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Decision Notice & Finding of No Significant Impact

East Boulder Fuels Reduction Project

**Yellowstone Ranger District
Big Timber Office
Gallatin National Forest
Sweet Grass County, Montana**

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**East Boulder Fuels Reduction Project
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Yellowstone Ranger District
Big Timber Office
Sweet Grass County, Montana**

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Introduction

This Decision Notice documents my decision and the “finding of no significant impact” (FONSI) concerning the implementation of a hazardous fuels reduction project on National Forest System lands in the East Boulder River Corridor drainage of the Yellowstone Ranger District. The Project Area has been identified as a wildland/urban interface (WUI). The East Boulder community is listed as a priority for treatment in the September 2008, Sweet Grass County Community Wildfire Protection Plan (CWPP). In addition, the East Boulder Fuels Reduction Project is identified on the list of proposed vegetation/fuel management projects on page 53 of the CWPP.

The project area is located in the Absaroka Mountain Range in the south-eastern portion of the Yellowstone Ranger District in Sweet Grass County, Montana and lies adjacent to the North Absaroka Inventoried Roadless Area, which includes the East Boulder Unit. The East Boulder Road #205 branches off of the Main Boulder highway approximately 20 miles south and west of Big Timber and is a highly maintained gravel road that follows the East Boulder River from its confluence with the Main Boulder River to the Stillwater Mining Corporation’s East Boulder Mine complex at its terminus. Approximately 6-7 miles of this road are adjacent to private lands up to the forest boundary, and an additional 5-6 miles of the road extend from the forest boundary to the mine with areas of private ownership interspersed (See Vicinity Map 1). The approximately 4,000 acre project area, which consists of the roaded portions of the East Boulder River corridor, is heavily utilized for mining operations and to a lesser degree by recreational users.

Treatment areas identified in the East Boulder Fuels Reduction Project selected alternative (Alternative 2) are located along the one-way in/out East Boulder Road #205, lie adjacent to the East Boulder Mine site, and/or private residences and improvements. All units are located inside the roaded portion of the drainage with no treatment activities proposed in the adjacent inventoried roadless area (IRA). Fuel management treatments will begin at the Forest boundary, just north of the East Boulder Campground, and extend for approximately six miles east-southeast to the Dry Fork area, which is adjacent to the East Boulder Mine. Treatments along the lower portion of the Lewis Gulch Road will begin at the East Boulder Mine and extend into the northeast quarter of Section 10 (Refer to Map 3). The East Boulder River corridor is located in Sweet Grass County with proposed treatment units located in T.3.S, R.13.E, Sections 29, 32, & 33 and T.4.S, R.13.E, Sections 2, 3, 4, 5, 10, & 11.

This project is part of the Gallatin Forest’s ongoing emphasis on implementing projects that increase firefighter and public safety in the event of a severe wildfire and is part of a broader program to implement the National Fire Plan (USDA Forest Service, 2000). Some of the important partners in the development of this project include private landowners and stakeholders, special interest groups, Boulder River Watershed Group, Sweet Grass County, Sweet Grass County Rural Fire Department, Stillwater Mining Corporation, Northern Rocky Mountain Resource Conservation and Development, and the Department of National Resources and Conservation.

Decision

After careful consideration of the impacts associated with the three alternatives analyzed in detail for the East Boulder Fuels Reduction Project Revised Environmental Assessment (EA), April 2011, I have selected Alternative 2 (Corridor Units only) for implementation. I thoroughly evaluated the benefits and risks associated to key resource concerns and public input, and chose to implement Alternative 2 because it most directly addresses all elements of the purpose and need, considering the areas of high fuel hazard, high risk of human-caused ignition, and high social values. My decision emphasizes treating those stands that are located along the road corridor, adjacent to the East Boulder Mine site and infrastructure, and/or

private property. The analysis clearly showed that the thinning of conifers and removal of ladder fuels in this area will reduce fire intensity, allowing for improved evacuation of public, private residents, and East Boulder Mine employees, as well as provide for greater firefighter safety, were a large wildfire event to occur in the drainage regardless of location or approach. Reducing the intensity of the wildfire as it approaches the roadway and key infrastructure, provides operational flexibility for fire managers and may improve the probability of success for the chosen strategy. Alternative 2 (Selected Alternative) will treat the minimum acres necessary, based on fire effects, to protect the evacuation route and minimize fire effects to private lands.

Treatment of the five Upper Lewis Gulch units, Alternative 3, was also intended to provide for public and fire fighter safety, by providing a deflecting mechanism if the large fire was to approach the area from the south. Modeling displayed that the proposed fuel treatments would decrease the time of arrival to existing infrastructure by up to two hours, however analysis showed that the likelihood of a fire starting south of Lewis Gulch and spreading to the north are relatively small (See Map 9-Fire History Map).

Alternative 2 also resulted in lesser effects to key issues (particularly noxious weeds and Canada lynx) when compared with Alternative 3. I feel that the risks of potentially spreading noxious weeds into upper Lewis Gulch (the additional units encompassing Alternative 3), where there are currently no known infestations, outweighed the additional benefits of treating hazardous fuels in this area. Because of the normally heavy snowload and the condition of the Lewis Gulch Road in winter, the majority of the harvest treatments, log hauling, and construction of temporary roads associated with these five units would occur when the area was neither frozen nor snow covered, resulting in additional soil disturbance that potentially could provide a seed bed for noxious weeds to spread into currently un-infested areas.

Consideration of Canada lynx habitat needs also played into my decision. Alternative 2 will treat roughly half the acreage of multi-storied snowshoe hare habitat as proposed with Alternative 3. The additional treatment units included in Alternative 3, located in upper Lewis Gulch, are at higher elevations, in cooler, moister habitat types preferred by lynx, and are in closer proximity to some of the higher quality lynx habitat in the East Boulder LAU. I concluded that Alternative 3 does not provide enough additional benefits that achieve the purpose and need for the project to warrant the additional treatment acres, which are located in multi-storied snowshoe hare habitat that is in closer proximity to higher quality lynx habitat.

Alternative 2 includes vegetation treatments on a maximum of 650 acres in twenty-five separate units. Stand density reduction utilizing tractor harvesting equipment will occur on a maximum of 490 acres on slopes up to 35%, harvesting both large and small diameter trees. A maximum of 20 acres of stand density reduction on slopes >35% will involve skyline cable harvest, and up to 140 acres will have hand-treatments (removal of ladder fuels, limbing of large diameter trees, and thinning of small diameter trees). Hand-treatments will occur in sensitive areas, areas where trees are too small for commercial harvest operations, and/or in areas that are not conducive to either tractor or skyline harvest methods. Map M-3 displays the units of treatment associated with the selected alternative (Alternative 2).

My decision incorporates all of the mitigation measures and design features identified on pages 13-23. Key items worth articulating include:

- Mechanically treated units in MA11 (big game winter range) will retain 15-20% of each unit's acreage in untreated clumps, along with individually spaced leave trees, to protect big game winter range habitat and address visual requirements of partial retention. Douglas fir, where available, will be favored to leave, either individually or in clumps, to further assist with snow intercept.

- Additional leave areas were incorporated in a portion of Unit 3, to further provide visual screening (Project File 6-12) for private residents.
- The East Boulder River, as well as secondary streams, will be buffered (uncut strips along streams) to minimize any sediment or fishery concerns and provide for big game travel corridors. Mechanized equipment will not be allowed within Streamside Management Zones or wet areas in conformance with the State of Montana Best Management Practices (BMP's).
- Mechanical, ground-based, harvest activities will generally begin after the conclusion of hunting season (Approximately 10/15-12/1) when feasible. This excludes hand treatments, temporary road construction, harvest Unit 13, and cable units 14 & 16. This mitigation was intended to reduce mule deer concerns during hunting season.

Background

The East Boulder Road, the only road servicing the corridor, is a county road that is plowed year round and maintained by Sweet Grass County. The project area contains a mixture of privately owned and National Forest System lands with approximately 5 year-round private residences, as well as several cabins and out-buildings, one Forest Service campground, and two Forest Service trailheads.

In addition to the rural residences and recreation facilities, at the end of the East Boulder Road is the East Boulder Mine, a division of the Stillwater Mining Corporation, which is the largest private employer in the State of Montana. There are currently approximately 300+ employees stationed at the East Boulder Mine. Paralleling the East Boulder Road is a high capacity transmission line (Owned by Park Electric Company) that provides a critical electrical source for mine operations. These operations range from everyday power usage in office settings, to air compressors and scrubbers that provide a breathable air source several miles below the surface of the ground for the actual mining operations.

The East Boulder Road is heavily traveled year round by mine employees, who are bused in and out of the drainage, and contractor delivery services to the mine. Private residents use the road to access their homes and property. There is also light usage in the summer months and moderate usage in the fall/winter months by recreationists and hunters. Because the East Boulder Road provides the only access into the drainage, emergency evacuation of the public from this corridor, in the event of a severe wildfire, would be difficult due to the proximity of heavy fuel buildups adjacent to the road.

Vegetative types within the East Boulder corridor vary, with spruce and remnant aspen occurring in the moist canyon bottoms and a mixture of primarily Douglas-fir and lodgepole pine on the side slopes. The primary concern related to the current fire risk within the East Boulder project area is the vertical and horizontal continuity of fuels, including standing and downed woody fuels, as well as the smaller understory tree components. Natural successional stand development, in conjunction with years of successful fire suppression have resulted in greater tree densities, with higher fuel loadings, and a continuous vertical and horizontal fuel bed arrangement throughout the drainage. Stand 'densification' has resulted in little or no space between the crowns of trees.

The area is also currently experiencing a moderate level of mountain pine beetle attacks, small patches of Douglas-fir beetle mortality, as well as infestations of spruce budworm. As insects move across the landscape and stands of trees become infested, red needles on standing dead trees become highly volatile and act as a catalyst that would intensify wildfire behavior until the needles are shed and decompose.

The East Boulder Corridor is prone to frequent high wind events with wind speeds of up to 35-40 miles per hour that sometimes persist for several hours, with dry thunderstorms, as well as Pacific Frontal Systems with their associated jet stream, often occurring during the summer and fall months, producing

strong downdrafts through the corridor. Current stand conditions, when combined with the potential for high wind events, set the stage for a potentially extreme crown fire situation.

Purpose and Need for Action

The primary purpose and need for this project is to improve public and firefighter safety by reducing the probability and effects of human caused fire starts along the corridor and reducing the effects of wildfire entering into the WUI of the East Boulder River corridor. This will be accomplished by breaking up the vertical and horizontal continuity of fuels by thinning trees, and removing ladder fuels and vegetation in the treatment units. Reducing the continuous fuel loadings along the East Boulder corridor will improve public and firefighter safety, as well as the safety of employees at the East Boulder Mine, by lessening the speed and intensity, and altering the pattern of a potential wildfire, thereby gaining additional time to implement an effective emergency evacuation out of the corridor and to conduct other necessary safety measures.

Note: My decision (Alternative 2) includes vegetation treatments only on National Forest System (NFS) lands. Private landowners are responsible for fuels reduction and structure protection measures on privately owned property and are encouraged to implement these types of treatments.

Scope of the Decision

The Council of Environmental Quality (CEQ) regulations implementing NEPA define the “scope” of an action consisting of “...the range of actions, alternatives, and impacts to be considered”. To determine the scope, federal agencies shall consider three types of actions; (1) connected actions; which are two or more actions that are dependent on each other for their utility; (2) cumulative actions; which when viewed with other proposed actions may have cumulatively significant effects and therefore be analyzed together; and (3) similar actions; which when viewed with other reasonably foreseeable or proposed actions have similarities that provide a basis for evaluating their environmental consequences together. (40 CFR 1508.25).

The scope of the proposed vegetative treatment actions addressed in this Decision Notice are limited to stand density reduction and the reduction of fuel loadings on National Forest Land including:

- Thinning and/or harvest of medium and large diameter (>6” dbh) green conifers to meet unit by unit fuel reduction objectives
- Harvest of insect or disease damaged/killed conifers except where needed to meet snag retention requirements.
- Thinning of Post & Pole size conifers (4” to 6” dbh)
- Slashing of small diameter conifers
- Piling and removing and/or burning of downed woody materials and fuels resulting from treatment actions.
- Construction of up to 2.1 miles of low standard temporary roads to access treatment areas and the recontouring and rehabilitation of these roads following completion of harvest related activities.

Other actions that are within the scope of the project that will be completed are cleanup and maintenance of roads utilized for project related activities and ecosystem restoration activities such as weed monitoring and spraying,

Detailed Description of the Decision

My decision is to implement Alternative 2. Alternative 2 was designed to address all elements of the purpose and need considering the areas of high fuel hazard, high risk of human-caused ignition, and high social values. Alternative 2 emphasizes treating those stands that are adjacent to the East Boulder Road, private property, and/or the East Boulder Mine site and infrastructure where thinning of conifers and removal of ladder fuels will improve public and firefighter safety. The majority of the units associated with Alternative 2 lie in Management Area (MA) 8 and MA 11, both of which include productive forest lands that are available for timber harvest. Some units have linear inclusions of MA 7 (riparian), and there are a few very small inclusions of MA 3 and MA 12, all of which allow for the harvest of wood products. Management area direction for these MAs is outlined in the Gallatin Forest Plan (pp. III-6 through III-39).

Map M-3 displays the units of treatment associated with Alternative 2, which includes vegetation treatments on a maximum of 650 acres in twenty-five separate units. Stand density reduction utilizing tractor harvesting equipment will occur on a maximum of 490 acres on slopes up to 35%, harvesting both large and small diameter trees. A maximum of 20 acres of stand density reduction on slopes >35% will involve skyline cable harvest, and approximately 140 acres will consist of hand-treatments (removal of ladder fuels, limbing of large diameter trees, and thinning of small diameter trees). Hand-treatments will occur in sensitive areas, areas where trees are too small for commercial harvest operations, and/or in areas that are not conducive to either tractor or skyline harvest methods.

Leave tree spacing will be irregular and somewhat variable between units. Mechanically treated units in MA11 will retain 15%-20% of the unit acres in untreated clumps to protect big game winter range habitat and address visual requirements of partial retention. Very small or narrow units will not include clump retention. The East Boulder River and secondary streams will be buffered (uncut strips along streams) to provide wildlife travel corridors. The resulting irregular stand structures will break the continuity of vertical and horizontal fuels in the project area. Prescriptions will vary between adjacent units to disrupt the continuity of fuel conditions among stands and will include:

Douglas-fir (DF) and mixed species dominated stands (>30% mixed)

MA11-Treatments will include a 40-60% canopy retention favoring DF then S to leave, irregular spacing with 13-15 feet between crowns. In addition, 15 to 20% of the unit acreage will be left in untreated irregular shaped clumps of approx. 1/3 acre in size. (Very small or linear units may not have clumps retained).

MA8-Treatments will include a 35-45% canopy retention favoring DF then S to leave, irregular spacing 13-15 ft between crowns. Clumps will not be retained in most MA8 units. Most LP and AF will be removed.

LP dominated stands (>70% LP)

MA11-Treatments will include 40-50% canopy retention. Leave DF and S where available with 13-15 feet irregular spacing between crowns. Leave 15–20% of the unit acreage in untreated irregular shaped clumps 1/10 to 1/8 acre in size. There will be some open areas within these stands.

MA8-Treatments will include 20-40% canopy retention. DF and S will be left, where available, with 13-15 feet irregular spacing between crowns. Where no other species are available, LP will be left in small clumps 1/8 to 1/10 acre in size. There will be openings in these units.

Clumps- Clumps will be located within the units and at least 200 feet from the power line, wherever possible. Clumps will have irregular shapes and sizes. DF and mixed species clumps will be approximately 1/3 acre in size, LP clumps will be 1/10 to 1/8 acre in size. Retention clumps will be

excluded from any type of treatment. Clumps will be placed on level benches where possible. Clumps will select for inherently heavier canopy cover, with the healthiest crowns favoring Douglas fir, subalpine fir, and spruce to leave.

Skyline cable units- Will have corridors approximately every 150 feet.

Hand treatments-Thinning from below, ladder fuels and small diameter trees will be slashed, hand piled, piles will be burned, and edges will be feathered to blend with adjacent stands. The objective is to break up continuous fuels and remove ladder fuels. Regeneration stands (20-30 year old sapling stands) will only be thinned where they are immediately adjacent to the high voltage Park Electric power line. Thinning will only occur within 200 feet of the power line.

Small diameter trees and activity fuels- Will be slashed, piled, and burned, or otherwise removed unless they lie within the untreated retention clumps. In mechanically treated units, activity fuels will be brought to designated landings. Handtreatment units will have small burn piles scattered through the units.

Downed Woody Debris-Approximately 15 tons/acre of downed woody debris per Gallatin Forest Plan direction will be left on site, where available. Large diameter pieces will be favored to leave.

Snags- Adhere to Forest Plan standards of leaving 30 snags per 10 acres greater than 18' and 10" DBH, where available. Wherever possible, snags will be retained within the untreated leave clumps for safety purposes. An additional 30 live snag replacement trees per 10 acres will be left in harvest units in either retention clumps or thinned areas. For Douglas-fir and subalpine fir sites on rocky or shallow soils designate 60 trees per 10 acres as replacement trees.

As a part of project layout, snags will be marked to leave either individually or within untreated leave clumps. No firewood cutting signs will be posted in the sale area to ensure that the snags will not be removed for firewood. If firewood cutting becomes a problem after these timber sale signs are removed (following completion of project activities), wildlife tree tags will be placed on snags that are visible and easily accessible from the East Boulder Road.

Rivers and streams- The East Boulder River will be buffered by a minimum of a 15' no cut zone, with a maximum of 50% of the trees 8" diameter and greater slated for removal in the areas 15'-50' from the river. There will be no harvest on any >35% slopes leading into the East Boulder River to protect water quality and aquatic habitat. In these areas, the 15' no cut buffer will begin at the break in the slope (top of terrace). No ground-based mechanical equipment will be allowed in the streamside management zones (SMZs). Best Management Practices as described in Appendix A of the EA will be followed. Tributary streams (Twin Creek, Lewis Creek, and Wright Creek) will have a 50' no cut buffer on either side of the streams; this is intended to provide travel corridors for wildlife on big game winter range.

Seeps, springs, wallows, etc. - These areas will not be treated and will be buffered. They will be identified as a portion of the unit's 15-20% untreated retention clumps.

Treatment descriptions for the individual units included in Alternative 2 are found in Table 1 below: Table 1 displays individual unit information. Design criteria and mitigation measures for the proposed treatments can be found on pp. 12-26 of this document.

Table 1 Alternative 2 (Selected Alternative) Treatment Descriptions

Unit #	Approx Acres	Logging System	MA	Road Needed	Treatment Type	Riparian Treatment	Season of Treatment
1	25	Tractor	11	Approx. 390 ft temp. road construction 510 feet existing rd. maintenance	Retain 15-20% in irregular shaped clumps (approx. 1/3 acre each), Irregular spacing individual leave trees 13-15 ft. between crowns, Favor DF	NA	Winter
2	10	Hand Treatment	11	NA	Remove dead and dying trees, Remove ladder fuels except near campsites (cut, buck, pile)	50 ft. no treatment buffer along East Boulder River (EBR)	Summer-Winter East Boulder Campgrnd.
3	120	Tractor	11, 8	Approx. 4215 ft temp road construction	N 1/2, MA11 Retain 15-20% untreated clumps (approx. 1/3 acre), Irregular spacing leave trees 13-15 feet. between crowns, S1/2 (MA8) irregular spacing 13-15 ft between crowns, remove LP Favor DF	Small ponds will be buffered as part of untreated clumps	Winter
3A	5	Hand Treatment	11	NA	Thin/remove small dbh (<8") trees approx. 13-15 ft. between crowns (slash & pile)	NA	Summer-Winter

Unit #	Approx Acres	Logging System	MA	Road Needed	Treatment Type	Riparian Treatment	Season of Treatment
4	25	Hand Treatment	12	NA	Thin small dbh (<8") (slash, & pile)	Minimum 15 ft. no cut along EBR; No treatment on steep slopes adjacent to EBR, buffer from top of the terrace	Summer-Winter
5	35	Tractor	11	Approx. 1110 ft. temp road construction (Alternative Practice stream crossing for Wright Creek was obtained)	Retain 15-20% in untreated irregular clumps (approx 1/3 acre in size), Leave tree irregular spacing (13-15 ft) between crowns, Favor DF	Minimum 15 ft. no cut along EBR, No treatment steep slopes adjacent to EBR, buffer from top of the terrace, 50 ft buffer both sides of Wright Creek	Winter
5A	45	Tractor	11	Approx. 705 ft. temp road construction	Retain 15-20% untreated clumps (approx 1/3 acre size), Leave tree irregular spacing (13-15 ft) between crowns, Favor DF& S, In LP areas leave 1/8 to 1/10 acre size clumps	50 ft. no cut buffer either side of Wright Creek except adjacent to power line	Winter
6	10	Hand Treatment	12	NA	Thin/remove small trees <8" in diameter (slash & pile)	Leave tree clump located along Lewis Creek	Summer-Winter

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Unit #	Approx Acres	Logging System	MA	Road Needed	Treatment Type	Riparian Treatment	Season of Treatment
7	30	Tractor	11, 8	Approx. 730 ft. temp road construction Approx. 925 ft. existing road maintenance	Retain 15-20% in untreated clumps (approx 1/3 acre in size), Leave tree irregular spacing (13-15 ft) between crowns, Favor DF	50 ft. no cut buffer either side of Twin Creek except adjacent to power line	Winter
7A	5	Tractor	11	NA	Irregular spacing 13-15 ft. between crowns Favor DF	NA	Winter
7B	1	Hand Treatment	11	NA	Thin small trees <8" dbh, Approx 13-15 ft. between crowns within 200' of powerline (Slash & pile)	50 ft. no cut buffer either side of Twin Creek	Summer-Winter
8	10	Hand Treatment	11	NA	Thin/remove small trees <8" dbh Approx 13-15 ft. between crowns (Slash & pile) Leave all DF except adjacent to power line	NA	Summer-Winter
8A	20	Hand Treatment	11	NA	Thin/remove small trees <8" dbh, Approx 13-15 ft. between crowns (Slash & pile) Leave all DF except adjacent to power line	NA	Summer-Winter

Unit #	Approx Acres	Logging System	MA	Road Needed	Treatment Type	Riparian Treatment	Season of Treatment
9	20	Tractor	11	Approx. 425 ft. temp. road construction Alternative Practice for unnamed stream crossing was obtained	Irregular spacing leaving 13-15 ft. between crowns Favor DF & S Remove LP, Remove all trees within 35' of power line	NW corner has a SMZ retention clump	Winter
9A	10	Tractor	8,12	Approx. 100 ft. temp road construction Approx 375 ft. existing road maintenance	Irregular spacing (13-15 ft) between crowns, Favor DF	50 ft. buffer of Lewis Creek	Winter
10	30	Tractor	8, 11	Approx. 500 ft. temp. road construction	Retain 15-20% in untreated clumps (approx 1/3 acre in size), Leave tree irregular spacing (13-15 ft) between crowns, Favor DF	NA	Winter
11	40	Tractor	8,12	Approx. 610 ft. temp. road construction	Irregular spacing leaving 13-15 ft. between crowns Favor S and DF	Minimum 15 ft. no cut along EBR; No treatment on steep slopes adjacent to EBR, buffer from top of the terrace	Winter (Identify & protect well heads belonging to mine)

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Unit #	Approx Acres	Logging System	MA	Road Needed	Treatment Type	Riparian Treatment	Season of Treatment
11A	45	Hand Treatment	8,12	NA	Thin/remove small trees <8" dbh, Approx 13-15 ft. between crowns (Slash & pile)	Minimum 15 ft no cut along EBR, No treatment 50 ft either side of Dry Fork; No treatment on steep slopes draining into EBR, buffer from terrace	Summer-Winter
12	10	Tractor	8	NA	Irregular spacing leaving 13-15 ft. between crowns Favor DF	50 ft. no cut buffer Lewis Creek	Winter
12A	5	Hand Treatment	11	NA	Thin/remove small trees <8" dbh, Approx 13-15 ft. between crowns Leave all DF except adjacent to power line	NA	Summer-Winter
13	70	Tractor	8,3	Approx. 1225 ft. temp. road construction	N ½ leave S & DF, Irregular spacing 13-15 ft. between crowns, S ½ leave 1/8 to 1/10 acre LP clumps	50 ft. no cut buffer either side of Lewis Creek	Summer-Winter
14	15	Skyline	8	Approx. 1530 ft. temp. road construction	13-15 ft irregular spacing between crowns, Favor DF	NA	Summer-Winter (Will need to lay down mine fence)
16	5	Skyline	8	NA	13-15 ft spacing between crowns, Favor DF Remove LP	50 ft. No cut buffer either side of Lewis Creek	Summer-Winter

Unit #	Approx Acres	Logging System	MA	Road Needed	Treatment Type	Riparian Treatment	Season of Treatment
17	25	Tractor	8	NA	LP dominates, leave 1/8 to 1/10 acre clumps, Leave untreated area on south end due to wetness	Minimum 15' no cut along EBR, No cut on steep slopes adjacent to EBR, Butter from top of terrace	Winter Buffer snotel site
18	25	Tractor	8	Need PVT Access Unit lies across East Boulder River	Remove LP, Leave 15-20% in untreated clumps 1/8 to 1/10 acre in size, Favor S	Minimum 15' no cut EBR, 50 ft no cut Dry Fork; No treatment on steep slopes adjacent to EBR or Dry buffer from top of terrace	Winter

Roads-No new permanent road construction is being proposed with the project. Primary access will be provided by the East Boulder Road #205. Commercial harvest operations are expected to require the construction of some temporary roads. A maximum of 2.1 total miles of temporary road may be needed to access the areas proposed for mechanical fuels treatment using conventional ground-based logging systems (tractor and skyline). Temporary roads will consist of several short spurs with an average length of 1/6 of a mile or less to access the interior of units and keep landing piles away from the main road. These areas will be re-examined on the ground prior to project implementation to determine whether opportunities exist to reduce the length of newly constructed temporary road. Another approximately 1/2 mile of road maintenance may be needed to reopen old roads to provide access to treatment areas. Other existing roads may require minor routine maintenance to support safe and efficient use, consistent with project design criteria and mitigation. Options to use existing roads will be examined to assure that the environmental effects of using roads on either public and/or private land do not exceed what has been disclosed in the Revised EA. Table 1 and Map M-3 disclose the approximate locations of proposed temporary roads and road maintenance. Actual temporary road locations are determined through agreement by the Forest Service and purchaser during timber sale contract administration. Temporary roads will be constructed to provide access to the interior of harvest units to facilitate ground-based harvest systems. These roads will be built on relatively flat slopes and will be constructed to the lowest possible standard capable of supporting log hauling in order to minimize ground disturbance. Temporary road construction, including clearing and removing of wood products from within the road right-of-way, will likely occur in late summer through fall, when soils are dry.

All newly constructed temporary roads will be closed to the public during harvest activities and permanently closed, recontoured, rehabilitated, and seeded with a certified weed-free seed mix within one year upon completion of harvest related activities. Rehabilitation will include making the temporary roads on National Forest System lands impassable for any motorized travel, as well as other resource protection practices. Existing roads that are improved and utilized for project related activities that are no

longer needed, do not provide deeded access to private lands, or are not identified to remain open in accordance with the October 2006 Gallatin National Forest Travel Plan Decision will also be rehabilitated within one year of completion of project related activities.

Design Features, Mitigation, and Monitoring

Various project design features, mitigation measures, and monitoring activities have been incorporated into my decision to reduce the probability of adverse impacts to resources from implementing Alternative 2. These mitigation and the effectiveness of such, as well as required monitoring are outlined below by resource:

Water Quality

- 1) SMZ treatments: 15' no cut zone adjacent to East Boulder River, additional SMZ retention guidelines of harvest up to 50% of trees >8" dbh, no harvest on >35% slopes in Units 5, 11, 17 & 18 adjacent the East Boulder River.
- 2) No treatment buffer of 50' on either side of Twin Creeks, Lewis Creek, and Wright Creek for big game winter range objectives.
- 3) Apply standard BT timber sale protection clauses to the commercial harvest activities to protect against soil erosion and sedimentation. Include standard BMP's for all activities including Montana SMZ compliance rules.
- 4) All required water quality permits would be acquired by the Gallatin National Forest prior to any ground disturbance activities for the East Boulder fuels project. If logging road stormwater discharge NPDES permits are required for East Boulder fuels project the Gallatin National Forest will work with the Montana DEQ to obtain the permits prior to project implementation.
- 5) 5) The Gallatin Forest Plan, Forest Wide Standards 10.2 (page II-23) requires that Best Management Practices (BMP's) will be used in all Forest watersheds. The Montana Forestry BMP's are included in Appendix A of this EA and are required to be followed in all timber harvest and road construction activities.

Effectiveness: No Gallatin NF timber sale-related BMP violations have been documented in implementation monitoring reviews since 1990 (GNF 1997 Annual Monitoring Report). Improved harvest methods, SMZ rules of 1993, and more complete BMP direction incorporated in NEPA documents and timber sale contracts have worked to virtually eliminate BMP problems (e.g., skidding across streams, insufficient sediment filtering, inadequate skid trail rehabilitation) of the past.

Aquatics

The underlying goal of protection measures for riparian and aquatic habitats is to follow a functional definition of riparian zone consistent with GNF Plan and FSM direction, and consider riparian vegetation in relation to stability, integrity, and meeting needs of riparian zone dependent species including fish and fish habitat. The following stream protection measures are included in the proposed action:

- 1) No riparian treatment up to 100 feet either side of streams except for designated areas where riparian harvest is necessary to meet fuels treatment objective along a critical reach. Where riparian treatment is necessary to meet fuels objectives, a 50 feet no treatment buffer is preferred. In limited areas where riparian treatment is critical to meet fuels objectives, treatment is allowed within 50 feet, but not closer than 15 feet of the high water mark. This is more restrictive than State SMZ rules. This "no harvest" mitigation protects thermal regulation, overhead cover, and protects banks. It also maintains age class diversity of trees along stream corridors. Where

riparian treatment is necessary within a 50 feet SMZ, additional mitigation measures described below apply.

- 2) Follow all SMZ rules and Gallatin FP regarding operation of wheeled or tracked equipment in riparian zones.
 - 3) Favor leaving large diameter trees along riparian corridors. Purpose is to protect those trees most likely to provide anchored and stable LWD when it is recruited to the channel. Fisheries biologist will be involved with marking cut trees along all riparian corridors.
 - 4) For tree retention guidelines follow SMZ rules which require retention of at least 50% of trees ≥ 8 in dbh. The SMZ retention guidelines apply to all stream segments beginning 15 feet from the stream high water mark and extend out 50 feet. As such, 50% of trees \geq dbh between 15' and 50' of the stream high water marks will be retained. Trees within the 15' no cut zone do not count towards the 50% retention.
 - 5) Favor leaving trees that are leaning towards the stream channels and favor taking trees leaning away from the stream channel. Purpose is to protect those trees most likely to provide anchored and stable LWD when it is recruited to the channel.
 - 6) To the extent possible, but still meeting fuels objective, leave species and size classes representative of original stand.
 - 7) Fisheries biologist will assist in tree marking along all riparian corridors.
 - 8) No riparian treatments on steep slopes $>35\%$ that drain directly into a stream with no floodplain filter, Buffer from the top of the terrace.
 - 9) No harvest in active floodplains (inundated on 1.5 – 2 year recurrence interval). Fisheries biologist will assist in identifying these areas.
- 11) Follow all BMP's and other mitigation measures outlined in the water quality section of the EA.

Effectiveness: Similar aquatic mitigation measures were applied to treatment units along the Main Boulder River and tributaries for the Main Boulder Fuels Reduction Project. During summer 2009, the Big Timber Ranger District hosted a field trip with fisheries professionals representing Yellowstone National Park, Montana Department of Fish, Wildlife and Parks, and US Forest Service. The intent of the field review was to solicit comments and input relative to the applied aquatic mitigations along the Main Boulder River and its tributaries. Collectively, the group considered the mitigation effective at protecting aquatic resources. For that project, the 15 foot no cut zone was applied to all streams. Though the group considered the 15 foot distance adequate to protect aquatic resources when applied in conjunction with other mitigation (e.g., selective harvest to protect LWD recruitment), there was a general consensus that 15 feet was the minimum distance necessary for adequate protection.

Air Quality

The primary focus of the East Boulder pile burning would be to prevent wildfire initiating from the burn projects. Specific mitigation includes:

- 1) Pile burning would be done in the spring, fall, or winter when wildfire potential is low.
- 2) Pile burning would be constrained to no more than 200 piles per day and at least 0.2 to 0.3 miles from the East Boulder mine, where possible, to keep smoke emissions within the National Air Quality Standard (NAAQS) for particulate matter. For Units 17 & 18 that are adjacent to the mine, piles will kept as small and as far from the mine as reasonably possible and piles should only be burnt during times of robust wind dispersion away from the mine and there is little risk of nighttime inversions

- 3) Pile burning should attempt to keep smoke away from the East Boulder mine as smoke in the mine ventilation system can be problematic for mine operations as it can trigger an evacuation.
- 4) All East Boulder pile burns will be coordinated with the Montana/Idaho State Airshed Group (<http://www.smoke.org>). The operations of the Montana/Idaho State Airshed Group are critical to minimize cumulative smoke/PM_{2.5} air quality impacts. The State Airshed Group, Monitoring Unit in Missoula, evaluates forecast meteorology and existing air quality statewide by individual air shed and specifies restrictions when smoke accumulation is probable due to inadequate dispersion. Pile burning would be done in coordination with the Montana/Idaho Airshed group on days of good-excellent stability.

Effectiveness: Particulate monitoring air quality particulates has not been done for fuels projects on the Gallatin NF. Particulate monitoring has, however, been conducted at the East Boulder Mine. Monitoring has also been conducted extensively on the Bitterroot NF to check calibration with the SIS model and compliance with NAAQS. The Montana/Idaho State Airshed group cooperates with the Montana DEQ and member agencies with an extensive network of TEOM's and Data Rams, which are used in scheduling prescribed burns and pile burns along with developing and managing burning restrictions. The program has been very effective in minimizing adverse smoke impacts from open burning for the last 15 years in Montana and Idaho. Prescribed burn projects on the Gallatin National Forest have been visually monitored for smoke dispersion effects for several years.

Soils

Use of these soil mitigation practices will protect soil productivity by meeting the Regional Soil Quality standards (USDA Forest Service. 1999). For further details, see soils section (Chapter 3) and soil specialist's report (Project File).

Skid Trail Placement and Slope Limitations

- 11) Require a systematic skid trail pattern during logging. Mechanical ground-based skidding and harvesting equipment may be used off of skid trails only to the degree necessary to harvest the available timber and only when soil moisture conditions are favorable (see below for details).
- 12) Use ground-based harvest systems only on slopes having sustained grades less than 35 percent.
- 13) Maintain an average of at least 75 feet between skid trails in partial cut areas. Skid trails may be closer than this spacing where converging so long as overall spacing averages 75 feet.
- 14) Lay out skid trails in a manner that minimizes or eliminates any extended sections of trail running down slope at grades steeper than 15%.
- 15) Avoid placing skid trails or temporary roads over convex knobs or along narrow, rocky ridges (areas least able to recover from disturbance) to the extent possible.

Limited Use of Skidding and Harvesting Equipment Off Skid Trails – Non-winter

- 16) Ground based skidding equipment may travel off of the established skid trails but only to the extent reasonably necessary to harvest timber based on the sale administrator's judgment and only when the top 6 inches of soil will not form a ribbon between the thumb and forefinger and will not form a ball when squeezed in the palm of the hand that will withstand a moderate amount of handling. (Criteria integrates the combined influence of soil texture and soil moisture – see USDA Technical Guide for Estimating Soil Moisture)
- 17) Feller/buncher/mechanical harvesters may be used off established skid trails to the extent reasonably necessary to harvest timber and only when the top six inches of soil will not form a ball when squeezed in the palm of a hand or will only form a weak ball and at most will form a weak ribbon between the thumb and forefinger. (Criteria integrate soil texture and soil moisture

effects – see USDA Estimating Soil Moisture Tech. Guide). Repeat passes over the same ground should be minimized.

- 18) In some limited instances, soils may be too dry to allow ground-based, mechanical skidding or harvesting equipment to operate off of established skid trails in sensitive areas, such as on sandy or shallow soils on south facing aspects, along ridges, and other convex slopes. These are often the lowest productivity sites within a stand in any event.

Winter Harvesting Restrictions

- 19) Tractor harvesting over snow or frozen ground in the winter should be limited to periods when there is a minimum of 8 inches of settled snow covering the ground or, in the absence of sufficient snow, when the top four inches of mineral soil is frozen. Otherwise, standard non-winter, off skid trail limitations will apply. Harvesting should not proceed if ponding occurs at the mineral soil surface due to partial thawing of a surface frost layer. Previously noted limitations to off skid trail use based on soil texture and moisture conditions and the need for a systematic skid trail system do not apply to winter harvesting providing the settled snow depth or frozen ground criteria are met.

Effectiveness: Proposals are for partially cut fuel treatments with 20-60% canopy coverage retention. No ground scarification or broadcast burning is proposed for the East Boulder Fuels Project in contrast to the earlier areas monitored. No significant off-trail use of ground-disturbing equipment is allowable for the East Boulder Project. The majority of tractor harvest units proposed for the East Boulder Fuels Project will be treated during the winter months. Tractor harvesting has been demonstrated to cause substantially less soil disturbance (Page-Dumroese, et.al. 2006) if it is conducted during winter months when the ground surface has adequate snow cover. On the Gallatin National Forest, the 2009 implementation review of treatment units in the Main Boulder Fuels Project showed very little detrimental soil disturbance in winter harvested units except for one unit where jack pot burning was included in the prescription (Keck 2009 -personal observations). In this case, some DSD due to burning, occurred immediately below the burn piles.

Combined influences of from all of the above will ensure that detrimental soil disturbance from the proposed fuels treatments will remain well below the 15% maximum DSD standard for Region One Forests. These guidelines were developed utilizing both Regional and research input and then modified to account for local conditions. Their purpose is to protect soil productivity for the next generation of forest vegetation. They reflect a "best estimate" of soil disturbance/soil productivity effects, based on scientific research and field experience. Use of these mitigation practices will also protect soil productivity by meeting the Regional Soil Quality standards (USDA Forest Service. 1999).

Noxious Weeds

Noxious weed prevention and control procedures are described in Forest Service Region 1 Supplement to Forest Service Manual 2080. This Supplement outlines responsibilities and methods to manage noxious weeds at Forest and District levels. It includes numerous best management practices that would be followed during activities associated with the East Boulder Fuel Reduction Project. The Manual includes an integrated approach of education, prevention, suppression, and monitoring. All manual direction would be followed. Follow Zero Code 2080- Noxious Weed Management Guidelines:

- 1) Remove the seed source that could be picked up by passing vehicles and limit seed transport into new areas.
- 2) Spray weed infested areas for noxious weeds prior to seed production each year during harvest and follow-up operations. The FS will coordinate weed spraying and funding with Sweet Grass County, the Stillwater Mining Corporation, and with Park Electric for the power line corridor.

- 3) Power wash to remove all mud, dirt and plant parts and inspect all off-road vehicles before entering the project area. Cleaning must occur off National Forest Lands. This does not apply to service vehicles that will stay on the roadway, traveling frequently in and out of the project area.
- 4) Any gravel or other surfacing/fill materials brought or moved on-site for project related activities must be from a weed seed free source. Any straw used for road stabilization and erosion control must be weed seed free.
- 5) Temporary roads, re-opened roads, and trails used during harvest will be closed to the public until harvest and reclamation operations are completed.
- 6) Minimize the creation of sites suitable for weed establishment. Designate all skid trails. Minimize road building and road cut and fill lengths.
- 7) Re-vegetate bare and disturbed soil, except on surfaced roads, in a manner that optimizes plant establishment. Use native plant seed where appropriate. Use weed-free seed as tested by a certified seed laboratory.
- 8) Harvest and skidding operations would have road restoration, and other ground disturbing activity reclamation completed as soon as possible after harvest to minimize establishment of non-native or noxious plants. Monitor and evaluate the success of revegetation.
- 9) Monitor harvest units and associated activity areas and treat new weed infestations for several years following harvest and reclamation. Treatment should begin the year following disturbance to be effective. Weed treatments will be mandatory and adequate funding will be allocated by either project related funds or as part of the annual district weed program.
- 10) Mechanical treatment units with ground disturbing activities must be conducted over 8" of settled snow or 4" of frozen ground (Except Unit 13, and skyline Units 14 & 16).
- 11) Include in retention areas (untreated clumps) portions of units heavily infested with knapweed or other noxious weeds. These would include knapweed infested portions of Units 1 & 7.
- 12) Avoid the use of meadow areas through layout as much as is practical, for temporary roads, slash or landing piles, decking, and mechanized equipment use.

Effectiveness: Mitigation measures such as these have proven effective on the Forest and throughout the Region as precautionary measures to reduce or minimize the spread of noxious weed species from one area to another (1992 Monitoring Report, pages 254 to 260, and 1997 Monitoring Report, pages 58 to 60).

Wildlife; Threatened, Endangered, Sensitive, Migratory Birds, and MIS Species (Includes Snags)

The Forest Plan contains direction for managing big game winter range to meet forage and cover needs of deer and other species, and to maintain hiding cover associated with key habitat components over time. Further, the Plan contains standards specific to MA 11 for management of big game winter range. Forest Plan amendments provide big game cover definitions (Amendment 14) establish minimum snag retention requirements (Amendment 15), incorporate direction pertaining to management for lynx (Amendment 46) and grizzly bear access within recovery zones. In addition, the project is located within designated Critical Habitat for lynx, and will require consultation with the US Fish and Wildlife Service.

- 1) As per Forest Plan Standard (6. A. 5. Pg. II-18), maintain at least 2/3 of the hiding cover associated with key habitat components over time. Buffer key components, such as wallows, when they are encountered during initial field review and/or during layout and marking. At least 2/3 of the existing hiding cover around these sites will be left untreated. The width of the buffers will be prescribed by the biologist based on an assessment of the site characteristics.

- 2) Retain 15-20% of the forested habitat component in each MA11 mechanical treatment unit as untreated clumps, strips or patches, at least 1/10 acre in size for LP dominated types, and at least 1/3 acre in size for Douglas-fir dominated types, in order to retain some degree of hiding and thermal cover, and provide habitat continuity for big game. Retention patches will be left so that no created openings are more than 600 feet of cover
- 3) Retention patches will favor key habitat features (e.g. wallows, licks, natural openings) where present, to assist with the requirement to maintain at least 2/3 of the hiding cover associated with these features.
- 4) The Forest Plan standard for snags and down woody debris is critical management direction to ensure habitat components key to species dependent on snags and down woody material for habitat or prey species' habitat. The Forest Plan provides specific direction for snag retention within areas prescribed for timber harvest (USDA 1987, Amendment #15, Wildlife Snag Amendment, 02/26/1993). Additional guidance in determining which trees to leave for snags includes:
 - a) Where possible to meet fuels objectives and safety concerns (OSHA 29CFR 1910.266), leave the largest snags standing in each treatment unit (at least 10" dbh and 18' tall).
 - b) Incorporate snag retention in leave (non-treated) clumps to meet snag retention objectives.
 - c) Large, broken-topped (live or dead) and trees with existing cavities should be a high priority for retention.
 - d) Strive to locate snag retention in areas away from easy access for firewood cutting. No firewood cutting signs will be posted within the Sale Area.
 - e) Leave hardwood snags where available; e.g. aspen, cottonwood, birch.
 - f) Where available, leave a variety of snags and/or replacement trees (e.g. species, size, form, rate of decay).
 - g) Snags will be marked to leave either individually or in clumps.
- 5) The Forest Plan provides no specific definitions and direction for road density outside of grizzly bear recovery areas. The FS is responsible for mitigating incidental take of the species and minimizing impacts to secure habitat and impacts during spring bear emergence. The project area is most likely to be used by transient grizzly bears during spring emergence. There are no standards that limit activities in these areas. The project would be active in winter in most of the mechanically treated roadside units; therefore no incidental take is expected or anticipated. Grizzly bears are not likely to be present in these habitats during harvest & treatment operations.
- 6) As per the Forest Travel Management Plan, (Guideline D-7, pg. I-II) any new project roads should be temporary in nature, and effectively gated to restrict public use. Once the activity is complete, these roads should be permanently and effectively closed and re-vegetated.
- 7) Forest Plan Amendment No. 46 incorporates conservation measures from the Northern Rockies Lynx Management Direction ROD. In addition, the Final Rule designating critical habitat for lynx (Federal Register, Feb. 2009) establishes Primary Constituent Elements (PCE) for lynx critical habitat that must be addressed in effects analyses for projects within designated critical habitat.

- a) Vegetation management projects must maintain habitat connectivity within a Lynx Analysis Unit (LAU)
 - b) Limit fuel reduction treatments in WUI that affect snowshoe hare habitat so that such treatments shall occur on no more than 6% (cumulatively) of lynx habitat mapped on the Gallatin National Forest
 - c) Evaluate effects to PCEs in lynx critical habitat, including: snowshoe hare habitat, winter snow conditions, denning habitat and matrix habitat.
- 8) Based on historic detections, an intensified survey effort to identify nest stands will be conducted within the analysis area prior to fuel reduction activities involving tree removal. If nests are located, maintain a minimum 40 acre no activity buffer around nest trees to maintain existing conditions in the nest stand. In addition, no treatment related activity will be allowed in the area representing the post fledgling area (PFA) (240 acres in size) from April 15-August 15 to protect the goshawk pair and young from disturbance during the breeding season until fledglings are capable of sustained flight. After August 15, treatment related activities may commence within the PFA, but outside the nest area, unless site-specific monitoring supports earlier entry. Additional guidance in determining which trees to leave for snags includes:
- a) No harvest of trees with goshawk nests or nests of other large raptors, whether they are occupied or inactive. Trees and snags with obvious large nest structures or cavities should be left intact, with immediately surrounding vegetation retained to provide security cover.
 - b) If found within treatment areas, leave a minimum 50-foot buffer around trees with large raptor nests.
 - c) Mechanical treatment prescriptions should be designed to leave irregular patterns with clumps of trees and a variety of age and size classes.
- 9) Maintain a 50-foot untreated buffer on each side of Wright Creek, Lewis Creek and Twin Creek to maintain cover in important wintering areas for mule deer and moose.
- 10) No treatment on steep (>35%) slopes that drain directly into a stream with no floodplain filter. This will help to maintain cover in riparian winter habitat for moose and mule deer.
- 11) Mechanical, ground-based, harvest activities will generally begin after the conclusion of hunting season (Approximately 10/15-12/1) when feasible. This excludes hand treatments, temporary road construction, harvest Unit 13, and cable units 14 & 16. This mitigation was intended to reduce mule deer concerns during hunting season.

Effectiveness: The Forest Plan was amended in 1993 in order to define big-game definitions for cover, hiding cover, thermal cover and security cover (Amendment 14). Pertinent literature was reviewed and contacts were made with Montana Fish Wildlife and Parks biologist to discuss potential impacts to big-game cover and possible mitigation solutions. The mitigation measures illustrated above were designed to minimize impacts to big-game species in relation to the retention and availability of appropriate types of cover. The project is affecting a narrow corridor of big-game habitat that currently receives abundant use by deer, but more limited use by elk and moose because of the proximity to the county road bisecting the analysis area. This road receives moderate traffic seasonally between May and October from forest users and heavy traffic yearlong by East Boulder Mine employees and delivery services. This activity

along with regular seasonal migration to higher elevations limits the presence of elk and moose in the area proposed for treatment. The resulting big-game cover and habitat should provide more foraging opportunity, while retention of clumps of cover in the silvicultural design will provide sufficient cover requirements. In addition, because of the linear nature of the proposed treatments there will be abundant cover of all types remaining within less than one-quarter mile of all proposed treatments.

The Forest Plan was also amended in 1993 to address issues related to the management of snags and down woody debris (Amendment No. 15). For Amendment 15, pertinent literature was reviewed, and contacts were made to individuals with expertise in wildlife and timber management. Information gathered was used to develop prescribed retention standards for snags and down woody debris listed in wildlife design feature measures numbers 2 and 8 above. These measures have been deemed adequate to provide the *minimum* amounts of standing and down dead, woody materials required to sustain suitable habitat for wildlife species that depend on these habitat components

The Forest Plan was again amended in 1996 in order to address concerns about motorized access in Grizzly Bear recovery zones (Amendment 19). This amendment sets a standard of “no net increase” in motorized road density within any Bear management Units (BMU) in the recovery zone. All pertinent literature was reviewed and consultations were conducted with the U.S. Fish and Wildlife Service in order to identify and mitigate any potential impacts to bears from the proposed treatments. In addition, Habitat Effectiveness Indices (HEI) was calculated for the analysis area in order to determine the potential impact of additional temporary roads from the proposed treatments. The analysis area provides abundant grizzly bear habitat, however the project area itself receives very limited use by grizzly bears. The HEI calculations indicated that habitat effectiveness in the recovery area would remain well above (85% - 95%) the standard of 70 percent. Furthermore, the road density will remain very low in comparison to other BMU’s and should not have any temporary or lasting impact to grizzly bears or their habitat. Although the analysis revealed that little to no impact to grizzly bears or their habitat is expected, the mitigation measures listed above were proposed to further limit any potential impacts to bears.

The Forest Plan was amended (Amendment No. 46) in 2007 to incorporate conservation measures from the Northern Rockies Lynx Management Direction (NRLMD) ROD. The Lynx Amendment underwent formal consultation with the US Fish and Wildlife Service (FWS). The FWS determined in a Biological Opinion that management direction contained in the NRLMD is compatible with recovery needs for lynx. Direction provided by the NRLMD is primarily habitat based, and addresses the habitat components described as PCEs for designated critical habitat. Therefore, following the NRLMD would also provide effective management of critical habitat for lynx.

Sensitive Plants

- 1) Sensitive plant surveys were conducted in July and August 2009 for the proposed treatment areas and are documented in the Project File. No locations of sensitive plants were found within proposed treatment areas
- 2) In the event that sensitive plant species are found in any treatment area, measures will be taken to protect them. If these measures are not adequate to provide protection, the Forest Service may cancel or modify units within this fuel reduction project.

Effectiveness: Sensitive plants species have been monitored since 1988. Monitoring has included basic inventories to determine a species’ distribution across the forest. Surveys occur on all activities that involve ground disturbance or burning. Qualified individuals conduct the surveys.

Visuals

Proposed fuels management activities in the East Boulder have the potential to negatively affect the scenic integrity of the corridor in areas managed for a Visual Quality Objective (VQO) of Partial Retention. This primarily includes areas along the East Boulder, Dry Fork and the intersection with the Lewis Gulch Road. The area in the upper Lewis and Wright Gulches are managed for the VQO of Maximum Modification and are less visually sensitive.

For discussions and mitigations regarding the Forest Plan Standard for the Visual Quality of Partial Retention, the applicable viewsheds (referred to as “Seen Areas” or “SAs”) are from these key observation areas:

- The East Boulder Road
- East Boulder Campground and
- Green Mountain Trailhead and Dry Fork Trailhead.

SAs from private land are not a consideration but would most likely be mitigated from other key observation points.

To meet the Forest Plan Standard for Visual Quality of Partial Retention, landscape modifications due to fuels treatment should not be visually dominant within the Seen Areas one year after the treatments and associated project activities are completed. Seen Areas, for the purpose of these mitigations, imply those areas that are currently visible as well as those areas that become visible after treatment. By incorporating the following mitigations in this project, the proposed work would meet the Forest Plan standards for Visual Quality for areas managed for Partial Retention.:

- 1) Edges of units would be irregularly shaped or feathered to be predominantly natural appearing where possible.
- 2) Where units abut the East Boulder Road and Lewis Gulch junction, unit prescriptions and treatment would, where possible, continue on either side of the road to avoid abrupt visual transitions. Due to interspersed private ownership and previously treated areas, there are several areas that this is not possible.
- 3) Within one year following completion of treatment activities, corresponding unit boundary signs, markers, flagging, etc. should not be readily discernible from the East Boulder Road.
- 4) Where practical, slash piles, decks and landings would be located away from the East Boulder Road. Where they cannot be located out of sight, they should not visually dominate the area. Residual work, such as slash treatment and site cleanup would preferably be completed within one year following stand treatments.
- 5) A variety of individual trees, tree groupings and vegetation clumps of a range of sizes and shapes would be left to provide natural appearing vegetation patterns, spacing, age class, and stand diversity. In addition to those trees that would remain according to the fuel treatment thinning prescriptions, an additional approximately 15-20% of many units’ overall acreage would be left in untreated clumps in many units (MA 11) to create these patterns.
 - a.) Favor leaving individual trees with larger crown ratios and crown diameters that would appear to be more naturally open-grown after treatment. Leaving spindly, small crowned individually standing trees would be avoided.
 - b.) Spacing between clumps and individual trees would be irregular and varied in size and shape.

- c.) All clumps would be selected to have edges and interior configurations to be as natural appearing as possible.
- 6) Within key observation areas, dependent upon the angle of the slope, the viewing situation, and the amount of residual vegetation and rocks, stumps would be cut to maximum of eight (8) inches in height, where ground surface conditions allow this to be done safely.
- 7) Treatment within and immediately adjacent to the East Boulder Campground should be sensitive to maintain what visual screening exists.
- 8) In areas of Maximum Modification (Lewis Gulch & units not visible from key observation points) treatment units can dominate the natural landscape but should look natural for a distance.

Effectiveness: Results of monitoring, when performed by qualified individuals from past timber sales on the Gallatin as well as other fuel reduction projects in the region demonstrate that the mitigations described above have been effective.

Recreation, Public Safety and Special Uses

Proposed fuels management activities in the East Boulder have little potential to negatively affect recreation opportunities. Incorporate the following mitigations in this project to protect recreation values and improvements:

- 1) All structures and improvements would be protected from damage due to project activities (Includes monitoring wells in Unit 11, and snotel site in Unit 17).
- 2) Fuel treatment, logging and log hauling would occur in a safe manner so as not to endanger Forest users.
- 3) Warning signs notifying Forest users of potential hazards would be used when fuel treatment activities are adjacent to East Boulder Campground, trailheads and Forest Service trails. Signs would be posted in both directions on roads and trails. If necessary, special orders would be drafted to temporarily close some areas or recreation sites to protect the public.
- 4) Holders of special use permits (such as powerline permittees and outfitters) would be notified prior to treatment in the vicinity of their authorization. Park Electric should be consulted regarding treatments in the vicinity of the 69 kV powerline.
- 5) No equipment use, staging or storage, nor the decking or piling of slash would occur within the campground, at trailheads or on Forest Service trails unless specifically approved.

Effectiveness: Results from past timber sales on the Gallatin as well as on other fuel reduction project in the Region have shown that these general design criteria and mitigations, combined with site specific marking have been effective in the protection of recreation facilities. Forest protection officers routinely monitor campgrounds, trails, signs, as well as other types of activities and/or restrictions on the Gallatin National Forest. Although there are always exceptions, restrictions have been effective on the Yellowstone Ranger District. The traveling public has come to recognize several components of traffic control plans by virtue of their past and continual use in timber sale contracts. Additionally, these provisions are monitored and enforced by the sale administrator and Forest Service Law Enforcement assigned to the area.

Roadless (the North Absaroka Roadless Area) and Private Land

Incorporate the following mitigations to prevent encroachment into the Inventoried North Absaroka Roadless Area No. 1-371 and private land.

- 1) Cutting unit boundaries adjacent to the IRA will be clearly painted and mapped to avoid IRA. No roads or skid trails would be constructed within the IRA. No treatment units or areas are located in the IRA.
- 2) Adjacent land owners should be notified and consulted regarding treatment adjacent to their property.
- 3) This project does not propose any treatments on private property. However, to avoid any unintentional treatment on private land, property boundaries adjacent to proposed units would be surveyed.

Heritage Resources

The following mitigation should be incorporated to protect the heritage resource:

- 1) An archaeologist and the sale administrator will properly flag off the known sites before work would begin in the site vicinity such that the sites would be avoided by any disturbing activities. Landing areas and skid trails would also be located outside of the heritage site(s) locations. The fuel reduction actions can easily be completed and still avoid the site as long as the operators and sale administrator know where the site is located.
- 2) If any additional heritage sites should be encountered during the project then disturbing actions should be halted immediately and an archaeologist contacted.
- 3) If for some unknown reason, a heritage site could not be avoided, then winter harvest methods described on p. 48 of the EA would be applied.

Effectiveness: Following these mitigation measures would allow for modification of the project should sites be found.

Road Maintenance/Rehabilitation

- 1) Temporary roads constructed or re-opened for project activity should be designed with minimum handbook standards necessary to accomplish the task, temporary in nature, and effectively signed or gated to restrict public motorized use. Once the activity is complete, all of these roads should be effectively closed and re-vegetated. All new temporary, as well as re-opened roads not needed for future access would be recontoured, drained, and seeded. (GNF Travel Management Plan FEIS, Detailed Description of the Alternatives, Chapter 1-31.)
- 2) Forest roads utilized by this project that are vulnerable to spring break up damage should be restricted during this time.

Effectiveness: By adhering to the above mitigation measures, no adverse environmental impacts are anticipated related to roads. The above mitigation have been utilized successfully with numerous similar projects on the Forest

Project Monitoring

My decision also incorporates various ecosystem monitoring methods. Monitoring will be conducted and documented by various specialists and/or their staff. Monitoring results will be used to determine whether objectives are being met. Sampling frequency of the required monitoring will vary somewhat from year to year and is subject to change depending on available monitoring resources and monitoring results.

The Gallatin Forest Plan Monitoring Report for the years 2005-2007 are included in the Project File. The report includes the results of the monitoring procedures that Gallatin National Forest specialists have used to measure the effectiveness of various mitigation measures and design criteria associated with recent projects. The May 2008 vegetation council review of the completed units of the Main Boulder Fuels Reduction Project is also included in the Project File. This project, although quite a bit larger in scale has the same purpose and need and includes very similar treatments to those being prescribed in the East Boulder Project.

The East Boulder Fuels Reduction Project incorporates various mitigation and design criteria that have been monitored for effectiveness for the past several years. Forest Service personnel are responsible for the general implementation of the project including project design, contract preparation, contract administration, and assurance that mitigation measures are being carried through in treatment prescriptions, contract provisions, and are implemented on the ground. Contract administration will be conducted on a regular basis to assure acceptable contractor performance. The responsible official and/or as appropriate, resource specialists will review changes in contract requirements or provisions. Contract violations will be addressed promptly and will be resolved prior to further fuel reduction actions being implemented. All contract activities and correspondence will be documented and filed in the fuels reduction contract records. Post-harvest monitoring will be conducted and evaluated to determine whether required mitigation was effective at achieving desired results and will be utilized to determine any follow-up treatments that may be necessary.

Fuels

The project area will be monitored following the Gallatin National Forest fire/fuels monitoring protocol. This includes taking photo points in years 1, 3, and 5 following treatment.

Recreation, Safety and Special Uses

Regular field visits by contracting officer's representatives/sale administrators and by other district personnel will be done to verify proper installation and maintenance of warning signs in accordance with a traffic control plan and/or public involvement plan.

The District Ranger will contact owners of adjacent properties to attempt to coordinate the fuel reduction projects on the National Forest lands with those on adjacent private land.

Noxious Weeds

Monitor units, temporary roads, and associated activity areas for new weed infestations both pre and post-activity for several years and treat infested areas within the project area until controlled.

Monitor and evaluate the success of revegetation of temporary roads and landings in relation to project plans.

Wildlife

The District wildlife biologist will monitor retention of conifer clumps, snags, and down woody debris retention during implementation of prescribed treatments (at a minimum) to determine whether the wildlife mitigation and snag retention prescriptions were effective in maintaining sufficient habitat to meet Forest Plan Standards.

For reporting mandated by the Northern Rockies Lynx Amendment, monitoring is required to quantify the presence of lynx foraging habitat in treatment units *prior to implementation* of fuel reduction actions. Monitoring post-treatment would help improve the accuracy of estimates for lynx habitat actually impacted by treatment. These estimates would be used to track Forest-wide impact on lynx habitat over time.

Water Quality/BMP's/Fisheries

At least one BMP review will be conducted for some of the larger treatment units as well as for temporary road construction and rehabilitation. The BMP review team will use the Montana BMP audit forms augmented by the additional BMP's and EA required mitigation for the East Boulder Fuels Reduction Project. The objective of the BMP review is to document BMP and SMZ rule compliance and to validate the erosion and water quality effects predicted by examination soil erosion, runoff and water quality response, and re-vegetation of understory burns. A BMP review report, including observations and recommendations, will be prepared by the Gallatin NF Hydrologist and submitted to the Yellowstone District Ranger.

Soils

None of the proposed mechanical treatment units had substantial previous ground based harvest. Pre-project monitoring was completed in the summer and fall of 2009 using traverses as allowed in the Region 1 Technical Guide for Soils NEPA Analysis (USFS 2009) for treatment areas where past and existing activities do not include ground based activities. Post-harvest monitoring will be undertaken in representative tractor harvested units as needed based on the judgment of the Soil Scientist for the Gallatin National Forest. Monitoring will be conducted using the Northern Region Soil Quality Monitoring Protocol (version current at the time). The timing of monitoring will be two years and five years after from the end of the contract period. The Soil Scientist for the Gallatin National Forest will be actively involved with implementation of the contract relative to soil related issues during harvest and will review all tractor harvest units and selected cable and hand thinning units in the field immediately after harvest.

In addition, soils will be monitored during the BMP reviews that would be conducted for some of the larger harvest units. The BMP review team would use the Montana BMP audit forms augmented by the additional BMP's for the East Boulder Fuels Reduction Project. The objective of the soils portion of the BMP review is to document compliance with the soils BMP and to validate soil effects related to maintaining soil productivity. A review report will be prepared by the Gallatin NF Soil Scientist and submitted to the Yellowstone Ranger District upon completion of the review.

Air Quality/Smoke

Pile burning associated with this project will provide an opportunity to validate the particulate (PM_{2.5}) effects predicted by actually measuring PM_{2.5} levels in sensitive areas. PM_{2.5} will be monitored with a Data RAM, taking measurements at 15-minute intervals. Observations will be averaged for 1, 8, and 24 hour periods to compare to the SIS model predictions and the National Ambient Air Quality Standards. Pre-burn particulate background will be measured for approximately 6 hours before the burn and continued for a 24-hour period to include the burn, smoldering, any down valley drift, and post burn emissions.

Insect and Disease Infestations

Aerial detection surveys will continue to be conducted yearly by the Regional Forest Health and Protection and made available to the Forest in January of the following year. Ground observations will also occur at least every five years to determine progression of mountain pine beetle and Douglas-fir beetle attacks.

Roads

Monitoring of the temporary road construction and rehabilitation would be administered as part of the project contract, including the effectiveness of closures of these roads to public use during project implementation.

General Monitoring

My decision incorporates various ecosystem monitoring methods. Monitoring will be conducted and documented by various specialists and/or their staff. Monitoring results will be used to determine whether objectives are being met. Sampling frequency of the required monitoring will vary somewhat from year to year and is subject to change depending on available monitoring resources and monitoring results.

Other Alternatives Considered in Detail

The ID Team developed and analyzed three alternatives in detail for the East Boulder Fuels Reduction Project. Alternative 1 is the No Action/No Treatment Alternative; Alternative 2 includes only those units along the East Boulder Road and/or units adjacent to the East Boulder Mine site; and Alternative 3 that includes all units in Alternative 2 plus an additional 5 units that are located along the upper portions of the Lewis Gulch Road.

In coming to my decision to select Alternative 2, which is fully described on (pp. 4-12), I also considered two other alternatives that are described below:

Alternative 1: No Action

The National Environmental Policy Act (NEPA) requires the consideration of a No Action Alternative (40 CFR 1502.14d), which provides a baseline of comparison to aid in determining the significance of issues and effects of the proposed action. Under this alternative, no vegetation treatments would occur. Vertical and horizontal fuel continuity of fuel arrangement would remain a concern in the East Boulder WUI, threatening public and firefighter safety.

With Alternative 1, no management actions would be undertaken over the next few years that respond to the purpose and need identified on p. 3. The opportunity to reduce fuel accumulations would be deferred with no vegetative treatments undertaken to treat stands that are susceptible to lethal fire, insect and disease outbreaks, or for fuels management. Because many of the stands in the drainage are currently heavily stocked with older trees, and experiencing mountain pine beetle infestations, the incidence of tree mortality is expected to increase over time. This would lead to an increase in the rate of accumulation of standing and down dead fuels available to support a fire, with a resulting increase in the probability that, once ignited, a wildfire would have sufficient material to burn and it would quickly increase in intensity and escape attempts to contain it. As it pertains to fuel structures along evacuation routes and existing infrastructure, Cohen (2009) continues by stating: “In some cases, we will not be able to modify the fuels enough to save homes, but maybe to reduce fire intensity along travel corridors enough so that people can survive in their vehicles...” thus allowing responding emergency personnel more time to evacuate an area. Both the Nexus and Farsite models indicated there is a need to treat hazardous fuels within the East

Boulder analysis area to promote public and fire fighter safety as well as reduce the impacts to existing infrastructure in the event a large wildfire occurs in the drainage.

Alternative 3 –Corridor and Lewis Gulch Units

Alternative 3 includes all units and activities associated with the selected alternative, as well as 5 additional treatment units that are located along Lewis Gulch Road (See Map 4). Alternative 3 includes vegetation treatments on a maximum of approximately 870 acres in thirty separate units. Stand density reduction utilizing tractor harvesting equipment would occur on a maximum of approximately 660 acres on slopes up to 35%, harvesting both large and small diameter trees. A maximum of approximately 70 acres of stand density reduction on slopes >35% would involve skyline cable harvest, and approximately 140 acres would consist of hand-treatments (removal of ladder fuels, limbing of large diameter trees, and thinning of small diameter trees). Hand-treatments would occur in sensitive areas, areas where trees are too small for commercial harvest operations, and/or in areas that are not conducive to either tractor or skyline harvest methods. All of the information included in the description of Alternative 2 and Table 1 is also applicable to Alternative 3. The additional Lewis Gulch units are mixture of tractor and skyline cable harvest areas. Treatment of units located along the Lewis Gulch Road would be conducted in the fall/winter from mid-August until snow accumulations prevent harvesting operations. Several of the units would utilize cable harvest systems, which can't be safely and effectively completed over heavy snow and there are not known weed populations in these units. Mechanical operations would be allowed from August 15 through March 31 as long as appropriate weather related conditions exist. Any ground disturbing activities would occur when soils are dry, frozen, or snow covered.

Alternatives Considered But Eliminated From Detailed Study

Throughout the analysis process, a number of other alternatives were presented and explored to address various issues. However, for one reason or another, many of these alternatives did not merit detailed analysis or further consideration in the process. The three alternatives that were considered but eliminated from detailed study are listed below and described in detail in the Revised EA on pages 60-61.

Alternative 4 – Additional Harvest in Steep Areas Adjacent to the East Boulder Road

There was concern that treatments should also occur on the steep slopes adjacent to the south side of the East Boulder Road in Sections 3 & 4 in order to maximize the effectiveness of meeting the purpose and need for the project. There are no existing roads that access these areas. In the current economy, we have been advised by the Regional office that helicopter harvest is not economically feasible and not to plan new projects that include this type of harvest. The cost and effects to resources of constructing the amount of temporary road that would be needed to utilize skyline cable harvest in these areas, coupled with the low value of the products that would be removed, make this option unreasonable as well. Therefore, Alternative 4 was dismissed from further analysis.

Alternative 5 – Defensible Space Alternative (300 foot buffer)

Concerns for the intensity and scale of changes to the current condition resulting from treatments in the East Boulder WUI would not be fully satisfied with Alternative 5. Treatments within roughly 300 feet of existing structures would occur on less than ten percent of the area proposed with either Alternatives 2 or 3. Alternative 5 is too limited in scale to satisfy the purpose and need of the project, which is to increase public and firefighter safety and extend the potential time available for evacuation in the event of a wildfire. The objective of the project is not to protect private structures. However, treatments that reduce the likelihood of an uncontrollable wildfire will, in turn, aid in protecting structures. Alternative 2 & 3

encompass the benefits of Alternative 5 and much more. For this reason, Alternative 5 was dismissed from further study.

Alternative 6 – Include Treatments in the Adjacent Roadless Area

The interdisciplinary team looked at opportunities to include treatments in the roadless areas in Sections 32, 33, 3 & 2 that lie adjacent to the north side of the East Boulder Road. Similar to the conclusions made for Alternative 4, we have been advised by the Regional office not to include helicopter harvest units in projects that the FS is currently planning for economic feasibility reasons. If helicopter treatment methods were not utilized, any mechanized harvest in these areas would require crossing the East Boulder River. The East Boulder Mine has several water quality monitoring sites located along this portion of the river, further complicating the issue. Much of the area immediately adjacent to the East Boulder Road is privately owned and would not be available for FS treatment, and there are currently several fairly open south facing meadows interspersed on these slopes. For these reasons, Alternative 6 was dismissed from further consideration.

Decision Criteria

Based on a comparison of the alternatives with the three criteria described below, I have decided to implement Alternative 2 (Corridor Units). The criteria are:

1. Achievement of the project purpose and need as outlined on p. 3 of this document.
2. Responsiveness to public comments (Decision Notice, Appendix A) and the environmental issues (Revised EA, pp. 25-30) identified in association with this project.
3. Consistency with laws, regulations, and policy as described in detail on (pp. 24-36) of this Decision Notice.

The EA for this project addresses in detail the potential effects of implementing or not implementing a hazardous fuels reduction project in the East Boulder WUI on a variety of National Forest resources for each of the alternatives considered. I conclude from this information that the predicted effects of implementing Alternative 2 are well within acceptable limits. After careful evaluation of the following decision criteria, I strongly believe that Alternative 2 best meets the purpose and need for the project as well as the overall public interest.

1) Achievement of the Purpose and Need

Alternative 1 (No Action Alternative) would not treat the vertical and horizontal continuity of fuel arrangement in the East Boulder WUI. No actions would be undertaken over the next several years that respond to the purpose and need for the project as identified on p. 3. The opportunity to reduce fuel accumulations would be deferred. These stands would continue to increase in susceptibility to lethal wildfire and/or insect and disease outbreaks that could eventually lead to a climax disturbance that would result in stand replacing conditions that would pose threats to evacuation of the public from the mine and East Boulder corridor and for firefighter safety. .

Alternative 2 (Selected Alternative) fully addresses the purpose and need for the project. This alternative was developed focusing on the areas of high fuel hazard, high risk of human-caused ignition, and high social values. The selected alternative emphasizes treating those stands located along the East Boulder Road, adjacent to the East Boulder Mine and infrastructure, and/or private structures where thinning and reduction of conifer encroachment will improve public and firefighter safety. Harvest units associated with Alternative 2 will be administered as

Management Area 8 (timber) and Management Area 11 (forested big game habitat) with some units having linear inclusions of Management Area 7 (riparian), all of which allow for commercial timber management in the Gallatin Forest Plan.

Alternative 3 (Corridor and Lewis Gulch Units) includes all units and activities associated with Alternative 2 and adds an additional 5 units that are located along the Lewis Gulch Road. Although not directly adjacent to the main corridor, the Lewis Gulch units would effectively change wildfire patterns on a local scale, however, once a fire burned around these treated units the fire would likely increase in intensity and flame length. It is important to note that the only way time of arrival was positively affected was if a fire were to ignite from the south, either inside or outside of the project area. Otherwise there would be very little difference between the effectiveness of Alternative 3 and the selected alternative.

2) Responsiveness to Environmental Issues and Public Comments

In coming to my decision, I considered internally generated issues, public issues, the comments submitted during the scoping phase of this analysis (Project File), and those comments submitted during the EA comment period (Appendix A). The Interdisciplinary Team thoroughly studied the various resource issues and developed a range of alternatives and mitigation measures that addressed the most critical issues. I reviewed the primary resource issues and public comments for the project and evaluated the implications of each alternative below:

Fuels: The conclusions I made after careful consideration of the effects analyses presented in the EA (pp. 73-84) and in the fuels specialist report (Project File 8-1) are documented below:

With Alternative 1, forested areas within the East Boulder WUI would continue to follow natural rates of succession, with fuels becoming denser in areas adjacent to the East Boulder Road, East Boulder Mine and private lands. Wind-driven wildfire would be expected to transition quickly from the ground into the forest canopy. Risks to public and firefighter safety from wildfire would be high and would continue to increase over time without treatment of fuels.

Implementation of Alternative 2 (Selected Alternative) will modify the volume and arrangement of fuels in the East Boulder WUI. Treatments will be focused on those areas adjacent to the East Boulder Road, East Boulder Mine, and private lands. Ladder fuels and surface fuel loadings will be reduced thus reducing the likelihood of crown wildfire along the corridor and providing additional time for public evacuation. Implementation will also greatly increase firefighting capabilities and safety in the WUI.

Implementation of Alternative 3 (Includes Lewis Gulch Units) would modify the continuous arrangement of vertical and horizontal fuels within the East Boulder WUI, the same as Alternative 2. Alternative 3 would include treatment of five additional units located along the Lewis Gulch Road. In addition to the benefits described above for Alternative 2, treating hazardous fuels in the five Upper Lewis Gulch units would provide a deflecting mechanism, were a large fire to approach the area from the south. Although modeling displayed that the proposed fuel treatments in Lewis Gulch would decrease the time of arrival to existing infrastructure by up to two hours, these additional benefits would be dependent on the location of the fire start and the direction of the prevailing wind.

Noxious Weeds: The conclusions I made after careful consideration of the effects analyses presented in the EA (pp. 85-98) and in the noxious weeds specialist report (Project File 14-1) are documented below:

With Alternative 1 (No Action), no fuel treatments, temporary roads, or ground disturbance would be related to the project. Minor amounts of ground disturbing activities would likely occur in the East Boulder Corridor over time with the effects of these activities directly related to mitigation used to control weeds. Budgets for monitoring and treating weeds would likely remain at current levels. It is expected that weeds would continue to spread slowly over time unless a large stand replacing wildfire event were to occur, in which case noxious weed species would likely take advantage of the lack of competition from other vegetative species.

Alternative 2 (Selected Alternative) includes fuel treatments in some areas that currently contain noxious weeds. Mitigation has been designed to limit the spread of weeds including winter harvest of the majority of the units over 8" of snow or 4" of frozen ground, washing of off-road equipment, minimizing ground disturbance in areas containing weeds, etc. Pre and post-harvest weed monitoring and treatments are included as mandatory and will be funded for this project and coordinated with the current noxious weed monitoring and treatments that are ongoing in the corridor. Implementation of Alternative 2 with the above mentioned mitigation will pose minimal threat for the expansion of noxious weed infestations in the corridor.

Alternative 3 (Includes Lewis Gulch Units) includes all treatments associated with the selected alternative, and also includes five additional units located in Lewis Gulch that do not currently contain known weed infestations. These units would likely need to be treated in summer/fall, and would require additional temporary road for access, so would create additional ground disturbing activities that would provide suitable habitat for noxious weed expansion into this area. All mitigation, monitoring, and weed treatments associated with Alternative 2 would also apply to Alternative 3. Implementation of Alternative 3 would pose a higher risk for expansion of noxious weeds into areas that are currently uninfested than Alternative 2.

Water Quality and Fisheries: The water quality and fisheries analysis is documented in the EA (pp. 99-116) and in the Water Quality and Fishery specialist reports (Project File 11-1 & 11-15). I considered this information and came to the following conclusions:

Alternative 1 would result in no direct or indirect effects to water quality, fish populations or riparian habitat because there would be no vegetation treatments. Environmental monitoring stations established by the Stillwater Mining Company would continue to be monitored. With the selection of Alternative 1 (No Action Alternative), continuous vertical and horizontal fuel concentrations would remain throughout the WUI and the likelihood of a catastrophic wildfire adversely affecting the riparian areas would continue to increase. Catastrophic wildfire has potential to increase soil erosion, debris flows, and sediment loadings to the East Boulder River.

Either Alternative 2 (Selected Alternative) or Alternative 3, as run by Region 1 sediment models, would cause a very slight increase in sediment short term, but in 3-4 years sediment levels would return to pre-treatment levels. The East Boulder River and tributaries would be buffered (left untreated). Sediment levels in the East Boulder River are currently very low and the 3-4% projected increase from project related activities is too low to be measurable in terms of sediment concentration or any adverse habitat

effects for fish populations. With implementation of either action alternative, there would be no effect to riparian integrity, channel or streambank stability, or aquatic habitat and biota. Continuous vertical and horizontal fuels would be broken up and decreased in the WUI and the likelihood of a catastrophic wildfire adversely affecting the riparian areas would be decreased. Environmental monitoring stations established by the Stillwater Mining Company would continue to be monitored. Both alternatives have been discussed with and have the support of the Madison-Gallatin Chapter of Trout Unlimited (Project File 4-6a).

Wildlife and Wildlife Habitat: Analysis of various species of wildlife and their habitat is documented in the EA (pp. 132-195) and in the various wildlife specialist reports (Project File). I considered this information and came to the following conclusions:

Selection of Alternative 1 (No Action Alternative) would not alter wildlife habitat by modifying forest structure. There would be no direct or indirect effects to various wildlife species. However, without treatment, insect and disease populations are expected to continue to build, as will fuel accumulations, increasing the potential for a large wildfire that could dramatically change vegetative conditions.

Implementation of Alternative 2 (Selected Alternative) will focus vegetation treatments along the East Boulder Road, East Boulder Mine and infrastructure, and adjacent private inholdings. Project design features and mitigation call for retaining untreated clumps of trees, untreated buffers along wet areas and other key habitat components and the East Boulder River and its tributaries to retain habitat for various species of wildlife and birds. Thinning will reduce hiding and thermal cover somewhat, but will increase forage availability by opening up the canopy and stimulating the production of grasses, forbs and shrubs. Effects to various species of wildlife and birds would be expected to be minor because the areas to be treated currently have high levels of human activity and are not considered to be prime habitat for most species of concern.

Alternative 3 would include all treatments and effects associated with Alternative 2, plus five additional units in Upper Lewis Gulch, which are more remote and contain prime habitat for lynx, travel corridors for deer and moose, and would have greater impacts on snags and snag dependent species. However, some species of concern would benefit from increased forage opportunities in these areas. Additional temporary roads would be needed to access these units, which would temporarily reduce habitat security until the roads are reclaimed.

Vegetative Structure/Old Growth: The vegetative structure/old growth analysis is documented in the EA (pp. 203-208) and in the vegetation/old growth specialist report (Project File 12-1). I thoroughly considered this information and came to the following conclusions:

Selection of Alternative 1 (No Action Alternative) would have no direct or indirect effect to vegetation because no vegetative treatments are proposed with this alternative.

Alternative 2 (Selected Alternative) will only slightly change the forested vegetative structural composition of the overall project area. Treatment activities will slightly reduce old growth from 21% to 20.5%, while mature forest will actually increase from 43% to 43.5%. Generally speaking stands dominated by Douglas-fir, Douglas-fir/lodgepole mix or lodgepole will continue to be dominated by those species. What will change is the percent canopy cover, which post-treatment in most stands will average

between 50%-60%, except in lodgepole dominated stands where post-treatment canopy will likely be somewhat less.

Alternative 3 would cause old growth to decline from 21% to 19.7% and would increase mature forest from 43% to 44.3%. Vegetative species composition and other structural stages would only see minor effects similar to those associated with Alternative 2.

Soils: The soils analysis is documented in the EA (pp. 119-125) and in the soils specialist report (Project File 10-1). I thoroughly considered this information and came to the following conclusions:

Selection of Alternative 1 (No Action Alternative) would have no effect on soil productivity because no ground-disturbing treatments are proposed with this alternative.

Implementation of either Alternative 2 (Selected Alternative) or Alternative 3 would have no long-term detrimental effect on soil productivity due to effective mitigation and restoration practices. Alternative 2 treats less area, requires less temporary roads, and creates less overall soil disturbance than Alternative 3, however, no treatment units associated with either alternative are predicted to exceed Region 1 standard of 15% detrimental soil disturbance. Alternative 2 requires the majority of the mechanical treatment units to be harvested over snow or frozen ground, which also limits detrimental soil disturbance, while the five additional Lewis Gulch units would likely be treated in the late summer/fall due to snowloads and the condition of the Lewis Gulch Road.

Other Issues: The NEPA provides for identification and elimination from detailed study, those issues that are not significant or which have been covered by prior environmental review, narrowing the discussion of these issues to a brief presentation of why they will not have a significant effect on the human environment or providing a reference to their coverage elsewhere (40CFR 1501.7(3)). While I considered these issues in making my decision, they were either unaffected, mildly affected, or the effects could be adequately mitigated for all of the alternatives. An assessment of each of these issues is provided in the Revised EA (Chapter 3). Public comments and responses regarding these resource issues are included in Appendix A of this document.

- A. **Air Quality**
- B. **Roadless/Unroaded**
- C. **Visuals**
- D. **Recreation**
- E. **Special Uses**
- F. **Insect & Disease**
- G. **Sensitive Plants**
- H. **Economics/Mine**
- I. **Heritage Resources**

3) Consistency with Laws, Regulations, and Policy

Laws, regulations, and policies that pertain to this project include the Gallatin Forest Plan (1987), the Gallatin National Forest Land and Resource Management Plan FEIS (1987); the Gallatin National Forest Travel Plan Decision (2006),), National Environmental Policy Act of 1969 (NEPA) as amended, National Fire Plan 2000, 1995 Federal Wildland Fire Management Policy and Program, Healthy Forest Restoration Act of 2003, Sweet Grass County Community Wildfire Protection Plan

(2008), Forest Service Manual 5150 Fuels Management, Region 1 Soil Standards, the Endangered Species Act of 1973, Federal Noxious Weed Management Act, Forest Service Manual 2526 Riparian Management, Migratory Bird Treaty Act (as amended); National Forest Management Act of 1976 (NFMA), National Historic Preservation Act of 1966 (as amended); State of Montana Water Act of 1974, Clean Air Act of 1963, State of Montana Best Management Practices; Trout Unlimited Settlement Agreement; Land Use Strategy for Westslope and Yellowstone Cutthroat Trout; Cooperative Conservation Agreement for Yellowstone Cutthroat Trout; and Executive Order 12962 (June 1995) Aquatic Resource Protection, Executive Order 12898 – Environmental Justice. More detailed descriptions of compliance with these can be found in the various resource analyses in Chapter 3 of the Revised EA. A comparison of compliance between the three alternatives is summarized below:

Alternative 1 (No Action Alternative) would be consistent with the above-mentioned laws, regulations, and guidelines. No vegetative treatments would occur in the East Boulder WUI with selection of Alternative 1 and opportunities to reduce fuels and improve forest health would be foregone in the immediate future. The 2000 National Fire Plan, Healthy Forest Restoration Act of 2003, and 2008 Sweet Grass County Wildfire Protection Plan all place a top priority on firefighter and public safety by implementing vegetation treatments in the WUI. With Alternative 1, there would be no modification of vertical and horizontal fuel loadings in the East Boulder WUI, adjacent to the East Boulder Road, East Boulder Mine and powerline, and private residences and structures.

Alternative 2 (Selected Alternative) and Alternative 3 will be consistent with all of the above-mentioned laws, regulations, and guidelines. Stand treatments are designed to be consistent with Forest Plan goals for MA 8, MA11, and MA7 will be achieved through the various vegetative treatments associated with both of the action alternatives. The 2000 National Fire Plan, Healthy Forest Restoration Act of 2003, and 2008 Sweet Grass County Wildfire Protection Plan all place a top priority on firefighter and public safety. Treatments associated with Alternative 2 and Alternative 3 would modify vertical and horizontal fuel loadings in the East Boulder WUI adjacent to the East Boulder Road, East Boulder Mine and powerline, and private residences and structures, providing additional time for evacuation of the corridor, and safer conditions for firefighters were a catastrophic wildfire to occur. Compliance with all other laws, regulations, and guidelines would be ensured by applying effective mitigation as outlined on pp. 12-23 of this Decision Notice.

Public Involvement

Collaboration with Sweet Grass County officials, Big Timber city officials, local fire departments, Stillwater Mining Corporation officials, BLM, local businesses, adjacent private landowners, recreationists, and other interested public has been and will continue to be important in the development of the East Boulder Fuels Treatment Project. The proposal was developed with input from adjacent private homeowners, as well as state, county, and local officials. Public meetings and field trips have been held with the Forest Service providing information and updates regarding the proposed project on National Forest System lands.

A listening session was held at the Big Timber Office on February 11, 2009. Local business representatives, city officials, county officials, fire department members, and local environmental group representatives that had previously expressed interest in helping to develop the East Boulder Fuel Reduction Project proposal were invited. The Big Timber District Ranger and various resource specialists facilitated the session. In attendance were representatives from the Stillwater Mining Corporation (East Boulder Mine), Big Timber Volunteer Fire Department, Boulder Watershed Association, RY Timber, and local environmental groups. The Forest Service also presented the same information later that day to members of the Cottonwood Resource Council (a local environmental group) at their monthly meeting

asking for their ideas and input reading the project. The purpose of these sessions was for the Forest Service to listen to what interested parties had to say regarding the project and to incorporate the public's ideas into the development of an initial proposal that was presented to the general public at a public meeting in March of 2009.

An open house regarding the project was held at the Big Timber Ranger District on March 18, 2009 to discuss the initial hazardous fuel reduction proposal. Notice of this meeting was posted as a Legal Notice in the Bozeman Daily Chronicle on Wednesday, February 25, 2009 and in the Big Timber Pioneer on Thursday February 26, 2009. The meeting, facilitated by the District Ranger and IDT members, and was attended by a representative from the Big Timber Pioneer, Sweet Grass County Commissioners, and some of the adjacent private landowners. The initial proposal was presented and discussed with the attendees. Ideas from this meeting were utilized in drafting the project proposal that went out for public scoping.

The scoping letter for the East Boulder Fuels Reduction Project was sent to interested parties on April 10, 2009 (Mailing List, Project File). More than 90 scoping letters were mailed to private individuals, organizations, groups, businesses, media and elected officials that the Forest Service felt would potentially be interested in the project. Ten groups or individuals responded to the scoping letter. A summary of scoping comments was created and all of these comments, as well as internal comments, were considered in determining potential issues and developing the actual treatment units that are associated with each of the action alternatives.

Public field trips have been available to anyone wanting to review the various activities associated with the alternatives for this project. The intention is to provide the interested public with an on the ground opportunity to comment on various aspects of the proposed project.

The environmental issues addressed in the Revised EA were identified through the processes described. Key issues were used to develop alternatives to the proposed action and to focus the scope of the analysis on the issues that are "key" to the decision to be made. Documentation of the review of scoping, comments, and potential issues can be found in the Project File.

Once the scoping process was completed, the interdisciplinary team (ID Team) developed alternatives to the proposed action with specific features designed to address the previously identified issues. For the East Boulder Fuels Reduction Project, the No Action Alternative, the Proposed Action Alternative, and one additional action alternative were developed for detailed consideration. The original EA for the project was released in March of 2010 and mailed to 35 potentially interested parties or groups. A total of three comment letters were received regarding the project. A Decision Notice, selecting Alternative 2 for implementation was released in June of 2010. Two appeals regarding the decision were received. Following the appeals, the Decision Notice and FONSI were thoroughly reviewed by the Forest and the Regional Appeal Panel. In light of recent court decisions relative to Management Indicator Species, the re-listing of the gray wolf, and the intricacies of meeting big game hiding cover standards required by the Gallatin Forest Plan, the decision was made to withdraw the June 4, 2010 Decision Notice and FONSI in order to further evaluate and conduct additional wildlife analyses for the project.

Upon completion of the additional analyses, a Revised EA for the project was completed and released to the public for a 30 day comment period on April 25, 2011. Six comment letters regarding the project were received.

The East Boulder Fuels Reduction Project was identified on the Gallatin National Forest NEPA Quarterly Project Listings from spring 2008 through summer 2011.

Consistency With Other Laws, Regulations, and Policies

Gallatin Forest Plan (1987)

The Gallatin Forest Plan (1987) embodies the provisions of the National Forest Management Act, its implementing regulations, and other guiding documents. The Forest Plan sets forth in detail the direction for managing the land and resources of the Gallatin National Forest. The East Boulder Fuel Reduction Project tiers to the Forest Plan FEIS, as encouraged by 40 CFR 1502.20. Chapter 3 of the EA includes a summary by resource of the standards and guidelines established in the Forest Plan that are pertinent to my decision. My decision tiers to the Final Environmental Impact Statement (FEIS) and Land and Resource Management Plan (Forest Plan) for the Gallatin National Forest (USDA Forest Service 1987 PF 206 & 206(a)). The Forest Plan provides direction for all resource management programs, practices, uses, and protection measures for the Gallatin National Forest. A Forest Plan compliance Table addressing each of the applicable Gallatin Forest Plan Standards was prepared for the project and is included in the Project File (1-13).

Forest Plan Goals & Standards for Fire

My decision to implement Alternative 2 is supported by the following Forest Plan direction:

Provide a fire protection and use program that is responsive to land and resource management goals and objectives. (FP p. II-2)

Fire Standards: Treatment of natural fuel accumulations to support hazard reduction and management area goals will be continued. (FP p. II-28)

Forest Plan Management Area Direction

The Forest Plan uses management areas to guide management of the National Forest lands within the Gallatin National Forest. Each management area (MA) provides for a unique combination of activities, practices, and uses. The East Boulder Fuels Reduction project area includes five management areas. The majority of the timber harvest and treatment activities involved with this project will occur in MA8 and MA11, with a few small inclusions of MA3 and MA12 and linear inclusions of MA7 in some units. All fuel reduction activities associated with the proposed actions comply with Forest Plan guidelines for the applicable MAs. See MA Map 5, EA, Ch 1-18 & 1-19 and Table 1 (Individual Unit Descriptions) for MA designations of individual units.

The Forest Plan (Chapter III) contains a detailed description of each management area as it relates to resource issues. Following is a brief description of the applicable management area direction and how my decision is consistent with this direction.

Management Area 8 (MA 8) - These areas consist of lands that are suitable for timber management. Douglas-fir and lodgepole pine should be favored in timber management. Both even aged and uneven aged harvest methods should be included. Project plans should incorporate considerations for fish and wildlife. My decision to implement Alternative 2 incorporates prescriptions that will favor Douglas-fir and lodgepole pine. A variety of different treatments have been incorporated into the individual unit prescriptions (See Table 1). Numerous mitigation have been incorporated into project design to protect fish and wildlife habitat and species. Detailed analysis was completed to identify and mitigate for any adverse affects. The action alternatives meet these wildlife and fishery standards applicable to MA 8. Standards for Management Area 8 applicable to the various resource issues will be met with the implementation of the mitigation measures outlined in on pp.???

Management Area 11 (MA 11)- These areas consist of forested big game habitat. They include productive forestlands that are suitable for timber harvest, provided that big game habitat objectives are met. Include even and uneven aged harvest systems. Wildfire suppression response will be control. MA11 requires that timber harvest on big game winter range is designed to enhance winter range capability and design even-aged openings so that no point is more than 600 feet from cover (p. III-34). The Gallatin Forest Travel Management Plan states that new roads built for administrative projects should be temporary in nature, and effectively gated to restrict motorized public use. Once the activity is complete, these roads will be permanently and effectively closed and re-vegetated (USDA 2006: I-II, Guideline D-7).

My decision will be in compliance with applicable direction for management of big game habitat because there will be adequate habitat maintained in the project area and surrounding vicinity to allow for increasing populations of big game species. Winter range will be managed to meet the forage and cover needs of deer, elk and moose, with increased forage/cover ratios. Proposed treatments within MA 11 are designed to enhance winter range capability by leaving key areas untreated to retain vital cover, while at the same time increasing forage production in areas where the forest canopy is opened. The Forest Plan standards to retain 2/3 of the hiding cover associated with key habitat features, and to ensure no even-aged openings are more than 600 feet from cover, will be met by incorporating 15% to 20% untreated clump retention through unit layout design. Road density will be managed by following the Travel Plan guideline to restrict public use on project roads during implementation and effectively close temporary roads upon project completion.

Management Area 7 (MA 7) - These areas consist of lands bordering lakes, streams, and/or springs that support moisture loving vegetation. They will be managed to protect the soil, water, vegetation, fish and wildlife dependent on it. These areas are classified as suitable for timber production if adjacent areas contain suitable timber. Design timber harvest to meet the needs of riparian dependent species. The wildfire suppression response will be the same as for the management areas surrounding riparian areas. *Note: These areas are normally too narrow to be displayed on Forest MA maps due to the small scale of these maps.*

Detailed analysis was completed to identify and mitigate for any adverse affects. Alternative 2 meets these wildlife and fishery standards applicable to MA7 (riparian). Standards for Management Area 7 applicable to various resource issues will be met with the implementation of the mitigation measures outlined in the EA, pp. 2-23 through 2-25 and BMPs will be followed to assure that the needs of riparian dependent species will be met with project implementation.

Management Area 3 (MA 3)- These areas consist of non-forest, noncommercial forest, and forested areas unsuitable for timber production. Timber salvage, product and firewood removal may occur where access exists. Salvage of dead, dying, or high-hazard trees to prevent insect and disease population buildups that could adversely affect regulated timber stands is permitted. Only two treatment units have very minor inclusions of MA3. Treatments within these areas will comply with management area direction with Alternative 2.

Management Area 12 (MA 12) - MA 12 provides goals and objectives to maintain and improve the vegetative condition to provide habitat for a diversity of wildlife species and a variety of dispersed recreation opportunities. Harvest of post, pole, and other wood products can take place adjacent to existing roads. Only small portions of primarily hand treatment

units lie within MA12. Treatments in these areas were designed to comply with MA12 management direction.

There is nothing in my decision (Alternative 2) that is incompatible with the direction for any of the Management Areas that are found in the treatment areas associated with the project.

Forest Plan General Direction (Standards & Goals)

The Gallatin Forest Plan contains a goal to provide habitat for all indigenous wildlife species including increasing populations of big game animals (p. II-1). Forest-wide standards in the Forest Plan require that winter range be managed to meet the forage and cover needs of deer, elk, moose and other big game species, and that at least two thirds of the hiding cover associated with key habitat components be maintained over time (p. II-18). Key habitat components include moist areas (wallows, etc), foraging areas (meadows and parks), thermal cover, migration routes and staging areas. Much of the proposed treatment falls within MA 11, which requires that timber harvest on big game winter range is designed to enhance winter range capability and to design even-aged openings so that no point is more than 600 feet from cover (p. III-34). The Gallatin Forest Travel Management Plan states that new roads built for administrative projects should be temporary in nature, and effectively gated to restrict motorized public use. Once the activity is complete, these roads should be permanently and effectively closed and re-vegetated (USDA 2006: I-II, Guideline D-7).

My decision to implement Alternative 2 would be in compliance with applicable direction for management of big game habitat. There would be adequate habitat maintained in the project area and surrounding vicinity to allow for increasing populations of big game species. Winter range would be managed to meet the forage and cover needs of deer, elk and moose, with increased forage/cover ratios under the action alternatives. Proposed treatment within MA 11 is designed to enhance winter range capability by leaving key areas untreated to retain vital cover, while at the same time increasing forage production in areas where the forest canopy is opened. The Forest Plan standards to retain 2/3 of the hiding cover associated with key habitat features, and to ensure no even-aged openings are more than 600 feet from cover, would be met through unit layout design. Road density would be managed by following the Travel Plan guideline to restrict public use on project roads during implementation and effectively close temporary roads upon project completion. Elk population goals have been met for this EMU and are considered to be healthy and widely distributed.

Forest Plan Standard for Wildlife and Fish, page II-18, section 6.a.5 – Maintain at least two thirds of the hiding cover associated with key habitat components overtime. Hiding cover was evaluated by assessing structural characteristics of forested habitats. Field visits were made to collect data using protocols described in literature (Lyon and Marcum 1986 and Smith and Long 1987) and outlined in detail in the Gallatin National Forest Plan Hiding Cover Assessment 2011 (Project File 9E-31). Sample points were selected in or adjacent to treatment areas in proportion to PI strata represented in the analysis area. Field data was summarized and averaged over each stratum. My decision would be in compliance with Forest Plan hiding cover standards (EA p. 191)

Forest Plan Standard for Wildlife and Fish, page II-18, section 6.a.8 – Emphasis will be given to the management of special and unique wildlife habitats such as wallows, licks, talus, cliffs, caves, and riparian areas. Key components such as cover, security areas, and road densities would remain unchanged with my decision. Alternative 2 would not result in adverse modification of big game or its associated habitat. Elk population goals have been met for this EMU and are considered to be healthy and widely distributed.

Forest Plan Standard for Threatened and Endangered Species, page II-18, section 6.b.all. Threatened and endangered species were addressed as part of the analysis for proposed vegetation and stewardship treatments (EA pp.132-142). My decision is in compliance with this standard.

Forest Plan Standards for Grizzly Bear for timber and fire management, p. G-10-11, are concerned with evaluating and reviewing biological information, utilizing proposed treatments to improve habitat for bears and minimizing open road density within occupied habitat and unoccupied habitat. The project is outside of the recovery area and is considered unoccupied by grizzly bears. The nearest boundary is approximately 2 miles from occupied habitat. Occasional grizzly sightings occur in the analysis area in the Deer Creek drainage that lies to the north of the project during spring emergence but grizzlies have not been documented in the project vicinity. All standards were considered during project development and mitigation measures have been incorporated to address any specific standards and issues that were identified. There are no standards specific to management for grizzly bears in the management areas associated with this project.

Forest Plan Standard for Wildlife and Fish, page II-18, section 6.a.12 – Habitat that is essential for species identified in the Sensitive species list developed for Region 1 (Project File 9B-1a through 9B-1c) will be managed to maintain these species. Sensitive species were addressed as part of the analysis for proposed vegetation treatment in the East Boulder project area. All terrestrial and aquatic sensitive species were dismissed or analyzed in detail. Mitigation measures were identified as appropriate.

Forest Plan Standard for Wildlife and Fish, page II-18, section 6.a.13 – Indicator species will be monitored. Indicator species were identified and addressed as part of the analysis for proposed vegetation treatment in the East Boulder project area. Mitigation measures were identified as appropriate. Effects from this project were evaluated in conjunction with the 2011 Gallatin Forest Plan Management Indicator Species Assessment (Project File 9B-5a).

The Gallatin Forest Plan (USDA 1987) contains standards for retention of snags and down woody debris (Amendment No. 15), which are important habitat components for a number of migratory bird SOC (See Issue N-Snags, pp. 3-95 through 3-97). Where possible, snags would be left in clumps with live trees for protection. Where there are not sufficient snags to meet the minimum retention standard of 30 snags per 10 acres, the largest available dead trees will be left as snags. As a part of project layout, snags will be marked to leave and tallied by unit. No firewood cutting signs will be posted throughout the sale area to ensure that the snags will not be removed for firewood. If firewood cutting becomes a problem after these timber sale signs are removed (following completion of project activities), wildlife tree tags will be placed on snags that are visible and easily accessible from the East Boulder Road. This would be consistent with the Snag Management Direction, Guideline A2 which states - "protect snags, purposefully retained for wildlife use, from loss to firewood cutting. Emphasize snag retention in areas away from easy access for firewood cutting" and A2-A "During timber sale layout, mark all designated snags and replacement trees that could be easily accessed by firewood cutters".

Between retention clumps and remnant trees in thinned areas, there should be no problem meeting the Forest Plan requirement for replacement snags. Regenerating stands scheduled for hand thinning (Units 2, 3A, 4, 6, 7B, 8, 8A, 11A, 12A) currently have no snags available for retention, but would meet requirements for replacement trees. Snag habitat needs were considered for Townsend's big-eared bat, flammulated owl, Northern goshawk, pine marten,

and migratory birds. Forest Plan standards for snag and down woody debris management would be met under my decision. Snag habitat would remain well distributed across the landscape within all forest types.

The Plan also contains a standard to maintain suitable habitat for those species of birds, mammals and fish that are totally or partially dependent upon riparian areas for their existence (p. III-19). My decision will be in compliance with applicable direction. Potential effects of the project have been evaluated, with focus on migratory bird species of concern. Standard operating procedures and project design criteria will be implemented to reduce potential impacts of fuel treatment, and meet Forest Plan direction.

Forest Plan (Vegetation Diversity Item 1, FP p. II-19) Forestlands and other vegetative communities such as grassland, aspen willow, sagebrush and whitebark pine will be managed by prescribed fire and other methods to produce and maintain the desired vegetative condition. Methods of site preparation will normally be machine scarification and piling or broadcast burning. Other methods may be prescribed which meet the objectives of the silvicultural system. These include underburning, trampling, hand tool scarification, machine yarding, herbicides, and others. Activity created dead and down woody debris will be reduced to a level commensurate with risk analysis. Treatment of natural fuel accumulations to support hazard reduction and management area goals will be continued. With the selection of Alternative 2, forestlands will be managed to produce desired vegetative conditions, activity fuels will be piled and burned, and natural fuel accumulations will be treated to support hazard reduction to increase public and firefighter safety.

Forest Plan Standard for Recreation, page. II-1 - Provide for a broad spectrum of recreation opportunities in a variety of Forest settings. The Forest Plan recognizes objectives for recreation settings by incorporating the Recreation Opportunity Spectrum (ROS), which provides a framework for stratifying and defining classes of outdoor recreation environments, activities, and experience opportunities (FP, pg. II-2). Furthermore, the Plan specifically identifies as objectives activities that will be managed 1) to provide for users' safety, 2) that existing recreational hunting opportunities will be maintained, 3) that recreation trails will provide safe public access, and 4) to continue the cabin rental program (FP, pg. II-2-3). My decision will comply with this direction provided by the Gallatin Forest Plan. The purpose and need for the project is to 1) provide for users safety (public and firefighter).

The Forest Plan identifies Inventoried Roadless Areas (IRAs), including area 1-372, the "North Absaroka" (FP, pg. V-9-10 and Appendix C-5), which is located within or adjacent to portions of the project area. My decision is in compliance with laws, regulations and direction regarding roadless area concerns. There will be no impacts to the North Absaroka Inventoried Roadless Area because there will be no project related activities within this inventoried roadless area.

The Gallatin Forest Plan (page 11-28) requires the Forest to implement an integrated weed control program in order to confine present infestations and prevent establishing new areas of noxious weeds. Weed monitoring and control are an important part of my decision. Numerous mitigation measures have also been established to minimize weed infestation and spread in the project area.

Forest Plan Direction for Visual Resource, page II-1 - Provide visitors with visually appealing scenery. Forest Plan Visual Quality Objectives (VQOs) are a blending of the results from the VMS Inventory and other resource considerations. The VQOs serve as the Forest Plan standards for visual quality that provide large-scale guidance for the degree of

acceptable landscape change for all management initiated landscape-altering activities (FP, pg. II-16). Within the East Boulder project area, the Forest Plan VQOs of Partial Retention and Maximum Modification apply. The definitions of these VQOs are shown on page VI-44 of the Gallatin National Forest Plan. By implementation of the mitigation and design criteria outlined in the Decision on pp. 12-22, my decision will easily meet Forest Plan standards for visual quality.

The Gallatin Forest Plan, Forest Wide Standards 10.2 (page II-23) requires that Best Management Practices (BMP's) will be used in all Forest watersheds. The Montana Forestry BMP's are included in Appendix A, BMPs, which are required to be followed in all timber harvest and road construction activities. Forest Plan Direction A.5 (page II-1) requires the Gallatin NF to meet or exceed State of Montana water quality standards. The East Boulder Fuels Reduction Project will be in compliance with Gallatin NF Forest Plan direction for water quality protection. Sediment modeling indicates that project sediment increases are immeasurable and well within the Gallatin NF sediment guidelines.

The Gallatin National Forest Plan provides broad direction for the management of forest fishery resources and more specific direction for management of sensitive species. Riparian Direction: MA7 (FP, p. III-19). Refer to Item No. 29f that resolves FP discrepancy for timber management in riparian zones. Standards have been incorporated as part of the Gallatin National Forest Travel Management Plan signed December 18, 2006 (GNF 2006). My decision complies with existing laws, regulations, and Forest Plan direction. My decision also meets the intent of the Trout Unlimited Settlement Agreement because riparian areas and aquatic resources are protected. The project has the support of the Madison-Gallatin Chapter of Trout Unlimited (Project File 4-5a). No effects to habitat and fish populations are expected.

Forest Plan Direction for Air Quality in Forest Wide Standards, page II-23. Require the Forest to cooperate with the Montana Air Quality Bureau (now DEQ) in the SIP and smoke management plan. By limiting the timing, quantity, and intensity of the pile burning activities as described on p. 14, my decision will comply with the air quality laws, guidelines and standards.

Gallatin Forest Travel Plan Direction (2006)

The 2006 Gallatin National Forest Travel Plan directs where specific types of motorized use can occur. My decision is in compliance with these laws, regulations, and direction regarding recreation concerns. Various laws provide the authority for special uses on NFS lands. The Forest Plan authorizes the issuance of special use permits on a case by case basis (FP, pg. II-27). Private Road Special Use Permits or easements are considered a variance to the 2007 Gallatin National Forest Travel Plan. All alternatives for the project are in compliance with law, regulation, and direction regarding special use concerns. Impacts to permittees with facilities on NFS lands can be easily avoided or mitigated with input from the permittees.

Stream standards have been incorporated as part of the Gallatin National Forest Travel Management Plan signed December 18, 2006 (GNF 2006). In the past, the sediment standard consisted of four categories of streams. Fishless headwater streams (i.e., Category C and D streams) were managed at a level below what Montana Department of Environmental Quality (MDEQ) considers as maintaining beneficial uses. This new direction formalizes these two standards for sediment. Class A streams are those streams that support a sensitive fish species or provide spawning or rearing habitat to the Gallatin, Madison, or Yellowstone Rivers, or Hebgen Lake. Class A streams are to be managed at a level which provides at least 90 percent of their inherent fish habitat capability. Class B streams are all other streams. My decision complies with existing laws, regulations, and Forest Plan direction.

Regional Standards

Region 1 Soil Standards

All soil mitigations and design criteria are intended to keep detrimental soil disturbance in treatment units below the 15% maximum allowable DSD as mandated by the R-1 Supplement 2500-99-1 to FSM 2500 – Watershed and Air Management standards. Coarse woody debris criteria have an additional benefit of ensuring that sufficient organic matter is retained on treatment sites to maintain soil fertility and carbon cycling levels. Other criteria that prevent soil erosion maintain soil fertility and carbon cycling functions in the soil as well.

My decision is consistent with current direction in the Gallatin Forest Plan. In addition, the soil mitigations and design features meet the full intent of relevant objectives and standards in the Forest Plan for the Gallatin National Forest. All of the above are designed to address the Forest Plan’s objective for mitigating “impacts occurring to the watershed resource from land use activities”. Minimizing soil erosion in treatment units through soil mitigations also helps meet the Forest Plan objective for “meeting State water quality standards”.

Relevant Forest Plan directives are: 8.b.1.c. “Maintain an adequate nutrient pool for long-term site productivity through the retention of topsoil and soil organisms”, 10.8. All management practices will be designed or modified as necessary to maintain land productivity and protect beneficial uses.” and 14.4. Treatment of natural fuel accumulations to support hazard reduction and support management area goals will be continued.

National Fire Management Direction

1995 Federal Wildland Fire Management Policy and Program

The 1995 Federal Wildland Fire Management Policy and Program contain guiding principles that support my decision regarding the East Boulder Fuels Reduction Project.

Firefighter and public safety is the first priority in every fire management activity. The primary purpose and need of the East Boulder Fuels Reduction Project is to improve firefighter and public safety by modifying fire behavior by changing the fuels environment in the portions of the WUI that are the closest to the East Boulder Road (evacuation route), the East Boulder Mine, the high intensity powerline servicing the mine, private residences and other structures. The modification of fuels will provide safer conditions for evacuation and firefighting in the event of a large wildfire event.

Fire management plans, programs, and activities support land and resource management plans and their importance. My decision is consistent with the Federal Wildland Fire Management Policy and the Gallatin National Forest Fire Management Plan.

Sound risk management is the foundation for all fire management activities. The East Boulder Project analyzes the risk to the public and firefighter communities associated with the Selected Alternative by comparing the resulting fuel conditions associated with management activities versus “no action”, as related to fire behavior.

Fire management programs and activities are economically viable, based upon values to be protected, costs, and land and resource management objectives. With the East Boulder Project, the overriding value at risk is the safety of the public and firefighters. A cash-flow analysis included Chapter 3 of the EA supports the conclusion that funds will be available to achieve the

ecosystem restoration items such as weed monitoring and spraying and treatment of sub-merchantable fuels.

Fire management plans must be based on the best available science. The East Boulder Project has incorporated the latest science and modeling techniques for fire behavior prediction and the effectiveness of fuels treatments. These techniques include Forest Vegetation Simulation – Fire/Fuel Effects Extension (FVS-FFE), NEXUS, and BEHAVE (See EA pp. 2-4 & 2-5 for a description of these modeling techniques).

Fire management plans and activities incorporate public health and environmental quality considerations. The East Boulder Project addresses the need for increasing public and firefighter safety in the event of a large fire event. Smoke management, recreational values, and the impacts of fuels treatments on wildlife, fish, noxious weeds, soils, and visuals are also addressed in the document.

Federal, Tribal, State and local interagency coordination and cooperation are essential. Coordination and cooperation for the project included local consultation with the Sweet Grass County officials including county commissioners, fire, and law enforcement; and the Northern Rocky Mountain Resource Conservation and Development Council (RC&D). All of these agencies support the project. Federal cooperation and consultation includes State and Federal Private Forestry groups and the Crow tribal government. Representatives from the Crow Tribal Nation met with the Forest archaeologist in the field and support the project. The wildlife biologist collaborated with Montana Fish, Wildlife, and Parks, as well as the US Fish and Wildlife Service. Both agencies support the project.

National Fire Plan 2000

The National Fire Plan 2000 states “Assign the highest priority for hazardous fuels reduction to communities at risk, readily accessible municipal watersheds, threatened and endangered species habitat, and/or other important local features, where current conditions favor uncharacteristically intense fires”. The analysis area for the project has been identified by the 2008 Sweet Grass County CWPP as a WUI that is at high risk for catastrophic wildfire. The actual treatment units associated with my decision are located in the portions of the East Boulder WUI that are in the closest proximity to the East Boulder Road, East Boulder Mine facilities and powerline, and private residences and structures.

Legal Requirements

My decision adheres to all of the following legal requirements:

Endangered Species Act (ESA) of 1973

Canada lynx are listed as a threatened species under the Endangered Species Act (ESA) and the Forest Service must therefore ensure that any action it authorizes is not likely to jeopardize the continued existence of this species, or to destroy or adversely modify critical habitat [Section 7(a)(2)]. To comply with the ESA, effects of Alternative 3, which is more impactful than Alternative 2, on lynx and critical habitat, were analyzed in a Biological Assessment prepared for this project. Since lynx are a native species, the Forest Service has a responsibility under the National Forest Management Act (36 CFR 219.19) to provide habitat. The Northern Rockies Lynx Management Direction (NRLMD) ROD was published in March 2007. This decision amended the Gallatin Forest Plan by incorporating goals, objectives, standards and guidelines for lynx habitat management. The NRLMD contains exemptions that allow a certain amount of thinning in snowshoe hare habitat if the purpose is

for fuel reduction within a Wildland Urban Interface (WUI). The Final Rule for lynx critical habitat identifies Primary Constituent Elements (PCE), which are those physical and biological features that are essential to the conservation of the species, and that may require special management considerations or protections (USDI 2009:8638). Where NRLMD standards are not strictly met for this project; i.e. where exemptions for standards VEG S5 and VEG S6 are applied. These factors were evaluated in a Biological Assessment and reviewed in consultation with the US Fish and Wildlife Service. The April 1, 2010 response letter from USFWS states that the effects of the East Boulder Project would fall within the range of effects analyzed in their 1st tier biological opinion for Canada lynx and the project conforms to their incidental take statement. Therefore no 2nd tier biological opinion is required for the project; the proposed treatments are well within the total acres anticipated for the Forest for fuels management in the WUI.

Under Section 7 of the Endangered Species Act, each Federal agency must ensure that any action authorized, funded or carried out is not likely to jeopardize the continued existence of any threatened or endangered species. . The project is outside of the recovery area and is considered unoccupied by grizzly bears. All standards were considered during project development and mitigation measures have been incorporated to address any specific standards and issues that were identified. My decision “*may affect but is not likely to adversely affect*” the grizzly bear. Based on the analysis, all applicable standards in the grizzly bear amendment will be met under my decision for the project.

Gray wolves were delisted from the list of Endangered and Threatened Wildlife Species on March 28, 2008 and the management of wolves on the Gallatin National Forest was transferred to the State of Montana. A Federal court decision reinstated Endangered Species Act protection for wolves again on August 5, 2010. Then on April 15, 2011 President Obama signed legislation that directed the Secretary of Interior to re-issue enactment of the final rule that removed gray wolves from the list of Endangered and Threatened Wildlife for the Northern Rocky Mountain District Population Segment of the gray wolf (*Canis Lupis*) again transferring management to the State of Montana. This action became effective on May 5, 2011 (Federal Register, Vol. 76, No. 87 2011) after the release of the Revised EA for the project.

Executive Order 12898 – Environmental Justice

Executive Order 12898 directs each Federal agency to make achievement of environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. The actions taken with my decision will not adversely affect any disadvantaged or minority groups because of the project area’s distance from large population centers and the diffuse level of adverse impacts on any social group. A project such as this will not produce hazardous waste or conditions that might affect human populations.

Federal Noxious Weed Act of 1974 (as Amended) and Executive Order 13112

The Forest Service is directed by law, regulation and agency policy to treat weeds. A number of laws give broad authority for control of weeds on National Forest System land, and several laws and regulations provide for control of such weeds. In particular Executive Order (03 February 1999), directs Federal Agencies to prevent and control invasive species. The Federal Noxious Weed Act of 1974 (PL 93-6329), authorizes the Secretary of agriculture to cooperate with other agencies to control and prevent noxious weeds. The Montana Noxious Weed Law 1948, amended in 1991, provides for designation of noxious weeds in the State,

direction of control efforts, registration of pesticides and licensing of applicators, and enforcement of statutes. The law delegates enforcement to County Commissioners. Weed monitoring and treatment are an important part of my decision, and weed monitoring and treatments will be mandatory and funded. Numerous mitigation measures have also been established to minimize weed infestation and spread in the project area (See EA, pp. 2-28 & 2-29).

Forest Service Manual (FSM 5150) Fuel Management

The objective of FSM 5150.2 is to identify, develop, and maintain fuel profiles that contribute to the most cost-efficient fire protection and use program in support of land and resource management direction in the forest plan. My decision will create a fuel profile that is safer for the public and firefighters. In doing so, fires will be less difficult to control and fire protection will be more cost-efficient.

The policy associated with FSM 5150.3 is to integrate fuel management and fire management programs in support of resource management objectives. Several resource management objectives will be met with the project as well as meeting the fuel management objectives.

Forest Service Manual (FSM) 2526 Riparian Area Management

Riparian ecosystems are defined as a transition area between the aquatic ecosystem and the adjacent terrestrial ecosystem; identified by soil characteristics or distinctive vegetation communities that require free or unbound water. For the East Boulder Fuels Reduction Project, Alternative 2 was designed to comply with Forest Service Manual 2526 objectives and policy.

Migratory Bird Treaty Act (As Amended)

Management of migratory bird species and their habitats are governed by a wide range of authorities. Most direction regarding conservation of these species falls under the umbrella of the Migratory Bird Treaty Act (16 USC 703-712) and an associated Presidential Executive Order. Executive Order 13186 requires agencies to ensure that environmental analyses evaluate the effects of federal actions and agency plans on migratory birds, with emphasis on species of concern. My decision will be in compliance with this direction. Potential effects of the project have been evaluated, with focus on migratory bird species of concern. Standard operating procedures and project design criteria will be implemented to reduce potential impacts of fuel treatment.

National Environmental Policy Act of 1969, as amended (NEPA)

The National Environmental Policy Act (NEPA) of 1969 requires an assessment of the impacts of human activities upon the environment. NEPA establishes the format and content requirements of environmental analysis and documentation. The entire process of preparing the East Boulder Fuel Reduction EA was undertaken to comply with NEPA.

National Forest Management Act of 1976 (NFMA)

The National Forest Management Act (NFMA) requires that Forest plans "preserve and enhance the diversity of plant and animal communities...so that it is at least as great as that which can be expected in the natural forest" (36 CFR 219.27). Furthermore, implementation regulations for the NFMA specify that, "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area".

There are currently 10 terrestrial species and 4 aquatic species identified as "Sensitive" that are known or suspected to occur on the Gallatin National Forest (USDA 2007, Updated 2011). With the implementation of my decision, the proposed vegetation and stewardship treatments will have "no impact" on peregrine falcon, trumpeter swan, harlequin duck, flammulated owl, northern goshawk, Townsend big-eared bat, wolverine, bighorn sheep, western toad, or northern leopard frog. Neither will there be any effect on the westslope cutthroat trout, arctic grayling, Yellowstone cutthroat trout, or western pearlshell mussel (See Biological Evaluation located in Project File and EA, pp. 3-70 through 3-77). Long-eared and long-legged myotis, two bat species that were incorrectly analyzed as R1 Regional Forester's Sensitive Species, were clearly identified and addressed in Table 25 (pages 151-152) and in narrative (pages 156-160 of the EA). Since that time, clarification via the February 25, 2011 letter "Regional Forester's Sensitive Species List, 2011 Update" has indicated that these two bat species are not designated as sensitive species in Montana.

There will be "no impact" to sensitive plants within the treatment areas due to lack of potential suitable habitat or absence of plants based on completed surveys.

National Historic Preservation Act of 1966 (NHPA)

The primary legislation governing modern heritage resource management is the National Historic Preservation Act (NHPA) of 1966 (amended in 1976, 1980, and 1992). All other heritage resource management laws and regulations support, clarify, or expand on the National Historic Preservation Act. These laws and regulations guide the Forest Service in identifying, evaluating, and protecting heritage resources on national forest system lands. The Forest Service is required to consider the effects of agency actions on heritage resources that are determined eligible for the National Register of Historic Places (NRHP) or on heritage resources not yet evaluated for eligibility. Eligible Heritage Guidelines for Archaeology and Historic Preservation are also an important element of federal agencies' management of cultural resources on public lands.

The Crow Tribal Nation located on the Crow Reservation, regards the Gallatin National Forest as an area of concern, and is consulted on all projects occurring on the Forest. The forest archaeologist hosted a field trip to the project area with Crow tribal members in June 2010. The Crow tribal members expressed concurrence with the project and were willing to help out in any way possible (Project File 13-7). Information regarding the project was also provided to the Shoshone-Bannack, and Salish-Kootenai tribes. Heritage and Tribal interests are regulated by federal laws that direct and guide the Forest Service in identifying, evaluating, and protecting heritage resources. My decision to implement Alternative 2 complies with all federal laws regarding heritage resources (See EA, pp. 217-220).

The State of Montana Water Quality Act (1969, 1975, 1993, 1996)

The State of Montana Water Quality Act requires the state to protect, maintain, and improve the quality of water for a variety of beneficial uses. Section 75-5-101, MCA established water quality standards based on beneficial uses. The Montana Department of Environmental Quality has designated all surface waters in the project area as B1 Classification. Waters classified as B1 must be suitable for drinking, culinary, and food processing purposes after conventional treatment; bathing, swimming and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply. A 5 NTU turbidity increase above naturally occurring turbidity is allowed in B1 waters. My decision will be in compliance with the Montana Water Quality Act and Administrative Rules of Montana, State of Montana Best Management Practices, WQLS/TMDL constraints, as well as Gallatin NF Forest Plan

direction for water quality protection. Sediment modeling indicates that project sediment changes are immeasurable and well within the Gallatin NF sediment guidelines.

Clean Air Act of 1963

Congress passed the Clean Air Act in 1963, and amended it in 1972, 1977, and 1990. The purpose of the act is to protect and enhance air quality while ensuring the protection of public health and welfare. The act established National Ambient Air Quality Standards (NAAQS), which must be met by state and federal agencies, and private industry. The Montana DEQ is currently cooperating with the Western Regional Air Partnership (WRAP) to establish visibility goals, monitoring plans, and control measures to comply with regional haze visibility standards in all Montana Class I areas including Yellowstone National Park. The Gallatin NF Forest Plan in Forest Wide Standards pp. II-23 requires that the Forest will cooperate with the Montana Air Quality Bureau (now DEQ) in the SIP and smoke management plan. Emissions from the East Boulder Fuels project are projected to be in compliance with the Gallatin NF Forest Plan in Forest Wide Standards pp. II-23 via compliance with the NAAQS 24 hour average PM_{2.5} 35 ug/m³ standard where the public would have access to air via the minimum ambient distances. Current compliance with the Montana DEQ includes meeting NAAQS, compliance with Montana open air burning provisions and operational constraints by the Montana/Idaho Smoke Management Group. By limiting the timing, quantity, and intensity of the burning activities as described in the EA (pp. 2-25 & 2-26), my decision will comply with the air quality laws, guidelines and standards.

Trout Unlimited Settlement Agreement

The goals, policies, and objectives for aquatic resources outlined in the Forest Plan have been further defined within an agreement with the Madison-Gallatin Chapter of Trout Unlimited (TU) in 1990. The intent of the Agreement was to provide more specific direction on timber harvest in riparian areas. Design features and mitigation have been incorporated into the East Boulder Project to assure that my decision will adhere to the TU Settlement Agreement (See EA, pp. 2-24 through 2-25). The Forest fisheries biologists met in person with a representative from the Madison-Gallatin Chapter of Trout Unlimited to discuss the proposed treatments and mitigation associated with the project in detail. A letter of support for the project was received from TU on June 20, 2011 (Project File 4-6a).

Land Use Strategy for WCT and YCT

Land Use Strategy for WCT and YCT: The Upper Missouri Short Term Strategy for Conserving Westslope Cutthroat Trout (UMWCT short term strategy) provides implementation direction for the MOU that was adopted in 1999. The Strategy calls for preventing habitat degradation and improving existing populations and their habitat until a long-term recovery strategy can be established and implemented. The Strategy ensures that land-use activities, like timber sales, will be implemented in a manner that results in a “beneficial impact” or “no impact” biological decision. Implementation of the East Boulder Project decision will have no effect to aquatic habitat or fish populations.

Cooperative Conservation Agreement for Yellowstone Cutthroat trout within Montana.

Cooperative Conservation Agreement for Westslope cutthroat trout and Yellowstone Cutthroat Trout in Montana, 2007: In 2007, the Gallatin and Custer National Forests joined numerous other agencies and the Crow Tribe in forming a MOU and Cooperative Conservation Agreement for Westslope cutthroat trout and Yellowstone Cutthroat Trout in

Montana. This agreement establishes a framework of cooperation between the participating parties to work together for the conservation of YCT. Because riparian and aquatic resources are protected with my decision, no effect to habitat and fish populations are expected.

Executive Order 12962 (June 1995)

Section 1. Federal Agencies shall, to the extent permitted by law and where practicable, and in cooperation with States and Tribes, improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities. Implementation of my decision will protect riparian areas and aquatic resources.

NPDES Stormwater Permits (8/23/2010 Court Opinion)

In an 8/23/2010 opinion for the NEDC vs. Brown suit filed by the Northwest Environmental Defense Center (NEDC) against state regulators and timber companies in Oregon, the NEDC asserted the defendants failed to provide or obtain NPDES permit coverage for stormwater runoff that flows from forest roads associated with logging into systems of ditches, culverts and channels, and which is then discharged into forest streams. The ruling is subject to further appeal and no injunction associated with the decision directly currently affects the Forest Service.

The exact regulatory process, format, permitting requirements of the NEDC vs. Brown decision to the East Boulder fuels project is currently unclear but the roads associated with the project were examined in detail in a hydrology/engineering review on October 12, 2010 in order to gather the appropriate data and information that could be needed for industrial stormwater NPDES permit applications. The road system, which would be used for the East Boulder Fuels project to the GNF Forest boundary, includes 61 road related drainage features including ditch relief culverts, waterbars/dips, and 1 bridge crossings. Of the 61 road drainage features, only 4 had any discernable connection to streams. Two could be eliminated via slightly enlarged berms associated with the East Boulder Mine stormwater control operations. The other two could be disconnected with small sediment traps.

All required water quality permits would be acquired by the Gallatin National Forest prior to any ground disturbance activities for the East Boulder fuels project. If logging road stormwater discharge NPDES permits are required for East Boulder fuels project, the Gallatin National Forest will work with the Montana DEQ to obtain the permits prior to project implementation.

Best Available Science

I am confident that the analysis of this project was conducted using the best available science. My conclusion is based on a review of the Project File that shows my staff conducted a thorough review of relevant scientific information, considered responsible opposing views, and acknowledged incomplete or unavailable information, scientific uncertainty, and risk. Please refer to the specialist reports in the Project File for specific discussions of the science and methods used for analysis and for literature reviewed and referenced.

Finding of No Significant Impact (40 CFR 1508.27)

The following is a summary of the project analysis to determine significance, as defined by Forest Service Handbook 1909.15_05. “Significant” as used in NEPA requires consideration of both context and intensity of the expected project effects.

Context means that the significance of an action must be analyzed in several contexts (i.e. local regional, worldwide), and over short and long time frames. For site-specific actions significance usually depends upon the effects in the local rather than in the world as a whole. This project is limited in scope and duration. The project was designed to minimize environmental effects.

Intensity refers to the severity of the expected project impacts and is defined by the 10 points below.

1. Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on the balance, the effects will be beneficial.

Implementation of the Selected Alternative (Alternative 2) will include a combination of mechanical and hand thinning on up to 650 acres that are adjacent to the East Boulder Road, East Boulder Mine and/or powerline, and/or private residences and structures in the East Boulder WUI (See Map 3) on National Forest System lands. Slash and landing piles will be burned in accordance with Montana Air Quality Standards (EA, pp. 116-118). No prescribed burning is associated with this project.

Alternative 2 was designed to be responsive to the effects of thinning, piling, and pile burning on the various resources present within the analysis area boundaries. By applying the mitigation for various resources outlined in this Decision Notice (pp. 14-25), there will be no significant adverse impacts to resources associated with this decision (EA, Chapter 3, various resource analyses). Even though forested areas will be thinned and wood fiber removed, these resources are recoverable within a relatively short timeframe (90-120 years). Beneficial effects from the implementation of Alternative 2 will increase public and firefighter safety in the corridor, increase certain wildlife foraging habitats, and improve forest health within localized treated areas.

2. The degree to which the proposed action affects public health or safety.

The selected alternative is consistent with the September 2008 Sweet Grass County Community Wildfire Protection Plan (CWPP). In fact, the project was specifically identified as Proposed Project 6.6.1.1.3 on page 53 of the CWPP and the East Boulder River corridor was included in the list of current priorities for treatment on p. 43 of the plan.

Implementation of the selected alternative will not create significant negative effects to public health and safety (air quality, water quality, recreation, special uses, transportation) due to the use of effective project design and mitigation measures as described in this decision (pp. 14-25). The Purpose and Need for the project as outlined on p.5 of this decision is specifically “to improve public and firefighter safety by reducing the probability and effects of human caused fire starts along the corridor and reducing the effects of wildfire entering into the WUI of the East Boulder River corridor”. This would be achieved by breaking up the continuous vertical and horizontal fuels, thus reducing the probability and/or intensity of a catastrophic crown fire in the corridor. The vegetation treatments were designed to reduce fuels along the main evacuation route to increase safety for East Boulder Mine employees, private residents, and recreating public, while also allowing for safer firefighter conditions.

3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

The project area is located in the Absaroka Mountain Range in the southern portion of the Yellowstone Ranger District in Sweet Grass County, Montana. The East Boulder Road #205 branches off of the Main Boulder highway approximately 20 miles south and west of Big Timber, Montana and follows the East Boulder River to the Stillwater Mining Corporation's East Boulder Mine complex at its terminus. The Sweet Grass County Community Wildfire Protection Plan (Project File 7-4), completed in September of 2008, identified the East Boulder River corridor as a community that is at risk from potential wildfire.

Approximately 6-7 miles of this road are adjacent to private lands up to the forest boundary, and an additional 5-6 miles of the road extend from the forest boundary to the mine with areas of private ownership interspersed (See Vicinity Map 1). The East Boulder corridor is bounded to the south by the East Boulder Plateau and to the north by Long Mountain. The area surrounding the East Boulder Mine consists of a "box canyon" cirque with steep sides and the East Boulder River flowing roughly 3000-4000 feet below the high elevation plateaus, which are located on both the north and south sides of the canyon. The drainage is characterized by a combination of rocky timbered slopes, scree slopes, and occasional meadows. Much of the area is forested with vegetation forming a continuous canopy of both surface and ladder fuels. The project area is heavily utilized for mining operations and to a lesser degree by recreation users.

The East Boulder portion of the inventoried North Absaroka Roadless (IRA) area 1-371 basically surrounds the project area; however, none of the project related treatments encroach into the Inventoried Roadless Area. Past management activities have occurred adjacent to the IRA and have influenced the characteristics of the "unroaded" resource. This includes the East Boulder Mine and power transmission line development, timber harvest and road construction. In the case of the East Boulder, any areas remaining of "unroaded" lands are not of a sufficient size or configuration to allow the protection of the inherent characteristics associated with an "unroaded" condition and therefore do not contain "unroaded" resource values (See Roadless/Unroaded Analysis EA, pp. 126-128). There are no Wild & Scenic Rivers or ecologically critical areas known to occur within the analysis area boundaries. Upon thoroughly reviewing the analysis completed, I conclude that there are no unique characteristics of the geographic area that will be affected by this decision.

4. The degree to which the effects of the decision on the quality of the human environment are likely to be controversial.

Observations of past thinning, piling, and pile burning associated with fuel reduction projects on the Gallatin National Forest lead me to conclude that the effects of this decision are likely to be predictable and consistent with the conclusions reached in the EA. There is no significant professional disagreement on the scope and effects of the selected alternative on the various resources. The Purpose and Need for the project is to increase safety for the public and firefighters in the event of a large wildfire in the area. For these reasons, I conclude that there is not likely to be significant controversy over the degree to which this decision affects the quality of the human environment.

5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

Effects of thinning in Wildland Urban Interface areas have been documented and monitored nationwide in various scientific publications. Thinning of various size classes of forested

stands on the Gallatin National Forest has occurred for the past four decades with results that have been relatively consistent and predictable. Historically, pile burning has been utilized by all Federal land management agencies for brush and slash disposal and temporary roads have been constructed and reclaimed effectively. The treatment actions proposed under my decision have been used in the past and have proven effective. For these reasons, I conclude this decision will not present highly uncertain, unique, or unknown risks.

6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

My decision to thin, pile, and burn piles to reduce fuels in the East Boulder Wildland Urban Interface is project specific. The actions associated with project implementation will be monitored and success in achieving the Purpose and Need for the project will be assessed. Although successful implementation of the project could lead to future fuel reduction projects on the Forest that are similar in nature, I do not foresee that this decision establishes a precedent for other future actions, nor does it represent a decision in principle about any other future consideration.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.

The reasonably foreseeable cumulative effects of this decision are detailed in the Revised EA, Chapter 3 for the various resources that could potentially be affected by the project. From these analyses, I conclude that neither the effects of this decision itself, nor cumulative or linked effects of past, current, or reasonably foreseeable future actions appear likely to lead to significant cumulative impacts.

8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in, or eligible for listing in, the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historic resources.

Within the East Boulder Fuels Reduction Project boundary, all areas that are considered “moderate-to-high probability for cultural resource occurrence” were surveyed by a qualified archaeologist on the 8th and 20th of July 2009. The area was previously surveyed in 1981 and 1982. Five cultural sites were known to exist within the treatment area boundaries and no new sites were found. All five of the sites have been evaluated, and are considered eligible for listing on the National Register of Historic Places. The Forest archaeologist consulted with the Crow Nation in April 2010 regarding potential project-related effects to these sites. A field visit to the project with representatives of the Crow Nation and the archaeologist occurred on June 15, 2010, resulting in concurrence from the Crow Nation for the project and a willingness to help out when needed (Project File 13-7).

Project mitigation and design specifies that the Forest archaeologist and the sale administrator will properly flag off the known sites before work begins in the site vicinity, such that the site will be avoided by any ground disturbing activities. Fuel reduction actions can easily be completed and avoid the sites as long as the operators and sale administrator know where the site is located. The proposed actions associated with Alternative 2 can be completed without any direct, indirect, or cumulative effects to heritage resources.

Following these mitigation will protect existing sites and will allow for modification of the project, should any new sites be found.

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

My decision to proceed with implementation of Alternative 2 will not significantly affect any endangered or threatened species or their habitat. Canada lynx are listed as a threatened species under the Endangered Species Act (ESA) and the Forest Service must therefore ensure that any action it authorizes is not likely to jeopardize the continued existence of this species, or to destroy or adversely modify critical habitat [Section 7(a)(2)]. To comply with the ESA, effects of the preferred alternative (Alternative 3), which is more impactful to lynx habitat than Alternative 2, were analyzed in a Biological Assessment. My decision will treat roughly half the acreage of multi-storied snowshoe hare habitat that was proposed with Alternative 3 and the additional treatment units in Alternative 3 are at higher elevations, in cooler, moister habitat types preferred by lynx. The Northern Rockies Lynx Management Direction (NRLMD) ROD was published in March 2007. This decision amended the Gallatin Forest Plan by incorporating goals, objectives, standards and guidelines for lynx habitat management. The NRLMD contains exemptions that allow a certain amount of thinning in snowshoe hare habitat if the purpose is for fuel reduction within a Wildland Urban Interface (WUI). The Final Rule for lynx critical habitat identifies Primary Constituent Elements (PCE), which are those physical and biological features that are essential to the conservation of the species, and that may require special management considerations or protections (USDI 2009:8638). Where NRLMD standards are not strictly met for this project; exemptions for standards VEG S5 and VEG S6 are applied. These factors were evaluated in the Biological Assessment and reviewed in consultation with the US Fish and Wildlife Service. The April 1, 2010 response letter from USFWS states that the effects of the East Boulder Project (Alternative 3) would fall within the range of effects analyzed in their 1st tier biological opinion for Canada lynx and the project conforms to their incidental take statement, therefore, no 2nd tier biological opinion or further consultation is required for the project. See the lynx analysis on pp. 132-138 of the Revised EA. As stated above, my selection of Alternative 2 would be much less impactful to lynx habitat than what was presented to USFWS in the BA.

The grizzly bear is also listed as a threatened species under the ESA. The project area is located outside of the grizzly bear recovery area. Grizzly bears are known to occasionally be present within the East Boulder analysis area, but have never been documented to occur in the project vicinity (i.e. along or adjacent to the East Boulder River outside the IRA). Grizzly bears typically move closest to the area during den emergence based on known spring sightings in the Deer Creek drainage, located north of the analysis area. There is very low potential for grizzly bear and human conflicts and activities associated with the planned project are not expected to increase the potential for these types of conflicts. Given the potential for impacts, however minimal, it is determined that the project “*may affect, but is not likely to adversely affect*” the grizzly bear or its habitat. All standards were considered during project development and mitigation measures have been incorporated to address any specific standards and issues that were identified. Based on the analysis, all applicable standards in the grizzly bear amendment will be met under my decision for the project. See the grizzly bear analysis on pp. 138-143 of the Revised EA.

Gray wolves were delisted from the list of Endangered and Threatened Wildlife Species on March 28, 2008 and the management of wolves on the Gallatin National Forest was transferred to the State of Montana. A Federal court decision reinstated Endangered Species Act protection for wolves again on August 5, 2010. Then on April 15, 2011 President Obama signed legislation that directed the Secretary of Interior to re-issue enactment of the final rule that removed gray wolves from the list of

Endangered and Threatened Wildlife for the Northern Rocky Mountain District Population Segment of the gray wolf (*Canis Lupis*) again transferring management to the State of Montana. This action became effective on May 5, 2011 (Federal Register, Vol. 76, No. 87 2011) after the release of the Revised EA for the project.

The Service recommends that the Forest analyze the impacts on nonessential experimental populations of wildlife, along with other populations of fish and wildlife, when complying with the requirements of the National Environmental Policy Act (NEPA) and other relevant land management statutes. Any protective measures in addition to those outlined in the final rules for managing the nonessential experimental wolf populations, or additional review procedures, are at the discretion of the Forest Service. Overall, population objectives for the recovery of the gray wolf have been met and Montana Fish, Wildlife, and Parks has recently re-enacted a controlled hunting season (with quotas in various districts) for the gray wolf for the 2011 hunting season.

There are no known wolf dens or rendezvous sites in the East Boulder project area at the present time although occasional sightings of individuals are reported. The closest known established pack is near Baker Mountain in the Main Boulder River drainage (MFWP 2010). Over the last seven years wolves have been reported using all the major drainages in the Upper Boulder (Paugh). The actions associated with Alternative 2 (Selected Alternative), as stated on p.147 of the Revised EA, are “not likely to jeopardize” the gray wolf. The gray wolf in the Yellowstone nonessential experimental population area does not require consultation under section 7, nor does it require the action agency to confer, if the determination is not likely to jeopardize the 10(j) gray wolf (USDI 2005). Upon the May 2011 delisting, downgrading the species to the sensitive category, the call for gray wolf is now “*may impact individuals or habitat, but will not likely result in a trend toward federal listing or reduced viability for the population or species*”.

10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

The applicable laws, regulations, and Forest Plan direction related to my decision are discussed in the Revised EA by resource in Chapter 3 and in the Decision Notice (pp. 24-36). I find my decision to be fully in compliance with applicable laws and regulations. Further, my decision is consistent with the Gallatin Forest Plan Management Area direction for the project area.

Conclusion

After considering the environmental effects described in the Revised EA and specialist reports, I have determined that Alternative 2 (Selected Alternative) will not have significant effects on the quality of the human environment considering the context and intensity of impacts (40 CFR 1508.27). Thus, an environmental impact statement will not be prepared.

Administrative Review or Appeal Opportunities

This decision is subject to appeal pursuant to 36 CFR 215.11. Only individuals or organizations that submitted comments during the comment period may appeal. A written appeal must be submitted within 45 days following the publication date of the legal notice of this decision in the Bozeman Chronicle, Bozeman, Montana. It is the responsibility of the appellant to ensure their appeal is received in a timely manner. The publication date of the legal notice of the decision in the newspaper of record is the *exclusive* means for calculating the time to file an appeal. Appellants should not rely on date or timeframe information provided by any other source.

Paper appeals must be submitted to: USDA Forest Service, Northern Region, ATTN: Appeal Deciding Officer, P.O. Box 7669, Missoula, MT 59807; or USDA Forest Service, Northern Region, ATTN: Appeal Deciding Officer, 200 East Broadway, Missoula, MT 59802. Office hours: 7:30 a.m. to 4:00 p.m. Fax (406) 329- 3411.

Electronic appeals must be submitted to: <appeals-northern-regional-office@fs.fed.us>. In electronic appeals, the subject line should contain the name of the project being appealed. An automated response will confirm your electronic appeal has been received. Electronic appeals must be submitted in MS Word, Word Perfect, or Rich Text Format (RTF).

It is the appellant's responsibility to provide sufficient project or activity-specific evidence and rationale, focusing on the decision, to show why the decision should be reversed. The appeal must be filed with the Appeal Deciding Officer in writing. At a minimum, the appeal must meet the content requirements of 36 CFR 215.14, and include the following information: The appellant's name and address, with a telephone number, if available; A signature, or other verification of authorship upon request (a scanned signature for electronic mail may be filed with the appeal); When multiple names are listed on an appeal, identification of the lead appellant and verification of the identity of the lead appellant upon request; The name of the project or activity for which the decision was made, the name and title of the Responsible Official, and the date of the decision; The regulation under which the appeal is being filed, when there is an option to appeal under either 36 CFR 215 or 36 CFR 251, subpart C; Any specific change(s) in the decision that the appellant seeks and rationale for those changes; Any portion(s) of the decision with which the appellant disagrees, and explanation for the disagreement; Why the appellant believes the Responsible Official's decision failed to consider the substantive comments; and, How the appellant believes the decision specifically violates law, regulation, or policy.

If no appeal is received, implementation of this decision may occur on, but not before, five business days from the close of the appeal filing period. If an appeal is received, implementation may not occur for 15 days following the date of appeal disposition.

Offer to Meet. When an appeal is received under this rule, the Responsible Official, or designee, must contact the appellant and offer to meet and discuss resolution of the issues raised in the appeal (36 CFR 215.17). If the appellant accepts the offer, the meeting must take place within 15 days after the closing date for filing an appeal (i.e. 45 to 60 days from the publication date of the legal notice of this decision in the Bozeman Chronicle). These meetings, if they take place, are open to the public. For information on if, when, and where such a meeting is scheduled, please visit the following web site:

www.fs.fed.us/r1/planning/final_appeals/current_appeals_and_objections.pdf

Implementation

If no appeals are filed within the 45-day time period, implementation of the decision may occur on, but not before, 5 business days from the close of the appeal filing period. Implementation of my decision to reduce hazardous fuels and implement vegetation treatment, under the conditions of this decision, will likely begin in the winter of 2012 and could continue for up to four years.

If appeals are filed, implementation may occur on, but not before, the 15th business day following the date of the last appeal disposition.

Further Information and Contact Persons

Copies of the East Boulder Fuels Decision Notice and FONSI are available at the Yellowstone Ranger District Office in Big Timber, MT, or the Bozeman Ranger District in Bozeman, MT. Copies are also available on the internet at <http://www.fs.fed.us/r1/gallatin> in the Project and Plans area.

For additional information or questions concerning this decision or appeals process, please contact Barbara Ping, East Zone NEPA Coordinator (406)-522-2558, or Lauren Oswald, Acting Yellowstone District Ranger at (406)-222-1892.

Lauren M. Oswald

Date

**Acting District Ranger
Yellowstone Ranger District**

Appendix A-Response to Revised EA Comments

Introduction

This appendix to the East Boulder Fuels Reduction Project Decision Notice contains the agency's responses to questions and comments received during the 30-day public review and comment period for the March 2010 Environmental Assessment. Official comments regarding the project were due on May 25, 2011.

A total of 6 letters were received. Table A-1 below lists the letter number and commenter. Comments are grouped by subject matter or resource. Each comment is identified by letter number first and then by individual comment number after the hyphen (Example 1-1). The comments were transcribed as written in the comment letters with the agency response following the comment. Some comments are repetitive, so responses to these comments will refer to previous letters where that specific comment has already been addressed in this appendix. Similar comments have been grouped, showing the letter and comment numbers that apply.

Table 2 Letters and Comments Received in Response to the April 2011 Revised EA

Letter Number	Commenter
1	Sara Jane Johnson-Native Ecosystems Council
2	Michael Garrity-Alliance for the Wild Rockies
3	Dick Artley
4	Claire Simmons & Robyn Roberts
5	Justin Paugh-MFWP
6	Travis Morris-Trout Unlimited

Response to Comments

General

Comment 2-1: The Alliance for the Wild Rockies supports the effort to protect the escape route for the miners at the top of East Boulder Creek in case of a wildfire. Our concern is that the project proposes logging beyond what is necessary to protect the road as an evacuation route, e.g. to protect the East Boulder Road, no new road construction should be required since logging can be done from the East Boulder Road.

Response: Although the majority of the units associated with the project lie adjacent to the East Boulder Road (evacuation route), the East Boulder Mine facilities and powerline, and/or private residences and structures, there will still be a need for a small amount of temporary roads to access the interior of the various treatment units and to keep landing piles away from the main road. Temporary road construction will be minimized to the extent possible, with the average length of temp. roads being less than .18 of a mile. These temporary roads will be closed to the public during project related activities and permanently closed, recontoured, and revegetated within one year of project completion.

Comment 2-4: The National Environmental Policy Act (NEPA) requires that all federal agencies prepare an environmental impact statement for significant actions that affect the environment. 42 U.S.C. 4332(2)(C). The implementing regulations for NEPA are binding upon the Forest Service. *Southern Oregon Citizens against Toxic Sprays, Inc. v. Clark*, 720 F.2d 1475, 1478 (9th Cir. 1983); see also *Citizens for Better Forestry v. U.S. Dept. of Agriculture*, 341 F.3d 961, 970-71 (9th Cir. 2003).

Response: As indicated in the attached revised FONSI, no significant actions that negatively affect any of the various resources are expected to occur with implementation of the project, so an Environmental Impact Statement is not required. Also see project compliance with laws, regulations, Forest Plan and other guidelines as described in the Decision Notice and in Chapter 3 of the Revised EA.

Comment 3-1: The natural resource harm discussed in my comments below is based on the science contained in my attachments above. Please quote the relevant science and the source of the science in each response to #1 and #4 above (40 CFR 1503.4 Response to comments). The comments contained in this comment letter are all grounded in science. Please use science to respond to the comments. Unsubstantiated statements refuting my comments are inappropriate.

(a) An agency preparing a final environmental impact statement shall assess and consider comments both individually and collectively, and shall respond by one or more of the means listed below, stating its response in the final statement.

(b) All substantive comments received on the draft statement (or summaries thereof where the response has been exceptionally voluminous), should be attached to the final statement whether or not the comment is thought to merit individual discussion by the agency in the text of the statement.

(c) If changes in response to comments are minor and are confined to the responses described in paragraphs (a)(4) and (5) of this section, agencies may write them on errata sheets and attach them to the statement instead of rewriting the draft statement. In such cases only the comments, the responses, and the changes and not the final statement need be

circulated (Sec. 1502.19). The entire document with a new cover sheet shall be filed as the final statement (Sec. 1506.9).

Response: As pointed out by the attached FONSI, this project does not require an Environmental Impact Statement to be prepared, so the CFR you quoted does not directly pertain. However, each substantive comment has been split out and either quoted directly or summarized (where comments are verbose). Each of your comments (concerns) will be considered and addressed in a professional manner with the appropriate science or literature discussed where it is warranted.

Comment 3-1b: Not only are the trees harvested in our national forest not needed, they are not wanted by the owners of the national forests. The information in the attachments to this comment letter shows that timber harvest activities do not “restore” or “benefit” any natural resource in the forest. Please use science to explain why this timber sale is being proposed.

Response: This project is a fuel reduction project that is located in the East Boulder WUI. Fuel reduction projects such as this are supported by the National Fire Plan (2000), Cohesive Strategy (2000), Ten Year Comprehensive Strategy (2001), Federal Wildland Fire Management Policy and Review (2001), and the Gallatin National Forest Fire Management Plan (Annually Updated) as discussed on pp. 22 through 24 of the EA. As discussed in the Purpose and Need for the project on page 16 of the Revised EA “The primary purpose and need for this project is to improve public and firefighter safety by reducing the probability and effects of human caused fires starts in the corridor and reducing the effects of wildfire entering into the WUI of the East Boulder River Corridor.” The project area has been identified in the Sweet Grass County Community Wildfire Protection Plan as a priority for treatment (EA pp. 7 & 11 of the EA). Although this is not the purpose of the project, there will be commercial timber that is harvested; these types of wood products are still in demand in this area. We have had numerous requests for timber from the National Forests from the few remaining large mills, as well as several small mills, and various wood product workers in the area. The project does not claim to “restore” any specific resource, and would create minor benefits for some resources, and some short-term minor negative effects for others. As stated in the attached FONSI, project implementation would not have any significant long-term effects.

Comment 4-5: In your revised EA, visuals were not listed as a “key” issue. It was felt any “visual” issues could be mitigated through project design. Let me make this very clear - for us, where our property is concerned, retaining the visual quality of the area that we view from our property and what the public sees from the county road is probably the most important issue relative to this fuels reduction proposal. We placed a conservation easement on our property with the intent to preserve the scenic values of the property for ourselves and the public in perpetuity. These values would be seriously compromised if unit 3 is treated as proposed. The view for the public traveling the county road will be compromised as well. This loss of scenic values is not acceptable.

Response: As described on pp. 55 & 56 of the EA, the Visual Quality Objectives for the corridor are partial retention and maximum modification for the Lewis Gulch area. Numerous mitigation for visuals have been incorporated into project design to be sensitive to the concerns of the public, including irregular unit edges, retention of numerous untreated leave clumps, as well as individuals trees. The prescriptions for leaving individual trees include leaving the healthiest trees with the fullest crowns of various diameters and species thus retaining a more natural appearance. The marking crew for the project was very sensitive to any concerns voiced by local residents and spent numerous hours working to address their concerns regarding visuals (See Project File 6-12a & 612b); however, the project must still meet the fuel reduction objectives. Thus, although visuals were not determined to be a “key” issue that would drive alternatives, the project was designed to be sensitive to visual concerns.

Wildlife & Wildlife Habitat

General

Comment 1-2: It is not clear why so many different sized analysis areas were used for measuring various wildlife effects. We would like to know all the wildlife impacts and habitat conditions for the 4,000 acre project area including goshawk habitat, old growth for goshawk and pine marten, habitat effectiveness during logging, snags before and after logging, acres of big game winter range in suitable condition, and where replacement old-growth is being provided.

Response: The geographic scale used to evaluate the effects of this project on wildlife species and their habitat was based on known occurrences of those species or on suitable habitat within the influence of the proposed treatment units. These were disclosed by individual species or habitat in the EA for goshawk, marten, big game, and snags on pages 166-167, 175, 181,183, and 197 respectively. Maps of the analyses areas are located in the Project File. Analyses areas were also defined for sensitive species on page 149 of the EA.

The Methodology section for individual species or habitat also describes what information was used to analyze the affected environment and effects. This includes all available records and surveys documenting presence and distribution of species, field reconnaissance visits, literature searches, GIS modeling, etc. The effects analysis utilizes this information to disclose effects following the Methodology and Affected Environment sections which are clearly identified by species or habitat groupings in the Table of Contents.

Information was also provided for the other issues of interest as indicated by the commenter. Big game winter range (Forest Plan Management Area (MA) 11) was addressed in the big game section and old growth on pages 203-209 of the EA.

Comment 1-14: Why were all of the wildlife issues raised in public involvement not considered to be “key” to project development (i.e. MIS, Sensitive,T&E species) in MA7, MA11, & MA12 lands.

Response: Issues raised by the public were considered as explained on page 27-30 of the EA. Key issues are those that are not readily mitigated, drive alternatives, are important considerations in the decision to be made, and their resolution is within the scope of the project. The magnitude of a key issue pertains to a resource, as the resource would be affected by a proposed action. None of the wildlife issues (i.e. MIS, sensitive, T&E species) were considered ‘key’ such that they would drive additional alternatives although pertinent wildlife species were analyzed in detail. Effects were limited in extent, duration, or intensity, or adequate project related mitigation was outlined to comply with the direction set forth in the Forest Plan for these management areas.

Comment 3-8: Roads fragment wildlife habitat. Forest roads also alter animal behavior by causing changes in home ranges, movement, reproductive success, and escape response. Forest road avoidance leads to underutilization of habitats that are otherwise high quality. Roads divide large landscapes into smaller patches and convert interior habitat into edge habitat. None of this can be mitigated effectively by elimination of vehicles with gates. Why does the Responsible Official believe that timber harvest is more important than the well-being of wildlife species in the area? If the answer to this question is economic, then please provide an economic analysis.

Comment 3-12: Forest roads lead to increased isolation of populations or species which cause adverse wildlife genetic effects; i.e. inbreeding depression (depressed fertility and fecundity,

increased natal mortality) and decreased genetic diversity from genetic drift and bottlenecks. Why is timber harvest so important that these adverse effects to wildlife are allowed?

Response: The effects of roads were acknowledged and are disclosed in the EA for a variety of wildlife species and habitats (pages 132, 139-143 (grizzly bear), 145-146 (wolf), 162 (wolverine), 177-178 (marten), 181, 184-190 (big game), and 196, 199 (snags)). Roads proposed for the project are to provide temporary access for commercial harvest operations necessary to meet the purpose and need of the project. No permanent road construction is being proposed with the project. The Gallatin Travel Plan management direction does allow for use of administrative roads or reopening of project roads for activities like the East Boulder fuel reduction treatments. Travel Plan standards and guidelines will be followed during and after project activities. In addition, project road design and best management practices are outlined in Appendix A of the EA (pages 230-232).

The FS does not believe that “timber harvest is more important than the well-being of wildlife species in the area”. The purpose and need for this project is to improve public and firefighter safety by reducing the probability and effects of human caused fire starts in the corridor and reducing the effects of wildfire entering into the WUI of the East Boulder River Corridor. In order to meet the purpose and need, some temporary roads will have to be constructed. The FS has fully considered the effects of this proposal on resources, including the effects of these temporary roads on wildlife, and has decided their effects are consistent with all pertinent management direction. Long term, roads would be permanently and effectively closed and re-vegetated; thus open road densities would remain the same. From a wildlife perspective, the project would be consistent with our Travel Plan direction (page 180 of the EA). Specifically, all newly constructed temporary roads would be closed to the public during harvest activities and permanently closed, recontoured, and rehabilitated within one year upon completion of harvest related activities. Rehabilitation will include making the temporary roads on National Forest System lands impassable for any motorized travel. Existing roads that are improved and utilized for project related activities that are no longer needed, do not provide deeded access to private lands, or are not identified to remain open in accordance with the October 2006 Gallatin National Forest Travel Plan Decision would also be rehabilitated within one year of completion of project related activities.

Comment 3-13: Forest roads provide increased opportunities for exploitation by humans, such as: poaching, overhunting, overfishing, and passive harassment of animals, increased trapping pressures, increased likelihood that snags and logs that are important habitat for some wildlife species will be removed for fuel wood. Is fuel wood gathering important on the forest? If so how will removing the snags and dead, downed trees be prohibited?

Response: Personal use firewood gathering is popular on portions of the Gallatin National Forest and there are standards in our Forest Plan to manage for this wildlife resource. Snags were analyzed in the EA (pages 196-203). Mitigation was incorporated to address the potential need for greater numbers of snags both within and outside the proposed fuel reduction units. Snags within units will be marked to leave either individually or within the leave clumps, which are marked to leave as untreated islands. Where possible these painted snags will be located away from easy access firewood areas. In addition, the sale area will be posted with no firewood cutting signs (See mitigation (4) on pp. 51-52 of the EA).

Threatened & Endangered Species

Comment 1-1: The EA fails to identify the “at risk” community being protected. The WUI buffer for lynx includes 1.5 mile from homes, while the WUI identified for this exemption includes many acres that are further from homes and/or communities

Response: The EA on p. 7 states, “The Healthy Forests Restoration Act of 2003 defines wildland/urban interface (WUI) as the area adjacent to an at-risk community that is identified in the community wildfire protection plan. If there is no community wildfire protection plan in place, the WUI is the area 0.5 mile from the boundary of an at-risk community; or within 1.5 miles of the boundary of an at-risk community if the terrain is steep, or there is a nearby road or ridgetop that could be incorporated into a fuel break, or the land is in condition class 3, or the area contains an emergency exit route needed for safe evacuations (Condensed from HFRA § 101).

The East Boulder project area qualifies as an “At-Risk Community” because it contains “other structures with basic infrastructure and services (i.e. utilities and collectively maintained transportation routes) within or adjacent to Federal land” (HFRA, Section 101.(1).(A).(ii)). The East Boulder community is listed as a priority for treatment in the September 2008 Sweet Grass County Community Wildfire Protection Plan (CWPP, Project File 7-4 p. 43) and also occurs on the list of proposed vegetation management/fuel modification projects in the CWPP (Project File 7-4, p. 53). Conditions on adjacent federal land have been determined to have high fire risk, hazard, and occurrence. Vegetation treatments that reduce fuels around the wildland/urban interface (WUI) are the primary focus of the proposed project.

The EA pp.9-10 states “The WUI as defined on Map 2 combines several parts of HFRA, Section 101.(16).(B) as the “area for which a community wildfire protection plan is not in effect” (HFRA, Section 101, (16).(B)). Because the Sweet Grass County CWPP stopped its WUI designation at the National Forest boundary, the mapped area meets criteria of both HFRA, Section 101, (16).(B).(ii) and (iii). The project treatment areas are “within 1 1/2 miles of the boundary of an at-risk community,” and includes “land that has a sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community;” as shown in the Sweet Grass County CWPP Land Cover Fire Risk. The area is also “adjacent to an evacuation route for an at-risk community that requires hazardous fuel reduction to provide safer evacuation from the at-risk community.” In addition, also see Fuel treatment rationale in lynx habitat (Juvan 2010), as referenced in the Biological Assessment.

Comment 1-5a: The East Boulder LAU is too large to ensure well distributed habitat because science on which the LCAS was based notes that habitat should be distributed every 640 acres and the exemption for logging of multi-storied hare habitat is illegal and is applied differently than other management standards which are per LAU, not large landscapes. The agency failed to identify that the project will adversely modify critical lynx habitat or on the lynx in general.

Response: As clearly explained in the EA (pages 51-54, 59, 132-133, and 137), Forest Plan Amendment No. 46 incorporates conservation measures from the Northern Rockies Lynx Management Direction Record of Decision (NRLA), which replaced the LCAS (Canada Lynx Conservation Assessment and Strategy) and is the most current management direction for lynx. In addition, the Final Rule designating critical habitat for lynx (Federal Register, Feb. 2009) establishes Primary Constituent Elements (PCE) for lynx critical habitat that must be addressed in effects analyses for projects within designated critical habitat. The Final Rule allows for treatment and subsequent alteration of lynx critical habitat through consultation with the US Fish and Wildlife Service (FWS).

The project is located within the East Boulder Lynx Analysis Unit (LAU), which was used as the analysis unit for determining effects on lynx. LAUs are intended to provide the fundamental scale at which to evaluate and monitor the effects of management actions on lynx habitat. Proposed treatment units are within a wildland-urban interface (WUI) as defined by the Healthy Forests Restoration Act (HFRA, Public Law 108-148) in that they are located within 1.5 miles of the boundary of an at-risk area (East Boulder road and mine) as delineated by the Sweet Grass County Community Wildfire Protection Plan (also see response to Comment 1.1 above). The effects analysis disclosed that

Alternatives 2 and 3 would be contrary to vegetation standards in the NRLMD regarding forest thinning that would affect snowshoe hare habitat but explained that the NRLMD contains exemptions that allow a certain amount of thinning in snowshoe hare habitat if the purpose is for fuel reduction within a Wildland Urban Interface (WUI). Where exemptions for these standards applied, factors were evaluated in a Biological Assessment and reviewed in consultation with the US Fish and Wildlife Service. A Biological Assessment (located in the Project File) was prepared for the East Boulder Fuels project for Alternative 3, which includes the maximum number of treatment units. Potential adverse effects to lynx and critical habitat were acknowledged in the BA and formal consultation with the FWS was conducted. The corresponding Biological Opinion received on April 1, 2010 (located in the Project File) concluded that “the effects of the East Boulder Fuels Reduction Project are not likely to result in the destruction or adverse modification of lynx critical habitat”.

The proposed actions would not remove critical habitat as asserted in the comment. Rather, as disclosed in the EA, proposed treatments would alter critical habitat, which may impact lynx, but would not change the designation of critical habitat, or reduce the amount of designated critical habitat within the Greater Yellowstone Lynx Critical Habitat Unit.

Comment 1-5b: The impact of logging on summer hare and red squirrel habitat was not evaluated or disclosed and there is no evidence of any hare sampling densities in the project area.

Comment 1-6c: The impact of logging on red squirrels, which are the key to the availability of whitebark pine nuts for grizzlies, was not addressed

Response: Habitat variables for lynx and grizzly bear were analyzed and effects disclosed in the EA and BA (located in the Project File). Relationships of lynx and grizzly bear to snowshoe hare and red squirrel were discussed. Habitat for snowshoe hare (primary prey species for lynx) was discussed and evaluated against management direction as identified on pages 52, 133-137) of the EA. The EA also explained why the red squirrel was not addressed in great detail for grizzly bear on page 140: “Whitebark pine, a key food source for grizzly bears, is present in the analysis area in a mostly monoculture condition without mixed conifer species. Because of this, it is not as valuable for grizzly bears because squirrels will not actively colonize and cache cones in monoculture whitebark pine stands. They prefer mixed conifer stands with whitebark included (Knight et.al. 1984). Therefore, there is little evidence in the analysis area that grizzly bears are actively foraging in these whitebark pine stands.”

Comment 1-5c: Thinning of forests in MA11 is an FP violation because pine beetles improve habitat for lynx by creating more hare habitat.

Response: Thinning of trees in MA11 is allowed for in the FP provided that big game habitat objectives are met. There is no requirement in the FP to create hare habitat. Effects to lynx were fully evaluated; see response to Comment 1.5a.

Comment 1-6a: Thinning in MA11 will be detrimental to the grizzly bear because downed logs will be reduced. There is no info regarding hiding cover required, although this information is provided in the BO for the Forest Plan. Hiding cover should be defined before and after project implementation.

Response: Hiding cover was one of the criteria used to evaluate existing vegetative habitat conditions for grizzly bears in the East Boulder analysis area (EA, page 138). Hiding cover is important to bears for security while feeding, resting or traveling. In order to provide for adequate security for bears at

least 30% of the moist forest types should be maintained to provide hiding cover. Within the East Boulder Fuel reduction project analysis area (22,850 acres) there are approximately 2,724 acres of moist forest cover types preferred by grizzly bears, currently in a condition to provide hiding cover. These are mostly located in the designated roadless areas that will not be affected by project actions. Approximately 6% of these moist habitats would be altered by proposed fuel treatment, leaving 94% in the current condition. Therefore, hiding cover was analyzed by assessing the amount of moist forested cover types available within the analysis area in comparison to the impacts to these habitats within the treatment units (i.e. before and after project implementation). In addition, a detailed big game hiding cover analysis was completed for the project displaying how each of the alternatives would affect hiding cover both before and after project implementation, the results of which are included in Table 30, p. 191 of the Revised EA. Details of how hiding cover was calculated can be found under methodology and scale on pp. 181-182 of the Revised EA.

Comment 1-6b: It is not clear how the agency determined that there would be no direct impacts to grizzly bear with the project. The EA infers that logging will improve grizzly habitat but literature and monitoring were not provided to support this. If logging degrades forage for big game why will it benefit the grizzly and what foods will increase?

Response: The EA disclosed the impacts to grizzly bears by evaluating hiding cover, foraging habitat, and motorized route density. The determination, which was concurred with by the FWS, was “may affect, but is not likely to adversely affect the grizzly bear or its habitat”. On page 139 of the EA, it is explained why there are no direct effects (or indirect or cumulative) on important hiding cover for grizzly bears. Similarly, effects to grizzly bear foraging habitat is considered to be an indirect effect and is expected to be minimal (page 140 of the EA). Whitebark pine habitat will not be affected by the project. Finally, effects of the proposed actions on motorized route densities (also considered to be an indirect effect) were disclosed (pp. 141-142 of the EA).

In addition to potential adverse effects, there was also discussion of potential beneficial effects. The proposed treatments could produce more succulent vegetation and preferred bear foods that may attract bears to the area in the future (p. 140 of the EA).

Comment 1-6d: The analysis infers that increase in open road densities will not be significant, although these changes were not defined. What research demonstrates that if motorized routes exclude public that grizzlies will not be displaced? Please discuss Swartz et al 2009 regarding the need for increased security for grizzlies in the GYE.

Response: The entire East Boulder fuels analysis area is outside the recovery zone; there is limited Forest Plan direction specific to grizzly bear habitat management *outside* the recovery zone. However, since the project area provides suitable habitat for grizzly bears, and is within an area considered occupied by grizzlies, human access was evaluated for potential effects of the project on grizzly bears or their habitat. Access management, including construction and use of roads for administrative projects, both within and outside the recovery zone, is subject to direction contained in the Gallatin National Forest Travel Management Plan which directs that project roads be temporary in nature, closed to public motorized use during project implementation, and permanently closed upon project completion.

The commenter is correct in that the analysis concludes that changes in open road densities will not be significant. These changes were not quantitatively defined by alternative but were displayed in cumulative effects section of the BA (located in project file). Within the cumulative effects analysis area, the open road density of all motorized routes is 0.3 mi/mi². Construction and use of the temporary roads associated with the East Boulder fuel reduction project would not appreciably change

overall motorized route density at the large geographic scale that is biologically meaningful to wide-ranging species such as the grizzly bear.

Additional rationale for concluding that these temporary roads do not contribute to an open road density that is detrimental to the grizzly bears is disclosed on pages 141-142 of the EA.

Approximately 2.1- 3.5 miles of temporary roads would be necessary throughout the duration of the project and would be within 1/2 mile of the existing open roads such that there would be little notable change in road density within the project area. It also explains that the majority of moist forest cover types, which is the most limiting and critical forest cover type preferred by grizzly bears, are located in the designated roadless areas that will not be treated.

I must assume the commenter is referencing Schwartz 2010 (not Swartz 2009), who modeled annual survival of grizzly bears and found that their top model strongly supported previous research that identified roads and developed sites as hazards to grizzly bear survival? Schwartz' et al. (2010) concluded that the amount of secure habitat and the density of roads in nonsecure habitat on public lands had the greatest effect on grizzly bear survival. Their management recommendations included the continued protection of secure habitats for grizzly bears in the GYE and maintaining road densities in nonsecure habitats at levels necessary to maintain source habitat. [They also concluded that as humans continue to dominate this landscape bringing future changes such as climate, energy development, and human population, that Government, nongovernment, and nonprofit organizations have the potential to influence habitat quality on private lands as well by influencing development adjacent to grizzly bear habitat with land-use planning that minimizes rural sprawl and considering wildlife needs and human safety. This part of the equation also needs attention by concerned citizens.] This information is not inconsistent with the analysis as the effects of roads were recognized and discussed (pp. 141-142 of the EA). The project was found to be consistent with the Travel Plan, which in turn was consistent with the Grizzly Bear Conservation Strategy and the Gallatin Forest Plan.

Comment 1-6e: What data is available to define grizzly bear use in this area? The EA infers that grizzly are displaced from the area due to open roads, however no information was provided as to what level of open roads will result in significant displacement of bears or what situation is within the project area.

Response: The assertion that bears are displaced recognizes the effects of roads on grizzly bears. The EA (p. 141) states that human access is an important factor to consider in assessing the condition of habitat for grizzly bears. The Biological Assessment (BA) (located in project file) goes into more detail. It states that roads and road densities can influence grizzly bear use of otherwise suitable habitat through a number of mechanisms. The regular daily motorized traffic from East Boulder Mine activities, Forest recreational users and private residence traffic all contribute to deterrence of wildlife presence except during periods of lower activity and during nocturnal hours.

As a result, grizzly bear use of the project area is rare, and probably limited to an occasional appearance by transient animals. Fortunately, as stated in the EA and BA, road densities are relatively low in the project analysis area, due to the inclusion of Inventoried Roadless Areas and designated Wilderness. Also see response to Comment 1-6d.

Comment 1-6f: The EA failed to define how the project is in compliance with the taking of grizzly bears outside the recovery zone.

Response: The entire East Boulder fuels analysis area is well outside the Recovery Zone where management direction is applicable, and at the time the Forest Plan was developed, was considered unoccupied. Grizzly bears have expanded outside of the Recovery Zone and, according to the FWS

list of species protected under the Endangered Species Act, and occurring on the Gallatin National Forest, include the area south of Interstate 90. However, Schwartz (2006) updated an earlier estimate of occupied range with data through 2004 identifying the ‘current’ distribution area of the grizzly bear. The East Boulder project area was not included within that distribution area at that time. However, because of incidental observations in the cumulative effects area, the suitable habitat for grizzly bears provided within the project area, and our obligation to the FWS, we assumed the area to be occupied.

As explained in the BA (Project File 9A-2a), there is limited Forest Plan direction specific to grizzly bear habitat management *outside* the recovery zone. The Gallatin National Forest Travel Management Plan (USDA 2006) provides direction pertaining to the construction and use of roads for projects both within and outside the recovery zone and a Forest-wide Special Order (#07-11-00-01) regulates the storage of food and other attractants on National Forest System lands within the entire Gallatin Forest boundary. Also, the US Fish and Wildlife Service issued two Biological Opinions, each with terms and conditions that apply to Gallatin National Forest management actions outside the grizzly bear recovery zone. The BA found that the proposed action would meet Forest Plan direction for fuel management projects, and would comply with all applicable terms and conditions listed in Biological Opinions for Gallatin Forest management actions outside the recovery zone and for the Gallatin Forest Travel Management Plan. The FWS reviewed the BA and concurred with the determination that the proposed action is not likely to adversely affect grizzly bears (received on April 1, 2010).

Comment 2-3: Much of the logging proposed is in lynx critical habitat and would adversely modify lynx critical habitat. Please conference with the U.S. Fish and Wildlife Service on this issue. If a decision is made to log lynx critical habitat and situation 1 grizzly bear habitat, this will adversely affect lynx and grizzly bears and would require an EIS rather than and EA. Please formally consult with the U.S. Fish and Wildlife Service on the impact this project will have on lynx and grizzly bears.

Response: Please see response to Comments 1-5a and 1-6f.

MIS/ Sensitive Species

Comment 1-7: The project failed to define how past and planned logging will affect the suitability of source habitat for the pine marten, including spruce-fir old growth. What data is available on the Gallatin NF to determine how logging impacts pine marten use? The agency has been monitoring since 1986, so what information was produced from this monitoring?

Response: Old growth and pine marten were both analyzed separately on pp 203-209 and 174-180 of the Revised EA, respectively. According to the old growth analysis, the selected alternative will only slightly change the forested vegetative structural composition of the overall project area. Treatment activities will slightly reduce old growth from 21% to 20.5%, while mature forest will actually increase from 43% to 43.5%. Old growth in the compartments within the project area consists of a variety of conifer species mix but is considered to be old growth as defined by Region 1 Guidelines. The effects of the proposed action were assessed relative to literature and verified estimates of old growth. Old growth forest would remain well distributed across the landscape within all forest types.

Pine marten was considered in the Gallatin Forest Plan Management Indicator Species Assessment-Population and Habitat Trends Assessment (Canfield, 2011 unpublished paper), which set a context for the assessment of project level effects for the various species. It described studies on the Gallatin Forest which increased our understanding of local behavior and ecology of this species. The spatial depiction of these habitats indicates that pine marten habitat is relatively plentiful in the Absaroka Mountains. The assessment also pointed out that while this species was selected as a MIS and is being

monitored accordingly, there are many other factors influencing populations besides habitat change. Because it is a harvested furbearer, fur market prices, accessibility to populations by humans, and other factors related to trapping may be the most important population level determinants. It finally concluded that pine marten populations will continue to follow statewide trends as influenced by furbearer management with well-distributed, plentiful habitat available across the Gallatin National Forest. In addition, Regional estimates of pine marten habitat using FIA data showed that 29.6-37.6 or 384,965 acres of the Gallatin National Forest was pine marten habitat (page 177 of the EA). The effects analysis for the East Boulder project concluded the proposed fuel reduction treatments will maintain viable populations of marten on the Forest because the project is consistent with Forest Plan standards for snag and down woody debris; habitat suitability maintenance recommendations of Warren (1990:33); old growth is well-distributed in the project area, and trapping mortality will not increase due to the project.

Comment 2-22: Forest Plan Standard 6.a (13) states: “‘Indicator species,’ which have been identified as species groups, whose habitat is most likely to be affected by Forest management activities, will be monitored to determine population change.” The Forest Plan requires the Forest Service to monitor old-growth indicator species (MIS) by determining population trends of old-growth MIS and their relationships to habitat change, reporting every 5 years. The Forest Plan identifies old-growth indicator species as: pine marten (moist Spruce sites) and northern goshawk (dry Douglas-fir sites). This is not being done.

Response: Management Indicator Species (MIS) are specifically addressed in the Gallatin National Forest Plan (1987: II-18, #13), which states “Indicator species, which have been identified as species groups, whose habitat is most likely to be affected by Forest management activities, will be monitored to determine population change.” Species listed as MIS, specific to old growth include the goshawk (dry Douglas fir old growth) and marten (moist spruce fir old growth). The monitoring section (1987: IV-6, #16) includes the following monitoring item relative to MIS “Determine population trends of indicator species and relationships to habitat changes. Moderate precision; Moderate Reliability, 5 year intervals.”

The Gallatin National Forest published the Forest Plan Monitoring Report summarizing information for the period 2004-2006. That report, with respect to MIS, indicated stable to increasing population trends for Gallatin MIS wildlife species (Project File 7-13). The purpose of the Gallatin Forest Plan Management Indicator Species Assessment-Population and Habitat Trends Assessment (Canfield, 2011 unpublished paper) is to update the best available information about population and habitat trends for Gallatin Forest Plan MIS species and to set a context for the assessment of project level effects (Project File 9B-5a). In addition to the analysis methodology used to analyze the effects of the proposed action and the alternatives (pp. 166-167 and 175 of EA), this assessment was used, along with Regional scale viability assessments, to determine the relative impact of the project (pp 173-174 and 177-178 of the EA).

Comment 1-7b: The project will have significant adverse impacts on marten and associated species through the loss of red squirrel and snowshoe hare habitat, riparian habitat, as well as the loss of winter habitat by removal of jack-strawed logs

Response: The effects analysis for pine marten (EA pp. 177-178) discloses that no direct effects are anticipated under any of the alternatives but that indirect effects to denning and foraging habitat would occur with Alternative 2 and 3 from the removal of overstory and understory trees that could eventually contribute to coarse woody debris, a habitat component important to martens for den sites and prey habitat. Intersection of proposed fuel reduction units and potential pine marten habitat indicate that approximately 249 and 366 acres would be impacted with Alternative 2 and 3

respectively. The fuel reduction treatments will reduce available snags, downed woody debris and overhead cover for marten. However, a minimum of 85% (under the most impactful Alternative 3) will remain in mature to old growth, preferred and/or suitable habitat after fuel reduction treatments. The conclusion was that there may be some effect to individual home ranges, but this is expected to be minor.

The proposed fuel reduction treatments will maintain viable populations of marten on the Forest because the project is consistent with Forest Plan standards for snag and down woody debris; habitat suitability maintenance recommendations of Warren (1990:33); and trapping mortality will not increase due to the project. The Gallatin Forest Plan Management Indicator Species Assessment (Canfield, unpublished paper:23) concluded that pine marten populations will continue to follow statewide trends as influenced by furbearer management with well-distributed, plentiful habitat available across the Gallatin National Forest (Project File 9B-5a).

Comment 1-8a: The EA does not identify nesting areas for goshawk and does not consider how past activities could have impacted goshawk habitat below thresholds for nesting. The % of old growth is only 5% in the analysis area which is far below the 20% recommended by Reynolds thus making the logging of prime low elevation old growth highly significant and the project will only exacerbate the existing problem.

Response: The commenter is correct that the EA does not identify nesting areas for goshawk. Goshawk surveys detected the presence of goshawk but no nests were located (Project File 9B-6). There are no documented nest stands, historical or current, in the analysis area. Since detections have been made, mitigation was developed to protect a nest stand if it is located prior to fuel reduction activity (pp. 53 (#8) and 173 of the EA). To conduct the effects analysis, goshawk nesting, post-fledgling, and foraging habitat was modeled using GIS tools based on R1-VMap which derives habitat estimates for those life forms and size classes that best describe goshawk habitat potential. Table 27 (p. 169 of EA) displays vegetation composition of PFAs in the East Boulder project area in comparison to the nearest geographic areas (Patla 1997 and Clough 2000) and with desired forest conditions from Reynolds et al. (1992). The tree size class of 5-9.9" and the percentage of forested areas with canopy cover of >40% with trees >5" is higher than Reynolds et al. (1992) recommended. This mirrors the analysis done for old growth and mature forest stands; the commenter is incorrect that there is only 5% old growth as it is clearly explained that the amount of old growth before and after treatment is 21% (Alternative 1), 20.5% (Alternative 2), and 19.7% (Alternative 3) (page 206 of EA). In addition, the number and size of nest areas within the East Boulder analysis area exceeds recommendations by Brewer et al. (2009). The amount of acres affected would not substantially change the overall percentages of each structural class to a range that is outside that reported by research.

The commenter also incorrectly states that past activities were not considered as the modeling was based on existing conditions which reflects any past harvest. Past activities and goshawk populations were considered in cumulative effects as well and through comparison with Forest and Region scale assessments and research (pp. 170-174 of the EA). Based on this broad scale habitat analysis, there is more than enough suitable nesting habitat currently available on the Gallatin National Forest to support a viable population.

It was recognized that ongoing natural disturbances such as mountain pine beetle attacks pose uncertain risks to goshawk populations as a function of habitat change. Reynolds et al. (1992) was cited for also stating that lack of disturbance can result in increased densities of trees above some threshold that may render habitats unsuitable for nesting and foraging goshawks as well as some prey species.

Comment 1-8b: The measures for goshawk habitat in the project area were not identified because the analysis area for goshawk of 22,850 acres is much larger than the average goshawk home range and will not address direct project related impacts. The impacts should be based on current best science (Reynolds Report) and we request that an accurate comparison to the Reynolds Report be provided.

Response: The analysis area for goshawk includes both National Forest and private lands in the lower East Boulder drainage, encompasses all proposed treatment units that may affect goshawk habitat, and is large enough to provide habitat for approximately two home ranges. The Northern Goshawk Northern Region Overview (Brewer et al. 2009:4) suggests use of R1-VMap and inventory data to classify and assess goshawk habitat. This approach considers multiple analysis levels. The broad level analyses set the context at the Regional population level and the role the Gallatin Forest has in that Regional population, as well as addresses NFMA requirements. The smaller level analysis is appropriate for analyzing project level impacts and addresses NEPA requirements. This is the best science applicable to the East Boulder project.

As clearly outlined in tables and narrative (pp. 166-174 of the EA), Reynolds et al. (1992) was utilized to compare the local stand conditions with his recommendations for the southwestern US. However, Brewer et al. (2009) explains why Reynolds work was not readily comparable to the studies in the northwestern United States. According to Brewer et al. (2009), Reynolds reviewed the 1992 management recommendations, recognized that specific forest conditions (overall composition, structure, pattern and dynamics) likely differ among different geographic regions, and concluded that the 1992 recommendations can be adapted to other geographic regions, based on more region-specific information.

Therefore, in addition to analysis of literature recommendations and comparisons to Reynolds, more local information was also utilized. These sources included a systematic random survey in Region 1 in 2005 which showed that the goshawk is relatively common and well-distributed in the Northern Region (Kowalski 2006:9); a region-wide conservation assessment for the northern goshawk was completed in 2006 (Samson 2006:39-40) which indicated that the short-term viability of the goshawk in the Northern Region is not an issue; an estimate of nesting, PFA and foraging habitat based on Forest Inventory Analysis (FIA) data (Bush and Lundberg 2008:4-6); Brewer et al. (2009:24) who summarized three broad level analyses for Region 1 and determined that goshawk habitat is abundant and well-distributed in the more managed portions of National Forest lands; the level of timber harvest of the forested landscape in Region 1 is insignificant; forested habitat is more extensive, less fragmented than historical times and continues to increase due to suppression of natural ecological processes (such as fire); and that habitat for maintaining viable populations is available in excess to that needed on each Forest in Region 1; and finally, Canfield (2011 unpublished paper) who determined that there is more than enough suitable nesting habitat currently available on the Gallatin National Forest to support a viable population. Also see response to Comment 1.8a above.

Comment 1-8c: The agency provided no information as to why the goshawk population on the Gallatin is viable and has not been significantly reduced by management practices. No Gallatin population monitoring was provided.

Response: As described in the February 2011 (Project File 9B-5a) Gallatin Forest Plan Management Indicator Species Assessment (Canfield, 2011 unpublished paper:23, pp. 17-19) the R1 piloted the "Northern Goshawk Bioregional Monitoring Design," a grid-based survey protocol based on a random sampling design during the 2005 breeding season. The purpose of the survey was to employ a statistically-based approach to: (1) estimate the rate of goshawk occupancy (frequency of presence)

within a grid that approximates the territory size for the species (1,700 acres); and (2) better define and document the geographic distribution of goshawks across R1.

As part of this Regional survey, 10 PSUs were sampled on the Gallatin; goshawks were detected in two of the PSUs and one active nest was found in an additional PSU. This rate of detection (33%) is similar to the Regional trend overall.

The Gallatin National Forest has also done independent surveys and inventories for goshawks, mostly in conjunction with project level analyses, and therefore generally outside of roadless and wilderness areas within the managed portions of the forest. In 2010, sites were resurveyed in 2010. The data is presented in tabular and narrative formats. The assessment acknowledges that while surveys may inform our knowledge of goshawk habitat use on the Gallatin National Forest, it is unlikely that statistically valid population “trends” can be determined without a more rigorous sample design accompanied by the funding needed for systematic inventories. A disproportionate amount of time is spent responding to appeals and litigation instead of planning and implementing rigorous monitoring designs and protocols. Instead, we rely heavily on the more rigorous survey design at the Regional level in 2005, where goshawk detections on the Gallatin appear to support populations that are stable and cycling at low numbers (as reported by Cherry in 2006, Gallatin National Forest Plan Monitoring Report for 2004-2006).

Comment 1-8d: There is a growing body of literature indicating that logging creates problems for goshawks and none of this literature was discussed in the EA.

Response: The commenter did not provide the referenced literature to review for applicability to this project other than what was cited. The EA did disclose the potential effects, both positive and negative, of the potential commercial harvest and hand-thinning fuel reduction project activities based on peer reviewed science. More importantly, the analysis was based on a Regional level model, which in turn was developed from actual statistically reliable data, to determine the site-specific impacts at the stand level. The analysis overwhelmingly supported the conclusion that the proposed treatments are not expected to contribute to a loss of viability because actively nesting goshawks would be adequately protected through activity timing restrictions, occupied nest areas will not be treated, PFA and foraging area habitat are consistent with recommendations and/or actual research relevant to the analysis area, adequate nesting habitat will remain in the analysis area to support the breeding pairs, and habitat Forest-wide is abundant and widely distributed (p. 173 of the EA).

Comment 1-8e: The EA infers that no impacts will occur to nesting goshawks because nests will be protected; who will locate and protect these nests?

Response: Surveys and potential protection measures would be conducted by either the East Zone Wildlife Biologist or biological technicians. Other Forest Service personnel working in the project area may also detect goshawk activity and/or nests and report them to the biologist. These FS employees could include marking crews, sale administrators, or other specialists working in the project area. There is a complete record of goshawk survey information from 1996, 2009, and 2010 in the Project File (9B-6) and summarized in the EA (page 167). To date in 2011, the East Boulder project area has been visited twice, and one detection has been made but no nest has been located.

Comment 2-30: The EA also notes that no wolverines, goshawks, grizzly bears or pine marten were found. The revised EA still fails to explain how the project complies with the Forest Plan and NFMA’s requirements on ensuring that the Forest Service is ensuring a viable population of MIS when no MIS were found. This is a violation of NEPA. The revised EA doesn’t seem to address this problem at all. The Forest Plan requires that the Forest Service ensures the

existence of viable populations of species, not the theoretical possibility that the species should be present. Moreover, without any indication that there are viable populations of MIS in the Project Area before the Project, it is unclear how the Forest Service could conclude that viable populations of MIS will be maintained after the Project.

Response: The commenter is incorrect that the Revised EA notes no MIS presence in the project area. For each of these species (*except wolverine which is not a Gallatin Forest MIS*), information is provided to indicate either their presence or rationale for not analyzing them in detail (bald eagle). Please refer to Table 26 (page 164) and the following pages of the EA: 165 (bald eagle and grizzly bear), 167 (goshawk), 176 (marten).

There is also a discussion of the Gallatin Forest Plan Management Indicator Species Assessment (Canfield, 2011 unpublished paper) regarding population trends at the Forest level. A summary of its conclusions are in the EA; the entire paper is located in the Project File 9B-5a.

Comment 2-31: There is evidence in the record that effectively rebuts the presumption that the habitat-as proxy-approach is taking care of the species viability in the Project Area. The Forest Service has failed to adequately address or explain this evidence or describe more adequately the potential reasons why the MIS have not been located in the Project Area. Accordingly, the decision to rely exclusively upon the old growth standards to meet the Forest Plan requirements for MIS monitoring and ensuring species viability in the Project Area was in error and the decision authorizing the Project must be set aside, because the Project's effect on species viability has not been addressed

Response: The MIS have been located in the project area, except for bald eagle as noted above. See response to Comment 2-30 above.

Comment 2-23: Forest Plan Standard 6.a(12) states: Habitat that is essential for species identified in the Sensitive Species list developed for the Northern Region will be managed to maintain these species. These Forest Plan Standards thus describe the GNF's way of maintaining viable populations of Sensitive and old-growth dependent wildlife species, as NFMA requires. Unfortunately, the GNF has failed to adhere to these standards, and therefore viability is not assured.

Response: As outlined in the 2011 Gallatin Forest Plan Management Indicator Species Assessment (Project File 9B-5a), there is nothing in the current NFMA direction about viability. "The Forest Service is required by National Forest Management Act (NFMA) to "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives" 16 U.S.C. 1604(g)(3)(B)". The sensitive species program is intended to be pro-active by identifying potentially vulnerable species and taking positive action to prevent declines that will result in listing under the Endangered Species Act. Forest Service Manuals (FSM 2670) provide policy under which Forest Service projects are designed to maintain viable populations of sensitive species and to ensure that those species do not become threatened or endangered due to Forest Service actions.

As part of the National Environmental Policy Act (NEPA) decision-making process, proposed Forest Service programs or activities are to be reviewed to determine how an action would affect any sensitive species (FSM 2670.32). The goal of the analysis should be to avoid or minimize impacts to sensitive species. If impact to a sensitive species cannot be avoided, the degree of potential adverse effects on the population or its habitat within the analysis area needs to be assessed.

The Regional Forester designated sensitive species for Region 1 (USDA 2011) were analyzed in this report on pages 149-163 of the EA. Three new wildlife species and one new fish species were added to the 2011 Regional Forester's list for the Gallatin National Forest effective May 27, 2011. The new wildlife species to consider include the bighorn sheep. The aquatic species is the western pearlshell mussel, however it is only found and applicable to portions of the west side of the Gallatin National Forest in the Gallatin and Madison River drainages, which are well outside of the project area so this species will not be analyzed for this project.

Comment 1-9: The EA states that logging will benefit migratory bird species but no literature citations or monitoring was provided to support this claim and no plan for the conservation of these species was provided as required by the MOU with the USFWS.

Response: Management of migratory bird species and their habitats are governed by a wide range of authorities – but the commenter is incorrect in stating there is a MOU with the USFWS requiring conservation. Most direction regarding conservation of these species falls under the umbrella of the Migratory Bird Treaty Act (16 USC 703-712) (MBTA) and an associated Presidential Executive Order. Under this Act, which implements various treaties and conventions for the protection of migratory birds, it is unlawful to take, kill or possess any migratory birds, except as regulated by authorized hunting programs. Executive Order 13186 requires agencies to ensure that environmental analyses evaluate the effects of federal actions and agency plans on migratory birds, with emphasis on species of concern. Montana Natural Heritage Program and Montana Fish Wildlife and Parks "Species of Concern" lists (SOC), along with the US Fish and Wildlife Service Birds of Conservation Concern were used to identify focal species for this analysis.

A literature review was conducted for additional information on migratory bird habitat use and possible impacts associated with timber harvest and burning. The full wildlife specialist report for migratory birds actually states that habitat modification can alter the quality and quantity of habitat available for migratory bird species such that it may have adverse impacts to some species, while others may benefit. It discussed some literature based conclusions of potential beneficial effects to SOC associated with proposed fuel reduction measures, as well as adverse effects which could result from disturbance impacts depending on the timing of the activity. This analysis satisfies the direction in the Executive Order to evaluate the effects of federal actions, with an emphasis on SOC.

Comment 3-4: The science presented in the attachments indicates that some timber sales that remove of dead and dying trees eliminates habitat required by bird species that feed on insects that attack living trees, with the result that outbreaks of pests may increase in size or frequency (Torgersen et al. 1990). Will dead and dying trees be harvested? How will the forest service compensate for the lost bird habitat?

Response: The literature to which the commenter refers, "Down Logs as Habitat for Forest-dwelling Ants – the Primary Prey for Pileated Woodpeckers in Northeastern Oregon" (Torgersen et al. 1990), is specific to habitat created for ants which are primary prey for pileated woodpeckers. The Gallatin Forest is outside the range of pileated woodpeckers. Down logs do serve as a foraging substrate for some migratory bird species. Down logs are created by trees falling down to the ground. Removing dead trees or snags could potentially reduce the amount of down logs available to these birds.

The migratory bird specialist report recognizes that downed woody material and snags are an important habitat component for migratory birds. It briefly discusses snags and down logs, and Forest Plan standards for snag and down woody debris retention in treatment units, to help maintain these components. Other issue analyses refer to snags and downed woody debris in relation to bird habitat needs (flamulated owls, black-backed woodpecker, Northern goshawk).

The snag analysis uses Bollenbacher et al. (2008) to provide context for managing forests to maintain ecosystem diversity for the snag resource and was consulted for insight into snag density estimates for a variety of landscapes and habitat conditions on the Gallatin Forest. It summarized disturbances in Region 1 from 2000-2007 and found that more than 300,000 acres were affected by fire, more than 5 million acres were affected by insects, and less than 45,000 acres were harvested or thinned. Due to the ongoing and predicted future increases in bark beetle epidemics and fire events, it is expected that there will be increasing snag densities in all diameter classes over time. Bollenbacher (2008) states that there has been no known extirpation of cavity nesting species from eastside Forests. Forest Plan standards for snag and down woody debris management would be met under both the action alternatives. Burned areas, insect infestations and natural forest succession will continue to provide forest structure that eventually produce snags and down woody material.

Comment 1-10: Black-backed woodpecker is known to be dependent on old growth when there are not fire or beetle epidemics present. The project will degrade old growth and thinning will reduce future habitat for woodpeckers by reducing the potential for mountain pine beetles. It is not clear what the basis for no effect for this species from the project was.

Response: Primary cavity nesters, such as black-backed woodpeckers, prefer disturbed landscapes of burned or insect killed forest with numerous snags containing wood boring insects. Disease and insect killed trees provide limited suitable habitat within the project area. Abundant optimal burned habitat was created by the Derby, Jungle, and Hicks Park Fires in 2006 & 2007, which consist of large acreages of burned trees that are in close proximity to the project area. No burned or substantial amounts of dead trees providing snags for nesting and foraging occur in the project area. Long term, thinning smaller diameter trees will maintain larger available trees for snag recruitment. Snag standards will be followed.

Comment 1-12: The EA falsely states that the project will not impact the wolverine but management of winter range should be optimized in MA11 to benefit wolverine.

Response: The commenter found an error in the EA. The determination for wolverine after consideration of the effects is noted twice, with two different conclusions. The conclusion of the analysis indicates “no impact” on wolverine (page 162 of the EA) and the summary Table (page 152 of the EA) indicates that the project “may impact individuals or habitat, but is not likely to cause a trend to Federal listing or loss of viability”. The summary Table is correct. While species presence is unknown, and there is no suitable denning habitat within any proposed fuel reduction treatment units, there is suitable foraging habitat in or near the units proposed for treatment. While no measurable change in available ungulate carrion anticipated, the wolverine is proposed for listing under the Endangered Species Act.

MA 11 is analyzed under big game (pages 180-193 of the EA). This MA contains standards for big game winter range such that timber harvest is designed to enhance winter range capability. For this project, this is done by leaving key areas untreated to retain vital cover, while at the same time increasing forage production in areas where the forest canopy is opened. However, the proposed fuel reduction treatment units are not substantial contributors to the forage base for wolverine due to the proximity to public roads and structures on private land and their associated activity.

Snags

Comment 1-4a: Please discuss how the lack of adequate snag habitat is impacting the distribution and viability of snag-associated wildlife in the project and analysis areas. How is the FP snag standard being implemented when past logging areas have no snags?

Response: The document *Estimates of Snag Densities for Eastside Forests in the Northern Region* (Bollenbacher et al. 2008) was consulted to compare snag density estimates for a variety of landscapes and habitat conditions based on Gallatin Forest data. Bollenbacher (2008) states that to date, there has been no known extirpation of cavity nesting species from eastside Forests, within or outside of roaded areas and that analysis of the roadless portion of these Forests will represent an appropriate range of snag numbers and distribution to develop desired snag conditions for planning purposes. To evaluate project compliance with Forest Plan snag standards and best science across the landscape, we compared the estimated average snag densities in the Gallatin National Forest as a whole to the Absaroka Mountain Range (Table 32 and 33, page 199-200 of the EA) and ultimately to the effects of the proposed vegetation treatments (page 6 of Snag Specialist Report, Project File 9C-1).

While the snag information provided in Bollenbacher et al. (2008) does not set forth management direction, it does provide best science for snag information and analysis. Technically, the Forest Plan snag standard only applies to the actual treatment units. The EA disclosed that relative to current Forest Plan snag management direction, the snag density estimates for the proposed treatment units do not meet the Forest Plan snag standards in all the units. The proposed action could further reduce current snag densities and availability of future snag replacement trees in the project area.

Mitigation was incorporated to meet Forest Plan snag standard within the units through prescriptions (clump retention, thinning specifications, tree species preferences, etc.) and other mitigation. The effects analysis explained how the East Boulder thinning prescriptions will move each respective stand towards a late seral condition, typically favoring tree species capable of producing the largest snags by removing smaller diameter trees and leaving on average the larger trees. Prescriptions also call for leaving clumps of trees that have no treatment, interspersed amongst thinned areas. Where units do not have 30 snags per 10 acres existing, the largest snags will be left and 30 live replacement trees per 10 acres will also be left to meet the Forest Plan snag standard. Mitigation would also reduce the risk of snag removal for firewood.

Perhaps most importantly, Bollenbacher et al. (2008) suggests that not only is it important to understand the distribution of snags and large-live remnant trees over time during various stages of succession [within a managed treatment unit], but it is important to explore how snags are distributed spatially across the landscape. Estimates of snags and live trees for the Absaroka Mountains are well over the 30 snags and 30 snag replacement trees per 10 acres (or 3.0 and 3.0 per acre) required by the Forest Plan. These estimates incorporate Gallatin data and provide a landscape context for the snag resource. This is a more holistic argument that provides some context within the proposed treatment units and across the direct, indirect, and cumulative effects analysis areas; across the Absaroka-Beartooth Mountain Range, and across the Gallatin Forest.

The EA also disclosed that with the recent wild fires and prescribed burns and appearance of mountain pine beetle in the project area, it is likely that snag availability has and will continue to increase in proposed treatment units and the project vicinity before project implementation is complete. The EA concluded that coupled with potential large scale tree mortality expected to result from insect infestations, snag habitat does not appear to be limited in the project vicinity, and proposed actions would have no measureable effect to any snag dependent species at the population level as the fuel reduction treatment would impact a relatively small area.

Comment 1-4b: How will snag recruitment be adequate if current levels are inadequate and why is 3 snags per acre all that is needed to maintain viability of associated species?

Comment 1-4d: It appears that the snag strategy is to leave snags in the leave clumps so how will this ensure an average of 3 snags per acre in logged units?

Response: Snag retention will be met through project design criteria and mitigation. The Forest Plan standard is not 3 snags per acre but rather 30 snags per 10 acres. The objective of the snag management direction states that distribution should vary with some snags left on the edge, interior, or in clumps and with an emphasis of snag retention in riparian areas, ridgetops, openings and areas of natural mortality. The standard requires that if there is not a sufficient number of existing snags to meet these criteria the largest available dead trees will be left. Prescriptions for fuel treatments typically favor tree species capable of producing the largest snags (e.g. Douglas fir and spruce) by identifying them as preferred conifer tree leave preference species. Prescriptions also call for leaving clumps of trees that have no treatment, interspersed amongst thinned areas. Leaving dense clumps of live trees around retention snags would help protect snags not only from environmental factors that would reduce longevity, but would also help shield them from view of potential firewood cutters.

The Gallatin Forest Plan Snag Management (Amendment No. 15, USDA 1993) contains direction to accommodate the needs of cavity nesting birds and other snag-dependent species in conjunction with timber harvest activities. Most cavity-nesting species prefer large-diameter snags while some species actually select smaller-diameter snags for nesting, and smaller snags provide valuable foraging strata for a number of species. Due to the complex relationship between a wide variety of snag-dependent species and their preferred habitats, it is desirable to have a range of snag conditions (tree species, size, structure, degree of decay) across the landscape. This direction would be met through project design criteria and other mitigation. Between retention clumps and remnant trees in thinned areas, there would be no problem meeting the Forest Plan requirement for replacement trees within units.

Also see response to Comment 1-4a.

Comment 1-4c: Since woodpeckers require continual supplies of newly dead snags, how can logged habitats meet their needs?

Response: The need for snags and down woody debris will be met within the units as noted in the mitigation section and snag discussion (page 51-52 (#4) and 202-203 of the EA). Mitigation was incorporated to address the potential need for greater numbers of snags both within and outside the proposed fuel reduction units. Regardless, the East boulder fuel reduction project will meet Forest Plan snag standard within the units through prescriptions (clump retention, thinning specifications, tree species preferences, etc.) and mitigation.

In contrast, Bollenbacher et al. (2008) suggest that the estimates of snags that are left within the entire project area, should apply to the average snag and live tree density within the total treatment unit acreage or even *across* the entire project area entire project treatment area and not to every treated acre within a project area. This is a more holistic argument that provides some context for the snag resource within the units; across the direct, indirect, and cumulative effects analysis areas; across the Absaroka-Beartooth Mountain Range, and across the Gallatin Forest. While the snag information provided in Bollenbacher et al. (2008) does not set forth mandatory or required direction, it does provide current snag information and analysis for consideration by the Forests, based on best science. Abundant optimal burned habitat was created by the Derby, Jungle, and Hicks Park Fires in 2006, which consist of large acreages of burned trees that are in close proximity to the project area. Natural processes will continue that have (or soon will) produce abundant snags. Burned areas, insect infestations and natural forest succession will continue to provide an abundance of such material over time. Also see response to Comment 3-4 and 1-10.

Comment 1-4e: The impact of logging on future snag recruitment due to the mountain pine beetle was not addressed.

Response: The impact on future snag recruitment by logging and mountain pine beetle was clearly addressed in the EA on pages 201-202, 211.

Revised EA p. 201 states, “Other developing stands in treatment units inventoried in 2009 had few existing snags, but had early signs of insect infestation which will promote snags over time. While some trees are capable of surviving insect attacks, tree mortality has been high in other areas of the Gallatin Forest, particularly in areas of mountain pine beetle infestation. With the recent appearance of mountain pine beetle in the project area, it is likely that snag availability will increase in proposed treatment units before project implementation is complete.”

Revised EA p.202, “Within the cumulative effects analysis area, natural processes will continue similar to that of Alternative 1 (No Action) that have (or soon will produce) abundant snags. Snags are typically created by ecological processes that result in a naturally “clumpy” distribution on the landscape. Other than continued tree mortality expected to result from insect activity, there are no reasonably foreseeable future actions that would influence snag occurrence, abundance or distribution in this watershed.”

Revised EA p. 211 states “At a much broader scale, Compartment 112 for instance (112 has around 10,800 forested acres), the treatment of around 900 acres amounts to approximately 8% of the area while the treatment differences between Alternative 2 and Alternative 3 amount to just over 2%. The scale of the project is small enough that little in the way of reducing a projected outbreak of mountain pine beetle is likely within the greater East Boulder drainage.”

Comment 1-4f: A number of bat species are dependent upon large snags and these needs were not clearly identified in the EA.

Response: Townsend’s big-eared bat was addressed in Table 25 of the Revised EA, which points out that suitable habitat is not found within the project area for this species. Long-eared and long-legged myotis, two bat species that were incorrectly analyzed as R1 Regional Forester’s Sensitive Species, were clearly identified and addressed in Table 25 (pages 151-152) and in narrative (pages 156-160 of the EA). Since that time, clarification via the February 25, 2011 letter “Regional Forester’s Sensitive Species List, 2011 Update” has indicated that these two bat species are not designated as sensitive species.

Comment 2-27: The GNF plan requires the F.S. to monitor and retain snags in previously logged areas. As you can see from the attached pictures of old clearcuts in the project area, there appears to be few if any snags and the GNF has done no monitoring to show any snags exists in these old clearcuts in violation of the forest plan, NFMA and the APA.

Response: Field surveys were conducted in 2009 to estimate snag density estimates in proposed treatment units. These surveys used a random point location system based on a chain grid system. Additional snag and down woody debris information was collected in stand exams conducted for each proposed treatment unit. Based on this information, snag presence within proposed treatment units was very variable. Snag survey data indicates 0-21 snags per acre across all units. Other data were utilized to evaluate effects and provide context for the snag resource including Forest Inventory and Analysis (FIA) data used to estimate average snag densities, and live replacement tree availability, in the 5th Code Hydrologic Unit for the Absaroka-Beartooth Mountain Range. Also, according to Bollenbacher et al. (2008), the proposed treatment units, which consist of either warm or cool habitat types, would be expected to reflect an average of 5.3-23.2 snags per acre inside unroaded areas and 2.2-12.0 snags per acre in the managed areas. Items 9C-3 & 9C-4 of the Project File contain snag survey maps, data, methodology used for inventory, as well as a snag inventory summary.

Comment 2-29: Considering potential difficulties of using population viability analysis at the project analysis area level (Ruggiero et al. 1994), the cumulative effects of carrying out multiple management projects across the Forest makes it imperative that population viability be assessed at least at the forestwide scale (Marcot and Murphy, 1992). It is also of paramount importance to monitor population trends (as mandated by the Forest Plan) during the implementation of the Forest Plan in order to validate assumptions used about long-term species persistence (i.e., population viability) (Marcot and Murphy, 1992; Lacy and Clark, 1993). In response to USDA Regulation 9500-4 and NFMA's viability provisions, the Forest Service Manual also outlines the need to design and implement conservation strategies for Sensitive species. The revised EA thus fails to come close to a genuine viability analysis for Sensitive and old-growth indicator species, such as the pine martin, wolverine, or northern goshawk. The significance of the cumulative effects of habitat fragmentation and reduction due to logging, road building, fire suppression, and other management activities in regards to their effects on population levels or viability was not disclosed.

Response: MIS for old growth (Northern goshawk and pine marten), and wolverine (sensitive species) were addressed and analyzed in the EA (pages 166-178 and 160-162 respectively). Effects on wolverine are so unlikely and the determination is conservative. However, the wolverine is proposed for listing under the Endangered Species Act so the conservative determination was selected. Cumulative effects were discussed for each of these species (pages 173, 178, and 162 of the EA). Conclusions from these analyses were that there were no concerns as cumulative effects, if any, were expected to be minor. The East Boulder project was found to be in compliance with all the laws, regulations, and Forest Plan direction (pages 178-180 of the EA).

Population viability has been assessed at the Forest level in the Gallatin Forest Plan Management Indicator Species Assessment-Population and Habitat Trends (Canfield, 2011 unpublished paper), which is located in the Project File (9B-5A). The purpose of this 2011 assessment is to update the best available information about the status of MIS on the Gallatin Forest. It summarized goshawk survey data and habitat threshold models specifically for the Gallatin Forest. Based on this broad scale habitat analysis, there is more than enough suitable nesting habitat currently available on the Gallatin National Forest to support a viable population. Relative to marten, the assessment concluded that as a fur market species, trapping is a mortality variable that may play a role in population trends. Therefore, population trends are not necessarily a function of habitat as quantity and distribution of habitat across the Gallatin appears to be well-distributed and plentiful. While the proposed fuel reduction treatments could impact habitat components to some degree, the amount of habitat affected is relatively small. It determined that habitat for the Northern goshawk and pine marten is present and well distributed on the Gallatin National Forest and that project activities are relatively inconsequential compared to natural events in terms of maintaining a viable population.

Big Game/Winter Range/MA11&MA12

Comment 1-11a: The project will violate MA7, MA11 & MA12 direction by degrading big game winter range and wildlife habitat. The agency failed to define how much suitable forest habitat must be maintained for moose and mule deer and how much habitat was lost by past activities. Logging of old growth in MA11 and MA7 is a Forest Plan violation

Response: The project will not violate direction for MA 7, MA11, or MA12. Harvest of old growth is not prohibited in MA11, as long as big game habitat objectives are met (FP III-33). Standards relative to wildlife within MA 11 were addressed in the big game specialist report (Project File 9E-1). MA 12 has no specific management direction for wildlife that pertains to the proposed East Boulder fuel reduction activities. Proposed treatment within MA 11 is designed to enhance winter range capability

by leaving key areas untreated to retain vital cover, while at the same time increasing forage production in areas where the forest canopy is opened. The Forest Plan standard in MA11 to ensure no even-aged openings are more than 600 feet from cover would be met through unit layout design.

Spatial boundaries for direct/ indirect and cumulative effects analysis were defined. The project area provides key habitat features for big game; these areas were mapped and quantified where possible and the maps are located in the Project File 9E-11 & 9E-12. Moist sites may be point source locations including streams that supply water, succulent forage, and wallows; as well as cover. These moist sites, along with non-forested foraging areas, are relatively rare habitat components in the project area. Non-forested foraging habitat consisting of natural meadows and parks, and relatively recently burned or harvested areas, represent less than 4% of the project analysis area. Open forest types (with less than 40% canopy cover) provide the majority of foraging habitat, and currently represent approximately 12% of the project area. The total proportion of foraging habitat is 16% of the project analysis area. Cover is not limited in the project area, with approximately 76% of the entire project area currently dominated by, or capable of providing dense conifer habitat at various stages of succession. Of this, approximately 36% currently serves as thermal cover as well. The remaining portion of the project area (approximately 8%) is covered by rock, water or permanent development, which do not provide cover or forage for big game. See the direct/indirect/cumulative effects analysis for big game (pp. 183-190 of the Revised EA).

Comment 1-11b: We have visited the project area and the level of thermal cover identified in the EA is highly under-estimated. Is this a means to claim that winter habitat will not be degraded? It also seems that the delineation of winter range is not accurate and correct delineations are important for wildlife management.

Response: The Forest Plan (Amendment No. 14) defines thermal cover as *“Cover used by animals to ameliorate chilling effects of weather; for elk and grizzly bear, a stand of coniferous trees 40 feet or taller with an average crown closure of 70 percent or more. For deer, thermal cover may also include saplings, shrubs, or trees at least 5 feet tall with a 75 percent crown closure. In some cases, topography and vegetation less than specified may meet animal needs for thermal regulation.”* This definition is also consistent with Black et al. (1976:19) who found that deer use small conifers and shrubs on winter range so there is a wider range of conditions that provide thermal cover for deer relative to elk.

Montana Fish Wildlife and Parks (MFWP) personnel were contacted for big game use and population trend information. Project File 9E-9 & 9E-10 contains Elk and Big Game Winter Range Maps for the East Boulder drainage from information provided by Montana Fish Wildlife & Parks and the delineations of MA11 as provided in the Forest Plan.

For this analysis, thermal cover was evaluated by assessing structural characteristics of forested habitats, including successional stage, dominant tree species, and canopy cover. Thermal cover was modeled using the definition for elk (above) and is a conservative approach to ensure that the needs of deer would be met; if optimal thermal cover requirements for elk are provided, the requirements for deer are more than adequately met. A small percentage of the total proposed treatment acres would be affected in Alternative 2 and 3. Thinning would reduce cover, but would increase forage availability by opening up the canopy, allowing more light to reach the forest floor, thus stimulating production of grasses, forbs and shrubs, which provide forage for big game. Project design features are specified to leave important deer wintering areas and travel corridors untreated.

Comment 1-11c: The use of canopy cover as a measure of impact is a violation of the FP and NEPA. The analysis of “baseline” hiding cover is illogical, since it misrepresents habitat conditions on the ground and is not consistent with the Forest Plan.

Comment 1-11e: The measurement of hiding cover did not include horizontal cover as per FP definition. In addition, areas with understory thinning only were not considered in regards to cover loss; this is possible by an invalid definition for hiding cover or canopy cover.

Response: MIS for old growth (Northern goshawk and pine marten), and wolverine (sensitive species) were addressed and analyzed in the EA (pages 166-178 and 160-162 respectively). Effects on wolverine are so unlikely and the determination is conservative. However, the wolverine is proposed for listing under the Endangered Species Act so the conservative determination was selected. Cumulative effects were discussed for each of these species (pages 173, 178, and 162 of the EA). Conclusions from these analyses were that there were no concerns as cumulative effects, if any, were expected to be minor. The East Boulder project was found to be in compliance with all the laws, regulations, and Forest Plan direction (pages 178-180 of the EA).

Population viability has been assessed at the Forest level in the Gallatin Forest Plan Management Indicator Species Assessment-Population and Habitat Trends (Canfield, 2011 unpublished paper), which is located in the Project File (9B-5A). The purpose of this 2011 assessment is to update the best available information about the status of MIS on the Gallatin Forest. It summarized goshawk survey data and habitat threshold models specifically for the Gallatin Forest. Based on this broad scale habitat analysis, there is more than enough suitable nesting habitat currently available on the Gallatin National Forest to support a viable population. Relative to marten, the assessment concluded that as a fur market species, trapping is a mortality variable that may play a role in population trends. Therefore, population trends are not necessarily a function of habitat as quantity and distribution of habitat across the Gallatin appears to be well-distributed and plentiful. While the proposed fuel reduction treatments could impact habitat components to some degree, the amount of habitat affected is relatively small. It determined that habitat for the Northern goshawk and pine marten is present and well distributed on the Gallatin National Forest and that project activities are relatively inconsequential compared to natural events in terms of maintaining a viable population.

Comment 1-11d: Habitat effectiveness and big game security was not identified for the project and analysis area during summer and fall, therefore failing to identify a direct project related impact within MA11. The EA did not define why logging was needed for wildlife, which could justify why roads could be constructed in MA11. What are fragmentation impacts, the status of motorized trails and what are the objectives for hiding and thermal cover for summer and winter range? How are these lands being managed to promote wildlife?

Response: The amount and distribution of roads and security habitat was evaluated relative to big game vulnerability in this analysis (see pp 184, 188, 189 of the Revised EA). The Gallatin National Forest has a generic standard to manage roads and forest cover to provide security. Big game security habitat within the analysis area is heavily influenced by location of existing infrastructure which is centered on the East Boulder and Lewis Gulch road systems; there are relatively few overall roads in the East Boulder drainage. Security areas were mapped per the Hillis et al. (1991) model and quantified for this project as well as by hunting districts as part of the Gallatin Travel Plan Environmental Impact Statement (EIS) (USDA 2006a:3-47). Big game secure habitat is approximately 46% in the direct/ indirect analysis area and 80% in the cumulative effects analysis area (Hillis recommends 30%).

In addition, road and motorized access routes were considered with respect to disturbance factors as well as contribution to big game vulnerability. The analysis discussed displacement of big game in relation to timber harvest operations. Temporary roads constructed or reopened for equipment access to the project area would not be open to public motorized use and would be closed after project activities. Construction and use of the few miles of temporary road associated with the East Boulder fuel reduction project would not appreciably change overall road or motorized route density at the large scale covered by the Hunting District. Road density in HD 560 is 0.3 mi/mi², well below recommended limits.

Travel corridors were discussed and project design criteria call for buffers in which no harvest would occur along creeks and along the East Boulder River. This measure would mitigate effects by retaining dense canopy cover along important winter travel routes and foraging areas for deer and moose. In addition, prescriptions for harvest units are designed to maintain approximately forested cover (including riparian buffers) in untreated clumps that exhibit hiding and/or thermal cover characteristics. Where moist to wet micro sites occur within proposed treatment units, mitigation measures and use of best management practices (BMPs) would maintain cover associated with these feature. Travel corridors, used within each season of use, are widespread and available for wildlife use in roadless and wilderness areas in the project vicinity.

The project will not violate direction for MA11. Harvest of old growth is not prohibited in MA11, as long as big game habitat objectives are met (FP III-33). Standards relative to wildlife within MA 11 were addressed in the big game specialist report (Project File 9E-1). Also see response to Comment 1-11a.

Comment 1-11f: Although it is noted that logging will increase forage, the EA notes that it will cause increases in unsuitable forage. The EA needs to provide a consistent analysis supported by monitoring and current published science. What species will increase that will benefit big game?

Response: Direct effects common to Alternatives 2 & 3 that would occur as a result of habitat alteration and disturbance include an increase in the amount of forage available for big game species. Deer and elk would benefit from increased grass, forb, and shrub production, while moose would benefit primarily from increased woody browse. Overstory removal can cause a change in understory species composition to dominance by unpalatable plants (Lyon et al. 2000:56), however these undesirable changes are typically associated with large scale projects where all or most of the forest overstory is removed. Given the relatively small size of the proposed actions, and prescriptions for thinning rather than regeneration harvest, major changes in species composition are not expected to occur. Proposed treatments would likely provide additional forage for mule deer wintering in the project area, as deer could be attracted to lichen on the branches of felled trees. Snow compaction from harvest activities would facilitate deer movement in treatment units and make it easier for them to get to lichen on felled materials (Paugh, personal communication 2009) (EA p. 185).

Comment 1-11g: If cover is being measured by canopy cover, how is the mountain pine beetle epidemic expected to affect cover in the next 5-10 years and how will the FP hiding cover requirement be met in the future.

Response: For this analysis, both hiding and thermal cover were evaluated by assessing structural characteristics of forested habitats, including successional stage, dominant tree species, and canopy cover. (pp. 181-182 of the EA). Also see response to Comment 1-11c and 1-11e.

The 2008-2009 Aerial Detection Surveys and field visits show moderate amounts of mountain pine beetle activity within timber Compartment 112 and adjacent timber Compartments (113, 114 and 115)

(EA p. 210)). The mountain pine beetle outbreak began in the project area in approximately 2007-2008 and was effectively halted during the fall of 2009 with a rather severe outbreak of cold temperatures during the second week of October. Temperatures in the area plunged to near -20 degrees Fahrenheit for nearly a week. These early cold temperatures killed many would be overwintering mountain pine beetles. They died because they were not completely physiologically prepared for such cold temperatures. If this event had occurred one month later, it is highly probable that overwintering beetle populations would not have been so severely affected. Since that time, few new attacks have been noted throughout the area. However, this does not mean that future beetle attacks will not occur. It just means that beginning in 2010, and for possibly the next few years, little in the way of new beetle attacks is expected.

Comment 1-11h: What will the FP hiding cover be before and after logging? How will the leave clumps provide hiding cover? What is the minimum width of effective hiding cover for big game and what data/science is available to demonstrate that these areas provide suitable hiding cover?

Response: Hiding cover estimates before and after the proposed fuel reduction treatments are provided in the big game analysis in the EA (pp. 180-193). Table 30 (p. 191 of the EA) provides a summary by alternative of remaining hiding cover post treatment.

Project design features, associated mitigation measures, and stand treatments call for retaining untreated clumps and strips of dense trees within proposed fuel reduction treatment units. Some of these retention patches would still provide hiding cover, but cover connectivity would be affected. Since it is difficult to estimate the amount and types of cover that would be left in each treatment unit, it was assumed for quantitative analysis purposes that all cover would be impacted within a treatment unit. Based on this assumption, hiding cover would be reduced but because the project involves thinning to reduce fuels (and not even age harvest, this analysis overestimates actual project impacts. The minimum width of affected cover depends on topography, stem density, etc. Hiding cover associated with specific key components will be retained through mitigation measures that buffer these areas either by project unit design, prescriptions, or actual marked buffers during timber sale layout and marking.

Comment 2-6: The Gallatin Forest Plan mandates that the Forest Service maintain two-thirds hiding cover associated with all key habitat elements. Please explain how this project will meet this requirement and include a map and discussion of the cumulative impact of how past clearcutting in the Project area which has resulted in a loss of hiding cover.

Response: Forest-wide standards in the Forest Plan require that at least two thirds of the hiding cover associated with key habitat components be maintained over time. Key habitat components include moist areas (wallows, etc), foraging areas (meadows and parks), thermal cover, migration routes and staging areas. Field site visits made to proposed treatment units recorded existing conditions including wildlife sign, cover and forage availability, and mapping habitat components. All the field data was summarized and spatially displayed as appropriate (located in Project File 9E-16).

The Gallatin Forest Plan Hiding Cover Assessment (USDA, unpublished paper, Project File 9E-31) provides interpretation and guidance on compliance of the Forest Plan hiding cover standard and was used as the project analysis framework to analyze and demonstrate compliance with this Forest Plan Standard for the East Boulder proposed fuel reduction treatments. The EA recognized and considered past management actions and natural events that have shaped big game habitat in the project area and was used to establish a 'baseline' amount and distribution of hiding cover for the project area. Step by step documentation and associated data and maps are located in the Project File (9E-14 through 9E-18).

The EA disclosed that under both action alternatives, foraging habitat for big game would be increased, and well over two thirds of the hiding cover associated with foraging habitat would be maintained within the project area through retention of dense patches of trees within treatment units, the thinning prescriptions themselves, as well as by existing cover adjacent to treatment areas. Where moist to wet micro sites occur within proposed treatment units, mitigation measures are prescribed to maintain hiding cover associated with these features. Acres of winter and summer thermal cover that would be affected was estimated. Project design features are specified to leave travel corridors in important deer wintering areas untreated. The Forest Plan standards to retain 2/3 of the hiding cover associated with key habitat features would be met through unit layout design and mitigation which call for retaining clumps, strips and patches of dense trees within proposed fuel reduction treatment units.

Comment 4-6: It seems more logical and far less damaging to the scenic and wildlife values to make the existing clearcut areas that border the East Boulder Road more fire proof. Most of the existing clearcuts were created from 1987-89 (there was a small 13 acre unit in 1992 and an 18 acre unit in 1998), and the regeneration in most of them is very dense and will carry a fire well. They will not provide any winter range value for at least another 50 years, and thinning them will reduce fuel loads, improve the growth rate of the trees that are left and probably actually make the cutover areas a little more visually attractive. Treating the old cutover areas will help slow the rate of spread of a wildfire in the area close to the road (something treating unit 3 really does not do). The USFS should manage the regeneration in the existing cutover areas before creating more problems by treating additional acres.

Response: Thinning only the previously clearcut, sapling stands that lie along the East Boulder Road would provide little in the way of increasing safety for public and firefighters. If a wildfire were to occur in these small areas, it would likely be a fairly low intensity surface fire with minimal flame lengths. The main areas of concern in these sapling stands are those that are immediately (within 200 feet) of the high voltage powerline that services the East Boulder Mine. Disruption of power would significantly increase evacuation time for mine employees and these small areas are currently included for treatment. The main emphasis of this fuels reduction project is to concentrate treatments in areas that would currently be conducive for intense, active crown fire with long flame lengths that could threaten public and firefighter safety. Generally, flame lengths less than four feet would not hamper nor be a direct threat for serious injury to the general public, mine evacuees, and/or firefighters.

In addition, the most current management direction for lynx found in the 2007 Northern Rockies Lynx Management Direction FEIS & ROD allows pre-commercial thinning only when regenerated stands no longer provide winter snowshoe hare habitat or when they meet a few exceptions that do not apply here. If this direction is modified at some point in the future, these areas could certainly be evaluated for fuels treatments with a wildlife habitat improvement emphasis. According to the definition of thermal cover in the Forest Plan, and literature specific to deer thermal cover, they may be utilizing this area where crown cover is dense enough to provide snow interception and tall enough to move underneath and browse available in the understory. Some of the clearcut areas have regenerated enough that they are capable of meeting this definition.

Comment 4-7: Most of this winter habitat is within a half mile of the East Boulder road (mostly south of the road). If your fuel reduction plan is carried out as described in the revised EA, you will pretty much eliminate the remaining big game winter habitat from this part of the drainage. The proposed tree spacing resulting in 13-15 feet between crowns with the occasional untreated clump (1/10 to 1/8 acre in size) will not retain the thermal cover and snow intercept values that currently make these areas winter range.

Response: We disagree that this project will “pretty much eliminate the remaining big game winter habitat”. Thermal cover is a habitat component that provides structure necessary to ameliorate effects of ambient temperature on big game species, thus reducing the amount of energy expenditure required for thermoregulation. The Forest Plan (Amendment No. 14) defines thermal cover as “*Cover used by animals to ameliorate chilling effects of weather; for elk and grizzly bear, a stand of coniferous trees 40 feet or taller with an average crown closure of 70 percent or more. For deer, thermal cover may also include saplings, shrubs, or trees at least 5 feet tall with a 75 percent crown closure. In some cases, topography and vegetation less than specified may meet animal needs for thermal regulation.*” This definition is also consistent with Black et al. (1976:19) who found that deer use small conifers and shrubs on winter range so there is a wider range of conditions that provide thermal cover for deer relative to elk. Therefore, thermal cover was modeled using the definition for elk (and grizzly bear) based on Black et al. (1976:19) who state that “if optimal thermal cover requirements for elk are provided, the requirements for deer are more than adequately met”.

For this analysis, both hiding and thermal cover were evaluated by assessing structural characteristics of forested habitats, including successional stage, dominant tree species, and canopy cover. Only about 38 acres of winter thermal cover would be affected under Alternative 2 (Selected Alternative). Project design features are specified to leave important deer wintering areas untreated. The total amount of winter thermal cover that was mapped was 997 acres. Implementation of the selected alternative for the East Boulder fuel reduction project would affect approximately 4% of the total amount of winter thermal cover as defined for elk (Project File 9E-13); deer would continue to use saplings, shrubs, and trees less than 5 feet tall with a 75% crown closure. Also see response to Comment 4-6.

Comment 5-1: We would like to see the Lewis Gulch units treated as proposed in Alternative 3 to improve long term seasonal big game forage availability. We encourage the Forest Service to hand treat/thin existing clear cuts in Lewis Gulch leaving scattered patches of dense trees and areas with more open spacing to improve forage capability where dense coniferous re-growth is occurring. This should also help to reduce fire risk as these units regenerate and promote a more diverse forest and forage age structure into the future. The risk of noxious weed invasion post treatment is minimal in these units.

You acknowledged FWP's support of the proposed treatments listed in Alternative 3 for the Lewis Gulch Units. Next, you explained that thinning/managing regeneration in existing clear cuts in Lewis Gulch was not an option at this point in the current project. However, managing the regeneration in these clear cuts with an emphasis on wildlife habitat improvement would be a priority in the future and may be accomplished as a pre-commercial thinning project.

Response: Because of language included in the 2007 Northern Rockies Lynx Management Direction FEIS & ROD, pre-commercial thinning of sapling stands is not currently permitted in areas considered to be suitable lynx habitat. If this direction is modified at some point in the future the FS the area could certainly be evaluated for treatment with a wildlife habitat improvement emphasis. I did consider treating the units in Lewis Gulch as proposed (Alternative 3), as the wildlife analysis did indicate that big game and other wildlife species have benefitted from the past harvest to some degree. However, I have decided to not select this alternative for the reasons provided in the Decision Notice.

Comment 5-2: No treatment in Unit #1. This area was treated 30-40 years ago and is finally producing a sufficient canopy cover to provide snow intercept and thermal cover for wintering mule deer. This unit is dominated by large fir trees with few ladder fuels. The area is a topographic 'flat spot' surrounded by steep slopes and is used by mule deer throughout the year, especially in winter.

You acknowledged the importance of canopy cover/thermal cover and energy conservation for mule deer wintering in the project area. You would attempt to retain some additional 'leave clumps' of large Douglas fir to help maintain the snow intercept/thermal cover functionality of the unit for wintering mule deer.

Response: Only a small portion of Unit 1 in the northern edge, adjacent to the East Boulder Road, has had previous treatment and is dominated by Douglas-fir (DF). The majority of the unit has not been previously treated and consists of a mixture of DF, lodgepole (LP), and spruce (S). The treatment type prescribed for Unit 1 is described on p. 34 of the Revised EA in Table 2. This treatment includes retaining 15-20% of the unit in irregular shaped untreated clumps that are approximately 1/3 acre in size. In addition, individual leave trees (favoring Douglas-fir (DF) to leave) would be spaced at approximately 13-15 feet between crowns. Marking guidelines and detailed silvicultural prescriptions for each of the units can be found in the Project File (11-14a & 11-14b). These treatment descriptions clearly point out that healthy DF with the largest crown ratios are the preferred species to leave.

In the short term, proposed treatment could actually provide additional forage for mule deer wintering in the project area, as deer might be attracted by lichen on the branches of felled trees. In the long term, fuel treatments could improve habitat for big game by increasing the amount of forest-nonforest edge which is important to big game; foraging habitat created by proposed treatment would typically be within 600 feet (three site distances) of cover, due to retention of strips, patches and clumps of untreated timber.

According to my fuels specialists, this unit is critical for the safety of firefighter and public during evacuation procedures and to protect existing infrastructure (power line). I felt that the prescriptions provide for wintering mule deer, to the extent practicable, while meeting the purpose and need.

Comment 5-3: Hand treating/thinning the coniferous re-growth in existing clear cuts along the East Boulder Road corridor leaving scattered patches of dense trees and areas with more open spacing to promote big game forage growth and diversity, while reducing fire risk.

Similar to point one, you stated that thinning/managing regeneration in existing clear cuts along the East Boulder Road corridor was not an option at this point in the current project. However, managing the regeneration in these clear cuts with an emphasis on wildlife habitat improvement would be a priority in the future and may be accomplished as a pre-commercial thinning project. You would leave some Douglas fir clumps in treatment unit 9A to provide cover and hopefully develop into mature trees that may provide snow intercept/thermal cover benefits in the long term.

Response: Because of language included in the 2007 Northern Rockies Lynx Management Direction FEIS & ROD, pre-commercial thinning of sapling stands is not currently permitted in areas considered to be suitable lynx habitat. If this direction is modified at some point in the future the FS the area could certainly be evaluated for treatment with a wildlife habitat improvement emphasis.

Treatment descriptions for Unit 9a are described in Table 2 on p. 37 of the Revised EA and in the prescriptions and marking guidelines in the Project File (11-14a & 11-14b). Again the DF is the preferred species to leave favoring the healthiest trees with the largest crown ratio.

The EA did disclose that mechanical thinning in these areas could have negative impacts on wintering deer in the project area, which is why project design criteria call for buffers where no harvest would occur along creeks and along the East Boulder River. This measure would mitigate effects by

retaining dense canopy cover along important winter travel routes and foraging areas for deer and moose.

Comment 5-4: No treatment in Units 5A and 10 except for along the power line/road corridor. These areas are not as steep as surrounding habitats and receive more winter mule deer use than nearby steeper slopes.

The size of Unit 10 decreased from approximately 30 acres in the EA to around eight acres in your unit lay out map. This will leave more canopy/thermal cover within the treatment unit, reducing my concern for wintering mule deer habitat needs. You also stated you would leave an untreated buffer strip of trees immediately down slope of the rocky cliffs/outcrops in unit 10 to improve cover and snow intercept for wildlife moving through this unit.

Response: The topography in Unit 10 significantly decreased the acres of mechanical treatments possible. This will indeed leave more canopy/thermal cover remaining within the unit. In addition 15-20% of the treated acres would contain untreated leave clumps of approximately 1/3 acre in size as well as individual DF to be left favoring the healthiest trees with the largest crown ratio. Any future treatments on the remaining acres in Unit 10 would likely only consist of hand treatments that remove small diameter trees (<8"). Also see response to Comment 5-3.

Comment 5-5: Hand treatment only (remove trees less than 8" dbh, 13-15 ft between crowns as defined in EA) in the remaining units and only as far upslope of the road and power line as needed to protect these structures from fire. This will keep a larger portion of mule deer winter range canopy cover/thermal cover intact while reducing noxious weed spread along the corridor. My initial concerns with this point were driven by the importance of dense canopy cover for wintering mule deer in the project area and my desire for the treatment to only reduce canopy cover on the area absolutely necessary for fire protection. Based on the detailed silviculture prescriptions you presented at the meeting along with the size reduction for mechanical treatments in several units there will be less impact to winter mule deer habitat. We didn't specifically discuss weed management post treatment during the meeting. FWP strongly encourages you to intensively control noxious weeds after treatment to reduce their impact to native vegetation.

Response: Upon layout of mechanical treatment units, topography in portions of some units did not lend for the use of mechanical equipment, so the mechanical treatments in some units will be on less than the total unit acres analyzed in the EA, and impacts will be somewhat less than those anticipated. Once the mechanical treatments have been completed, the untreated unit acres will be evaluated for whether some amount of hand treatments are warranted.

Several weed mitigation have been incorporated into project design and are spelled out in detail on pp. 50-51 of the Revised EA. Weeds monitoring and treatments would be a mandatory part of project implementation and have been included in the ecosystem restoration expenditures outlined on p. 214 of the Revised EA. As stated on p. 50 of the EA weed spraying of infested areas would occur prior to seed production each year of harvest and follow-up operations and would be coordinated with Sweetgrass County, Park Electric, and Stillwater Mining Company efforts and requirements. Harvest units and associated activity areas will be monitored and new infestations treated for several years following harvest and reclamation. Areas of bare soil will be seeded with a certified weed-free seed.

Vegetation, Old Growth, & Insect & Disease

Comment 1-3a: The Forest Plan states that dry Douglas-fir is being managed for goshawk, while spruce-fir is being managed for the pine marten. Please map and define how many acres and where these old growth types are being provided in the project area for MIS and associated species.

Response: The Forest Plan does not “state that dry Douglas-fir is being managed for goshawk, while spruce-fir” What is said (under Chapter II of Forest Management Direction, section E Forest-Wide Standards, Wildlife and Fish a. general) is that ““indicator species” which have been identified as species groups whose habitat is most likely to be affected by Forest management activities, will be monitored to determine population change. Goshawk---is the species, which is indicative of old growth dependent species, dry Douglas fir sites and Marten---is the species , which is indicative of old growth dependent species, moist spruce sites.” What is directed in the Forest Plan (II-19 and 20) is that “the Forest *will strive* to develop the following successional stages in timber compartments containing suitable timber:

<u>Successional Stages</u>	<u>Minimum % of Acres</u>
Grass-forb	10
Seedlings	10
Saplings	10
Pole	10
Mature	10
Old Growth	10

During the analysis of old growth for this project we did not develop maps of old growth specific to Douglas-fir or moist spruce sites. What the FS developed was overall old growth amounts for the Forest, Mountain Range, and affected timber compartments as was suggested by the Forest Plan on page II 19 and 20. See East Boulder Revised EA pages 203-209 for more information about old growth.

Comment 1-3b: How were the old growth stands field verified and what is the minimum patch size recommended for associated wildlife and migratory birds?

Response: All of the proposed treatment units were visited in the field by the Forest silviculturist to determine whether or not these stands would meet old growth standards (Project File 12-10). Stand exams were completed in summer of 2009 by FS field crews for all stands associated with the project that did not have recent completed exams. Copies of those exams can be found in the Project File 12-11. Stands with recent exams were walked through to verify that information in the exam is current. Stands within the project area not scheduled for treatment were validated by either an informal ‘walk through’, or by using older stand exam data in areas that have not been affected by large disturbances such as fire, insects, windthrow or tree diseases and validating this data by means of aerial photo interpretation. The field data was reviewed utilizing the Region 1 standard of old growth as defined by Green et al., which has been used for determining old growth since the early 1990s.

Old growth was considered in wildlife effects analyses discussions for individual species. There is no standard minimum patch size recommended for all species, nor do all wildlife species use old growth in the same way. For example, of all migratory birds listed as State Species of Concern (SOC) considered, there are two that are more common in old growth than mature forests, and mostly absent from logged areas (page 193 of the EA). Implementation of either Alternative 2 or 3 would reduce the proportion of old growth and/or forest interior habitat. However, the increased availability of recently burned forest, grass, and shrub habitat would benefit or maintain the other eleven SOC species that

prefer open coniferous forest with a high proportion of grass and shrub. Resulting habitat alterations would reduce suitable habitat for forest interior species, but could be attractive for migratory bird species that prefer more open forest structure and/or a higher proportion of edge habitat (Page 194 of the EA).

The goshawk and pine marten are the Forest Plan indicators for old growth. These species also exhibit variable habitat nuances such as home range size and diversity of habitat needs during the entire life cycle.

As explained in detail in the EA (pp. 167-169), goshawk home ranges consist of three levels of habitat – the nest area (stand), post-fledgling area (PFA), and some amount of general habitat used for foraging. Average size of the nest area and subsequent recommendations varies; following best science, the analysis clearly identified how the number and size of nest areas within the East Boulder analysis area exceeds recommendations even with the implementation of Alternatives 2 or 3. The EA also disclosed that literature review indicates that no evidence exists that the goshawk is dependent on large, unbroken tracts of “old growth” or mature forest or specifically selects for “old growth”.

Pine marten prefer mature to old growth forests with well developed vegetation but have been known to use logged areas. This variability has been explained as a function of prey abundance, prey availability, site quality, and habitat type. The fuel reduction treatments will reduce available snags, downed woody debris and overhead cover for marten to some degree. However, the analysis area meets recommendations post treatment (page 176-177 of the EA).

Comment 1-3c: What is the level of old growth in the 22,820 acre analysis area and how will this ensure source habitat for wildlife?

Response: The amount of old growth is displayed in the Revised EA on p. 205. Currently, there is between 22-27% old growth for forested acres in Timber Compartments 112-22%, 114-27% and 115-27%. Timber compartment 112 comprises the majority of the treatment areas (See Map 6). Timber Compartment 113 currently has 8% old growth; however, no old growth stands will be treated in this compartment. The FS will ensure that old growth habitat remains in the analysis area because there currently is such a large amount of old growth and mature forest, with estimates of old growth and mature forest in each timbered Compartment ranging from 64% to 82% and these structural stages are only minimally affected by project related treatment activities..If anything, one should worry about the quantity of younger age stands present in this area.

Comment 1-3d: The Forest Plan notes that 30% old growth is best for grizzly bear, 20% for goshawk, and 25% for migratory birds so why is 10% considered to be adequate for these species?

Response: The Gallatin Forest Plan on p. II-20 states that the Forest will strive to develop a minimum of 10% old growth and 10% mature forests in timber compartments containing suitable timber. A 10% standard appears adequate from an ecological perspective. Previous modeling exercises and a study by B. John Losensky of Ecological Services, April 2002 titled “Historic Vegetation in the Northern Rockies Lynx Amendment Area” discusses forest types and age classes in the year 1900 for all areas in Region 1 of the Forest Service, including Eastern Montana. For Eastern Montana (which includes the Absaroka Mountain Range) it was estimated that old growth amounts for all forest types was approximately 10% to 11% of forested lands before logging, fire suppression, and road building. Levels as high as 30% old growth were highly unusual because of the high amount of disturbance from wildfire, insects and disease common to this area. These disturbances kept many a forest from ever becoming old growth (at least historically speaking). Currently, we are living in a time where

old growth and mature forests dominate. Likely, this current condition is a blip in time, where at some point the future forests will revert back to much younger overall stand ages with the projected increase of wildfires and insect outbreaks.

Comment 1-3e: It appears that the FP standard of 10% is not even being met for the analysis area since the EA at 139 notes that there are 1200 acres of old growth in the 22,850 acre analysis area, thus additional cutting of old growth will violate the Forest Plan.

Comment 2-21: The Gallatin Forest Plan Standard 6.c (2) requires the Forest Service to maintain at least 10% of each timber compartment containing suitable timber in old-growth condition. The DM does not prove the Project complies with this requirement.

Response: The assertion that the FS is violating or not complying with the Forest Plan standard of 10% old growth is not accurate (see the Revised East Boulder EA, pp. 203-209 for further details). Compartment 113 is currently below the suggested 10% level of old growth, but the FS is not planning to treat any old growth stands in Compartment 113. There is about 59% mature forest in this timber compartment, which will likely be old growth forest within 10 to 30 years, so should be considered as replacement old growth. All the other Compartments (112, 114 and 115) in the project analysis area are well above the Forest Plan direction of 10% (see Revised East Boulder EA pages 203-209).

Comment 2-10: Please clearly disclose which treatment units are for fuel reduction and which are to deal with the alleged “forest health” problem(s). Likewise, the appropriate landscape scale for the “forest health” issues is also beyond the treatment units, but not adequately considered.

Response: None of the treatment units were designed to meet objectives solely related to alleged forest health issues, although some will benefit from treatment. All units identified within the various alternatives were selected based on location to existing roads, infrastructure, and accessibility to the treatment areas. There were additional areas within the project area that also would have greatly reduced and effectively changed fire behavior characteristics, which would further enhance the outcome of the project. However, these areas are untreatable, due to steep slopes, would require extensive road construction and/or would produce greater amounts of soil disturbance, thus were determined to be infeasible and subsequently dropped from the design package.

The appropriate scale to analyze “forest health” issues depends on the question(s) being asked. Depending on the question, the scale of analysis could small or large (let’s 20,000 acres plus). So, to state that the appropriate landscape scale for the “forest health” issues is beyond the treatment units, and was not adequately considered is a poorly stated complaint that is not the purpose and need for the project (EA p.16)

Comment 2-18: Published scientific reports indicate that climate change will be exacerbated by logging due to the loss of carbon storage. Additionally, published scientific reports indicate 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 East Boulder Creek 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.

Response: See pp. 208-209 of the Revised EA for a discussion regarding Vegetation and Climate Change. After reviewing all of the above mentioned publications, it is reasonable to expect that under many harvest scenarios, carbon sequestration in forests would be less than if no harvest were to occur (either by thinning or by clearcutting). However, the amounts of carbon that can be sequestered from forests that are harvested and forests that are not harvested can be quite variable. Such differences depend on location, forest type, time between disturbances and type of disturbances (insects, fire, harvest rotations, disease, etc.). All the above papers were written about the Pacific Northwest where disturbances from fire, disease, insects on those forest types are much different than that in the Intermountain West. Certainly, one can conclude some basic tenets about forestry and carbon sequestration, but the magnitude of differences may be considerable. We, however, depart on the idea that the project as described would have ‘significant’ adverse effects on the environment and also disagree with the idea that because climate change is likely to increase the amount and type of wildfires in the future, that the project in the East Boulder drainage is pointless. The main purpose and need for this project is to allow for additional fire fighter safety, improve evacuation along the East Boulder Road and East Boulder Mine site in the event of wildfire. All of these goals will be better met with treatment than without.

Comment 2-24: The GNF has indicated that there is no forest-wide old-growth inventory. Only 40 of a total of 139 compartments forest-wide have had their structural stages analyzed. The available information is not adequate to determine if sufficient, well-distributed old-growth habitat exists on the GNF. Although the Forest Service claims that there is more than enough old growth to meet the 10% distribution standard, the Forest Service lacks sufficient information on the forestwide old-growth situation to justify logging old growth.

Response: The Revised East Boulder EA on page 205, clearly states, “Forest-wide on the Gallatin National Forest (using Forest Inventory Analysis (FIA) data) the amount of old growth calculated is approximately 28% with a confidence interval of 24% to 32% at the .90 confidence limit. For a large area in and around the East Boulder area in the Absaroka-Beartooth Mountain Range (which includes seven 5th code HUCs) old growth averages (using FIA data) 23% with a range at the .90 confidence

limit of between 15% and 33%. The old growth is considered to be old growth as defined by Region 1 Guidelines (USDA, Green et. al”

Comment 2-25: Rather than performing adequate samples of old-growth stands in the project area to allocate old growth to meet Forest Plan requirements and validate the EA’s assumptions, the GNF apparently uses a database analysis to identify old growth in the project area. The Forest Service has admitted that these databases are of limited usefulness for habitat analyses:

Response: All of the proposed treatment units were visited in the field by the Forest silviculturist to determine whether or not these stands would meet old growth standards. Stand exams were completed in summer of 2009 by FS field crews for all stands associated with the project that did not have recent completed exams. Copies of those exams can be found in the Project File. Stands with recent exams were walked through to verify that information in the exam is current. Stands within the project area not scheduled for treatment were validated by either an informal ‘walk through’, or by using older stand exam data in areas that have not been affected by large disturbances such as fire, insects, windthrow, or tree diseases and validating this data by means of aerial photo interpretation. We disagree that the Gallatin National Forest stated that the databases we use are of limited usefulness for habitat analysis. The FS feels that if used correctly, databases are exceedingly valuable in helping with habitat analysis, in particular with such large areas such as the East Boulder drainage.

Comment 2-26: Canopy closure, snags, and down woody material are characteristics important for providing habitat structures needed for old-growth wildlife species. Forest areas failing to contain those characteristics fail to meet Region 1 old growth criteria, as described in Green, et al., and do not provide for the habitat need of old-growth dependent wildlife species.

Response: Yes, we agree that the above-mentioned characteristics are important for defining old growth and for wildlife species that use old growth. All of the proposed treatment units were visited in the field by the Forest silviculturist to determine whether or not these stands would meet old growth standards (Project File 12-10). Stand exams were completed in summer of 2009 by FS field crews for all stands associated with the project that did not have recent completed exams. Copies of those exams can be found in the Project File 12-11. Stands with recent exams were walked through to verify that information in the exam is current. Stands within the project area not scheduled for treatment were validated by either an informal ‘walk through’, or by using older stand exam data in areas that have not been affected by large disturbances such as fire, insects, windthrow or tree diseases and validating this data by means of aerial photo interpretation. The field data was reviewed utilizing the Region 1 standard of old growth as defined by Green et al., which has been used for determining old growth since the early 1990s.

Comment 2-28: The Forest Plan and Forest Plan EIS also fail to cite any scientific research that justifies the Plan’s 10% Standard. The Standard itself appears to be arbitrary. Maintaining only 10% of the forested areas in old-growth condition will likely result in significantly reduced populations of old-growth wildlife species, and at those levels population viability is in doubt. The Forest Plan fails to provide any detailed guidance for maintaining viable populations of the listed Sensitive species. The combination of project impacts and inadequate FEIS analyses means that the FOREST SERVICE cannot assure that viable populations of Sensitive species are being maintained, as NFMA requires.

Response: Challenging the validity of the Gallatin Forest Plan Standard is outside of the scope of this project. However, in response to your claim, the best information regarding how much old growth existed in this area historically and what the normal historic ranges consisted of is best inferred from a report by B. John Losensky of Ecological Services, April 2002. The report “Historic Vegetation in the

Northern Rockies Lynx Amendment Area” discusses forest types and age classes in the year 1900 for all areas in Region 1 of the Forest Service, including Eastern Montana. For Eastern Montana (which includes the Absaroka Mountain Range) it was estimated that old growth amounts for all forest types was approximately 10% to 11% of forested lands before logging, fire suppression, and road building. The Watershed Risk Assessment completed for this project (using the model SIMPPLLE) also refers to historic levels of mature and old growth forest.

Old growth in the compartments within the project area consists of a variety of conifer species mix but is considered to be old growth as defined by Region 1 Guidelines. The effects of the proposed action were assessed relative to literature and verified estimates of old growth. Old growth forest would remain well distributed across the landscape within all forest types. The purpose of the February 2011 Gallatin Forest Plan Management Indicator Species Assessment-Population and Habitat Trends Assessment, which is located in the Project File is to update the best available information about population and habitat trends for Gallatin wildlife MIS species, at the Forest level or other scales, if biologically appropriate. This will set a context for the assessment of project level effects for the various species.

Roadless/Unroaded Areas

Comment 1-13: The EA incorrectly claims that the unroaded lands in the project area are not suitable for wilderness designation because of size; these areas are adjacent to wilderness habitat, have high value for various wildlife species, and include key low elevation habitat values that were not identified in the EA. In addition, the effects of road corridors will be long term on grizzly bears and wolverines and were not addressed.

Response: “Unroaded areas” are defined as contiguous lands adjacent to inventoried roadless areas that may have roadless characteristics similar to the inventoried roadless areas. For the purpose of this analysis, specialists considered all areas within the project area or adjacent to the IRA, that may meet any portion of this definition.

There are approximately 3,200 acres within the East Boulder Drainage that lie adjacent to or are in close proximity to the North Absaroka IRA. This area consists of a long, linear stretch which lies along the East Boulder Road and is somewhat contiguous geographically, but is bisected by the heavily travelled road that provides access to the East Boulder Mine, private inholdings, and includes additional miles of old skid trails and designated FS Roads. This acre calculation also does not fully discount for the East Boulder Mine improvements, which include a large disturbance area consisting of the mine, outbuildings, parking lots, storage areas, large tailing pond, waste rock piles, as well as other disturbances.

This heavily travelled, bisected area is not of a sufficient size or configuration to provide for the protection of inherent characteristics associated with an “unroaded” condition and does not have the features that would make it suitable for wilderness recommendation in Forest planning. Substantial past management activities have occurred within this area, including timber harvest, and road construction. Furthermore, the current condition and ongoing management activities within and/or adjacent to this area include those associated with the East Boulder Mine, the maintenance of a major power transmission line that lies along the entire stretch of the East Boulder Road terminating at the mine, as well as activities associated with the numerous private inholdings that are interspersed through the area.

Based on this information, the 3,200 acre area does not meet the minimum “unroaded” definition or intent. There are no “unroaded areas” meeting the criteria within proximity to this project, therefore none will be analyzed (Revised EA pp. 126-127).

Comment 2-42: The revised EA pretends there is some biological or other tangible difference between uninventoried roadless areas (“unroaded areas”) and Inventoried Roadless Areas (IRAs), yet fails to disclose just what those real, tangible differences are. In fact, there are none. Previous roadless inventories, both RARE II and during preparation of the Gallatin Forest Plan, omitted unroaded areas adjacent to the IRAs. There are no maps showing the location of unroaded areas—the boundaries of these areas.

Response: There are approximately 3,200 acres within the East Boulder Drainage that lie adjacent to or are in close proximity to the North Absaroka IRA. This acreage accounts for all areas within the East Boulder drainage that are not within the IRA. It is the maximum acreage as described:

“This area consists of a long, linear stretch which lies along the East Boulder Road and is somewhat contiguous geographically, but is bisected by the heavily travelled road that provides access to the East Boulder Mine, private inholdings, and includes additional miles of old skid trails and designated FS Roads. This acre calculation also does not fully discount for the East Boulder Mine improvements, which include a large disturbance area consisting of the mine, outbuildings, parking lots, storage areas, large tailing pond, waste rock piles, as well as other disturbances” (Revised EA p.126).

Comment 2-43: The idea of doing separate analyses for the vaguely defined “unroaded” areas and contiguous or noncontiguous inventoried roadless lands make no sense. Since the existing inventoried roadless area boundaries were often adopted arbitrarily, analyzing effects on wilderness characteristics of all roadless acres—whether inventoried, uninventoried, uninventoried contiguous with inventoried, or any combination—is clearly called for in this analysis. Again, with all the controversy surrounding the roadless issue, to analyze impacts on uninventoried roadless lands separate from inventoried roadless areas is completely illogical and constitutes a violation of NEPA. Nothing is discussed as far as the possibility that the uninventoried roadless areas may be eligible for later inclusion as inventoried roadless under the upcoming Revised Forest Plan or as eligible for Wilderness designation.

Response: This heavily travelled, bisected area is not of a sufficient size or configuration to provide for the protection of inherent characteristics associated with an “unroaded” condition and does not have the features that would make it suitable for wilderness recommendation in Forest planning. Substantial past management activities have occurred within this area, including timber harvest, and road construction. Furthermore, the current condition and ongoing management activities within and/or adjacent to this area include those associated with the East Boulder Mine, the maintenance of a major power transmission line that lies along the entire stretch of the East Boulder Road terminating at the mine, as well as activities associated with the numerous private inholdings that are interspersed through the area.

Unit prescriptions were reviewed relative to potential effects to roadless character and identified in the field and office during initial planning stages of this project. There are no treatments proposed within the North Absaroka IRA. There are no adjacent lands determined to have met the “unroaded lands” definition. See the Forest Service Manual FSH 1909.12 (72.1) for definitions of wilderness characteristics.

The following five “wilderness” attributes are the basis for evaluation of the effects of the alternatives. These characteristics are those used to define wilderness attributes of an area and are the basis for evaluating actions or proposals that could affect future wilderness designation.

- 1) Natural - the extent to which long-term ecological processes are intact and operating.
- 2) Undeveloped - means the environment appears natural to most people.
- 3) Outstanding opportunities for solitude or primitive unconfined recreation - a personal, subjective value defined as the isolation from the sights, sounds, and presence of others and development of man. Primitive recreation is characterized by meeting nature on its own terms, without modern comfort or conveniences.
- 4) Manageability and Boundaries - ability to manage a roadless area to meet the minimum size criteria, which is 5,000 acres, for wilderness.
- 5) Special Features or Values - refers to attributes of the area that are special or valuable to stakeholders, and are often less tangible than the previous 6 attributes. Special features can include such factors as unique ecological, scientific or geologic features; significant cultural or historic resources; or outstanding scenic resources. Special values are often intangible and not clearly articulated by inventories or data relating to the natural environment.

Comment 2-44: It is well established that logging in an uninventoried area 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 EA failed to 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 was no analysis of the project’s impact on the unique values of unroaded areas together with their adjacent inventoried roadless areas. The EA does not constitute the “hard look” requirement with respect to the environmental impact of logging and roading uninventoried roadless areas.

Response: There are approximately 3,200 acres within the East Boulder Drainage that lie adjacent to or are in close proximity to the North Absaroka IRA. This acreage accounts for all areas within the East Boulder drainage that are not within the IRA.

This heavily travelled, bisected area is not of a sufficient size or configuration to provide for the protection of inherent characteristics associated with an “unroaded” condition and does not have the features that would make it suitable for wilderness recommendation in Forest planning. Substantial past management activities have occurred within this area, including timber harvest, and road construction. Furthermore, the current condition and ongoing management activities within and/or adjacent to this area include those associated with the East Boulder Mine, the maintenance of a major power transmission line that lies along the entire stretch of the East Boulder Road terminating at the mine, as well as activities associated with the numerous private inholdings that are interspersed through the area.

There are no treatments proposed within the North Absaroka IRA. There are no adjacent lands determined to have met the “unroaded lands” definition. See the Forest Service Manual FSH 1909.12 (72.1) for definitions of wilderness characteristics.

Furthermore, with my selection of Alternative 2 for implementation, all of the units are immediately adjacent to the highly travelled East Boulder Road, the Lewis Gulch Road, East Boulder mine site or

facilities, and/or private inholdings. The FS did take a “hard look” at the impacts of fuels treatments and construction of small segments of temporary road that would be permanently closed, recontoured, and rehabilitated following completion of harvest related activities and determined that there would be no “irreversible and irremediable” commitment of resources to roadless or wilderness. This topic is addressed in the FONSI on p. 51 of the Decision Notice.

Noxious Weeds

Comment 1-15: There was no information regarding cumulative effects of logging on weeds; we are referring to Main Boulder Project, which has resulted in huge increases in weeds in some units? How can East Boulder mitigation claim to be effective if Main Boulder were not: please provide a complete update on weed conditions in Main Boulder logging units and what will be done differently for the East Boulder Project?

Response: Populations of noxious weeds in the East Boulder and Main Boulder corridors are currently and will continue to be treated annually. In addition, any new noxious weed populations will also be monitored and treated. The east side of the Gallatin National Forest treats approximately 1,000 acres of weeds annually. Of these 1,000 acres, 50% are monitored for effectiveness. To be effective, at least 80% of the weeds that were treated must die. Over the past several years, the Main Boulder corridor has been treated by Forest Service weed crews or contract spray crews as a part of the regular Forest weed program. Due to the recent economic decline, only a portion of the units in the Main Boulder Fuel Reduction Project have thus far been thinned. After the remaining fuels treatments are completed, all thinned units have and will continue to be monitored for noxious weed infestations and treated as necessary. The Main Boulder corridor is currently an East Zone priority for treatment and monitoring.

For the East Boulder Project, mitigation measures were designed to limit the potential spread of noxious weeds in treatment units. These measures will be incorporated into the plan of operations for the project. Winter harvesting of units is a mitigation specifically related to minimizing the spread of noxious weeds (Mitigation #10 on p. 16). Also note that weed spraying is a mandatory stewardship item that will be funded as a part of project implementation (See weed mitigation #9 on p. 16). Weed spraying will be coordinated with Stillwater Mining Company, Park Electric, and Sweet Grass County who are currently responsible to spray weed infestations along the high voltage powerline, mine facilities, and East Boulder Road corridor to make sure that spraying is conducted in all necessary areas at the proper time of year (Mitigation #2 on p. 16).

Comment 2-40: The FS has no idea how the productivity of the land been affected in the project area and forestwide due to noxious weed infestations, nor how that situation is expected to change. 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.

Response: Several past projects on the Gallatin National Forest have implemented noxious weed mitigations to help prevent the spread of weeds. Field observations by the district Rangeland Management Specialist and East Zone weeds crew indicate that noxious weeds have not increased on the numerous road decommissioning projects across the zone, and that pre and post treatments of these areas have been effective at decreasing the spread of noxious weeds within these project areas.

The EA describes in detail the potential direct, indirect, and cumulative impacts that are likely as a result of implementation of the proposed project (Revised EA pp. 91-98). There have been numerous successful treatments across the Forest and on the Yellowstone District. Annually, the Forest treats

approximately 4,000 acres and the District treats 1,000 acres. The success of these treatments is based on targeting high priority weed species (spotted knapweed, leafy spurge, etc.) and reducing the density of populations and potential vectors of spread. The Forest also monitors weed treatments annually to measure success. Complete removal of noxious weed species is very difficult. Annual treatments must be and are repeated for several years because the seeds of most species remain viable in the seed bank for many years after treatment. Given the limited funding available annually, the Gallatin National Forest has been very successful in limiting the spread and density of weed populations and preventing establishment of new populations.

Comment 3-10: Roads are the major vector for weeds and disease. How will this be eliminated?

Response: The construction of up to 2.1 miles of low standard, temporary road in support of timber and fuels material removal would equate to approximately 3.6 acres of disturbed soils for Alternative 2 (Selected alternative). This acreage is calculated based on a 14 foot road bed, which is based on the current average width for low standard temporary roads on the Gallatin National Forest (See soils analysis). In general, roads represent the most continuously disturbed soil areas available for colonization by non-native plant species. Newly disturbed roadbeds allow for inadvertent transport of non-native plant materials into relatively undisturbed areas, while providing favorable growing areas for windblown seeds that are free from competition by existing plants. As such, proposed roads are potentially the most detrimental aspect of this project from the perspective of weeds proliferation, weed control, and native plant communities. However, all newly constructed temporary roads would be closed to the public during harvest activities and permanently closed, recontoured, and rehabilitated within one year upon completion of harvest related activities. Rehabilitation would include making the new temporary roads on National Forest System lands impassable for motorized travel, as well as other necessary resource protection practices (i.e. re-vegetating disturbed areas with weed-free native seed mix and/or pre/post weed treatments) as described in the Decision pp. 16-17. These areas would be monitored and treated for weeds for several years if populations are detected.

If service vehicles remain on the roadways, off-road equipment is washed before entering the project area, ground disturbing practices related to harvest and temporary road construction activities are minimized, and weeds mitigation (Decision pp. 16-17) are adhered to, it is anticipated that the spread of noxious weeds in the treatment areas would be relatively low (EA p. 93).

Comment 4-4: Your EA lists the risk of weed invasion in unit 3 as “Very High.” Under Alternative 2 you propose to treat up to 650 acres of timbered habitat in 25 units with the risk of weed invasion listed as “High” or “Very High” in 18 of those units (510 total acres). You list plans to mitigate the establishment and spread of weeds, but, although your intentions may be good, based on past performance I seriously doubt that you will be able to control the spread of noxious weeds following your proposed treatments. If the proposed fuels reduction program is carried out, there will undoubtedly be a much larger weed problem in the East Boulder following treatment which could eventually result in a reduction in desirable native plant species, a loss of wildlife habitat and long-term increased weed control costs being incurred by private property owners.

Response: The most protective timber harvest and fuel removal techniques or systems are those that are most protective to the soil and the existing native understory plant communities. Hand treatments create little ground disturbance. Utilization of skyline logging, where the terrain lends and deemed appropriate, would also limit potential impacts. Skyline harvest normally causes minimal detrimental ground disturbance and is likely to be more effective than ground-based machine harvest techniques in inhibiting weed colonization. With this in mind, a combination of the following techniques would be

utilized to minimize ground disturbance and mitigate potential weed expansion where ground-based mechanical (tractor) harvest systems are required.

- Whole tree yarding using any logging system over 8 inches of settled snow or 4 inches of frozen ground.
- Use of dedicated skid trails for all non-winter harvesting
- Minimize the amount of new temporary road building (cut and fill, etc)
- No site prep using scarification or ripping following harvest
- Burning to occur only at the landings (limits soil disturbance to accessible areas) except in hand treatment units where piles are small
- Complete harvest and treatment in one entry, with no re-entry to further harvest damaged trees or to disturb soil at a later date.

In general, roads represent the most continuously disturbed soil areas available for colonization by non-native plant species. Newly disturbed roadbeds allow for inadvertent transport of non-native plant materials into relatively undisturbed areas, while providing favorable growing areas for windblown seeds that are free from competition by existing plants. As such, proposed roads are potentially the most detrimental aspect of this project from the perspective of weeds proliferation, weed control, and native plant communities. However, all newly constructed temporary roads would be closed to the public during harvest activities and permanently closed, recontoured, and rehabilitated within one year upon completion of harvest related activities. Rehabilitation would include making the new temporary roads on National Forest System lands impassable for motorized travel, as well as other necessary resource protection practices (i.e. re-vegetating disturbed areas with weed-free native seed mix and/or pre/post weed treatments) as described on pp. 16-17. These areas would be monitored and treated for weeds if populations are detected.

No broadcast burning is proposed. Hand piling and burning would occur within the hand treatment units, however piles would be small and areas of bare soil post-burn would be seeded with a weed-free native seed mix. For mechanized harvest units (tractor and skyline) piling and burning of piles would be conducted at designated landings. Landing piles would be dispersed, located near roads, and would be seeded with a weed-free native seed mix after pile burning has been completed. These areas would be monitored and treated for weeds if populations are detected. The effects of pile burning on the proliferation of weeds are varied depending on the size of piles, burn intensity, time of year, weeds present, soil moisture at time of burn, and mitigation incorporated.

If service vehicles remain on the roadways, off-road equipment is washed before entering the project area, ground disturbing practices related to harvest and temporary road construction activities are minimized, and weeds mitigation (pp. 16-17) are adhered to, it is anticipated that the spread of noxious weeds in the treatment areas would be relatively low. The only exception would be in areas within the lower East Boulder Corridor that are currently infested with knapweed, oxeye daisy, or other weeds, or where units are immediately adjacent to areas infested with these weeds. Noxious weeds that are currently present within or adjacent to landings and/or handpiles may expand after the piles are burned. However, this would be mitigated by spraying weed infested areas prior to seed production (pre and post-harvest), and seeding these areas with native seed mixes after the piles are burned to help reduce suitable habitat for noxious weeds. Monitoring for and treating noxious weed

populations for several years following harvest is a requirement associated with implementation of this project (pp. 16-17, 24-25).

Fuels

Comment 2-7: Published scientific reports indicate that the logging prescription proposed by the Forest Service for the East Boulder Creek area will actually increase fire severity -- *not* reduce fire severity – as assumed by the Forest Service. Because this issue is the central underlying theme that is critical to support the proposed logging project, the Forest Service must candidly disclose, consider, and fully discuss the published scientific papers that analyze whether commercial logging is an effective means of fire suppression. The Forest Service should have discussed *published* scientific papers, which make findings *based on actual studies*, not simply on models. Not doing this is a violation of NEPA, NFMA, the APA and the Forest Plan. In the analysis, the Forest Service should have at least addressed the issues of (a) which 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. See Ruggiero (2007)(discussing the fact that land managers are part of a different branch of the Forest Service than research scientists, and the position of the land managers implies that they are not independent of policy decisions, and therefore may not be scientifically credible). The Forest Service should disclose and discuss the findings of – at least – 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.

Response: There exists conflicting information regarding the effectiveness of thinning treatments in modifying fire behavior. Most of the published literature on this subject is based on the premise of creating forested stands that are resilient to fire effects and result in lessened post-treatment mortality. Fire intensity, as a matter of survivability, was used in the development of the desired condition. Furthermore, the best available science to determine and disclose the effect of the proposed treatment lies with modeling research, much as the models used in this project.

One of the goals of the East Boulder Fuels Reduction project is to minimize residual tree mortality following the proposed fuel treatments (thinning and prescribed understory burning). The Raymond and Peterson 2005 study, which the AWR, NEC and MEDC reference, concluded the following: “Thinning changed the overstory structure and composition to that of a more fire resistant stand by increasing crown base height and mean tree diameters, and selecting for fire-resistant tree species.” (p. 2990). Furthermore, “(The) thinning and underburning treatment reduced crown fire potential more than thinning alone.” *Ibid*. As stated in the Revised East Boulder Fuels Reduction EA, downed woody fuels and the fuels resulting from the thinning treatment activities would be piled and removed or burned (EA, p. 18 and 20), thus mitigating the concerns expressed in Raymond et al regarding thinning only and no post-treatment of activity-related fuels. The fire behavior and fuel models used for the supporting fire/fuel analysis include NEXUS and Farsite (EA, p. 28), similar models as used by Raymond et al 2005. These models have extensive peer reviewed scientific publications in which the validity of the models are brought into question and then tested in a laboratory setting. Detailed

information concerning the models and the parameters and simulations used to determine pre-treatment and post-treatment fuel management actions has been provided in the EA, Chapter 3 - Issue 1 Fuels (pp. 74-84).

AWR, NEC and MEDC also requested a response to the findings disclosed in Odion et al 2004 in comparison to the proposed fuel management activities. This study occurred in the Klamath Mountains, which have a very distinct and unique coastal Douglas-fir, closed forest canopy structure and fire regime. Odion et al compared the probably fire regime and fire severity in coastal Douglas-fir forests with that of the open ponderosa pine forests. They concluded that “(fuel) buildup in the absence of fire did not cause increased fire severity as hypothesized. Instead, fuel that is receptive to combustion may decrease in the long absence of fire in the closed forests of (the) study area, which will favor the fire regime that has maintained these forests.” However, Odion et al also concluded, “Based on the empirical data analyzed, the fuel-buildup model of dry, formerly open ponderosa pine forests does not apply to the natural forests of our study area. These findings further suggest the modeled fuel dynamics need to be tested before it is exported to other forest types” (Odion et al 2007, p. 934). As such, the findings have very little applicability to the fuels situation and fire regimes found on the Gallatin National Forest. Although their conclusions may be appropriate for the Klamath Mountain study area, it is inappropriate to apply such conclusions from this fire regime to the site-specificity of the East Boulder River corridor. The fire and fuel analysis describes the overall East Boulder River area as closed tree canopy forests of lodgepole pine, Douglas-fir and Engelmann spruce (EA, p. 73). Based on peer-reviewed, extensively used research, such as Fischer and Clayton 1983, Scott and Reinhardt 2001, Scott and Burgen 2005, Arno and Brown 1991, and Arno 1980, and the fire behavior exhibited during recent fire events in our area since 1988, these closed forest types in Southwestern Montana burn and burn readily due to the drier nature of these habitats as compared to the coastal Douglas-fir forests.

Comment 2-8: The current fuel/fire hazard situation on land of all ownerships within the WUI (at least the WUI that’s relevant to this area) must be displayed on a map. More importantly, the fuel/fire hazard situation post-project on land of all ownerships within the WUI must also be displayed on a map.

Response: The current fuel conditions, on National Forest System Lands, are disclosed within the fuel specialist report in the EA in terms related to Scott and Burgan’s Standard Fire Behavior Fuel Models. As for other ownerships, the Forest Service cannot effectively control or enforce standards for private citizens to manipulate vegetative conditions to meet a desired condition on their private property. Map 2, contained in the Revised EA displays the East Boulder WUI, as well as the High Risk Areas as identified in the Sweet Grass County Community Wildfire Protection Plan (Project File 7-4).

Comment 2-9: 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, and private landowners, must understand the implications of the long-term 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.

Response: As stated in the Environmental Assessment (EA, p. 20-21 and 76), long-term efforts to maintain the post-treatment condition would most likely be needed in approximately twenty years. Future management options and treatment needs to maintain the desired fuels condition would be

analyzed at that time in another future NEPA decision document. Furthermore, the request to address future funding needs and scenarios would be difficult to predict with any amount of accuracy.

Comment 2-11: The EA fails 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.

Response: Wildland fire and fire spread is not restricted by land ownership. This underlying premise perpetuates the complexity of fire management in all federally held lands. Furthermore, it’s agreed that fire effectively operates differently in different vegetative types and elevation zones within the area. The intent of the project is not to alter or reduce these fire mechanics within the larger landscape, but rather to minimize undesirable fire effects along existing infrastructure and existing travel routes to promote safety for both public and responding fire management resources.

Comment 2-12: The EA also fails 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 EA’s overly simplistic analyses.

Response: The temporal scale of the project was analyzed for the timeframe that the post-treatment effects are expected to remain valid for a period of approximately 20-30 years (EA p. 76), which is based on expected, typical growth responses of the vegetative types found in the project area. In the future, managers may determine that further treatments are required to maintain the desired conditions, thus requiring another environmental analysis to be performed at that appropriate time.

As for heightened fuel risks associated with the proposed actions, all activity-related fuel (slash) will be removed, piled, and burned following the management activity, subsequently reducing the fuel loadings to acceptable levels. It is expected that following this activity, forbs and other understory vegetation will respond with new growth. However, the intensity of a fire burning in these newly established fuel beds will be much less than the existing vegetative structure due to the increase in overall live fuel moisture of the newer vegetation growth. Based on the expected reduction in intensity, the overall result will allow for increased public and fire fighter safety.

Comment 2-13: The Gallatin 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 essentially calls into question the entire manipulate and control regime, as represented in the EA. The managed portion of the Gallatin 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. Please consider and discuss Hayward 1994.

Comment 2-14: 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. Please review and discuss Huff, et al 1995; DellaSala et al 1995, Sierra Nevada Ecosystem Project 1996 Final Report to Congress.

Response: None of the treatment units were designed to meet objectives solely related to forest health issues, although some will benefit from treatment at a localized scale. All units identified within the various alternatives were selected based on location to existing roads, infrastructure, and accessibility to the treatment areas. There were additional areas within the project area that also would have greatly reduced and effectively changed fire behavior characteristics, which would further enhance the outcome of the project. However, these areas are untreatable, due to steep slopes, would require extensive road construction and/or would produce greater amounts of soil disturbance, thus were determined to be infeasible and subsequently dropped from the design package.

It is agreed that wildland fire and fire spread is not restricted by land ownership. This underlying premise perpetuates the complexity of fire management in all federally held lands. Furthermore, it's agreed that fire effectively operates differently in different vegetative types and elevation zones within the area. The intent of the project is not to alter or reduce these fire mechanics within the larger landscape, but rather to reduce undesirable fire effects along existing infrastructure and existing travel routes to promote safety for both public and responding fire management resources.

While it is likely that a revised or amended Gallatin Forest Plan will include (or at least consider) additional goals and objectives for hazardous fuels reduction, the current Forest Plan does contain management direction supportive of the East Boulder Project in addition to the management direction provided through the National Fire Plan (2000), Healthy Forest Restoration Act of 2003, Sweet Grass County Community Wildfire Protection Plan (2008), and the East Boulder Watershed Risk Assessment (2007), as discussed on pp. 7-12 of the Revised EA. Refer to standard 14(1) on page II-28 of the Forest Plan which states "Treatment of natural fuel accumulations to support hazard reduction and management area goals will be continued." Secondly, the decision for this project will not [*did not*] rely on the analysis that was done during the 1980s for the Forest Plan. The EA is comprehensive in addressing the direct, indirect and CUMULATIVE effects of the proposed East Boulder Project. In considering cumulative effects, the geographic and temporal extent of the direct and indirect effects were identified to establish the scope within which the additive effects of other past, present, and reasonably foreseeable actions should be considered. Determining "how much of the Forest is to be treated" for fuels reduction into the future is unnecessary to adequately understand the potential consequences of this small fuel reduction project designed to improve public and firefighter safety along a highly traveled corridor.

In consideration of the above-mentioned literature, treatments associated with the East Boulder project are not at a landscape scale, no prescribed burning (Huff et al) is included and all are well within the WUI mix of homes, infrastructure and flammable fuels, which is supported by Della Salla 1995 (p. 354) and Sierra Nevada Ecosystem Project Report (p. 17). All of the treatment units are adjacent to, or in close proximity to the heavily utilized East Boulder Road, East Boulder Mine site and major powerline, or other private infrastructure. There is heavy traffic and human presence associated with the mine, and the area to be treated is not prime owl habitat (Hayward 1994) that would be affected by project related activities. In fact, DellaSala et al., 1995 states: "Furthermore, fuel breaks are never designed to stop fires but to allow suppression forces a higher probability of successfully attacking a

wildland fire”. Allowing firefighters the means to safely and successfully suppress a potential wildfire in the WUI of the East Boulder River corridor is what this project is all about.

Comment 2-15: The EA takes 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.

Response: It is agreed that thinning a stand will result in faster rates of spread (Graham et al). Intuitively, opening a dense stand allows for understory vegetation to establish, and understory vegetation usually consists of grasses and small forbs. However, the intensity of the burning understory or the surface fire situation, is much less than the intensity associated with a dense timber stand or crown fire. Under most surface fire conditions, four foot flame lengths and below provide for survivable situations for both the public and fire management resources. Once again, the intent of the project is not to change rates of spread or to effectively change fire behavior within the landscape. The intent of the project is to reduce fire intensities to an acceptable level along the East Boulder Road and other existing infrastructure to provide for both public and fire management resource safety.

Recent experience has shown the effectiveness of fuel treatments to allow firefighters to safely attack fires within treated areas. Fuel treatments, both large and small, allowed firefighters on the Wallow Fire 2011 to engage in tactical actions that successfully defended structures. While the East Boulder project does not create defensible space or defend structures, the effects to protecting the evacuation route would be similar to those experienced on the Wallow fire (Project File 8-27).

Comment 2-16: 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, “(We cannot mitigate a highly vulnerable HIZ with fuel reduction activities beyond the HIZ...” Outside these safe areas, the escape routes, and the HIZ, these researchers indicate no need to focus on fuel reduction for life safety reasons. Please consider and discuss.

Response: Very similar to the Main Boulder Project, the East Boulder Project focuses on vegetative treatments to promote human safety, by reducing fire behavior characteristics for public and fire management resources in an around existing roads and infrastructure. However, unlike the Main Boulder Project, the East Boulder Project is not adjacent to a wilderness area that would allow for naturally occurring wildfire to be used as a management tool for resource benefit. Efforts are currently being undertaken by the Forest to utilize this tool outside of the Wilderness Areas, but they have not yet been finalized. As for Cohen and Butler’s 2005 recommendations regarding the creation of safe zones to promote life safety (pp. 1, 4-5), this project was designed to meet similar objectives and this information was taken into account during the design phase of this project.

Notes from the August 2009 field trip on the Gallatin National Forest with Jack Cohen are included in the Project File (8-10) state “Small areas can be managed for un-natural conditions, but on the larger landscape fire is inevitable. In some cases, we may not be able to modify the fuels enough to save homes, but maybe to reduce fire intensity along travel corridors enough so that people can survive in their vehicles”. This is exactly the purpose and need for this project “To increase public and firefighter safety”(Revised EA p. 16).

Comment 2-17: 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?

Response: Other past management activities within the project area (i.e. logging) will actually increase the degree of effectiveness of the overall project design, due to the past units locations being located adjacent to existing roads and travel corridors. These sapling stands were not included as treatment units with this project, due to language included in the 2007 Northern Rockies Lynx Management Direction FEIS & ROD, where pre-commercial thinning of sapling stands is not currently permitted in areas considered to be suitable lynx habitat. If this direction is modified at some point in the future, the FS the past regeneration units could certainly be evaluated for treatment. The existing conditions of these sapling stands are currently within the acceptable range of expected fire intensities and were not considered to be a major threat to public or fire management resource safety except for portions of these stands that are immediately adjacent (within 200 feet) to the high voltage powerline, which services the East Boulder mine, and are included for handtreatment only.

Comment 3-11: Forest roads allow more human-caused fires to be ignited because they provide easier access. How will this be controlled during the life of the sale?

Response: No new permanent road construction is being proposed for the project. Primary access will be provided by the East Boulder Road #205 and the Lewis Gulch Road #6644. Commercial harvest operations are expected to require the construction of some temporary roads. A maximum of 3.5 miles of temporary road may be needed to access the areas proposed for mechanical fuels treatment using conventional ground-based logging systems (tractor and skyline). Another ½ mile of existing road maintenance may be needed to provide access to treatment areas. These areas will be re-examined on the ground prior to project implementation to determine whether opportunities exist to reduce the length of newly constructed temporary road. These roads would be built on relatively flat ground slopes and would be constructed to the lowest possible standard capable of supporting log haul in order to minimize ground disturbance. All newly constructed temporary roads would be closed to the public during harvest activities and permanently closed and rehabilitated within one year upon completion of harvest related activities. All new temporary roads will be recontoured and rehabilitated making the temporary roads on National Forest System lands impassable for any motorized travel, as well as necessary other resource protection practices. Existing roads that are improved and utilized for project related activities that are no longer needed, do not include deeded access to private lands, or are not identified to remain open in accordance with the October 2006 Gallatin National Forest Travel Plan Decision would also be rehabilitated within one year of completion of project related activities (Revised EA pp. 39-40).

Comment 4-1: We really do not see the overwhelming need for the full-blown fuels reduction program that is described in this document. The East Boulder road can easily be safely driven at 30-40 mph. In the event of a wildfire somewhere in the drainage which required a rapid evacuation of the area, once in our vehicle we can be out of the canyon in less than 5 minutes. Once they are loaded up, personnel from the mine could travel the 5.1 miles down to Anderson Springs in 8-10 minutes. If necessary, people recreating in the Dry Fork area could evacuate the area by going east over Squaw Pass and down Meyers Creek. In 2008 and 2009 the USFS conducted prescribed burns on 2,850 acres of land in the Dry Fork to reduce wildfire potential and provide for public and firefighter safety. Compared to the Main Boulder, the likelihood of being trapped anywhere in the East Boulder drainage is relatively remote.

Response: The Stillwater Mining Company has a detailed Fire Prevention, Response, and Evacuation Plan (Project File 7-14) that includes coordination with Sweet Grass County and the Forest Service. “The Stillwater Mining Company (SMC) fully supports the proposed action for fuels reduction in the East Boulder River watershed. Continuous improvement in personal and public safety is one of SMC’s core values. SMC recognizes the value of the proposed action toward enhancing public safety, landowner safety, firefighter safety, and mine safety. The evacuations and forest fires of 2006 were a harsh reminder of the power of a forest fire and the associated threat to public safety. We need to take the lessons learned from recent forest fires and apply them through beneficial projects like this. SMC believes that the proposed action would effectively create a break in the continuity of fuels, improve forest health, reduce the potential severity of a forest fire, and most importantly, would improve SMC’s ability to evacuate our employees safely from the mine and permit area in the case of a large fire.”

Prior evacuations of similar areas have shown that it takes quite a long time both to locate and evacuate recreational users and even residents in the event of a wildfire. The East Boulder Mine, with up to 300 people, generally takes more than 3 hours to evacuate, even with a plan in place. This does not include the 40 to 50 vehicles which travel the road each day for mine business. If the power line is damaged, or destroyed, evacuation could take longer (Project File 3-10).

The second part of an evacuation is the ingress of firefighting resources. For firefighters to be able to effectively respond, the road must be safe from fire effects and traffic hazards. This adds additional time to the evacuation. The Dry Fork prescribed burn was a part of an ongoing effort to manage forest lands and fire effects on the forest.

Comment 4-2: If getting people safely out of the drainage is the major focus of the fuels reduction project, these “pinch-point” areas are the areas that should be treated to further secure the road corridor. One of the major “pinch-points” (a stretch of about 0.4 miles) is a point where the road passes through private property (Pam Russell property). The remainder is all on national forest land and all of these areas are proposed for treatment under Alternatives 2 and 3. Treatment of these areas would be a good idea, but the proposed project includes far more acreage than is necessary to just secure the road. The Lewis Gulch treatment area (Alternative 3) is totally unnecessary to secure the road corridor.

Response: The USFS is unable to treat the above noted “pinch-point” due to it being on private land. One project related objective is: “Encouragement of adjacent private property owners and local groups to develop hazardous fuel reduction plans.” Areas like these are noted in the Sweet Grass County Wildfire Protection Plan for treatment by other methods. As stated, all other “pinch-points” on National Forest land that are currently treatable are proposed to be treated, including those acres with dense timber that are adjacent to the roads, the high voltage powerline, private residences and structures, and the East Boulder Mine infrastructure. Some areas are not currently treatable due to topography, lynx amendment constrictions, and the current economy, which does not allow for the use of helicopter operations. The areas proposed are the minimum acres necessary, based on fire effects, to protect the evacuation route and minimize fire effects to private lands. Alternative 3 also includes areas in Lewis Gulch that would contribute indirectly to securing the road by delaying a potential wildfire from reaching the East Boulder Road by one to two hours. This applies primarily to fires that would start from the south or southwest of the project area.

Comment 4-3: The private property owners within the project area including home and cabin owners and the Stillwater Mine should take responsibility for fire-proofing their own property. They already have a large, totally treeless defensible space around the mine site totaling at least 170 acres. Do they really need more? It is true that the heavy smoke and intense heat generated

by a large wildfire could damage the high voltage power line that services the mine, but Park Electric built that power line with the intent to make money by selling power to the mine. When they built that line they knew there was a risk of wildfire in the area. Now this fuels reduction plan proposes to further secure the line including treating several steep areas that with no merchantable timber and requiring hand treatment (units 8 and 8A for example). Since Park Electric and Stillwater Mine appear to be the primary beneficiaries of this road corridor/power line corridor improvement, they should pay for the costs associated with these treatments rather than the taxpayers.

Response: Although the mine area, itself, may be relatively safe from fire, sheltering people in place is a short-term option. Intense smoke from a large wildfire would create unhealthy conditions and at some point, mine employees would have to travel the road to evacuate the drainage. The goal of the project is to make the road safe to travel, increasing the effectiveness of wildfire evacuations, as well as creating safer conditions for firefighters. Due to the location of the power-line, it is difficult to separate out the treatments that would benefit the road and the power-line. The intent is not to protect the power-line for continued operation of the mine, but for the safe and orderly shutdown and evacuation of the site. Generators on site provide for a controlled evacuation and shutdown but should not be relied upon. Neither the mine nor the power company has responsibility for NFS lands along the road. While the East Boulder Mine and Park Electric are two notable beneficiaries, all users of the forested lands in the drainage would benefit from a safe evacuation route.

Water Quality/Sediment/Roads

Comments 2-2: The Ninth circuit recently ruled that sediment from ditches and culverts on FS roads are point source pollutants and require a permit from the EPA; do you have this permit? The analysis for a project must be done before the project is approved so the public can be engaged and notified of the process. A failure to consider this important factor violates the APA and NEPA.

Response: This issue is discussed at length in the Revised EA (pp. 99-100) and Water Quality Report (project File 11-1) The 10/12/2010 field trip documented that only 4 of the 61 road related drainage features in the East Boulder Fuels project had discernable connection to streams (Project File 11-7). All could be mitigated. Permits, such as 124, 404, or storm water permits are not acquired during the NEPA phase of a project but rather a few months before actual project implementation. The EA clearly commits to acquiring of all required water quality permits from the Montana DEQ prior to ground disturbance. The DEQ specifically recommended acquiring storm water permits, if needed, no sooner than 90 days prior to project implementation.

Comment 2-5: We are also concerned about the proposed logging that will occur within 15 feet of the East Boulder Creek and will violate the Forest Plan and the Clean Water Act since the stream is a WQLS and a TMDL as not yet been completed.

Response: It is clearly stated that no logging would occur within the minimum of 15' no treatment buffer for the East Boulder River, which is incorporated into project design. See the Revised EA pp. 33-39 under 7) Rivers and Streams and the unit by unit Riparian treatments in Table 2. The Revised EA documented compliance with the TMDL constraints but the actual TMDL listing is contained in the Water Quality specialist report (Project File 11-1, pp. 2-3) Project File Document 11-3a shows the 3 East Boulder TMDL listings. Project File Document 11-3b is the completed and approved East Boulder TMDL which was developed with the legal TMDL requirements mentioned in the appeal. Project File Document 11-3c is the EPA East Boulder (part of the Boulder River watershed) TMDL

approval letter. The East Boulder drainage has 3 TMDL segments. The segment within the East Boulder Fuels project area 143 (to the Forest Boundary) was assessed by Montana DEQ with all uses fully supported and no TMDL required. The Gallatin NF has been actively collaborating with the Montana DEQ in preparation of the Boulder River watershed TMDL for the last 8 years and cooperated with the Stillwater Mining Company in water quality data collection which supported the TMDL development since 1997 as summarized in the Revised Water Quality Specialist Report (Project File 11-1). Your comment is probably referring to downstream segments 141 and 142, which are included in the East Boulder TMDL for flow alterations and agriculture impacts. The East Boulder TMDL (page 43) documents that new data and information for downstream segment 141 (starts 3 miles below the Forest boundary) indicates that a sediment levels are low enough to meet narrative water quality standards and that the Montana DEQ is not proceeding with a sediment TMDL in the East Boulder TMDL. The East Boulder TMDL, therefore, provides no specific sediment constraints, other than Montana water quality standards, to the East Boulder River, including the East Boulder Fuels project area, which is on upstream National Forest land.

Comment 3-3: Logging landings, skid trails, and skyline chutes are frequently a source of sediment during precipitation events. Has the total sediment delivery been predicted for this timber sale? Could it be detrimental to aquatic species?

Response: Total estimated sediment from all logging, temporary roads, and other cumulative effect activities are disclosed in detail in the Revised EA (pp. 101-105) and in the revised water quality specialist report (Project File 11-1). Sediment levels, as disclosed in the above references, are too low to pose detrimental effects to aquatic species. Sediment increase levels are highly mitigated, too low to be measurable with conventional sediment measurement equipment, well within Gallatin NF sediment standards, and well within Montana water quality standards and in compliance with the completed East Boulder TMDL (Project File 11-3b).

Comment 3-5a: There is literature available that explains why temporary roads cause aquatic damage for many years after they are obliterated. Please read and consider this literature: “Temporary Roads are Like Low Fat Ice Cream” by George Wuerthner , 3-17-09. The link to this article is at http://www.newwest.net/topic/article/temporary_roads_are_like_low_fat_ice_cream/C564/L564/ If the Responsible Official is aware of literature that refutes Mr. Wuerthner’s temporary road explanation, then please include it in the final EA.

Response: The article cited above suggests that temporary roads are frequently left open to motorized use. The Gallatin NF during the last 10 years has done a thorough job of obliterating temporary roads and well as decommissioning hundreds of miles of other un-necessary roads. The East Boulder Fuels Project temporary roads would be closed to the public during harvest activities and permanently closed, re-contoured, and rehabilitated within one year upon completion of harvest related activities as clearly stated on pp.39-40 of the Revised EA and in A-12 of the Revised Water Quality report (Project File 11-1)..

Comment 3-5b: Forest road drainage excavates gullies and cause landslides downslope on roads requiring full-bench construction. Will any of the roads be constructing on slopes greater than 40%?

Response: None of the temporary roads in either Alternative 2 or 3 would be constructed with full bench construction or on slopes greater than 40% (Revised EA pp. 39-40)

Comment 3-6: Forest roads change the microclimate by altering temperature and moisture regimes. How will this be mitigated?

Response: Road microclimates and moisture regimes will not change in existing roads. All newly constructed temporary roads would be permanently closed, re-contoured, and rehabilitated within one year upon completion of harvest related activities which would largely mitigate microclimate or moisture change effects. The East Boulder Fuels Appendix BMP's has extensive description of road related BMP's and mitigation (Revised EA pp. 40, 237).

Comment 3-7: Compacted forest road surfaces generate overland flow, and much of this flow often enters the channel system, locally increasing peak flows.

Response: See response to Comment 3-7 above. Also, please note that road sediment was evaluated and disclosed in the Revised EA (pp. 101-105) and in the revised water Quality report (Project File). Road sediment effects for the East Boulder Fuels project are very minor. Potential water yield increases for the project is also discussed in the above references and is liberally calculated 0.06% to 0.07% for both of the action alternatives (Alts 2 & 3), which is much too low to be measurable.

Comment 3-9: Forest roads adversely alter the subsurface hydrology of the area. They involve slope-cuts and ditching that may intersect the water table and interrupt natural subsurface water movement. Has this been considered?

Response: Forest road hydrology was considered and is an integral part of the WEPP:road evaluation procedures for the East Boulder Project as disclosed in the Revised EA (pp. 101-102) and the revised water quality report (11-1, pp. 6-8).

Comment 6-1: Initially, we have a concern over the key issues identified for the decision making process. We have to ask the question, how and why water quality and quantity were not considered as "key issues". Water is a basic resource that is a necessity for all animal and plant life and should be recognized in any natural resource management plan proposal. This was a fundamental concern we expressed during the development of the Main Boulder River Project.

Response: On June 2nd, 2011 Scot Shuler and Clint Sestrich (Fisheries biologists for the East Zone of the Gallatin National Forest) met with Chuck Jones representing the Madison/Gallatin Chapter of Trout Unlimited (MGTU) at the Bozeman Ranger District to clarify, discuss, and address concerns raised by MGTU in their May 23rd East Boulder Fuels Reduction Revised EA comment letter. Scot and Clint agreed with Chuck that water quality and quantity are key issues for any project with potential effects to streams. In the case of East Boulder project, Scot explained that anticipated effects to water quality and quantity are minimal or non-existent and were not sufficient to drive alternatives for the project (Project File 11-1, Revised EA pp. 99-105). Clint referred to the sediment analysis in the fisheries specialist report (Project File 11-15), which quantified projected sediment increases and pointed out that these were very low. Clint sent the complete hydrology specialist report to Chuck for review. As stated in MGTU's June 20th letter to the FS, "The opportunity to receive and review the Water Quality Analysis report, the Fisheries Report and a copy of the appropriate BMP's added significantly to the understanding and support of the proposal. As a result, MGTU is comfortable in stating its support for the project".

Aquatics

Comment 2-19: 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.

Response: Madison-Gallatin Chapter of Trout Unlimited (MGTU) and the GNF are committed to meeting the intent of riparian protections outlined in the MGTU Settlement Agreement. The GNF and MGTU have recently reaffirmed commitments to meet riparian dependent resource needs (MGTU letter 11-17). In a (27 November, 2007) letter, MGTU also recognized that, in some cases, limited and carefully designed entry into riparian areas may be necessary for meeting project objectives to protect public and firefighter safety. Projects where riparian harvest is proposed are reviewed by MGTU on a case by case basis along with project specific mitigation intended to protect riparian resources and dependent species. For example, MGTU and the GNF worked cooperatively to develop enhanced streamside protection measures that fully protect riparian function and habitat for riparian dependent species, including aquatic biota, and allow for limited riparian vegetation management in the Main Boulder Fuels Reduction Project. MGTU was mailed the project proposal along with site specific mitigation for the East Boulder Project.

As part of the MGTU Settlement Agreement the GNF agreed that “vegetative manipulation within riparian areas will occur only for the purpose of meeting riparian dependent resource objectives such as watershed, wildlife, or fisheries.” The Agreement further defines riparian areas as “the land and vegetation for approximately 100 feet from the edges of perennial streams, and intermittent streams of sufficient size, to include a distinct riparian vegetation community and rock substrate stream channel. This area should correspond to at least the recognizable area dominated by riparian vegetation.” As noted in the Revised Aquatic Specialist Report: “During summer 2009, the Big Timber Ranger District hosted a field trip with fisheries professionals representing Yellowstone National Park, Montana Fish, Wildlife, and Parks and US Forest Service. The intent of the field review was to solicit comments and input relative to the applied aquatic mitigations along the main Boulder River and its tributaries as part of the Main Boulder Fuels Reduction Project. These mitigations and design features, which were agreed upon with MGTU, were similar but less restrictive than those applied to the East Boulder Fuels project. Collectively, the group agreed that the mitigation applied was effective at protecting aquatic resources in the main Boulder River corridor (Main Boulder Fuels Reduction Stewardship Streamside Protection Implementation Monitoring Review notes, Project File 7-13)”.

As explained in the Revised EA (pp. 113-114), riparian treatments are not prescribed within 50 feet of all tributaries to the EBR. Because tributary streams are steep and incised, a distinct riparian vegetative community typically does not extend beyond 15 feet of the high water mark. As such, from a functional perspective, there will be no treatment within any distinct riparian vegetative community for tributary streams. Additional mitigation effectively protects all trees outside the riparian zone that have potential to fall towards the stream and provide a source of large woody debris recruitment. Likewise, standard SMZ operational restrictions adequately protect soils near stream courses. Therefore, the project fully complies with the Agreement for all tributary streams.

As explained in the Aquatics section of the EA, the East Boulder River (EBR) throughout the project area, with few exceptions, is incised between high terraces with steep slopes on either side of the channel. Riparian mitigation prohibits any treatment on steep slopes draining directly into the EBR. Although there is a 15 feet no treatment mitigation that generally applies along the EBR, the steep slopes effectively precludes treatment within 50 feet of the stream in most areas because the lineal distance from the high water mark to the top of the terrace exceeds 50 feet. Unit boundaries are located on the top of the terrace, well outside of any distinct riparian vegetative community. As such, the project fully complies with the Agreement along the majority of the EBR. There are few short

segments in some units where the stream is not incised and limited riparian treatment is needed to meet fuels objectives. The 15 foot no cut buffer applies to these short interspersed reaches. Design features and mitigations (EA pp. 45-47) provide effective protection for these limited reaches where steep slopes do not occur. These mitigations are the same as those MGTU agreed upon for the Main Boulder Fuels Project.

Default buffer widths for tributary streams are 100 feet; the deviation of buffer widths was intended to allow vegetation management as appropriate outside of riparian areas. Units with 50 foot buffer widths either did not have sufficient or feasible opportunities for fuels reduction within 50 feet from channels, or had wildlife objectives such as mule deer “winter range” migration corridors.

A meeting with TU representative Chuck Jones and fisheries biologists Scot Shuler and Clint Sestrich was held on June 2, 2011 to discuss the project in detail and address any concerns that TU had regarding the project (Project File 4-6b). A letter of support for the project was received on June 20, 2011 from the Madison/Gallatin Chapter of Trout Unlimited (Project File 4-6a).

Comment 6-2: Again, dealing with water quality, your proposal identifies a 15’ no cut zone adjacent to East Boulder River. A 15’ buffer is hardly adequate to insure the protection of the water resource. Encroachment to within 15’ of the river is very likely to cause irreparable damage to the vegetation and a resultant impact to the water resource. In contrast, there is a 50’ wide no treatment buffer on either side of Twin Creeks, Lewis Creek and Wright Creek. Also there is a 100’ buffer in units 22 and 22A along Wright Creek. The question that begs to be asked is why is there no consistency for all of the streams within the project area dealing with no cut and buffer zones?

Response: See response to Comment 2-19 above.

Revised EA p. 114 states, “Likewise, riparian treatments are not prescribed within 50 feet of all tributaries to the EBR. Because tributary streams are steep and incised, a distinct riparian vegetation community typically does not extend beyond 15 feet of the high water mark of streams. As such, from a functional perspective, there will be no treatment within any distinct riparian vegetative community. Additional mitigation measures effectively protect all trees outside the riparian zone that have potential to fall towards the stream and provide a source for LWD recruitment. Likewise, standard SMZ operational restrictions adequately protect soils near stream courses.”

Additionally, the 50-foot buffers on either side of Wright, Lewis, and Twin Creeks and 100 ft buffer on upper portions of Lewis Creek in Lewis Gulch are wildlife mitigation that are described on p. 53 of the Revised EA:

- 12) Maintain a 50-foot untreated buffer on each side of Wright Creek, Lewis Creek, and Twin Creek except in Unit 22 & 22A where Lewis Creek will be buffered by 100’ to maintain cover in important wintering areas for mule deer and moose.

The use of these areas by wintering mule deer is described on p. 180 of the EA. The East Boulder River corridor and associated tributaries (specifically Twin Creek, Wright Gulch, and Lewis Gulch) contain important winter range for mule deer and moose. About 100 mule deer and a few moose consistently winter within the project area. Mule deer utilize areas along streams with dense canopy cover to escape deep snow conditions. Forest canopy cover in these areas intercepts snow, and provides protection from wind and sun, which can reduce snow crusting, and make movement less difficult. These features create an environment where deer can move around more easily, and find suitable bedding and loafing areas, thus reducing energy costs. Forest structure along Twin Creek,

Wright Gulch, and Lewis Gulch, particularly the lower reaches near the confluence with East Boulder River provide winter travel corridors and resting areas for deer, while the river bottom produces good browse material for winter forage.

Comment 2-32: Instead of managing this area to maintain or recover this critical population of cutthroat trout – 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.”

Response:

The Revised EA on p. 116 summarizes the Upper Missouri Short Term Strategy for Conserving Westslope Cutthroat Trout (1999) and Cooperative Conservation Agreement for Westslope Cutthroat Trout and Yellowstone Cutthroat Trout (2007), which provide direction for cutthroat trout conservation that were carefully utilized in unit design and mitigation measures to insure protection for the Yellowstone Cutthroat Trout population in the headwaters of the East Boulder River as described in the EA on pp. 108-109. The East Boulder River is considered to be a Class A stream per Gallatin NF implementation guidelines, which requires maintaining fishery habitat at 90% or greater of its inherent capability, including spawning habitat fines standards, and no greater than 30% over reference sediment standards. The EA further describes that the East Boulder Fuels Reduction Project complies with the Trout Unlimited Settlement Agreement because riparian areas and aquatic resources are protected. Further explanation is provided in the full aquatics report in the Project File (11-15).

The EA states that sediment effects on adult and juvenile trout can occur when sediment concentrations exceed the capacity of the channel to flush sediment, and pools fill or riffles become more embedded. Pools are areas of higher velocity during peak flows, but at low flows their depth creates a depositional environment for fine sediment. A cursory analysis of habitat and channel type data collected for streams throughout the Gallatin National Forest shows that residual pool volume and maximum pool depth decreased slightly in channels that were more sensitive to changes in sediment yield. (i.e., lower gradient B4 and C4 channels). For A2, A3, B2, and B3 channel types, like those in this project area, there was no apparent relationship between residual pool volume or depth and road development. Based on channel surveys and observations for streams in the project area, excessive fine sediment deposits in depositional zones (e.g., pool tail-outs and channel margins) do not occur.

For Alternative 2 (selected alternative) sediment modeling results suggest that sediment yield would increase from 4.3% over natural (existing condition) to 5.7% over natural, and for Alternative 3 to 6.2% over natural. These slight increases over existing condition for either alternative are well within natural variation for the East Boulder River and would recover to existing conditions 3-4 years post treatment. Given the high gradient nature, resiliency to changes in streamflow and sediment discharge, and low to very low sediment supplies of all channels in the project area except Dry Fork creek, the slight increases in sediment yield predicted by the R1R4 model are not expected to result in measureable changes or adverse habitat effects for any life stage in the East Boulder River.

Likewise, project related activities would have little potential to influence the integrity of existing biomonitoring sites established in the EBR to monitor mine operations. Considering the high resiliency of all channels throughout the project area, the limited treatments along riparian zones, and additional mitigation, Alternatives 2 or 3 pose little threat to the physical integrity of riparian areas or streambank stability. Channels throughout the project area generally have stable stream banks with a very low to moderate sensitivity to disturbance and riparian vegetation exerts low to negligible control on channel form and bank stability. With the protection measures included in both action alternatives,

fuel treatments are designed to maximize the amount of LWD available for recruitment to stream channels.

Comment 6-3: Other than identifying a fish biologist will assist in tree marking along all riparian corridors, reference to riparian lands seems to be lacking. Riparian lands should be identified prior to project implementation and there should be no equipment allowed within those identified areas during the project activity.

Response: Design criteria and mitigation outlined on pp. 45-46 of the Revised EA for water quality and aquatics are designed to specifically address the types of treatments allowed along riparian corridors;

Water Quality

- 6) SMZ treatments: 15' no cut zone adjacent to East Boulder River, additional SMZ retention guidelines of harvest up to 50% of trees >8" dbh, no harvest on >35% slopes in Units 5, 11, 17 & 18 adjacent the East Boulder River.
- 7) No treatment buffer of 50' on either side of Twin Creeks, Lewis Creek, and Wright Creek except in Unit 22 & 22A where Lewis Creek will be buffered by 100' for both water quality and winter range objectives.
- 8) Apply standard BT timber sale protection clauses to the commercial harvest activities to protect against soil erosion and sedimentation. Include standard BMP's for all activities including Montana SMZ compliance rules.
- 9) All required water quality permits would be acquired by the Gallatin National Forest prior to any ground disturbance activities for the East Boulder fuels project. If logging road stormwater discharge NPDES permits are required for East Boulder fuels project the Gallatin National Forest will work with the Montana DEQ to obtain the permits prior to project implementation.
- 10) 5) The Gallatin Forest Plan, Forest Wide Standards 10.2 (page II-23) requires that Best Management Practices (BMP's) will be used in all Forest watersheds. The Montana Forestry BMP's are included in Appendix A of this EA and are required to be followed in all timber harvest and road construction activities.

Effectiveness: No Gallatin NF timber sale-related BMP violations have been documented in implementation monitoring reviews since 1990 (GNF 1997 Annual Monitoring Report). Improved harvest methods, SMZ rules of 1993, and more complete BMP direction incorporated in NEPA documents and timber sale contracts have worked to virtually eliminate BMP problems (e.g., skidding across streams, insufficient sediment filtering, inadequate skid trail rehabilitation) of the past.

Aquatics

The underlying goal of protection measures for riparian and aquatic habitats is to follow a functional definition of riparian zone consistent with GNF Plan and FSM direction, and consider riparian vegetation in relation to stability, integrity, and meeting needs of riparian zone dependent species including fish and fish habitat. The following stream protection measures are included in the proposed action:

- 10) No riparian treatment up to 100 feet either side of streams except for designated areas where riparian harvest is necessary to meet fuels treatment objective along a critical reach.

- 11) Where riparian treatment is necessary to meet fuels objectives, a 50 feet no treatment buffer is preferred. In limited areas where riparian treatment is critical to meet fuels objectives, treatment is allowed within 50 feet, but not closer than 15 feet of the high water mark. This is more restrictive than State SMZ rules. This “no harvest” mitigation protects thermal regulation, overhead cover, and protects banks. It also maintains age class diversity of trees along stream corridors. Where riparian treatment is necessary within a 50 feet SMZ, additional mitigation measures described below apply.
- 12) Follow all SMZ rules and Gallatin FP regarding operation of wheeled or tracked equipment in riparian zones.
- 13) Favor leaving large diameter trees along riparian corridors. Purpose is to protect those trees most likely to provide anchored and stable LWD when it is recruited to the channel. Fisheries biologist will be involved with marking cut trees along all riparian corridors.
- 14) For tree retention guidelines follow SMZ rules which require retention of at least 50% of trees ≥ 8 in dbh. The SMZ retention guidelines apply to all stream segments beginning 15 feet from the stream high water mark and extend out 50 feet. As such, 50% of trees \geq dbh between 15’ and 50’ of the stream high water marks will be retained. Trees within the 15’ no cut zone do not count towards the 50% retention.
- 15) Favor leaving trees that are leaning towards the stream channels and favor taking trees leaning away from the stream channel. Purpose is to protect those trees most likely to provide anchored and stable LWD when it is recruited to the channel.
- 16) To the extent possible, but still meeting fuels objective, leave species and size classes representative of original stand.
- 17) Fisheries biologist will assist in tree marking along all riparian corridors.
- 18) No riparian treatments on steep slopes $>35\%$ that drain directly into a stream with no floodplain filter.
- 19) No harvest in active floodplains (inundated on 1.5 – 2 year recurrence interval). Fisheries biologist will assist in identifying these areas.
- 12) Follow all BMP’s and other mitigation measures outlined in the water quality section of the EA.

Effectiveness: Similar aquatic mitigation measures were applied to treatment units along the main Boulder River and tributaries for the Main Boulder Fuels Reduction Project. During summer 2009, the Big Timber Ranger District hosted a field trip with fisheries professionals representing Yellowstone National Park, Montana Department of Fish, Wildlife and Parks, and US Forest Service. The intent of the field review was to solicit comments and input relative to the applied aquatic mitigations along the main Boulder River and its tributaries. Collectively, the group considered the mitigation effective at protecting aquatic resources. For that project, the 15 foot no cut zone was applied to all streams. Though the group considered the 15 foot distance adequate to protect aquatic resources when applied in conjunction with other mitigation (e.g., selective harvest to protect LWD recruitment), there was a general consensus that 15 feet was the minimum distance necessary for adequate protection.

Comment 6-4: Additional information and explanation by Scot and Clint (fisheries biologists for the Forest) clarified the issues for the most part to MGTU’s satisfaction. The opportunity to receive and review the Water Quality Analysis report, the Fisheries Report and a copy of the

appropriate BMP's added significantly to the understanding and support of the proposal. As a result, MGTU is comfortable in stating its support for the project.

MGTU appreciates the opportunity to continue to participate in the resource management activities on the Gallatin National forest and look forward to coordinating in the future.

Response: Thank you for your support. The Gallatin National Forest is eager to collaborate, consult, and work with other interested agencies and groups. This helps the Forest to be able to design and implement more effective, mutually beneficial projects.

Soils

Comment 2-20 & 2-33: Please ensure that the Project complies with regional soil quality standards. FS studies and analyses have more than amply demonstrated that logging operations and grazing significantly compact soils, resulting in persistent cumulative damage to the soils (USFS and USBLM, 1997a; USDA Forest Service 2002a; USDA Forest Service, 2002b; Grier et al., 1989). Therefore, the GNF must measure soil compaction and bulk density in units and properly analyze and disclose this data in order to adequately disclose existing soil conditions, including the extent of DD, and likely future soil conditions, including the extent of DD under the action alternative.

Response: There has been plenty of empirical evidence as well as research to demonstrate logging operations and cattle grazing have the potential to significantly compact soils in a manner that creates persistent detrimental soil disturbance. What is missing from the above statement is recognition of the many soil and management factors that on a site specific basis affect the level of soil compaction that actually occurs. Important management factors include the type (tractor logging versus other methods) and season (winter versus non-winter) of harvesting, the volume of timber removed (clearcutting versus partial cutting), layout of the timber sale, and the effectiveness with which harvesting Best Management Practices (BMP's) are implemented. Management factors have an obvious effect on logging impacts. Soil factors also play a major role in determining the amount of detrimental soil disturbance, including soil compaction that occurs due to either logging or grazing. Soil factors of greatest importance include: soil texture, the amount of rock fragments in the soil, and soil moisture content at the time the activity takes place. Each of these factors can have a tremendous impact on the level of DSD that results from any given management activity.

The assessment of soil compaction is a standard part of all soil quality monitoring and/or soil field assessments made on the Gallatin National Forest. Nowhere in the Forest Service, Region One soil quality standards, however, is bulk density identified as a required measurement for determining the presence or absence of soil compaction. The 1999 Region One Supplement to the FSM 2500 (USFS-R1 1999) used increased bulk density in the definition of detrimental compaction; "detrimental soil compaction is a 15 percent increase in natural bulk density". The same document indicates that observing management induced platy structure, changes in macroporosity, or penetration resistance, as well as using root-restricting bulk densities for various soil particle size classes from the National Soil Survey Handbook 618.06 (USDA-NRCS 1997) can all be used to assess soil compaction in the field. Other observable changes in the soil, such a change in rooting patterns, can also be valuable in identifying the occurrence of management caused soil compaction.

Please see Keck, T. J. 2010. Technical Note: Detrimental soil disturbance and soil mitigations on the Gallatin National Forest. 12pp. (Keck, T. J. 2010) for a more complete discussion on the limitations of using bulk density to determine soil compaction.

Comment 2-34: The revised EA fails to disclose the location, size, cumulative area, and number of landings. This is a significant defect because landings have soil and watershed impacts that are similar to roads in intensity and persistence on a per unit area basis (e.g., Beschta et al., 2004), although this, too, is inadequately disclosed in the EA.

Response: Predicted levels of detrimental soil disturbance associated with landings by treatment unit are presented in Tables 22 and 23, on pages 123 and 124 of the Revised EA. Specific details providing the basis for how these values can be found in the East Boulder Fuels Soil Specialist Report (Project File). An abbreviated explanation is that calculations are based on having approximately one half acre landing per each 20 acres within a treatment unit. Specific locations for landings, in most instances, are decided jointly in the field between the timber contractor and the sale administrator. Thus, exact landing locations are not known at this time.

I have reviewed the paper by Beschta et al. al. (2004) that was cited in your comment as the basis for the following: “landings have soil and watershed impacts that are similar to roads in intensity and persistence on a per acre basis”. While this was an excellent paper for me to review, I only found two references to landings in the paper. The first one on page 964 simply indicates that “road and landing construction is expensive” The second mention of landings is in the Conclusions section, page 965, where “road and landing construction” where viewed as not being beneficial post-wildfire remediation activities. The article is about post-wildfire management on forested public lands so, in general, information in the article is not directly applicable to treatments proposed for the East Boulder Fuels project.

Comment 2-35: The revised EA fails to adequately disclose that dedicated skid trails represent an irretrievable loss of soil productivity and persistent source of soil impairment (Beschta et al., 2004), as the FS has repeatedly acknowledged (USDA Forest Service, 2003b).

Response: At least for the Gallatin National Forest, which has substantial coarse textured soils and abundant rock fragments in most areas, I can say without a doubt that the above statement regarding skid trails is false. Perhaps the “dedicated” portion of the statement is intended to indicate continual use, which could reduce productivity for an extended period in intensively managed stands. Again, this would not apply to the Gallatin National Forest.

I did not note a single reference to skid trails in the Beschta et al. (2004) cited in support of this contention. The U.S. Forest Service citation was unfortunately not included in your references.

Comment 2-36: The revised EA fails to adequately analyze and disclose the amount of burning that is expected to result in DD or TSRC. This assumes a level of perfection in carrying out post-cutting burning, which doesn't exist in the real world. A considerable amount of areas burned post-logging may have suffered high severity burns at the soil surface, which plainly causes DD. However, the EA provides no quantitative disclosure of this amount that has been, or will be, caused by post-logging burning in the project area or activity areas.

Response: Estimates of treatment related detrimental soil disturbance have been provided in Tables 22 and 23 on pages 123 and 124, respectively. In tractor harvest units, it is assumed that whole tree yarding will be used and that excess fuels above the target course woody fuels goal will be piled and burned at the landings. Fifty percent of the total predicted DSD at landings in Tables 22 and 23 is attributed to the area beneath the burn pile. In hand treatment units, woody debris in excess of fuel targets will be hand piled into jackpot burning piles. The 1% DSD predicted in hand treatment units is almost entirely attributed to burning of the forest floor beneath the hand piled slash. See the Soil Specialist report for further details (Project File 10-1).

Comment 2-37: The revised EA and Forest Plan also fail to adequately address the long-term reduction of coarse woody debris (CWD) in activity areas, a condition that would be exacerbated by the logging activities. Although not disclosed in the EA, the USFS's own ICBEMP assessment concluded that the loss of CWD coupled with the impacts of logging have persistent and serious impacts on soils (USFS and USBLM, 1997a; b). The EA's analysis of soil impacts inadequately analyzes the effects of tree removal on short- and long-term CWD and its effects on soil productivity, based on a thorough analysis of the best available scientific information on the issue.

Response: Page 43 of the Revised EA, under Fuels, specifies that, "Approximately, 10-15 tons per acre of down woody material would be left on the ground for nutrient recycling, favoring large diameter trees." This statement does not indicate actual CWD levels but it can be assumed that 80 to 90% of the material left behind, on a mass basis, would be 3 inches in diameter or larger. More specific details on coarse woody debris to be left behind in forest stands are provided on page 238 of the Revised EA under Implementation of Gallatin National Forest, Soil Best Management Practices. The values used for partial cutting are pro-rated based on the proportion of stand removal from Graham et.al.'s (1994) CWD recommendations for clearcutting in seasonally dry Douglas-fir and subalpine fir forest habitat types in Montana and Idaho. They represent minimum CWD levels to be left on the ground at the completion of logging activity.

Comment 2-38: Ground cover, including fine dead material and regenerating vegetation, is a critical issue with respect to soil impacts and soil erosion (Graham et al. 1994). However, the EA fails to disclose existing and likely future levels of ground cover currently and under the selected alternative.

Response: Graham et al. (1994) refer specifically to coarse woody debris. See discussion above. Extrapolating from the 10 to 15 tons per acre of down woody material note on page 43 of the revised EA, approximately 1 to 3 tons per acre of fine (<3 inch diameter) woody material would be left on the ground after logging. This does not include surface litter and humus layers that will remain intact over much of the area due to the use of winter harvest activities over snow or frozen ground. In addition, fuel treatments that include only partial removal of trees, especially when broadcast burning is not used, have a much less severe impact on ground cover than clearcutting. Opening up stands will result in increased understory growth of grasses, forbs, and shrubs.

Comment 3-2: The science presented in the attachments indicates the some timber sales reduce the organic parent material (duff and woody residues) available for soil-formation processes. To what extent will this occur?

Response: See responses to previous comments (2-37, 2-38), re: coarse woody debris (CWD) and ground cover. Soils within the project area have already formed. Goals for retaining adequate CWD as well as fine, dead material on site are intended to maintain the existing soil/site productivity levels. Levels recommended are in line with Graham et al. (1994) which remains the best science available on this topic for our area.

We often tend to assume that more soil organic matter or organic substrates are always better. Soil organic matter (SOM) and organic substrates are obviously extremely important components to healthy, productive forest soils. Like many other soil factors, however, there is an optimum SOM level in the soil that for any given plant species (Zone of the Optimum) provides the best growth medium. Much has been made of the build-up of forest fuels (organic materials) in some forest stands due to fire suppression during the past century. A corollary to the above is the build-up of forest floor

litter and canopy closure in certain, seasonally dry (limited decomposition) forest stands, which increases soil drought and can result in lost site productivity. This applies to forest stands in the East Boulder Fuels Project as well as many of the lower elevation forest types on the Gallatin National Forest.

More surface litter may not always be better for soil health, especially in soils with ustic, xeric, or the dry end (bordering on ustic or xeric) of udic soil moisture regimes. Please see Keys to Soil Taxonomy (USDA 2006) for definitions of soil moisture regimes.

Comment 2-39: In interpreting the requirements of NEPA, the federal courts have evaluated the adequacy of mitigation measures that EISs and EAs rely upon. Relying upon inadequate mitigation measures to protect soils fails to meet this judicially specified test of compliance with NEPA regulations.

Response: All treatment units in both action alternatives will meet the 15% maximum DSD standard for Region One forests even before mitigation measures are applied. Mitigation of disturbances from temporary roads, landings, and along some skid trails, where needed, will provide further improve site conditions and enhance natural recovery of the disturbances that remain. These mitigation are not essential, however, in order to meet the Region One soil detrimental soil disturbance standards for this project.

Comment 2-41: 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.

Response: “Because productivity effects are spatially static and productivity in one location does not influence productivity in another location, it is appropriate to spatially limit the cumulative effects analysis to the activity area” (USFS-R1 2009). There may be a couple exceptions to the previous statement. The first would be if timber harvesting within an activity were to result in active erosion or deposition which then degrades land outside the activity area. Proposed fuels treatments in this project are partial cuts. There is no expectation that the planned activities will create off-site soil erosion or deposition impacts. This conclusion is based on the lack of such impacts in previous, much more severe, past harvest activities, especially up Lewis Gulch. It is also based on the high rock fragment content of most soils in the area.

The second possible exception would be if treatment units are interspersed with previously harvested areas on Forest Service lands that far exceed the 15% DSD standard to the extent that a contiguous area of Forest Service land, including past harvests and proposed treatments, would exceed the DSD standard. Field reconnaissance of previous timber harvest areas in the project area indicate that these areas have good conifer regeneration and have recovered well from past timber harvesting. The area as a whole will come nowhere close to exceeding the 15% DSD standard at the end of logging activities for either treatment alternative.

Comment 3-20: Macropores, which provide soil drainage and infiltration, have been shown to significantly decrease in size as a result of road construction and use. Has this been considered?

Response: Yes, this has been considered. The above statement about macropores is true. The degree and depth of soil compaction, however, depends on the particle size distribution of substrates being compacted. Soils in the East Boulder Fuels project area contain abundant rock fragments. These limit the degree of soil compaction as well as the depth of compaction depth. The majority of soils in Lewis Gulch and those associated with glacio-fluvial deposits along the East Boulder River also have coarse

soil textures, which help limit soil compaction. Ripping temporary roads during decommissioning will break up compaction in near surface layers.

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