ENVIRONMENTAL CONSEQUENCES

This section summarizes the environments of the affected project areas and the potential changes due to implementation of the alternatives. It also presents a summary of the scientific and analytical basis for comparison of alternatives presented in the chart above. Additional information specific to each issue or resource area can be found in project Specialist Reports, which are included as appendices to this EA in electronic version on the Custer National Forest's webpage at: http://www.fs.fed.us/r1/custer/ Printed copies of Specialist Reports are available upon request. Additional supporting documentation and reference materials are in the Project Record, which is on file at the Beartooth Ranger District and available for public review upon request.

Fuels

Effectiveness of fuels treatments in decreasing fire risk and improving firefighter and public safety is a key issue. The measurement criteria used to display effects of alternatives is a qualitative change in future fire behavior within the treatment areas based on modeling results. The Fuels Report For the Beatooth Front Storm Damage Clean-Up and Fuels Reduction Project (Appendix A) discloses the effects of this project to fuels and potential fire behavior. Following is a brief summary of the report:

Affected Environment

Main Fork Rock Creek:
On National Forest lands, the northern portions of the Main Fork canyon is mostly even aged lodgepole, approximately 110 to 120 years old, putting the last potential stand replacement fire in the 1890s. Lodgepole pine is the predominant tree species in the drainage. Fire return intervals are generally moderately long to long intervals of (e.g., 100-200 yr) stand replacement fires, with a substantial amount of terrain influenced by moderately long interval (e.g., 50 to 100 yr) mixed severity fires (Hann et al 2008). Since 1953 there have been 80 recorded wildfires in the Main Fork Drainage ranging in size from 0.1 to 1503 acres. Of those, 33 have been lightning (41%) and 47 human or other ignition sources (59%). Over the last ten years, there have been 20 fires, or and average of 2 fires per year. Of those fires, 8 were lightning (40%) and 12 were human caused or other ignition sources (60%). From 1953 to 2007, 3 recorded fires have occurred within or on the edge of the proposed treatment units in the Main Fork of Rock Creek. Two fires were human caused and 1 caused by lightning.

On November 11, 2007 a wind event converted approximately 367 acres of timber fuel model (FM) 8 in proposed treatment areas to three blowdown fuel models. FM 8, blowdown FM SB2 and blowdown FM SB4 are the predominant fuel models in the proposed treatment units. Firefighter initial attack capabilities to suppress and contain wildfires under current conditions are limited by several factors. Predicted fire behavior under extreme conditions along the road corridor could preclude direct attack and

potentially limit access and egress. Under predicted fire behavior, access by firefighters and emergency personnel could be limited. Crown fire rates of spread and long range spotting in the canyon bottom could compromise egress on Highway 212 and Road # 2421. Highway 212 is the only egress opportunity for vehicles exiting the canyon. Under current conditions, an active crown fire in the Main Fork of Rock Creek drainage could limit access to firefighting resources to prepare or defend structures. Current fuel loads in conjunction with structure conditions, could make many structures in the Main Fork of Rock creek drainage un-defendable and reduce survivability.

The Main Fork of Rock creek drainage has openings of grass, talus slopes, rock outcrops, and area of grass/sage and timber mix that could be potential fire safe zones within the canyon where the general public or firefighters could go to ride out a flaming front of fire. These areas, along Highway 212 and Road # 2421, may need to be modified to be fire safe, in the event of a wildfire. Access to these potential zones under extreme fire behavior could be compromised.

Benbow Area:

Fire return intervals are generally 100-200 years for stand replacement fires, with a substantial amount of terrain influence. Since 1953 there have been 28 recorded wildfires in the Fishtail creek and Little Rocky creek drainages, and surrounding area ranging in size from 0.1 to 380 acres. Of those, 12 have been lightning (43%) and 16 human or other ignition sources (57%). Over the last ten years, there have been 2 lightning fires, both in 2007. From 1953 to 2007, 3 recorded fires have occurred within or on the edge of the project area. Two fires were lightning caused and one human caused (Benbow fire). The Benbow fire (380 acres, 1980) occurred in portions of proposed treatment units 3 and 59. This was a human caused fire which destroyed one primary residence in a small subdivision along Meadow creek. Several wind driven stand replacement fires have occurred in the local area around Fishtail and Little Rocky creeks, including Shepard Mountain (14,890 acres, 1996), Storm Creek (61,300 acres, 1988) and Derby (281,000 acres, 2006). The Shepard Mountain fire occurred in the East Rosebud drainage, which has approximately the same orientation as both Fishtail and Little Rocky creek drainages. At the height of burning on the Shepard Mountain fire, the crown fire spread 5 miles in three hours, burning 35 homes and cabins.

Three fuel models for a total of 377 acres were identified within the project area prior to the November, 2007 wind event. After the November, 2007 wind event approximately 265 acres of FM 8 spread across the proposed treatment units were converted to blowdown fuel models. Outside the proposed treatment units, within the Fishtail and Little Rocky Creek drainages, there is estimated to be an additional 5900 acres of heavy to moderate blowdown. Of those acres, approximately 2400 acres are a heavy blowdown FM SB4, and approximately 3500 acres are moderate blowdown FM SB3. Area fuel loading for FM 8 ranges approximately 6-40 tons per acre, and approximately 90-105 tons per acre in FM SB2. Fuel loads in blowdown FM SB3 and SB4 range between 105-150 tons per acre. Most of the proposed treatment units and project area have ladder

DRAFT

fuels from regeneration. Blowdown and snow damaged tops and downed trees are very prevalent.

Values at Risk:
Values at risk within and adjacent to the Main Fork Rock creek, Little Rocky creek, and Fishtail creek include numerous private residences and Forest Service infrastructure. Forest Service infrastructure in the Main Fork area includes 6 campgrounds, 6 trailheads, and 60 recreation residence lease cabins. The City of Red Lodge and outlying subdivisions, high-value individual homes, and Rock Creek Resort are located in and at the north end of the Main Fork of Rock creek canyon. Values at risk near or in the Little Rocky and Fishtail drainages, include the towns of Dean and Nye, a small subdivision consisting of 6 structures along Meadow creek off Benbow Road #2414, high-value individual homes and ranches along Fiddler Creek road, and the Stillwater Mine. Numerous privately owned groundwater wells and springs used for residential drinking water and ditch systems and wells used for irrigation purposes, are fed by water from Main Fork Rock Creek, and Fishtail and Little Rocky Creeks.

Effects of the No-Action Alternative

Direct effects: There are no known direct effects to fire behavior or changes to fuel loading in the short term by taking no action.

Indirect effects: Indirect effects would be that in the absence of wildfire or any fuels treatment, fuel loading would continue to increase. Severe fires would be most likely to occur where dead fuels have accumulated. With concentrations of dead fuels, individual trees or groups of trees may torch, and fire can continue through the crowns aided by high winds (Anderson 2003). Flame lengths in the predominate fuel types would range from 39.9 feet to 60.7 feet. Crown fire was modeled in FM 8 and SB2. Modeled rates of spread ranged from 133.8 Chains per Hour (CPH) to 451 CPH in predominant fuel models (One chain is 66 feet in length or 1/80 of a mile). Production rates for fire resources for fuel model 8 would be 7-15 CPH for crews and engines, and 105-120 CPH for equipment. Production rates for fire resources for blowdown FM SB2 and FM SB4 would be 10-20 CPH for crews and engines, and 40-55 CPH for equipment.

Cumulative effects**:** Cumulative effects to fuels would be that in the absence of stand replacement fire from suppression efforts, fuels within the project area would continue to accumulate. Under the current fuel loading and stand conditions, there is potential to have stand replacement fire.

Effects of the Action Alternative

Direct effects: Surface and canopy fuels would be reduced by removing crowns of standing trees and removal of down and dead fuels within the project area. Thinning would reduce ladder fuels, increase canopy base height and reduce canopy bulk densities.

Indirect effects: Desired conditions for the project areas would be conditions that reduce fire behavior with the purpose of improving access and egress for firefighters, emergency personnel and the general public; and improve firefighter capabilities in suppressing fires in the project area. Treatments would include thinning to a 10 X 10 foot crown spacing, and reduction of surface fuels to 10 tons to the acre or less. The proposed action would reduce fuels in blowdown and timber models resulting in reduced fire behavior in proposed treatment areas. Reduced fire behavior would be surface fire (rather than crown fire). Surface fire was modeled in post-treatment fuel models. Based on modeling, rates of fire spread would range from 5.8 CPH to 249.3 CP) in post treatment fuel models. Flame length heights would be reduced to a range of 2.1 to 18.2 feet. Production rates for fire resources for post-treatment FM 8 and FM SB2 would be 15-40 CPH for crews and engines, and 105-120 CPH for equipment. Production rates for fire resources for post-treatment blowdown FM SB4 would be 15-24 CPH for crews and engines, and 125-145 CPH for equipment.

Cumulative effects: Proposed treatment areas and past timber harvest have and would only change small portion of the total fuels loads present within the three drainages. Theses treatments are designed to enhance egress and access in the canyons by public and firefighters, improve firefighter capabilities in suppressing wildfires, and improve the survivability of structures, within the proposed treatment units. The proposed action would reduce the potential for ignitions from any source to result in undesirable effects within the project area. Proposed treatments would limit fire intensity and duration within the treatment units, which would be less impactive to riparian areas and soils, and potentially allowing these areas to recover faster from wildfire effects.

Visuals Resource

A key issue is effects to visual resources, particularly the visual appearance around recreation sites and those areas with Forest Plan visual quality objective of retention (retention VQO). The analysis indicator and threshold for this issue are the visual quality objectives assigned to the project area by the Forest Plan (USDA 1986). The Visuals Resource (Scenery) Specialist Report (Appendix B) describes the existing condition of the scenic resources within the project area and evaluates the potential effects of the alternatives on scenic resources. Following is a brief summary of that report:

Affected Environment

In the Main Fork Rock Creek Area, forested stands of lodgepole pine surround recreation sites and cover the valley floor. Open sagebrush and grassland parks to the east and northeast of the project area offer panoramic views of the surrounding canyon walls and the Main Fork project area. In the Little Rocky Creek area, or Benbow area, the subdued, rounded landforms and vegetative components, consisting of a continuous forest canopy with few natural openings, result in a landscape common to the area with some inclusions of distinctive features.

DRAFT

The landscape character attributes of form and texture have been affected by the November 2007 wind event, resulting in downed trees and openings where a continuous canopy of trees had previously characterized the area. In some areas the wind damaged and fallen trees dominate the landscape character being viewed with large areas of downed trees and large, up-ended root wads dominating the view. Wind damage viewed from the Main Fork Road generally does not dominate the landscape being viewed. More wind damaged trees and up-ended root wads are noticeable beyond Greenough Lake Campground and near M-K Campground. From Benbow Road, the wind damage is primarily viewed as broken topped trees with some up-ended trees. Larger areas of wind damage are not easily viewed from Benbow Road due to vegetative screening. These downed trees will continue to dominate the landscape being viewed until new growth sprouts around them.

The wind event has affected the scenic attributes around recreation sites by altering the valued landscape character attributes around these sites, changing the shade, screening, and views from these sites. The wind event has removed vegetative screening in some areas and opportunities now exist which provide dramatic views of the surrounding cliff walls and rugged, picturesque mountains.

Effects of the No-Action Alternative

Hazardous buildups of vegetative fuels in the forest would remain and current management practices would continue to occur in the Main Fork and Benbow areas. Visual quality objectives under the No Action Alternative would be maintained. Large amounts of downed woody material would continue to be visible in the immediate foreground of sensitivity level one travel routes and use points. Large amounts of dead woody material are perceived negatively by viewers regardless if the tree mortality is caused by harvesting or natural forces (Ryan 2005). No action would be taken to improve the existing visual condition, and the valued landscape character attributes would be at risk. If the vegetation in these areas was consumed by a future fire, scorched timber would alter the forested setting, changing the sense of place for visitors in the area and the existing landscape character would be lost for 20 to 30 years until the re-growth of vegetation begins to develop characteristics of a closed canopy and the valued landscape character attributes return. If recreation sites were consumed by fire, scenery viewing opportunities would be altered and valued cultural landscape attributes would be lost.

Effects of the Action Alternative

The majority of effects to scenery resources are short term in duration with long term benefits which would help maintain the valued landscape character and valued cultural attributes. Tree stumps would impact visual resources in the short term and would be most noticeable in the immediate foreground views of Main Fork Road, Benbow Road, recreation sites, and system trails. Mitigation measures would be applied to reduce the visibility of stumps and minimize their impacts. Stumps would become less visible within one to two growing seasons as grasses, forbs, and shrubs sprout new growth. The Action Alternative would meet the retention, partial retention, and modification VQOs as

outlined in the Custer National Forest Management Plan, because the effects of proposed activities in retention VQO are anticipated to be naturally appearing, repeating the form, line, color, and texture which are frequently found in the characteristic landscape. It is anticipated that the proposed activities would meet VQOs assigned to the project area in the short term either at project completion or about one to two growing season after all proposed project activities are complete.

The Action Alternative would be consistent with Custer National Forest Management Plan goals, standards, and guidelines for visual resources. No direct, indirect, or cumulative effects to scenery resources would be expected in the long term from the storm damage clean-up and fuels reduction activities. There would be no irreversible or irretrievable commitments related to scenery resources from the Action Alternative.

Water Resources

Potential effects to water quality are a key issue. The Water Resources analysis (Appendix C) discloses effects to water quality by focusing on the effects of the proposed activities to hydrologic processes and water resources; specifically water yield, sedimentation, and channel and floodplain function. Units of measure utilized to display effects are equivalent clearcut area acres (ECA) and a qualitative description of project effects. Following is a brief summary of that report:

Affected Environment

Rock Creek generally has moderate entrenchment, sinuosity and gradient with cobble sized substrate (B3 streamtype, Rosgen 1996). Less entrenched segments result in decreased gradient and substrate size (C4 streamtype). Little Rocky and Fishtail Creeks are relatively high gradient with moderate entrenchment and sinuosity, and boulder sized substrate (B2a streamtype). B stream types with large substrate are relatively resistant to changes in streamflow or sediment loads.

Numerous watersheds were affected by the November 2007 storm event and were evaluated for project analysis (see Appendix C). Past and present land management activities along with natural events have influenced hydrologic processes in all watersheds within the project area. ECA analysis involving past timber harvest, road construction, wildfire and wind events suggests that hydrologic processes in nearly all watersheds are not affected to any substantial degree. The exception is the West Fork Fishtail and Upper Little Rocky watersheds which are in an ECA condition of 22% and 30%, which, primarily due to November 2007 storm damage, are at or slightly above levels that could produce measurable changes in annual water yield and possibly streamflow (Troendle 1983, Stednick 1996).

From a physical standpoint, large woody debris is an important component in all streams within the analysis area because it adds stability to the system through flow energy dissipation and bank armoring, both of which reduce channel scour and bank erosion. Reduced streamflow velocities, and obstacles provided by woody debris causes sediment to be trapped and deposited rather than flushing through the entire system.

DRAFT

Effects of the No-Action Alternative

There would be no directs effects associated with the no-action alternative. ECA modeling for the No-action alternative indicates that streamflows and water yields could slightly increase in the West Fork Fishtail and Little Rocky drainages due to blowdown, but there is a low risk of existing levels of blowdown to cause substantial increases in water yield and streamflow downstream of the immediate blowdown areas. Based on ECA modeling, no detectable increases in streamflows and water yields would be expected in other streams analyzed for the No-action alternative.

Cumulative effects include the possibility of a high intensity/long duration wildfire scenario, with substantial risk of impact to adjacent soils, streams and floodplains in areas of high blowdown density.

Effects of the Action Alternative

Since a reduction in timber canopy has already occurred from the November 2007 blowdown event, removing all or a portion of the windthrown timber will have little additional influence on water yield and streamflows in the short-term. The Action Alternative would comply with State and Federal water quality laws assuming adequate implementation of BMPs and SMZ stipulations occur.

While on-site sediment production is anticipated from the proposed activities that utilize machinery/heavy equipment to remove or pile trees, the majority of this sediment would be deposited and stabilized prior to reaching perennial streams and wetlands. Effects of temporary road construction and skidding operations would be short-term as roads and skid trails stabilize and revegetate after closure. Closure and obliteration of temporary roads would involve ripping, seeding, slashing and installation of appropriate drainage features. Construction of new stream crossings, i.e., bridges, culverts or fords, is the only action that would have a direct effect to water resources due to the immediate sediment delivery and flow disruption that generally occurs during structure installation and removal. However, all crossings would meet the requirements of SMZ regulations, Montana Forestry BMP's, and MTDFWP 124 permit stipulations and be fully rehabilitated to ensure approaches are adequately drained, revegetated, stabilized and closed to future traffic. Sediment generation should subside to background levels soon after sites are closed and rehabilitated.

No adverse indirect effects are anticipated. From a direct and indirect effects standpoint, the proposed treatments would have minimal additional influence on water yield and streamflow for two main reasons. First, hydrologic processes have already been affected by the loss of timber canopy from blowdown. The proposed treatments would not further reduce timber canopy to any substantial degree. Secondly, the amount of blowdown treated is a small percentage of the total blowdown that currently exists. However, from a cumulative effects standpoint, considering the potential for wildfire, the proposed treatments would help to reduce fire intensity within blowdown areas, reduce impacts to riparian areas, and hasten recovery of post-fire landscapes. It must be recognized that these benefits of treatment under a wildfire scenario are localized, as only a small

percentage of the total blowdown would be treated. Therefore, from a watershed scale perspective, the Proposed Action is not substantially different than the No-Action alternative.

Recreation

Effects to recreation, including visitor use, access, and dispersed camping activities are key issues. The issue indicator is consistency with applicable Forest Plan recreation goals, objectives, and standards. Effects of tree removal and equipment use on future off-road use and car camping sites is also a key issue. The issue indicator is post-project compliance with Beartooth Travel Management Plan (USDA 2008b).

Comments for analysis related to recreation are: 1) Effects of project activities to subdivisions adjacent to the Forest boundary. 2) Effects of logging truck traffic and associated safety concerns. 3) Identification of a need for interpretive education associated with project. 4) Suggestion to "allow the public to use the plowed road on weekends to drive to a plowed parking area beyond….."

The Recreation Specialist Report (Appendix D) analysis describes the existing condition of the recreation resources within the project area and evaluates the potential effects of the alternatives on recreation resources. Following is a brief analysis of effects to recreation resources based on that report:

Affected Environment

The project area includes the Main Fork Road, Highway 212, Benbow Road, developed recreation sites, numerous dispersed recreation sites and system trails in the Benbow and Main Fork Rock Creek Areas. The affected environment includes the roads, trails, developed recreation sites and recreation residence tracts in or accessed through the proposed treatment units. Dispersed recreation use (i.e. camping and picnicking) occurs within 300 feet of the roads near the proposed treatment areas. Heavy recreation use of sites in the Main Fork Rock Creek occurs due to proximity to Red Lodge and US Highway 212, the Beartooth All-American Highway. Roads in the Benbow area are frequently used for motorized recreation, such as travel with ATV's or motorcycles.

Effects of the No-Action Alternative

The No Action Alternative would result in blown down and hazard trees remaining in areas accessed by recreation users. Therefore the direct and indirect effects of this alternative would reduce recreation opportunities because the blown down trees and hazard trees reduce access for recreation in these areas, including blocking traditionally used dispersed recreation sites. No routes or dispersed recreation sites would be opened by fuels treatment and storm damage clean-up in the Main Fork and Benbow areas. User created and unauthorized activities by forest recreation users would be expected in response to the No Action Alternative. Recreation users would take on clearing trees or creating new user routes around them to meet their own immediate needs for recreation

DRAFT

or access. Increased resource damage and exposure to potential liability due to a lack of clearing standards and resource protection measures would be likely.

Cumulative effects would include increased resource impacts from increased use being focused into nearby areas without blown down. Hazard trees would concentrate recreation users and degrade the recreation opportunities in those areas. The increased risk of wildfire and decreased ability to suppress a fire event would increase risk to recreation users in the event of a fire in these areas.

There would be no direct, indirect or cumulative effects to subdivisions adjacent to the Forest boundary. Needs for project-specific interpretive education would not be addressed by the no-action alternative. There would be no safety concerns or direct, indirect or cumulative effects from logging truck traffic. Since the Benbow and Main Fork roads would not be plowed under the no-action alternative, there would be no opportunities for winter wheeled vehicle use on plowed roads during weekends.

The Forest Plan goal of providing a spectrum of recreation opportunities and settings would not be met because of limited use and access to NFS lands created by the blown down and hazard trees. Standards for public safety and removal of hazard trees to protect improvements would not be met because the blown down trees and hazard trees would remain in place.

Effects of the Action Alternative

The majority of effects to recreation resources are short term in duration with long term benefits which would help maintain recreation opportunities. Short-term effects of storm damage clean-up and fuels reduction activities are the loss of use or access to recreation opportunities during some if not all of the time project implementation activities occur. The timing of project implementation for treatment of units in the Main Fork of Rock Creek and the Benbow area has a direct impact to recreation users. Project implementation during the summer use season would impact more recreation users than during the other three seasons of the year due to activity and noise caused by workers and equipment in proposed treatment units and on roads accessing these units. Short-term effects would be temporary displacement of recreational users while proposed activities are occurring. Beyond the short-term, the Action Alternative would result in removal of blown down and hazard trees that currently impact access and use of the treatment units for recreational users. Therefore the results of this alternative would restore and maintain recreational uses in the treatment areas because after project implementation the removal of the blown down trees would help disperse users and reduce impacts of concentrating use in areas unaffected by storm damage.

The proposed project has the potential to create new dispersed camping sites due to thinning, skid trails and pile burning activities. Routes or dispersed recreation sites opened by or used for fuels treatment and storm damage clean-up in the Main Fork and Benbow areas not designated for motorized recreation use in the Beartooth Travel Management Plan (USDA 2008b) would be rehabilitated and physically blocked off at the end of the project.

DRAFT

If the design features and mitigation measures are implemented, the Action Alternative would meet the goals, objectives and management standards outlined in the Custer National Forest Management Plan. No direct, indirect, or cumulative effects to recreation resources are expected in the long term from the storm damage clean-up and fuels reduction activities. There are no irreversible or irretrievable commitments related to recreation resources from the Action Alternative.

Comments for analysis related to recreation are addressed through project specific mitigations detailed in the Action Alternative Design and Mitigation Measures section of this EA. These comments are: 1) Effects of project activities to subdivisions adjacent to the Forest boundary; 2) Effects of logging truck traffic and associated safety concerns; 3) Identification of a need for interpretive education associated with project; 4) Suggestion to allow the public to use the plowed road on weekends to drive to a plowed parking area. With application of prescribed design and mitigation measures, these comments are addressed and there would be no significant direct, indirect, or cumulative effects to resources associated with these comments.

Wildlife

Effects to snag amount and distribution is a Key Issue. The measurement indicator is the average minimum number of snags retained per acre, with the threshold being determined by recommendations in the Northern Region Snag Management Protocol (USDA 2000).

Numerous Analysis Issues were identified relative to wildlife (Effects to: moose, snag habitat, snag associated species viability, wildlife habitat diversity, MIS & MIS viability, old growth habitat and species, Sensitive wildlife species, pine marten, and lynx). The affected environment and environmental effects to old growth and old growth habitat are disclosed in analysis for the goshawk, which is the Custer Forest Plan old growth habitat indicator species.

Project analysis and effects determinations for wildlife issues are disclosed in the Biological Evaluation and Assessment for Threatened, Endangered, Sensitive and Management Indicator Species/Key Species for Beartooth Front Storm Damage Clean-Up and Fuels Reduction Project 2008 (Appendix E). Following is a brief summary of that report:

Affected Environment

The Main Rock Creek and Little Rocky Creek drainages support land of varied topography with elevations ranging between 5500 to 8000 feet and a variety of forested and non-forested plant communities. The forest stands in Main Rock Creek are primarily mature to pole sized lodgepole pine stands. Spruce/lodgepole and spruce/sub-alpine fir stands are located along the riparian corridor with occasional aspen stands throughout the drainage. The Little Rocky Creek drainage area is dominated by dry site lodgepole pine and Douglas-fir stands with intermixed grassy meadows and aspen stands.

<u>Snag Amount and Distribution, snag habitat, snag associated species viability:</u> Snags are essential for both primary and secondary cavity users. Site specific snag densities and

DRAFT

sizes are not available for the project area, but snag densities based on 1997 Forest Inventory and Assessment (FIA) samples are available for the entire Beartooth Ranger District. Snag densities > 10.0 inches diameter at breast height (dbh) are 12.7 per acre for the Beartooth District. Data indicates large diameter snags > 20 inches dbh are relatively rare in watersheds where treatment are proposed (0.3 to 0.7 snags >20 inches dbh per acre). FIA samples were collected in 1997 and there have been several wildfires since 2000 that have killed trees and increased the number of snags on the District. Due to resource concerns and timber harvest economics, no salvage sales or large-scale snag removal efforts have occurred. Due to increases in the number of dead trees on the landscape, 1997 FIA snag estimates are likely low.

Wildlife habitat diversity: The diversity of forest stand structure in the project area is decreasing due to the current successional pathway and disturbance patterns. This has led to a gradual elimination of the more open, fire maintained stands of larger diameter coniferous trees and healthy aspen stands. Lack of low-intensity fire disturbance has resulted increased tree density in the overstory; abundant tree regeneration and shrub development in the understory on wet sites; little tree regeneration or shrub development in the understory on dry sites; and a buildup of ground fuels (both larger diameter and litter layers). This has resulted in pole to mid aged/sized contiguous tree stands that are more prone to stand replacing fire because of increased fuel loading.

MIS & MIS viability, old growth habitat and species, Threatened, Endangered, and Sensitive wildlife species, pine marten, and lynx: Suitable habitat for and documentation of occurrence of various wildlife species in the project area are summarized in Tables 7, 8, 9, and 10.

Table 7. Threatened, Endangered, or Proposed Wildlife Species Considered for Analysis

Species[1]	Suitable Habitat w/in Project Area	Species Documented w/in Cumulative Effects Area	Basic Habitat Description[3]	No-Action Determination of Effect[2]	Proposed Action Determination of Effect[2]	Rationale for Proposed Action Determination

Species[1]	Suitable Habitat w/in Project Area	Species Documented w/in Cumulative Effects Area	Basic Habitat Description[3]	No-Action Determination of Effect[2]	Proposed Action Determination of Effect[2]	Rationale for Proposed Action Determination
Canada Lynx (*Lynx Canadensis*)	Yes	No	Spruce/fir, high alpine, and habitats with high horizontal cover	No effect.	May effect - Not likely to adversely affect	1) impacts to lynx habitat would be low; 2) the project is in compliance with applicable lynx standards, guidelines, and conservation measures; 3) a positive change in prey habitat would likely occur; 4) lynx have not been reported in the area; 5) only 9% of the total blowdown is proposed for salvaging leaving over 14,000 acres of new denning and foraging habitat; and 6) the project is small in scale where less than 2% of the cumulative effects analysis area (LAUs) would receive vegetation treatments.
Gray Wolf (*Canis lupus*)	Yes	Yes	Remote, well connected forested generalist	No effect.	Not likely to jeopardize the continued existence of the species or result in destruction or adverse modification of proposed critical habitat.	1) wolves in the project area are designated as nonessential experimental population; 2) den and rendezvous sites are not known to occur in the area; 3) the project is temporary and small in scale(<2% of cumulative effects analysis area); and 4) impacts to wolf habitat and prey are low.

[1] Federally listed species based on USFWS website, May 10, 2008, Listed Species by National Forest.
[2] The determination is based on the presence of suitable habitat.
[3] Montana Natural Heritage Database. 2008. http://www.mtnhp.org/animalguide/

Table 8. Determination of effect for Region 1 Sensitive Species with Suitable Habitat w/in Project Area and/or documented within cumulative effects area.

Species[1]	No-action Determination of Effect[2]	Proposed Action Determination of Effect[2]	Basic Habitat Description[3]	Rationale for Proposed Action determination
Grizzly Bear (*Ursus horribilis*)	No Impact		Remote, well connected forested generalist.	1) The project area is located outside the Primary Conservation Area; 2) Den sites are not known to occur in the area; 3) impact to grizzly bear habitat is considered low; 4) the food storage orders are in place; 5) the

DRAFT

Species[1]	No-action Determination of Effect[2]	Proposed Action Determination of Effect[2]	Basic Habitat Description[3]	Rationale for Proposed Action determination
		May impact individuals or Habitat, but is not likely to cause a trend to Federal listing or loss of viability		project is in compliance with Forest Plan Standards and conservation plan standards, goals, and guidelines; 6) No road construction, reconstruction, or maintenance would occur; and 7) the project is small in scale where less than 2% of the cumulative effects analysis area would receive vegetation treatments.
Harlequin duck *(Histrionicus histrionicus)*	No Impact	No Impact	Inhabit fast moving, low gradient clear mountain streams	1) implementation of Best Management Practices; 2) implementation of Streamside Management Zone guidelines; 3) the project will not effect overhanging bank vegetation; and 4) the project is small in scale where less than 2% of the cumulative effects analysis area would receive vegetation treatments.
Wolverine *(Gulo gulo)*	No Impact	No Impact	Remote subalpine and spruce/fir forested areas	1) Den sites are not known to occur in the project area; 2) only 9% of the total blowdown is proposed for salvaging leaving over 14,000 acres of new denning and foraging habitat; 3) the project is temporary and small in scale (<2% of cumulative effects analysis area); and 4) impacts to wolverine habitat and prey are low.

[1] Species listed as sensitive on the 2004 Forest Service Northern Region Sensitive Species List (Threatened and Endangered Species and Species of Concern Resource Guidance website).
[2] The determination is based on the presence of suitable habitat.
[3] Montana Natural Heritage Database. 2008. http://www.mtnhp.org/animalguide/

Table 9. Custer National Forest terrestrial Habitat Indicator Species (MIS) and Key Wildlife Species with suitable habitat within project are or documented within cumulative effects area.

Species	Description of No-Action Effect[3]	Description of Proposed Action Effect[3]	Basic Habitat Description[4]	Rationale for Proposed Action Determination
MIS[1]				
Old Growth habitat indicator - Northern goshawk *(Accipiter gentilis)*	Neutral	Neutral	Mature forest generalist	1) impacts to potential goshawk habitat would be low; 2) no negative change in prey base would occur; 3) the proposed action would make the project area less vulnerable to stand replacement wildfire; 4) goshawk have not been reported in the area; and 5) the project is small in scale where less than 2% of the cumulative effects analysis area would receive vegetation treatments.
Dog hair ponderosa pine indicator - White-tailed deer (*Odocoileus virginianus)*	Neutral	Neutral	Grassland to montane conifer forest	1) the proposed action would temporarily increase the amount of human related activities and associated noise throughout the project area but over the long-term forage would be improved; 2) the proposed action would make the project area less vulnerable to stand replacement wildfire; 3) implementation of the project design features; and 4) the project is small in scale where less than 2% of the

Species	Description of No-Action Effect[3]	Description of Proposed Action Effect[3]	Basic Habitat Description[4]	Rationale for Proposed Action Determination
				cumulative effects analysis area would receive fuel treatments.
Aspen indicator - Ruffed grouse *(Bonasa umbellus)*	Neutral	Neutral	Primary habitat includes dense early seral staged forests dominated by aspen, secondary habitat includes other dense deciduous or conifer woodland areas	1) the proposed action would temporarily increase the amount of human related activities and associated noise throughout the project area but over the long-term, forage and nesting cover would be improved; 2) the proposed action would make the project area less vulnerable to stand replacement wildfire; 3) if all proposed project design measures are followed, there would be little risk to altering nesting behaviors or success within the project area; and 4) the project is small in scale where less than 2% of the cumulative effects analysis area would receive fuel treatments.
Riparian tree indicator - Bullock's (Northern) oriole *(Icterus bullockii)*	Neutral	Neutral	Open deciduous woodland and riparian areas	1) the proposed action would temporarily increase the amount of human related activities and associated noise throughout the project area but over the long-term forage and nesting cover would be improved; 2) the proposed action would make the project area less vulnerable to stand replacement wildfire; 3) this activity could have short-term adverse impacts on nesting activities, but is not believed to be substantial due to the small area affected and duration of expected impact. There would be little risk to altering nesting behaviors or success within the project area; 4) Opening the tree canopy would help to stimulate deciduous shrub growth and improve habitat for all three species; and 5) the project is small in scale where less than 2% of the cumulative effects analysis area would receive fuel treatments.
Riparian shrub indicator - Yellow warbler *(Dendroica petechia)*	Neutral	Neutral	Brushy riparian especially with willows	
Hardwood draw tree indicator - Ovenbird *(Seiurus aurocapillus)*	Neutral	Neutral	Mid-late successional, closed-canopied deciduous or deciduous/conifer forests with limited understory	
KEY SPECIES [2]				
Elk *(Cervus Canadensis)*	Neutral	Neutral	Grassland to forested alpine areas	1) the proposed action would temporarily increase the amount of human related activities and associated noise throughout the project area but over the long-term forage would be improved; 2) the proposed action would make the project area less vulnerable to stand replacement wildfire; 3) implementation of the project design features; and 4) the project is small in scale where less than 2% of the cumulative effects analysis area would receive fuel treatments.
Mule deer *(Odocoileus hemionus)*	Neutral	Neutral	Rugged grassland to forested alpine areas	
White-tailed deer (*Odocoileus virginianus*)	Neutral	Neutral	Grassland to montane conifer forest	

[1] Management Indicator Species include the categories of Habitat Indicator and Key (Major Interest) Species. Habitat Indicator species are based on the Custer Forest Plan (USDA 1986).
[2] The Key (Major Interest) Species are based on the Custer Forest Plan. Management Indicator Species include the categories of Habitat Indicator and Key (Major Interest) Species.
[3] The determination is based on the presence of suitable habitat.
[4] Montana Natural Heritage Database. 2008. http://www.mtnhp.org/animalguide/

Table 10. Wildlife Species of Local Public Concern Considered for Analysis.

Species[1]	Suitable	Species	Description	Description	

DRAFT

	Habitat w/in Project Area	Documented w/in Cumulative Effects Area	of No Action Effect[2]	of Proposed Action Effect[2]	Basic Habitat Description[3]
Moose (*Alces alces*)	Yes	Yes	Neutral	Neutral. See white-tailed deer, mule deer and elk section for effects	Variable: summer, mountain meadows, river bottoms, wet areas; winter, willow flats, mature coniferous forests. Willows are an important habitat component.
Pine martin (*Martes Americana*)	Yes	Yes	Neutral	Neutral. See goshawk section for effects	Boreal preferring mature conifer or mixed wood forests. Uses deadfall and snags as den sites.

[1] The Wildlife Species of Local Public Concern are based on public comments received during the public scoping period (January 2008).
[2] The determination is based on the presence of suitable habitat.
[3] Montana Natural Heritage Database. 2008. http://www.mtnhp.org/animalguide/

Effects of the No-Action Alternative

Snag Amount and Distribution, snag habitat, snag associated species viability: There would be no effects to Snag Amount and Distribution, snag habitat, or snag associated species viability. Recommendations in the Northern Region snag management protocol (USDA 2000) would be met.

Wildlife habitat diversity: The diversity of forest stand structure in the project area would continue to decrease due to the current successional pathway and disturbance patterns.

MIS & MIS viability, old growth habitat and species, Sensitive wildlife species, pine marten, and lynx: The determination of effects of the No-action for Federally threatened and endangered species are summarized in Table 7. The determination of effects of the No-action for USFS sensitive species with habitat or known occurrence in the project area are summarized in Table 8. The description of effects of the No-action for other Management Indicator Species and "Key species" with habitat or known occurrence in the project area are shown in Table 9. Table 10 displays the description of effects of the No-action for wildlife species of local public concern.

Effects of the Action Alternative

Direct, Indirect, and Cumulative Effects to Snag Amount and Distribution, snag habitat, snag associated species viability: The proposed action would likely remove some existing snags that were created (wind damaged trees) by the November 11, 2007 storm event. However many of the wind damaged trees do not have commercial value due to fracturing so they would remain on the landscape to provide snag habitat. Non-commercial treatments including mechanical and prescribed burning would tend to retain

large live trees during the mechanical phase and consume and create several snags during the prescribed burning phase. Considering the past, present and reasonably foreseeable future actions of cumulative effects the proposed action would remove some existing snags because of timber harvest activities and prescribed burning. These losses in snags are expected to be offset by the creation of snags from prescribed burning.

Implementation of the proposed action would have a neutral effect on snag habitat. This determination is based on the following rationale: 1) the proposed action would meet the regional snag management recommendations (USDA 2000); 2) the proposed action has a project design feature that would maintain existing snag habitat in the projects area; 3) some of the proposed treatments would create additional snag habitat and 4) the project is small in scale where less than 2% of the cumulative effects analysis area would received fuel treatments.Maintaining an average of at least 2 snags, where available, per acre that are greater than or equal to 12" diameter, which are greater than 75 feet from roads and/or private property, and are not a safety hazard during project implementation would maintain essential habitat for cavity users.

Species Viability: On the Custer National Forest, all of the species considered in Appendix E occur over a geographical area encompassing several states. Because their distribution is so large, the viability of the species is not tied to actions occurring only on a small portion of their natural range such as the Custer National Forest. Therefore, one could argue that viability at the Forest scale is not an issue. Even so, it is recognized that adverse actions occurring within a small portion of the range, if extended out to their entire range, could lead to problems in species viability over time. Therefore, it is important to assess how the actions within a portion of a species range contribute to the viability across the range. To address this, activities are evaluated in terms of their effect on habitat, at the project level, landscape level, and planning unit, if needed. At the project and forest level, the analysis focuses upon the likelihood of the species or its habitat "persisting" within the analysis area over time. No significant adverse effects to persistence or species viability would occur (see Appendix E).

MIS & MIS viability, old growth habitat and species, Sensitive wildlife species, pine marten, and lynx: The habitat, presence and determination of effects of the Proposed Action for Federally threatened and endangered species are summarized in Table 7. The habitat, presence, and determination of effects for USFS sensitive species with habitat or known occurrence in the project area are summarized in Table 8. The habitat, presence, and description of effects for other Management Indicator Species and "Key species" with habitat or known occurrence in the project area are shown in Table 9. Table 10 displays the habitat, presence, and description of effects for wildlife species of local public concern.

Additional background information and rationale for the determination of effects for these species is in the Biological Evaluation and Assessment for Threatened, Endangered, Sensitive and Management Indicator Species/Key Species for Beartooth Front Storm Damage Clean-Up and Fuels Reduction Project 2008 (Appendix E). Effects to old growth habitat and species are disclosed in the analysis for the goshawk, which is the Forest Plan old growth indicator species (USDA 1986).

DRAFT

Conclusions:

With application of prescribed design features and mitigations detailed in the Action Alternative Design and Mitigation Measures section of this document, the Action Alternative would not result in significant direct, indirect, or cumulative effects to wildlife resources.

Fisheries

Effects to fisheries is a key issue. The issue indicator is equivalent clearcut area acres (ECA) and a qualitative determination of the potential for riparian, streambank stability and LWD related effects to aquatic species and habitat, accounting for aquatic mitigation measures. Effects to Sensitive wildlife species and MIS were identified as comments for analysis. The Fisheries Report and Biological Evaluation (Appendix F) analysis describes the existing condition of fisheries and amphibian resources within the project area and evaluates the potential effects of the alternatives on these resources. Following is a brief summary of that report:

Affected Environment

Stream channels throughout the project area generally have stable stream banks with a very low to moderate sensitivity to disturbance. As a result of the November 2007 wind storm, ECA condition is at or slightly above levels that could produce measurable changes in annual water yields and possibly streamflows in West Fork Fishtail and Upper Little Rocky.

Fish bearing streams and lakes occurring within the project area include: 1) East Fork Fishtail, West Fork Fishtail and Little Rocky creeks in the Benbow area, and 2) Hellroaring, Wyoming, and Rock creeks, and Greenough Lake in the Main Fork Rock Creek area. The remaining, much smaller perennial systems in the project area, including Dale Creek in the Benbow area, and 7 unnamed headwater tributaries, are not known to support fish. No Federally listed threatened or endangered fish or amphibian species, designated critical habitat, fish or amphibian species proposed for Federal listing, or proposed critical habitat occur in the project area. Yellowstone cutthroat trout, a Forest Service sensitive fish species, are present within the Little Rocky Creek and Wyoming Creek drainages in the project area. The project area is within the historic distribution of the Western (Boreal) toad and Northern Leopard frog. Yellowstone cutthroat trout are the only sensitive fish species present in the project area. Nonnative wild trout occurring in the project area include brook, brown, and rainbow trout.

Amphibian habitats present within the treatment area include isolated wetlands in portions of Unit 58 (Little Rocky Creek drainage) and Unit 60 (West Fishtail Creek drainage), and Greenough Lake (Unit 45) in the Main Fork Rock Creek drainage.

Potential sensitive amphibian species include the Northern leopard frog (*Rana pipiens*) and Western toad (Boreal toad) (*Bufo boreas*). Non-sensitive native amphibians present in the project area include the Columbia Spotted frog (*Rana luteiventris*), Boreal Chorus frog (*Pseudacris maculate*), and Tiger salamander (*Ambystoma tigrinum*).

Table 11 summarizes the potential effects to aquatic sensitive species and Management Indicator Species in the project area. Additional discussion of effects is provided in the subsections below and in Appendix F.

Table 11. Potential effects of the alternatives on sensitive and management indicator (MIS) aquatic species and wild trout in the project area.

SENSITIVE AND MIS SPECIES	*NO ACTION ALTERNATIVE*	ACTION ALTERNATIVE
Yellowstone cutthroat trout	May impact Individuals or habitat but will not likely contribute to a trend towards federal listing or loss of viability to the population or species.	May impact Individuals or habitat but will not likely contribute to a trend towards federal listing or loss of viability to the population or species.
Northern leopard frog	No impact	No impact
Western (Boreal) toad	No impact	No impact
Wild Trout	May impact Individuals or habitat but will not likely contribute to a trend towards federal listing or loss of viability to the population or species.	May impact Individuals or habitat but will not likely contribute to a trend towards federal listing or loss of viability to the population or species.

Effects of the No-Action Alternative

There are no directs effects to fish and amphibian species and their habitats associated with the No-Action alternative. Indirect effects to aquatic habitat and species under the No Action Alternative would result from retention of excessive amounts of large woody debris from the November 2007 storm remaining in stream channels. Densities of LWD in storm-impacted areas would continue to likely exceed the range of variability that these stream systems developed under and would remain subject to high intensity riparian burns and be prone to excessive scour of streambed and banks at higher flows when LWD is mobilized. This would have localized adverse impacts to fish and amphibian populations in stream systems, but would not impact the entire population.

Cumulative effects include potential for wildfire throughout the project area and in some cases excessive fuel loads in riparian areas could produce high intensity burns, and if followed by a high precipitation or flashing runoff event, could be detrimental to local fish and amphibians and their habitats, including Yellowstone cutthroat trout in the Little Rocky Creek drainage. In this event, streams would eventually stabilize as vegetative recovers. However in some areas, already isolated and fragmented populations of trout may be lost before recovery is achieved and the aquatic environment stabilizes (Little

DRAFT

Rocky Creek). Native, common amphibian populations may be displaced until wetland areas and lake environments recover, but populations are not expected to be impacted under this scenario.

Effects of the Action Alternative

Under the Action Alternative, construction of stream crossings (log bridges, armored fords, or culverts) for equipment access to windfall areas and equipment use along riparian areas and wetlands, are the only actions that could impose direct effects on aquatic species. Protection measures included in the proposed action would ensure the physical integrity of riparian areas, wetlands, and stream courses and direct mortality of individual aquatic species as a result of this action is expected to be negligible to nonexistent. Additionally, temporary crossing would be fully rehabilitated once the project was completed. Sediment generation should be minimal, short in duration, and localized.

Adverse indirect effects would not be expected from the proposed treatments, but long-term beneficial effects would be. A reduction in timber canopy has already occurred as a result of the windfall events and thinning and some prescribed burning activities in these areas are expected to reduce the potential for high intensity wildfire, decrease the risk of streambed and bank scour, and allow for faster regeneration on stream banks and riparian buffer areas.

The cumulative effects of the Action Alternative on aquatic resources, when combined with past activities and natural processes, should be beneficial to aquatic resources, including wild trout populations, sensitive and MIS aquatic species, non-sensitive native amphibian species, and their habitats. Risk to riparian and aquatic environments is expected to decrease and these areas should stabilize more rapidly under the Action Alternative.

Forest Vegetation

Several comments for analysis were identified relative to forest vegetation: 1) Wind damage potential from effects of tree thinning; the issue indicator is the level of risk of wind damage; 2) Bark beetle potential in areas of wind damaged trees; the issue indicator is increased wind damage levels over the next 2 years; 3) Effects of post treatment regeneration on fire potential; the issue indicator is potential future fire type (surface, passive crown, active crown or running crown);

Following is a summary of Forest Vegetation analysis presented in Appendix G:

Affected Environment

The predominant forest cover in the Main Fork treatment area is lodgepole pine (spruce, sub alpine fir and Douglas fir occur as smaller components) and in Benbow the major components are ponderosa pine, Douglas fir and lodgepole pine. Much of the lodgepole forest types on the Beartooth Face of the Beartooth district experienced a large stand

replacing fire in the early 1900's and most lodgepole pine stand ages are about 100 years old.

Physical damage is common from both snow and wind. The November 2007 wind event in 2007 damaged thousands of acres of trees across the Beartooth District. This damage is seen as individual trees to small groups or swaths of trees several acres in size of uprooted, snapped off and leaning trees. In some areas the resulting fuel loads are in excess of 100 tons to the acre. This event has created a complex fuel depth from the ground level up to the canopy base and into the canopy.

Wind Damage Potential: Intermediate cutting (thinning) and creating openings (clearcutting) increases the potential for wind damage in many timber types. As the intensity of tree removal increases stands becomes more susceptible to wind damage. Lodgepole pine, spruce, and sub alpine fir is prone to wind damage due to its typical shallow root system. Ponderosa pine and Douglas fir develop a much deeper tap root which tends to better anchor them from wind damage effects.

Bark beetle potential in areas of wind damaged trees: These forested areas have endemic levels of insects and minor infections of diseases. Beetles are a component and function of the forested ecosystem and are one of the primary recycling agents in forested stands. Prominent bark beetle species found in treatment areas include: pine engraver beetle (*Ipps. pini*.), Douglas fir beetle (*Dendroctonus pseudotsugae*), mountain pine beetle (*Dendroctonus ponderosae*), western balsam beetle (*Dryocoetes confuses*), and spruce beetle (*Dendroctonus rufipennis*). Mortality from these insects have been minor in the proposed treatment areas as noted in the 2001, 2002, 2003, 2005, and 2007 aerial insect detection flights. These species are currently at endemic levels killing incidental individuals or groups of 5 to 10 trees within the project area. Beetle mortality is closely associated with overstocked, continuous stands, drought periods and secondary damaging agents such as snow or wind damage. Recent storm damage mortality is likely to be infested with beetles. Dependent on weather, vigor of trees and population levels beetles could infest live trees. The amount and expanse of this wind damage has caused concern of what it may do to elevate beetle infestations and potentially increasing mortality which further ads to the hazardous fuel loads. Gibson (2008) indicated that there is a high potential for pine engraver beetle (*Ipps pini*) to infest the lodgepole pine and spruce beetle (*Dendroctonus rufipennis*) to infest downed spruce. It is reasonable to assume there will be insipient populations concentrating in some of the numerous windthrown spruce trees. The potential for the downed Douglas-fir being infested is high. On the adjacent National Forest System lands near 4K ranch a few new attacks by the engraver beetle in downed ponderosa pine and Douglas-fir beetle in the downed Douglas-fir were observed in May 2008. Attacks are just starting and anticipated to increase. Mountain pine beetle was also found in the lodgepole and ponderosa pine. These attacks represent endemic populations; however with the extensive lodgepole pine stands on the District and the documented high mountain pine beetle populations across the region (more than 891,000 acres in 2007) the potential must be recognized. The potential for mountain pine beetle populations to increase due to the wind damaged trees is low because mountain pine beetles rarely attack downed trees.

Effects of post treatment regeneration on fire potential: The majority of the proposed silviculture systems would be intermediate and not regeneration treatments. The

DRAFT

intermediate treatments are not designed for regeneration establishment; to meet the fuel objectives single story structures are desired. However, it is realized that the shade-tolerant species (Douglas-fir, Engelmann Spruce and sup alpine fir) would continue to establish under these canopies (creating ladder fuels). Understory establishment would depend on factors such as weather, species, seed availability, adequate seed bed, moisture, etc.. It is also realized that future treatment of new understory is likely. Timing of treatment would depend on when this undersory becomes a risk for fire moving into the crowns. These units would expected to be managed as single story conditions into the future until another decision is made.

Effects of the No-Action Alternative

Wind Damage: Small scale wind damage would continue with areas having concentrated damage due to strong frontal passages and high impact storm events (i.e. thunderstorms). Wind events like that of 2007 on the Beartooth District are not common, but can happen in the future. Occurrence of that type of event would likely see similar wind damage. The overall effects of the no action alternative (not including 2007 type events) are that the treatment areas landscapes would likely remain in a lowlow to a highlow risk for additional wind damage.

Bark beetle potential in areas of wind damaged trees: Weather conditions into 2010 are likely the main factor that will determine which direction beetle populations will go. If weather conditions are cool and wetter, under both the no action and the proposed action it can be expected that endemic populations will persist in the wind damaged trees over the next few years with continued activity across the treatment area in live trees as seen over the past years. If weather conditions are warmer and dryer, under the no action alternative, populations of the Douglas-fir beetle and the spruce beetle would have the highest potential to move into live trees and potentially create high mortality.

Effects of post treatment regeneration on fire potential: Modeled simulations (see Appendix G) show that the no action alternative exceeded the threshold of active crown fire in all but the first five years under severe fire conditions. For moderate conditions the no action stayed below the threshold of active crown fires. A simulated 2026 fire in modeled areas would kill the entire stands of trees.

Effects of the Action Alternative

Wind Damage: When considering species susceptibility, treatment intensity, creation of openings, topographic position and the prevailing winds the direct effects of the proposed treatments would increase the risk for wind damage. Post treatment, the Benbow treatment area would be in a low risk for wind damage largely due to the dominance of windfirm species, the topographic position and the treatment units not being in the drainage bottoms that parallel the prevailing winds. The overall wind damage risk for Main Fork after treatment would be lowmoderate mainly due to the major species susceptibility to wind damage and the fact that the treatment units lie in or slightly above the drainage that parallels the prevailing winds.

Bark beetle potential in areas of wind damaged trees: If weather conditions are cool and wetter, under both the no action and the proposed action it can be expected that endemic populations will persist in the wind damaged trees over the next few years with continued activity across the treatment area in live trees as seen over the past years. The proposed action if implemented would reduce that potential in the treatment units for two reasons. First, removal of infested downed trees (large slash and cull material) removes the potential brood sites for the beetle. Second, the proposed thinning and regeneration harvests will change stand conditions (stocking density) not conducive to beetle infestations. Stand alterations to reduce susceptibility are well documented for each beetle species (Appendix G).

Effects of post treatment regeneration on fire potential: Modeled simulations (see Appendix G) show that implementing the proposed action (promoting regeneration) would lower fire severity and the predicted potential of mortality under severe fire conditions. The proposed action promoting regeneration stayed below the threshold in both modeled stands for both severe and moderate fire conditions. Passive fires are predicted under severe fire conditions in year 2019 to 2026. A simulated 2026 fire in modeled areas would kill the entire stands of trees.

Heritage Resources

While effects to cultural resources were not identified as either a key issue or comment for analysis, ensuring compliance with applicable law and policy is necessary. A Cultural Resource Specialist Report was prepared but it is not included as part of this Environmental Assessment. Pursuant to the Freedom of Information Act and various cultural resource protection laws and regulations, information contained in this report is considered confidential and cannot be released to the general public. The following is a summary of this report that does not include confidential information:

The proposed project falls under the CNF Site Inventory Strategy (SIS) known as the *Wildland Urban Interface and Large Scale Hazardous Fuels Reduction SIS* implemented in 2005 to address landscape scale (500 acres or greater) hazardous fuel reduction projects proposed under the Healthy Forest Restoration Act of 2003 and the "Healthy Forest Initiative". This strategy allows for proactive site treatment to reduce hazard fuels, making cultural resources more fire resistant, rather than leaving untreated islands within project areas.

In 1999, the CNF identified sites that met the national criteria for "priority heritage assets. Priority asset sites are those sites that have had a significant value investment; and/or are eligible for nomination to the National Register of Historic Places (NRHP); and/or are considered "at risk" due to substantial effects to site integrity. Culturally sensitive sites are defined as "Cultural resources associated with traditional Indian ceremonies, cultural practices and important events in tribal history…" and include "…burials, rock art, stone circles of greater than 7m in diameter, monumental rock features, fasting structures, eagle catching pits, sweat lodges, wooden structures, Sun Dance lodges and grounds, offering and prayer locales and historic battle sites."

DRAFT

Affected Environment

At least half of the project area has been previously inventoried for the presence of cultural resources. The un-inventoried acres consist primarily of hazardous areas that are currently unsafe to enter due to high amounts of congested windfall debris that resulted from the recent high-wind storm event. The probability of cultural resources being present in these un-inventoried areas is almost equally divided across high, medium and low areas. Twenty-five known sites were reviewed and only one has been formally recommended Not Eligible for nomination to the National Register of Historic Places (NRHP).

Effects of the No-Action Alternative

Under the No Action Alternative no direct effects would occur to sites in open settings, on private property or sites treated previously. Direct effects consisting of tree fall debris/fuel loading and tree uproot could occur on several sites located in timbered areas. While there would be no ground disturbing activities associated with the No Action Alternative, the probability of future catastrophic wildfires in the project area would be likely. Hazardous fuels would continue to accumulate across the project area.

In terms of indirect effects, all known cultural resources sites could be damaged or consumed by wildfire or by fire suppression activities. Following a wildfire event improved ground surface visibility could lead to the discovery of known or new cultural resources and subsequent illegal artifact collecting, damage or vandalism could occur. Erosion, due to loss of vegetation cover from fire, may also result in damage to cultural resources.

The cumulative effect of the No Action Alternative would be the continued buildup of hazardous fuels with an increased potential for multiple damaging effects to cultural resources. The opportunity to treat cultural resources, with the goal to make them more "fire resistant" or to insure their continued historic use would not be realized.

Effects of the Action Alternative

Under the Action Alternative, direct effects would occur on, or adjacent to, 11 cultural resource sites. Two of these sites are priority assets and one is culturally sensitive. The proposed treatment plans for these 11 sites will be reviewed by the MT SHPO. An archaeologist would identify all site locations and/or structures to be treated and would monitor all treatment activities. The culturally sensitive site may require consultation with the Crow Tribe in order to verify its significance and to insure its respectful consideration and treatment.

Three historic roads would be routinely maintained and used during the proposed project. Routine maintenance would serve as a beneficial activity by providing for the continued use of these cultural resources. One of these roads accesses the NRHP listed 4K Ranch but none of the structures associated with this former dude ranch would be disturbed.

Over one-half mile of historic road, located on Forest Service administered land and private property, dates to 1899-1901 and retains nearly all of its original alignment and some original character. This road becomes a historic trail shortly after entering the Forest Service boundary. Proposed use (including maintenance and/or realignment) of this road by log trucks and heavy equipment may require MT SHPO consultation prior to any disturbance.

Complete avoidance would occur at nine sites. These sites may be monitored during and after unit treatment activities to insure that they are not disturbed.

Seven unrecorded sites would be formally recorded during project implementation.

The cumulative effect of the Action Alternative would be the restoration of the project area to a more desired condition and the protection and preservation of cultural resources, through fuel load reduction, making them more fire resistant.

Soils

While effects to soils were not identified as either a key issue or comment for analysis, ensuring compliance with Region 1 Soil Quality Standards (USDA 1999) is necessary. The Beartooth Front Storm Damage Cleanup and Fuels Reduction project area was surveyed to detail existing condition and determine potential effects to the soil resource and a Soils Specialist Report (Appendix H) was prepared. Following is a brief summary of this report:

Affected Environment

The project area was visited and surveyed on May 1, 2008 (Benbow Area) and June 13, 2008 (Main Fork). Field review consisted of traversing representative units and assessing soil parameters as well as visually estimating existing disturbance. Little of the area was impaired from current cattle use and recreational activities. There is some evidence of stumps and some old trails. Stumps appear to be from firewood cutting or post and pole harvest. Trails appear to be from ATV's or are associated with dispersed recreation sites. Most of the proposed treatment units in the Main Fork and West Fork of Rock Creek are along the road and get a lot of recreation use, both at dispersed and developed sites. No proposed units were identified as having previous commercial timber sale activities. It is estimated that less than 3% of the area was detrimentally disturbed.

The majority of the soils on sampled sites are coarse textured, having a high cobble and gravel content. This is a sign that they will resist erosion. A majority of these sites also have subangular blocky or granular structures. This is an indicator that these sites do not have residual compaction or detrimental effects from historic management. There is very little bare ground, a sign of resistance to erosion and most sites have high coarse woody debris content, reflecting a historic buildup of woody material from fire exclusion.

DRAFT

Effects of the No-Action Alternative

There would be no short-term effects on the soil resource over and above the existing condition. No additional thinning, fuels reduction, prescribed burning, or road management activities would disrupt the natural soil processes. No soil compaction, rutting, puddling, or soil displacement would occur with no action. Soils that are undisturbed would remain so. Standing dead and damaged trees, downed trees, needles and branches would remain on the site and fall to the ground. Soil organisms would decompose the organic materials thus adding humus and nutrients to the soil. Natural processes would continue until another major disturbance such as fire or a windstorm opens the tree canopy and speeds up the recycling process again.

An intense wildfire is a possibility at some time in the future. An extreme wildfire followed by a severe rain event could lead to accelerated erosion and sedimentation, and possible mass wasting. Soil erosion rates would fluctuate with natural changes in vegetation. Historically, in the Beartooth Ranger District forests generally recover over time following wildfires. Depending on the severity of the fire the time frame could be as long as decades.

Effects of the Action Alternative

Based on field reconnaissance, review of literature, and GIS analysis, impacts to long term soil productivity are not anticipated from any of the proposed activities. Mechanical treatments would meet Region 1 soil quality thresholds (USDA 1999) assuming use of existing travel routes is maximized and dry conditions exist. No adverse impacts from hand piling/burning would occur. Long term cumulative effects are not anticipated since regrowth potential of the grassland/shrubland understory is high and that mechanical fuels treatments would maximize use of existing travel routes to limit disturbance.

Long term impacts to soils would not be anticipated from the proposed treatments. The soil analysis indicates that all alternatives and all activities proposed would meet the Region 1 Soil Quality Standards through the implementation of management practices outlined in the previously described Design Features and Mitigations measures, including restoration of landings and heavily used skid trails, if needed, to reduce the total amount of detrimental soil impacts. The existing condition indicates there is little detrimental soil disturbance throughout the project area. All Forest Plan management direction would be met by the proposed action.

Noxious Weeds

Effects of project implementation to noxious weed proliferation and post-project weed monitoring needs is a Key Issue. The Forest Service Northern Region Risk Assessment Rating Procedure for Undesirable Plants (USDA 2001) was used to determine the risk of noxious weeds and other undesirable plants spreading in the analysis area due proposed activities. The indicator for this Key Issue is the noxious weed risk rating. Following is

a brief summary of the Range/Noxious Weeds Report (Appendix I):

Affected Environment

There are noxious weed infestations in small portions of storm damaged areas that are proposed for clean-up and fuel reduction. These infestations have very low canopy cover of each noxious weed species and are less than 1% cover in each mapped vegetation polygon. In the Benbow area, noxious weeds include Canada thistle, spotted knapweed, sulfur cinquefoil, and houndstongue. In the Main Fork of Rock Creek in the vicinity of the project area, spotted knapweed and Canada thistle are the two noxious weeds of concern. They are found in small scattered stands, or as individual plants along all the roads in the area.

Noxious weeds (seeds and reproductive plant parts) are easily spread by vehicles and heavy equipment. These vehicles can spread existing plants and seed as well as bring noxious weed seed into an area where ground disturbance assists in providing a good seed bed.

The Beartooth District Weed Control Program is actively monitoring and treating noxious weeds annually on all of the known weed infestation within the project area. This activity, as authorized by the Custer National Forest Final EIS for Weed Management (USDA 2006) will continue regardless of whether a decision is made to conduct all, or part, of the storm clean-up and fuel treatment. The goal for noxious weed management in the project area is to prevent noxious weeds from going to seed, reducing the number of acres infested with noxious weeds, and to eradicate, and reduce, all new starts as soon as they are found.

Effects of the No-Action Alternative

Direct and indirect effects if no action is taken are that the consequence of noxious weed establishment is low to moderate. Cumulative effects on the native plant community are likely, but are limited with continued monitoring and treatment. Current activities in the areas would continue to spread spotted knapweed, Canada thistle, and sulfur cinquefoil and the potential new noxious weed species within the project area either through moving noxious weed seeds from on site plants, or from bringing seed and reproductive plant parts of the same or new species into the project area. Noxious weed treatment as authorized by the Custer National Forest Final EIS for Weed Management (USDA 2006) would continue.

Effects of the Action Alternative

Direct and indirect effects of this project are that the consequence of noxious weed establishment is moderate. Project activities, especially in treatment units where logging equipment and vehicles would be used off main roads, would likely to result in some areas becoming infested with undesirable plant species even when preventative management actions are followed. Logging equipment and vehicles can spread spotted knapweed, Canada thistle, and sulfur cinquefoil and potential new noxious weed species

DRAFT

within the project area either through moving noxious weed seeds from on site plants, or from bringing seed and reproductive plant parts of the same or new species into the project area.

Cumulative effects on the native plant community are likely, but are limited with continued monitoring and treatment. Specific activities, including recreational use, potential mining, mineral exploration, grazing and natural forces, would combine with fuel reduction and clean-up activities to cumulatively introduce and spread noxious weeds in the project area. Noxious weed treatment, as authorized by the Custer National Forest Final EIS for Weed Management (USDA 2006) would continue regardless of whether a decision is made to conduct storm clean-up and fuel treatment.

Sensitive Plants

Effects to sensitive plants were analyzed to meet legal and policy requirements for protecting plants listed by the Forest Service as sensitive. Following is a brief summary of the Sensitive Plants Report (Appendix J):

Affected Environment

Based on review of potential habitat, there is low to moderate potential for occurrence of the following Forest Service Region 1 sensitive plants in the project areas: Musk-root, Small yellow lady's slipper, Giant helliborine, Hiker's gentian, Beartooth goldenweed, Hall's rush, Mealy Primrose, Threeranked humpmoss, Jove's Buttercup, and Shoshonea.

Effects of the No-Action Alternative

There are no known sensitive plants or sensitive plant populations that would be affected by the No-Action Alternative.

Effects of the Action Alternative

There are no known sensitive plants or sensitive plant populations in any areas that would be affected by the Action Alternative. Based on closest known populations, potential of occurrence, vulnerability to project effects, An effects determination of "No Impact" for all sensitive plants with potential for occurrence in project activity areas.

DRAFT

CONSULTATION AND COORDINATION

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

ID TEAM MEMBERS:

Forest Service ID Team Members are listed in Table 12.

Table 12. ID Team Members**.**

Position Title	Person	Project Responsibilities
District Ranger / Responsible Official	Traute Parrie	Responsible Official, Public collaboration, Project record review.
ID Team Leader	Dan Seifert	IDT Leader, Public collaboration, Writer-editor, GIS support, Project record documentation.
Engineering	Arlin Krogstad	Engineering / transportation input. Property boundary surveys.
Fisheries	Darin Watschke	Fisheries input.
Fuels	Mark Hale	Fuels and fire suppression input.
Fuels	Jeff Stockwell	Fuels oversite. Fire suppression input.
GIS Support	Mary Gonzales	GIS Map production and analysis.
Heritage	Mike Bergstrom	Heritage input.
Heritage consultation	Halcyon LaPoint	Heritage input review and approval. Coordination with tribes and Montana SHPO.
Hydrologist	Mark Nienow	Hydrology input.
Lands	Lisa Subcasky	Land access agreements.
Landscape architect	Nicole Hill	Visuals/landscape architecture input.

DRAFT

Noxious weeds and Range	Terry Jones	Noxious weeds and range input.
Planner	Mark Slacks	Biological Evaluation review and approval.
Recreation	Jeff Gildehaus	Recreation input. Unit design at/near developed recreation sites, trails.
Sensitive Plants	Kim Reid	Sensitive plants input
Silviculture	Dennis Sandbak	Forest Vegetation and silviculture input.
Soils	John Lane	Soils input.
Timber	Eric Stiefvater	Timber input, GIS support, Logging systems & timber unit layout.
Timber	John Clark	Timber review & oversight.
Wildlife biologist	Barb Pitman	Biologist input.
Wildlife biologist	Tom Whitford	Wildlife Biological Evaluation. USFWS informal consultation.

FEDERAL, STATE, AND LOCAL AGENCIES:

Federal:

Lou Hanebury and Mark Wilson, U.S. Fish and Wildlife Service.

State:

Dick Moore, Fred Bicha, and Bob Moorehead, State of Montana Department of Natural Resources and Conservation.

Jim Olsen and Shawn Stewart, State of Montana Fish Wildlife and Parks.

Mark Baumler, Montana State Historic Preservation Officer.

Local:

Carbon County Commissioners.

DRAFT

Stillwater County Commissioners.

Stillwater County Sheriff and Coroner.

Mayor Betsy Scanlin, City of Red Lodge.

City Council, City of Red Lodge.

Tom Kuntz, Red Lodge City/Rural Fire Department

Nye Volunteer Fire Department.

TRIBES:

Crow Tribe.

Eastern Shoshone Tribe.

REFERENCES CITED

42 USC 300. 2006. United States Code, Title 42--The Public Health And Welfare, Chapter 6a--Public Health Service, Subchapter Xii--Safety Of Public Water Systems. Available online at: http://www4.law.cornell.edu/uscode/42/ch6AschXII.html

Anderson, Michelle D. 2003. Pinus contorta var. latifolia. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available online at: http://www.fs.fed.us/database/feis/

ARM 2007a. Administratve Rules of Montana, Chapter 30 Water Quality. Available online at: http://www.mtrules.org/gateway/chapterhome.asp?chapter=17.30

ARM 2007b. Administrative Rules of Montana, Title 36 – Natural Resources and Conservation, Chapter 9 – Forestry, Subchapter 3 - Streamside Management Zone Rules. Helena, MT. Available online at: http://www.mt.nrcs.usda.gov/technical/ecs/forestry/technotes/forestryMT18/

Carbon County 2005. Carbon County Pre-Disaster Mitigation/Community Wildlife Protection Plan. Available online at: http://dma.mt.gov/DES/Counties/carbon/index.asp

City of Red Lodge 2008. 2008 Red Lodge Growth Policy. Available online at: http://www.cityofredlodge.com/downloads/DevCode/2008%20Red%20Lodge%20Growth%20Policy%20071208%20no%20maps.pdf

Connaughton 2002. Council on Environmental Quality December 9, 2002 memoradum. Subject: Guidance for environmental assessments of forest health projects. Available online at: http://ceq.hss.doe.gov/nepa/regs/guidance_for_environmental_assessments.pdf

DNRC 2002. Montana Department of Natural Resources and Conservation. Best management practices for forestry in Montana. MTDNRC, Forestry Division, Missoula,

DRAFT

MT. Available online at: http://dnrc.mt.gov/forestry/serviceforestry/ForestryBestManagementPractices/BMPs.pdf

Hagle, S.T., K.E. Gibson, and S. Tunnock. 2003. A Field Guide to Diseases & Insect Pests Of Northern & Central Rocky Mountain Conifers. Report number R1-03-08. USDA Forest Service State and Private Forestry, Northern and Intermountain Regions. Available online at: http://www.fs.fed.us/r1-r4/spf/fhp/field_guide/index.htm

Gibson, Ken. 2008. Trip Report MFO-TR-08-03, Blowdown on Beartooth Ranger District, Custer National Forest, May 20-21, 2008. USDA Forest Service, Intermountain and Northern Regions Forest Health Protection. Unpublished report. 13 p.

Graham R. T. Jain T. B. and McCaffrey S. January 2004. Science basis for changing forest structure to modify wildfire behavior and severity. General Technical Report RMRS-GTR-120. Fort Collins CO: USDA Forest Service Rocky Mountain Research Station. 49 pp. Available online at: http://www.fs.fed.us/rm/pubs/rmrs_gtr120.pdf

Hann et. al. 2008. Interagency and The Natural Conservancy fire regime condition class website. USDA Forest Service, US Department of the Interior, The nature Conservancy and Systems for Environmental Management. Available online at http://www.frcc.gov. Accessed July, 2008.

Healthy Forest Restoration Act of 2003. Available online at: http://www.fs.fed.us/biology/wildecology/HFRA.pdf

Miller WW, DW Johnson, TM. Loupe, JS. Sedinger, EM Carroll, JD Murphy, RF Walker and D Glass. 2006. Nutrients flow from runoff at burned forest site in Lake Tahoe Basin. California Agriculture, Volume 60, Number 2. Available online at: http://calag.ucop.edu/0602AMJ/pdfs/3_BurnRunoff.pdf

Montana DNRC. July 1993. Fire Protection Guidelines for Wildland Residential Interface Development. Available online at: http://dnrc.mt.gov/forestry/Fire/Prevention/documents/WUIrewrite/protguwp.pdf

Rosgen, D. 1996. Applied River Morphology. Wildland Hydrology, Pagosa Springs, CO. Chpt 5, page 6.

Ruediger 2000. Canada Lynx Conservation Strategy. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Forest Service Publication #R1-00-53, Missoula, MT. 142 pp.

Ryan, Robert L. 2005. Social Science to improve fuels management: a synthesis of research on aesthetics and fuels management. Gen. Tech. Rep. NC-261. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 58 p.

Samman, Safiya; Logan, Jesse, tech. eds. 2000. Assessment and response to bark beetle outbreaks in the Rocky Mountain area. Report to Congress from Forest Health Protection, Washington Office, Forest Service, U.S.Department of Agriculture. Gen. Tech. Rep RMRS-GTR-62. Ogden, UT: U.S. Department of Agriculture, ForestService, Rocky Mountain Research Station. 46 p. Available online at: http://www.fs.fed.us/rm/pubs/rmrs_gtr62.pdf

DRAFT

Stednick, John D. 1996. Monitoring the effects of timber harvest on annual water yield. Journal of Hydrology. 176:79-95.

Stillwater County Community Wildfire Protection Plan (CWPP) available online at: http://www.stillwater.mt.gov/DES/Wildfire_Plan.asp

Troendle, Charles A. 1983. The Deadhorse Experiment: A Field Verification of the Subalpine Water Balance Model. U.S. Dept. of Agriculture - Forest Service, Research Paper RM425. Rocky Mountain Forest and Range Experiment Station. Fort Collins, CO. 7 p.

USDA 2008a. Custer National Forest Fire Management Plan. US Forest Service, Northern Region, Custer National Forest. Unpublished report on file at Custer National Forest offices.

USDA 2008b. Beartooth Travel Management Plan. US Forest Service, Northern Region, Custer National Forest. Available online at: http://www.fs.fed.us/r1/custer/projects/planning/nepa/d2_travel_mgmt/index.shtml

USDA 2007. Northern Rockies Lynx Management Direction Record of Decision. March 2007. National Forests of Montana, and parts of Idaho, Wyoming, and Utah. 67 pages.

USDA 2006. Custer National Forest Weed Management Final Environmental Impact Statement. US Forest Service, Northern Region, Custer National Forest. Available online at: http://www.fs.fed.us/r1/custer/projects/planning/weedwebdocs/index.shtml

USDA 2001. Forest Service Manual 2080, Region 1 Supplement Number R1 2000-2001-1. Noxious Weed Management Northern Region (Region 1) Missoula, MT. Available online at: http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsm?2000

USDA 2000. Northern Region Snag Management Protocol. USDA Forest Service, Northern Region. Missoula, MT. Available online at: http://www.landsinfo.org/ecosystem_defense/science_documents/USDA_Forest_Service_2000d.pdf

USDA 1999. Forest Service Manual, 2550 - Soil Management. Region 1 Supplement 2500-99-1. Missoula, MT. Available online at: http://www.fs.fed.us/im/directives/field/r1/fsm/2500/2550.rtf

USDA 1986. Custer Forest Plan. US Forest Service, Northern Region, Custer National Forest. Available online at: http://www.fs.fed.us/r1/custer/projects/environmental/index

Western Governor's Association 2006. A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-year Strategy Implementation Plan. Available online at: http://www.forestsandrangelands.gov/plan/documents/10-YearStrategyFinal_Dec2006.pdf

Westerling, AL, HG Hidalgo, DR Cayan, and TW Swetnam 2006. Warming and Earlier Spring Increase Western U.S. Forest Wildfire Activity (18 August 2006) Science 313

DRAFT

(5789), 940. Accessed online 4/24/08 at: http://www.sciencemag.org/cgi/reprint/313/5789/940.pdf

Wondzell, S. M., and J. G. King. 2003. Post-fire erosional processes in the Pacific Northwest and Rocky Mountain region. Forest Ecology and Management 178:75-87.

DRAFT