Supplemental
BIOLOGICAL ASSESSMENT for the Grizzly Bear on the Beaverhead-Deerlodge National Forest Service

2009 Revised Beaverhead-Deerlodge Forest Plan

Prepared By:

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Section A INTRODUCTION AND ACTION AREAS

A1 Introduction

The Beaverhead-Deerlodge National Forest issued a Revised Forest Plan in January 2009. In accordance with the Endangered Species Act (ESA), implementation regulations and FSM 2671.4, the Beaverhead-Deerlodge National Forest (BDNF) is required to consult with the U. S. Fish and Wildlife Service (USFWS) on any prospective agency action authorized, funded or carried out by that agency if the agency believes that the action will likely affect any species listed under the ESA as threatened or endangered.

This biological assessment is based on the best current data and scientific information available. A revised biological assessment must be prepared if: 1) new information reveals affects, which may impact threatened, endangered, and proposed species or their habitats in a manner or to an extent not considered in this assessment; 2) the proposed action is subsequently modified in a manner that causes an affect, which was not considered in this assessment; or 3) a new species is listed or habitat identified, which may be affected by the action.

The Forest Plan revision process occurred over an 8 year period from 2002 to 2010, with the first Record of Decision signed in January, 2009 and a second Record of Decision signed in February, 2010. The BDNF entered into early consultation with the Montana Field Office (USFWS) on the forest plan revision process in 2003. Consultation on the 2009 Revised Forest Plan for the Yellowstone Distinct Population Segment (DPS) of grizzly bears was completed in August 2010.

The BDNF 2009 Revised Forest Plan incorporated the 2006 *Forest Plan Amendment for Grizzly Bear Habitat Conservation for the Greater Yellowstone Area National Forests* (2006 Forest Plan Amendment) (USDA Forest Service 2006). The 2006 Forest Plan Amendment adopted the habitat standards and other relevant provisions of the March, 2003 *Final Conservation Strategy for the Grizzly Bear in the Yellowstone Ecosystem* (2003 Conservation Strategy). The 2006 Forest Plan Amendment encompasses the former Beaverhead National Forest, though the primary focus of the 2006 Forest Plan Amendment is those conditions and actions that occur within the Primary Conservation Area of the Yellowstone Grizzly Bear Ecosystem (YGBE). With the reclassification of the grizzly bear as threatened in 2009, the BDNF retained the direction of the 2006 Forest Plan Amendment and 2003 Conservation Strategy in the 2009 Revised Forest Plan. The 2006 Amendment and 2003 Final Conservation Strategy apply only to the area of the former Beaverhead National Forest, which is part of, but not the entire action area of this consultation. See Section A2, below.

Likewise, the 2010 Biological Assessment and corresponding *Biological Opinion for Effects of the Revised Land and Resource Management Plan (2008)* (sic) *for the Beaverhead-Deerlodge National Forest on Grizzly Bears* only applies to a portion of the BDNF. The 2010 Biological Opinion only applies to the area of the Yellowstone DPS, which encompasses the Madison, Gravelly and Tobacco Root landscapes in their

entirety and a small portion of the Jefferson River and Upper Clark Fork landscapes. The small portion of the Jefferson River and Upper Clark Fork landscapes in the Yellowstone DPS is National Forest System (NFS) lands in the Highland Mountains south of and bounded by interstate highways 15 and 90.

This biological assessment supplements the biological assessment prepared for the 2010 consultation on the Yellowstone DPS. New information now demonstrates that grizzly bears from the Northern Continental Divide (NCDE) and other grizzly bear ecosystems are advancing on to the northern tier of the BDNF, and the BDNF is now reinitiating consultation based on this new information.

On June 5, 2012, the BDNF submitted the *East Deerlodge Valley Restoration Project* biological assessment to the Montana Field Office, USFWS. The June 5, 2012 biological assessment determined that implementation of the proposed action (which entails vegetation management, the use of the transportation system, road management and road decommissioning) may affect, {but is} not likely to adversely affect the threatened grizzly bear. Conversely, the June 5, 2012 biological assessment also determined that the environmental baseline, specifically the open motorized road and trail density in the Boulder River and Clark Fork-Flints landscapes, was adversely impacting grizzly bears. This biological assessment augments the June 5, 2012 biological assessment by describing various aspects of the environmental baseline at a much broader scale and context.

The BDNF encompasses approximately 3.3 million acres in southwest Montana. The 2009 Revised Forest Plan Forest-wide desired future condition and revised goals, objectives, and standards have been established for a variety of social values and environmental factors. These social values and environmental factors include air quality, American Indian rights & interests, aquatic resources, economics and social values, fire management, heritage resources, infrastructure, lands, livestock grazing, minerals/oil/and gas, recreation and travel management, scenic resources, soils, special designations (wilderness, national scenic trails, historic sites, scenic byways, research natural areas), timber management, vegetation, and wildlife habitat.

Organization of this document This biological assessment includes Section A, the preceding introduction and considers 5 key areas of national forest management:

Section B- Vegetation Management

Section C- Access Management & Secure Habitat

Section D- Attractant Management and Developed Sites

Section E- Livestock Management

Section F- Oil and Gas leasing

Summary of potential effects **Implementation of the 2009 Revised Beaverhead-Deerlodge Forest Plan**

Vegetation Management	May affect {but is} not likely to adversely affect
Access Management and Secure Habitat	May affect {and is} likely to adversely affect
Attractant Management and Developed Sites	May affect {and is} likely to adversely affect
Livestock Management	May affect {but is} not likely to adversely affect
Oil and Gas Leasing	May affect {but is} not likely to adversely affect

A2 Action Areas There are two related action areas for this biological assessment. Action Area A is that area of the BDNF that is outside of the Yellowstone DPS and includes eight of the landscapes on the northern and western portions of the BDNF. This area of the BDNF is not currently within a grizzly bear distinct population segment as recognized under the Endangered Species Act. The total area of the action area is approximately 2,460,300 acres, or about 73 percent of the BDNF. Action Area A is the primary action area of this analysis. See Figures A2a and A2b.

Action Area B is specific to Section F of this biological assessment. Action Area B differs from the action area of the previous sections. The action area for consultation on the 2012 Oil and Gas ROD is the former Beaverhead National Forest, including the Anaconda, Beaverhead, Pioneer and Tendoy mountain ranges. The action area also includes the Madison, Gravelly and the southern portion of the Tobacco Root mountains which are in the Yellowstone Grizzly Bear DPS. See Figure F1a. This analysis also describes Action Area B as the **Beaverhead portion of the BDNF**.

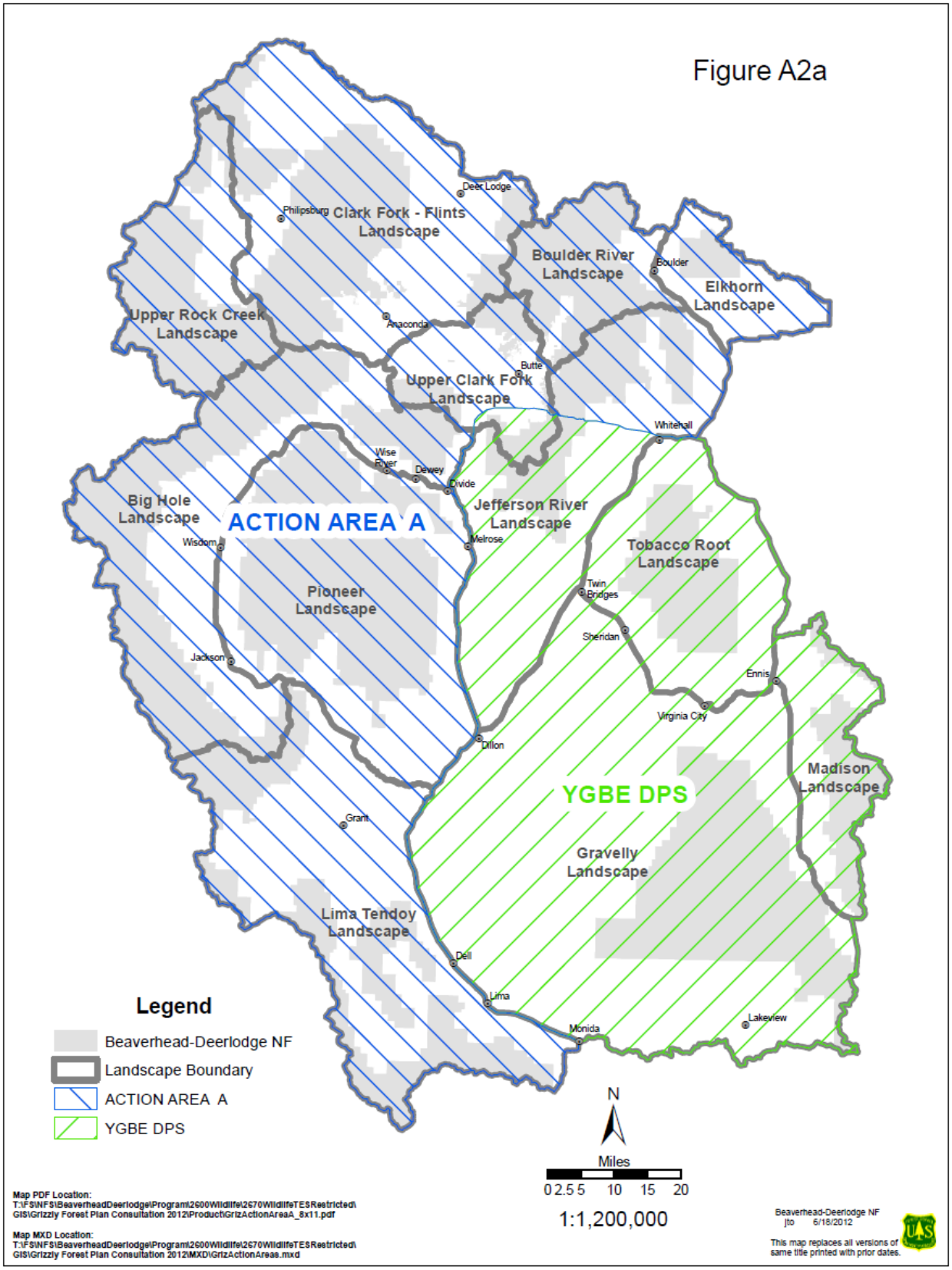
Figure A2a
Deer Lodge
Philipsburg
Clark Fork - Flints Landscape
Boulder River Landscape
Boulder
Elkhorn Landscape
Upper Rock Creek Landscape
Anaconda
Butte
Upper Clark Fork Landscape
Whitehall
Wise River
Dewey
Divide
Big Hole Landscape
ACTION AREA A
Jefferson River Landscape
Melrose
Tobacco Root Landscape
Wisdom
Pioneer Landscape
Twin Bridges
Sheridan
Jackson
Ennis
Virginia City
Dillon
Madison Landscape
YGBE DPS
Grant
Gravelly Landscape
Lima Tendoy Landscape
Dell
Lima
Monida
Lakeview
Legend
Beaverhead-Deerlodge NF
Landscape Boundary
ACTION AREA A
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Map PDF Location:
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Beaverhead-Deerlodge NF
jto 6/18/2012
This map replaces all versions of same title printed with prior dates.

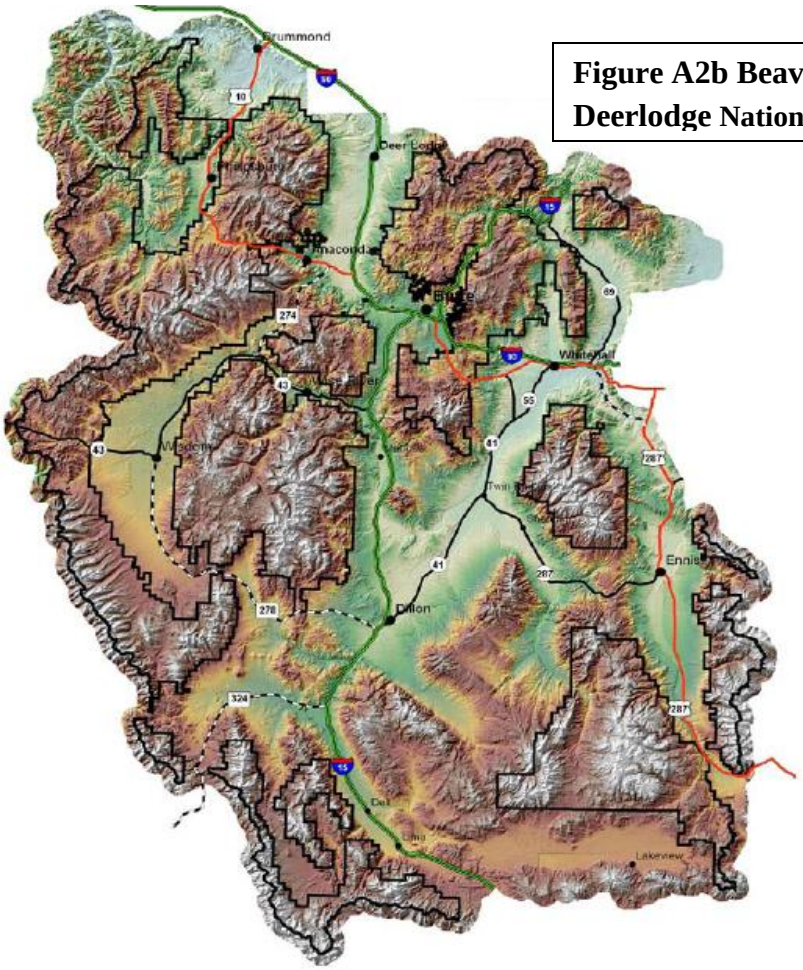


Figure A2b Beaverhead – Deerlodge National Forest

A3 Status, distribution, life history and use of the Action Area on the BDNF

A3a Status The grizzly bear is listed as threatened throughout its range in the lower 48 states. Populations in the Yellowstone DPS and the NCDE are increasing in size and expanding in area.

A3b Distribution Grizzly bears currently occur on the southeast and northwest portions of BDNF. The Yellowstone DPS is in the southeast of the BDNF, and the Madison and Gravelly mountain ranges are currently occupied by grizzly bears. To our knowledge, the Tobacco Root and Highland mountains (also within the Yellowstone DPS) are not occupied by grizzly bears at this time.

Grizzly bears are gradually moving south on to the BDNF from the NCDE and other grizzly bear ecosystems. At this time, it appears that grizzly bears are using the northern portions of the BDNF in the Boulder River, Clark Fork-Flints and Upper Rock Creek landscapes.

The historic range of the grizzly bear in the continental United States extended from the central Great Plains, west to California, and south to Texas and Mexico. Between 1800 and 1975, grizzly bear populations in the lower 48 states declined from over 50,000 to less than 1,000 animals. As Euroamerican settlement expanded westward, the grizzly bear was extirpated from most of its historical range. The grizzly bear was listed as threatened under the ESA in 1975.

Five areas in the lower 48 states currently support grizzly bears. These areas are in Washington, Idaho, Wyoming and Montana and include the Northern Cascades Ecosystem, Selkirk Ecosystem, NCDE, Cabinet-Yaak Ecosystem and Greater Yellowstone Ecosystem (GYE). These areas represent less than 2 percent of the grizzly bear's former range. The Record of Decision for the Environmental Impact Statement to reintroduce an experimental population of grizzly bears into the Selway-Bitterroot Wilderness in Idaho and Montana was signed in December 2000. As of May, 2012, grizzly bears have not been reintroduced into the Selway-Bitterroot Wilderness.

A3c Life History Grizzly bears are in the family *Ursidea*. Grizzly bears are generally larger than black bears and can be distinguished by having longer front foot claws (2 to 4 inches), a distinctive shoulder hump, rounded ears that are proportionately smaller than the black bear, and a dished-in profile between the eyes and end of the snout. Pelage coloration is highly variable, ranging from light brown to nearly black. Guard hairs are often paled at the tips, and give the bear a grizzled appearance. Spring shedding, new growth, nutrition, and climate all influence coloration.

Physical Characteristics Grizzly bears are generally larger than black bears with longer, curved claws distinctive humped shoulders and a concave face. Pelage coloration is variable. In the lower 48 States male grizzlies average 400 to 600 pounds with females averaging 250 to 300 pounds. An occasional male may attain 800 to 1000 pounds. Adults stand 3.5 to 4.5 feet at the hump and rear up to more than 8 feet on their hind legs.

In the continental US, the average adult male grizzly bear weighs between 400 to 600 pounds and the average female 250 to 350 pounds. Grizzly bears are long-lived and many individuals live over 20 years. Adult bears are individualistic in behavior and normally are solitary wanderers. Females with cubs and bears defending food supplies are common causes of confrontation between humans and bears.

Home ranges of adult bears may overlap. The home ranges of adult male grizzly bears are generally two to four times larger than those of adult females. The home ranges of females are smaller while they have cubs, but increase when the cubs become yearlings. Home ranges vary in relation to food availability, weather conditions, and interactions with other bears. Home ranges are larger in the GYE compared to the more productive habitats in the northern ecosystems.

The age of first reproduction and litter size varies and may be related to the nutritional state of the female bear. The age at first reproduction averages 5.5 years, and ranges

from about 3.5 to 8.5 years of age. Reproductive intervals for females average 3 years and litter size averages two cubs (one to four cubs per litter). The limited reproductive capacity of grizzly bears precludes rapid increases in population. Grizzly bears have one of the lowest reproductive rates among terrestrial mammals. During a female's lifetime, if she has litters of two cubs with a 50:50 sex ratio, and a 50 percent survivorship of young to age 5.5 years, at best a breeding female can replace herself with one other breeding age female in the first decade of her life.

Adult bears are normally solitary except for breeding and while the female cares for cubs. The young will stay with the female for approximately two years. Siblings may stay together for several years after being weaned.

Grizzly bears excavate dens as early as September or prior to entry in November. Dens are usually dug on steep slopes where wind and topography cause an accumulation of deep snow and where snow is unlikely to melt during warm periods. Dens are generally found at high elevations well away from human activity and development.

Grizzly bears are opportunistic feeders and will prey or scavenge on almost any available food. Plants with high crude protein content and animal matter are most important food items. The search for food has a prime influence on grizzly bear movements. Upon emergence from the den grizzlies move to lower elevations, drainage bottoms, avalanche chutes, and ungulate winter ranges where their food requirements can be met. Throughout spring and early summer grizzly bears follow plant phenology back to higher elevations. In late summer and fall, there is a transition to fruit and nut sources, as well as herbaceous materials. This is a generalized pattern and it should be noted that bears will go where they can best meet their food requirements.

The grizzly bear has a broad range of habitat tolerance. Occupied habitat is generally characterized as contiguous, relatively undisturbed mountainous habitat with considerable topographic and vegetative diversity. Historical declines are related to habitat loss and human caused mortality.

The management of human use levels through access route management is one of the most powerful tools available to balance the needs of grizzly bears with the activities of humans. Secure habitat for grizzly bears is accomplished through managing access routes at low levels.

A4 Grizzly Bear Use of the Action Area Actual use of the action area by grizzly bears is not well known. Reports and observations of grizzly bears on or near the northern portion of the BDNF span about 7 years and include three grizzly bear mortalities (all males) in close proximity to the forest boundary. Credible observations in 2011 and 2012 indicate grizzly bears are using National Forest System (NFS) lands of the BDNF. In the early spring of 2012, a wolverine bait station motion detector camera maintained by Montana Fish Wildlife and Parks (MFWP) documented an independent

bear near Electric Peak on the northern boundary between the BDNF and the Helena National Forest. This lead to focused discussions between MFWP and the BDNF concerning credible observations of grizzly bears on and around NFS lands on the northwest tier of the BDNF over the last 5 years. Those observations were outlined in the May 17, 2012 reinitiation letter:

> *There have been approximately 5 new verified observations of grizzly bears or their tracks on the BDNF since the 2010 consultation. These observations have been have north of Butte in Elk Park, near Electric Peak, Lockhart Meadows southwest of Electric Peak, in the Boulder River watershed and north and west of Anaconda in the in the Philipsburg area. In addition, there has been one additional unverified observation in the Anaconda-Pintler Wilderness.*

It is possible that the 5 observations listed above may represent only 3 unique individuals. The bear "north of Butte in Elk Park" was killed while depredating farm animals. Lockhart Meadows and Electric Peak are in the Boulder River Watershed, so it is possible, if not likely, that these three observations are of the same bear. The Boulder River Watershed is about 16 miles and east of the Deerlodge Valley from the Flint Creek Range; Phillipsburg lies on the west slope of the Flint Creek Range about 35 miles west of the Boulder River Watershed.

It is possible that more bears are using NFS lands than are being observed. To date, we have no information to suggest that there have been conflicts between grizzly bears and humans on NFS lands on the northwest section of the BDNF.

Section B- VEGETATION MANAGEMENT

Vegetation management includes a number of potential actions that may influence habitat in Action Area A. Of these, four alter coniferous vegetation and are considered in this analysis. The four actions are 1) reduction of conifer encroachment into grassland habitat, 2) aspen restoration entailing the removal of coniferous trees from aspen groves 3) timber harvest for resource enhancement and fiber production, and 4) using fire as a tool for vegetation management.

B1- ***Reduction of conifer encroachment*** The reduction of conifer encroachment in riparian areas, shrublands and grasslands is an objective in the 2009 Revised Forest Plan. Specifically, the BDNF would treat 74,000 acres to achieve this objective over the life of the 2009 Revised Forest Plan. In general, the encroachment of conifers into these habitats reduces plant species diversity and reduces the productivity of the site.

Treatment of conifer encroachment would typically be by hand, felling conifers with chainsaws, scattering or piling cut trees and disposing of slash with pile, jackpot or broadcast burning. Mastication using a "skid steer" type machine which typically spreads wood chips across the site may also occur. It is possible that piling and

bunching felled small-diameter trees may follow removal of material for biomass utilization. Actions would occur when sites are accessible, generally June through October. Access is generally via existing open roads unless a site-specific decision allows otherwise.

B2- ***Aspen restoration*** There is a long history of actions aimed at increasing the distribution and vigor of aspen on the BDNF. Monitoring of active management actions over the last 30 years has refined the current approach to aspen restoration. Recognizing that aspen is a key component of the vegetative diversity of conifer-dominated forest areas of the northern Rocky Mountains, and that aspen has declined substantially across the western United States, successful aspen restoration is an important objective for the BDNF.

The primary focus for aspen restoration on the BDNF is felling conifers that are successionally replacing aspen. Typically, felled conifer trees remain on site, and in some projects jackpot burning is conducted to reduce 1 hour and 10 hour fuels. Other aspen treatments may include a broader application of fire. The 2009 Revised BDNF Forest Plan established a goal to increase the aspen component within lodgepole pine and other vegetation types on 67,000 acres across the forest within the life of the plan.

B3 ***Timber Harvest*** Timber harvest on the BDNF can occur on lands that are identified as *suitable for timber production* or on lands that are identified as lands not suitable for timber production but where timber harvest is *permitted to meet other resource objectives*. Lands that are suitable for timber production are managed for the growth and yield of sawtimber, crop trees, pulp wood and other forest products, including salvage harvest. These lands are generally called the *suitable timber base*, and are intended to produce wood fiber for use and consumption by the public. Timber harvest on lands other than the suitable timber base is designed to accomplish resource objectives that include fire protection of wildland urban interface, forest improvements, aquatic system restoration, fuel reduction, wildlife habitat enhancement and similar opportunities.

There are large areas of the BDNF where no timber harvest is permitted. Table B3a identifies those areas in Action Area A where timber harvest will not occur as a result of law, policy or a decision on land allocation.

Table B3a Areas removed from the timber base in the Action Area		
Anaconda-Pintler Wilderness		Quigg Recommended Wilderness
Anaconda-Pintler Recommended Wilderness Additions		Stony Mountain Recommended Wilderness
West Pioneer Wilderness Study Area		Table Mountain Recommended Wilderness
Sapphires Wilderness Study Area		Electric Peak Recommended Wilderness
Garfield Mountain Recommended Wilderness		Torrey Mtn Recommended Wilderness
Italian Peak recommended Wilderness		West Big Hole Management Area

The 1986 Beaverhead and Deerlodge forest plans identified 646,000 acres as in the suitable timber base for the combined forests. The 2009 Revised Forest Plan reduced the acres identified as suitable for timber production to 284,000 acres forest-wide. In Action Area A, the acres suitable for timber production were reduced from 614,000 acres to 271,500 under the 2009 Revised Forest Plan (Table B3b), a substantial reduction in acres managed for timber production. Note that in every landscape the acres of suitable timber base were reduced. The 271,500 acres remaining in the suitable timber base represent about 11 percent of Action Area A.

In the 1986 plans, approximately 768,000 additional acres were available for management entry for other resource benefits, such as fuel reduction; salvage harvest and wildlife habitat improvement. These acres have increased in the 2009 Revised Forest Plan. Approximately 1,633,000 acres are available for management entry for other resource benefit, representing about 66 percent of the land area of Action Area A.

The distinction between suitable timber base and managing for other resource is important. Providing opportunities for vegetation management on lands outside of the suitable timber base provides managers with the tools to manage public forests of the BDNF in an adaptive manner, and is key to accomplishing the 2009 Revised Forest Plan Vegetation Objective for resiliency:

Reduce forest density in the large size classes of dry forest communities and some lodgepole pine communities to maintain or improve resilient forest conditions.

An example of using commercial vegetation management for the benefit of other resources would be working to reduce the loss of key ecosystem components in condition class three areas of the BDNF. Fire Regime Condition Class (FRCC) is an interagency, standardized tool (Hann et al 2005) for determining the degree of departure from reference condition vegetation, fuels and disturbance regimes. Areas in condition class three exhibit a high departure from the natural/historic regime of vegetation characteristics, fuel composition, fire frequency, severity and pattern and other disturbance related elements. Dry forests in condition class three may typically have a high density of trees 80 years old or younger surrounding large stature, late seral trees (see Heyerdahl et al. 2006) which are of very high importance to some species of wildlife. Actions to reduce the number of small diameter trees surrounding late seral forest would reduce the potential for drought stress and reduce ladder fuels. There are an estimated 650,000 acres on the BDNF in condition classes two and three exhibiting a moderate (condition class two) to high (condition class three) departure from reference conditions.

Areas available for vegetation management for other resource benefit would be screened and evaluated using site specific criteria. Site-specific project analysis will determine the type and extent of harvest, following a specific classification protocol (the *timber protocol*- see Timber Standard 6, below) that ensures that environmental factors- soils, slope, location- are appropriate for the vegetation management action proposed.

Table B3b: Suitable Timber Acres in the Action Area					
Landscape (acres)	***Timber Suitability Classification***	***Acres***		***Percent of Landscape***	
		1986 Plan	2009 Plan	1986 Plan	2009 Plan
Big Hole 542,823	Suitable for Timber Production	184,766	83,151	34	**15**
	Not Suitable, Timber Harvest Allowed	123,730	246,904	23	45
	Not Suitable, No Harvest Allowed	235,034	212,512	43	39
Boulder River 219,050	Suitable for Timber Production	81,327	62,571	37	**29**
	Not Suitable, Timber Harvest Allowed	60,842	115,463	28	53
	Not Suitable, No Harvest Allowed	768,687	40,771	35	19
Clark Fork - Flints 426,799	Suitable for Timber Production	113,777	52,174	27	**12**
	Not Suitable, Timber Harvest Allowed	88,871	248,648	21	58
	Not Suitable, No Harvest Allowed	224,284	124,868	53	29
Jefferson River 212,226	Suitable for Timber Production	28,076	20,789	13	**10**
	Not Suitable, Timber Harvest Allowed	59,248	119,490	28	56
	Not Suitable, No Harvest Allowed	125,011	71,781	59	34
Lima-Tendoy 372,954	Suitable for Timber Production	30,047	15,918	8	**4**
	Not Suitable, Timber Harvest Allowed	74,802	141,046	20	38
	Not Suitable, No Harvest Allowed	268,808	215,813	72	58

Table B3b: Suitable Timber Acres in the Action Area					
Pioneer 583791	Suitable for Timber Production	68,505	26,344	12	**5**
	Not Suitable, Timber Harvest Allowed	99,895	223,714	17	38
	Not Suitable, No Harvest Allowed	416,528	333,614	71	57
Upper Clark Fork 93940	Suitable for Timber Production	21,844	10,565	23	**11**
	Not Suitable, Timber Harvest Allowed	31,007	62,222	33	66
	Not Suitable, No Harvest Allowed	41,085	20,887	44	22
Upper Rock Creek 290598	Suitable for Timber Production	85,983	0	30	**0**
	Not Suitable, Timber Harvest Allowed	52,941	135,577	18	47
	Not Suitable, No Harvest Allowed	152,380	154,969	52	53

Annual Timber Target The current annual timber target for the BDNF is 30 million board feet. This annual timber target is higher than the annual timber target prior to the mountain pine beetle (MPB) outbreak of the last 8 years. The annual timber target for the BDNF was 20 million board feet prior to the MPB outbreak, and we anticipate that the annual timber target will return to 20 million board feet in the foreseeable future.

Harvest for the 30 million board feet annual timber target occurs across all landscapes of the BDNF. In general, 16 to 20 percent (5 to 6 million board feet) of the annual timber target is generated through the non-commercial harvest of firewood, posts and poles, Christmas trees and similar forest products. These types of activities are conducted by individuals or small groups and are dispersed across the landscape. Occasionally, actions are concentrated in area but dispersed temporally, as with personal use post and pole harvest. Unlike firewood and Christmas tree harvest, personal use post and pole harvests occur in designated harvest units, and the public is directed to these areas over the course of a year or more. Potential impacts to grizzly bears from these activities would stem largely from disturbance- noise, localized actions of a few individuals and sanitation. These non-commercial actions are generally directly adjacent to or within a short distance of roads open to the public.

The remaining 80 percent of the BDNF annual timber target is accomplished through a variety of commercial actions. The current mountain pine beetle outbreak is impacting approximately 1.3 million acres with varying levels of tree mortality on the BDNF. Since 2007, the BDNF has planned and implemented five large projects that have felled and removed hazard trees along roads that are open to the public, and additional projects that fell and remove hazard trees from campgrounds, picnic areas and other facilities. Moving forward, it is likely that the felling and removal of standing dead trees adjacent to BDNF infrastructure would continue, at least in the near term. In addition, the mountain pine beetle outbreak has left large amounts of standing dead biomass where lodgepole pine is the dominant tree species. The BDNF will commercially remove some of this biomass to meet multiple objectives while the biomass has commercial value. We expect standing dead biomass from the mountain pine beetle outbreak to have little if any commercial value by 2017.

Salvage of timber and biomass in areas burned by wildfire may also occur. Salvage harvest is limited by post-fire conditions, and generally occurs on a small percentage of the fire area, if at all. Following the 2007 Rat Creek Fire west of Wisdom, MT for example, salvage harvest entered about 6 percent of the 26,600 acre fire. As the number of large fires increases in the western United States (see Westerling et al. 2006), fire salvage harvest may increase on the BDNF.

Timber harvest also occurs in Douglas fir. Actions on Douglas fir sites typically are intended to reduce stem densities and foster large diameter Douglas fir trees. On sites that are within the suitable timber base, Douglas fir thinning may remove trees of all size classes. On sites that are not in the suitable timber base but where harvest is allowed for other resources, commercial actions in Douglas fir essentially thin Douglas fir stands by removing smaller diameter trees. This “thinning from below” reduces the potential for drought stress and can result in an increase in the rate of growth. Further, stand thinning promotes resilient forest conditions, as described by the Society of American Foresters *Dictionary of Forestry* (1998). Increasing the resiliency of forests is a key component of the Forest Service July, 2010 *National Roadmap for Responding to Climate Change* and a Vegetation Objective in the 2009 Revised Forest Plan.

Vegetation Standard 1 in the 2009 Revised Forest Plan requires that mechanical actions and prescribed fire in forested stands that meet the Green et al. (1992) criteria for old growth do not reduce the age, number of trees and basal area below the minimum criteria established for individual, site specific forests types. This establishes a no net loss scenario for oldgrowth BDNF-wide, ensuring that late seral structural habitat components will be retained on the landscape to the extent possible on the part of the BDNF.

To meet the annual BDNF timber target, timber harvest occurs on approximately 2000 acres per year incorporating the concepts, methods, objectives and standards described above. Two thousand acres is 0.061 percent of the land area on the BDNF. That is, if timber harvest occurred at 2000 acres per year for 100 years, 6.1 percent of

the BDNF would have been entered for timber harvest. As implemented over the 15 year life of the 2009 Revised Forest Plan, less that 1 percent of the land area of the BDNF would be entered for timber harvest.

Commercial timber harvest in both areas that are within the suitable timber base and in areas where harvest is allowed for other resource benefits is generally limited to areas that are accessible by open roads. As described in Section C2, below, there has been very little permanent road construction on the BDNF in the last decade. Temporary roads may be constructed for timber harvest, however. These roads are generally low-standard and are generally reclaimed a short time following the completion of actions associated with the timber sale.

There are six standards in the 2009 Revised Forest Plan that apply directly to timber harvest. Table B3c summarizes these standards.

Table B3c. Summary of 2009 Forest Plan Standards for Timber Management

Standard		***Description***
Standard 1		Even Aged Harvest- On lands suitable for timber production, even aged harvest may only occur upon a finding that it is the appropriate & optimum method for the timber type.
Standard 2		Opening size- On lands suitable to timber production, the maximum size of openings of openings by one regeneration harvest shall not exceed 40 acres.
Standard 3		Culmination of mean annual increment- On lands suitable for timber production even aged regeneration harvest shall not occur unless the stand has reached the culmination of mean annual increment. Numerous exceptions exist.
Standard 4		Replace natural barriers to livestock movement removed by harvest with some other barrier.
Standard 5		When trees are cut to achieve timber production objectives the cuttings shall be made in such a way as to assure that he technology & knowledge exists to restock the lands.
Standard 6		The Timber Harvest Classification Protocol establishes where timber harvest is not allowed and where harvest is permitted to meet other resources.
Source:		

B4 Fire for Resource Benefit The 2009 Revised Forest Plan substantially expanded opportunities for managing unplanned ignitions for resource benefits. Under the 1980s era plans, unplanned ignitions -wildfires- could be managed for resource benefits over about 2,869,000 acres of the combined area of the Beaverhead and Deerlodge national forests. Under the 1980s era plans, however, an area-specific wildfire management plan had to be completed prior to the use of wildland fire. The 2009 Revised Forest Plan authorizes managing fire for resource benefit across the entire BDNF. Wildland fire control efforts and prescribed burning will continue under the 2009 Revised Forest Plan.

Fire will also be managed for resource benefit as one of the tools for vegetation and fuels. The acres available for managing fire for resource benefit and the locations where this tool is used will vary within and between landscapes. The impacts of managing fire for resource benefit cannot be predicted with any precision; it is

anticipated that most sites would recover to a pre-disturbance state with a liberal allowance of time. It is likely that a managed wildfire would leave a mosaic of post-fire conditions on a forested landscape. This mosaic would include areas of high mortality of the forest overstory and areas where only small diameter (1 and 10 hour) fuels are consumed. For grizzly bears, the most important example is the 1988 fire in Yellowstone National Park that burned through the heart of the YGBE Recovery Zone. The 1988 fires had no observable impact on the number of bears in the Greater Yellowstone area (USFWS 2003, Franke 2000).

We recognize that broad-scale wildfire may have the potential to result in the conversion of some forested sites to grassland as described by Westerling et al. (2011) in the Greater Yellowstone Area. Conditions in the northern US Rocky Mountains are predicted to be warmer and drier in the foreseeable future (see Ashton 2010, McWethy et al. 2010), and the use of managed fire for resource benefit, prescribed fire and mechanical actions that increase the resiliency of forested systems reduce the potential for broad-scale site conversion of forested areas to grassland from as a result of unplanned and unmanaged fire.

Whitebark Pine Whitebark pine (WbP) is a candidate for listing under the ESA, and is currently a sensitive species in Region 1 of the Forest Service. It is widely recognized that WbP is an important food species for grizzly bears where WbP currently occurs. WbP is not a commercial species, and harvest of WbP is not programed under the 2009 Revised Forest Plan.

On the BDNF, actions associated with WbP are likely to be focused on a) minimizing potential impacts to WbP that stem from other vegetation management activities, or b) the long-term restoration of WbP through the various tools available to forest managers. We anticipate that actions that minimize potential impacts to WbP are benign in nature. Those actions that are focused on the restoration of WbP are anticipated to be beneficial to individuals and the species across Action Area A. Of these, using fire for resource benefit has a high potential for long-term restoration of this species, but this tool has a potential for adverse impacts as well, at least in the short term.

There are currently two strategies for whitebark pine that are applicable to the BDNF. The May, 2011 *Whitebark Pine Strategy for the Greater Yellowstone Area* (GYCC 2011) established strategic objectives for whitebark pine conservation, including the strategic objective to:

> ***Ensure natural regeneration and genetic diversity through protection of cone-bearing whitebark pine.***

Clearly, there are potential impacts to cone-bearing WbP trees with the use of unplanned ignitions for resource benefit. Another important element of the GYA Whitebark Pine Strategy is to:

Promote fire planning and use that protects high value whitebark pine and provides for long-term restoration.

This approach leads fire managers to recognize the importance of whitebark pine when devising strategies for the use of unplanned ignitions for resource benefit. It also highlights the principle conservation need to protect large, cone bearing whitebark pine trees strategically located across the GYA.

The *Range-wide Restoration Strategy for Whitebark Pine Forests in the Western United States* (Keane et al. 2012) identifies several key principles associated with fire and the use thereof. In general, Keane et al. are proponents of restoring natural fire regimes to the forests of the Rocky Mountains using planned and unplanned ignitions. Wildland fires, whether unplanned ignitions or prescribed fires, are important disturbances for whitebark pine restoration and important components of WbP management as they create diverse shifting mosaics of upper subalpine communities.

Fire for resource benefit is an important tool for progressive management of whitebark pine. Fire may be used for seedbed preparation, the reduction of competing subalpine fir and reducing the potential for unplanned ignitions to impact whitebark pine.

B5 Summary of Potential Effects from Vegetation Management and Determination

The opportunity for timber harvest for growth and yield/timber production ranges from 0 percent to 29 percent per landscape across Action Area A, and averages about 11 percent of the land area of each landscape (Table B3b). While the area where timber harvest for other resource benefit may occur increases under the 2009 Revised Plan, such delineation does not automatically lead to implementation of harvest activities. Site specific analysis required by Forest Plan Timber Standard 6 (Timber Harvest Classification Protocol) would be applied prior to entry, as would analysis under the National Environmental Policy Act and consultation on potential effects to species listed under the Endangered Species Act.

Every proposed vegetation management project on the BDNF will consider potential effects to grizzly bears during the NEPA analysis process specific to that project. Any project that the BDNF determines may affect the threatened grizzly bear would be subject to section 7 consultation with the USFWS.

The vegetative environmental baseline of the BDNF is a mosaic of forests and grasslands maintained over time by disturbance from insects, disease, fire and mechanical forces. Changes to the environmental baseline from vegetation management are extremely minor when compared to the changes that occur through natural processes. Noncommercial actions are restorative in nature or benign. Only a very small portion of Action Area A is entered for commercial timber harvest in any given year and at the current planned rate of harvest, less than 7 percent of the land area of the BDNF would be entered for commercial harvest over the next 100 years.

Commercial timber harvest will not change the permanent open motorized route density on the BDNF.

B6 Determination The environmental baseline as influenced by the reduction of conifer encroachment, aspen restoration, commercial timber harvest, biomass removal and fire for resource benefit is suitable habitat for grizzly bears. We find that vegetation management as directed and authorized by the 2009 Revised Forest Plan may affect, (but is) not likely to adversely affect the threatened grizzly bear.

Section C ACCESS MANAGEMENT AND SECURE HABITAT

C1 Overview of Travel Management on the BDNF

General Travel management on the BDNF has evolved over time, under various policies and decisions. Travel maps have been produced several times over the course of decades, showing travel routes and restrictions for public use. The scale of these maps limited the routes shown on these maps, so travel restrictions for routes not shown on these maps were covered by area restrictions, coded along with specific route restriction in the legend of each version of the map. Cross country travel was allowed in certain areas of the BDNF, and prohibited in others, according to the current restrictions on the map.

Tri-State OHV Decision (2001) Cross country travel was prohibited on the BDNF upon issuance of the 2001 OHV Forest Plan Amendment for Montana, North Dakota, and South Dakota. This decision restricted motorized travel to "existing" routes, and gave the user direction to determine the status of routes as "existing" based on a visual determination.

Travel Management Rule (2005) The Forest Service published the travel management rule governing use of motor vehicles on NFS lands in November 2005. The travel management rule (36 CFR part 212, subpart B) requires each administrative unit or ranger district to designate those NFS roads, NFS trails, and areas on NFS lands that are open to motor vehicle use by vehicle class and, if appropriate, by time of year. The travel management rule also required designated roads, trails and areas to be identified on a motor vehicle use map. After designated roads, trails and areas have been identified on an motor vehicle use map, motor vehicle use inconsistent with those designations is prohibited under 36 CFR 261.13. This rule replaced all previous regulation and policies, and prohibited off-road travel except in designated areas.

Revised Forest Plan (2009) Motorized travel routes, both roads and trails, were mapped for inclusion in the 2009 Revised Forest Plan environmental analysis. The 2009 Revised Forest plan also incorporated routes that existed under the Tri-State OHV Decision, as appropriate. This base map eliminated the ambiguity of on-the-ground visual interpretation of which "existing routes", and established a recognized transportation system of motorized roads and trails.

This base map formed the 2009 Forest Plan Interim Roads and Trails Inventory GIS Layer, displayed on page 53 of the Forest Plan and as amended by the 2010 ROD 2 (Interim Inventory). The map was developed through the Forest Planning process and serves as the interim motorized road and trail inventory for the entire BDNF. Motorized vehicles are restricted to these routes until a more site-specific travel management decision is reached. Recreation Standard 3 from the 2009 Revised Forest Plan also restricts wheeled motorized travel to designated routes.

Chapter 3 of the 2009 Revised Forest Plan presents desired conditions, goals, objectives and standards for the Forest, Landscapes and Management Areas. A number of desired conditions, goals, objectives and standards will be considered under travel planning and analyses, and would be identified and described accordingly in site-specific environmental analysis conducted to meet the requirements of the Travel Management Rule.

Site-Specific Analyses Site specific travel analysis as currently occurring on the BDNF implements the 2005 Travel Management Rule by designating a system of roads, trails and areas for motorized use, resulting in the production of a Motor Vehicle Use Map (MVUM). The MVUM replaces the Interim Roads and Trails Inventory displayed on page 53 of the 2009 Forest Plan, and becomes the official travel plan for that portion of the BDNF represented by the MUVM.

The Forest Supervisor and District Rangers have made several project-level travel management decisions over the years. These decisions are reflected on the current visitor's map and in travel orders available at local offices. The Travel Management Rule does not require these to be revisited in travel planning processes.

C2- Motorized routes on the BDNF- the Environmental Baseline

The 2009 Revised Forest Plan identified 6974 miles of motorized routes (motorized roads and trails) on the BDNF that are open to use during all or part of the summer season[1]. As described in Section C1 above, the current transportation system on the BDNF has been shaped by travel management planning and Forest Service policy. The interim route inventory established by the 2009 Revised Forest Plan is the current travel management plan for most of the BDNF. The Madison Ranger District in the Yellowstone Grizzly Bear Ecosystem is the only unit on the BDNF that has completed travel planning and the subsequent MVUM as required under the 2005 Travel Management Rule.

The 2009 Revised Forest Plan established motorized route management objectives for each landscape and MFWP hunting district on the BDNF. These objectives were designed to set achievable desired levels for capping and reducing, as appropriate, the miles of routes at the landscape and hunting district scales to maintain and improve wildlife habitat. See Table C2a and C2b. The numbers in parentheses in these tables are the number of miles of motorized routes that would be closed to meet the desired route density. The Gravelly, Madison and Tobacco Root landscapes are not in Action Area A but are included here for reference.

[1] The 2009 Revised Forest Plan uses the *summer season* for open mororized roads and trails to distingush between wheeled vehicles and over the snow vehicles. The *summer season* in this context includes the fall general hunting season.

Table C2a. Existing and Desired Motorized Road and Trail Densities by Landscape		
Landscape	***Existing Route Density***	***Desired Route Density***
Big Hole	1.3	1.2
Boulder River	2.0	1.9 (34)
Clark-Fork Flints	1.8	1.9
Gravelly	0.7	0.7
Jefferson River	1.8	1.6 (33)
Lima-Tendoy	1.1	1.0
Madison	0.0	0.0
Pioneer	1.3	1.5
Tobacco Root	1.2	1.3
Upper Clark Fork	2.0	2.0
Upper Rock Creek	0.9	0.9
Source: 2009 Revised Forest Plan Corrected Final Environmental Impact Statement		

Under the 2009 Revised Forest Plan, open motorized road and trail densities are calculated for summer and fall at the landscape and hunting unit scales, respectively. Motorized route densities are reduced in the fall (10/15 through 12/1) to increase wildlife security during the general hunting season. There is a substantial pulse of dispersed recreation related to deer/elk hunting that is unmatched at other times of the year. Southwest Montana receives approximately 30 to 40 percent of the elk hunting activity in Montana, with the bulk of it focused on hunting districts on the BDNF (USDA 2009b).

Motorized route objectives for the MFWP hunting districts on the BDNF are displayed in Table C2b. Again, the numbers in parentheses are the number of miles of motorized routes that would be closed to meet the desired route density. Hunting Districts on the BDNF that are not in Action Area A are included here for comparison.

The 2009 Revised Forest Plan also established standards for those landscapes and MFWP hunting districts that do not currently meet desired motorized road and trail densities. Wildlife Standards 1 and 2 require that landscapes and hunting districts that exceed the open motorized road and trail objective have no net increase in designated road and trail mileage. The term *mileage* as used in Wildlife Standards 1 and 2 is key in this standard as it not based on route density. Wildlife Standards 1 and 2 do not allow any increase in the motorized route miles in landscapes or hunting districts that exceed the objectives.

The desired motorized road and trail densities were developed using several criteria. Interaction with stakeholders during the planning process of the 2009 Revised Forest

Table C2b. Existing and Desired Motorized Road and Trail Densities by MFWP Hunting District						
Hunting District	***Existing***	***Desired***		***Hunting District***	***Existing***	***Desired***
210	0.9	0.9		*324*	*0.5*	*0.4*
211	0.6	0.5		*327*	*0.8*	*0.8*
212	1.3	1.4		328	1.0	0.8
213	1.5	1.4		329	1.0	1.1
214	1.6	1.6		*330*	*0.7*	*0.7*

215	1.9	1.5 (52)		331	1.4	1.5
216	0.9	0.8		332	0.8	0.8
300	0.7	0.6 (12)		*333*	*1.0*	*0.9 (16)*
302	1.2	1.0 (11)		340	1.5	1.4
311	0.0	0.0		341	0.6	0.5 (6)
318	1.9	1.8 (22)		350	1.5	1.3 (26)
319	0.7	0.6		*360*	*0.0*	*0.0*
320	*0.7*	*0.8*		*362*	*0.0*	*0.0*
321	1.1	1.1		370	0.9	1.0
323	*0.5*	*0.5*				
Source: 2009 Forest Plan Corrected Final Environmental Impact Statement. Districts in italics are not in Action Area A but are shown here for comparison.						

Plan influenced the final Desired Route Densities brought forward in the 2009 Revised Forest Plan. The desired motorized road and trail densities are intended to be ceilings, in that open motorized road and trail densities could go lower if localized conditions warranted.

Note that the Boulder River Landscape and Hunting Districts 215 and 318 support the highest open motorized road and trail densities on the BDNF. This area appears to be one of the primary places where grizzly bears from the NCDE are entering the BDNF.

There is no question that roads and the use thereof influence bear behavior and are a leading proximate cause of grizzly bear mortality. Appendix B of the 1993 Grizzly Bear Recovery Plan observed:

> Mortality is the most serious consequence of roads in grizzly habitat. Research has confirmed that grizzlies experience increased vulnerability to legal harvest and poaching as a consequence of increased road access by humans (Schallenberger 1980, Zager 1980, McLellan and Mace 1985, Aune and Kasworm 1989)[2]. McLellan and Mace (1985) found that a disproportionate number of human-causes grizzly mortalities occurred near roads. In Montana, Dood et al. (1986) reported that 48 percent of all known non-hunting mortalities during 1967-1986 occurred within one mile of roads. Aune and Kasworm (1989) reported 63 percent of known human-caused grizzly deaths on the east front of the Rocky Mountains occurred within 1 km of roads, including 10 of 11 known female grizzly bear deaths. Bears are also killed by vehicle collision, the most direct form of road-related mortality (Greer 1985, Knight et al. 1986, Palmisciano 1986).

Recognizing that Action Area A is substantially removed from the Cabinet Yaak, Northern Continental Divide and Yellowstone grizzly bear recovery zones, it was not clear what the target motorized route density should be for Action Area A at the time of completion of the 2009 Revised Forest Plan. Suggested motorized route densities for areas with seasonal year-long grizzly bear activity (Management Situation 1) ranged from 0.75 mi/mi^2 to 1.0 mi/mi^2. Action Area A clearly does not support seasonal year-

[2] These citations are not included in the reference section of this Biological Assessment.

long grizzly bear activity. With the absence of *population centers* (as described in the 1993 Grizzly Bear Recovery Plan) for grizzly bears in Action Area A and an existing motorized route density substantially above 1.1 mi/mi^2, the BDNF found that conditions in many parts of Action Area A were more similar in concept to Management Situation 4 or 5 as described in the 1993 Grizzly Bear Recovery Plan. Review of period literature surrounding the 1993 Grizzly Bear recovery Plan identified no prescribed or recommended open motorized road and trail density for Management Situations 4 and 5. In addition, it is unlikely that the open motorized road and trail density range of .75 mi/mi^2 to 1.0 mi/mi^2 would be achievable in Action Area A over the life of the 2009 Revised Forest Plan.

In coordination with MFWP, the BDNF established a target "optimum" motorized route density of 1.5 mi/mi^2 or below during the development of the 2009 Revised Forest Plan. The Desired Route Densities in Tables C2a and C2b were tempered by our anticipated abilities and opportunities to accomplish these density objectives over the life of the 2009 Revised Forest Plan. Pragmatically, the BDNF linked areas with elevated motorized route densities to prospective broad-scale land management activities as the highest priorities for achieving route management objectives.

Over the last decade, the BDNF has been successful in decommissioning motorized routes that are no longer necessary for natural resource management activities. Data from the BDNF road accomplishment reports (the official reporting mechanism for road management activities) for FY1999 through FY2011 demonstrate that routes that are no longer needed for management are being decommissioned. Table C2c identifies new road construction (system roads) and decommissioning (system and unauthorized roads) from FY 1999 through FY 2011 for the entire BDNF.

Table C2c identifies a reduction in system roads of 117.5 miles and 92 miles of unauthorized routes between 1999 and 2011. In February 2010, ROD 2 of the 2009 Revised Forest Plan was signed, ending the use of 107 miles of motorized routes in non-motorized allocations.

Note that only 1.5 miles of new construction took place during this same period. New routes constructed were at existing administrative or recreation sites. In 2003, for example, the 0.5 miles of new routes were the Pintler Ranger Station parking lot (0.1 mi) in Philipsburg, MT and recreation enhancement at Lemhi Pass (0.4 mi). These data are consistent with the current direction of the BDNF.

Continued implementation of the 2005 Travel Management Rule will lead to completion of Motor Vehicle Use Maps (MVUM) for all of Action Area A during the life of the 2009 Revised Forest Plan. Currently only the Madison Ranger District in the Yellowstone Grizzly Bear Ecosystem has completed this level of travel planning on the BDNF.

We anticipate that the BDNF will complete the MVUM for the Big Hole, Pioneer and Lima-Tendoy landscapes late in 2013. Preliminary analysis suggests that open motorized road and trail densities may be reduced substantially in these three landscapes with completion of this MVUM.

Table C2c. Road construction and decommissioning 1999 through 2011.

Fiscal Year	New road construction (miles)	Decommissioning (miles)		
		System roads	Unauthorized roads	Total
1999	0.0	26.5	9.5	36.0
2000	0.0	0.0	12.0	12.0
2001	1.0	15.0	14.0	29.0
2002	0.0	0.0	3.0	3.0
2003	0.5	1.5	1.5	3.0
2004	0	0.9	9.5	10.4
2005	0	3.5	0	3.5
2006	0	0	0	0
2007	0	0	0.5	0.5
2008	0	3.0	0	3.0
2009	0	0.0	2.0	2.0
2010	0	67.0	40.0	107.0
2011	0	0.1	0	0.1
Totals	**1.5**	**117.5**	**92.0**	**209.5**

Of primary concern are the Boulder River, Jefferson River, Clark Fork – Flints and upper Clark Fork landscapes. These landscapes and corresponding MFWP hunting districts exhibit the highest open motorized road and trail densities on the BDNF. These are the landscapes where grizzly bears are entering the BDNF from the NCDE and other grizzly bear ecosystems to the north. The three grizzly bear mortalities described in Section A4, above, occurred immediately adjacent to these BDNF landscapes.

The BDNF anticipates that the MVUM for the Boulder River, Jefferson River, Clark Fork – Flints and Upper Clark Fork landscapes should be completed in late 2017. With completion of this MVUM, Action Area A would have completed comprehensive travel planning and management. We anticipate that completion of the MVUM for the Boulder River, Jefferson River, Clark Fork – Flints and Upper Clark Fork landscapes would result in substantial step toward reaching the Desired Route Management objectives outlined in Tables C2a and C2b.

C3 Secure habitat

Secure habitat is essentially those polygons that are formed in the interstitial areas between roads. Secure habitat as a key component of the BDNF habitat management strategy for grizzly bears was developed in the 2003 Final Conservation Strategy for the Grizzly Bear in the Yellowstone Ecosystem. This management strategy was applied to the Gravelly Landscape in the 2009 Revised Forest Plan, as that landscape was the only portion of the BDNF that was known to be occupied by grizzly bears at that time. Managing for secure habitat elsewhere on the BDNF is not required under the 2009 Revised Forest Plan.

Beginning in 2008, the BDNF monitors the density of motorized routes on the Beaverhead portion of the Forest, comparing open motorized access route density (OMARD), total motorized access route density (TMARD) and secure habitat in the YGBE to the 2003 baseline for outside the Primary Conservation Area (PCA), the former recovery zone of the YGBE. The BDNF established 12 Bear Analysis Units (BAUs) outside of the PCA in 2003. The BDNF added an additional BAU in 2008 so that the Tobacco Root Mountains were not artificially divided by a biologically-unsupportable line between administrative units, specifically the line between the former Beaverhead and Deerlodge national forests. The BDNF added the Highland BAU in 2010 to reflect the inclusion of this portion of the Forest in the Yellowstone DPS. These analysis units approximated the size of BMU subunits in the Yellowstone Recovery Zone. With the exception of the Highland BAU, motorized access in these units has been monitored every other year since 2008. See Figure C3a.

There are currently 14 BAUs on the Beaverhead portion of the BDNF wherein OMARD, TMARD and secure habitat are monitored every other year. The results of this monitoring are reported every other year in the annual report of the Interagency Grizzly Bear Study Team.

The 2008 monitoring analysis for areas outside of the PCA used the Interim Roads and Trails Inventory developed for the 2009 Revised Forest Plan. This data layer was used to derive secure habitat values for BAUs for comparison with the 2003 baseline. Table C3b displays secure habitat values for the 14 BAUs for the 2003 baseline.

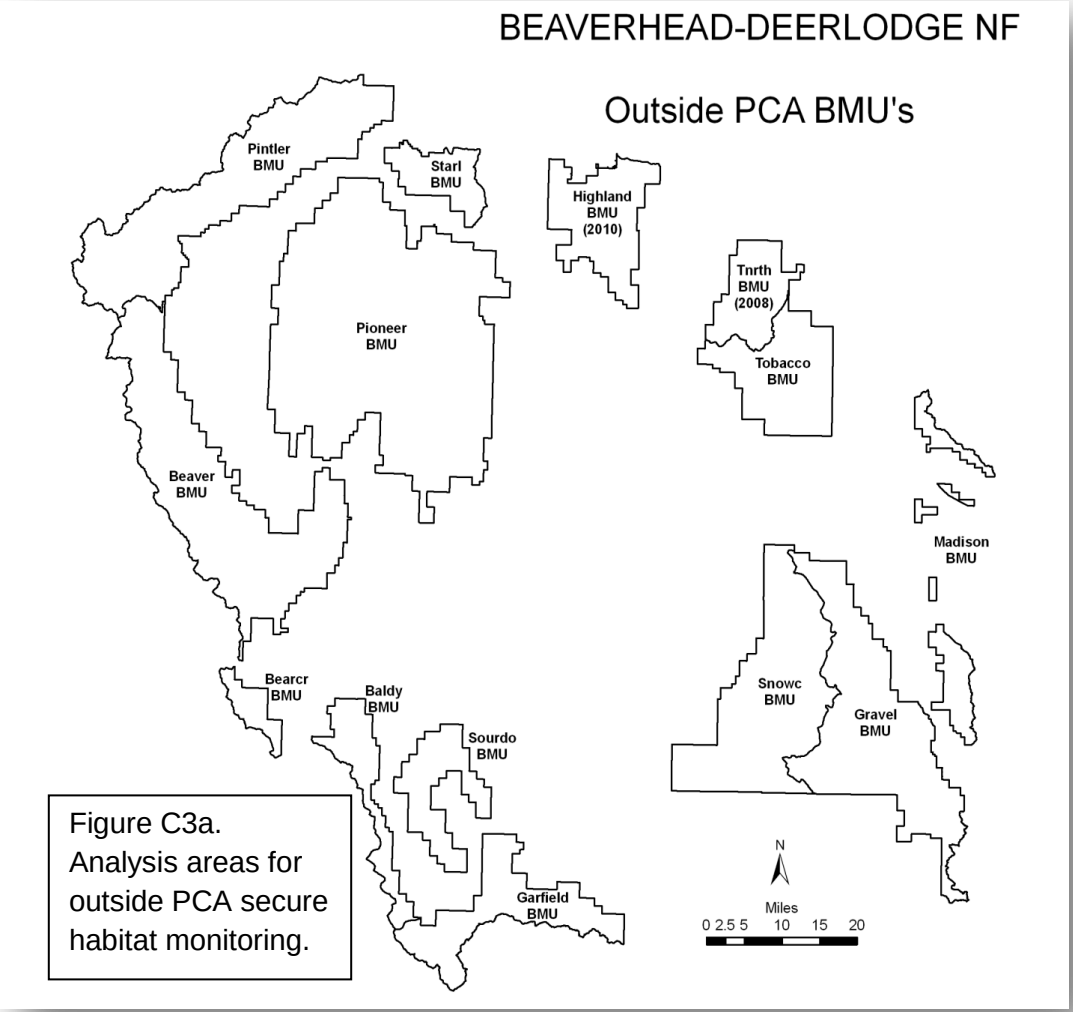


Figure C3a. Analysis areas for outside PCA secure habitat monitoring.

Note that Table C3b identifies substantial differences in secure habitat values between 2003 and 2008. In 2003, the BDNF trails layer had not yet been attributed with the motorized status of all individual routes, and consequently many were labeled “status unknown”. Routes labeled “status unknown” were not included in the 2003 baseline data provided to the Grizzly Bear Habitat Modeling Team.

Since 2003, site specific information has been assembled for forest plan revision. Today, most motorized trails on the BDNF have been attributed with their appropriate motorized status. Trail attributing resulted in a large difference in secure habitat (as modeled in this effort) in some BAUs. For example, in the Pioneer Mountains, there were no routes in the West Pioneers WSA identified as ‘motorized’ in 2003, though it was known that some routes were being used by motorized vehicles. In 2008, nearly 81 miles of existing motorized trail were identified in the Pioneer Mountains WSA.

Table C3b. Secure Habitat on the BDNF		
Analysis Unit	2003 baseline Secure Habitat (percent)	2008 Secure Habitat (percent)
Baldy BAU	57.4	46.2
Bear Creek BAU	38.6	60.8
Beaver BAU	52.9	48.6
Garfield BAU	54.1	65.7
Gravelly BAU	64.0	62.1
Highlands BAU		
Madison BAU	97.1	100
Pintler BAU	62.4	59.2
Pioneer BAU	62.3	53.0
Snowcrest BAU	66.0	71.0
Sourdough BAU	47.8	40.1
Starlight BAU	51.6	40.0
T Root N BAU		52.8
T Root S BAU	46.7	47

For the 2008 Outside the PCA Monitoring Report, each BAU was reviewed, and all changes in secure habitat between 2003 and 2008 are a result of this updated data, and not a result of a change in motorized access management. Motorized routes that are physically on the landscape in 2008 were also there in 2003, but were not identified as such in the 2003 baseline. No new routes have been constructed. See Table C2c, above.

Table C3b identifies an increase in secure habitat in the Bear Creek analysis unit of 22 percent between 2003 and 2008. In 2003, the BDNF identified many routes as open to motorized use, when in actuality most motorized routes identified were closed level-one roads. Again, BAUs were established for the southern portion of the BDNF, not the entirety of Action Area A. Monitoring of open motorized route density and secure habitat every other year currently occurs on these areas following the YGBE protocol.

2009 Revised Forest Plan The 2009 Revised Forest Plan incorporates *secure areas for wildlife* and motorized route density into the wildlife standards, objectives and goals for maintaining and enhancing wildlife habitat across the BDNF. Management for *Grizzly Bear Security* at 60 percent is a wildlife habitat goal for the Gravelly Landscape. *Grizzly Bear Security* in this context is similar to Yellowstone Grizzly Bear Ecosystem (YGBE) secure habitat as used in the 2006 Forest Plan Amendment and monitored in the PCA and across the Beaverhead portion of the BDNF in that it identifies areas that are secure for wildlife based on area size and distance from motorized routes. *Grizzly Bear Security* differs from *secure habitat*, however, in two key ways. Whereas the criterion for the distance from motorized routes for YGBE secure habitat is 500 meters (1640 feet), the distance criterion for *Grizzly Bear Security* is 1760 feet, 120 feet further from motorized routes. As a result, *Grizzly Bear Security* is a more conservative approach to identifying secure areas for bears and other wildlife species. Motorized routes that are gated as the method of closure are not buffered by the 1760 buffer during the period of the year when the gate is closed. This is similar to YGBE secure habitat in which motorized routes must be inaccessible to motorized vehicles year round. Grizzly Bear Security is also measured at the landscape scale- the Gravelly Landscape rather than the BMA scale as in the YGBE. See table C2d, below.

In addition to the criterion difference identified above, the protocol for roads outside of National Forest System (NFS) lands differs as well. Under the YGBE secure habitat protocol, roads outside of NFS lands do not detract from secure habitat values. The BDNF *Wildlife Secure Areas* protocol requires that roads outside of NFS lands are buffered to the full 1760 feet. Roads outside of NFS lands have the potential displace grizzly bears from otherwise suitable habitat on NFS lands.

Table C3c presents the most up to date values for wildlife security on the landscapes of the BDNF. In the 2009 Revised Forest Plan, the BDNF incorporated *Grizzly Bear Security* into *Wildlife Secure Areas* for parts of the BDNF outside of the Gravelly Landscape. Wildlife Secure Areas are delineated using the same methodology described above- buffering all motorized routes 1760 feet to form polygons 10 acres or larger in size. For simplicity, this biological assessment captures the concept of *grizzly bear security* and *wildlife secure areas* with the term **secure habitat.**

Table C3c. Comparison of secure habitat and grizzly bear security analysis methods

Landscape	***Percent Wildlife Secure Area****	***Data Source Year***	***Motorized Route Data Source***
Big Hole	52.1	2012	Pre project existing condition
Boulder River	32.5	2012	Pre-project existing condition
Clark Fork–Flints	38.6	2012	E. Deerlodge project analysis existing condition
Elkhorn	33.7	2010	2009 RFP ROD 2
Gravelly	61.3	2011	D6 MVUM Decision
Jefferson River	45.2	2012	Pre-project existing condition
Lima Tendoy	57.3	2012	Pre-project existing condition
Madison	96.4	2011	D6 MVUM Decision
Pioneer	53.2	2012	Pre-project existing condition
Tobacco Root	45.5	2011	D6 MVUM Decision
Upper Clark Fork	34.6	2012	Pre-project existing condition
Upper Rock Cr.	62.1	2010	2009 RFP ROD 2

*percent wildlife secure area is based on most current route data. The Madison, Gravelly and Tobacco Root landscapes are outside Action Area A.

Note that seven of the 12 landscapes listed above identify 2012 as the data source year. These are the landscapes where travel management planning is underway or will occur. As described in Section C2, above, the BDNF is implementing the 2005 Travel Management Rule and will be continuing travel management planning on all portions of Action Area A over the next 5 years. We anticipate that most landscapes in Action Area A will achieve increases in the percentage of the landscape that is wildlife secure area, though the increase will vary between landscapes.

The BDNF uses the landscape and MFWP hunting district as the principle analysis units for most BDNF activities. Bear Analysis Units and secure habitat are only used for the bi annual monitoring of OMARD, TMARD and secure habitat as required under the 2003 Conservation Strategy and corresponding 2006 Forest Plan Amendment.

Other roadless areas The 2009 Revised Forest Plan recommended additions to the National Wilderness Preservation System. These areas are listed in Table B3a, above. Direction in the 2009 Revised Forest Plan manages recommended wilderness such that motorized vehicles and mechanized transport are prohibited uses. These recommended wilderness additions contribute to secure habitat on the BDNF.

C4 Winter Motorized Access

As described in Table C4a, the 2009 Revised Forest Plan establishes considerable changes in winter motorized access across the BDNF. Table C4a compares the acres in Action Area A that the 1980s Beaverhead and Deerlodge forest plans permitted winter motorized travel with the 2009 Revised Forest Plan. The 2009 Revised Forest Plan reduces winter motorized access by 635,881 acres in Action Area A. See Table C4a.

Table C4a. Winter Motorized Access

Landscape	Acres	1980s forest plans winter motorized (acres)	2009 Forest Plan winter motorized (acres)
Big Hole	542,823	449,583	353,760
Boulder River	219,050	189,131	132,455
Clark Fork-Flints	426,799	399,499	306,543
Jefferson River	212,226	190,573	90,193
Lima – Tendoy	372,954	291,963	202,404
Pioneer	583,791	531,932	424,498
Upper Clark Fork	93,940	74,276	55,537
Upper Rock Cr.	290,598	207,880	133,566
TOTAL	***2,742,181***	***2,334,837 (85%)****	***1,698,956 (62%)***

*Percent is the percent of the acres in Action Area A.

Changes in winter motorized acres result from changes in land allocations made in the 2009 Revised Forest Plan. Winter motorized recreation has been restricted in those areas that have been recognized as having wilderness character and have been recommended for inclusion in the National Wilderness Preservation System. In addition, the 2009 Revised Forest plan added winter non-motorized recreation allocations to provide for quiet recreation opportunities. Generally, these non-motorized recreation allocations are in portions of the landscape that, for the most part, are high in elevation and maintain snow cover later in the year; many areas

are at the current upper end of accessibility for over-snow machines. Winter non-motorized recreation allocations are in favorable locations for wildlife and many acres of winter non-motorized are in potential grizzly bear denning habitat and year-round wolverine habitat.

C5 Summary of Potential Effects of Access Management and Secure Habitat

The 2009 Revised Forest Plan establishes road density objectives at the landscape scale for summer and at the hunting unit scale for the fall (Tables C2a and C2b). Fall road density objectives are lower in response to the large influx of recreationists associated with the general hunting season. Potential disturbance to grizzly bears, including direct mortality, is highest during the general hunting season. The increased visitation during the hunting season accounts for 20 to 25 percent of the annual recreation visitor days on the forest. In Montana, 35 to 40 percent of big game hunter days are spent in MFWP 3 (southwestern Montana) which encompasses all of the Beaverhead and a large section of the Deerlodge portions of the BDNF. Reducing open motorized route densities reduces the potential for illegal and defensive of life mortality for grizzly bears.

Winter motorized recreation is reduced by 635,881 acres in Action Area A with implementation of the 2009 Revised Forest Plan (Table C4a). This is a 23 percent reduction in acres available for winter motorized use over the 1980s era forest plans.

Determination Motorized access as implemented in the 2009 Revised Forest Plan and subsequent ROD 2 reduces open motorized road and trail densities and increases the area secure habitat available to grizzly bears at all times of the year. We anticipate further reductions in motorized access with continued implementation of the 2005 Travel Management Rule and completion of two MVUMs in Action Area A by about 2017. Reductions in motorized access in Action Area A would be beneficial to grizzly bears. We recognize, however, that elevated open motorized route densities and the corresponding low levels of secure habitat in the Boulder River, Jefferson River, Clark Fork Flints and Upper Clark Fork landscapes create conditions that are not favorable to grizzly bears. Continued implementation of the 2009 Revised Forest Plan for access management and secure habitat will improve conditions over time.

Though improving, the environmental baseline for access management exhibits open motorized road and trail densities above desired conditions as described in the 2009 Revised Forest Plan. For this reason, the environmental baseline for access management and the corresponding metric secure habitat **may affect, {and is} likely to adversely affect the threatened grizzly bear**.

Section D ATTRACTANT MANAGEMENT AND DEVELOPED RECREATION SITES

D1 Attractant Management

There is a long history of required food storage/attractant management on the Beaverhead portion of the BDNF. Attractant management has been required on areas of the Beaverhead portion BDNF since 1987, 1 year after the signing of the 1986 Beaverhead Forest Plan. The 1987 Regional (USFS R1) Special Order required that any nourishing substance (excluding baled hay and water) for humans, pets and livestock be acceptably stored under specified criteria. Further, the 1987 order required that harvested wildlife carcasses be managed to reduce potential human/grizzly bear interaction. The 1987 special order required attractant manage in the area delineated as the recovery zone for the Yellowstone grizzly bear population, currently recognized as the PCA.

In 2000, area restrictions for attractant management were issued for those portions of the Madison Landscape not included in the 1987 Special Order. The 2000 Area Restriction Order identified the primary goal of the order was to "minimize grizzly bear/human encounters and thereby provide for user safety and protection" of the then-threatened species. The 2000 order also revised key definitions and the period the year when restrictions are in place, extending the restriction period 1 month earlier and 10 days later in the year.

In 2004, the BDNF instituted mandatory attractant management on the Gravelly and Tobacco Root landscapes following the general principles of the earlier two orders in place on the Madison landscape. The 2004 order expanded the definition of items requiring acceptable storage to include human health care products, refined the definition of animal carcass and clarified the intent of "acceptable storage".

In 2006, the Beaverhead Forest Plan was amended with the 2006 Forest Plan Amendment that institutionalized the 2003 Conservation Strategy. The BDNF 2009 Revised Forest Plan adopts the attractant management direction from the 2003 Conservation Strategy as follows:

2006 Forest Plan Amendment standard for food storage: *Inside the PCA, minimize grizzly bear/human conflict using food storage, information and education and other management tools.*

2006 Forest Plan Amendment guideline for food storage: *Outside the PCA in areas identified in state management plans as biologically suitable and socially acceptable for grizzly bear occupancy, emphasize proper sanitation techniques, including food storage orders, information and education, while working with local governments and other agencies.*

Currently, the BDNF has three separate attractant management orders in place with slightly different required criteria and restriction dates, all within the portion of the BDNF

in the Greater Yellowstone Area and not within Action Area A. All three attractant management orders are actively enforced. The 2009 Revised Forest Plan specifically calls for implementing food storage and sanitation orders in areas classified as occupied grizzly bear habitat as Wildlife Objective 1:

Grizzly Bear Conflicts: *implement food storage and sanitation orders in areas classified as occupied grizzly bear habitat.*

Attractant management is not currently required in Action Area A. Dispersed camping may occur essentially anywhere on the BDNF in Action Area A. The nature of dispersed camping limits the opportunity to reach forest users with comprehensive information about sanitation and safe behavior in grizzly bear habitat, and limits the Forest Services' ability to provide food storage infrastructure. Experience in the YGBE leads us to believe that education and infrastructure can reduce potential conflicts stemming from attractant management mishaps. Typically, backcountry and dispersed site visitors are somewhat more aware and better informed about potential conflicts with grizzly bears. We recognize, however, that there is potential for conflict between grizzly bears and humans through dispersed camping and that there is the potential habituation and/or food conditioning to occur anywhere in Action Area A.

Montana Fish, Wildlife and Parks Region 3 captured 170 black bears in management captures[3] over the 9-year period from 2003 through 2011. Analysis of MFWP data determined that management capture of a black bear was the result of an average of 7 call or incidents for approximately 1190 black bear incidents in MFWP R3 over the 9 year period. The majority of management captures involved black bears seeking/encountering unnatural foods (Frey 2012)[4]. While most of these management captures were on private land, black bear incidents have and will continue to occur on NFS lands in Action Area A.

Food conditioning of black bears has occurred in several locations in or adjacent to Action Area A in the last 5 years. In 2007, for example, the BDNF instituted temporary food storage requirements at Sawtooth and Dingley lakes in the Pioneer Landscape following an incident in which black bears showed aggressive behavior associated with a food reward. Also in 2007, the BDNF temporarily closed Mussigbrod Campground in the Big Hole Landscape because of aggressive black bear behavior. With grizzly bears extending in to Action Area A from the YGBE and NCDE, it is likely that conflicts between grizzly bears and humans will occur over time. The potential for conflict between grizzly bears and humans is also likely to increase as the density of grizzly bears increases in Action Area A. The potential for conflict would be substantially reduced if attractant management was effectively implemented across Action Area A.

[3] Management captures typically result in removal of the bear from the population.
[4] Unfortunately, similar information is not readily available for MFWP R2. This is a reflection of the timeliness of the information request of the BDNF, not the lack of data or the willingness of MFWP to provide it.

The BDNF is proposing to implement a Forest-wide attractant management order in 2014. As described below, the BDNF is developing attractant management infrastructure in Action Area A in preparation for the 2014 order.

D2 Developed Sites

There are numerous developed sites in Action Area A. For the purpose of this analysis, we consider campgrounds, cabins available for public rental, picnic area and trailheads with facilities as developed sites on the BDNF. The potential for conflict between grizzly bears and humans is highest where humans have attractants for extended periods of time, such as campgrounds and camp areas

There are 108 Forest Service developed sites in Action Area A, as summarized in table D2a. Note that there are 54 camp grounds or camp areas in Action Area A. In this analysis, sanitary facilities, specifically the modern equivalent to a pit toilet, at locations where the public regularly camps are identified as *camp areas.* Typically, camp areas do not have picnic tables, established fire rings or other infrastructure in addition the sanitary facility. While conflicts between humans and grizzly bears could occur at any developed site, camp grounds and camp areas are the most likely locations for conflict for several reasons. The duration that attractants such as food, refuse, hygiene products and game meat is present on a seasonal and annual basis is long in campgrounds and camp areas. Some bears may become habituated to the relatively constant presence of humans and human activity in campgrounds and camp areas. Habituation may lead to grizzly bears approaching areas with concentrated human activity more readily than would otherwise occur. The potential for grizzly bears to receive a food reward is substantially higher in campgrounds and camp areas than other developed sites. All campgrounds and camp areas currently allow tent camping. Human food and hygiene products are generally more readily available to grizzly bears when they are in tents rather than a hard-sided container or vehicle.

Table D2a. Developed sites in Action Area A

Landscape	***Cabins***	***Camp grounds/areas***	***picnic sites***	***Trail heads***	***Total***
Big Hole	5	10	1	6	**22**
Boulder River	0	4	5	1	**10**
Clark Fork Flints	3	10	8	1	**22**
Jefferson River	1	3	2	1	**7**
Lima-Tendoy	2	4	0	0	**6**
Pioneer	2	16	2	6	**26**
Upper Clark Fork	1	1	3	1	**6**
Upper Rock Cr	3	6	0	0	**9**
Total	**17**	**54**	**21**	**16**	**108**

Cabins are generally less of a potential point of conflict, as food, hygiene products and refuse can be contained in the cabin. However, cabins are generally small and are often rented by parties that are larger than the cabin can comfortably accommodate.

Cabin sites may be points of moderately high human activity during the summer season, and thus potential sites for conflict. .

Picnic sites are less likely points for conflict, as picnic areas are typically intended for day use only. Food at picnic area is generally closely attended during the period of use of the site. Trailheads that are not associated with camp grounds, camp areas or picnic sites are generally the least likely points of conflict between grizzly bears and humans due to the transient nature of trailhead users.

Food storage infrastructure is currently available at only a few developed sites in Action Area A, most notably at campgrounds in the Upper Rock Creek, southern half of the Pioneer and in the Lima-Tendoy landscapes. Over the next two years, however, food storage infrastructure will continue to be installed at developed sites in Action Area A. See Table D2b.

Table D2b Attractant management infrastructure in Action Area A

Campground	***Landscape***		***Campground***	***Landscape***
Price Creek	Pioneer		May Creek*	Big Hole
Grass Hopper	Pioneer		East Fork*	Upper Rock Creek
Dinner Station*	Pioneer		Copper Creek*	Upper Rock Creek
East Creek	Lima-Tendoy		Stony*	Upper Rock Creek
Reservoir Lake	Big Hole		Spillway*	Upper Rock Creek
Mussigbrod*	Big Hole		Orofino*	Upper Rock Creek
Miner Lake*	Big Hole		Flint Creek*	Clark Fork-Flints
Twin Lake*	Big Hole			

*denotes infrastructure to be installed in 2012

Note that none of the campgrounds listed in Table D2b are in the Boulder River Landscape or the adjoining Upper Clark Fork and Jefferson River landscapes. Table D2a identifies 4 campgrounds in the Boulder River Landscape and an additional 4 between the Upper Clark Fork and Jefferson River landscapes. Section A4, above, describes grizzly bears moving southward onto the BDNF in the Boulder River and Upper Clark Fork landscapes. The four campgrounds in the Boulder River landscape and the four campgrounds in the adjoining Jefferson River and Upper Clark Fork landscapes are high priorities for food storage infrastructure and Be Bear Aware education.

Food storage/attractant management is not currently required in Action Area A. However, informative signing recommending food storage//attractant management has been available for and in place in most developed sites in Action Area A since 2010. Also, developed sites on the BDNF are generally *pack it in, pack it out,* which means that there are no garbage facilities at developed sites. This, in some ways, is a two edged sword. While not having institutional refuse collection generally means that refuse attractants aren't stored, even temporarily, on NFS lands, it also means that some visitors will leave refuse at undesirable locations. For good reason, forest visitors

are reluctant to use food storage infrastructure that contains garbage or is malodorous to store food.

There are no planned reductions for developed sites in the 2009 Revised Forest Plan.

D3 Summary of Potential Effects of Attractant Management and Developed Sites and Determination

As grizzly bears expand in to Action Area A from the YGBE and NCDE, the potential for conflict between grizzly bears and humans increases. Dispersing camping provides many opportunities for humans and grizzly bears to come into contact. Developed sites are the most likely places where grizzly bears and humans can come into contact and where the potential for conflict is the highest. Most developed sites in Action Area A do not have food storage/attractant management infrastructure, and food storage/attractant management is not currently required in Action Area A. There will be no enforceable attractant management order in place until 2014. To our knowledge, however, there have been no conflicts between grizzly bears and humans in Action Area A to date.

At the end of 2012, we anticipate that 15 camp areas in Action Area A will have attractant management infrastructure available for the visiting public. The remaining 34 campgrounds/ camp areas will not have attractant management infrastructure entering the 2013 field season. There is no attractant management infrastructure in place in campgrounds in the Boulder River or Upper Clark Fork landscapes where we know we have grizzly bears moving on to the BDNF. None of the landscapes in Action Area A have a full complement of bear resistant infrastructure in each campground/camp area.

Determination With no active attractant management order in effect, and only 28 percent of the campgrounds/ camp areas in Action Area A with attractant management infrastructure available to the visiting public, there is a moderate and increasing potential for conflict between grizzly bears and humans. Conflict will likely be resolved to the detriment of the grizzly bear.

The environmental baseline as established by the 2009 Revised Forest Plan and implemented such that camping at dispersed sites and the continued use of developed sites in Action Area A without attractant management regulation and infrastructure **may affect, {and is} likely to adversely affect the threatened grizzly bear.**

Section E LIVESTOCK GRAZING

E1 Environmental Baseline

The 2009 Revised Forest Plan used two related concepts to analyze the capacity of the landscape for livestock grazing and the appropriateness of areas of the landscape for livestock grazing. These concepts are *Capability* and *Suitability*, as described in the Forest Service Manual (FSM 1905).

Capability *is the potential of an area of land to produce resources, supply goods and services and allow resource uses under an assumed set of management practices and a given level of management intensity*.

Suitability *is the appropriateness of applying certain resource management practices to a particular area of land as determined by an analysis of the economic and environmental consequences and alternative uses foregone.*

Table E1a describes the capable and suitable acres in Action Area A.

Table E1a. Capable and Suitable acres in Action Area A.

Landscape	***Capable Acres***	***Percent of Landscape***	***Suitable Acres***	***Percent of Landscape***
Big Hole	69,000	13	62,000	12
Boulder River	37,000	16	27,000	12
Clark Fork Flints	78,000	21	64,000	17
Jefferson River	44,000	23	44,000	23
Lima Tendoy	178,000	48	173,000	47
Pioneer	106,000	18	79,000	14
Upper Clark Fork	13,000	16	12,000	15
Upper Rock Creek	27,000	10	22,000	8
Total	*552,000*	*21*	*483,000*	*19*

Source: 2009 Revised Forest Plan Final Environmental Impact Statement

Note that all of the acreage figures in table E1A are very generalized and rounded to the nearest 1000 acres. This represents the coarse nature of these data and illustrates the intended use of the information generated by these models. Models of this nature are intended for broad scale or *coarse filter* analysis and are rarely appropriate for scales smaller than the landscapes of the BDNF. Site specific analyses are required for smaller scales of planning, such as developing allotment management plans. The allotment management planning process incorporates and refines the estimates of capability and suitability using site specific analysis of on the ground conditions.

There are approximately 189 active livestock allotments in Action Area A. Of these, 187 are cattle and horse allotments; generally these are stocked with cow/calf pairs, though

some are stocked with yearling cows. Two allotments in Action Area A are stocked with domestic sheep. Table E1b describes allotments in Action Area A.

Table E1b

Landscape	***Cattle/Horse***		***Sheep***		Permitted Numbers*
	Allotments	***Acres***	***Allotments***	***Acres***	
Big Hole	29	324,199			5238
Boulder River	17	203,537			2451
Clark Fork Flints	32	183,192			3490
Elkhorn	1	33,390			344
Jefferson River	16	170,645			3040
Lima Tendoy	41	280,884	2	11,696	7919/1203
Pioneer	27	364,351			6070
Upper Clark Fork	19	69,448			740
Upper Rock Creek	15	197,397			1420
		1,827,043			30,712/1203**

*permitted numbers are the number of cow calf pairs permitted on the allotment; **cattle/sheep.

As described in Table E1b, about 75 percent of the land area of Action Area A is within an actual livestock allotment. This does not mean, however, that 75 percent of Action Area A is actively grazed by livestock. Livestock allotments are generally delineated using naturally-occurring boundaries and landscape features such as watershed divides and ridgelines. Lower allotment boundaries are often the national forest boundary at or near the valley bottom. A substantial portion of delineated livestock allotments may be physically unavailable to cattle or may be timbered and producing little forage.

The area in livestock allotments has not changed substantially over the last three decades, though some allotments have been closed. What has changed since the 1980s era Beaverhead and Deerlodge forest plans is the expectation that domestic livestock grazing would remain static in the number of permitted animals, or the number of permitted would increase through the decades of the 1990 and 2000. The 1980s era plans predicted potential stocking rates of 191,000 Animal Unit Months[5] (AUMs) for the Beaverhead and 64,000 AUMs on the Deerlodge for a total of 255,000 AUMs. The permitted use under the 1980s era plans was 254,600 AUMs. Table E1c outlines the trend in livestock numbers over the last 67 years,

[5] The Forest Service defines AUM as the amount of forage required to sustain a 1000 pound animal for 1 month.

Table E1c. Annual Livestock Numbers on the BDNF		
Year	***Cattle***	***Sheep***
1945	45,870	139,194
1960	45,650	79,208
1965	45,020	69,541
1985	59,042	21,309
1990	56,932	21,579
1995	53,504	12,550
2003	49,492	15,750
Source: 2009 Revised Forest Plan Corrected Final Environmental Impact Statement		

As described in Table E1C, cattle use on the BDNF has remained fairly constant. From the 1970s through the 1990s, 8,000 to 14,000 more cattle grazed on NFS lands of the BDNF than the 3 decades prior and the decade following. It is unclear why this occurred, but the increase in cattle numbers does correspond to the period where the Beaverhead and Deerlodge national forests were harvesting substantially more timber than today or in the decades prior. Timber harvest using even-aged harvest techniques often results in a rapid increase in graminoid growth with increasing insolation and moisture availability. The increase also corresponds with a general reduction in the number of sheep grazed on NFS lands. Some sheep allotments were converted to cattle allotments during this period, resulting in increased numbers of cattle in the BDNF. We also note that the increase in cattle numbers was not limited to the Beaverhead and Deerlodge national forests, but occurred across Region 1 of the Forest Service. This suggests that there may have been an institutional change in the manner in which cattle were counted. Unfortunately, corporate memory can't confirm any of these hypotheses.

From 2001 through 2003, the annual use of BDNF allotments averaged 177,278 AUMs, 30 percent lower than the actual use that occurred under the 1980s plans. The 2009 Revised Forest Plan adopted the actual use from 2001 through 2003 (177,278 AUMs) as the base level of livestock use going forward.

In 2007, the BDNF initiated an annual review of livestock allotments on the Beaverhead portion of BDNF where conditions are biologically suitable and socially acceptable for grizzly bears. This is the scale established for secure habitat and livestock grazing monitoring under the 2006 Forest Plan Amendment. There are currently 148 active allotments on the Beaverhead portion of the Forest, 10 are inactive (vacant) and 22 are closed. Nine of the active allotments are sheep allotments. Seven of these are on the Gravelly Mountains; two are in the Tendoy Mountains. None of these sheep allotments are located in the Deerlodge portion of the BDNF, the northern portion of Action Area A north of the Big Hole landscape (Figure A2a)

As of June, 2012, the BDNF has had few confirmed depredations on livestock from grizzly bears. The few depredations have been in the Gravelly Landscape, outside of Action Area A. There have been no documented grizzly bear depredations in the landscapes in Action Area A.

E2 Summary of Potential Effects of Livestock Management and Determination

Livestock management under the 2009 Revised Forest Plan will maintain the existing number and distribution of allotments. Two of these allotments are grazed by domestic sheep. No increase in livestock numbers is anticipated under the 2009 Revised Forest Plan.

Livestock management as conducted under the 2009 Revised Forest Plan improves upon grazing management that occurred under the 1980s era Beaverhead and Deerlodge Forest Plans. Potential impacts from livestock grazing are anticipated to be discountable. Livestock Grazing as conducted under the 2009 Revised Forest Plan **may affect, {but is} is not likely to adversely affect the threatened grizzly bear.**

Section F ENVIRONMENTAL IMPACT STATEMENT RECORD OF DECISION ON OIL AND GAS LEASING

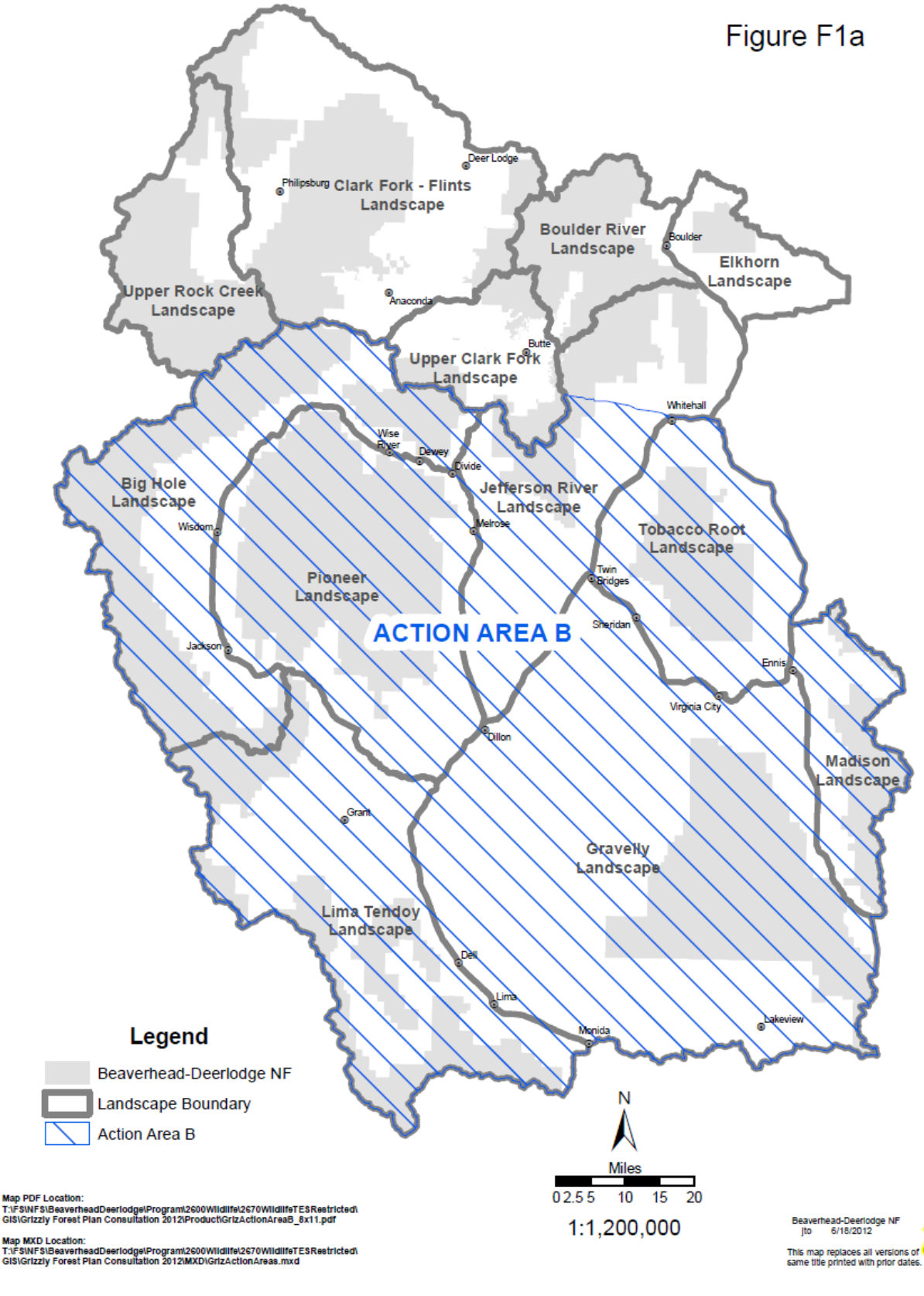
Section F identifies and analyzes potential actions associated with leasing parcels of NFS land for oil and gas exploration and development as described in the 2012 Oil and Gas Record of Decision (ROD). This ROD incorporates data and analysis from the 1995 *Beaverhead National Forest Oil and Gas Leasing Final Environmental Impact Statement* and associated ROD and from the 2009 *Beaverhead-Deerlodge National Forest Land and Resource Management Plan Corrected Final Environmental Impact Statement.* The BDNF reviewed the pertinent sections of both of these analyses to determine if changed conditions warranted further environment review and prepared a supplemental information report (SIR) in 2012. The 2012 Oil and Gas ROD will be the third from the forest planning process on the Beaverhead-Deerlodge National Forest (BDNF) that began in 2003, and is scheduled to be released in 2012.

The Beaverhead National Forest consulted with the USFWS on the 1996 Oil and Gas ROD. The BDNF determined that implementation of the 1996 Oil and Gas ROD may affect (but is) not likely to adversely affect the threatened grizzly bear in the Yellowstone Grizzly Bear Ecosystem. In 1995, grizzly bears on the Beaverhead National Forest were essentially limited to the Yellowstone Recovery Zone and Lee Metcalf Wilderness on the Madison Ranger District on the south east side of what is now the BDNF. In 1995, very little occupied grizzly bear habitat was available for oil and gas leasing.

F1 Action Area B

Action Area B is specific to Section F of this biological assessment. Action Area B differs from the action area of the previous sections. The action area for consultation on the 2012 Oil and Gas ROD is the former Beaverhead National Forest, including the Anaconda, Beaverhead, Pioneer and Tendoy mountain ranges. The action area also includes the Madison, Gravelly and the southern portion of the Tobacco Root mountains which are in the Yellowstone Grizzly Bear DPS. See Figure **F1a**. This analysis describes the action area as the **Beaverhead portion of the BDNF**.

Figure F1a



Map PDF Location:
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Map MXD Location:
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Beaverhead-Deerlodge NF
jto 6/18/2012

This map replaces all versions of same title printed with prior dates.

F2 Proposed Action

The 2012 Oil and Gas ROD would make two primary decisions:

- The decision to amend the 2009 Forest Plan, pages 27-28, and Appendix B to include four new species-specific stipulations to address species that have been added to the R1 Sensitive Species list since the January 14, 2009 signing of the FP ROD. Minor editorial changes were also made to pages 27-28 and Appendix B to provide clarity. The edits do not change the intent of the protections required by the Forest Plan.

- The decision designating which lands will be made administratively available for oil and gas leasing on the Beaverhead portion of the BDNF in Montana (36 CFR 228 Subpart E, 228.102(d)). This decision requires potential lessees to accept lease stipulations established in Appendix B of the 2009 BDNF Revised Forest Plan to mitigate potential impacts to surface resources resulting from anticipated oil and gas activities.

The 2012 Oil and Gas ROD does not:

- Authorize site specific exploration or development for oil and gas. If and when parcels are leased on the southern BDNF, lessees must work through the Application for Permit to Drill (APD) at which time the agencies (USFS and BLM) would conduct site-specific analysis following procedures under the National Environmental Policy Act (NEPA) on the proposed drill location and actions. See *Staged Oil and Gas Decision Making and Phased NEPA*, below.

Staged Oil and Gas Decision Making and Phased NEPA Oil and gas development incorporates a decision process that requires three steps.

- First, the federal land management agency, in conjunction with the Bureau of Land Management, identifies areas that are available for leasing and establishes lease stipulations governing the use of these areas (according to the Mineral Leasing Act of 1920, The Mineral Leasing Act for Acquired Lands of 1947 and the Federal Onshore Oil and Gas Leasing Reform Act of 1987). Identifying lease areas and stipulations is conducted under NEPA and decisions related to lands open for leasing and stipulations are, most often, documented in a Record of Decision.
- Second, when interest in leasing is expressed, the BLM delineates individual lease parcels. Stipulations required by the leasing decision are applied to parcels. BLM state offices hold four or more lease sales per year. Leases are awarded to the highest bidder at the sale or, if competitive interest is lacking, on a non-competitive basis following the sale.
- Third, following award, lessees may submit an *Application for Permit to Drill* (APD) which contains the site specific plan of operations. The BLM and the federal land management agency review the APD and, using a second stage of

NEPA processing, develop conditions-of-approval within the terms of the lease. The resulting Permit to Drill contains site specific requirements for ground-disturbing exploration and development.

The projected 2012 Oil and Gas ROD will complete the first phase of the staged decision process.

Oil and Gas Potential There is potential for oil and gas development on the BDNF. Earlier analysis conducted by the Deerlodge National Forest (the northern portion of what is now the BDNF) determined that, based on the underlying volcanic geologic strata, there was a nearly nonexistent potential to locate oil and gas reserves. On the Beaverhead portion of the BDNF however, moderate potential exists in some areas, and there is a low to very low potential under much of the southern BDNF.

Most of the Beaverhead portion of the BDNF is in the Montana Thrust Belt Province, which consists of numerous thrust sheets and intrusive bodies. Areas of interest for oil and gas leasing include the Blacktail Salient Oil Play which includes a portion of the Tendoy Mountains and the Tertiary Basin Oil and Gas Plays contained in the Big Hole Valley. In addition, the Beaverhead River Basin and the upper Ruby River Basin are believed to contain sediments with source and reservoir potential.

Permits and leases to companies for oil and gas exploration have been issued for federal land in southwest Montana in the past. During the 1980s, most available land on the Beaverhead portion of the BDNF was leased; all 1980s era leases have since lapsed. Though several wells were drilled in the vicinity of the Beaverhead portion of the BDNF during this period, only three were on the Forest, all three were dry and all three have been reclaimed. A few new leases were issued after the 1996 Oil and Gas ROD, but these leases too have since lapsed.

The 1995 Beaverhead Reasonable Foreseeable Development Scenario (see Section F3) predicted that 14 wells would be drilled on the Beaverhead portion of the BDNF over a 15 year period. No wells have been drilled on the southern BDNF following the 1996 Oil and Gas ROD to date. As oil prices rose in 2007, twelve parcels were leased on the southern BDNF. As of November 2007, there were 27 authorized federal oil and gas leases on all ownerships in Beaverhead and Madison Counties covering 36,384 acres.

The 1996 Oil and Gas ROD identified lands available for leasing and stipulations that would apply to available lands. Subsequent analysis for the 2009 Revised Forest Plan revised some elements of the 1996 Oil and Gas ROD, and the 2012 SIR reviewed land availability and stipulations to verify the appropriateness and local applicability of the stipulations. The following list outlines the categories of stipulations from the most restrictive to the least restrictive:

- **Not Available** (NA) Whether legally or administratively unavailable, the area will not be leased;
- **No Surface Occupancy** (NSO) This stipulation allows leasing, but use or occupancy of the surface for fluid mineral exploration or development is prohibited;

- **Timing Limitation** (TL) This stipulation prohibits fluid mineral exploration and development activities for certain time periods;

- **Controlled Surface Use** (CSU) This stipulation is to be used when fluid mineral occupancy and use are generally allowed on all or portions of the lease area year-round, but because of special values or resource concerns, lease activities must be strictly controlled. The CSU stipulation is used to cover leasing of inventoried roadless lands due to lawsuits regarding what kind of activities may or may not take place in these areas.

Standard lease terms, (ST) are applicable to all lands approved for leasing. Stipulations are listed and described in Appendix B of the revised plan.

Table F2a, below describes the development potential on the southern BDNF.

Table F2a Development potential in the action area.

Stipulation and Potential	**1996 O&G (acres)**	**2009 RFP (acres)**
Legally Unavailable Mod & Low Potential	244,000	348,200
Legally Unavailable Very Low Potential	268,000	258,000
Administratively Unavailable Mod and Low potential	*	5,900
Administratively Unavailable Very Low Potential	*	4,700
No Surface Occupancy Moderate & Low Potential	329,000	326,000
No Surface Occupancy Very Low Potential	150,000	413,700
Timing Limitation Moderate & Low Potential	**	1,700
Timing Limitation Very Low Potential	**	400
Controlled Surface Use Moderate & Low	474,000	311,600
Controlled Surface Use Very Low Potential	268000	474700
Total Acres- Action Area	2,149,000	2,144,900

*legally and administratively unavailable areas combined in 1996 EIS.
** Timing limitations not included in 1996 EIS. SOURCE 2009 Revised FEIS P. 336-Table 79

Table F2b. Acreage Changes Between 1996 Decision, 2009 Plan Decision (with updated resource data) and 2012 O&G Decision			
Availability or Stipulation	***1996 O&G Decision***	***2009 Plan Decision with Updated Resource Data***	***2012 O&G Decision – Includes Updated Resource Data and Plan Amendments***
Legally Unavailable for Lease	512,000	592,926	592,926
Administratively Unavailable		10,595	10,595
No Surface Occupancy	479,000	732,370	732,411
Controlled Surface Use	742,000	802,289	807,058
Timing Limitation	*	3,065	2,380
Standard lease Terms	416,000	16,050	11,924
Total Beaverhead Acres	2,149,000	2,157,294	2,157,294
*Timing limitation combined with CSU for 1996 decision. Data from 1996 Decision: Beaverhead Oil & Gas Leasing FEIS, page 11-8. SOURCE: Proposed 2012 O&G ROD			

Several key changes have occurred in the potential for oil and gas leasing between the 1996 Oil and Gas ROD and the proposed 2012 Oil and Gas ROD. The number of acres legally available for leasing declined 14 percent as a result of the land allocation decision reached in the second ROD (2010) from the 2009 Revised Forest Plan. The area in stipulations would increase by 21 percent with the 2012 Oil and Gas ROD from leasing conditions established by the 1996 Oil and Gas ROD. In general, these changes represent increased sensitivity to resources other than oil and gas exploration and development in the Beaverhead portion of the BDNF.

F3 Reasonably Foreseeable Development Scenario

The 1995 Oil and Gas EIS described a Reasonable Foreseeable Development Scenario (RFDS) that estimated the number of wells that could be expected to occur on the Beaverhead portion of the BDNF over the 15-year planning window of the 1996 Oil and Gas ROD. This RFDS portrays a scenario in which 14 wells are drilled in dispersed areas across the Beaverhead portion of the BDNF. Of nine exploratory wells, all but two are dry. One of the two producing wells produces oil, the other gas, both in relatively small quantities. Five additional wells are drilled to fully develop the small oil and gas discoveries. The following area-specific scenarios, headed by the corresponding mountain range, are from the 1995 Oil and Gas Leasing EIS:

- **Gravelly Range** (Gravelly Landscape) This is the portion of the Beaverhead Forest with the largest area of moderate development potential, and the part

likely to experience the most drilling. Because of the amount of moderate potential, 2 wildcat wells are expected in the Ruby Basin subplay of the Gravelly Range. One of those wells is expected to make a minor oil discovery in the neighborhood of 2 million barrels (ultimate). Two additional development wells are expected to fully develop the field. At the level of development described above, about 4.7 miles of new access routes would be developed in the Gravelly Mountains.

- **Snowcrest Range** (Gravelly Landscape) Two wildcat wells are also expected in the moderate-low development potential area of the Snowcrest Range, within the Snowcrest Subplay within the forest. For analysis purposes, both are assumed to be dry holes. At the level of development described above, about 0.7 mile of new access route would be developed in the Snowcrest Range.

- **Madison Range** (Madison Landscape) The Lee Metcalf Wilderness has a very low development potential ranking, the lowest rating, because it is off limits to leasing and development by an act of Congress. Because no leasing is authorized in the wilderness and the proximity of the low potential area to the wilderness areas, no wells would occur, and no new access routes would be required.

- **Tobacco Root Range** (Tobacco Root Landscape) The entire Tobacco Root Range is ranked very low for oil and gas development due primarily to the Precambrian rocks and Tertiary volcanics exposed at the surface, which are thought to extend into the basement. Some land may be leased, but no wells are expected to be drilled and no new access routes would be required.

- **Pioneer Range** (Pioneer Landscape) There is no high or moderate development potential in this portion of the forest which is partly a reflection of the lack of historical drilling activity in this part of the forest. The complexities of delineating the deep structural traps that are likely present, the depth and associated high cost of drilling a well, and the complicated environmental mitigation that is sure to be associated with any proposed drilling, also affect the development potential of this area. As a result, this area is only likely to experience sporadic wildcat drilling over the next 15 years, provided the FS authorizes leasing. It is anticipated that one wildcat well would be drilled in the low development potential area of the Pioneers, and it is predicted to be a dry hole. The well will probably be in the low development area on the east side of the Pioneers where seismic activity was concentrated in the 1980s. At the level of development described above, about 1.25 mile of new access routes would be developed in the Pioneer Range.

- **Tendoy Mountains** (Lima-Tendoy Landscape) The Tendoy Mountains were not included in a U.S. Geological Survey oil and gas play at the time of the last national assessment. However, gas shows reported in the Amoco Snowline Federal well, a deep overthrust test that Exxon drilled just across the border in

Idaho, warrant at least a moderate potential ranking for part of the Tendoy Mountains. Two wildcat wells are forecast for this part of the Tendoy Mountains, one a dry hole, the other a minor gas discovery (a 140 BCF field). Two to three development wells would have to be drilled to fully delineate the field.

The low development potential portion of the Tendoy Mountains near the Amoco McKnight Canyon well will also see some sporadic wildcat drilling over the next 15 years. Two wildcats will be drilled, but for analysis purposes they are both forecast as dry holes. At the level of development described above, about 18.15 miles of new access routes would be developed in the Tendoy Mountains.

- **Beaverhead/Bitterroot[6] Ranges** (Big Hole Landscape) Most of this area is rated very low development potential, and the remaining area is ranked low. No wells are expected to be drilled here in the next 15 years. However, because this range is within the Sevier Overthrust Belt, there may be leasing interest, despite the very low/low development potential of the ranges. No new access routes would be required.

- **Anaconda Range** (Big Hole Landscape) The Anaconda Range contains the southern portion of the Anaconda-Pintler Wilderness. The Anaconda-Pintler Wilderness has a very low development potential ranking, (the lowest rating), as it is off unavailable for leasing and development due to its wilderness status. No wells would be drilled in the Anaconda Range. No new access routes would be required.

We recognize that actual exploration and development may differ substantially in location and outcome from the scenario described above. However, given the parameters outlined in Section 6C, we anticipate the intensity of development would be similar to that described above.

In 2005, the BLM reevaluated the oil and gas occurrence potential for Madison and Beaverhead Counties as part of their RFDS for the Dillon Resource Management Plan. The BLM modifications for the occurrence potential mapping were incorporated into the 2009 Revised BDNF Forest Plan, and inform the 2012 Oil and Gas ROD. Dillon Field Office RFDS changed the boundaries of the areas mapped as moderate or low potential, and did not add any areas of high potential. The overall oil and gas potential for the Beaverhead portion of the BDNF as described by the 2005 BLM RFD is similar to the 1995 Oil and Gas Leasing EIS, in that lands in the action area are primarily low or very low potential for occurrence of oil and/or gas with some areas of moderate potential.

Since the 2005 BLM analysis and the 2009 BDNF Revised Forest Plan decision, the petroleum industry has developed more unconventional formations and zones (USDI USGS 2012). Unconventional formations include methane bearing coal zones, gas or

[6] The Beaverhead Mountains are south of the Bitterroot Mountains, but have been called the *Southern Bitterroot Range* and simply the *Bitterroot Mountains.* This analysis used the Beaverhead Mountains.

oil bearing shale zones, gas hydrates, or "tight gas" in low porosity or permeability traditional zones. Specific to southwest Montana, the following four items further describe the potential for unconventional formations underlying the BDNF:

1. A review of the prospective formations in the vicinity of the southern BDNF does not indicate a presence of significant coal zones (USDI USGS 2006) in general. The USGS's Fact Sheet FS-123-00, *Coal-bed methane: Potential and Concerns* does not map any coal bed methane potential in the Beaverhead area of southwest Montana (USDI USGS 2012b).

2. The Energy Information Administration (EIA) compiled information on the oil or gas shale plays in the lower 48 states. The study shows that southwestern Montana is not included in one of the hydrocarbon rich shale plays (EIA 2011).

3. A third source of unconventional gas is gas hydrates. Since hydrates are encountered in off-shore drilling or in Arctic situations (USDI USGS 2012c), there is a very low to no potential for occurrence in the southern BDNF area.

4. Montana Board of Oil and Gas Generalized Stratigraphic Correlation Chart cross-section (MBOG 2012) for hydrocarbon bearing formations shows a variety of traditional sandstone or carbonate formations may be potential traps for oil or gas. If oil or gas is discovered in the formations that were the targets of the prior drilling on the Beaverhead portion of the BDNF or are producing formations in other parts of Montana, there is a possibility that these more traditional formations may be called unconventional because of low porosity or permeability.

Technology Advances Two technology advances have been increasingly used since the 2009 Revised BDNF Forest Plan was completed. These advances are horizontal drilling and hydraulic fracturing. While hydraulic fracturing has been a technique used by the oil and gas industry since the 1940s, the intensity of action and quantity of materials used has increased as drill holes have grown deeper and longer.

If oil and/or gas are discovered on the Beaverhead portion of the BDNF and if geologic conditions warrant, horizontal drilling and hydraulic fracturing may be proposed as part of the development. These actions are described in depth in the *BDNF Oil and Gas Leasing Decision RFDS and Oil and Gas Scenario Review* (2012 Oil and Gas Scenario Review) prepared for the 2012 BDNF Oil and Gas Leasing ROD. The 2012 Oil and Gas Scenario Review is used extensively in the following discussion.

The surface use aspects of horizontal well drilling are very similar to the surface use aspects of vertical well drilling. Wells drilled horizontally may require larger drill pads and may require a longer development period than vertical wells that reach similar formations at similar depths. Though the drill pad size may increase if horizontal drilling is required, drill pad examples at current sites on the Little Missouri National Grasslands in North Dakota are within the range of drill pad sizes evaluated in the 1995 Oil and Gas

EIS. Horizontal wells on the Little Missouri National Grasslands currently require an average drill pad size of about 5 acres. The estimated drill pad sizes analyzed in the 1995 Oil and Gas EIS range from 2 to 8 acres, which captures the average size of actual drill pads in current development in the Little Missouri National Grasslands where horizontal drilling and hydraulic fracturing are used. See Table F3a.

Table F3a. Comparison of RFDS parameters from the 1995 O&G EIS and actual drilling actions on the Little Missouri Nat'l Grasslands (LMNG)

Operation	LMNG Information	1995 Oil and Gas EIS	Comparison
Pad size	Under 5 acres	Between 2 to 8 acres with an average for analysis of 5 acres	Increased pad size is within the scope analyzed in the 1995 FEIS.
Drilling time	18 to 45 days	90 to 300. Average 200 days	Drilling times have decreased over the last 15 years.
Time to complete the fracture stimulation	2 to 5 days	Included in general drilling operations	Time to drill plus run the fracture stimulation is within the estimated drilling time.
Water needs for fracture stimulation	1.68 to 2.0 million gallons	Not analyzed	
Vehicle traffic needed for fracture stimulation/well	280 to 440 truckloads	Not analyzed	

Source- 2012 Beaverhead-Deerlodge NF Oil and Gas Leasing Decision RFDS and Oil and Gas Scenario Review.

Other surface factors estimated in the 1995 Oil and Gas EIS also coincide with current development practices in use on the Little Missouri National Grasslands. Wells drilled on the Little Missouri National Grasslands are similar in depth to the deepest predicted wells in the 1995 Oil and Gas EIS. Since the 1995 Oil and Gas EIS, drilling technology has shortened the time needed to drill a vertical well. The projected drilling time for horizontal wells is now equal to or shorter than the drilling times predicted for a vertical well in 1995. As such, most impacts associated with horizontal drilling are within the range of impacts predicted for vertical wells in the 1995 Oil and Gas EIS. Other

potential impacts such as visuals, noise and access needs within the same range as evaluated in 1995 Oil and Gas EIS.

Current hydraulic fracturing operations differ somewhat from the Well Stimulation actions described in the 1995 Oil and Gas EIS. One of the primary differences between Well Stimulation and the current action of hydraulic fracturing is the amount of water used. Hydraulic fracturing operations can use 0.5 to 5 million gallons of water at each well site during the short duration of the fracturing process. While oil and gas exploration requires vehicle access to establish the access route and drill pad, construct the drilling apparatus and associated infrastructure, transporting water to the drill pad for hydraulic fracturing would result in a substantial pulse of large truck traffic for a short period.

Fluid flowing back after the fracturing can carry treatment chemicals and oil, gas or brine from the deep formations. The water source, handling, and disposal are regulated or controlled by multiple agencies. Specific decisions about hydraulic fracturing are part of Application for Permit to Drill (APD) process when specifics about well location, target formations and season of drilling are known to the Agencies. If the APD's NEPA analysis shows that there will be an unacceptable impact from using surface or ground water from NFS lands or from the proposed disposal plan, the use or disposal plan can be denied. The operator would have to buy or obtain water from off-Forest sources and transport that water to the site via NFS roads.

Hydraulic fracturing produces post-fracturing fluids (flowback water) that may be reused at other hydraulic fracturing sites or, as waste, be disposed of. The operator would be required acceptably treat the flowback water or dispose of the water in a state or EPA approved disposal well or site. The disposal plan would be required to provide for protection of federally-managed resources as well as meet state requirements.

State and BLM regulations require specified actions to prevent fracturing fluid or flowback water from entering usable and accessible drinking water. In general, bore holes are lined with casing and the casing cemented in place to the depth of and below the usable and accessible drinking water location. The BLM and state regulate and monitor the down-hole portion of oil and gas exploration and development.

The 1995 Oil and Gas EIS and corresponding ROD developed the initial RFDS for the Beaverhead portion of the BDNF. The 2009 Revised BDNF Forest Plan modified the 1995 leasing landscape by increasing the number of acres on the Beaverhead portion of the BDNF where the No Surface Occupancy, Timing Limitation and Controlled Surface Use stipulations would apply. The 2012 Oil and Gas Scenario Review evaluated the 1995 Oil and Gas EIS RFDS in light of new advances in technology, finding that the 1995 RFDS was still applicable to the Beaverhead portion of the BDNF. The 2012 Oil and Gas Scenario Review strongly supports that the RFDS for the Beaverhead portion of the BDNF is a realistic view of potential future oil and gas development.

F4 Potential Adverse Effects to Grizzly Bears

Oil and gas exploration and development on the Beaverhead portion of the BDNF is likely to be similar in scope and intensity as described under section 6c, above. Potential effects of oil and gas activity to grizzly bears may occur from several aspects of oil and gas exploration and development. In general, we consider oil and gas development similar to the development and use of developed sites as described under Section D, above, and the construction and use of motorized routes as described under Section C. The 1987 *Grizzly Bear Compendium* (IGBC 1987) identified those items in Table F4a as potential impacts of oil and gas activity and road development. In general, two specific mechanisms of impact may occur: 1) habitat loss, and 2) disturbance to bears from human related activities.

Table F4a. Potential impacts of oil and gas activity on grizzly bears*	
1	Construction or upgrading of roads providing increased access into grizzly bear habitat and consequent escalation of human activities
2	Increased human activity related directly to project construction or maintenance, resulting in avoidance/displacement of grizzly bears away from roads and road activity
3	Increased availability of artificial attractants (especially garbage) and possibly increased legal and illegal grizzly bear mortality due to 1 and 2 above
4	Possible displacement or disruption of normal behavior patterns (including denning, movements and habitat use) due to increased human activity, construction, operation of industrial equipment or habitat modification
5	Direct habitat loss due to road construction, buildings, etc.
6	Increased aircraft disturbance
7	Direct mortality from road kills, legal and illegal harvest and other factors resulting from increased human-bear encounters
8	Changes in grizzly bear behavior, especially habituation, due to ongoing contact with roads and road activity
*Adapted from the 1987 Grizzly Bear Compendium.	

Habitat Loss We are using the Reasonably Foreseeable Development Scenario as the basis for our analysis of habitat loss, and assuming that full development at all sites occurs simultaneously. Though simultaneous development is unlikely, we use this to characterize the intensity and temporal extent of activities associated with oil and gas exploration and development. We assume that access routes would be constructed to a width of 22 feet to accommodate heavy equipment traffic, and that substantial improvement of portions of other NFS roads would be required. We also assume that drill pads would be constructed at the maximum size described in the 1995 Oil and Gas EIS and displayed in Table F3a. Further, we assume that oil and gas exploration and development would occur under the stipulations that would be established in the 2012 Oil and Gas ROD, which represent increased sensitivity to resources other than oil and gas exploration and development in the Beaverhead portion of the BDNF. In addition,

we assume that grizzly bear populations continue to expand on to the BDNF from the Yellowstone Grizzly Bear and Northern Continental Divide ecosystems.

The RFDS estimated that approximately 25 miles of new road would be constructed in three landscapes of the Beaverhead portion of the BDNF. For the analysis of the influence of roads (and the traffic thereon) on wildlife, the BDNF uses a linear distance of 1760 feet from the edge of the road. This distance exceeds the 500 meter distance used to delineate secure habitat in the 2003 *Final Conservation Strategy for the Grizzly Bear in the Yellowstone Ecosystem,* providing a slightly wider buffer area for effects analysis.

Using the 1760 feet buffer width and applying this width to both sides of the theoretical road 22 feet in width, each mile of road constructed for oil and gas exploration and development would result in an estimated 429 acres where grizzly bear use could be reduced or not occur. This analysis considers these acres unavailable to grizzly bears.

With simultaneous development, 25 miles of road would be constructed at various locations over three landscapes of the Beaverhead portion of the BDNF. Using the 429 acres of grizzly bear habitat per mile that would become unavailable, construction of 25 miles of routes would result in about 10,800 acres that would be unavailable to grizzly bears between the Gravelly, Lima-Tendoy and Pioneer landscapes as a result of access route construction.

The construction and operation of drill pads would also reduce available habitat for grizzly bears. Assuming an 8 acre drill pad size and using the 1760 feet buffer, each drill pad would make approximately 331 acres unavailable for grizzly bears. The RFDS would construct 14 drill pads, resulting in about 4,650 acres of habitat unavailable for grizzly bears as a result of construction and operation of the drill pads. This number may overestimate the area that would be unavailable, as 4 or more of the wells would be confirmation wells which may be close to or within the 331 acre polygon around the initial well. None the less, we will use the 4,650 acre size for this analysis.

The combined area of the three landscapes in which the RFDS predicted oil and gas exploration and development would occur is 1,4307,787. The estimated 10,800 acres (roads) and the 4650 acres (drill pads) that would become unavailable to grizzly bears with simultaneous implementation of the actions described in the RFDS would make 1.1 percent of the combined area of the three landscapes unavailable. See Table F4b.

The RFDS described exploration and development on three different landscapes. Table F4b describes the acres of habitat that would be unavailable for grizzly bears and the percentage of the land area of each landscape that would be unavailable with oil and gas exploration and development as described in the RFDS. Note that on the Lima-Tendoy Landscape where oil and gas development is the highest in the RFDS, the combined actions in the RFDS result in 3 percent of the land area becoming unavailable for grizzly bears.

Table F4b. Area unavailable in the Gravelly, Lima-Tendoy and Pioneer landscapes with simultaneous development of the RFDS.			
Landscape	***Area (acres)***	***Acres unavailable***	***% Unavailable***
Gravelly	474,454	4688	1%
Pioneer	583,379	870	0.2%
Lima-Tendoy	372,954	9954	3%
Total Acres	*1,4307,787*	*15,512*	*1.1%*

Oil and gas exploration would add motorized routes to the landscape. Table F4c describes the miles of access routes that would be constructed under the RFDS. Note that total access route construction for oil and gas development does not appreciably increase the open motorized road and trail density (OMRTD) in any landscape.

Table F4c. Access roads & changes to OMRTD				
Landscape	**Mi^2**	**OMRTD***	**RFDS Roads (miles)**	**Percent increase in OMRTD**
Gravelly	741	0.7	5.4	0.007
Pioneer	912	1.5	1.25	0.001
Lima-Tendoy	504	1.0	18.15	0.04
*2009 RFP FEIS				

The Reasonably Foreseeable Development Scenario estimates that two of the exploration wells- one in the Gravelly Mountains and one in the Tendoy Mountains- would produce oil or gas. Seven other exploration wells would be dry- not capable of producing a recoverable product. The most likely scenario would be that the drilling of each well would require about 5 months from the time the site is located on the ground to well completion. When drilling is completed and the well is found to be dry, the well would be capped, the drilling infrastructure removed and the access route to the site and the drill pad reclaimed. For dry wells, drilling, capping and pad/access route reclamation could be accomplished in a 5-month period. The footprint of the area that is unavailable to grizzly bears is substantially reduced within a few months.

Completion of the drilling phase of production wells would be followed by drilling additional confirmation wells at one or more locations proximate to the production well. These confirmation wells are intended to identify the extent of the recoverable product and may be drilled simultaneously. The RFDS identifies 3 confirmation wells at the Tendoy Mountains location and two development wells at the Gravelly Mountain site. Once these confirmation wells are completed and infrastructure removed, gas wells are capped and the site reclaimed if dry and if productive, they may lie idle until a pipeline is completed to the well. The familiar oil pumping apparatus is constructed at productive oil wells, and the pumped oil is contained near the well head in storage tanks. When these wells go into production, parts of the drill pad that are no longer needed are

reclaimed. For production wells, start-up to well completion also requires about 5 months.

In general, once the well is drilled and the derrick or apparatus is removed, activity at the site declines dramatically. Over time & with reduced human activity, grizzly bear use of the area would again occur.

Disturbance to Grizzly Bears from Human Related Activities Table F3a identifies actions associated with well drilling. Each of these actions is directly associated with human activities in the general vicinity of the actual areas of oil and gas leasing. The above analysis isolated these activities from grizzly bears by assuming that the area containing the activity was already unavailable to bears due to the level of human activity.

Table F3a highlights the number of large trucks that are required for hydraulic fracturing at well sites. In the Little Missouri National Grasslands in North Dakota, up to 440 truckloads of water and fracturing fluids are required during the 2 to 5 day fracturing operation. Assuming 440 trucks over a 5 day fracturing period, 88 large water hauling trucks would travel two-ways over existing NFS roads and through potential or currently occupied grizzly bear habitat. Associated support vehicles would also use these routes during the short hydraulic fracturing period described in Table F3a. Grizzly bears and other wildlife would likely be displaced from areas adjacent to routes used for access during the hydraulic fracturing process and other periods of concentrated oil and gas activities, including derrick construction and derrick disassembly and removal.

Potential adverse effects to grizzly bears may occur through elevated use of the Forest transportation system outside of those routes that have been specifically created for oil and gas drilling. Moving large drilling apparatus and tank trucks would require a substantial upgrade to segments of forest roads used to access drill pads and access roads. Widening turn radiuses, extending sight distances, widening narrow sections of NFS roads all would increase the de facto design speed of these motorized routes, which will lead to increased traffic speed. The increase in design speed of NFS routes is a long-term change in habitat conditions for grizzly bears.

During the production phase of two sites where production does occur, activities at the individual well heads, at storage tanks and along associated pipelines would be substantially less than during the development phase. Should oil be found and wells go to production, each well will likely be checked daily to ensure proper operation. Gas well operation is generally easier to monitor as remote, computerized monitoring is more applicable, though gas wells are generally visited each month. Oil from wells is generally transferred to and stored in tanks associated with the individual well, though oil storage is not necessarily in the immediate vicinity of the well head. Oil from these tanks must be removed fairly regularly, based on the rate of production and volume of the tank. We assume that oil from production well heads transferred to and stored in tanks would be removed monthly.

Access to each well would be required during the entire period the well is in operation. Daily inspections/maintenance of oil wells would likely require that access to oil wells would be via plowed roads during the snow season.

F5 Summary of Potential Effects to Grizzly Bears and Determination

Habitat Loss During the initial period of exploration, grizzly bears would be displaced from habitat in areas surrounding the drill pads and access routes associated with the individual wells. Under the Reasonably Foreseeable Development Scenario, approximately 15,500 acres would be made unavailable to grizzly bears given the assumptions outlined above. These acres represent about 1.1 percent of the NFS land area of the three landscapes where the RFDS suggests exploration and development would occur.

Over time, the area unavailable to grizzly bears would be reduced with reclamation of drill pads and access roads associated with dry wells, and the reduction in the size of the drill pad needed when producing wells go to production. Similar to other developed sites, well heads, storage tanks and other infrastructure would have continuous, though not constant, human activity. Human activity would result in habitat not being available to grizzly bears to some extent for the duration of the well.

Disturbance to Grizzly Bears from Human Related Activities We recognize that habitat loss in the context used in this analysis is directly related to human use. We consider *Disturbance to Grizzly Bears from Human Related Activities* in addition to those actions that result in habitat being unavailable to grizzly bears.

The extensive use of the NFS transportation system for access and transport outside of the area that would be unavailable to grizzly bears has the potential to result in short and long-term adverse impacts to grizzly bears. We anticipate that the RFDS would result in periods of very high use of the NFS transportation system at various times during the exploration and development process. Further, use of the transportation system for the actions identified in Table 6c1 would lead to an increase in the de-facto design speed of NFS routes used. Increased traffic elevates the potential for conflict between humans and bears, and increased design speed heightens the potential for bears to be struck by vehicles, resulting injury or mortality.

High levels of human activity in grizzly bear habitat can lead to habituation and possibly food conditioning. Grizzly bears may adjust to elevated levels of human activity. This results in humans and bears interacting more frequently, and bears coming closer to developed sites. Frequent interaction between bears and humans often results in conflict. Conflict directly between humans and grizzly bears often leads to defense of life mortality in bears. Habituation of bears to human activities may last the life of the bear, indicating that conflict between humans and individual bears may extend well beyond the period of oil and gas exploration.

On specific landscapes of the Beaverhead portion of the BDNF, all forest users are required to manage attractants- food, refuse, personal hygiene products etc.- such that they are unavailable to bears. At this time, the Gravelly, Madison and Tobacco Root landscapes have such requirements. In other landscapes in the Beaverhead portion of the BDNF, forest users will be required to manage attractants as described above in 2014. These landscapes are the Tendoy, Beaverhead, and Pioneer mountains and the Anaconda Range. Until 2014, attractant management is only recommended in these landscapes. Should oil and gas exploration or development occur in areas where attractant management is not required and grizzly bears occur, the potential for food conditioning is elevated. Food conditioning is conflict between grizzly bears and humans, and as mentioned above, conflict between humans and grizzly bears, specifically where food conditioning has occurred, often leads to mortality loss of the bear.

Table F4a, above identifies aircraft use as on potential mechanism of impact to grizzly bears from oil and gas exploration and development. The RFDS does not include any aspect of aircraft use. We do not anticipate the use of aircraft to be important in the potential for oil and gas development on the Beaverhead portion of the BDNF.

Determination The area available for oil and gas leasing and the stipulations that would be on those acres that are available for oil and gas leasing that would be established with the 2012 Oil and Gas ROD substantially reduce the spatial extent and intensity of potential oil and gas exploration and development on the Beaverhead portion of the BDNF. These changes in the area available for oil and gas exploration/development and the stipulations associated with those acres that are available for oil and gas exploration/development work toward minimizing potential effects to bears.

The potential for oil and gas development on the Beaverhead portion of the BDNF is low. The Beaverhead portion of the BDNF does not contain the oil and gas bearing formations that have driven extensive development in other parts of North America. Earlier exploration and test wells have failed to locate recoverable oil and gas, though exploration on the Beaverhead portion of the BDNF has not been extensive.

This analysis has identified several potential mechanisms that may result in adverse effects to grizzly bears with oil and gas exploration and development. Section F2, above described the three phases of the phased NEPA decision process. We are currently in the initial - leasing - phase of the process, and recognize that actions proposed under the Application for Permit to Drill phase may lead to adverse effects to grizzly bears. Specifically, extensive upgrade and use of the NFS transportation system to and around oil and gas development sites and other actions of this or similar intensity, may result in adverse effects to grizzly bears. For the reasons identified above, however, we cannot say that oil and gas development is reasonably certain to occur, and thus cannot say that adverse effects associated with these actions is reasonably certain to occur. As such, the decision to lease lands with stipulations on

the Beaverhead portion of the BDNF **may effect**, (but is) **not likely to adversely affect the threatened grizzly bear**.

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