretrievable" commitment of resources that "could have serious environmental consequences" Smith v. U.S. Forest Service, 33 F.3d 1072, 1078 (9th Cir. 1994). The ROD and FEIS failed to adequately address the effects of logging and roading the uninventoried roadless areas on their characteristics vis-à-vis potential for future wilderness or inventoried roadless area designation. The discussion of the impacts on unroaded areas was superficial. There is no mention of the Northern Rockies Ecosystem Protection Act, H.R. 980 which would designate all of the roadless areas and adjacent unroaded areas as wilderness. There was no mention of the potential for weeds to permanently impact the area after logging, burning and road building in violation of NEPA and NFMA. Page 301 of the FEIS says: "Weeds (and invasive species in general) take advantage of pathways to establishment. Logging,
burning and associated activities provide pathways in the form of disturbed areas, motor vehicles for seed transport, etc. Other pathways also come into play such as livestock, recreational vehicles, hikers, domestic dogs, wildlife, etc. (National Invasive Species Council 2005). Weeds could expand populations and occupy new areas because of this proposal but not every acre of activity would result in weed establishment."

Page 310 of the FEIS says: "All the action alternatives would result in several thousand acres becoming more susceptible to weed establishment when compared to the no action alternative 1 which only has 192 acres along
roads. This is because of several factors: areas of the landscape are drier and therefore more susceptible; the presence of weeds would take advantage of reduced competition from prescribed fire or logging (FEIS 2006); and, there are pathways for the weeds to reach the disturbed sites."

Page 291 of the FEIS notes:" Noxious weeds cause a number of potentially significant problems. According to Sheley et. al.
2005 noxious weeds:
− displace native plants
− reduce biodiversity
− affect threatened and endangered species

− alter normal ecological processes (e.g., nutrient cycling, water cycling)
− decrease wildlife habitat
− reduce recreational value
− increase soil erosion and stream sedimentation
− cause major economic losses.
Additional information can be found on the web at http://www.weedawareness.org.
Because of the ecological problems that weeds pose, it has been identified as a top threat to the health of National Forests".

Pages 292-293 of the FEIS says: "Roads are obviously a main source of weed establishment and dispersal. It has also been shown
that as roads are improved and use increases so does weed establishment and dispersal into adjacent areas. There are a number of reasons for roads being sources of weed establishment. For example, roads are disturbed sites that offer a continual seedbed of soil free of other plants. Since weeds are often very competitive they are able to establish and thrive. Another reason is that noxious weed seeds are continually transported to road surfaces. This is usually done by vehicles, livestock, wind, wildlife, domestic dogs, and recreationists. Roads are also free of shade that might otherwise not allow weeds to grow (Forman et. al. 2003). The vast majority of weed infestations (+90%) and hence treatment areas on the District are along roads (Gallatin TERRA Data Base 2003).

Disturbed sites associated with forest management activities have the potential to allow weed establishment. Motorized equipment may transport weed seeds to these areas during logging or if these sites are not reclaimed weeds may establish after logging. Skidtrails, skyline corridors, log landings, road construction, contaminated gravel, removal or thinning of the forest canopy, and disturbance of native vegetation either by prescribed fire or from equipment can create areas for weed establishment. They can also allow existing populations to expand. Fire can increase soil nitrogen, decrease shade, and decrease competition from desirable plants all conditions that favor weed invasion (USDA FEIS, Clark 2003)."

Page 297 of the FEIS says that the fighting weeds is not always successful and the needed funding to fight weeds caused by this project are not secured:" Effectiveness and financing: These methods are effective in some cases. Not all weeds can be treated with these methods because some still flower and regenerate after mowing, pulling does not work on weeds with rhizomatous roots, and there are not biological controls approved for all weed species. These methods are figured into the cost of weeds treatments. Other financing options include such things as volunteer weed pulls which have been used in the past with some success. Also the District is pursuing opportunities for grants to finance non chemical treatments."

The FEIS and ROD do not constitute the "hard look" requirement with respect to the environmental impact of logging, roading and weed infestation on inventoried and uninventoried roadless areas.

Impact of Weeds/Type Conversion

Page 27 of the ROD admits that weeds will increase because of this project: “My decision was influenced by consideration of the noxious weeds which could be established or spread by disturbances associated with the project activities. Compared to Alternative 5, Alternative 6 will result in fewer total acres of activities occurring on those sites most conducive to weed establishment. The overall cost of weed treatments in Alternative 6 is also predicted to be less than Alternative 5.
The action alternatives vary in their potential for weed spread. Alternative 4 treats the most acres and has the second highest cost of weed treatment because of the high level of prescribed burning. However, Alternative 4 has less soil disturbance than Alternatives 2, 3, 5 or 6 again, because of the large number of acres being treated with prescribed burning. Tractor logging and associated road construction, and soil disturbance from landings and skid trails in Alternatives 2, 3, 5 and 6 have a higher likelihood of new weed establishment than Alternatives 1 or 4.
The additional temporary roads needed to use cable and tractor logging systems in Alternatives 2, 3, 5 and 6 have the potential to create pathways for weed establishment and dispersal. While activities associated with the action alternatives increase the potential for weed establishment, there are several mitigations such as washing equipment, identifying and treating weed infested areas, and maintaining weed free equipment parking areas that are included in this project” .

The FS has no idea how bad the productivity of the land been affected in the project area and forest wide due to noxious weed infestations, nor how that situation is expected to change. The FS recently stated:

> Weed infestations are known to reduce productivity and that is why it is important to prevent new infestation sand to control known infestations. …Where infestations occur off the roads, we know that the productivity of the land has been affected from the obvious vegetation changes, and from the literature. The degree of change is not generally known. …(S)tudies show that productivity can be regained through weed control measures… (Northeast Yaak FEIS at 4-61.)

However, the FS never cites results of successful of weed treatments on the GNF, that have been proven to significantly reduce noxious weed populations over time, or prevent spread. This is an ongoing issue of land productivity for which the FS is in violation of NFMA and NEPA.

Nowhere does the EA disclose existing amounts of DD or TSRC in past “activity areas” despite the history of heavy logging. Cumulative effects of past compaction, soil displacement, erosion, and management burning are treated as irrelevant.

Native plants are the foundation upon which the ecosystems of the Forest are built, providing forage and shelter for all native wildlife, bird and insect species, supporting the natural processes of the landscape, and providing the context within which the public find recreational and spiritual opportunities. All these uses or values of land are hindered or lost by conversion of native

vegetation to invasive and noxious plants. The ecological threats posed by noxious weed infestations are so great that a former chief of the Forest Service called the invasion of noxious weeds "devastating" and a "biological disaster." Despite implementation of Forest Service "best management practices" (BMPs), noxious weed infestation on the Forest is getting worse and noxious weeds will likely overtake native plant populations if introduced into areas that are not yet infested. The Forest Service has recognized that the effects of noxious weed invasions may be irreversible. Even if weeds are eliminated with herbicide treatment, they may be replaced by other weeds, not by native plant species.

Invasive plant species, also called noxious weeds, are one of the greatest modern threats to biodiversity on earth. Noxious weeds cause harm because they displace native plants, resulting in a loss of diversity and a change in the structure of a plant community. By removing native vegetative cover, invasive plants like knapweed may increase sediment yield and surface runoff in an ecosystem. As well knapweed may alter organic matter distribution and nutrient through a greater ability to uptake phosphorus over some native species in grasslands. Weed colonization can alter fire behavior by increasing flammability: for example, cheatgrass, a widespread noxious weed on the Forest, cures early and leads to more frequent burning. Weed colonization can also deplete soil nutrients and change the physical structure of soils.

The Forest Service's own management activities are largely responsible for noxious weed infestations; in particular, logging, prescribed burns, and road construction and use create a risk of weed infestations. The introduction of logging equipment into the Forest creates and exacerbates noxious weed infestations. The removal of trees through logging can also facilitate the establishment of noxious weed infestations because of soil disturbance and the reduction of canopy closure In general, noxious weeds occur in old clearcuts and forest openings, but are rare in mature and old growth forests. Roads are often the first place new invader weeds are introduced. Vehicle traffic and soil disturbances from road construction and maintenance create ideal establishment conditions for weeds. Roads also provide obvious dispersal corridors. Roadsides throughout the project area are infested with noxious weeds. Once established along roadsides, invasive plants will likely spread into adjacent grasslands and forest openings.

Prescribed burning activities within the analysis area would likely cumulatively contribute to increases to noxious weed distribution and populations. As a disturbance process, fire has the potential to greatly exacerbate infestations of certain noxious weed species, depending on burn severity and habitat type (Fire Effects Information System 2004). Soil disturbance, such as that resulting from low and moderate burn severities from prescribed fire and fire suppression related disturbances (dozer lines, drop spots, etc.), provide optimum conditions for noxious weed invasion. Dry site vegetation types and road corridors are extremely vulnerable, especially where recent ground disturbance (timber management, road construction) has occurred. These units have the highest potential for noxious weed infestation and exacerbation through fire activities. The Bozeman Municipal Watershed project did not provide an alternative that eliminates units that have noxious weeds present on roads within units from fire management proposals in violation of NFMA and NEPA.

The EIS did not adequately address the ecological, social and ascetic impact of current noxious weed infestations within the project area. Include an analysis of the impact of the actions proposed by this project on the long and short term spread of current and new noxious weed infestations. The FEIS should have included a map of current noxious weed infestations which includes knapweed, Saint Johnswort, cheat grass, bull thistle, Canada thistle, hawkweed, hound's-tongue, oxeye daisy and all other Category 1, Category 2 and Category 3 weeds classified as noxious in the MONTANA COUNTY NOXIOUS WEED LIST. State-listed Category 2 noxious weed species yellow and orange hawkweeds are recently established (within the last 5 to 10 years) in Montana and are rapidly expanding in established areas. They can invade undisturbed

areas where native plant communities are intact. These species can persist in shaded conditions and often grow underneath shrubs making eradication very difficult. Their stoloniferous (growing at the surface or below ground) habit can create dense mats that can persist and spread to densities of 3500 plants per square mile (Thomas and Dale 1975). The EIS does not adequately address the issue of weeds in violation of NFMA and NEPA and the Forest Plan.

Page 311 of the FEIS says: "Spatial boundary: We predict there would be a flow of weed seeds to and from the project area. Not only would seeds be brought into the activity areas but as weeds become established their seed would be moved out to new areas. The type of seed dispersal mechanism for a weed determines how well its seeds disperse. Seeds may be carried by birds or travel dozens of miles
in a car or on wildlife, dogs or clothing. Because of the wide and unpredictable nature of seeddispersal we chose to evaluate cumulative effects on those areas immediately adjacent to the project area Appendix 4. Beyond this distance it would be too complex, expensive and time consuming to evaluate. Appendix 4 contains the GIS generated maps used in the cumulative effects analysis." This is a violation of NEPA. Just because it is hard or expensive is not a legal excuse not to do this analysis.

The EIS does not address the cumulative, direct and indirect effects of the proposed project on weed introduction, spread and persistence that includes how weed infestations have been and will be influenced by the following management actions: road construction including new permanent and temporary roads, and skid trails proposed within this project; opening and decommissioning of roads represented on forest service maps; ground disturbance and traffic on forest service template roads, mining access routes, and private roads; removal of trees through commercial and pre-commercial logging and understory thinning; and prescribed burns. The EIS does not adequately discuss what open, gated, and decommissioned Forest Service roads within the project area proposed as haul routes have existent noxious weed populations and what methods will be used to assure that noxious weeds are not spread into the proposed action units.

Noxious weeds are not eradicated with single herbicide treatments. A onetime application may kill an individual plant but dormant seeds in the ground can still sprout after herbicide treatment. Thus, herbicides must be used on consistent, repetitive schedules to be effective.
The EIS does not commitment to a long-term, consistent strategy of application is being proposed for each weed infested area within the proposed action area in violation of NEPA and NFMA. The EIS does not discuss what long term monitoring of weed populations is proposed.

When areas treated with herbicides are reseeded on national forest land, they are usually reseeded with exotic grasses, not native plant species. The EIS does not discuss what native plant restoration activities will be implemented in areas disturbed by the actions proposed in this project. The EIS adequately discuss howl disturbed areas including road corridors, skid trails, and burn units be planted or reseeded with native plant species.

The scientific and managerial consensus is that prevention is the most effective way to manage noxious weeds. The Forest Service concedes that preventing the introduction of weeds into uninfested areas is "the most critical component of a weed management program." The Forest Service's national management strategy for noxious weeds also recommends "develop[ing] and implement[ing] forest plan standards . . . ." and recognizes that the cheapest and most effective solution is prevention.

Page 314 of the FEIS says:" Implementing Alternative 1 (No Action) would result in 3,018 acres of cumulative acres of activities in areas most susceptible to weeds. Alternatives 2, 3, 4, 5 and 6 would result in 8,762, 11,148, 12,352, 11,184, and 9,934 acres respectively. These numbers

indicate how many cumulative acres of various activities would contribute to weed establishment over the next 10
years. These are the measurable items."

The Bozeman Municipal Watershed ROD and FEIS did not include an action alternative in the that includes land management standards that will prevent new weed infestations by addressing the causes of weed infestation. The failure to include preventive standards violates NFMA because the Forest Service is not ensuring the protection of soils and native plant communities. Additionally, the omission of an alternative that includes preventive measures would violate NEPA because the Forest Service failed to consider a reasonable alternative.

Rare Plants

The ESA requires that the Forest Service conserve endangered and threatened species of plants as well as animals. In addition to plants protected under the ESA, the Forest Service identifies species for which population viability is a concern as "sensitive species" designated by the Regional Forester (FSM 2670.44). The response of each of the sensitive plant species to management activity varies by species, and in some cases, is not fully known. Local native vegetation has evolved with and is adapted to the climate, soils, and natural processes such as fire, insect and disease infestations, and windthrow. Any management or lack of management that causes these natural processes to be altered may have impacts on native vegetation, including threatened and sensitive plants. Herbicide application – intended to eradicate invasive plants – also results in a loss of native plant diversity because herbicides kill native plants as well as invasive plants. Although native species have evolved and adapted to natural disturbance such as fire on the landscape, fires primarily occur in mid to late summer season, when annual plants have flowered and set seed. Following fall fires, perennial root-stocks remain underground and plants emerge in the spring. Spring and early summer burns could negatively impact emerging vegetation and destroy annual plant seed.

The EIS does not adequately examine what threatened, endangered, rare and sensitive plant species and habitat are located within the proposed project area in violation of the ESA, NEPA, the APA and NFMA. The standards used to protect threatened, rare, sensitive and culturally important plant species and their habitats from the management actions proposed in this project are inadequate.

SENSITIVE PLANTS

NFMA Background

The National Forest Management Act (NFMA) directs that federal lands be managed for the optimum biodiversity that the land can provide. Additionally, NFMA indicates that "habitats for all existing native and desired non-native plants, fish, and wildlife species will be managed in order to maintain at least viable populations of such species". As a result of this and other laws, such as the Endangered Species Act, the Forest Service has been evaluating rare plant species via the sensitive species list formulated on a Region by Region basis. This sensitive species list is a list of known species that are currently not formally listed as Threatened and Endangered, but may be moving toward formal listing. The rationale for compiling the sensitive species list is to preclude formal listing through the modification of land management practices conducted on Forest Service lands if those land management activities may potentially lead to the formal listing of a particular plant species. The modification of land use or land management practices is intended to ensure continued viability of the potentially affected population. This policy is found in Forest
Service Manual (FSM) 2670, specifically 2670.22 and 2670.32.

NEPA Background

NEPA clearly requires that consideration of environmental impacts of proposed projects take place before a final decision is made. LaFlamme v. FERC, 842 F.2d 1063, 1071 (9th Cir.1988) (emphasis in original), see also City of Tenakee Springs, 915 F.2d at 1313("NEPA requires consideration of the potential impact of an action before the action takes place."). Once a project begins, the "pre-project environment" becomes a thing of the past, thereby making evaluation of the project's effect on pre-project resources impossible. LaFlamme, 842 F.2d at 1071. Without establishing the baseline conditions which exist in the vicinity of the project before it begins, there is simply no way to determine what effect the proposed project will have on the environment and, consequently, no way to comply with NEPA. Half Moon Bay Fishermans' Marketing Ass'n, 857 F.2d at 510; see also, Habitat Education Center v. Bosworth, 363 F.Supp.2d 1070 (E.D. Wis. 2005)("It is important that the baseline be accurate and complete.").

One of NEPA's goals is to facilitate "widespread discussion and consideration of the environmental risks and remedies associated with the pending project," thereby augmenting an informed decision-making process. Warm Springs Dam Task Force v. Gribble, 621 F.2d 1017, 1021 (9th Cir.1980) (per curiam). NEPA requires that this evaluation take place before a project is approved. 40 C.F.R. §§ 1500.1(a), 1501.1, 1502.5 (1987); see Andrus v. Sierra Club, 442 U.S. 347, 351, 99 S.Ct. 2335, 2337, 60 L.Ed.2d 943 (1979).

If numerous species are omitted from the environmental baseline, neither the Court nor the public can be assured that the BLM took a "hard look" at the environmental impacts on those species. See Neighbors of Cuddy Mountain v. U.S. Forest Serv., 137 F.3d 1372, 1379-80 (9th Cir.1998). "[T]he very purpose of NEPA's requirement that an EIS be prepared for all actions that may significantly affect the environment is to obviate the need for speculation by insuring that available data is gathered and analyzed prior to the implementation of the proposed action." Foundation for North American Wild Sheep v. United States Department of Agriculture, 681 F.2d at 1179.

BMW Sensitive Plant Evaluation

Baseline

Forest Service sensitive species are defined as "Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by: a) significant current or predicted downward trends in population numbers or density or b) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution." The current USFS Northern Region (R-1) sensitive plant species list was developed October 28, 2004.

The Forest Service violated NEPA by failing to establish a baseline for sensitive plants because sensitive plant surveys were not completed for all treatment units in the project area. FEIS 3-418.

The FEIS makes generalizations that do not satisfy NEPA or NFMA. For instance, the FEIS states that "Most sensitive plant species are associated with …" FEIS 3-418. Most is not all. The F.S. failed to even list what sensitive plant species occur on the Gallatin National Forest, let alone in the project area, let alone how they would be impacted if they occur there. Failure to state what plants occur in the area and the impacts to each is a violation of NEPA. Habitat Education Center v. Bosworth, 363 F.Supp.2d 1070, 1082 (E.D. Wis. 2005)

Tiering

Tiering to past plant surveys is inappropriate where the data is stale--nearly 15 years old. FEIS 3-148. See Lands Council v. Powell, 379 F.3d 738, 738-749 (9th Cir. 2004) (holding data about habitat of certain fish species "was too outdated to carry the weight assigned to it"). The Forest Service has not described the life cycle of any of the sensitive plants that occur in the project area, but it is unlikely that any live for 15 years. The converse is true. New plants may have populated the area within the last 15 years. Moreover, the FEIS fails to state whether the stale data it tiers to encompassed all of the proposed cutting units in the BMW project. Finally, it is unclear from the EIS whether new plants have been added to the R-1 sensitive plant list that were not on the list in 1996.

Mitigation

The FEIS notes that if sensitive plant populations are identified in cutting units, mitigation measures would be applied so that sensitive plants would be protected from harm that cold result from proposed treatment. FEIS 3-148-139. This approach has already been rejected by the 9th Circuit:

> [R]eliance on a post-[EIS] study to fully develop a mitigation plan deprives [defendant] of any foundation upon which to base their conclusion that the project's impact…will not be significant.

LaFlamme v. FERC, 842 F.2d 1063, 1071 (9th Cir.1988)

> We fail to see how mitigation measures can be properly analyzed and their effectiveness explained when they have yet to be fully developed.

Oregon Natural Resources Council v. Marsh, 832 F.2d 1489, 1493 (9th Cir.1987).

The BMW FEIS violates NFMA because the agency has not surveyed and does not know how plants will be impacted. It has not described population levels of plants that occur in the project area or how they are distributed throughout the forest.

Failing to survey or Threatened, Endangered, and Sensitive plants also violates NEPA. 40 C.F.R. § 1502.15 requires the agency to gather baseline information and address direct impacts:

> The environmental impact statement shall succinctly describe the environment of the area (s) to be affected or created by the alternatives under consideration. The descriptions shall be no longer than is necessary to understand the effects of the alternatives. Data and analyses in a statement shall be commensurate with the importance of the impact, with less important material summarized, consolidated, or simply referenced. Agencies shall avoid useless bulk in statements and shall concentrate effort and attention on important issues. Verbose descriptions of the affected environment are themselves no measure of the adequacy of an environmental impact statement.

NEPA clearly requires that consideration of environmental impacts of proposed projects take place before a final decision is made. LaFlamme v. FERC, 842 F.2d 1063, 1071 (9th Cir.1988) (emphasis in original). Without establishing the baseline conditions which exist in the vicinity of the project before it begins, there is simply no way to determine what effect the proposed project will have on the environment and, consequently, no way to comply with NEPA. Half Moon Bay Fishermans' Marketing Ass'n, 857 F.2d at 510. An EA may be found inadequate under NEPA if it does not reasonably [set] forth sufficient information to enable the decisionmaker to consider the environmental factors and make a reasoned decision. Id. at 508, citing Oregon Environmental

Council v. Kunzman, 817 F.2d 484, 493 (9th Cir.1987).

Whitebark Pine

Not all ecosystems or all Rocky Mountain landscapes have experienced the impacts of fire exclusion. In some wilderness areas, where in recent decades natural fires have been allowed to burn, there have not been major shifts in vegetation composition and structure (Keane et al. 2002). In some alpine ecosystems, fire was never an important ecological factor. In some upper subalpine ecosystems, fires were important, but their rate of occurrence was too low to have been significantly altered by the relatively short period of fire suppression (Keane et al. 2002). For example, the last 70 to 80 years of fire suppression have not had much influence on subalpine landscapes with fire intervals of 200 to several hundred years (Romme and Despain). Consequently, it is unlikely that fire exclusion has yet to significantly alter stand conditions or forest health within Rocky Mountain subalpine ecosystems.

Whitebark pine seedlings, saplings and mature trees, present in subalpine forests proposed for burning, would experience mortality from project activity. Whitebark pine is fire intolerant (thin bark). Fire favors whitebark pine regeneration (through canopy opening and reducing competing vegetation) only in the presence of adequate seed source and dispersal mechanisms (Clarks Nutcracker or humans planting whitebark pine seedlings).

White pine blister rust, an introduced disease, has caused rapid mortality of whitebark pine over the last 30 to 60 years. Keane and Arno (1993) reported that 42 percent of whitebark pine in western Montana had died in the previous 20 years with 89 percent of remaining trees being infected with blister rust. The ability of whitebark pine to reproduce naturally is strongly affected by blister rust infection; the rust kills branches in the upper cone bearing crown, effectively ending seed production.

Montana is currently experiencing a mountain pine beetle epidemic. Mountain pine beetle prefer large, older whitebark pine, which are the major cone producers. In some areas the few remaining whitebark that show the potential for blister rust resistance are being attacked and killed by mountain pine beetles, thus accelerating the loss of key mature cone-bearing trees.

Whitebark pine seedlings and saplings are very likely present in the subalpine forests proposed for burning and logging. In the absence of fire, this naturally occurring whitebark pine regeneration would continue to function as an important part of the subalpine ecosystem. Since 2005, rust resistant seed sources have been identified in the Northern Rockies (Mahalovich et al 2006). Due to the severity of blister rust infection within the region, natural whitebark pine regeneration in the project area is prospective rust resistant stock.

Although prescribed burning can be useful to reduce areas of high-density subalpine fir and spruce and can create favorable ecological conditions for whitebark pine regeneration and growth, in the absence of sufficient seed source for natural regeneration maintaining the viability and function of whitebark pine would not be achieved through burning. Planting of rust-resistant seedlings would likely not be sufficient to replace whitebark pine lost to fire activities.

The ROD and FEIS do not show that surveys have been conducted to determine presence and abundance of whitebark pine re-generation or iIf whitebark pine seedlings and saplings are present, what measures will be taken to protect them. The project should have included an alternative that excludes burning in the presence of whitebark pine regeneration (consider ‘Daylighting’ seedlings and saplings as an alternative restoration method).

Soils

The project is in violation of NEPA, NFMA, the Forest Plan and the APA for not disclosing to the public or taking a hard look at how this project will affect soils..

Sec. 6. of the National Forest Management Act states:

(g) As soon as practicable, but not later than two years after enactment of this subsection, the Secretary shall in accordance with the procedures set forth in section 553 of title 5, United States Code, promulgate regulations, under the principles of the Multiple-Use, Sustained-Yield Act of 1960, that set out the process for the development and revision of the land management plans, and the guidelines and standards prescribed by this subsection. The regulations shall include, but not be limited to-

(3) specifying guidelines for land management plans developed to achieve the goals of the Program which-

(E) insure that timber will be harvested from National Forest System lands only where-

(i) soil, slope, or other watershed conditions will not be irreversibly damaged;

NFMA regulations at 36 C.F.R. § 219.27 (Management requirements) state:

(a) Resource protection. All management prescriptions shall--

(1) Conserve soil and water resources and not allow significant or permanent impairment of the productivity of the land;

(b) Vegetative manipulation. Management prescriptions that involve vegetative manipulation of tree cover for any purpose shall--

(5) Avoid permanent impairment of site productivity and ensure conservation of soil and water resources;

Lacy, 2001 examines the importance of soils for ecosystem functioning and points out the failure of most regulatory mechanisms to adequately address the soils issue. From the Abstract:

> Soil is a critical component to nearly every ecosystem in the world, sustaining life in a variety of ways—from production of biomass to filtering, buffering and transformation of water and nutrients. While there are dozens of federal environmental laws protecting and addressing a wide range of natural resources and issues of environmental quality, there is a significant gap in the protection of the soil resource. Despite the critical importance of maintaining healthy and sustaining soils, conservation of the soil resource on public lands is generally relegated to a diminished land management priority. Countless activities, including livestock grazing, recreation, road building, logging, and mining, degrade soils on public lands. This article examines the roots of soil law in the United States and the handful of soil-related provisions buried in various public land and natural resource laws, finding that the lack of a public lands soil law leaves the soil resource under protected and exposed to significant harm. To remedy this regulatory gap, this article sketches the framework for a positive public lands soil protection law. This article concludes that because soils are critically important building blocks for nearly every ecosystem on earth, an holistic approach to natural resources protection requires that soils be protected to avoid undermining much of the legal protection afforded to other natural resources.

Lacy goes on:

> Countless activities, including livestock grazing, recreation, road building, logging, mining, and irrigation degrade soils on public lands. Because there are no laws that directly address and protect soils on the public lands, consideration of soils in land use planning is usually only in the form of vaguely conceived or discretionary guidelines and monitoring requirements. This is a major gap in the effort to provide ecosystem-level protection for natural resources.
>
> The rise of an “ecosystem approach” in environmental and natural resources law is one of the most significant aspects of the continuing evolution of this area of law and policy. One writer has observed that there is a

> fundamental change occurring in the field of environmental protection, from a narrow focus on individual sources of harm to a more holistic focus on entire ecosystems, including the multiple human sources of harm within ecosystems, and the complex social context of laws, political boundaries, and economic institutions in which those sources exist.
>
> As federal agencies focus increasingly on addressing environmental protection from an holistic perspective under the current regime of environmental laws, a significant gap remains in the federal statutory scheme: protection of soils as a discrete and important natural resource. Because soils are essential building blocks at the core of nearly every ecosystem on earth, and because soils are critical to the health of so many other natural resources—including, at the broadest level, water, air, and vegetation—they should be protected at a level at least as significant as other natural resources. Federal soil law (such as it is) is woefully inadequate as it currently stands. It is a missing link in the effort to protect the natural world at a meaningful and effective ecosystem level.
>
> … This analysis concludes that the lack of a public lands soil law leaves the soil resource under-protected and exposed to significant harm, and emasculates the environmental protections afforded to other natural resources.

(Emphasis added.) The problems Lacy (2001) identifies of regulatory mechanisms certainly exists in Regional and Forest-level standards and other guidance applicable for this project proposal.

The amount of detrimental soil disturbance would increase with the implementation of the proposal; therefore soil productivity would be reduced. Some activities, such as log landing construction and intensive log skidding would essentially permanently reduce the productivity of the soil on those sites directly affected. Will the FS utilize the services of a soil scientist on the ID Team?

The intent of the Regional Soil Quality Standards is that the FS must, in each case, consider the cumulative effects of both past and proposed soil disturbances to assure the desired soil conditions are met. This includes impacts from activities that include logging, firewood gathering, livestock grazing, and motorized recreation impacts. This was not done.

It should be noted that the FS assumes that maintaining soil productivity is achieved simply by limiting detrimental disturbance to no more than 15% of an Activity Area (logging or "treatment" unit) or limiting "total resource commitment" in another arbitrarily defined area. Unfortunately, the scientific adequacy of the FS's methodology for maintaining soil productivity on the GNF has never been demonstrated. The FS's determination that it may permanently damage the soil over that much area and still meet NMFA and planning regulations is arbitrary. The EIS does not cite any scientific basis for adopting its percent numerical limits.

Furthermore, the ROD and FEIS did not cite the results of soil productivity monitoring. The ROD AND FEIS did not deal with the very basic question: What are the quantitative effects of management activities on the productivity of the land?

The only way for there to be any meaning to the numerical standards in cases where logging is proposed over previously disturbed soils and where activity area boundaries are not kept constant is if a qualified soil scientist actually performs site-specific field measurements to measure the existing percentages of detrimental soil disturbance within the already-established boundaries of activity areas, and within newly-established activity areas.

The precision or amount of error, in the measures of detrimental disturbance for activity areas must be disclosed. They are estimates, based upon sampling that inherently has an amount of error. The FS, in its "Response to Motion for Preliminary Injunction" brief in the recent litigation on the Kootenai NF, states in regards to a scientific report, "Dr. Schloeder's purported 'statistical analysis' reports no confidence intervals, standard deviations or standard errors in association with its conclusions." The FS must be held to the same standards of data and information quality it expects of those who disagree with FS conclusions. Therefore, the ROD AND FEIS must present "confidence intervals, standard deviations or standard errors in association with its conclusions" regarding the amount of activity area detrimental soil disturbance as well as all other resource impacts estimations or modeling which it did not do.

The ROD and FEIS did not provide estimates of current detrimental disturbance in all previously established activity areas. The ROD AND FEIS did not discuss the link between current and cumulative soil disturbance in the Project Area to the impacts on water quantity and quality.

Alexander and Poff, 1985 (cited in Forest Management Handbook at FSH 2509.18) reviewed literature and found that as much as 10% to 40% of a logged area can be disturbed by skyline logging. They state:

> There are many more data on ground disturbance in logging, but these are enough to indicate the wide diversity of results obtained with different equipment operators, and logging techniques in timber stands of different composition in different types of terrain with different soils. Added to all these variables are different methods of investigating and reporting disturbance.

The ROD and FEIS did not disclose the implications of all land type limitations for detrimental soil impacts. Some of these land types may have "moderate" or "severe" soil erosion and sediment hazard potential, and soil erosion or mass wasting (a severe form of erosion) are both kinds of detrimental impacts. The public must be able to tell which proposed activity areas fall into which land types, and therefore might be more at risk for erosion or other detrimental impacts that decrease soil productivity. Finally, the ROD AND FEIS did not disclose the results of monitoring of past actions on these various land types that would reveal the differential levels of soil impacts of the various logging activities carried out in the past (and now proposed with this new project).

The ROD and FEIS did not disclose the locations and sizes of proposed log landings, which is important because of the extreme amount of soil and other disturbance that occurs on these sites —they will be essentially industrialized for the long-term, despite "mitigation."

The ROD and FEIS did not measure or provide scientifically sound estimates of detrimental soil disturbance or soil productivity losses (erosion, compaction, displacement, noxious weed spread) attributable to off-road vehicle use in violation of NFMA and NEPA.

The Sheep Creek Salvage FEIS (USDA Forest Service, 2005a) states at p. 173:

> Noxious weed presence may lead to physical and biological changes in soil. Organic matter distribution and nutrient flux may change dramatically with noxious weed invasion. Spotted knapweed (Centaurea biebersteinii D.C.) impacts phosphorus levels at sites (LeJeune and Seastedt, 2001) and can hinder growth of other species with allelopathic mechanism. Specific to spotted knapweed, these traits can ultimately limit native species' ability to compete and can have direct impacts on species diversity (Tyser and Key 1988, Ridenour and Callaway 2001).

The ROD and FEIS did not disclose how the productivity of the land been affected in the project area and forest wide due to noxious weed infestations, and how that situation is expected to change in violation of NEPA and NFMA.

The ROD and FEIS did not disclose the results of weed treatments on the GNF that have been projected to significantly reduce noxious weed populations over time, or prevent spread. This is an ongoing issue of land productivity.

The chemical and biological make-up of the specific soils in the project area, and their ability to withstand detrimental disturbance that lowers soil productivity is not a subject adequately taken up by the FS. Harvey et al., 1994 state:

> The ...descriptions of microbial structures and processes suggest that they are likely to provide highly critical conduits for the input and movement of materials within soil and between the soil and the plant. Nitrogen and carbon have been mentioned and are probably the most important. Although the movement and cycling of many others are mediated by microbes, sulfur phosphorus, and iron compounds are important examples.
>
> The relation between forest soil microbes and N is striking. Virtually all N in eastside forest ecosystems is biologically fixed by microbes... Most forests, particularly in the inland West, are likely to be limited at some time during their development by supplies of plant-available N. Thus, to manage forest growth, we must manage the microbes that add most of the N and that make N available for subsequent plant uptake. (Internal citations omitted.)

The FS has essentially admitted that it is in the dark as far as doing scientific research on soil productivity changes following management activities. In response to comments on the Black Ant Salvage DEIS, the LCNF states:

> Soil Quality Standards "provide benchmark values that indicate when changes in soil properties and soil conditions would result in significant change or impairment of soil quality based on available research and Regional experience" (Forest Service Manual 2500, Region 1 Supplement 2500-99-1, Chapter 2550 – Soil Management, Section 2554.1).
>
> A formal research study, the "Long Term Soil Productivity Study," is currently being conducted by the Research Branch of U.S. Department of Agriculture, Forest Service to validate these soil quality standards.

(USDA Forest Service, 2002a.)

It is clear that the intent of the Regional Soil Quality Standards is that the FS must, in each case, consider the cumulative effects of both past and proposed soil disturbances to assure that soil productivity will be maintained. This includes impacts from activities that include logging, motorized vehicle use, etc. Such cumulative effects analysis found in the Soil and Water Conservation Practices Handbook (FSH 2509.22). FSH 2509.22 states:

> Practice <u>11.01 – Determination of Cumulative Watershed Effects</u>
> OBJECTIVE: To determine the cumulative effects or impact on beneficial water uses by multiple land management activities. Past, present, or reasonably foreseeable future actions in a watershed are evaluated relative to natural or undisturbed conditions. Cumulative impacts are a change in beneficial water uses caused by the accumulation of individual impacts over time and space. Recovery does not occur before the next individual practice has begun.

> EXPLANATION: The Northern and Intermountain Regions will manage watersheds to avoid irreversible effects on the soil resource and to produce water of quality and quantity sufficient to maintain beneficial uses in compliance with State Water Quality Standards. Examples of potential cumulative effects are: 2) excess sediment production that may reduce fish habitat and other beneficial uses; 3) water temperature and nutrient increases that may affect beneficial uses; 4) compacted or disturbed soils that may cause site productivity loss and increased soil erosion; an 5) increased water yields and peak flows that may destabilize stream channel equilibrium.
>
> IMPLEMENTATION: As part of the NEPA process, the Forest Service will consider the potential cumulative effects of multiple land management activities in a watershed which may force the soil resource's capacity or the stream's physical or biological system beyond the ability to recover to near-natural conditions. A watershed cumulative effects feasibility analysis will be required of projects involving significant vegetation removal, prior to including them on implementation schedules, to ensure that the project, considered with other activities, will not increase sediment or water yields beyond or fishery habitat below acceptable limits. The Forest Plan will define these acceptable limits. The Forest Service will also coordinate and cooperate with States and private landowners in assessing cumulative effects in multiple ownership watersheds.

The ROD and FEIS did not disclose how the proposed project units would be consistent with Graham, et al., 1994 recommendations for fine and coarse woody debris, a necessary consideration for sustaining long-term soil productivity.

The FS recognizes that soil quality standards must be validated. FSM 2500-99-1 requires that Forest Supervisors must:

- Assess … whether (soil quality standards) are effective in maintaining or improving soil quality;
- Evaluate the effectiveness of soil quality standards and recommend adjustments to the Regional Forester; and
- Consult with soil scientists to evaluate the need to adjust management practices or apply rehabilitation measures.

This all implies that monitoring must be undertaken. Furthermore, FSM 2500-99-1 recognizes that soil productivity is defined not merely in terms of the absence of meeting the 15% standard. "Soil Function" is defined thus:

> Primary soil functions are: (1) the sustenance of biological activity, diversity, and productivity, (2) soil hydrologic function, (3) filtering, buffering, immobilizing, and detoxifying organic and inorganic materials, and (4) storing and cycling nutrients and other materials.

And "Soil Quality" is defined as "The capacity of a specific soil to function within its surroundings, support plant and animal productivity, maintain or enhance water and air quality, and support human health and habitation."

Neither soil function nor soil quality have ever been monitored on the GNF following management activities. This has long-term implications for sustained timber production as well as the ecological relationships in the soil upon which timber production so very much depends.

The Forest Management Handbook at FSH 2509.18 directs the FS to do validation monitoring to "Determine if coefficients, S&Gs, and requirements meet regulations, goals and policy" (2.1 –

Exhibit 01). It asks what we are asking: "Are the threshold levels for soil compaction adequate for maintaining soil productivity? Is allowing 15% of an area to be impaired appropriate to meet planning goals?" The Ecology Center recently asked the Northern Region if they have ever performed this validation monitoring of its 15% Standard, in their February 26, 2002 Freedom of Information Act request to the Regional Forester, requesting:

> The Forest Management Handbook at FSH 2509.18 provides the Forest Service with examples of validation monitoring to "Determine if coefficients, S&Gs, and requirements meet regulations, goals and policy." It asks "Are the threshold levels for soil compaction adequate for maintaining soil productivity? Is allowing 15% of an area to be impaired appropriate to meet planning goals?" We request all documentation of validation monitoring by the Forest Service in the Northern Region that answers those two questions.

The Northern Region's reply letter stated that there is no documentation that responds to this request. The ROD and FEIS are therefore in violation of NEPA, NFMA, the Forest Plan and the APA.

The FEIS does not disclose the efficacy of its proposed "mitigation"—neither its effectiveness for improving soil quality so that sites no longer qualify as "detrimentally disturbed" so that areal extent of an activity area is disturbance is reduced, nor its effectiveness in improving the actual productivity of the soil. This is a NFMA violation. The FEIS does not cite any specific monitoring evidence that shows the LNF has used the FEIS's proposed mitigations or restorations in the past to bring activity areas that exceed the SQS 15% standard into compliance.

In 2005, the Bitterroot National Forest reported, "It is acknowledged that the effectiveness of soil restoration treatments may be low, often less than 50 percent." (USDA Forest Service, 2005b at p. 3.5-20.) Mitigation techniques such as ripping and subsoiling to reduce compaction may alleviate a minor percentage of compaction, but produce soil mixing and contribute to erosion and displacement, which are not factored into the equation. It is not disclosed in the FEIS that mitigations are, as the BNF reports, effectively "low." This is a NEPA violation.

The Soil Specialist Report states that:

> Land slope must be appropriate for ground-based harvesting methods. Using these methods on slopes over 40% generally results in unacceptable soil damage. Unacceptable soil damage will probably result from using these methods on these [units].

Despite these types of warnings, the FEIS still proposes to tractor log these steep slopes. See table 13-6 (units 15, 20, 21, 22, etc.).

There is no discussion of the soil specialist's warning, or how mitigation will or will not be effective in these steep cutting units. The FEIS's discussion of cumulative impacts is inadequate in light of the specialist's report that cumulative effects are significant if additional harvest occurs in these areas, especially if ground-based.

<u>Mitigation</u>

Ground-based logging in steep cutting units appears to be in direct contradiction to the Soil Scientist's mitigation recommendations and the GNF Soils BMP:

> All actual cutting units should have sustained slopes less than 40% if using ground-based harvest methods.

Specialist Report 19. Nonetheless, the Project will log un units with steep slopes.

The FEIS makes the assumption that as long as specified mitigations are followed there will be no direct or cumulative effects to soils with any alternative. See FEIS 3-330. However, the FEIS states that recontouring is for slopes less than 20%. FEIS 3-321. The F.S. does not appear to have any mitigation methods for steeper slopes using ground-based logging.

The FEIS states that restoration effectiveness is not quantified because no local research exists. FEIS 3-322. The FEIS goes on to state that restoration has been shown to have been beneficial effects to soil properties in this region. Id. This vague statement does not really address the science that it relies on. Does the cited science say that restoration maintains productivity 100% of the time? Were there some instances where restoration was ineffective? The Forest Service failed to explain any potential short-comings. If restoration is not 100% effective, there is a chance that the Forest Service will be violating the 15% standard. The FEIS failed to adequately apply or describe the science and methodology it was relying on to make its determination that restoration will keep disturbance to 15%.

The FEIS states that all units having previous harvest have specified restoration (Table 13-6) (FEIS 3-329), but the table merely states the "estimated" acres of restoration needed. Placing a box in a table does not adequately inform the public what restoration activities will be implemented. The soil specialist recommended adding top soil and obliterating temporary roads. Soil Specialist Report 19. The FEIS does not adequately inform the public about any sort of mitigation, where such mitigation would take place, and the efficacy of mitigation—especially in steep cutting units and areas with mass wasting.

Flawed Methodoloy/Analysis

The FEIS Table 13-6 does not state whether each individual unit for Alternative 6 is expected to meet soil quality standards. None of the boxes were filled out. This might be due to the printer you were using. At any rate, it is unlikely the F.S. would ever tell the public it wasn't going to meet soil quality standards. As such, we assume the agency meant to say "yes." Nonetheless, when you step back and look at the Table 13-6, the numbers don't add up.

The FEIS starts out by saying all previous cutting units have 22% soil disturbance from past harvesting. FEIS 3-322. This assumption flaws all analysis afterwards. The F.S. is making an assumption that all units have 22% disturbance, when in reality some have 50% or more. See Specialist Report at 17 ("detrimental disturbance is 50% based on review of similar areas."). The Forest Service should have used the local data it had available to accurately portray the amount of disturbance per unit. Because it did not, its analysis regarding how many acres of restoration are required is skewed. A unit with 50% disturbance would require more restoration than one with only 22% disturbance. By using 22% across the board the agency has masked the impacts and the true amount of restoration needed for each individual unit. In addition, it is entirely possible that in units with detrimental disturbances greater than 22%, the unit would have greater than 15% soil disturbance after restoration.

Impacts on Soils From Temporary Roads and Landings

The FEIS states:

> The additional disturbance from either temporary roads or previous harvest is mitigated by restoration, so their effects are not counted in the estimated predicted total detrimental disturbance column.

FEIS 3-322.

However, the soil specialist report states that:

> Even if harvest methods follow the soil protection BMP, the effects of excess temporary roads may cause excessive disturbance when allocated to harvest units.

Specialist Report 18.

These conflicting views were never squared.

The FEIS states that "landings are not good candidates for restoration." FEIS 3-322. Landings detrimentally disturb soil, but there does not appear to be any restoration to ensure productivity is maintained in areas with these disturbances. If landings aren't mitigated and are placed in areas that have already been logged (>15% disturbance), then it follows the 15% disturbance standard will not be met. The FEIS does not state where the landings will be located so we have no way of evaluating the impacts.

Forest Plan Standards: Soils

The Forest Plan requires:

> All management practices will be designed or modified as necessary to maintain land productivity and protect beneficial uses.

F.P. II-24 (8).

The BMW project appears to violate this Forest Plan standard by allowing increased detrimental disturbance to soil in areas where there has been no previous logging. No mitigation is required in these areas with less than 15% soil disturbance. By increasing soil disturbance, the Forest Service is decreasing land productivity and likely violating the Forest Plan. It should be noted that this Forest Plan standard is separate and exclusive from the R-1 Soil Quality standards.

LYNX CRITICAL HABITAT

The Bozeman Municipal Watershed Project (Project) violates the Endangered Species Act. The Project will adversely modify lynx critical habitat. To the extent the Project relies on the Northern Rockies Lynx Management Direction (lynx amendment), the Project and the lynx amendment are in violation of the Endangered Species Act.

The lynx amendment underwent formal consultation and it was determined that the amendment would not jeopardize lynx. 2007 Lynx Amendment Biological Opinion at 75. The FWS further stated, "no critical habitat has been designated for this species on federal lands within the NRLA area, therefore none will be affected." Id. The BMW Project cannot rely on the lynx amendment and its exceptions because the 2007 biological opinion did not analyze the impacts to critical habitat.

On February 25, 2009, lynx critical habitat was designated on the National Forests. 74 Fed. Reg. 8615. A new biological opinion should have analyzed the designation of new critical habitat on National Forests.

The Endangered Species Act regulations require such evaluation after new critical habitat has been designation:

§ 402.16 Reinitiation of Formal Consultation.

Reinitiation of formal consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and:

(a) If the amount or extent of taking specified in the incidental take statement is exceeded;
(b) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;
(c) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or
(d) If a new species is listed or critical habitat designated that may be affected by the identified action.

The BMW Consultation finding that the BMW project would not adversely modify critical habitat relies almost exclusively on the 2007 biological opinion of the lynx amendment that allows incidental take and provides monitoring protocol. Again, this biological opinion did not analyze adverse modification of critical habitat because there was no critical habitat designated on National Forests at the time. While the final rule that designated critical habitat notes that the 2007 biological opinion mentioned recovery in two pages of its jeopardy analysis (74 Fed. Reg. 8619), the 9th Circuit has already held that this lack of adverse modification analysis isn't judicially defensible. See Natural Resources Defense Council v. Rodgers, 381 F.Supp.2d 1212, 1233 (E.D. Cal 2005) ("Common sense as well as binding precedent dictates that even the mention of 'recovery' does not indicate analysis of recovery in the context of critical habitat.") (citing Gifford Pinchot Task Force v. U.S.F.W.S., 378 F.3d 1059, 1074 (9th Cir. 2004).

The BMW Project, lynx amendment, and final rule designating critical habitat violate the ESA to the extent consultation should have been re-initiated with regards to adverse modification of critical habitat after designation of critical habitat on forest lands.

Please attached our appeals of the Northern Rockies Lynx Management Direction Record of Decision signed by Rick Cables, Regional Forester Rocky Mountain Region on March 21, 2007.

The BWM Project also violates the NEPA and ESA because it failed to look at how the BMW project, combined with the reasonably foreseeable South Cottonwood Logging project and the City of Bozeman's proposed new dam would impact individual lynx and their critical habitat.

Grizzly Bear
Page 15 of the ROD says: "Within the Inventoried Roadless Area (IRA), helicopter logging must be completed in the winter denning season or limited to one non-denning season (March 1 to Nov. 30) (FWS, Biological Opinion; Terms and Conditions).
Manage the schedule for completion of all helicopter logging to be completed in as few days as possible. Track the number of helicopter logging flight days and reinitiate consultation if the operations exceed a total of 144 days for the duration of the project (USFS, Biological Assessment; FWS, Biological Opinion; Terms and Conditions)." This is arbitrary and in violation of NFMA and the ESA.

Page 360-361 of the FEIS says:" Helicopters would be used to extract merchantable products from some commercial thinning units, and also for aerial ignitions in prescribed burn units.

Helicopter use for the project would involve repeated, low-elevation (< 500m AGL) flights and occasional landings over an extended
period of time (up to 5 consecutive years). Further, helicopters would be used in this project tool to extract merchantable timber from, and ignite prescribed burns in, inventoried "roadless" areas (IRA). Roadless areas have the same general characteristics as "core" habitat identified within the grizzly bear recovery zone. Core habitat provides secure areas for bears to be relatively free from the chronic disturbances associated with roads. Female grizzly bears select home ranges with a large percentage of core habitat, suggesting that areas relatively free of intense human disturbance are particularly important for this cohort. Helicopter use in core (or roadless) habitat could result in more pronounced disturbance response from grizzly bears since bears are not conditioned to expect disturbance from motorized equipment or vehicles in core habitat (MT/ID Level 1 Team, 2009:8)." Nothing in the above paragraph says it is OK to fly noisy helicopters over core grizzly bear habitat as long as it is limited to 144 days. Since this project could permanently drive grizzly bears from the core habitat since females with cubs will leave and the cubs will be taught that this is not secure habitat. The ESA applies since this is occupied grizzly bear habitat.

The cumulative effects of the road construction and other ongoing foreseeable fuel reduction such as the proposed dam by the City of Bozeman, cumulative with every other fuel reduction or other project the GNF or the city of Bozeman wants to implement in the vicinity, must be considered as a whole. This was not done in violation of NEPA, NFMA, the APA, the ESA, the Clean Water Act and the Forest Plan.

RELIEF REQUESTED

The decision-making process supporting the Bozeman Municipal Watershed Project ROD AND FEIS is inadequate. The impacts on the environment are unacceptable. Appellants request the Bozeman Municipal Watershed Project ROD AND FEIS be withdrawn. If the GNF wishes to further carry out management activities in the Bozeman Municipal Watershed project area, it must prepare an Environmental Impact Statement that remedies all the violations of Federal and State laws, policies, and regulations identified in this Statement of Reasons.

Submitted respectfully for the appellants:

/s/

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Please find our attachments in pdf format.

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