

## ISSUE 10: GRIZZLY BEAR

### Changes from the Draft to the Final EIS

Information about standards for developed sites and motorized route densities is given in more detail in the Affected Environment section. A new table, Table 3.10.2.b, was added to this section to address the effects of non-Forest Service routes on route densities in the bear subunits.

Due to receiving a number of comments on the effects of grizzly bears and snowmobiling, the Winter Motorized Use portion of the Affected Environment section of this Issue was significantly expanded.

A map of the Grizzly Bear Management Units and Subunits and Travel Planning Areas on the Gallatin National Forest was added (see Figure 3.10.1).

Under Direct and Indirect Effects, in the Methodology section, the Cumulative Effects Model (CEM), Access model is explained in greater detail. The basic difference among the 7 alternatives is explained in greater detail than in the DEIS, and Alternative 1 is the alternative best used for comparison with the other alternatives. In discussions with other agency biologists, there was a desire to see the effect of project and administrative road treatment under the Alternatives 2 through 7-M. Under full implementation of all the Alternatives 2 through 7-M, project roads will disappear, and administrative routes will be gated to the public with the exception of a few that will become ATV and/or motorcycle routes (and are treated as motorized in this analysis). We were able to display administrative roads as gated such that there is a difference between TMARD and OMARD for subunits where administrative roads exist. Under Alternatives 2 through 7-M, in subunits where there are administrative roads, there is a difference between TMARD (Total Motorized Access Route Density) and OMARD (Open Motorized Access Route Density) with OMARD density figures being lower since these routes are closed to the public. TMARD counts all roads, while OMARD drops administrative roads. Use of administrative roads is limited and should not be viewed the same as a road that is open to the public, and administrative roads are gated. The motorized route density categories of most interest to agencies involved in grizzly bear management are when TMARD is greater than 2 mi/sq mi and when OMARD is greater than 1 mi/sq mi (ICST 2003). The higher the density of public motorized routes, the less likely a grizzly bear is to use an area.

It should be noted that the calculations for each subunit include the acreage under adjacent federal management, such as other National Forests and Yellowstone National Park. Because of this, it is correct to compare only the numbers across Alternatives 1 through 7-M. Alternative 1 is the closest to CEM but usually does not match those numbers exactly. Alternative 2 shows the effects of closing project roads. In addition, this analysis counts all road jurisdictions (Federal, State, County and private) in the OMARD and TMARD calculations just as the CEM Access model does.

Between Draft and Final EIS, a more thorough literature review was conducted by Tyers (2006) and is summarized in a section entitled *Overview of the Effects of Motorized and Non-Motorized Use on Grizzly Bears*.

The cumulative effects section has been enlarged and is more thorough (see Cherry, 2006, Cumulative Effects Worksheet in the Project Record for this issue).

Information was added to Alternative 3 and Alternative 7-M on proposed backcountry landing strips for aircraft.

Alternative 7 was removed from analysis and discussion and Alternative 7-M was added.

Some seasonal motorized route restrictions specifically related to grizzly bears were included.

## **Introduction**

The issue of travel management is important to the conservation of the grizzly bear, a species currently listed as threatened under the Endangered Species Act. The grizzly bear is known to be sensitive to the effects of access management, especially as related to motorized use. Grizzly bears tend to avoid areas used by motorized vehicles (McClelland and Shackleton 1988, Kasworm and Manley 1989, Mace et al. 1996, Wiegus et al. 2002). This section addresses the potential effects of summer motorized use and winter motorized use on grizzly bears. There are more studies of the effects of motorized use on bears than of non-motorized use. Because of this, the effects of non-motorized use are discussed in less detail.

## **Affected Environment**

### **Background on Motorized Access and Grizzly Bears on the Gallatin National Forest**

In general, grizzly bears occur throughout that portion of the Gallatin National Forest south of Interstate 90. In 1996, the Gallatin National Forest amended the Forest Plan for Access in the Grizzly Bear Recovery Zone (Amendment #19). This Amendment was intended to bring motorized access management on the Forest more in line with current science, and removed much of the previous access management direction related to grizzly bears from the Gallatin Forest Plan (USDA 1987) in relation to grizzly bears. The basis of the amendment was a 1995 Biological Opinion from the US Fish and Wildlife Service (USDI 1995). The crux of Amendment 19 is that the Forest would manage human motorized access in the Recovery Zone (Primary Conservation Area, ICST 2003) to help meet the goal of grizzly bear recovery. Standards would be to adopt Yellowstone Park access standards when they become available. In the interim, the Forest would manage bear subunits (unless allowed through consultation with the US Fish and Wildlife Service) for:

- 1) No increase in open motorized access route density (OMARD) from the current level.
- 2) No increase in total motorized access route density (TMARD) from the current level.
- 3) No decrease in core (secure) area from the current level.

A guideline is to utilize the best available technology to analyze human access and its effects on the grizzly bear in the Recovery Zone for motorized access.

The Conservation Strategy for Grizzly Bear in the Yellowstone Ecosystem (ICST 2003) was developed by the Interagency Conservation Strategy Team and completed in March 2003. The three Regional Foresters managing Forests in the Greater Yellowstone Area, the three Directors of State Fish and Game agencies and Bureau of Land Management signed a Memorandum of Understanding (ICST 2003:12-13) to seek implementation of the Grizzly Bear Conservation Strategy. The Conservation Strategy is currently undergoing a NEPA process that will amend it to the Forest Plans of Forests in the Yellowstone area and will replace most, if not all, of their current Forest Plan direction for grizzly bears.

The direction in the Conservation Strategy (ICST 2003) clarifies motorized access direction, and bases it on the most recent science. The Conservation Strategy (2003) direction was used in this issue to assess the effects of travel management on grizzly bears. Amendment #19 (1996) and Biological Opinion of the USFWS (1995) stated that the Gallatin National Forest was to adopt Yellowstone access standards when they became available. The Conservation Strategy makes these standards available. The Forest Service will be undergoing consultation with the US Fish and Wildlife Service during this travel management planning process that will cover all Threatened and Endangered species in relation to travel management. In addition, if the access standards for the grizzly bear change during the Conservation Strategy amendment process for Greater Yellowstone Area Forests, those standards would then become direction.

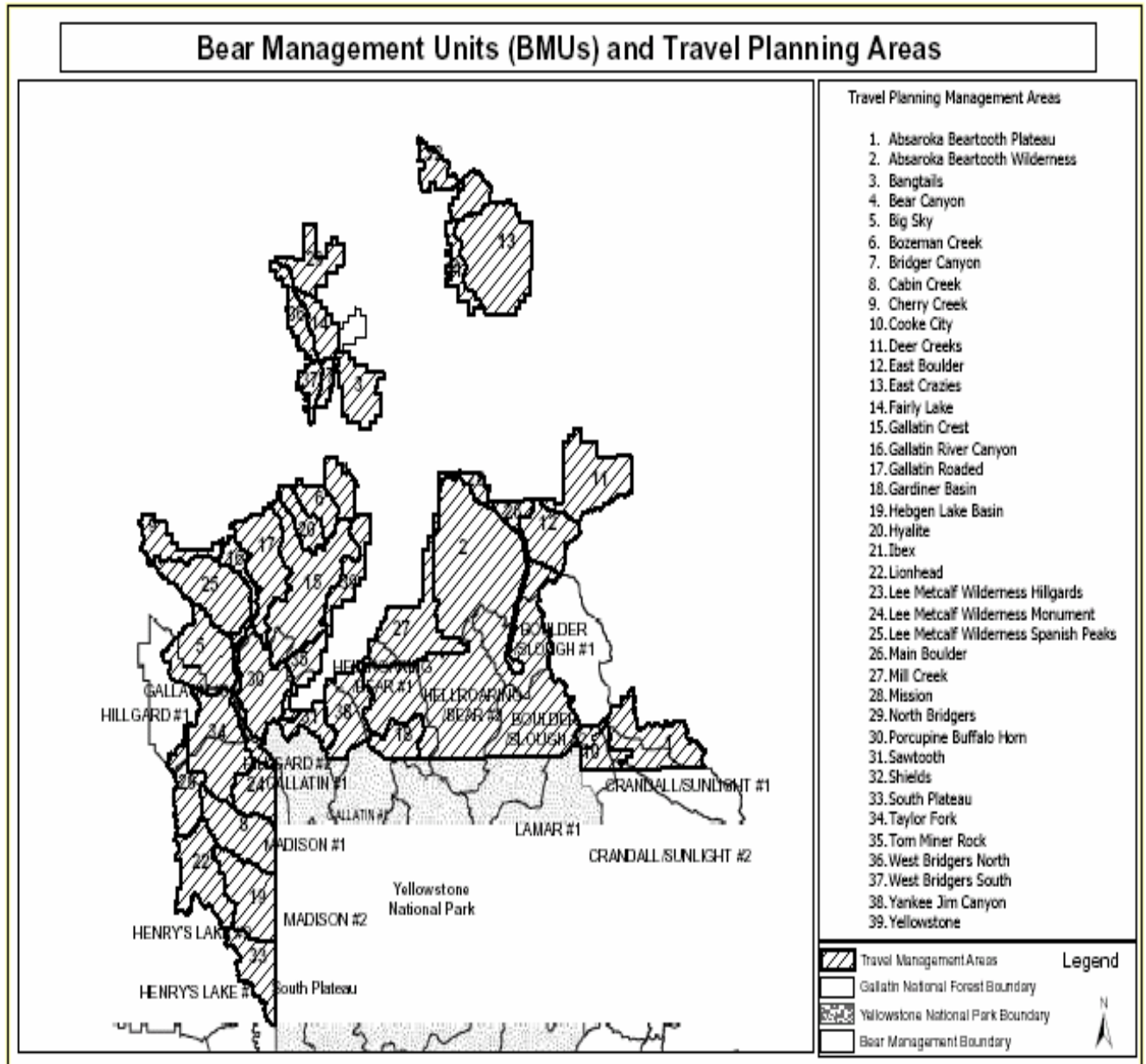
The standard for access management in the Conservation Strategy is to “*maintain secure habitat in bear management subunits at or above 1998 levels*” (ICST 2003:39). **Secure habitat** is defined as any area more than 500 m from an open or gated motorized access route (Table 3.10.1). The year 1998 was chosen as the baseline because this was the access level at which the grizzly bear population recovered. Some deviations are allowed under specific conditions. This direction applies only to the Recovery Zone (Primary Conservation Area). The rule set for projects is found in the Conservation Strategy (ICST 2003:41) (Table 3.10.1). There are three subunits designated as needing improvement: Henry’s Lake #2, Gallatin #3 and Madison #2. These lie at least partially on the Gallatin National Forest (Figure 3.10.1).

It should be noted that the Conservation Strategy (2003) also has a standard for a 1998 baseline for the number of developed sites within the Recovery Zone (PCA). If new developed sites are proposed, they must be mitigated for within the subunit. For travel management planning, this direction relates most directly to fact that trails are linked to trailheads that may often be developed sites. This document does not address trailhead development, but it should be kept in mind that there are some constraints in the PCA. This direction also relates to the development of backcountry airstrips which are proposed under Alternative 3 and considered in Alternative 7-M. For the Recovery Zone as proposed in Alternative 3, these would be new developed sites, and they could be associated with an increase in motorized route density and a reduction in secure habitat. If any backcountry airstrips are going to be developed in the Recovery Zone, they would have to be mitigated for within the same subunit. There are three proposed backcountry airstrips in the PCA under Alternative 3. They are Horse Butte (Madison #2 subunit), South Plateau (Plateau #1 subunit), and Ferrell Lake (Gallatin #3 subunit). Alternative 7-M excludes airstrips from portions of the Forest including the Recovery Zone.

Additional information from the Draft EIS for Forest Plan Amendments for Grizzly Bear Conservation for the Greater Yellowstone Area National Forests (p. 36, USDA FS, 2004) indicates

that habitat monitoring items include secure habitat, OMARD greater than one mile/square mile, and TMARD greater than 2 miles/square mile. These route densities are of the greatest concern to the US Fish and Wildlife Service because they are the densities at which bears seem to experience more difficulty moving through the landscape.

**Figure 3.10.1 Grizzly Bear Management Units and Subunits and Travel Plan Areas for the Gallatin National Forest.**



**Table 3.10.1 The rule set for secure habitat management in the Yellowstone Primary Conservation Area (Recovery Zone) (ICST 2003:41).**

Criteria	Definition
Software, Database and Calculation Parameters	ARC INFO using the moving window GIS technique (Mace et al. 1996), 30 m pixel size, square mile window size and density measured as mi/sq mi. Motorized access features from the Cumulative Effects Model (CEM)* GIS database
Motorized Access Routes in Database	All routes having motorized use or the potential for motorized use (restricted roads) including motorized trails, highways, and forest roads. Private roads and state and county highways counted.
Season Definitions	Season 1 – 1 March to 15 July. Season 2 – 16 July to 30 November. There are no access standards in the winter season (1 December to 28 February).
Habitat Considerations	Habitat quality not part of the standards but 1) Replacement secure habitat requires equal or greater habitat value 2) Road closures should consider seasonal habitat needs.
Project	An activity requiring construction of new roads, reconstructing or opening a restricted road or recurring helicopter flights at low elevations.
Secure Habitat	More than 500 m from an open or gated motorized access route or reoccurring helicopter flight line. Must be greater than or equal to 10 acres in size. Replacement secure habitat created to mitigate for loss of existing secure habitat must be of equal or greater habitat value and remain in place for a minimum of 10 years. Large lakes not included in calculations.
Activities Allowed in Secure Habitat	Activities that do not require road construction, reconstruction, opening a restricted road, or reoccurring helicopter flights. Over-snow use allowed until further research identifies a concern.
Inclusions in Secure Habitat	Roads restricted with permanent barriers (not gates), decommissioned or obliterated roads, and/or non-motorized trails.
Temporary Reduction in Secure Habitat	One project per subunit is permitted that may temporarily reduce secure habitat. Total acreage of active projects in the Bear Management Unit (BMU) will not exceed 1% of the acreage in the largest subunit within the BMU. The acreage that counts against the 1% is the 500-m buffer around open motorized access routes extending into secure habitat. Secure habitat is restored within one year after completion of the project.
Permanent Changes to Secure Habitat	A project may permanently change secure habitat provided that replacement secure habitat of equivalent habitat quality (as measured by CEM or equivalent technology) is provided in the same grizzly subunit. The replacement habitat either must be in place before project initiation or be provided as an integral part of the project plan.
Subunits with Planned Temporary Secure Habitat Reduction	Secure habitat for subunits Gallatin #3 and Hilgard #1 will temporarily decline below 1998 values due to the Gallatin Range Consolidation Act. Upon completion of the land exchange and associated timber sales, secure habitat in these subunits will be improved from the 1998 baseline.
Subunits with Potential for Improvement	Access values for Henry’s Lake #2, Gallatin #3, and Madison # 2 have the potential for improvement. The quantity and timing of the improvement will be determined by the Gallatin National Forest Travel Management Plan.
Proactive Improvement in Secure Habitat	A proactive increase in secure habitat may be used at a future date to mitigate for impacts of proposed projects of that administrative unit within that subunit.
Exceptions for Caribou-Targhee National Forest	When fully adopted and implemented the Standards and Guidelines in the 1997 revised Targhee Forest Plan met the intent of maintaining secure habitat levels.

\*CEM DEFINITION- Cumulative Effects Model - a model for assessing effects of habitat and human activities on grizzly bears. The model includes a habitat routine and a disturbance routine. Habitat value is the innate value of the habitat for bears based on vegetation, cover, edge and protein sources. Habitat effectiveness is how effective the habitat is for bears after the inclusion of human activities.

Table 3.10.2a shows the relative size of the subunits, secure habitat, and how much of each subunit is in a situation where it is somewhat protected from the likelihood of additional motorized routes. It can be seen that some subunits have a lot of secure habitat and are likely to remain that way. Most of the largest subunits have quite a bit of Wilderness and National Park land within them. There are some subunits that have a low percentage of these protected areas and currently have a relatively low percentage of secure habitat. These include Henry’s Lake #2, Gallatin #3 and Madison #2 which are also the subunits “in need of improvement” because of a lower percentage of

secure habitat existing within the subunit. Other subunits that might be considered at some risk due to the lack of protected areas are Plateau #1, Hilgard #1 and #2, Crandall/Sunlight #1 and #2, and Hellroaring/Bear #1, however, these subunits currently have more than 69 or 70% secure habitat.

**Table 3.10. 2a Square miles of secure habitat in the subunits all or part on the Gallatin National Forest (numbers include private inholdings within Forest Service boundaries and all ownerships of roads, FS, NPS, BLM, state, county, private) as given in Conservation Strategy (ICST, 2003, p. 151). Subunits “in need of improvement” are highlighted.**

Subunit	Subunit Area (sq mi)	Total Secure Habitat (sq mi)	Percent Secure Habitat	Wilderness or Park Secure Habitat (sq mi)	Percent Secure as Wilderness or Park
Boulder Slough #1	282	272	96%	269	95%
Boulder Slough #2	232	227	98%	227	98%
Lamar #1	300	268	89%	256	85%
Crandall Sunlight #1	130	105	81%	57	44%
Crandall Sunlight # 2	316	260	83%	97	31%
Hellroaring/Bear #1	185	142	77%	101	55%
Hellroaring/Bear #2	229	228	100%	228	100%
<b>Gallatin #3</b>	<b>218</b>	<b>120</b>	<b>55%</b>	<b>8</b>	<b>4%</b>
Hilgard #1	201	140	70%	107	53%
Hilgard #2	141	100	71%	63	45%
Madison #1	227	163	72%	108	48%
<b>Madison #2</b>	<b>149</b>	<b>99</b>	<b>66%</b>	<b>94</b>	<b>63%</b>
<b>Henry’s Lake #2</b>	<b>140</b>	<b>64</b>	<b>46%</b>	<b>0</b>	<b>0%</b>
Plateau #1	286	197	69%	124	43%

Table 3.10.2.b shows the effects of non National Forest routes on the subunits lying all or in part on the Gallatin National Forest. This shows that the 3 subunits ‘in need of improvement’ are all fairly heavily impacted by non-Forest Service routes. For instance, if the Gallatin National Forest closed all of its routes in Henry’s Lake #2, there would still be 15% of the subunit that would not be secure habitat.

**Table 3.10.2.b. Effects of non-National Forest routes (private, state, and county) on Gallatin National Forest grizzly bear subunits (excerpted from p. 136, Conservation Strategy, ICST, 2003)**

Subunit	Non-FS OMARD % > 1 mi/sq mi	Non-FS TMARD % > 2 mi/sq mi	Percent Secure Habitat
Boulder Slough #1	2	0	97
Boulder Slough #2	0	0	100
Lamar #1	2	1	97
Crandall Sunlight #1	6	1	92
Crandall Sunlight # 2	8	1	89
Hellroaring/Bear #1	9	4	91
Hellroaring/Bear #2	0	0	100
<b>Gallatin #3</b>	<b>16</b>	<b>8</b>	<b>81</b>
Hilgard #1	6	2	91
Hilgard #2	2	3	93

Subunit	Non-FS OMARD % > 1 mi/sq mi	Non-FS TMARD % > 2 mi/sq mi	Percent Secure Habitat
Madison #1	6	3	94
<b>Madison #2</b>	<b>8</b>	<b>4</b>	<b>90</b>
<b>Henry's Lake #2</b>	<b>14</b>	<b>7</b>	<b>85</b>
Plateau #1	2	1	95

## Habitat Value and Habitat Effectiveness

Habitat value is the quality of the habitat for grizzly bears without taking any human activities into account. From the following Table 3.10.3, it can be seen that more than half of the habitat value in some subunits rates High Moderate value or above. Habitat value is a seasonal habitat value based on habitat characteristics of plant food, cover, edge and protein source (usually big game winter range). These include: Boulder Slough #1 and #2, Lamar #1, Hellroaring/Bear #1 and #2, Gallatin #3 and Hilgard #1 and #2. Of these subunits, Boulder Slough #2, Lamar #1, Hellroaring/Bear #1, Gallatin #3 and Hilgard #1 and #2 have secure habitat that is more than 50% High Moderate or above.

**Table 3.10. 3 Percent of six habitat value categories in each of the grizzly bear management subunits on the Gallatin National Forest. Six categories were determined from raw CEM habitat value outputs that provide relative comparisons across seasons. They are: VL = Very Low, L = Low, LM = Low Moderate, HM = High Moderate, H= High, VH = Very High. Excerpted from p. 143 of the Conservation Strategy (ICST 2003).**

Subunit	Habitat Value Category Percent of Subunit						Subunit Area (sq mi)	Habitat Value Category Percent of Secure Habitat						Total Secure Habitat (sq mi)
	VL	L	LM	HM	H	VH		VL	L	LM	HM	H	VH	
Boulder Slough #1	12	1	40	45	32	0	282	13	1	42	43	2	0	272
Boulder Slough #2	9	6	33	52	1	0	232	9	6	34	50	1	0	227
Lamar #1	4	2	26	68	1	0	300	4	1	25	70	0	0	268
Crandall Sunlight #1	10	34	43	11	2	0	130	11	35	42	10	2	0	105
Crandall Sunlight #2	5	30	34	30	1	0	316	4	32	34	29	1	0	260
Hellroaring/Bear #1	17	20	12	51	0	0	185	17	15	11	57	0	0	142
Hellroaring/Bear #2	21	5	26	47	2	0	229	21	5	26	46	2	0	228
Gallatin #3	18	17	13	51	1	0	218	21	12	12	55	1	0	120
Hilgard #1	19	12	18	51	1	0	201	20	10	19	51	0	0	140
Hilgard #2	13	8	17	61	1	0	141	15	8	13	64	1	0	100
Madison #1	4	12	52	21	10	2	227	5	12	58	17	8	1	163
Madison #2	2	6	69	19	3	2	149	0	4	79	14	2	1	99
Henry's Lake #2	7	19	26	46	2	1	140	9	17	24	50	0	1	64
Plateau #1	2	29	58	11	0	0	286	1	28	58	13	0	0	197

Table 3.10.4 shows the habitat effectiveness of each subunit throughout the bear year. Habitat effectiveness is a number derived from a combination of habitat qualities and types of human activity or disturbance in the area. It can be seen from this table that some subunits, like Boulder/Slough #1 have habitat effectiveness that is high relative to the other subunits throughout the year. Others, like Plateau #1 and Gallatin #3, do not have especially high habitat effectiveness values at any time of year. Many of the subunits only have good values in one or two of the four seasonal periods. By looking at the value by season, one can decide if seasonal route closures may be of benefit to the grizzly bear in certain subunits.

**Table 3.10. 4 Habitat effectiveness by season for subunits on the Gallatin National Forest from the Grizzly Bear Cumulative Effects Model. Subunits “in need of improvement” of secure habitat are highlighted. Excerpted from p. 141 of the Conservation Strategy (ICST 2003).**

Subunit	Spring 3/1 - 5/15	Estrus 5/16 - 7/15	Early Hyperphagia 7/16 - 8/31	Late Hyperphagia 9/1 - 11/30
Boulder Slough #1	105*	105	119	853
Boulder Slough #2	123	112	111	521
Lamar #1	127	118	136	571
Crandall Sunlight #1	53	94	78	800
Crandall Sunlight #2	52	82	124	329
Hellroaring/Bear #1	85	74	95	628
Hellroaring/Bear #2	117	99	98	628
<b>Gallatin #3</b>	<b>78</b>	<b>69</b>	<b>89</b>	<b>599</b>
Hilgard #1	99	68	91	614
Hilgard #2	81	97	132	902
Madison #1	53	115	227	329
<b>Madison #2</b>	<b>41</b>	<b>60</b>	<b>147</b>	<b>63</b>
<b>Henry’s Lake #2</b>	<b>41</b>	<b>41</b>	<b>33</b>	<b>614</b>
Plateau #1	26	49	36	109

\* Numbers for habitat effectiveness by season with higher numbers equating with greater value are calculated by computer program (ICST 2003 p.140). Habitat effectiveness is a relative measure of that part potentially derived from an area that is available to bears given their responses to humans.

## Overview of the Effects of Motorized and Non-Motorized Use on Bears

Tyers (2006) summarized recent literature on the effects of various types of uses on bears, focusing on grizzly bears. This information is presented in this Overview Section.

Various efforts have been made to aggregate and interpret abundant data related to the effects of human activities on grizzly bears. For example, the Interagency Grizzly Bear Committee, a consortium of state and federal managers, published the *Grizzly Bear Compendium* (1987), to review all available information on grizzly bear biology and management in North America through 1987.

In addition, Joslin and Youmans (1999) coordinated preparation of *Effects of Recreation on Rocky Mountain Wildlife* for the Montana Chapter of the Wildlife Society, the organization for professional wildlife biologists in Montana. It provides a Montana perspective on the ecology of a variety of wildlife species, including the grizzly bear, as well as insights into the development of



regional wildlife management policies (Claar 1999 *in* Joslin and Youman). In contrast to the *Compendium*, Joslin and Youman's review of grizzly bear management literature is less expansive but more contemporary. Specific to grizzlies, it briefly summarizes current knowledge on the effects to bears of motorized and non-motorized recreation, hunting, and structural developments.

These and other documents reveal that our understanding of the effects of human activities on grizzly bears has evolved, progressing with the addition of each new research finding. The grizzly bear was listed in 1975 under the Endangered Species Act. This initiated a sequence of increasingly sophisticated management strategies directed towards population recovery and enhanced by corresponding research. Associated studies were a successive response to the concerns expressed by agency personnel as the complexities of grizzly bear management emerged following listing.

When the grizzly bear was initially listed, mortality prevention was the primary focus for species conservation. However, subsequent recovery strategy iterations recognized habitat use, quality, and availability as important elements of grizzly bear management (Claar 1999 *in* Joslin and Youmans). The effects of human activities on bear displacement and mortality risk levels were prominent in grizzly bear conservation discussions while National Forest Plans were developed in the 1970s and 1980s.

Since the creation of the respective Forest Plans, substantial increases have occurred in the human population within and adjacent to the grizzly bear recovery area, along with a concomitant demand for recreation opportunities on public lands. These patterns necessitated commensurate grizzly bear management guidelines (Claar 1999 *in* Joslin and Youmans). In response, in 1986, the Interagency Grizzly Bear Committee outlined procedures for grizzly bear habitat maintenance and improvement, minimizing grizzly-human conflict potential, and resolving grizzly-human conflicts (Claar 1999 *in* Joslin and Youmans).

Off-highway vehicle (OHV) capabilities have become an additional factor to contend with in managing grizzly bear habitat. From the 1950s through the 1970s, land management agencies established road systems on public lands outside of wilderness to provide access to timber and mineral resources and to accommodate public use. However, in the interim, there have been major technological improvements to summer and winter OHVs. These machines have become easier to use and more reliable and affordable. Consequently, OHV use on public lands has increased along with concerns for the effects of this use on grizzly bears (Claar 1999 *in* Joslin and Youmans).

As stated earlier, research techniques addressing the effects of human activities on grizzly bears evolved parallel to the development of management strategies and practices. For example, a number of early studies (IGBC 1987, Claar 1999 *in* Joslin and Youmans) dealt with the effects of roads on grizzly bears and, to various degrees, universally showed negative impacts (Archibald et al. 1987, Mattson et al. 1987, McLellan and Shakleton 1988, Kasworm and Manley 1990). Geographic information systems technology allowed more recent studies to calculate precise estimates of road density and the response of grizzlies to these densities. The next generation of studies used multivariate analysis to examine the relationships among roads, habitat, and grizzly bear use at hierarchical levels. Most simply stated, these efforts indicated that the effects to bears are increasingly negative as road densities and traffic volumes increase (Claar 1999 *in* Joslin and Youmans).

Compared to assessments of grizzly bear response to roads, few studies reported the effects of motorized recreation on bears during the winter. Efforts to assess den abandonment resulting from over snow traffic are common to these studies, although data are limited. In addition, various authors express concern that physiological stresses could result in serious consequences to bears, with perhaps the greatest potential for disturbance from snowmobile activity occurring when females with cubs are still confined to the den vicinity during spring and when bears descend to more gentle terrain accessible to snowmobiles. However, again, data are limited. Almost no data are available on the effects of winter non-motorized human use on grizzlies (Claar 1999 *in* Joslin and Youmans).

Human activities apart from roadways and settlements have been another management consideration and research focus. Encounters between grizzly bears and people often occur in the backcountry on public lands. Similar to the road density studies, data on the impacts of human foot traffic on bears also indicate a negative relationship, although fewer studies quantify these effects. A common conclusion among these efforts is that the rate of fear-induced charges and consequent injuries is less where human activities are predictable and when trails are separated from preferred habitat (Claar 1999 *in* Joslin and Youmans).

The following sections break the effects out by season and type of use.

## **Summer Motorized Use**

Various efforts have been made to aggregate and interpret a plethora of data related to the effects of human activities on grizzly bears. For example, the Interagency Grizzly Bear Committee, a consortium of state and federal managers, directed preparation of the Grizzly Bear Compendium (IGBC 1987:145-148) to facilitate review of all available information on grizzly bear biology and management in North America through 1987.

In addition, Joslin and Youmans (1999) coordinated preparation of the Effects of Recreation on Rocky Mountain Wildlife for the Montana Chapter of the Wildlife Society. It provides a Montana perspective on the ecology of a variety of wildlife species, including the grizzly bear, as well as insights into the evolution of regional wildlife management policies. Compared to the Compendium, Joslin and Youman's review of grizzly bear management literature is less exhaustive but more contemporary. Specific to grizzlies, it briefly summarizes current knowledge on the effects to bears of motorized and non-motorized recreation, hunting, and structural developments.

These and other documents reveal that, when the grizzly bear was listed in 1975 under the Endangered Species Act, the primary focus for species conservation was mortality prevention. However, later species recovery strategies have recognized habitat use, quality, and availability as important elements of grizzly bear management (USDI 1982, 1993).

The effects of human activities on bear displacement and mortality risk levels assumed prominence in grizzly bear conservation discussions as National Forest plans were developed in the 1970s and 1980s. In 1986, the Interagency Grizzly Bear Committee provided guidelines for agencies to maintain and improve habitat, minimize grizzly-human conflict potential, and resolve grizzly

human conflicts. Since the creation of these documents, substantial increases have occurred in human population within and adjacent to the Grizzly Bear Recovery Zone along with a concomitant demand for recreation opportunities on public lands, a pattern that necessitates grizzly bear management guidelines commensurate with this phenomenon (Joslin and Youmans 1999).

Off-highway vehicle capabilities have become an additional factor to contend with in managing grizzly bear habitat. From the 1950s through the 1970s, land management agencies established road systems on public lands outside of Wilderness to provide access to timber and mineral resources and provide public access. However, in the interim, there have been major technological improvements to off-road vehicles (all-terrain, trail bikes, and snowmobiles). These machines have become easier to use, more reliable, and more affordable. Consequently, their use on public lands has increased along with concerns for the effects of this use on grizzly bears (Joslin and Youmans 1999).

Studies addressing the effects of human activities on grizzly bears have gone through several evolutions. A number of early studies (IGBC 1987, Joslin and Youmans 1999) addressed the effects of roads on grizzly bears and, to various degrees, universally showed negative impacts (Archibald et al. 1987, Mattson et al. 1987, McLellan and Shakleton 1988, Kasworm and Manley 1990).

There have been a number of studies on the effects of various types of routes (motorized roads and trails and non-motorized trails) on different types of wildlife species. Most studies have focused on big game species and grizzly bears. Results vary, but the most common theme seems to be that motorized routes generally displace elk and bears, and they use the habitat adjacent to motorized routes less than areas farther from these routes. Results vary somewhat with habitat quality, cover availability, traffic volume, season and some other variables. There are less studies on the effects non-motorized routes on wildlife species. There are also few studies comparing motorized roads to motorized trails.

Geographic information systems technology has allowed more recent studies to calculate precise estimates of road density and the response of grizzlies to these densities. For example, Mattson (1993) employed this technology in the Yellowstone area and recommended maximum road densities for grizzly bear habitat maintenance of 0.6 mi/sq mi with 0.26 mi/sq mi for home ranges of wary female bears. Similarly, in preliminary reports, Mace et al. (1996) concluded that bear use in the South Fork of the Flathead was significantly less than expected where open road density was >1mi/sq mi or total road density was >2mi/sq mi.

Mace et al. (1996) furthered their studies in the Flathead area by assessing bear habitat use at a landscape level, within the defined area of composite home ranges, and in relationship to roads with differing traffic volume. Most simply stated, this and other studies indicate that the effects to bears are increasingly negative as road densities and traffic volumes increase.

At the broadest scale, female grizzlies selected against private lands with high human and road densities (Mace et al. 1996). The relative probability of occurrence of bear activity was zero for these areas even though they contained high quality seasonal ranges including ungulate wintering areas and riparian habitat. Similarly, selection was greatest for unroaded cover types on multiple

use public lands and declined as road densities increased. For example, the relative probability of occurrence of grizzlies on the National Forest was negatively associated with increasing values of road density and declined to zero as densities approached 6.0 km/km<sup>2</sup> (Mace et al. 1996). Within a 0.5 km buffer around roads, the next level of habitat selection, bear responses differed by season and traffic volume. Few home ranges contained roads with traffic volumes of >60 vehicles/day, and most bears avoided roads having >10 vehicles/day. During all seasons, most individual bears exhibited neutral or positive selection for buffers surrounding closed roads and roads receiving <10 vehicles per day, implying that important habitat features such as avalanche chutes and cutting units occurred near these roads.

Analysis of bear habitat use at three spatial scales in relationship to roads demonstrated a common pattern (Mace et al. 1996). Avoidance of roads increased as road densities and traffic volumes increased. At all landscape levels, bear density declined as road density and traffic volume increased. Under certain habitat conditions and seasons, the positive attraction to specific cover types was stronger than the negative impacts of roads. Thus, in highly preferred seasonal habitats that tended to be open-canopied, grizzly bears would tolerate low levels of disturbance and would not abandon the habitat. In these circumstances, bears tolerated low levels of disturbance but their vulnerability to humans increased.

There was a relationship found between mortality of instrumented grizzlies and human activities (Mace et al 1996). From 1988 through 1994, humans killed eight marked grizzly bears in the study area. These deaths were directly influenced by road access through illegal killing and through management removal of bears conditioned to human foods in developed areas.

Mace et al. (1996) summarized by stating that grizzly bears can utilize roaded habitats, but spatial avoidance will increase and survival will decrease as traffic levels, road densities, and human settlement increases. They believe that the long-term survival of grizzly bears in the Swan Mountains in northwest Montana will depend on their ability to utilize and survive in lower elevation, mixed ownership habitats. Moreover, efforts to mitigate road effects through access restrictions on multiple-use lands would have limited value if habituation and mortality levels are not minimized on or adjacent to private land.

In response to their findings, Mace et al. (1996) recommended several management strategies. They advocated that road density standards and road closure programs incorporate seasonal habitat requirements of grizzly bears. Specifically, management should minimize road density and traffic volume in watersheds having highly preferred habitats. Consequently, based on local knowledge of grizzly bear habitat selection patterns, road density standards could then be relaxed to some degree in less suitable habitats, allowing increased public access while minimizing threats to the local grizzly bear population. Road access programs could include short-term access during periods when displacement impacts to grizzly bear are minimal.

McClelland and Shackleton (1988) found that most grizzly bears used habitats within 100 m of roads to a lesser degree than expected, which equated to an 8.7% habitat loss. The loss of this habitat was disproportionate to (greater than) its size because areas juxtaposed to roads contained high quality bear foods in spring and fall. They also concluded that bear avoidance of roads was independent of traffic volume, suggesting that even a few vehicles can cause displacement. This

conclusion is contrary to the findings of some other studies. Reduced use by grizzly bears of habitat within 100 m of roads did not differ among primary, secondary and tertiary roads.

Bear behavior reduced the effects of road-related habitat loss. Roads and nearby areas were used at night but avoided during the day (McClelland and Shackleton 1988). Darkness probably provided security cover, but traffic levels were also likely lower during those hours.

Limited data indicated minimal demographic effects during their study, but the authors also pointed out that roads increased access for legal and illegal hunters, the major source of adult grizzly mortality (McClelland and Shackleton 1988). When roads are developed for resource industries in grizzly bear habitat, the bear population becomes vulnerable unless vehicle access and people with firearms are controlled.

Mattson and Knight (1991) concluded that Yellowstone Park's backcountry remains the safest for bears, and areas impacted by secondary roads and major developments, remain the most lethal. Given questions about the grizzly bear population's viability, they discouraged an increase in the area impacted by secondary roads and major developments.

Archibald et al. (1987) investigated the responses of grizzly bears to logging truck traffic in the Kimsquit River Valley, British Columbia. Sound level readings were recorded along 18 transects perpendicular to the roads in areas with and without cover. Specifically, these readings were recorded at 25 m intervals from 0-200 m along the transects. Noise level contours were drawn around the road at the 80, 70 and 60 dBC (decibels) levels to establish the zone of hauling activity. Noise levels below 60 dBC were not considered relevant because they were often masked by ambient noise. Grizzly bear location information was gathered on two resident radio-collared adult females whose home ranges were bisected by the road. Data were available for four years: two pre-logging years (1982 and 1983) and two logging years (1984 and 1985).

The average number of daily loads hauled over the 1984 season was 14, and the maximum was 27 (Archibald et al. 1987). On average, logging trucks moved along the main haul road at 30-minute intervals and 15-minute intervals during peak activity. In 1985, hauling distances were greater and the average daily number of loads declined to 10. The maximum daily haul was 15. In 1985, logging trucks traveled the main haul road at 35-minute intervals on average and 25-minute intervals during peak activity. There was a 78% reduction in the percentage of relocations in the zone of hauling activity between the pre-logging and logging periods. Moreover, the bears avoided the zone of hauling activity independent of the presence of visual screens. There was a 33% decline in the number of times Bear #25 crossed the road and a 39% decline in the number of times Bear #8 crossed the road between periods.

Mattson, Knight and Blanchard (1991) found that grizzly bear occupancy of habitat near human facilities was reduced, efficient foraging strategies were disrupted, and subordinate or security-conscious cohorts were displaced into habitat nearer developments by the more dominant ones, particularly during summer and fall. Adult females and subadult males residing closer to developments were management-trapped at a higher rate than animals of the same class residing farther away. Adult females and subadults bore a disproportionate part of costs associated with avoiding roads and developments. For these reasons, and because adult females are generally thought to operate under considerable energetic costs in the Yellowstone area, tolerance of

developments and roads may have resulted in higher mortality and lower productivity among the adult female cohort.

Wieglus et al. (2002) investigated grizzly bear selection of three road types in the Selkirk Mountains of northern Idaho, northeastern Washington, and southern British Columbia from 1986-1991. They analyzed use of roads by 11 bears (5 female and 6 male) in an area containing open (motorized public use allowed) and closed roads (no motorized public use allowed) and 11 bears (7 female and 4 male) in an adjacent area containing restricted roads (forestry use only).

As predicted, most females and males selected against open roads (Wieglus et al. 2002). However, most females selected against closed roads, and no bears selected against restricted roads. The fact that female grizzly bears selected against closed roads was contrary to expectations. As an explanation, the authors suggested that females might first choose their home range area based on a paucity of open roads and then select against closed roads within the resulting home range. They did not believe that females avoided closed roads to prevent encounters with males utilizing the best habitat because they did not observe sexual segregation and avoidance of males by females as a general behavioral pattern. Instead, they interpreted the selection against closed roads by females as cautious behavior. Because open roads are in relatively close proximity to closed roads and within bear home ranges, female bears may have failed to discriminate between open and closed roads.

Chruszcz et al. (2003) found that grizzly bears used areas close to roads more than expected, particularly roads with low traffic volume. Habituated bears were closer to roads than wary bears. Males were closer to low-volume roads than females, but crossed roads less than females during the berry season. Bears were more likely to cross low-volume roads than high-volume roads and were more likely to cross at points with higher habitat rankings. In addition, bears were more likely to cross high volume roads when moving from areas with low habitat values to areas with high habitat values.

Efforts to prevent loss of habitat connectivity across highways should involve maintenance of high-quality grizzly bear habitat adjacent to roads and should address the effects of traffic volume on the road-crossing decisions of grizzly bears (Chruszcz et al. 2003). Two patterns emerge from their study: the avoidance of high-volume roads in a major transportation corridor, and the importance of high quality habitat in determining grizzly bear movements in relation to highway traffic volumes. The reduced cross-valley permeability caused by the presence of the Trans Canada Highway (TCH) may result in harmful population effects in view of the great mobility and extensive spatial requirements of grizzly bears. They advocated continuous highway fencing and effective wildlife passages.

Yost and Wright (2000) investigated moose, caribou and grizzly bear distribution in relation to road traffic in Denali National Park, Alaska, 1996-1997. Caribou and grizzly bear distributions indicated no pattern of traffic avoidance. Road traffic appeared to influence grizzly bear distribution less than forage availability, abundance and phenology. While some bears might have been intolerant of road activity and avoided its vicinity, many were clearly habituated and carried out daily activities in close proximity to traffic and human onlookers.

Kasworm and Manley (1989) found that grizzly bears used habitat 0-914 m from open roads less than expected based on availability during spring and fall. Black bears used habitat 0-274 m from open roads less than expected during spring and used habitat 0-914 m from roads less than expected during fall. Grizzly bears used habitat 0-122 m from trails less than expected during spring and fall. Black bears used habitat 0-122 m from trails less than expected during spring and used habitat 0-305 m from trails less than expected during fall. Habitat availability appeared related to grizzly bear avoidance of trails, and black bear avoidance of roads and trails. Mean distance from grizzly bear radio-locations to a seasonally closed road increased when the road was opened, though black bear locations did not.

Trails (including closed roads) displaced both species of bears less than open roads. Twenty-eight percent of all grizzly bear locations occurred in the three closest Distance to Road Categories (DRCs) (60% of the area) (Kasworm and Manley 1989). Grizzly bear avoidance of high quality habitat near roads and trails may lessen the opportunity for individuals to obtain food and increase intraspecific competition by further forcing bears into limited remote habitat. Conversely, 58% of black bear locations occurred in the three closest DRCs. Black bear tolerance of disturbance may provide an opportunity for this species to exploit habitat in DRCs 1-3 in the relative absence of grizzly bears.

Schallenger (1977) reviewed the literature related to the effects of oil and gas exploration on grizzly bears at a time when few studies were available to establish predevelopment guidelines. He concluded that these activities are generally detrimental to bears and summarized the greatest impacts involved the construction of roads into unroaded areas and increased numbers of people.

Gibeau et al. (2001) used 4,359 daily telemetry locations from 49 grizzly bears from 1994-1998. Of the four types of human developments they investigated, the Trans Canada Highway (TCH) was avoided most by grizzly bears. Female bears avoided the freeway regardless of the habitat quality or time of day. Males, and especially subadult males, were found closer to the TCH when within or adjacent to high quality habitat and during the human inactive period. Part of the influence is the high density of humans in the valley where the TCH is found. Greater use of hiding cover by males may be part of the strategy used to take advantage of high quality habitat near roads. Although grizzly bears become accustomed to predictable occurrences including traffic, these results suggest otherwise. For high-speed high-volume highways, there is a point where the combination of traffic volume and highway configuration overrides a bear's attraction to high quality habitat. Bears were generally reluctant to cross it, and they concluded that it is a barrier to adult female grizzly bear movement. The same pattern of grizzly bear response to paved roads was seen as with the TCH, although both sexes were found closer than a random pattern would predict. Females remained further than males from approved roads regardless of the habitat quality or time of day. Males were found closer to paved roads when within or adjacent to high quality habitat and during the human inactive period. Unlike paved roads that were located in valley bottoms and good quality habitat, high use trails were widely distributed throughout all types of habitats.

While distance measurements were not as great as for the TCH, bear response to high use features (highways) were still twice as high those of paved roads or high use trails females, and especially subadult females were found closer to features when within or adjacent to high quality habitat

during the human inactive period (Gibeau et al. 2001). Males, on the other hand, remained further away from features regardless of habitat quality or time of day.

Graves (2002) is the only study known at this time to look at how grizzly bears use the habitat in relation to motorized trails. Although the sample size was small, she found that grizzly bears used areas near trails less than expected. This result was true for both ATV trails and single-track motorcycle trails. Bears selected against areas within 250-900 m of ATV trails and within 450-600 m from single-track trails. Levels of human use, habitat quality, bear experience and habituation may have had something to do with whether or not a bear used an area near a trail less than expected.

## **Summer Non-Motorized Use**

The following information pertains more to non-motorized trails and their effects on bears. McClellan and Shackleton (1989) summarized their study by stating that bears responded more strongly to ground based human activities, such as people on foot or moving vehicles, when in the open than when in cover. Cover was less important in determining bear behavioral responses to fixed wing aircraft than the other stimuli. With the exception of people on foot, bears generally displayed stronger reactions to human activities that occurred <75 m away than at greater distances. The strongest responses of bears was to people on foot, and these reactions were most extreme in areas of low human use.

Jope (1985) found that although bears were seen as often on heavily used trails as on trails with little human use, full charges towards people by bears occurred primarily on trails with little human use. The findings of this research together with records on human injuries in Yellowstone Park suggest that habituation of grizzly bears to hikers reduces the rate of fear-induced charges and consequent injuries.

Gunther (1989) documented 36 encounters between bears and backcountry users. Subadults and females with cubs-of-the-year were involved in 67% of the encounters, but represented 31% of the bear sightings. Grizzlies reacted to encounters by fleeing (53%), showing no reaction (31%), or charging (14%). In 18 of 19 incidents where bears fled, they ran to forest cover before stopping. Bears made significantly more frequent use of areas >500 m from tree cover during the closed and restricted periods than during the open periods. Foot parties were more likely to be charged during an encounter with a grizzly than were people on horseback.

Mace and Waller (1996) found that grizzly bears in the Jewel Basin Hiking Area did not position themselves in a random fashion relative to trails and lakes with campsites. During each season, bears were significantly farther away from areas frequented by humans than from other areas. Grizzly bear distances from both lakes and campsites and trails generally increased as the seasons progressed. Their data suggest that grizzly bears positioned themselves further from lakes with campsites than from trails. In multivariate models, however, distance to trails and lakes were significant variables only during summer and autumn. During these two seasons, the relative probability of grizzly bear use increased as distances to trails and lakes with campsites increased. During all seasons, grizzly bears in this area selected for open habitat types relative to the forest



habitat type. Most of the trail system (66%) occurred in the forest habitat type, which may partially explain the lack of confrontations between hikers and grizzly bears.

Bears were found closer to trails during the night when within high quality habitat and further from trails when distant from high quality habitat (Gibeau et al. 2001). Their observed avoidance of high use trails far from high quality habitat may be a reflection of a greater opportunity for bears to select high quality habitat in the relative absence of humans. Grizzlies may not have the opportunity to truly avoid paved roads without forfeiting access to much of the high quality habitats.

It is clear that bears tend to react negatively to humans on foot. What is less clear is a quantitative relationship of how far bears are displaced from foot trails. Bears apparently also habituate to humans on trails, but cover and habitat quality also have an effect on whether or not bears will be in areas that humans frequent on foot.

## **Winter Motorized Use**

In 2002, all the Greater Yellowstone Area National Forests (Gallatin, Custer, Beaverhead-Deerlodge, Shoshone, Bridger-Teton), with the exception of the Caribou-Targhee, consulted with the US Fish and Wildlife Service on the effects of snowmobile use on grizzly bears on these National Forests. A literature review was conducted and a Biological Assessment was written and submitted to the USFWS (Cherry, 2002). A Biological Opinion was received from the USFWS (USDI 2002).

Humans can access some grizzly bear denning habitat in a number of different ways including cross-country skiing, snowshoeing, driving, snowmobiling, hiking and snowboarding. Any of these winter activities has the *potential* to affect denning grizzly bears.

There is a fairly small volume of literature on the effects of winter use on bears, and even less information about the effects of snowmobiles on grizzly bears. Some of the relevant literature is presented here.

Swenson et al. (1997) recommended that humans avoid areas around known active bear dens. They suggested that dens be avoided by 100 m to 1 km, and that disturbance be minimized in areas with high concentrations of dens. Linnell et al. (2000) reviewed the literature on disturbance to denning bears. They concluded that bears tend to select dens 1-2 km away from human activity such as roads and dwellings, and bears seemed tolerant of activities that occurred more than 1 km from the den. Activity closer than 1 km, especially within 200 m of the den, led to variable responses from bears. Bears may abandon dens if activity occurs within this zone, particularly early in the denning season. Bears often den at some distance from where they denned the previous year, indicating that loss of a single denning area due to human disturbance does not always lead to deleterious effects if alternate denning habitat is available within the bear's home range.

The insulating quality of snow (Blix and Lentfer 1992; P. Farnes pers. comm.), and the locations bears chose to den in the Yellowstone area (forested, steep, north aspects with deep snow) (Judd et al. 1986) are such that the degree of disturbance by snowmobiles activity is questionable. The information on impacts to denning bears is largely anecdotal and collected in the course of other

research, with few, if any, studies actually designed to look at this phenomenon. The March 2000 Draft of the Grizzly Bear Conservation Strategy for the Yellowstone area concluded that there was insufficient information to call for specific management direction for snowmobile use (ICST 2000).

Snowmobiling has occurred for many years, with gradual increases in use and improvements in technology (J. Kempff pers. comm.). This means grizzly bears have likely habituated to snowmobile use (Knight and Gutzweiler 1995 p. 114,133) or bears may have moved their den site to another location the next year (Shoen et al. 1987). Grizzly bears are noted to den primarily in remote locations (Judd et al. 1983). Grizzly bears are unlikely to abandon their dens very late into the winter due to the high costs (both energetic and fitness) of doing so (Linnell et al. 2000). It is likely that hibernating bears exposed to meaningless noise (no negative consequences to the bear) habituate to this type of noise (Knight and Gutzweiler 1995 p. 133). A few researchers have found that some bears do, at least on occasion, appear to respond to noise or disturbance near the den site by waking up and moving around in the den (Reynolds et al. 1986; Miller pers. comm. to Dolan). On rare occasions, bears may abandon a den due to some disturbance (Reynolds et al. 1976, Swenson et al. 1997).

Linnell et al. (2000) advised the following:

- 1) Locate den concentrations.
- 2) Minimize winter activity in denning areas.
- 3) If winter activity is unavoidable, it is better to commence activity about the time bears are entering dens so they can choose to avoid certain areas.
- 4) Confine winter activity to regular routes and valley bottoms.
- 5) Avoid known den sites by 1 km.
- 6) Off-route use, which is not predictable, may have more serious impacts than more predictable activities and should be minimized.

The IGBST analysis using the Mahalanobis distance model for suitable denning habitat showed that a large proportion of the Forest and the Yellowstone area, is comprised of suitable denning habitat. Approximately 25% of the suitable denning habitat is in areas where snowmobile use occurs (Podruzny et al. 2002).

A large proportion of the Yellowstone Grizzly Bear Recovery Zone is protected from snowmobiling. Of the 380 known den locations in the Yellowstone area, between 1975 and 1999, approximately 88% were in areas currently closed to dispersed snowmobile use (USDI 2000). Most of the known den locations (333) were in the Recovery Zone because that is where trapping and radio collaring efforts have been emphasized. Even if not officially protected by being in the National Parks away from designated snowmobile routes or designated Wilderness Areas, many areas are undesirable for snowmobile use due to being forested, too steep, or inaccessible due to terrain. For instance, only about 15% of the Gallatin National Forest in the Recovery Zone is considered desirable for this type of use although 44% of this area is technically open to snowmobiling. Approximately two-thirds of the Gallatin National Forest south of I-90 (approximately 1 million out of 1.5 million acres) meets the definition of “secure” according to the IGBC (1998). About 9% of this “secure” habitat is used by snowmobiles.

Only about 7% of the den sites documented from 1975-99 in the GYA were inside dispersed snowmobile areas or within 500 meters of these areas or snowmobile routes. Data are not available to evaluate the level or timing of snowmobile use associated with each den site during the year it was documented. It is unknown if den sites within snowmobile areas were located in inaccessible micro sites (steep terrain or dense forest) or were potentially available for snowmobile access (Cherry 2002). Monitoring that has been conducted since 2001 has indicated that known grizzly bear dens within areas legally accessible by snowmobiles are typically in locations inaccessible to the machines due to timber or terrain (USDA FS 2004).

Of the known dens sites in the Greater Yellowstone Area, relatively few (12.4%) were found to be in areas near snowmobiling (Cherry 2002). In addition, 82.6% of dens were located >2000 meters from snowmobile use areas. The Gallatin National Forest had eight dens in snowmobile use areas. The Mahalanobis Distance Model predicted that there was a lot of grizzly bear denning habitat available (greater than 60%) in the Forests and federal land in the Greater Yellowstone Area. It also indicated the Gallatin National Forest had 74% of the Recovery Zone that met the denning criteria, and that 68% of the areas where bears occur on the Forest met denning criteria (Podruzny et al. 2002). Over 70% of this suitable denning habitat both in the Recovery Zone and on the Gallatin National Forest where bears occur is legally open to snowmobiling as of 2000. The definition of “secure” habitat in the Grizzly Bear Conservation Strategy (ICST 2003) does not consider snowmobile use in these areas as removing them from secure.

From a practical standpoint, it should be noted that grizzly bears rarely reuse a den. Therefore, protecting actual den locations is infeasible as they change from year to year. Even protecting denning concentrations is infeasible because we only know where 26 dens were located on the Gallatin National Forest during the last 25 years because most trapping and radio collaring efforts occurred in Yellowstone National Park. Protecting potential denning areas means letting the public know why a certain area is closed, and perhaps focusing unwanted attention on grizzly bear denning habitat. This, in and of itself, may pose a risk to the grizzly bear.

It is possible that there could be a greater potential negative impact from snowmobiles to sows with cubs-of-the-year (COY) upon emergence from their dens than to denning bears. About 60% of sows emerge between the first and fourth weeks of April (USDI 2000). Most emerging bears move immediately to a known, reliable spring food source, such as a big game winter range (Reinhart and Tyers 1999). However, sows with COY may remain near the den for a period of time. It is possible that snowmobiles could disturb females with cubs at this time of year, although there is no known incidence of this in the Yellowstone area. Depending on where one is on the Gallatin National Forest, snowmobile season ends from March 30 to late May or June in some years at the higher elevations. The conditions that usually force den emergence (melting snow and moisture in the den) are the same conditions that cause poor snowmobiling conditions (Farnes pers. comm.). In many cases the access to snowmobiling on the National Forest has become limited before the emergence dates due to the exposure of mud and rock at lower elevations. A disturbance would have to be severe for a sow to abandon her cubs (Linnell et al. 2000). Although probably quite rare, the potential seriousness of a sow with COY being displaced post-emergence, and perhaps abandoning her cubs, means this type of disturbance should be considered. The IGBST is conducting research on spring emergence habitat for sows in the GYA that will be utilized once it becomes available.

Monitoring efforts since 2001 (USDA FS 2004) have not revealed any conflict between snowmobiling and grizzly bear dens or emergent bears.

Although the determination of the 2002 Biological Assessment for the effects of snowmobiling on the grizzly bear in the Yellowstone (Cherry 2002) was 'may affect-likely to adversely affect,' for snowmobiling, this is extremely conservative and based more upon the potential impact of snowmobiling on sows with COY upon den emergence, rather than the effects on denning bears in the Yellowstone area.

Snowmobiling is not a new use or impact but is merely the continuation of an existing use that has been ongoing for many years with few, if any, impacts on either individuals or the population. Although snowmobiling may occasionally affect an individual bear, it is very unlikely to affect the population as a whole, especially a population such as the Yellowstone grizzly bear, which has met recovery criteria.

There are a number of key points about grizzly bears and snowmobiling in the Yellowstone Area. The major points are:

- 1) The grizzly bear population in the Yellowstone area is nearing recovery or has met recovery criteria.
- 2) Snowmobiles are only one of several means by which humans can access denning habitat in the winter, on or off trails.
- 3) Snowmobile use has been around for many years, and has increased over a long period.
- 4) Bears have had a chance to either habituate or move to a new den site if disturbed.
- 5) Bears tend to den in remote areas with characteristics that are not entirely conducive to snowmobiling (steep, forested habitats).
- 6) Snow is an excellent sound insulator.
- 7) A large proportion of the Recovery Zone and area where bears may occur (68 and 63%, respectively) provides suitable denning habitat (Cherry 2002).
- 8) A large proportion of known dens in the Yellowstone area (88%) are located in areas where snowmobile use does not occur (2002) and suitable denning habitat is well distributed on the Forests.
- 9) Within the Recovery Zone, a relatively small percent (16%) of suitable denning habitat is in areas potentially used by snowmachines (2002). In the areas where grizzlies may occur, the percentage of suitable denning habitat that is potentially used by snowmobiles increases to 69%.
- 10) On the five National Forests looked at in depth, only 3-19% of the secure area within the Recovery Zone that is suitable for denning is potentially used by snowmobiles (2002). In the area where bears may occur, 6-31% falls into this category. The percentages are very similar for secure areas used by snowmobiles without considering whether or not it is suitable denning habitat (2002). In the National Parks, less than 5% of the total area is open to snowmobiling. This provides a large acreage of suitable denning habitat where no snowmobiling occurs.
- 11) Information on effects of snowmobiling on bears is largely anecdotal, although there is sufficient information to indicate that some individual bears have the potential to be disturbed.
- 12) Potential effects of snowmobiling on reproduction and survival of grizzly bears in Yellowstone Park and the Greater Yellowstone Area are not evident in the population statistics.

The determination of the 2002 Biological Assessment on the effects of snowmobiling on grizzly bears was “may affect-likely to adversely affect” (Cherry, 2002). This is because it is not known where all grizzly bear dens are located, and exact snowmobile routes are not predictable. Thus, preventing snowmobiles from traveling near a den site cannot be assured. Snowmobile activity may disturb or displace an individual grizzly bear. Generally, snowmobile effects are not significant, but because of the unpredictability of snowmobile use and the possibility that a snowmobile could affect an individual bear, especially sows with cubs-of-the-year, we could arrive at a “no effect” determination for bears.

The Biological Opinion from the USFWS (USDI, 2002) concluded that the level of snowmobile activity authorized in 2002 on the Forests (including Custer, Shoshone, Gallatin, Beaverhead-Deerlodge and Bridger-Teton) was not likely to jeopardize the continued existence of the grizzly bear. The best information suggests that current levels of snowmobile use are not appreciably reducing the likelihood of either the survival or recovery of grizzly bears in the Yellowstone recovery zone. They based this on the facts that direct and indirect effects of snowmobiles on grizzly bears are not well documented, grizzly bears may habituate to disturbance, and that population parameters for Yellowstone grizzly bears are excellent among other things.

Graves and Reams (2001) edited the output of an expert workshop for protocols to monitor snowmobile effects on wildlife. Several issues to monitor were identified for *Ursids*. These included the effect of presence on emerging animals and the effect of noise on hibernating bears. It appears that although it is important to understand population level effects, most information available is on individual effects. The expert group discussing bears decided that impact to emergent bears is higher than bears still within their dens. They also believed that determining if bears are avoiding denning in snowmachine use areas is impossible to determine. Possible effects listed by this group were disturbance for emerging family groups before young are mobile, increased movement and energetic costs, and displacement from habitat. Other possible effects of noise for denning bears include den abandonment, loss of young, increased energetic costs, death, learned displacement from denning areas where snowmachine use occurs. Determining where bears are denning and what areas snowmobiles are using are basic steps to understanding effects on bears. We have attempted to do this in the Yellowstone area (Cherry 2002). In addition, monitoring of spring snowmobile use and known grizzly bear dens is continuing. At this time (2006), there have been no known conflicts between denning or emerged bears and snowmobiles. Even with monitoring efforts, there has been no evidence found that snowmobiles affect grizzly bears that are either denning or emerging from dens. In addition, the Forest and other cooperators will continue to monitor known den sites and snowmobile use (USDA FS 2004). If any conflict is discovered, appropriate mitigation measures will be taken. Grizzly bears are not a legitimate reason to curtail snowmobile use in the spring.

The Travel Plan management alternatives have different effects on the amount of acres of the Gallatin National Forest open to snowmobiling. For this discussion, the acres of area that are legally closed to snowmobiling either seasonally or yearlong are presented. There are additional acres that, although they are technically open, may not really have snowmobile use due to being heavily forested, having terrain that cannot be negotiated by snowmobile, or generally have too little snow accumulation for snowmobiling to occur.

## Winter Non-motorized Use

There is little literature on the effects of winter non-motorized use on grizzly bears. Therefore, some of the literature summarized below is from research on brown bears in other climates or black bears and within different climates and using different den types.

Swenson et al. (1997) believed that fall hunting, which occurs early in the European brown bear denning period in Sweden, may contribute to fall disturbance and early den abandonment by brown bears. They suggest that bears may be more tolerant of industrial activity located some kilometers from the den, but not of humans or human related activity near or at the den site. A number of the human activities at or near the den site were not motorized (i.e. hunting, survey work, shooting, and fishing at or near the den, and a dog at the den site, etc.). Swenson et al. (1997) found that there was no significant difference in den abandonment in a 'protected area' versus areas where there was military activity and timber harvest. They also found that when there was some type of human activity at or within 100 m of den sites, 12 of 18 dens were abandoned.

Craighead and Craighead (1972) apparently caused den abandonment by a female grizzly bear in the fall that they tracked to within 200 ft of its den.

Kolenosky and Strathearn (1986) found that rates of black bear den abandonment in Ontario were inversely related to duration of denning. In other words, den abandonment is much more likely early in the fall than any other time. Smith (1983) also found that black bears (6 of 9) abandoned their dens less than 2 weeks after den entry, but bears within the dens more than 4 weeks (n = 12) did not abandon their dens. This study was in a mild climate where many bears use tree dens and even den in the open (on the ground), and there is no snow. Beecham et al. (1983) also found that den abandonment was inversely related to the length of time that the bear had been denned. Reynolds et al. (1976) and Tietje and Ruff (1980) also found this for black and brown bears.

Goodrich and Berger (1984) cite 3 cases of black bear cub abandonment (out of 12 cases of den abandonment) - one after researchers entered the den to radio-collar the female and two as researchers approached the den. They conclude, "Since the quiet approach of investigators sometimes causes abandonment of dens and cubs (this and other studies; Manville 1983, Kolenosky and Strathearn 1987), skiing and other recreational activities could have the same or a heightened effect." Den site abandonment in response to investigator disturbance occurred at both study areas, and all but one disturbed bear remained active after abandonment. Applications of the findings of this study to grizzly bears should be made with caution because these black bears were most commonly denning in trees, either at the base or in elevated tree dens, rock dens, and in some cases in logs, brush piles or on the ground, which can occur when winters are relatively mild. The time of year for den abandonment was not provided.

## Direct and Indirect Effects

### Analysis Methodology

A large quantity of GIS maps was prepared for this issue analysis (see Project Record, Grizzly Bear GIS queries). Because of the size and number of these maps, they are in the Project Record (Grizzly Bear maps) but not within the text of the FEIS. There are maps for all 7 alternatives for each bear subunit for secure habitat, TMARD and OMARD. There is a difference in the way in which the CEM Access map was prepared and the way in which the travel plan alternatives were prepared. The CEM Access map includes a one-mile buffer around each bear subunit that is included in the calculation of route density for the subunit. This one-mile moving window extends outside the Forest boundary for subunits lying on the boundary, includes adjacent subunits on the Forest, and includes non-Forest Service routes in these areas. The maps for the travel plan alternatives do not include any access routes beyond the Forest boundary unless they are on the Gallatin National Forest. These routes within the 1 mile moving window of the GIS model add to the route density categories or subtract from secure, as the case may be. Both the CEM values and Forest Travel Plan Alternatives include federal, private, state and county roads on the Forest. Calculations include private land acreage within the Forest boundary on the Gallatin National Forest. Land outside of the Gallatin National Forest has no road density values. It is ***only appropriate to compare these secure habitat numbers across all seven alternatives to determine which alternative has the most secure habitat or motorized access in grizzly bear habitat and which has the least because Alternative 1 may or may not match CEM for the reasons presented.*** The numbers presented in the alternatives are the portion over which the Gallatin National Forest has jurisdiction.

Alternative 1 is what is legally available to the public for travel on the 1999 Forest visitor map and is the ‘no action’ alternative. Under this alternative, the OHV rule is not in place which means that off-route travel is legal, there is no travel plan, and routes are not designated. Alternative 2 is the closest alternative to what people are actually currently doing on the ground with the OHV rule in place, making off-route travel illegal and designating routes if it is selected. Alternative 2 is sort of a ‘snap shot’ of current use, but with a travel plan in place as its main action. Under Alternatives 3 through 7-M, project routes are expected to go out of use over time. Many of them are already grown in and are impassable or have been obliterated. Under all Alternatives 2 through 7-M administrative routes will be closed to all but administrative use and gated to the public. Under Alternative 1, all motorized routes (including project and administrative) are counted as open to the public.

Under Alternatives 2 through 7-M, in subunits where there are administrative roads, there is a difference between TMARD and OMARD with OMARD density figures being lower. TMARD counts all roads, while OMARD does not count administrative roads. Use of administrative roads is limited and should not be viewed the same as a road that is open to the public, and administrative roads are gated. The motorized route density categories of most interest to agencies involved in grizzly bear management are when TMARD is greater than 2 mi/sq mi and when OMARD is greater than 1 mi/sq mi (ICST 2003). The higher the density of public motorized routes, the less likely a grizzly bear is to use an area.

Although all types of motorized vehicle routes count the same in the access model and CEM, there is likely to be a difference among types and frequencies of use. For instance, a State highway with numerous vehicles at high speeds may not have the same effect on wildlife as a seasonal, rarely used, motorcycle route. However, little research appears to show this distinction. Effects on grizzly bears are complicated by habituation, cover, habitat quality, and other variables. Seasonal closures are not considered in depth in this analysis.

A number of the subunits lying entirely or in part on the Gallatin National Forest have a high amount of secure habitat (89% or higher in CEM) (Table 3.10.2a). These are Boulder/Slough #1 and #2, Hellroaring #2, and Lamar #1. Other subunits above 70% secure habitat (in CEM) include Crandall/Sunlight #1 and #2, Hellroaring #1, Hilgard #1 and #2, and Madison #1. There are three subunits that the Conservation Strategy (ICST 2003) designates as “in need of improvement” in amount of secure habitat that currently have less than 70% secure habitat. These are subunits Gallatin #3 at 55% in CEM, Henry’s Lake #2 at 46%, and Madison #2 at 67%. Plateau #1 subunit has a 69% secure value in CEM, but the Gallatin National Forest includes only a small portion of this subunit. It should be noted that the calculations for our travel plan alternatives for each subunit do include the portion under adjacent federal management, such as other National Forests or Yellowstone National Park., but do not count routes on these lands. That is one reason why it is correct to only compare the numbers among Alternatives 1 through 7-M, and consider that although Alternative 1 compares with CEM, it may not match secure and route densities for CEM.

The current condition is actually a combination of Alternatives 1 and 2, however Alternative 2, shows the effects of closing project roads. These alternatives most accurately reflect what was on the ground in 1998 and what is currently on the ground. TMARD and OMARD can be compared among alternatives. TMARD is comprised of all motorized routes of all jurisdictions (FS, state, county, private, etc.) in the subunits. OMARD drops only administrative routes from route density. The direction in the Conservation Strategy (ICST 2003) focuses on secure habitat, however, this analysis also presents TMARD >2 mi/sq mi and OMARD > 1 mi/sq mi for the subunits.

To analyze snowmobiling and its potential effects on grizzly bears, the acres and percentages of Travel Planning Areas (TPAs) with yearlong and seasonal closures to snowmobiles were reviewed. The TPAs were also combined upward into mountain ranges. Under all Alternatives 2 through 7-M, the percentage of the Forest legally open to snowmobiling yearlong is reduced from the present.

## **Effects of Summer Motorized Use by Grizzly Bear Subunit**

### **Boulder/Slough #1 and #2**

Throughout the following discussion, Alternative 1 considers effects without the OHV EIS decision in place, which would allow off-road vehicle use to continue.

#### **Effects common to all alternatives**

Two of the simplest subunits to address are the Boulder/Slough #1 and #2. Under the CEM Access Model, these had 96.6% and 97.7% secure habitat, respectively (Table 3.10.5). Both of these subunits have very high percentages of secure habitat and low motorized route densities under all



alternatives. Because these subunits have no administrative roads, TMARD and OMARD percentages are the same for each subunit.

**Table 3.10.5 Total Motorized Access Route Densities (TMARD), Open Motorized Access Route Densities (OMARD), and percent secure habitat of the Boulder/Slough #1 and #2 Grizzly Bear Subunits. These numbers include all road jurisdictions (FS, State, County, Private, etc).**

<b>Boulder/Slough #1 OMARD and TMARD</b>	<b>CEM</b>	<b>Alt. 1</b>	<b>Alt. 2</b>	<b>Alt. 3</b>	<b>Alt. 4</b>	<b>Alt. 5</b>	<b>Alt. 6</b>	<b>Alt. 7-M</b>
<b>Percent Secure</b>	96.6	96.3	96.4	96.4	96.4	96.7	96.7	96.6
<b>Density Percent: &gt;2 mi/sq mi</b>	0	0	0	0	0	0	0	0
<b>Density Percent: &gt; 1 mi/sq mi</b>	2.5	2.3	2.3	2.3	3.3	2.2	2.2	2.3
<b>Boulder/Slough #2 OMARD and TMARD</b>	<b>CEM</b>	<b>Alt. 1</b>	<b>Alt. 2</b>	<b>Alt. 3</b>	<b>Alt. 4</b>	<b>Alt. 5</b>	<b>Alt. 6</b>	<b>Alt. 7-M</b>
<b>Percent Secure</b>	97.7	100	100	100	100	100	100	100
<b>Density Percent: &gt;2 mi/sq mi</b>	0	0	0	0	0	0	0	0
<b>Density Percent: &gt;1 mi/sq mi</b>	0	0	0	0	0	0	0	0

Boulder/Slough #1 lies entirely in the Absaroka Beartooth Mountains on the Gallatin National Forest and varies only a small amount across alternatives. This subunit is almost entirely Wilderness. The small amount of road density occurs due to the Main Boulder road, the Iron Mountain Road to the northeast part of the subunit, and the Lake Abundance Road to the southeast which are within the 1 mile window of the Access model. The difference among the percentages from CEM and the alternatives is in the very southeast portion of the subunit near Cooke City and varies depending on the management of the Lake Abundance Road, which is actually not within this subunit, but the effects are included by the 1 mile moving window. There is no road density in the >2 mi/sq mi category in any alternative. Without consideration of roads under National Forest jurisdiction, there is 97% secure habitat, therefore, the Forest motorized routes detract slightly from secure and add only slightly to route densities.

## **Boulder/Slough #1**

### **Alternative 1**

This alternative has 96.3% secure habitat and an OMARD and TMARD of > 1 mi/sq mi of 2.3%. There is no motorized route density >2 mi/sq mi. A combination of Alternative 1 and 2 are the approximate current condition on the landscape. These are the alternatives compared to Alternative 7-M to determine if that alternative is maintaining the baseline or becoming better or worse.

### **Alternatives 2 and 3**

These alternatives are very similar to Alternative 1 and have 96.4% secure habitat, 2.3% of the subunit in the >1 mi/sq mi density category and no density in the >2 mi/sq mi category.

### **Alternative 4**

This alternative is also similar to the previous 3 alternatives, and it has of 96.4% secure habitat, 3.3% of the subunit in the > 1 mi/sq mi road density category and no density in the >2 mi/sq mi category. It has a lower percent secure habitat than Alternatives 1-3, but has the same motorized route densities as Alternative 3.

### **Alternatives 5 and 6**

These alternatives have 96.7% secure habitat, 2.2% of the subunit in the >1 mi/sq mi density category and no route density in the >2 mi/sq mi category. These alternatives have slightly higher secure habitat than the other alternatives.

### **Alternative 7-M**

This alternative has 96.6% secure habitat, 2.3% of the subunit is in the > 1 mi/sq mi density category. There is no route density >2 mi/sq mi. This is a slight improvement over both Alternatives 1 and 2.

## **Boulder Slough # 2**

### **Effects common to all alternatives**

The Boulder/Slough #2 subunit, also in the Absaroka Beartooth Mountains, is shared between the Gallatin National Forest and Yellowstone National Park. The portion on the Forest is 100% secure habitat and is entirely Wilderness. There is no difference among the Gallatin Forest Travel Plan alternatives in percent secure habitat because there are no motorized routes on the National Forest in this subunit.

## **Crandall/Sunlight #1 and #2**

The Crandall/Sunlight subunits #1 and #2 lie on the eastern side of the Gallatin National Forest and are shared with the Shoshone National Forest. The Gallatin National Forest has a small percent respectively of both subunits, 81.1% and 82.3% secure habitat in CEM.

Under CEM, Alternatives 1 and 2 are considered to be an approximation of the current condition on the ground. These percent secure figures do not compare directly with the CEM secure figures because for the alternatives the roads on the Shoshone National Forest roads are not considered in the calculations. Therefore, the percentages for Alternatives 1 and 2 should be used for comparison to the other alternatives to determine if there is an increase or decrease in secure or percent of area affected by road densities. The alternatives are all very similar. The highest road density in the Gallatin portion of the subunit is primarily related to Highway 212 and development on private land. There are no project or administrative roads within these subunits that make any contribution to road densities, therefore, OMARD and TMARD are the same.

**Table 3.10.6 Total Motorized Access Route Densities (TMARD), Open Motorized Access Route Densities (OMARD), and percent secure habitat of the Crandall/Sunlight #1 and #2 Grizzly Bear Subunits. All road jurisdictions are included, private, county, state and FS.**

<b>Crandall/Sunlight #1 TMARD and OMARD</b>	<b>CEM</b>	<b>Alt. 1</b>	<b>Alt. 2</b>	<b>Alt. 3</b>	<b>Alt. 4</b>	<b>Alt. 5</b>	<b>Alt. 6</b>	<b>Alt. 7-M</b>
<b>Percent Secure</b>	81.1	96.0	96.3	96.1	96.1	96.7	96.7	96.3
<b>Density Percent: &gt;2 mi/sq mi</b>	4.0	1.1	1.1	1.1	1.1	1.1	1.0	1.1
<b>Density Percent &gt; 1 mi/sq mi</b>	16.3	3.0	3.0	3.4	3.3	2.4	2.3	2.9
<b>Crandall/Sunlight #2 TMARD and OMARD</b>	<b>CEM</b>	<b>Alt. 1</b>	<b>Alt. 2</b>	<b>Alt. 3</b>	<b>Alt. 4</b>	<b>Alt. 5</b>	<b>Alt. 6</b>	<b>Alt. 7-M</b>
<b>Percent Secure</b>	82.3	99.7	99.7	99.7	99.7	99.7	99.7	99.7
<b>Density Percent: &gt;2 mi/sq mi</b>	5.5	0	0	0	0	0	0	0
<b>Density Percent &gt;1 mi/sq mi</b>	13.6	0.1	0.1	0.1	0.1	0.1	0.1	0.1

## **Crandall/Sunlight #1**

### **Alternatives 1 and 2**

These alternatives, which serve as a baseline, have 96.0 and 96.3% secure habitat, respectively, and 3.0% of the subunit in the >1 mi/sq mi density category and 1.1% in the greater than 2 mi/sq mi density category. Under this alternative, there are few seasonal restrictions of any kind north of the highway.

### **Alternatives 3 and 4**

These alternatives are very similar with 96.1% secure habitat with 3.4% and 3.3%, respectively, in the >1 mi/sq mi category and 1.1 % of the area in the >2 mi/sq mi density category. There tends to be less seasonal restrictions under these alternatives than Alternatives 5, 6, and 7-M.

### **Alternatives 5 and 6**

These alternatives are very similar with 96.7% secure habitat, 2.3-2.4% of the subunit in the > 1 mi/sq mi density category and 1.1 and 1.0% in the >2 mi/sq mi density category. These two alternatives tend to have the most seasonal motorized restrictions. These alternatives decommission the Goose Lake road north of Long Lake.

### **Alternative 7-M**

This alternative has 96.3% secure habitat, and 3.4% of the subunit in the > 1 mi/sq mi density category and 1.1% in the >2 mi/sq mi category. This alternative has the same percent secure as Alternative 2, but more secure than Alternative 1. It has the same density in the >2 mi/sq mi as Alternatives 1 and 2, and is slightly lower in the > 1mi/sq mi density category than Alternatives 1 and 2. Under this alternative, during good whitebark pine crop years, an emergency closure may be placed on the Sheep Mountain (#3224) and Goose Lake (#3230) roads to avoid bear/human conflict. In other years, these routes are open from June 15 - December 2. Motorized routes in the Cooke

City area will be open from June 15 to December 2. This Alternative also leaves Goose Lake road open to the Wilderness boundary with seasonal restrictions.

## **Crandall/Sunlight #2**

For Crandall/Sunlight #2, there is no difference on the Gallatin National Forest in secure habitat (99.7%) among alternatives. The small portion of the subunit on the Gallatin National Forest is most affected by Highway 212.

## **Lamar #1**

A small portion of Lamar #1 subunit lies on the Gallatin National Forest, and the remainder lies in Yellowstone Park and the Custer National Forest. Under the CEM Access Model, this subunit has 89.4% secure habitat, and under Alternatives 1 and 2 (closest to 1998 baseline), are 93.9-94.5% secure, respectively (Table 3.10.7). The analysis for this subunit includes the small portion of the Custer National Forest in this area administered by the Gallatin National Forest. The effects of the heavily motorized Cooke City area are somewhat compensated for by large non-motorized parts of the Lamar #1 subunit. However, the area around Cooke City and to the north provides some good quality bear habitat (Table 3.10.2a and Table 3.10.3). Cooke City has also been an area of high grizzly bear mortality in the past. Although this subunit has very high percentages of secure habitat under all alternatives, some alternatives produce more security and are more responsive than other alternatives to bear habitat quality and road management. This subunit is bisected by Highway 212.

**Table 3.10.7 Total Motorized Access Route Densities (TMARD), Open Motorized Access Route Densities (OMARD), and percent secure habitat of the Lamar #1 Grizzly Bear Subunit. (All road jurisdictions are included.)**

Lamar #1 TMARD and OMARD	CEM	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7-M
Percent Secure	89.4	93.9	94.5	94.4	94.4	95.2	95.1	94.5
Density Percent: >2 mi/sq mi	3.2	3.7	3.5	3.6	3.6	3.4	2.6	3.6
Density Percent > 1 mi/sq mi	6.9	5.4	5.0	5.3	5.3	4.7	4.2	5.3

### **Alternative 1**

This alternative has 93.9% secure habitat, a motorized route density of 5.4% is in the > 1 mi/sq mi density category, and 3.7 % of the subunit is in the > 2mi/sq mi route density category. This alternative is without the OHV EIS decision, and in the Cooke City area where OHV use is very popular, it would likely lead to increased off-road use.

### **Alternative 2**

This alternative has 94.5% secure habitat, a motorized route density of 5.0% in the > 1 mi/sq mi route density category, and 3.5% is in the >2 mi/sq mi category. This alternative is similar to Alternative 1, but with the OHV EIS decision in effect.

### **Alternatives 3 and 4**

These alternatives have 94.4% secure habitat, a motorized route density of 5.3% in the > 1 mi/sq mi, and 3.6% in the > 2 mi/sq mi category.

### **Alternative 5**

This alternative has 95.2% secure habitat, a motorized route density of 3.4% in the > 1 mi/sq mi category and 4.7% in the >2 mi/sq mi category. Alternative 5 truncates the Lake Abundance road and creates more secure habitat in an area of high habitat quality. It also has lower motorized route density to the northeast and Goose Lake.

### **Alternative 6**

This alternative has 95.1% secure habitat, a motorized route density of 2.6% of the subunit in the >1 mi/sq mi category and 4.2% in the > 2 mi/sq mi category. This alternative truncates the Lake Abundance road and creates more secure habitat in an area of high habitat quality. It also has lower motorized route density to the northeast and Goose Lake.

### **Alternative 7-M**

This alternative has 94.5% secure habitat, a motorized route density of 3.6% of the subunit in the > 1 mi/sq mi category and > 5.3 in the >2 mi/sq mi category. This has more secure habitat and less road densities in the higher categories than Alternative 1. Under Alternative 7-M there is a new ATV/motorcycle route #3226 near Miller Creek and a small connector to #3223 that are not found in Alternatives 1 or 2. Several small project roads (i.e. #570) will no longer exist under implementation of Alternative 7-M, which compensate for these small additions.

## **Hellroaring/Bear #1 and #2**

The Hellroaring/Bear #1 and #2 subunits lie east of Gardiner in the Absaroka Beartooth Mountain range. The Hellroaring Bear #1 and #2 subunits have 77% and 99.5% secure habitat, respectively, under the CEM Access Model (Table 3.10.8). Hellroaring/Bear #1 is located partially inside the Wilderness. Hellroaring/Bear #1 has some project roads that will be not be designated for use under full implementation of Alternatives 2 through 7-M. This is the primary difference between Alternatives 1 and 2 for TMARD and OMARD

The Hellroaring/Bear #2 subunit is entirely in Wilderness. In Hellroaring/Bear #2, the only area of motorized route density lies at the edge of the Wilderness in the Mill Creek drainage. Hellroaring/Bear #1 shows some slight differences amongst the alternatives.

## **Hellroaring/Bear #1**

### **Alternative 1**

This alternative has 75.1% secure habitat, and it has a TMARD of 13.2% in the >2 mi/sq mi route density category. For OMARD, this alternative has 18.3% in the >1 mi/sq mi route density category.

**Table 3.10.8 Total Motorized Access Route Densities (TMARD), Open Motorized Access Route Densities (OMARD), and percent secure habitat of the Hellroaring/Bear #1 and #2 Grizzly Bear Subunits (Including all road jurisdictions).**

Hellroaring/Bear #1	CEM	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7-M
Percent Secure	77	75.1	79.5	81.3	81.3	81.3	81.3	80.4
TMARD Density Percent: >2 mi/sq mi	13.5	13.2	11.2	11.2	10.1	10.1	10.1	10.0
OMARD Density Percent > 1 mi/sq mi	20.8	18.3	17.2	16.8	16.8	16.6	16.6	16.5
Hellroaring/Bear #2	CEM	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7-M
Percent Secure	99.5	98.1	98.5	98.5	99.0	99.0	99.0	99.7
TMARD Density Percent: >2 mi/sq mi	0	0	0	0	0	0	0	0
OMARD Density Percent >1 mi/sq mi	0	0.4	0.2	0	0	0	0	0

### Alternative 2

This alternative has 79.5% secure habitat, and it has a TMARD of 11.2% in the >2 mi/sq mi route density category. For OMARD, this alternative has 17.2% in the >1 mi/sq mi route density category. One difference between Alternatives 1 and 2 is that project roads drop out of the calculation for the Alternative 2. Another difference between Alternative 1 and 2 appears to be a route connecting Sixmile with Emigrant Gulch on the north end of the subunit which exists in Alternative 1 but not in Alternative 2. There is also a little higher motorized route density in the non-Wilderness area around Jardine.

### Alternative 3

This alternative has 81.3% secure habitat, and it has a TMARD of 11.2% in the >2 mi/sq mi route density category. For OMARD, this alternative has 16.8% in the >1 mi/sq mi route density category.

### Alternative 4

This alternative has 81.3% secure habitat, and it has a TMARD of 10.1% in the >2 mi/sq mi route density category. For OMARD, this alternative has 16.8% in the >1 mi/sq mi route density category. This alternative is very similar to Alternative 3.

### Alternatives 5 and 6

These alternatives have 81.3% secure habitat, and a TMARD of 10.1% in the >2 mi/sq mi route density category. For OMARD, these alternatives have 16.6% in the >1 mi/sq mi road density category.

### Alternative 7-M

This alternative has 80.4% secure habitat for OMARD and TMARD, and TMARD of 10.0% in the >2 mi/sq mi route density category. For OMARD this alternative has 16.5% in the >1 mi/sq mi road density category. This alternative provides more than the amount of secure habitat that

presently exists (in Alternatives 1 and 2) and less motorized route density in the higher density categories for OMARD and TMARD. This alternative includes an administrative route in the vicinity of Red Mountain south of the State Dome Mountain Wildlife Management Area not seen in other alternatives. This was an error of omission and is actually the same in all Alternatives 2 through 7-M. Although the overall secure and density percentages for this subunit look fairly good, the non-Wilderness and non-Park portions of the subunit are fairly heavily motorized under all alternatives.

## **Hellroaring/Bear #2**

The differences among the alternatives for this subunit are entirely due to motorized access adjacent to the boundary of the Wilderness to the north in Mill Creek at the East Fork of Mill Creek, Passage Creek, Colley Creek and Lambert Creek. This subunit has 99.5% secure habitat under CEM.

### **Alternative 1**

This alternative has 98.1% secure habitat, and none of the subunit falls in the >2 mi/sq mi motorized route density for TMARD, while only 0.4% of the subunit lies within the >1 mi/sq mi density category for OMARD.

### **Alternative 2**

This alternative has 98.5% secure habitat, and none of the subunit falls in the >2 mi/sq mi motorized route density for TMARD, while only 0.2% of the subunit lies within the >1 mi/sq mi density category for OMARD. This minor change between Alternatives 1 and 2 is due to the loss of project roads under full implementation of the Alternative 2.

### **Alternative 3**

This alternative has 98.5% secure habitat, and none of the subunit falls in the >2 mi/sq mi motorized route density for TMARD or the >1 mi/sq mi density category for OMARD.

### **Alternatives 4 – 6**

These alternatives have 99.0% secure habitat, and none of the subunit falls in the >2 mi/sq mi motorized route density for TMARD or the >1 mi/sq mi density category for OMARD. There is little measurable difference among the alternatives because private land in Passage Creek will continue to be accessed by a private road whether or not there is a Forest Service route. A very slight difference appears among the alternatives concerning motorized routes in Colley and Lambert Creeks.

### **Alternative 7-M**

This alternative has 99.7% secure habitat and 0% in the road density categories. This is an improvement over Alternatives 1 and 2.

## **Gallatin #3**

The Gallatin #3 subunit is located in the southern part of the Gallatin Range, and is shared with Yellowstone Park. The vast majority of this subunit lies within the Gallatin National Forest. The CEM Access value for secure habitat in this subunit is 55.3% (Table 3.10.9). This is one of the

subunits in the Yellowstone Area designated “in need of improvement” in the Grizzly Bear Conservation Strategy (ICST 2003). The Gallatin #3 subunit can only be improved to a certain point due to the presence of many non-Forest Service routes and their effects on this subunit (Table 3.10.2.b). This subunit has many non-Forest Service routes, especially on the east side of the subunit, and has state highways that bound the subunit on the east and west sides. These routes affect secure habitat by decreasing it to 81% before even considering the effect of National Forest routes. All alternatives improve the percentage of secure habitat available in this subunit.

**Table 3.10.9 Total Motorized Access Route Densities (TMARD), Open Motorized Access Route Densities (OMARD), and percent secure habitat of the Gallatin #3 Grizzly Bear Subunit. (All road jurisdictions are included.)**

<b>Gallatin #3</b>	<b>CEM</b>	<b>Alt. 1</b>	<b>Alt. 2</b>	<b>Alt. 3</b>	<b>Alt. 4</b>	<b>Alt. 5</b>	<b>Alt. 6</b>	<b>Alt. 7-M</b>
<b>Percent Secure</b>	55.3	54.4	59.4	60.1	62.2	71.8	81.0	70.2
<b>TMARD Density Percent: &gt;2 mi/sq mi</b>	16.9	15.4	14.0	14.1	12.1	10.9	10.6	11.7
<b>OMARD Density Percent &gt;1 mi/sq mi</b>	41.0	36.4	35.0	33.9	32.7	24.6	17.4	24.9

### **Alternative 1**

This alternative has 54.4% secure habitat, and a TMARD of 15.4% in the >2 mi/sq mi route density category. For OMARD, this alternative has 36.4% in the >1 mi/sq mi route density category. The Gallatin #3 subunit can only be improved to a certain point due to the presence of many non-Forest Service routes and their effects on this subunit (Table 3.10.2.b). This Alternative has less seasonal restrictions on motorized use than the other alternatives.

### **Alternative 2**

This alternative has 59.4% secure habitat, and a TMARD of 14.0% in the >2 mi/sq mi route density category. For OMARD, this alternative has 35.0% in the >1 mi/sq mi route density category. The difference between Alternatives 1 and 2 are due to the fact that project roads do not count in the Alternative 2. Alternative 1 and 2 are the closest to the current condition and the 1998 access baseline. Alternatives 2-4 are somewhat more restrictive on seasonal dates for motorized trails than Alternatives 5 through 7-M.

### **Alternative 3**

This alternative has 60.1% secure habitat, and a TMARD of 14.1% in the >2 mi/sq mi route density category. For OMARD, this alternative has 33.9% in the >1 mi/sq mi route density category. Alternatives 2-4 are somewhat more restrictive on seasonal dates for motorized trails than Alternatives 5 through 7-M.

Under Alternative 3, a backcountry airstrip may be proposed named Ferrell Lake which is a National Forest section of land that lies within the Recovery Zone. However, because it is a recent acquisition, it lies outside of the Forest boundary. This piece of land would be part of Gallatin #3



subunit, a subunit “in need of improvement”. This would be a new developed site and would decrease secure habitat and increase road densities. This project would have to be mitigated for within the subunit if it were to occur.

#### **Alternative 4**

This alternative has 62.2% secure habitat, and it has a TMARD of 12.1% in the >2 mi/sq mi route density category. For OMARD, this alternative has 32.7% in the >1 mi/sq mi route density category. Alternatives 2-4 are somewhat more restrictive on seasonal dates for motorized trails than Alternatives 5 through 7-M.

#### **Alternative 5**

This alternative has 71.8% secure habitat, and it has a TMARD of 10.9% in the >2 mi/sq mi route density category. For OMARD, this alternative has 24.6% in the >1 mi/sq mi route density category. Alternative 5 creates large pieces of secure habitat on the east side of this subunit and in the southern part of the subunit. This Alternative closes many of the trails on the Porupine/BuffaloHorn/Gallatin Crest year long.

#### **Alternative 6**

This alternative has 81.0% secure habitat, and it has a TMARD of 10.6% in the >2 mi/sq mi route density category. For OMARD, this alternative has 17.4% in the >1 mi/sq mi route density category. This alternative has the most secure habitat of any alternative, and removes almost all of the motorized routes over which the Forest Service has jurisdiction. This Alternative closes many of the trails in the Porupine/BuffaloHorn/Gallatin Crest year long.

#### **Alternative 7-M**

This alternative has 70.2% secure habitat, and it has a TMARD of 11.7% in the >2 mi/sq mi route density category. For OMARD, this alternative has 24.9% in the >1 mi/sq mi route density category. Alternative 7-M is a substantial improvement over the current condition (Alternatives 1 and 2). The main changes in between Alternative 7-M and Alternatives 1 and 2 are removal of motorized use from much of the southern part of the subunit, and a reduction in motorized use on the east side of the Gallatin Crest. This creates two fairly large pieces of secure habitat that do not currently exist. In addition the Crest trail and other connecting trails allow motorcycles only rather than motorcycles and ATVs as it is currently. The motorcycle only trails on the Porcupine/Buffalo Horn/Gallatin Crest are open July 15 - September 5. This offers seasonal protection for big game winter range in the spring, and also protects grizzly bear foraging areas in the fall and spring. This alternative comes very close to meeting or exceeding 70% secure, although there are some slight differences between CEM and how the alternatives are compared.

### **Hilgard #1 and #2**

The Hilgard #1 and #2 subunits lie on the west side of the Gallatin National Forest in the Madison Mountain range. Hilgard #1 is shared with the Beaverhead-Deerlodge National Forest, and the entire part on the Beaverhead-Deerlodge is in the Lee Metcalf Wilderness. A small piece of Hilgard #2 lies within Yellowstone National Park. The CEM shows secure percentages at 69.8% and 71.5%, respectively for these two subunits (Table 3.10.10). The large difference between OMARD and TMARD percentages reflect the extensive administrative routes in this subunit.

**Table 3.10.10 Total Motorized Access Route Densities (TMARD), Open Motorized Route Density (OMARD), and percent secure habitat of the Hilgard # 1 and #2 Grizzly Bear Subunits. Includes all road ownerships, FS, Private, etc.**

<b>Hilgard #1</b>	<b>CEM</b>	<b>Alt. 1</b>	<b>Alt. 2</b>	<b>Alt. 3</b>	<b>Alt. 4</b>	<b>Alt. 5</b>	<b>Alt. 6</b>	<b>Alt. 7-M</b>
<b>Percent Secure</b>	69.9	75.0	78.6	78.6	81.1	81.7	89.2	81.1
<b>TMARD Density Percent: &gt;2 mi/sq mi</b>	12.4	9.9	5.9	5.9	5.1	4.9	2.9	4.9
<b>OMARD Density Percent &gt; 1mi/sq mi</b>	25.0	19.4	15.4	15.4	14.3	11.0	6.7	14.2
<b>Hilgard #2</b>	<b>CEM</b>	<b>Alt. 1</b>	<b>Alt. 2</b>	<b>Alt. 3</b>	<b>Alt. 4</b>	<b>Alt. 5</b>	<b>Alt. 6</b>	<b>Alt. 7-M</b>
<b>Percent Secure</b>	71.5	78.7	81.8	81.8	81.3	82.9	90.2	83.1
<b>TMARD Density Percent: &gt;2 mi/sq mi</b>	10.3	2.9	2.9	2.9	2.8	2.4	1.8	2.8
<b>OMARD Density Percent: Total &gt; 1mi/sq mi</b>	22.0	14.2	11.2	11.2	11.8	9.5	5.1	9.4

## **Hilgard #1**

### **Alternative 1**

This alternative has 75.0% secure habitat, and it has a TMARD of 5.9% in the >2 mi/sq mi route density category. For OMARD, this alternative has 19.4% in the >1 mi/sq mi route density category. This alternative is without the OHV EIS decision, which would allow off-road OHV use to continue. The large difference between OMARD and TMARD percentages reflect the extensive administrative routes in this subunit. This alternative has the least seasonal restrictions to motorized routes.

### **Alternatives 2 and 3**

These alternatives have 78.6% secure habitat, and they have a TMARD of 5.9% in the >2 mi/sq mi route density category. For OMARD, these alternatives have 15.4% in the >1 mi/sq mi route density category. The main difference between Alternatives 1 and 2 are that the project roads no longer exist in full implementation of Alternative 2. Alternatives 1 and 2 are the closest alternative to the baseline or 1998 condition.

### **Alternative 4**

This alternative has 81.1% secure habitat, and it has a TMARD of 5.1% in the >2 mi/sq mi route density category. For OMARD, this alternative has 14.3% in the >1 mi/sq mi route density category. This alternative creates a piece of secure habitat in the Marble Lake area that does not exist in Alternative 1.

### **Alternatives 5**

This alternative has 81.7% secure habitat, a TMARD of 4.9% in the >2 mi/sq mi route density category. For OMARD, this alternative has 11.0% in the >1 mi/sq mi route density category. This alternative creates a piece of secure habitat in the Marble Lake area that does not exist in Alternative 1, truncates motorized use at the Third Yellow Mule drainage, but also increase motorized routes in the First Yellow Mule area.

### **Alternative 6**

This alternative has 89.2% secure habitat, and it has a TMARD of 2.9% in the >2 mi/sq mi route density category. For OMARD, this alternative has 6.7% in the >1 mi/sq mi route density category. This alternative has the greatest percentage of secure habitat of any of the alternatives, and creates secure habitat with most motorized use being confined to the Taylor Fork road and access in the lower parts of Buck Creek and Cache Creek. This Alternative has the most seasonal restrictions on motorized routes.

### **Alternative 7-M**

This alternative has 81.1% secure habitat, and it has a TMARD of 4.9% in the >2 mi/sq mi route density category. For OMARD, this alternative has 14.2% in the >1 mi/sq mi route density category. This alternative has decreases in the higher motorized route density categories and increases secure habitat over the current condition. Compared to Alternative 1, it provides a block of secure habitat in the Marble Lake area but adds a motorcycle and ATV route on the Forest just south of Big Sky in the Yellow Mules area. Some of the trails in the Hilgard #1 subunit become motorcycle only rather than both ATV and motorcycle that they are presently, and the Oil Well Road ATV/motorcycle trail is restricted from December 2 through July 15 which will reduce grizzly bear disturbance in spring and early summer. Buck Ridge motorcycle trail is closed December 2. Deadhorse overlook is open July 1.

### **Hilgard #2**

The Hilgard #2 subunit is partially comprised of the Monument Mountain part of the Lee Metcalf Wilderness on the east side of the subunit.

### **Alternative 1**

This alternative has 78.7% secure habitat, and it has a TMARD of 2.9% in the >2 mi/sq mi route density category. For OMARD, this alternative has 14.2% in the >1 mi/sq mi route density category.

### **Alternatives 2 and 3**

These alternatives have 81.8% secure habitat, and they have a TMARD of 2.9% in the >2 mi/sq mi route density category. For OMARD, these alternative have 11.2% in the >1 mi/sq mi route density category. The main difference between Alternatives 1 and 2 is that project roads go away under full implementation of the Alternative 2.

#### **Alternative 4**

This alternative has 81.3% secure habitat, and it has a TMARD of 2.8% in the >2 mi/sq mi route density category. For OMARD, this alternative has 11.8% in the >1 mi/sq mi route density category.

#### **Alternative 5**

This alternative has 85.5% secure habitat, a TMARD of 2.4% in the >2 mi/sq mi route density category. For OMARD, this alternative has 9.5% in the >1 mi/sq mi route density category.

#### **Alternative 6**

This alternative has 90.2% secure habitat, and it has a TMARD of 1.8% in the >2 mi/sq mi route density category. For OMARD, this alternative has 5.1% in the >1 mi/sq mi route density category. Alternative 6 drops motorized access in the southern part of the subunit and creates a large piece of secure habitat.

#### **Alternative 7-M**

This alternative has 83.1% secure habitat, and it has a TMARD of 2.8% in the >2 mi/sq mi route density category. For OMARD, this alternative has 9.4% in the >1 mi/sq mi route density category. This alternative is almost the same as Alternative 2 except that Slide Creek Trail #71 becomes non-motorized. Alternative 7-M is substantially different from Alternative 2 and increases secure habitat. In addition, part of Trail #74 is closed to motorized use while Trail #203 is opened to motorized use. Trail #203 is mostly open to motorcycle use and not ATVs. The Wapiti road is open May 15 to the cabin, but closed above the cabin until July 1. South of the Taylor Fork road, ATV trails are open until December 2 and motorcycle trails close October 15.

### **Madison # 1 and #2**

The Madison subunits #1 and #2 are shared with Yellowstone Park, and lie at the southern end of the Madison mountain range. Madison #2 is one of the subunits in the Conservation Strategy (ICST 2003) that is termed “in need of improvement.” The CEM Access Model secure values for Madison #1 and #2 are 71.5% and 66.5%, respectively (Table 3.10.11 and Table 3.10.12). Most of the secure habitat for both of these subunits lies within Yellowstone Park, with some secure habitat in Madison #1 on the Forest, but almost no secure habitat in Madison #2 on the Forest. Madison #1 subunit which includes the Cabin Creek Recreation and Wildlife Management Area, is high quality grizzly bear habitat, however, most of the secure habitat in this subunit lies within Yellowstone National park or in the Lee Metcalf Wilderness.

### **Madison #1**

#### **Alternative 1**

This alternative has 75.4% secure habitat, and a TMARD of 6.5% in the >2 mi/sq mi route density category. For OMARD, this alternative has 19.5% in the >1 mi/sq mi route density category. This alternative tends to have the least seasonal motorized restrictions.

### **Alternative 2**

This alternative has 79.1% secure habitat, and it has a TMARD of 4.8% in the >2 mi/sq mi route density category. For OMARD, this alternative has 17.2% in the >1 mi/sq mi route density. Alternatives 1 and 2 are the closest alternatives to the current condition and the 1998 baseline. The main difference between Alternatives 1 and 2 is that under Alternative 2 the project roads disappear upon full implementation.

### **Alternative 3**

This alternative has 82.2% secure habitat, a TMARD of 4.3% in the >2 mi/sq mi route density category. For OMARD, this alternative has 14.4% in the >1 mi/sq mi route density.

### **Alternative 4**

This alternative has 83.2% secure habitat, and it has a TMARD of 3.9% in the >2 mi/sq mi route density category. For OMARD, this alternative has 13.0% in the >1 mi/sq mi route density. This is a decrease in the high density motorized categories and an increase in secure habitat. Both Alternatives 3 and 4 have an ATV route connecting to Taylor Fork which impacts the percentage of secure habitat.

### **Alternative 5**

This alternative has 83.4% secure habitat, and a TMARD of 3.5% in the >2 mi/sq mi route density category. For OMARD, this alternative has 11.6% in the >1 mi/sq mi route density. This is a decrease in the high density motorized categories and an increase in secure habitat. This alternative tends to have more seasonal motorized restrictions.

### **Alternative 6**

This alternative has 89.6% secure habitat, and a TMARD of 3.8% in the >2 mi/sq mi route density category. For OMARD, this alternative has 8.0% in the >1 mi/sq mi route density. This alternative tends to have more seasonal motorized restrictions.

### **Alternative 7-M**

This alternative has 83.7% secure habitat, and it has a TMARD of 3.9% in the >2 mi/sq mi route density category. For OMARD, this alternative has 12.4% in the >1 mi/sq mi route density. This is an increase in secure habitat and a decrease in the higher motorized route densities over the current condition. Because of its high quality habitat, and the fact that most of the secure habitat for this subunit exists in either Yellowstone National Park or the Lee Metcalf Wilderness, increasing the percent secure habitat on the portion of the subunit on the National Forest is important. Several large pieces of secure habitat are created under this alternative, which is highly beneficial to grizzly bears. Other routes that exist allow motorcycle only rather than motorcycle and ATV use as they are currently. Alternatives 5 and 7-M remove the ATV route that connects to the Taylor Fork. This does not make a very noticeable numerical difference in the percent secure habitat among the alternatives, but may be very important to the human use patterns of this subunit and secure grizzly bear habitat. In addition, motorized use on motorcycle trails would be restricted from November 15 through July 15, and ATV/motorcycle trails would be restricted from December 2 through July 15, which would reduce disturbance in grizzly bear habitat in spring and early summer. Seasonal restrictions do not exist on Red Canyon, Whits, Beaver Creek or Teepee Road in this alternative.

**Table 3.10.11 Total Motorized Access Route Densities (TMARD), Open Motorized Access Route Densities (OMARD) and percent secure habitat of the Madison # 1 Grizzly Bear Subunits. (All road jurisdictions are included).**

<b>Madison #1</b>	<b>CEM</b>	<b>Alt. 1</b>	<b>Alt. 2</b>	<b>Alt. 3</b>	<b>Alt. 4</b>	<b>Alt. 5</b>	<b>Alt. 6</b>	<b>Alt. 7-M</b>
<b>Percent Secure</b>	71.5	75.4	79.1	82.2	83.2	83.4	89.6	83.7
<b>TMARD Density Percent: &gt;2 mi/sq mi</b>	22.3	6.5	4.8	4.3	3.9	3.5	3.8	3.9
<b>OMARD Density Percent: Total &gt;1 mi/sq mi</b>	24.6	19.5	17.2	14.4	13.0	11.6	8.0	12.4

## **Madison #2**

For Madison #2, the CEM and existing condition in the alternatives secure percentages are fairly close (Table 3.10.11). This is one of the subunits that has been termed “in need of improvement”. The CEM percent secure is 66.5%. As mentioned above, most of the secure habitat is in Yellowstone Park. There is almost no secure habitat on the Gallatin National Forest. This is a subunit with fairly poor habitat effectiveness and habitat value (Table 3.10.2a and Table 3.10.3). This subunit is comprised of relatively poor habitat (Tables 3.10.12 and 3.10.4) and also has been a place in which bears tend to find attractants due to the high human use of this area (Gunther et al. 2004). Improvement of secure habitat and road densities in this area is of questionable value due to the risk to grizzly bears when they venture into this subunit that is so heavily used by humans.

### **Alternative 1**

This alternative has 66.7% secure habitat, and it has a TMARD of 29.1% in the >2 mi/sq mi route density category. For OMARD, this alternative has 32.9% in the >1 mi/sq mi route density.

**Table 3.10.12 Total Motorized Access Route Densities (TMARD), Open Motorized Access Route Densities (OMARD) and percent secure habitat of the Madison #2 Grizzly Bear Subunits. (All road jurisdictions are included).**

<b>Madison #2 TMARD</b>	<b>CEM</b>	<b>Alt. 1</b>	<b>Alt. 2</b>	<b>Alt. 3</b>	<b>Alt. 4</b>	<b>Alt. 5</b>	<b>Alt. 6</b>	<b>Alt. 7-M</b>
<b>Percent Secure</b>	66.5	66.7	71.7	71.7	71.7	71.7	71.7	71.8
<b>TMARD Density Percent: &gt;2 mi/sq mi</b>	22.3	29.1	17.5	17.5	17.5	16.9	17.5	17.4
<b>OMARD Density Percent &gt;1mi/sq mi</b>	31.7	32.9	26.3	26.3	26.4	21.5	19.9	26.5

### **Alternatives 2 and 3**

These alternatives have 71.7% secure habitat, and they have a TMARD of 17.5% in the >2 mi/sq mi route density category. For OMARD, these alternatives have 26.3% in the >1 mi/sq mi route density. The difference between Alternatives 1 and 2 is that under the Alternative 2, the project roads are gone under full implementation

A backcountry airplane landing strip may be proposed under Alternative 3 for this area on the north side of the Horse Butte peninsula. This airstrip would lie within a subunit 'in need of improvement'. This would be a new developed site and could decrease secure habitat and increase road densities. This project would have to be mitigated for within the subunit if it were to occur.

#### **Alternative 4**

This alternative has 71.7% secure habitat, and it has a TMARD of 17.5% in the >2 mi/sq mi route density category. For OMARD, this alternative has 26.4% in the >1 mi/sq mi route density. This alternative is very similar to Alternatives 2 and 3.

#### **Alternative 5**

This alternative has 71.7% secure habitat, and it has a TMARD of 16.9% in the >2 mi/sq mi route density category. For OMARD, this alternative has 21.5% in the >1 mi/sq mi route density. Although the percent secure is the almost the same as Alternatives 2, 3, and 4, there is a decline in the higher road density categories under this alternative.

#### **Alternative 6**

This alternative has 71.7% secure habitat, and it has a TMARD of 17.5% in the >2 mi/sq mi route density category. For OMARD, this alternative has 19.9% in the >1 mi/sq mi route density. Again, this alternative is very similar to Alternatives 2-5.

#### **Alternative 7-M**

This alternative has 71.8% secure habitat, and it has a TMARD of 17.4% in the >2 mi/sq mi route density category. For OMARD, this alternative has 26.5% in the >1 mi/sq mi route density. Alternatives 2 through 7-M for Madison #2 are very similar and an improvement over Alternative 1 because the project roads not be designated legal routes. This improvement brings this subunit close to or exceeding 70% secure, however, most of the secure habitat lies within Yellowstone National Park to the east. A route (#2530) that is currently open to motorized use on Horse Butte is changed to a project road under this alternative indicating that it will go out of public use. In Alternatives 1-6, the Rendezvous Ski Trail routes, located just south of West Yellowstone, were not included as administrative routes. These routes are maintained infrequently by motorized vehicles in the summer to remove downfall and trim trees growing into the trails. This was corrected for Alternative 7-M for this issue, and should be the same across all alternatives for this issue. This means that all alternatives have 71.8% secure, and there is very little difference among the action alternatives.

#### **Plateau #1**

A small portion (about 15%) of the Plateau #1 subunit lies on the Gallatin National Forest. Most of this subunit is in the Caribou-Targhee National Forest and Yellowstone Park. The portion in the Park is almost entirely secure habitat, and the portion on the Caribou-Targhee has several large pieces of secure habitat. The percent secure in CEM and the Conservation Strategy is 68.9% (Table 3.10.13). The noticeable differences among the alternatives for Plateau #1 are because Alternatives 1 through 7-M analyzed only routes on the Gallatin National Forest and used no motorized routes for the Park and Caribou-Targhee.

**Table 3.10.13 Total Motorized Access Route Densities (TMARD), Open Motorized Access Route Densities (OMARD), and percent secure habitat of the Plateau # 1 Grizzly Bear Subunit. All route jurisdictions are included.**

<b>Plateau #1</b>	<b>CEM</b>	<b>Alt. 1</b>	<b>Alt. 2</b>	<b>Alt. 3</b>	<b>Alt. 4</b>	<b>Alt. 5</b>	<b>Alt. 6</b>	<b>Alt. 7-M</b>
<b>Percent Secure</b>	68.9	92.1	93.8	93.8	93.8	93.8	93.8	93.8
<b>TMARD Density Percent: &gt;2 mi/sq mi</b>	9.6	4.3	1.4	1.4	1.4	1.4	1.4	1.4
<b>OMARD Density Percent &gt; 1 mi/sq mi</b>	28.3	5.4	2.8	3.3	3.3	3.3	3.3	2.4

**Alternative 1**

This alternative has 92.1% secure habitat, and it has a TMARD of 4.3% in the >2 mi/sq mi route density category. For OMARD, this alternative has 5.4% in the >1 mi/sq mi route density.

**Alternative 2**

This alternative has 93.8% secure habitat, and it has a TMARD of 1.4% in the >2 mi/sq mi route density category. For OMARD, this alternative has 2.8% in the >1 mi/sq mi route density. The difference between Alternatives 1 and 2 is that the project roads go away with full implementation of the travel management plan.

**Alternatives 3-6**

These alternatives have 93.8% secure habitat, and they have a TMARD of 1.4% in the >2 mi/sq mi route density category. For OMARD, these alternatives have 3.3% in the >1 mi/sq mi route density. This is very similar to Alternative 2.

A backcountry airplane landing strip may be proposed under Alternative 3 for this area at the very southern end of the Forest on South Plateau. This would be a new developed site and could decrease secure habitat and increase road densities. This project would have to be mitigated for within the subunit if it were to occur

**Alternative 7-M**

This alternative has 93.8% secure habitat, and it has a TMARD of 1.4% in the >2 mi/sq mi route density category. For OMARD, this alternative has 2.4% in the >1 mi/sq mi route density. This alternative is very similar to Alternatives 3-6 except for a slight decline in the OMARD >1 mi/sq mi density category. As previously discussed, the 92% secure figure is misleading. The Gallatin National Forest comprises only about 15% of this subunit. Routes on the Caribou-Targhee were excluded from the alternatives, giving it the appearance of a highly secure subunit, when in fact only the Yellowstone Park portion of the subunit has a large proportion of secure habitat. Alternative 7-M is an improvement over Alternative 1 and a very slight improvement over Alternative 2.



## Henry’s Lake #2

The Henry’s Lake #2 subunit lies on the southwest part of the Gallatin National Forest in the Henry’s Mountains and is shared with the Caribou-Targhee National Forest. The CEM secure habitat value for Henry’s Lake #2 is 45.7% (Table 3.10.14). With Henry’s Lake #2, as with Plateau #1 subunit, the Caribou-Targhee routes are only present in the CEM data and not in the Gallatin Forest travel alternatives. Most of the secure habitat lies on the Caribou-Targhee portion of this subunit. The percentages derived from secure habitat for the alternatives do not match CEM since only the Gallatin portion of the subunit counts motorized routes. The Park and Targhee are counting as non-motorized and totally secure. The way to look at the change across alternatives is to compare the percentages for the alternatives, using 1 and 2 as the existing condition to see if there is improvement. The east side of the subunit remains fairly heavily motorized under all alternatives. The Henry’s Lake #2 subunit is one of those designated “in need of improvement” in the Conservation Strategy (ICST 2003). This subunit overlaps the Lionhead TPA, which is an area of concern as a wildlife corridor from east to west toward Reynolds Pass. Part of the Lionhead TPA is outside of the Recovery Zone and therefore outside of the subunit. Travel through the eastern part of this subunit and Lionhead TPA could be problematic for grizzly bears and other species, due to high motorized route densities throughout almost the entire east side of the subunit from north to south.

**Table 3.10.14 Total Motorized Route Densities (TMARD), Open Motorized Route Densities (OMARD), and percent secure habitat of the Henry’s Lake #2 Grizzly Bear Subunit. (All route jurisdictions included).**

Henry’s Lake #2 TMARD	CEM	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7-M
Percent Secure	45.7	52.7	57.7	57.7	58.8	64.5	67.5	62.5
TMARD Density Percent: >2 mi/sq mi	28.3	29.0	21.1	21.1	20.7	17.2	15.7	19.0
OMARD Density Percent > 1 mi/sq mi	46.1	36.5	28.0	28.0	27.4	22.6	22.3	25.1

### Alternative 1

This alternative has 52.7% secure habitat, and it has a TMARD of 29.0% in the >2 mi/sq mi route density category. For OMARD, this alternative has 36.5% in the >1 mi/sq mi route density.

### Alternatives 2 and 3

These alternatives have 57.7% secure habitat, and they have a TMARD of 21.1% in the >2 mi/sq mi route density category. For OMARD, these alternatives have 28.0% in the >1 mi/sq mi route density. The difference between Alternatives 1 and 2 is that the project roads drop out under full implementation of the Alternative 2.

### Alternative 4

This alternative has 58.8% secure habitat, and it has a TMARD of 20.7% in the >2 mi/sq mi route density category. For OMARD, this alternative has 27.4% in the >1 mi/sq mi route density. Alternative 4 shows some improvement in secure habitat in the northwest part of the subunit.

### **Alternative 5**

This alternative has 64.5% secure habitat, a TMARD of 17.2% in the >2 mi/sq mi route density category. For OMARD, this alternative has 22.6% in the >1 mi/sq mi route density. Under this alternative, more of the western portion of this subunit on the Gallatin becomes secure habitat.

### **Alternative 6**

This alternative has 67.5% secure habitat, and it has a TMARD of 15.7% in the >2 mi/sq mi route density category. For OMARD, this alternative has 22.3% in the >1 mi/sq mi route density.

### **Alternative 7-M**

This alternative has 62.5% secure habitat, and it has a TMARD of 19.0% in the >2 mi/sq mi route density category. For OMARD, this alternative has 25.1% in the >1 mi/sq mi route density. This alternative is an improvement over both Alternatives 1 and 2, the current condition. It improves the subunit over the current level of secure habitat mostly on the west side of the subunit. Some routes within this subunit (#218 and parts of #215) are closed to motorized use under this alternative. Several routes become project routes and will go out of public use (#2540). Motorized use on the Two Top trail would be restricted to motorized use from December 2 through June 30 which would reduce disturbance in spring and early summer grizzly bear habitat.

## **Areas of the Gallatin National Forest Outside of the Recovery Zone**

All portions of the Gallatin National Forest south of Interstate-90 were analyzed regardless of whether they were inside or outside the Recovery Zone. This is because grizzly bears are moving into these areas. The areas analyzed south of I-90 are analyzed with all route ownerships (federal, state, county and private) (Tables 3.10.15-3.10.17). The area outside the National Forest boundary does not count toward road density. The Draft Conservation Strategy (2005) requires that only percent of secure habitat be monitored outside of the PCA. Therefore, secure habitat is what this analysis is based upon. There are no CEM data for these areas, because CEM Access data does not exist for the parts of the Forest outside of the Recovery Zone. The Grizzly Bear Conservation Strategy calls for monitoring only secure habitat in areas outside of the PCA where grizzly bears occur.

Alternative 1 is what is legally available to the public on the 1999 Forest visitor map and is the 'no action' alternative. Under this alternative, the OHV rule is not in place which means off-route travel is legal, there is no travel plan, and routes are not designated. Alternative 2 is the closest alternative to what people are actually currently doing on the ground with the OHV rule in place, making off-route travel illegal, and designating routes. Alternative 2 is a 'snap shot' of current use, but with a travel plan in place. Under Alternatives 2 through 7-M, project routes are expected to go out of use over time. Many of them are already grown in and are impassable or have been obliterated. Under all Alternatives 2 through 7-M, administrative routes will be closed to all but administrative use and gated to the public. In a few cases, administrative roads become ATV and/or motorcycle routes. Under Alternative 1, all motorized routes are counted as open to the public.

## Mile and Sheep Creek

The Mile and Sheep Creek portions of the Henry's Mountains are located west of Henry's Lake Subunit #2 on the Gallatin National Forest, and are part of the Lionhead TPA. The Lionhead TPA is believed to be the wildlife corridor for east to west movement of animals to and from the area west of the Forest. This area is approximately 33 square miles. It is a relatively secure piece of habitat, but could be improved slightly (Table 3.10.15).

**Table 3.10. 15 Percent secure habitat in the Mile/Sheep Creek area outside of the Grizzly Bear Recovery Zone. Includes all route ownerships, federal, state, county and private.**

Mile/Sheep Creek	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7-M
Percent Secure	74.6	77.3	77.3	77.7	87.6	87.6	87.7

### Alternative 1

This alternative has 74.6% secure habitat.

### Alternatives 2 and 3

These alternatives have 77.3% secure habitat. Under these alternatives, there is some high density motorized use at Little Mile Creek. Although these roads show as motorized in the analysis, they are rarely used and are almost impassable. Alternatives 1 and 2 are closest to the current condition and 1998 baseline for comparison, however, project roads go away under Alternatives 2 through 7-M, and this is why secure habitat is improved.

### Alternative 4

This alternative has 77.7% secure habitat.

### Alternatives 5 and 6

These alternatives have 87.6% secure habitat. Under these alternatives this area is not bisected from east to west by the motorized Sheep Creek trail. This explains the increase in percent secure habitat.

### Alternative 7-M

This alternative has 87.7% secure habitat. Under this alternative, this area is not bisected from the east to west by the motorized Sheep Creek trail. This is an improvement over the current condition.

## Absaroka Beartooth

This is the northern part of the Absaroka Beartooth (AB) Mountains, located to the north of the Primary Conservation Area on the east side of the Gallatin National Forest and south of I-90. This is a large area (478 sq mi) that includes substantial Wilderness acreage. Most of the motorized routes occur in the Mill Creek, East Boulder and Deer Creeks TPAs. The Deer Creeks is not known to be used by grizzly bears at this time, and it has much drier habitat types than most of the Forest. Mill Creek is a heavily motorized area just north of the Recovery Zone. There are some differences

among the alternatives for Mill Creek, but it remains heavily motorized under all alternatives (Table 3.10.16). All road jurisdictions are counted. As in the analysis inside for the areas inside the PCA, project roads are expected to go away over time in Alternatives 2 through 7-M. This area does not have many administrative roads.

**Table 3.10. 16 Percent secure habitat of the Absaroka Beartooth area outside of the Grizzly Bear Recovery Zone. Includes all road jurisdictions.**

North Absaroka/Beartooth	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7-M
Percent Secure	73.8	75.8	75.8	80.6	83.5	83.6	78.9

**Alternative 1**

This alternative has 73.8% secure habitat.

**Alternatives 2 and 3**

These alternatives have 75.8% secure habitat. Alternatives 1 and 2 are the closest alternative to the current condition. The main difference between these and Alternative 1 appears to be the loss of some project roads in the Mill Creek area under Alternatives 2 through 7-M.

**Alternative 4**

This alternative has 80.6% secure habitat. The East Boulder TPA is less motorized under Alternatives 4-6 than the other alternatives.

**Alternative 5**

This alternative has 83.5% secure habitat. The East Boulder TPA is least motorized under Alternatives 5 and 6.

**Alternative 6**

This alternative has 83.6% secure habitat. The East Boulder TPA is least motorized under Alternatives 5 and 6.

**Alternative 7-M**

This alternative has 78.9% secure habitat. There is an increase in secure habitat in this area under this alternative over Alternatives 1 and 2 (representing the current condition).

**Gallatin/Madison**

This is the portion of the Gallatin and Madison Mountain ranges north of the Recovery Zone and south of I-90. In the Madison Range, it includes the Spanish Peaks part of the Lee Metcalf Wilderness Area. These two TPAs are heavily motorized under all alternatives (Table 3.10.17). The Madison (western) part of the area changes little across alternatives. On the Gallatin side, the alternatives that remove motorized use from some or most of the Gallatin Crest allow grizzly bears and other wildlife to have a relatively non-motorized north-south movement corridor. These alternatives also protect some whitebark pine stands from motorized activity. On the Madison side, there is fairly good secure habitat available north of the Recovery Zone. However, movement into

this area is likely hampered by the increasing development in the Big Sky area on the east side of the Madison Range. Grizzly bears may find a safer or easier route to the north on the west side of the Madison Range, which is on the Beaverhead-Deerlodge National Forest.

**Table 3.10. 17 Percent secure habitat of the Gallatin/Madison area outside of the Grizzly Bear Recovery Zone. Includes all road jurisdictions.**

Gallatin/Madison	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7-M
Percent Secure	49.1	52.6	52.6	57.2	59.1	60.2	57.0

**Alternative 1**

This alternative has 49.1% secure habitat,

**Alternatives 2 and 3**

These alternatives have 52.6% secure habitat. Alternatives 1 and 2 are the closest alternatives to the current condition, and the increase in secure habitat is due to the removal of project roads in the Alternatives 2 through 7-M.

**Alternative 4**

This alternative has 57.2% secure habitat. This alternative has less motorized use in the Gallatin Crest TPA than Alternatives 1 and 2.

**Alternative 5**

This alternative has 59.1% secure habitat.

**Alternative 6**

This alternative has 60.2% secure habitat. The main changes in the Gallatin (eastern) part of the area occur with less motorized use in the Gallatin Crest TPA, most notable under Alternative 6.

**Alternative 7-M**

This alternative has 57.0% secure habitat. Under this alternative, there are more motorized routes in the Gallatin Roded and Hyalite TPAs. This is an improvement over the current level of secure habitat (Alternatives 1 and 2) in this area. Most of the decrease appears to be east of the Gallatin Crest.

**Summary for Summer Motorized Use**

Several grizzly bear subunits have very high percentages of secure habitat under all alternatives. These include Boulder/Slough subunits #1 and #2, Crandall/Sunlight #1 and #2, Lamar #1, and Hellroaring/Bear #2. These are all on the eastern portion of the Forest and are largely comprised of Wilderness with some National Park acreage. The Hellroaring/Bear #1 subunit differs slightly among the alternatives and has about 80% secure habitat on average across the alternatives.

The Gallatin National Forest contains portions of three subunits designated by the Grizzly Bear Conservation Strategy (ICST 2003) as “in need of improvement.” These are the Gallatin #3,

Madison #2, and Henry's Lake #2 subunits. The Gallatin #3 subunit currently has about 55% secure habitat. Alternatives 2 through 7-M increase secure to about 60% under Alternatives 2 and 3, 62% under Alternative 4, 72% under Alternative 5, 81% under Alternative 6, and 70% under Alternative 7-M. Alternatives 5, 6, and 7-M offer substantial improvement in the security of this subunit. Under Alternative 7-M, the main change is the removal of motorized use from the southern part of the subunit and the reduction in motorized use on the east side of the Gallatin Crest. This creates two fairly large pieces of secure habitat.

The Madison #2 subunit shows about 67% secure currently. This increases to about 72% under Alternatives 2 through 7-M. Madison #2 subunit has almost no secure habitat on the National Forest. There are many private dwellings and attractants in this subunit. It appears there is little potential to increase secure habitat (no change among Alternatives 2 through 7-M), and this is a subunit where grizzly bears face a higher risk of conflict with humans than in many other subunits (Gunther et al. 2004). Gunther et al. (2004) studied grizzly bear/human conflicts from 1992 to 2000 and found several clusters of conflicts on the Gallatin National Forest. One is in the Madison #2 subunit, another is in the Hilgard subunits (Taylor Fork), and the third is in Gallatin #3 (near Gardiner). In a review of the conflicts and mortalities since 2000 for Madison #2, there continue to be 2-4 conflicts reported each year in this subunit tied to attractants such as garbage and pet or livestock food. There have also been a number of mortalities on both private and public land in the Madison #2 vicinity (ICST Annual Reports 2000-2003). Although Alternatives 2 through 7-M increase secure habitat, it is in very small pieces surrounded by motorized access routes. The largest piece of secure habitat created on the Forest is less than about 200 acres. It is of questionable benefit to the grizzly bear to use scarce resources to improve this subunit given its inherent low habitat value, the attractants available, and mortality risk to bears in this area.

Henry's Lake subunit #2 has about 53% secure under the current situation. This improves to about 58-59% under Alternatives 2-4, to about 65% for Alternative 5, 68% for Alternative 6, and 63% for Alternative 7-M. All alternatives other than Alternative 1 improve secure habitat on this subunit. This subunit is heavily motorized on the east side.

Hilgard #1 and #2 subunits both have approximately 70% secure habitat under the current situation. These subunits are improved from about 79% to about 90% under Alternatives 2 through 7-M. Alternative 6 offers the greatest percentage secure habitat, Alternatives 2, 3, and 4 offer the least improvement in secure habitat. Alternative 7-M has a secure habitat percentage of over 80% for both subunits.

Madison #1 subunit is about 75% secure and improves over Alternatives 2 through 7-M. Again, Alternative 6 shows the greatest percent secure and 3-5 have little difference among the alternatives. Alternative 7-M provides about 84% secure, most of which lies within Yellowstone National Park. Plateau subunit #1 shows a slight increase in percent secure habitat over the current situation for Alternatives 2 through 7-M which all have the same percent secure. Most of this subunit lies within the Park.

Areas outside of the Grizzly Bear Recovery Zone are not subject to the Grizzly Bear Conservation Strategy access standards at this time, however, when the Forest Plans are amended with the Conservation Strategy for Grizzly Bear, the percent secure in these areas will be monitored and

reported on a regular basis. All three areas outside of the Recovery Zone but south of I-90 show an increase in secure over the current situation. Sheep and Mile Creek are outside of the Recovery Zone in the Henry's Mountains. The percent secure in this area increases from the current situation of about 77% to almost 88% under Alternatives 5, 6, and 7-M. This is primarily due to the change to non-motorized use for the Sheep Creek Trail.

The Absaroka Beartooth area north of the Recovery Zone and south of I-90 includes substantial Wilderness acreage. Under Alternative 1, secure habitat is about 74%, about 76% under Alternatives 2-3, 81% under Alternative 4, about 84% under Alternative 5 and 6 and 79% under Alternative 7-M.

The Gallatin/Madison areas north of the Recovery Zone and south of I-90 include some of the Lee Metcalf Wilderness. Under Alternative 1 there is about 49% secure habitat in this area, and it increases under Alternative 2-3 to 53%, is about 57% under Alternative 4, 59% under Alternative 5, 60% under Alternative 6 and 57% under Alternative 7-M.

In conclusion, all Grizzly Bear subunits on the Gallatin National Forest either remain the same that they are at the present time or have increased secure habitat under Alternatives 2 through 7-M. Some of this is due to the fact that project roads will go out of use for any of these alternatives. Six of the subunits have a very high percentage of secure habitat and had little room for improvement. In addition, all three subunits "in need of improvement" (ICST 2003) have increased secure habitat, with a substantial improvement for Gallatin #3, a reasonable improvement for Henry's Lake #2, and a slight improvement for Madison #2. The three areas outside of the Recovery Zone but south of Interstate-90 (where grizzly bears may occur) also show an increased amount of secure habitat. Mile/Sheep Creek shows a substantial increase in secure habitat while the Gallatin/Madison and Absaroka/Beartooth show some increase in secure habitat.

## **Motorized Winter Use**

The Grizzly Bear Conservation Strategy (ICST 2003) has no standards relating to winter use or snowmobiling. However, due to public interest in this issue, it is being addressed here.

## **Absaroka Beartooth Mountains**

The Absaroka Beartooth Mountains include the following TPAs: Beartooth Plateau, Wilderness, Cooke City on the Gallatin National Forest, Deer Creeks, East Boulder, Gardiner Basin, Main Boulder, Mill Creek, Mission and the Custer National Forest portion of the Cooke City area that is administered by the Gallatin National Forest. Total National Forest acres in the AB Mountains are approximately 825,900 (Table 3.10.18). There is a slight variation among alternatives in acreage legally closed yearlong to snowmobiling. Across the alternatives, the range is from approximately 607,700 to 637,800 acres. There is no acreage under seasonal closure to snowmobile in this mountain range.

**Table 3.10.18 Yearlong snowmobile closures in the Absaroka Beartooth Mountains, by alternative.**

Absaroka Beartooth Mountains TPAs	Acres		Percent Yearlong Snowmobile Closure						
	Gross	Net	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7-M
Beartooth Plateau	65,747	65,670	100	100	100	100	100	100	100
Wilderness	518,959	517,975	100	100	100	100	100	100	100
Cooke City (GNF only)	19,405	16,631	0	0	0	23	23	23	0
Deer Creeks	66,937	65,759	0	0	0	0	5	0	0
East Boulder	41,297	39,831	0	0	9	9	9	9	9
Gardiner Basin	25,509	23,286	52	52	55	55	55	55	55
Main Boulder	20,671	16,788	0	0	1	1	3	1	0
Mill Creek	74,552	69,916	15	20	20	20	39	20	26
Mission	11,736.7	10,010	17	17	61	61	61	61	17
<b>TOTAL</b>	<b>844,815</b>	<b>825,866</b>	<b>74</b>	<b>74</b>	<b>75</b>	<b>75</b>	<b>77</b>	<b>75</b>	<b>75</b>

**Alternatives 1 and 2**

These alternatives have 74% of the AB Mountains legally closed yearlong to snowmobiling. This is the current condition and what is actually happening on the ground.

**Alternatives 3 and 4**

These alternatives have 75% of the AB Mountains legally closed yearlong to snowmobiling. These alternatives have slightly more of the East Boulder, Gardiner Basin, Main Boulder and Mill Creek TPAs closed to snowmobiling than Alternative 1, and has significantly more of the Mission TPA closed to snowmobiling.

**Alternative 5**

This alternative has 77% of the A/B Mountains legally closed yearlong to snowmobiling. This alternative has slightly more of the Deer Creeks, East Boulder, Gardiner Basin and Main Boulder TPAs closed to snowmobiling compared to Alternative 1. It also has quite a bit more of the Cooke City (Gallatin part), Mill Creek and Mission TPAs closed to snowmobiling. Some of the Custer National Forest part of the Cooke City TPA is closed to snowmobiling under this alternative.

**Alternatives 6 and 7-M**

These alternatives have 75% of the A/B Mountains legally closed yearlong to snowmobiling. These alternatives have slightly more of the East Boulder, Gardiner Basin, Main Boulder and Mill Creek TPAs closed to snowmobiling than Alternative 1, and has significantly more of the Mission TPA closed to snowmobiling. Some of the Custer National Forest part of the Cooke City TPA is closed to snowmobiling under this alternative.



## Gallatin Mountain Range

The Gallatin Mountains include the following TPAs: Bear Canyon, Bozeman Creek, Gallatin Crest, Gallatin River Canyon, Gallatin Roaded, Hyalite, Porcupine Buffalo Horn, Sawtooth, Tom Miner Rock, Yankee Jim Canyon, and Yellowstone. Total National Forest acreage in the Gallatin Mountains is approximately 376,794 acres (Table 3.10.19).

**Table 3.10. 19 Yearlong snowmobile closures in the Gallatin Mountains, by alternative.**

Gallatin Mountains TPAs	Total Acres		Percent Yearlong Snowmobile Closure						
	Gross	Net	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7-M
Bear Canyon	20,533	10,716	3	3	0	36	37	36	44
Bozeman Creek	21,583	17,542	85	85	99	100	100	100	100
Gallatin Crest	112,350	106,086	27	27	53	87	94	94	94
Gallatin River Canyon	35,517	29,930	23	23	58	58	60	64	66
Gallatin Roaded	61,123	57,329	2	2	0	2	2	2	2
Hyalite	20,756	20,281	2	2	95	100	100	100	100
Porcupine Buffalo Horn	60,051	53,891	36	36	29	29	68	86	63
Sawtooth	19,616	16,643	1	1	97	97	99	100	99
Tom Miner Rock	24,539	13,331	0	0	55	55	83	62	56
Yankee Jim Canyon	49,587	33,451	60	60	99	99	99	99	99
Yellowstone	30,383	17,595	46	46	5	25	23	23	100
<b>TOTAL</b>	<b>456,038</b>	<b>376,795</b>	<b>27</b>	<b>27</b>	<b>49</b>	<b>61</b>	<b>70</b>	<b>72</b>	<b>72</b>

### Alternatives 1 and 2

These alternatives have 27%, or about 100,000 acres, of the Gallatin Range legally closed to snowmobiling yearlong. TPAs with the largest percentage closed to snowmobiling are Bozeman Creek (85%), Yankee Jim Canyon (60%), Yellowstone (46%), Porcupine Buffalo Horn (36%), Gallatin Crest (27%), and Gallatin River Roaded (23%). There are small closures in Bear Canyon, Gallatin Roaded, Hyalite, and Sawtooth TPAs.

These alternatives have 5%, or about 17,800 acres of the Gallatin Range legally closed to snowmobiling seasonally (Table 3.10.20). These include portions of the Gallatin River Canyon and Porcupine Buffalo Horn TPAs.

### Alternative 3

This alternative has 49%, or about 182,300 acres, of the Gallatin Range legally closed to snowmobiling yearlong. When compared to Alternative 1, this alternative has a much greater percentage closed in Gallatin Crest, Gallatin River Canyon, Hyalite, Sawtooth, Tom Miner Rock, and Yankee Jim Canyon TPAs. There is less area closed in Bear Canyon, Gallatin Roaded, Porcupine Buffalo Horn, and Yellowstone TPAs. This alternative has 5%, or about 17,500 acres, of the Gallatin Range legally closed to snowmobiling seasonally. These areas include portions of the

Gallatin River Canyon and Porcupine Buffalo Horn TPAs. The acreage seasonally closed in the Gallatin River Canyon is slightly lower than in Alternatives 1 and 2.

**Table 3.10. 20 Seasonal snowmobile closures in the Gallatin Mountains, by alternative (in addition to yearlong closures).**

Gallatin Mountains TPAs	Total Acres		Percent Seasonal Snowmobile Closure						
	Gross	Net	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7-M
Bear Canyon	20,533	10,716	0	0	0	0	0	0	0
Bozeman Creek	21,583	17,542	0	0	0	0	0	0	0
Gallatin Crest	112,350	106,086	0	0	0	0	0	0	0
Gallatin River Canyon	35,517	29,930	11	11	10	0	0	0	0
Gallatin Roaded	6,1123	57,329	0	0	0	0	0	0	0
Hyalite	20,756	20,281	0	0	0	0	0	0	0
Porcupine Buffalo Horn	60,051	53,891	27	27	27	0	0	0	0
Sawtooth	19,616	16,643	0	0	0	0	0	0	0
Tom Miner Rock	24,539	13,331	0	0	0	0	0	0	0
Yankee Jim Canyon	49,587	33,451	0	0	0	0		0	0
Yellowstone	30,383	17,595	0	0	0	0	0	0	0
<b>TOTAL</b>			<b>5</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**Alternative 4**

This alternative has 61%, or about 228,400 acres, of the Gallatin Range legally closed to snowmobiling yearlong. When compared to Alternative 1, this alternative has more area closed in every TPA but two, Porcupine Buffalo Horn and Yellowstone. Many of the TPAs have a much larger percentage closed than under Alternative 1. There is a tiny amount (<1%) closed seasonally in the Gallatin River Canyon TPA.

**Alternative 5**

This alternative has 70%, or about 263,900 acres, of the Gallatin Range legally closed to snowmobiling yearlong. When compared to Alternative 1, this alternative has greater acreage closed to snowmobiling in all TPAs except for the Yellowstone. All TPAs except Bear Canyon, Gallatin Roaded and Yellowstone have more than 60% of their area closed to snowmobiling. There is a tiny amount (<1%) closed seasonally in the Gallatin River Canyon TPA.

**Alternative 6**

This alternative has 72%, or about 272,300 acres, of the Gallatin Range legally closed to snowmobiling yearlong. When compared to Alternative 1, this alternative has greater acreage closed to snowmobiling in all TPAs except for the Yellowstone. All TPAs except Bear Canyon, Gallatin Roaded and Yellowstone have more than 60% of their area closed to snowmobiling. There is a tiny amount (<1%) closed seasonally in the Gallatin River Canyon TPA.

### Alternative 7-M

This alternative has 72% of the Gallatin Range legally closed to snowmobiling yearlong. This alternative is very similar to Alternative 6 but with less of Porcupine Buffalo Horn and Tom Miner Rock closed to snowmobiling but the Yellowstone TPA is completely closed.

### Henry’s Mountains

The Henry’s Mountains include the following TPAs: Lionhead, South Plateau and Hebgen Lake Basin. Total National Forest acreage in the Henry’s Mountains is approximately 143,000 acres (Table 3.10.21). Only Alternative 5 has any measurable seasonal snowmobile closures.

**Table 3.10. 21 Yearlong snowmobile closures in the Henry’s Mountains, by alternative.**

Henry’s Mountains TPAs	Total Acres		Percent Yearlong Snowmobile Closure						
	Gross	Net	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7-M
Lionhead	56,965	56,692	44	44	56	61	61	67	53
South Plateau	39,723	39,174	13	13	13	13	14	32	0
Hebgen Lake Basin	57,811	47,059	9	9	9	9	19	21	0
<b>TOTAL</b>	<b>154,499</b>	<b>142,924</b>	<b>24</b>	<b>24</b>	<b>29</b>	<b>31</b>	<b>34</b>	<b>42</b>	<b>21</b>

### Alternatives 1 and 2

These alternatives have 24%, or about 34,600 acres, of the Henry’s Mountain Range legally closed to snowmobiling yearlong. The Lionhead TPA has the largest percentage closed, followed by South Plateau and Hebgen Lake Basin. There are a few acres of the Hebgen Lake Basin closed seasonally to snowmobiling (Table 3.10.22).

**Table 3.10. 22 Seasonal snowmobile closures in the Henry’s Mountains, by alternative (in addition to yearlong closures).**

Henry’s Mountains TPAs	Total Acres		Percent Seasonal Snowmobile Closure						
	Gross	Net	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7-M
Lionhead	56,965	56,692	0	0	0	0	4	0	0
South Plateau	39,723	39,174	0	0	0	0	0	0	0
Hebgen Lake Basin	57,811	47,059	0	0	0	0	2	0	0
<b>TOTAL</b>	<b>154,499</b>	<b>142,924</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>

### Alternative 3

This alternative has 29%, or about 41,200 acres, of the Henry’s Mountains legally closed to snowmobiling yearlong. The Lionhead TPA shows an increase from the percentage closed in Alternatives 1 and 2. There are a few acres of the Hebgen Lake Basin closed seasonally to snowmobiling.

#### **Alternative 4**

This alternative has 31%, or about 43,800 acres, of the Henry's Mountains legally closed to snowmobiling yearlong. The Lionhead TPA shows an increase in the percentage closed in Alternatives 1 and 2. There are a few acres of the Hebgen Lake Basin closed seasonally to snowmobiling.

#### **Alternative 5**

This alternative has 34%, or about 51,200 acres, of the Henry's Mountains legally closed to snowmobiling yearlong. The Lionhead TPA shows an increase from the percentage closed in Alternatives 1 and 2. The other two TPAs have also increased the area closed, but to a lesser extent than Lionhead. This alternative closes 4% of Lionhead and 2% of Hebgen Lake Basin TPAs seasonally to snowmobiling.

#### **Alternative 6**

This alternative has 42%, or about 61,100 acres, of the Henry's Mountains legally closed to snowmobiling yearlong. All three TPAs show an increase over the percentage closed in Alternatives 1 and 2. There are a few acres of the Hebgen Lake Basin closed seasonally to snowmobiling.

#### **Alternative 7-M**

This alternative has 21%, or about 30,000 acres, of the Henry's Mountains legally closed to snowmobiling yearlong. The Lionhead TPA shows an increase in the percentage closed in Alternative 7-M over what was closed in Alternatives 1 and 2, and the Hebgen lake Basin and South Plateau have no closures in Alternative 7-M. There are a few acres of the Hebgen Lake Basin closed seasonally to snowmobiling.

### **Madison Mountain Range**

The Madison Mountain Range includes the following TPAs: Cabin Creek, Taylor Fork, Cherry Creek, Big Sky and the three Wilderness TPAs (Lee Metcalf Wilderness Hilgards, Monument and Spanish Peaks). The three Wilderness TPAs are legally closed to snowmobiling under all alternatives (Table 3.10.23).

#### **Alternatives 1 and 2**

These alternatives have 50%, or about 149,500 acres, of the Madison Range legally closed to snowmobiling yearlong. Twenty percent of Taylor Fork, 2% of Cabin Creek and 3% of Big Sky TPAs are closed. This is the existing condition. For Alternative 1, there are seasonal closures in 77% of Cherry Creek, 45% of Big Sky and 36% of Taylor Fork. This is slightly different in Alternative 2 with a 60% closure in Taylor Fork.

#### **Alternative 3**

This alternative has 59%, or about 177,400 acres closed to snowmobiling yearlong in the Madison Range. Under this alternative, as compared with Alternatives 1 and 2, the percentage closed in the Taylor Fork is increased to 25%, in Big Sky 24% and Cherry Creek is completely closed. This alternative has seasonal closures in 61% of Taylor Fork and 45% of Big Sky (Table 3.10.24).

**Table 3.10. 23 Yearlong snowmobile closures in the Madison Range, by alternative.**

Madison Range TPAs	Total Acres		Percent Yearlong Snowmobile Closure						
	Gross	Net	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7-M
Cabin Creek	54,735	54,674	2	2	2	2	2	100	2
Taylor Fork	76,960	73,281	20	20	25	25	28	80	65
Cherry Creek	26,684	20,392	0	0	100	100	100	100	100
Big Sky	64,342	17,798	3	3	24	41	41	41	24
LM Wilderness Hilgards	33,344	33,341	100	100	100	100	100	100	100
LM Wilderness Monument	32,347	32,309	100	100	100	100	100	100	100
LM Wilderness Spanish Peaks	68,076	68,074	100	100	100	100	100	100	100
<b>TOTAL</b>	<b>356,489</b>	<b>299,869</b>	<b>50</b>	<b>50</b>	<b>59</b>	<b>60</b>	<b>60</b>	<b>92</b>	<b>69</b>

**Alternative 4**

This alternative has 60%, or about 180,500 acres, closed to snowmobiling yearlong in the Madison Range. Under this alternative as compared to Alternatives 1 and 2, the percentage closed in the Taylor Fork is increased to 25%, in Big Sky to 41% and Cherry Creek is completely closed. This alternative has seasonal closures in 61% of Taylor Fork and 48% of Big Sky.

**Table 3.10. 24 Seasonal snowmobile closures in the Madison Range, by alternative (in addition to yearlong closures).**

Madison Range TPAs	Total Acres		Percent Seasonal Snowmobile Closure						
	Gross	Net	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7-M
Cabin Creek	54,735	54,674	0	0	0	0	98	0	0
Taylor Fork	76,960	73,281	36	60	61	61	57	6	40
Cherry Creek	26,684	20,392	77	77	0	0	0	0	0
Big Sky	64,342	17,798	45	45	45	48	48	48	45
LM Wilderness Hilgards	33,344	33,341	0	0	0	0	0	0	0
LM Wilderness Monument	32,347	32,309	0	0	0	0	0	0	0
LM Wilderness Spanish Peaks	68,076	68,074	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>356,489</b>	<b>299,869</b>	<b>17</b>	<b>23</b>	<b>18</b>	<b>18</b>	<b>35</b>	<b>4</b>	<b>13</b>

**Alternative 5**

This alternative has 61%, or about 183,000 acres, closed to snowmobiling yearlong in the Madison Range. Under this Alternative compared to Alternatives 1 and 2, the percentage closed in the Taylor Fork is increased to 28%, in Big Sky to 41% and Cherry Creek is completely closed. This alternative has seasonal closures in 57% of Taylor Fork and 48% of Big Sky. A major change occurs in Cabin Creek with 98% seasonally closed to snowmobiling.

### **Alternative 6**

This alternative has 92%, or about 274,800 acres, closed to snowmobiling yearlong in the Madison Range. Under this alternative as compared to Alternatives 1 and 2, the percentage closed in Cabin and Cherry Creek is 100%, while Taylor Fork is increased to 80%, and Big Sky to 41%. This alternative has seasonal closures in 6% of Taylor Fork and 48% of Big Sky.

### **Alternative 7-M**

This alternative has 69%, or about 206,700 acres, closed to snowmobiling yearlong in the Madison Range. Under this alternative compared to Alternatives 1 and 2, the percentage closed in the Taylor Fork is increased to 65%, in Big Sky to 24% and Cherry Creek is completely closed. This alternative has seasonal closures in 35% of Taylor Fork and 45% of Big Sky.

## **Summary of Winter Motorized Snowmobile Effects**

In the Absaroka Beartooth, the alternatives range from 74% to 77% closed yearlong to snowmobiles. In the Gallatin the closures under the alternatives range from 27% to 72%, in the Henry's Mountains they range from 21% to 42%, and in the Madison Range they range from 5% to 92% closed.

Areas with seasonal restrictions to snowmobiling in the Gallatin Range range from 0 to 5% closed. There are no seasonal restrictions in the Absaroka Beartooth, but there is already a large percentage closed yearlong. The Henry's Mountains TPA has from 0-2% seasonal restrictions under the alternatives, and the Madison Range has from 4% to 35% seasonal restrictions under the alternatives.

Alternatives 2 through 7-M for these mountain ranges generally show an increase in areas closed yearlong to snowmobiling except for the Henry's Mountains. This indicates that grizzly bear denning habitat will be even less affected than it was at the time consultation with the US Fish and Wildlife Service occurred on this subject (2002). In addition, monitoring of grizzly bear dens and snowmachine use will continue. There is still the potential for snowmobiles to affect individual bears, particularly sows with cubs-of-the-year, but it is less than it is under current Forest travel management. In monitoring efforts since 2002, no evidence has been found that snowmobiles have disturbed denning or recently emerged grizzly bears (USDI FS 2004).

## **Cumulative Effects**

Of some concern for Cumulative Effects, but largely beyond human control, is the potential loss of important food sources to grizzly bears. Food sources most in question are whitebark pine and spawning cutthroat trout that are seeing declines due to disease and introduction of lake trout, respectively. Army cutworm moths are another food source, but seem to be relatively constant in the late summer and fall in certain locations where bears have learned to use them. Ungulates, both live and as carrion, may vary somewhat in availability with weather conditions, population size, and other factors. Weather conditions also affect availability of food to bears and may affect reproduction and survival. These items are a component of the environmental baseline.

## **Net Effects of Past and Present Programs and Activities**

There are several recurring themes in discussing past and present cumulative effects on grizzly bears. These are activities or situations in the past that have led to grizzly bear/human encounters and/or mortality. These themes are: 1) motorized access routes, 2) availability of food or garbage attractants, and 3) livestock grazing.

Past effects of timber harvest on the Forest in relation to grizzly bear were mostly temporary in nature: loss of hiding cover, change in forage quality and quantity, and the activities related to the timber sale. The longer lasting effect of these projects was the creation and often maintenance of roads used to access and remove timber from the Forest. Motorized access into areas is known to decrease habitat quality for grizzly bears by displacing them from areas near roads. Motorized access also allows more humans into areas where conflicts with grizzly bears may then arise (see the earlier portion of this issue for a discussion of this).

Prescribed fire likely has a neutral to beneficial effect for wildlife depending on the area burned. Where prescribed fire is used to reduce fuels in the urban interface, there is probably a neutral impact since unhabituated bears tend to avoid these areas (for a more extensive review of cumulative effects see Cherry, 2006, Cumulative Effects Worksheet in the Project Record for this issue). Fire can result in an increase in succulent forage post-burn. Fire is a natural component of the environment and the natural fire cycle is important for these fire-adapted systems. Fire suppression has resulted in the disruption of the natural fire regime in this area and caused an unnatural buildup of fuels leading to more intense fires. Although an increase in cover provided by fire suppression has some benefits to the bear due to the presence of humans, it may not be the best overall vegetative condition. Restoration of fire into the landscape in some important habitats and fire dependent species is important.

Livestock grazing has been a part of the area that became the Gallatin National Forest since white settlers first arrived in the area. Sheep, goats, cattle, and horses have been grazed on the Forest, and sheep were grazed in large numbers in the 1800's and early 1900's. Grizzly bears seem to have had relatively few interactions with cattle and horses on the Gallatin National Forest, but have run into conflicts on sheep allotments. It is likely that many grizzly bears were killed due to conflicts with livestock, primarily sheep, prior to grizzly bears being protected by law. The reduction in sheep allotments and numbers that has gradually occurred over the years has been beneficial in reducing negative interactions between sheep and bears, and reducing grizzly bear mortalities. A very recent development is the closing of the Ash/Iron Mountain sheep allotment, a site of recent grizzly bear/livestock conflict.

Weed control is beneficial to grizzly bears and their habitat. Restoration and maintenance of native plant species is important. Efforts to restore whitebark pine and aspen are both important for the grizzly bear. Whitebark pine is a very important food source, and efforts to plant this species post-fire and conduct research on its status in the area are important.

Projects that benefit fisheries and riparian habitat typically also benefit grizzly bears, because of the importance of riparian habitat to grizzly bears.

Mining has been occurring on the Forest since the time of early settlement. This activity occurred in some areas of high quality habitat, such as Cooke City, and there were undoubtedly conflicts and grizzly bear mortalities as a result. Small mining activities probably have minor impacts on bears, but large operations and also reclamation efforts probably displace bears from some parts of the Forest (such as New World Mine) due to noise and activity.

Maintaining and improving motorized routes through the Gallatin National Forest is not beneficial for grizzly bears. High speeds can lead to direct grizzly bear mortality on these routes. Maintenance and improvement of roads can increase users of the Forest which can result in increased bear/human encounters. Federal, state and county roads also have the same issues with direct mortality to grizzly bears mentioned before, especially as driving speeds increase. Major routes, such as I-90, can serve as barriers to grizzly bear movement (see Biological Diversity Issue for an analysis and discussion of wildlife corridors).

The Gallatin National Forest receives a lot of dispersed recreation use with many visits from the public occurring each year. Recreational activities lead to the potential for grizzly bear/human encounters. Encounters with negative consequences seem to be more frequent during the fall hunting season when occasionally grizzly bears are wounded or killed and humans are injured or killed. Spring bear hunting season has also led to negative grizzly bear/human encounters and loss of grizzly bears through confusion with black bears.

When humans bring food to the National Forest and do not properly store it, the presence of an attractant can also lead to grizzly bear/human encounters. The Grizzly Bear Recovery Zone has had a Food Storage Order in place for over 25 years, which helps to minimize attractant related encounters. A number of human fatalities and injuries and bear mortalities and injuries have resulted from past dispersed use on the Forest.

There are numerous outfitters/guides of various types bringing people to the Forest to recreate for many days. Hunting season is again a time of most negative encounters. Food storage is a part of the outfitter/guide permit and permits are subject to revocation in cases of noncompliance. Many of the outfitted activities, such as rafting, are very unlikely to result in bear/human encounters, but proper food and garbage handling is essential to avoid the presence of food attractants at either over night camps or during day use activities. Winter activities have little potential to affect the grizzly bear except for minor cover removal due to the removal of trees for the trails on several cross-country ski resorts.

Recreation residences are under special use permits and as long as residents follow the food storage order and do not create attractants for bears, they can coexist fairly well with bears. Most of the approximately 200 recreational residences on the Forest are on Hebgen Lake and Bozeman Ranger Districts.

Most non-recreational special uses are fairly benign once the facility is in place. However, some of these things, such as power lines, come with increased motorized access to the Forest due to service roads for the facilities.



The checkerboard landownership of the National Forest has been problematic for bears. Much of this private land came to be owned by timber companies and led to harvest of accessible acreage. Other land was sold to private developers. The timber harvest itself was not the real problem for grizzly bears, but the road building to access the timber had impacts. Roads and human activity tied to them displace bears from otherwise usable habitat, and also allow humans easier access into areas where grizzly bears occur and resulted in bear mortalities. Lands that are developed into home sites or ski areas result in direct habitat loss and displacement from grizzly bears in these areas. More human access into these areas increases the probability for bear/human encounters resulting in injury or mortality. A significant portion of the checkerboard lands have recently been added back to the National Forest through land acquisitions and adjustments. Recovering this habitat to public ownership has been very beneficial to many wildlife species, including the grizzly bear.

The Food Storage Order on in the Recovery Zone on the Forest has been very beneficial to bears and has undoubtedly decreased bear/human interactions. The implementation of the Food Storage Order and installation of bear resistant garbage containers and food storage boxes has occurred on the Forest and on private lands. This has reduced bear/human encounters. The Grizzly Bear Conservation Strategy (2003) has helped focus grizzly bear conservation efforts.

The presence of large amounts of fairly secure (non-motorized) habitat in Yellowstone National Park is of benefit to the grizzly bear. Creation of designated Wilderness areas also created large pieces of secure habitat for grizzly bear. Restriction of OHVs use off-road has helped reduce the chance of bear/human encounters and made motorized use predictable to motorized routes.

MFWP sets the hunting and fishing seasons in Montana. Big game season seems to be one of the times of year when grizzly bear mortality occurs due to numerous people being in areas where bears occur and those people are armed. Occasionally grizzly bears are killed through misidentification for black bears. The MFWP has instituted a bear identification course that all black bear hunters must take before they may hunt. In addition, multiple agencies and groups endorse the carrying and use of bear pepper spray in bear encounters. In addition, bear safety is taught by several groups in the state. The MFWP recently complete the State Grizzly Bear Plan for SW Montana.

The Canada lynx was listed as threatened under the ESA in 2000. The Forest has been using guidance in the Lynx Conservation Assessment and Strategy in analysis and to guide decisions, primarily related to winter use (Ruediger et al. 2000).

The reintroduction of the gray wolf into the GYA in 1995 has led to some interactions among grizzly bears and wolves. In recent years, gray wolves have moved onto the National Forest and caused depredation on some cattle and sheep allotments. In some cases, it is unclear which species (bears or wolves) caused the depredation, and which species just took advantage of the situation.

The combination of the effects of the above activities along with protection of the grizzly bear under the Endangered Species Act has overall been positive for the bear. Some activities or effects have been negative, such as the history of motorized access route building and management. Some have been very positive, such as the acquisition of private checkerboard lands, implementation of the Food Storage Order and decline of sheep grazing on the Forest. On the whole, the resulting

effects have been positive. The grizzly bear population in the GYA has met or exceeded recovery criteria.

The following information is on the effects of routes and land not under Forest Service jurisdiction.

The Boulder #1 subunit is almost entirely Wilderness. However, this subunit contains the private land in the Main Boulder corridor as well as the non-Forest Service road leading up the Main Boulder. This subunit offers large secure acreage for grizzly bears.

Boulder #2 lies on the Forest and in Yellowstone Park. The only motorized route in the subunit is the non-Forest Service road in the Park. This subunit also offers large secure habitat for grizzly bears.

The Crandall/Sunlight #1 subunit contains a piece of Highway 212 and has private routes associated with private land near Colter Pass. When combined with Forest Service routes, the northwest edge of this subunit is fairly motorized with an area of highest road density around the private land.

Crandall/Sunlight #2 has only a minute portion on the Gallatin National Forest. This small piece is affected by Highway 212 and only has a small portion non-motorized. The numbers in Table 3.10.6 are percentages for the entire subunit, not just the Gallatin National Forest. This subunit lies almost entirely on the Shoshone National Forest.

Lamar #1 is the subunit that includes Cooke City and is bisected by Highway 212. The road density along Highway 212 and the private land area is very high due to the state highway and private routes. Miller Creek road is a county road. When combined with the Forest routes, the portion of this subunit on the National Forest is fairly heavily motorized and has very little secure habitat. A small piece of this subunit lies on the Shoshone National Forest while most of this subunit lies within Yellowstone National Park.

Hellroaring #1 subunit has Highway 89 on the west side with numerous small pieces of private land and high motorized route density all along this highway corridor. The town of Gardiner is within the subunit. The main road to Jardine and then to the southeast is not a Forest Service road. A fairly large piece of this subunit is in the AB Wilderness, with a small portion in the Park, and these are non-motorized areas. When non-Forest Service routes are added to Forest Service routes, almost the entire Bear Creek/Eagle Creek area has high route densities.

Hellroaring #2 subunit is largely in the AB Wilderness on the Forest and partially in the Park. The only private land and route affecting this subunit is the small route up Passage Creek at the north side of the subunit.

Gallatin #3 has many non-Forest Service routes, especially on the east side (Cinnabar and Mulherin drainages), and state highways on the east and west sides (Highway 191 and 89). Tom Miner and other areas on the northeast side of the subunit also have private land and motorized routes. With all motorized routes, including Forest Service routes, the subunit is most heavily impacted on the east side and has numerous routes on the west side with some pieces of secure habitat. The small portion of the subunit in the Park is non-motorized.

Hilgard #1 and #2 include Highway 191 and the Taylor Fork Road. There are some private land parcels and accompanying routes in Hilgard #1 and #2. Hilgard #1 includes a piece on the

Beaverhead-Deerlodge National Forest that is all Wilderness and has some minor route density along the western boundary. Hilgard #2 includes the Monument Mountain piece of the Lee Metcalf Wilderness and a small piece of Yellowstone Park. These are non-motorized except for a piece of Highway 191 in the Park. This yields large pieces of secure habitat in both subunits with some smaller pieces of secure habitat as well.

Madison #1 includes parts of Highways 191 and 287. In addition, there is a large piece of private land near the junction of these two routes, a smaller private piece at Red Canyon, and some private land along the north lake shore that are fairly heavily motorized. The portion of the subunit that lies in Yellowstone Park is non-motorized except for Highway 191. In conjunction with Forest Service routes, this gives some secure habitat primarily in the Cabin Creek area and in the Park.

Madison #2 includes the town of West Yellowstone and several private subdivisions that have high motorized route densities. The most noticeable of these is the Horse Butte area. This subunit also includes Highways 20 and 191, and a county road leading to Horse Butte. In conjunction with Forest Service routes, this cumulatively gives the portion of the Madison #2 subunit lying on the Gallatin National Forest a very high motorized route density. Fortunately, the National Park part of this subunit is almost entirely non-motorized except for the road leading into the Park from West Yellowstone.

Plateau #1 has few cumulative effects from private, state or county routes in the subunit on the Gallatin National Forest. The subunit portion in the Park is virtually entirely non-motorized but has some route density near the boundary due to buffering routes on the Forest. On the Caribou-Targhee Forest in the southwest part of the bear subunit, there are fairly high route densities on the western part of the subunit and along the Park boundary, but it also has three sizeable pieces of secure habitat.

Henry's Lake #2 is bisected by Highway 20 from east to west. There is high route density in the private land located on the east side of the subunit, mostly north of Highway 20 and west of the South Fork of the Madison River. This area consists of over 3,000 acres of private land. There is also high route density on the private land in the area just north of Spring Creek on the western shore of Hebgen Lake. When added to the road densities on the National Forest and Forest Service routes, this makes almost continuous areas of high motorized route density on the part of this subunit that lies on the Gallatin National Forest. The Caribou-Targhee National Forest portion of this subunit is bisected by Highway 20 and a Forest Service road, Twin Creek. The Caribou-Targhee Forest has three sizeable pieces of secure habitat.

The Absaroka Beartooth Range outside of the Recovery Zone has some effects from non-Forest Service routes. On the Big Timber Ranger District, these areas are mostly in the Main Boulder, East Boulder, some private inholdings on the north edge of the Forest near the West Boulder, Mill Fork and Mission Creek. On the Livingston Ranger District, they are in Mill Creek and Emigrant Gulch areas. The effects of these routes are compounded by the addition of Forest Service routes, especially in the Mill Creek and Main Boulder drainages.

The Madison and Gallatin Range portions outside of the Recovery Zone have quite a few more areas of private inholdings and associated routes, as well as the development up and down the Gallatin Canyon and Big Sky in the Madison Range. There is some checkerboard ownership on the east side of the Gallatin Range in the Fridley and Miller Creek areas, with numerous motorized

routes. State Highway 191 goes through the Gallatin Canyon, and the Big Sky area is heavily developed with many motorized routes.

The Mile/Sheep Creek area is located outside of the Recovery Zone. This piece is relatively unaffected by non-Forest Service routes.

It is likely that the number of motorized routes adjacent to the National Forest and accessing private land within the Forest boundaries will continue to increase. Existing state, county and federal routes such as I-90 are unlikely to change very much in the future, and there probably will not be many more of these routes constructed, but existing routes may be widened or otherwise altered. Motorized routes within 500 m of the National Forest boundary affect bears on the National Forest according to the Moving Windows Analysis with the 500-m buffer. Grizzly bears that use this area do venture onto private, state and county lands near the Forest. Where speed limits are higher, bears are more likely to be hit by motor vehicles when they try to cross these routes. There have been some grizzly bear mortalities on highways that pass through the Forest.

## **Projected Combined Effects of Reasonably Foreseeable Programs and Activities**

There are several recurring themes in discussing reasonably foreseeable cumulative effects on grizzly bears. These are activities or situations in the past that have led to grizzly bear/human conflict and/or mortality. These themes are: 1) motorized access routes, 2) availability of food or garbage attractants, and 3) livestock grazing. An improving trend in all three of these factors is occurring, and is expected to continue to occur.

Future projects involving timber removal may tend to be tied largely to fuels reduction and management and will tend to be partial cuts. The major effect of timber activities on grizzly bears, that of new motorized routes, will be limited to temporary and low grade routes, if any new routes are needed, and all project routes are to be closed and/or obliterated after the project is completed.

Efforts are being made to increase the number of acres treated annually with prescribed fire. These projects will be coordinated and planned with wildlife in mind, and should overall be beneficial or neutral for the grizzly bear. Fire is a natural component of the landscape, and returning the Forest to a normal fire regime is beneficial for many wildlife species.

More efforts to maintain native species of vegetation on grazing allotments and protect riparian areas are occurring through the range management program. These efforts are beneficial to all wildlife species, including grizzly bears. Depredation from grizzly bears should decrease with the loss of sheep allotments on the Forest.

Expanded efforts to control weeds on the Forest are occurring. This will have an overall positive effect for wildlife species. Continuing the whitebark pine and aspen efforts at some level would be beneficial to the grizzly bear.

Future fisheries habitat enhancement will be of benefit to the grizzly bear, especially when riparian areas are improved.

Future minerals activity on the Forest is an issue due to the presence of the grizzly bear. Of particular concern is the exploration for leasable minerals. This can lead to an increase in motorized activities such as helicopters and motorized access routes. Direction from the Grizzly Bear Conservation Strategy does not allow new motorized routes or developed sites within the Recovery Zone without compensation within the same subunit. At this time, most of the interest in leasable minerals appears to be in the Crazyes and Bridger Mountains which are currently well outside areas currently inhabited by grizzly bears. There is the potential for new mineral claims within grizzly bear habitat and the activity that accompanies them. These activities must be mitigated.

According to the travel plan and following direction from the Grizzly Bear Conservation Strategy, there will be no new developed sites on the National Forest in the grizzly bear Recovery Zone, and there will be no decrease in secure habitat in the Recovery Zone and an increase in secure habitat in some subunits. Road and trail maintenance will continue at the levels stated in the travel plan. Implementation of Alternatives 2 through 7-M is an improvement over the current secure habitat situation for grizzly bears given the closure of project roads and designation of routes.

From a dispersed recreation perspective, the types of activities that lead to grizzly bear/human encounters on the Forest seem to show an increase indicating greater future use by day hikers, backpackers, and wildlife watchers among others. With a concurrent increase in the numbers of grizzly bears and an increase in the area utilized by bears, we can expect an increase in bear/human encounters. The Food Storage Order is planned to be expanded Forest-wide in 2007. This should help modify bear/human encounters related to attractants. In addition, Montana FWP and the FS as well as other entities, are encouraging the public to carry bear pepper spray when recreating on the National Forest. In the future, this should help to defuse some bear/human encounters. Educational programs on bear identification and safety are continuing and improving. No matter how much or how hard we work to prevent it, as long as humans and grizzly bears occupy the same landscape, there are likely to be bear/human encounters. We can strive to decrease the negative outcomes of these encounters, and steps are being taken to do so.

Outfitting/guiding is likely to increase with demand on the Forest. Outfitters/guides assuring that their group follows the rules are probably less likely to have bear/human encounters than the general public.

The number of recreation residences is not expected to increase in the future, and although there may be some modifications, their impacts will be about the same as they are at present. Permits for most of these facilities are being renewed in 2008. Language is being added to all permits on proper storage of food and garbage and consequences for noncompliance. Language is also being added to assure that any user of the residences is responsible, not just the permit holder.

Requests for special uses permits for non-recreational uses will continue. The main concern would be during the construction phases of the projects and then afterward if any motorized access routes are created. All of these requests will go through site-specific NEPA. Motorized access routes must be minimized or avoided in the Grizzly Bear Recovery Zone and where bears occur on the Forest.

The Forest will continue to acquire appropriate lands and conservation easements that will have an overall beneficial effect for wildlife, including grizzly bears.

The expansion of the Food Storage Order Forest-wide will be beneficial for bears and other wildlife. It will keep wild animals from becoming habituated to human food and losing their innate fear of humans. It should also reduce the potential for bear/human encounters. The future amendment of the Conservation Strategy for Grizzly Bear to the Forest Plans in the GYA will help assure the conservation of this species.

As the grizzly bear population increases, and human population and traffic in the area increases, the potential for grizzly bear mortality on highways increases. Increased driving speeds and poor sight distances contribute to mortality. Working with the highway departments on wildlife passage, including grizzly bears, is important.

The Gallatin National Forest's travel management plan is likely to reduce motorized routes on the Forest and thus increase secure habitat for grizzly bears and reduce motorized route densities. Other Forests are also undergoing travel management planning, either by district or Forest. The trends are likely to be similar to those of the Gallatin within the Recovery Zone.

The bison capture facility is likely to continue to exist at Horse Butte and one may be built north of the Park on the National Forest. The same situation is likely to continue at Horse Butte, and any new facility on the Forest will have to go through site-specific NEPA and will include an effects analysis for grizzly bears.

Hunting seasons will continue, and due to the presence of hunters with guns and grizzly bears in close proximity, human/bear encounters are likely to continue to occur. Education and enforcement of food storage may help to reduce the likelihood that these will be fatal encounters. Food Storage efforts must be maintained and increased as the human population increases and the bear population expands. The expansion of the Food Storage Order is one item that will occur in 2007.

The combination of wolves and grizzly bears in livestock depredation scenarios is not a good one. At this time, it appears that wolves are exerting a significant influence on some cattle allotments in terms of distribution of animals, etc. Grizzly bears have not been involved in cattle depredations in the past, but it is uncertain what the future holds. Because sheep have gradually phased out of the allotments on the Forest, that issue of depredation has been resolved.

The Grizzly Bear Conservation Strategy Amendment to the Forest Plans in the GYA gives a detailed look at the effects of reasonably foreseeable activity on the grizzly bear on a GYA-wide basis. For additional information, please see this DEIS or FEIS when that becomes available. Using the Lynx Conservation Assessment and Strategy (Rueudiger et al. 2000) guidance generally benefits grizzly bear by addressing effects of motorized use on habitat.

**Table 3.10.25. Table of secure habitat percentages by subunit and area outside of the Recovery Zone across Travel Plan alternatives.**

Subunits and areas outside Recovery Zone	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7-M
Boulder Slough #1 Percent Secure	96.3	96.4	96.4	96.4	96.7	96.7	96.6
Boulder Slough #2 Percent Secure	100	100	100	100	100	100	100
Crandall/Sunlight #1 Percent Secure	96.0	96.3	96.1	96.1	96.7	96.7	96.3
Crandall/Sunlight #2 Percent Secure	99.7	99.7	99.7	99.7	99.7	99.7	99.7
Lamar #1 Percent Secure	93.9	94.5	94.4	94.4	95.2	95.1	94.5
Hellroaring/Bear #1 Percent Secure	75.1	79.5	81.3	81.3	81.3	81.3	80.4
Hellroaring/Bear #2 Percent Secure	98.1	98.5	98.5	99.0	99.0	99.0	99.7
Gallatin #3 Percent Secure	54.4	59.4	60.1	62.2	71.8	81.0	70.2
Hilgard #1 Percent Secure	75.0	78.6	78.6	81.1	81.7	89.2	81.1
Hilgard #2 Percent Secure	78.7	81.8	81.8	81.3	82.9	90.2	83.1
Madison #1 Percent Secure	75.4	79.1	82.2	83.2	83.4	89.6	83.7
Madison #2 Percent Secure	66.7	71.7	71.7	71.7	71.7	71.7	71.8
Plateau #1 Percent Secure	92.1	93.8	93.8	93.8	93.8	93.8	93.8
Henry's Lake #2 Percent Secure	52.7	57.7	57.7	58.8	64.5	67.5	62.5
Mile/Sheep Creek Percent Secure	74.6	77.3	77.3	77.7	87.6	87.6	87.7
North Absaroka/Beartooth Percent Secure	73.8	75.8	75.8	80.6	83.5	83.6	78.9
Gallatin/Madison Percent Secure	49.1	52.6	52.6	57.2	59.1	60.2	57.0

## **Cumulative Effects of Past, Present and Reasonably Foreseeable Programs and Activities with the Travel Plan Alternatives**

Table 3.10.25 summarizes the effects of Travel Plan alternatives by presenting the percentage of secure habitat across the alternatives by grizzly bear subunit or area outside of the Recovery Zone south of I-90 where grizzly bears may occur. More detail is available in the body of this issue on effects by subunit.

Private, state, county and other non-Forest Service motorized routes affect grizzly bears the same way that motorized Forest Service routes affect bears, and many times, the speed limits are higher and surfaces are different. There are some areas with very high amounts of non-Forest Service routes.

## Effects common to all Alternatives

Boulder/Slough subunits #1 and #2 have an extremely high percentage of secure habitat under all seven alternatives (Table 3.10.25). In both subunits, the preferred alternative (7-M) has the same or slightly higher secure habitat values than the current condition. This complies with direction in the Grizzly Bear Conservation Strategy (ICST 2003). Since there are no project roads in these subunits, OMARD and TMARD have the same values.

Crandall/Sunlight subunits #1 and 2 have very high secure habitat values (Table 3.10.25). The Gallatin National Forest has only a small proportion of these two subunits. For Crandall/Sunlight #2, there is no difference among the seven alternatives. For Crandall/Sunlight #1, there is a slight difference among alternatives, and it appears that Alternative 7-M is a slight improvement over the existing condition. Since there are no project roads in this subunit, OMARD and TMARD have the same values.

Hellroaring/Bear subunits # 1 and #2 lie east of Gardiner in the Absaroka Beartooth Mountains, and Hellroaring Bear #2 consists almost entirely of Wilderness, resulting in a high secure percentage. Because some project roads affecting these subunits, therefore they have different OMARD and TMARD. The percent secure does not change from OMARD to TMARD for Hellroaring/Bear #1 (Table 3.10.25). Hellroaring/Bear #1 differs only slightly among the alternatives. Alternative 7-M has a higher percent secure than Alternatives 1 and 2. Hellroaring/Bear #2 is almost totally within the Absaroka Beartooth Wilderness, and therefore, it is almost totally secure under all alternatives except for some changes in roads in the Passage Creek area of Mill Creek that influence this subunit.

Madison #2 has OMARD and TMARD percentages for road densities that are fairly similar (Table 3.10.25). This subunit has almost no secure habitat on the National Forest. There are many private dwellings and attractants in this subunit. It appears there is little potential to increase secure habitat, and this is a subunit where grizzly bears face a higher risk of conflict with humans than in many other subunits (Gunther et al. 2004). Gunther et al. (2004) studied grizzly bear/human conflicts from 1992 to 2000, and found several clusters of conflicts on the Gallatin National Forest. One is in the Madison #2 subunit, another is in the Hilgard subunits (Taylor Fork), and the third is in Gallatin #3 (near Gardiner). In a review of the conflicts and mortalities since 2000 for Madison #2, there continue to be 2-4 conflicts reported each year in this subunit tied to attractants such as garbage and pet or livestock food. There have also been a number of mortalities on both private and public land in the Madison #2 vicinity (ICST Annual Reports 2000-2003). Although Alternatives 2 through 7-M increase secure habitat, it is in very small pieces surrounded by motorized access routes. The largest piece of secure habitat created is less than about 200 acres. It does not appear to be logical to use scarce resources to improve this subunit given its inherent low habitat value, the attractants available and mortality risk to bears in this area. In Alternatives 1-6, the Rendezvous Ski Trail routes were accidentally omitted as administrative routes. These routes are maintained infrequently in the summer by motorized vehicles to remove downfall and trim trees growing into the trails. This was corrected for Alternative 7-M, and is the same across all alternatives. This means that Alternatives 2 through 7-M have 71.8% secure habitat, but Alternatives 1-6 were not reanalyzed.



A small portion (about 15%) of the Plateau #1 subunit lies on the Gallatin National Forest. Most of this subunit is in the Caribou-Targhee National Forest and Yellowstone Park. The portion in the Park is almost entirely secure habitat, and the portion on the Caribou-Targhee has several pieces of secure habitat. The percentages given are somewhat misleading because they are for the entire subunit but omit motorized routes in the Park and on the Caribou-Targhee National Forest. There is no difference between secure habitat percentages under all Alternatives 2 through 7-M indicating that there are not a lot of options to improve this area (Table 3.10.25).

Henry's Lake #2 subunit is shared between the Gallatin and Caribou-Targhee National Forests, and is one of the subunits designated "in need of improvement" by the Grizzly Bear Conservation Strategy (ICST 2003). This subunit is heavily motorized on the east side.

### **Alternative 1**

This alternative is the "no action" alternative which retains current Forest Plan direction, does not include the OHV EIS decision, and does not direct project roads to go out of use, or designate routes. Under this alternative, use would continue as it has except cross-country OHV use would be allowed as shown under the current Forest visitor map.

Hilgard #1 secure habitat is 75% and 78.6% under Alternatives 1 and Alternative 2, respectively (Table 3.10.25). Madison subunits #1 and #2 are shared with Yellowstone Park, and Madison #2 is one of the subunits that the Grizzly Bear Conservation Strategy designates as "in need of improvement." Madison #1 shows Alternative 1 at 75.4% secure. Madison #2 has Alternative 1 at 66.7% secure. Under Alternative 1, project roads remain open, and under Alternatives 2 through 7-M, these roads go away over time. The OMARD and TMARD percentages for road densities are fairly similar. No attempt is made to increase secure habitat and decrease motorized route densities. This alternative could negatively impact grizzly bears and potentially affect grizzly bear recovery.

### **Alternative 2**

This alternative is basically what is currently happening on the Forest with the OHV EIS decision in place. This alternative would include new programmatic direction and would include the direction provided in the Grizzly Bear Conservation Strategy (2003) according to the MOU (2003) stating that the Forests should implement the Strategy as well and the FWS BO (1996) that told the Gallatin National Forest to adopt GYA access standards when they became available. This alternative includes the programmatic direction in the Travel Plan. This alternative would also designate routes. This alternative moves toward being more compatible with grizzly bears and recovery, and in most cases it has increased secure habitat and decreased route densities in the 3 subunits in need of improvement on the Forest (Gallatin #3, Madison #2, and Henry's Lake #2) simply by putting project roads out of use, designating routes and prohibiting cross-country OHV use.

Hilgard #2 subunit shows a slight increase in secure habitat from 78.7% and 81.8% in Alternatives 1 and 2, respectively (Table 3.10.25). Madison Alternative 2 is 79.1% secure. Madison #2 Alternative 2 is a slight improvement over Alternative 1 due to the loss of project roads. Henry's Lake #2 Alternative 2 shows an improvement over Alternative 1 due to the loss of project roads.

### **Alternative 3**

This alternative responded to the Benchmark and identifies or reinstates numerous motorized routes. This alternative would include new programmatic direction and would include the direction provided in the Grizzly Bear Conservation Strategy (2003) according to the MOU (2003) stating that the Forests should implement the Strategy as well and the FWS BO (1996) that told the Gallatin National Forest to adopt GYA access standards when they became available. This alternative includes the programmatic direction in the Travel Plan. This alternative would also designate routes. This alternative moves toward being more compatible with grizzly bears and recovery, primarily through the loss of project roads. This alternative also proposes several backcountry airstrips on the Forest, including three in the Recovery Zone.

### **Alternative 4**

This alternative is similar to the Starting benchmark proposal. This alternative designates some new ATV/motorcycle trails and creates some new trail connectors and loop opportunities. This alternative would include new programmatic direction and would include the direction provided in the Grizzly Bear Conservation Strategy (2003) according to the MOU (2003) stating that the Forests should implement the Strategy as well and the FWS BO (1996) that told the Gallatin National Forest to adopt GYA access standards when they became available. This alternative includes the programmatic direction in the Travel Plan. This alternative would also designate routes. This alternative moves more toward being compatible with grizzly bears and recovery, any improvement is due to the loss of project roads.

### **Alternative 5**

This alternative is more restrictive on motorized uses than most of the other alternatives. This alternative is similar to the Starting benchmark proposal. This alternative designates some new ATV/motorcycle trails and creates some new trail connectors and loop opportunities. This alternative would include new programmatic direction and would include the direction provided in the Grizzly Bear Conservation Strategy (2003) according to the MOU (2003) stating that the Forests should implement the Strategy as well and the FWS BO (1996) that told the Gallatin National Forest to adopt GYA access standards when they became available. This alternative includes the programmatic direction in the Travel Plan. This alternative would also designate routes. This alternative is compatible with grizzly bears and recovery, and has met the Conservation Strategy (2003) standard of increasing secure habitat and decreasing route densities in the 3 subunits in need of improvement on the Forest (Gallatin #3, Madison #2, and Henry's Lake #2) as well as maintaining or improving secure habitat percentages in other subunits and maintaining or improving route densities.

### **Alternative 6**

This alternative is the most restrictive on motorized use. This alternative would include new programmatic direction and would include the direction provided in the Grizzly Bear Conservation Strategy (2003) according to the MOU (2003) stating that the Forests should implement the Strategy as well and the FWS BO (1996) that told the Gallatin National Forest to adopt GYA access standards when they became available. This alternative includes the programmatic direction in the Travel Plan. This alternative would also designate routes. This alternative is compatible with grizzly bears and recovery, and has met the Conservation Strategy (2003) standard of increasing secure

habitat and decreasing route densities in the 3 subunits in need of improvement on the Forest (Gallatin #3, Madison #2, and Henry's Lake #2) as well as maintaining or improving secure habitat percentages in other subunits and maintaining or improving route densities.

### **Alternative 7-M**

This alternative lies somewhere in between Alternatives 3-4 and 5-6 in its effects to grizzly bears. In all cases it is at least equal to if not an improvement over Alternatives 1 and 2 for secure habitat and road densities. This alternative would include new programmatic direction and would include the direction provided in the Grizzly Bear Conservation Strategy (2003) according to the MOU (2003) stating that the Forests should implement the Strategy as well and the FWS BO (1996) that directed the Gallatin National Forest to adopt GYA access standards when they became available. This alternative includes the programmatic direction in the Travel Plan. This alternative would also designate routes. In almost all subunits, the impacts of Alternative 7-M are in between those of Alternatives 3 and 4 and those of Alternatives 5 and 6. Thus secure habitat is higher than Alternatives 3 and 4 and route densities are lower than in 7-M. Secure habitat is lower than in Alternatives 5 and 6 and the route densities are higher than in 7-M. This alternative is compatible with grizzly bears and recovery, and has met the Conservation Strategy (2003) standard of increasing secure habitat and decreasing route densities in the 3 subunits in need of improvement on the Forest (Gallatin #3, Madison #2, and Henry's Lake #2) as well as maintaining or improving secure habitat percentages in other subunits and maintaining or improving route densities. This Alternative has met the intent of the Conservation Strategy direction. This Alternative considers the proposal of some backcountry airstrips, but these are excluded from the Grizzly Bear Recover Zone and some other parts of the Forest.

For Gallatin #3, one of the "subunits in need of improvement", Alternative 7-M is a substantial improvement over the current condition in all categories (Table 3.10.25). The main change is the removal of motorized use from the southern part of the subunit and the reduction in motorized use on the east side of the Gallatin Crest. This creates two fairly large pieces of secure habitat. Gallatin #3 is one the subunits designated "in need of improvement" according to the Grizzly Bear Conservation Strategy (ICST 2003). Alternative 7-M improves this subunit to 70.2% secure habitat over the current at 54.4% for Alternative 1 and 59.4% for Alternative 2. Because there are project roads, this area improves with the implementation of Alternative 2. TMARD and OMARD are slightly different, but they both show a decline in route densities in their highest categories from the current condition to Alternative 7-M.

Only a small portion of the Lamar #1 subunit is on the Gallatin National Forest, however, it includes Cooke City and a fairly highly motorized area to the north of Cooke City. Alternative 7-M is very similar to the current condition with an improvement over Alternative 1 and the same amount of secure habitat as Alternative 2 (Table 3.10.25). The main difference occurs in the northwest part of the subunit where an area becomes part of the higher route density category. Since there are no project roads in this subunit, OMARD and TMARD have the same values.

Hilgard #1 and #2 subunits lie on the west side of the Forest and both contain some of the Lee Metcalf Wilderness. Hilgard #1 secure habitat is 81.1% under Alternative 7-M (Table 3.10.25). TMARD and OMARD differ somewhat. Alternative 7-M decreases in the higher motorized route

density categories and increases secure habitat. Hilgard #2 is 83.1% secure in Alternative 7-M. Road densities also decrease in the higher road density categories.

Madison subunits #1 and #2 are shared with Yellowstone Park, and Madison #2 is one of the subunits that the Grizzly Bear Conservation Strategy designates as “in need of improvement.” For Madison #1, Alternative 7-M also shows a decrease in the higher motorized route densities categories in TMARD and OMARD (Table 3.10.25). Madison #2 shows Alternative 7-M with 71.8% secure which is about the same as Alternatives 2-6 showing that there is little option for improvement.

Plateau #1 shows a slight improvement in the higher motorized route densities from Alternative 1 to Alternative 7-M (Table 3.10.25).

Henry’s Lake #2 subunit Alternative 7-M at 62.5% secure is an improvement over both Alternatives 1 and 2 (52.7% and 57.7% secure, respectively), those alternatives closest to the current condition (Table 3.10.25). It improves the subunit over the current level of secure habitat mostly on the west side of the subunit.

Sheep and Mile Creek are outside of the Recovery Zone in the Henry’s Mountains. This area improves to 87.7% secure habitat in Alternative 7-M (Table 3.10.25). This is primarily due to the change to non-motorized use for the Sheep Creek Trail. The Absaroka Beartooth area north of the Recovery Zone and south of I-90 includes substantial Wilderness acreage. Secure improves to 78.9% under Alternative 7-M. The Gallatin/Madison areas north of the Recovery Zone and south of I-90 include some of the Lee Metcalf Wilderness. Under Alternative 1 there is 49.1% secure habitat in this area, and it increases under Alternative 2 to 52.6%. Under Alternative 7-M, secure habitat increases to 57.0%.

For yearlong snowmobiling, the percentage of the mountain ranges open to snowmobiling south of I-90 by Mountain range is decreased for all mountain ranges except the Henry Mountains where the percentage is increased slightly in Alternative 7-M. The A/B sees little change across the alternatives. The Gallatin Range and Madison Range have a fairly large shift by an increase in acres closed to snowmobiles in Alternative 7-M. Additional seasonal closures are insignificant. Although the issue of grizzly bear denning and emerging and snowmobile impacts has not been substantiated in this area, additional acreage closed to snowmobiling means that grizzly bear denning habitat is more protected from potential disturbance.

Throughout this EIS process, how to deal with access management direction related to grizzly bears has been evolving. In Alternative 7-M, grizzly bear direction becomes part of Chapter II, while for Alternatives 2-6, it was in Chapter II in the goals, objectives, standards and guidelines.

Cumulatively, management actions on the Gallatin National Forest generally improve conditions for the grizzly bear over the current condition. In addition, there are large pieces of secure habitat found in the National Parks and Forests in the Yellowstone area. Some alternatives of this travel plan, especially in Alternatives 5, 6 and 7-M, provide increased habitat security for grizzly bears. Most impacts to grizzly bears are from cumulative effects on private lands, and are not from the actions of the Forest Service or other agencies. Alternative 7-M uses the current direction for

access management which is beneficial for grizzly bears. The future Grizzly Bear Conservation Strategy Amendment to the Forest Plans also offers protection of grizzly bear habitat.

## **Effects of Proposed Goals, Objectives, Standards and Guidelines**

Alternatives 2 through 7-M propose a number of goals and objectives to provide for recreation opportunity, access and to improve other resource conditions that may have been adversely affected by the Forest's transportation system. Goals and objectives, by themselves, have no environmental effect because they do not constitute final agency decisions. Environmental effect under NEPA is more appropriately addressed at such time that specific actions are proposed to achieve these goals and objectives. The proposed Travel Management Plan does include the final agency decisions for management of public travel and this reflects implementation of the goals and objectives proposed for recreation opportunity (for example Forest-wide Goal A, Objective A-1, and Travel Planning Area Goals 1 and 2 and Objectives 1-1 and 2-1). The predicted direct, indirect and cumulative effects of public travel on Grizzly Bear, and hence the implementation of these goals and objectives are addressed earlier in this section.

Alternatives 2 through 7-M also propose standards and guidelines to provide for protection of other resources during Travel Plan implementation. Standards and guidelines include protection measures within which future proposals for road and trail construction, reconstruction, maintenance and decommissioning must take place. These are considered final agency decisions because they set limitations within which future actions must take place.

The proposed goals, objectives, standards and guidelines that are relevant to the protection of Grizzly Bear are discussed below.

Where Alternative 7-M differs from Alternatives 2-6, it is noted below in parentheses. The benefits to grizzly bears accrue through the implementation of any alternative which designates routes, places the Forest under the OHV EIS and generally reduces motorized routes and protects wildlife habitat. There is a goal for wildlife corridors (Goal E in Alternatives 2-6 and Goal F in Alternative 7-M) which are specifically addressed in this issue. Other items are more general but benefit grizzly bears by protecting or enhancing habitat for wildlife and/or fish, protecting rare habitats or rare species, promoting connectivity, or reducing human impacts. Additional comments on how this direction affects biological diversity appear below in italics.

## **Proposed Forest-wide Direction, Alternatives 2-6 and 7-M**

**Standard A-6. Off-route travel.** Wheeled motorized vehicle travel shall be prohibited off of designated routes with the following exceptions. (This standard and the following exceptions under Alternatives 2-6 become Standard A-8 in Alternative 7-M. There are slight modifications of wording in the exceptions from Alts. 2-6 to Alt. 7-M.) *This standard is beneficial to many species of plants and animals, including grizzly bears, by limiting almost all use to designated routes with minor exceptions, rather than allowing off-route use.*

**GOAL C. Resources (General).** Manage a system of roads and trails and associated public use that is consistent with Forest Plan goals for water quality; wildlife habitat; fish habitat; threatened

and endangered species recovery; and historical resources (Note: Until Forest Plan revision refer to Forest Plan (9/87), pages II-1, II-2, and Amendment 19). (This Goal under Alternatives 2-6 becomes Goal D in Alternative 7-M, and the following objectives remain the same.) *This goal is beneficial to many species and their habitats on the Forest by allowing uses consistent with water quality, wildlife habitat, fish habitat, etc.*

**OBJ. C-1. Road Rehabilitation.** Close and rehabilitate existing roads that are in excess to administrative, recreation and access needs. (This objective becomes **Objective D-1** under Alternative 7-M.) *This objective reduces the amount of roads and their effects on the landscape to grizzly bears.*

**OBJ. C-2. Trail Rehabilitation.** Close and rehabilitate existing non-system trail not otherwise designated for public travel. (This objective becomes **Objective D-2** under Alternative 7-M.) *This objective reduces impacts of humans to grizzly bears.*

**GOAL D. Fisheries.** Manage a road and trail system that fully supports the beneficial use of growth and propagation of salmonid fishes and associated aquatic life. This is followed by a number of objectives. (In Alternative 7-M, Goal D becomes **Goal E. Water Quality, Riparian, Fisheries and Aquatic Life** with numerous objectives, standards, and one guideline.) *The protection of water quality, riparian habitats, fisheries and aquatic life is important for many species including the grizzly bear. The language in Alternative 7-M is an improvement over the language in Alts. 2-6.*

**GOAL E. Wildlife Corridors.** Provide for wildlife movement and genetic interaction (particularly grizzly bear and lynx) between mountain ranges at Bozeman Pass (linking the Gallatin Range to the Bridger/Bangtails); in the North Bridgers (linking the Bridger Range to the Big Belt Mountains); across Highway 191 from Big Sky to its junction with Highway 287 (linking the Gallatin and Madison Mountain Ranges); the Lionhead area (linking the Henry's Lake Mountains to the Gravelly Mountains and areas west); Yankee Jim Canyon (linking the Absaroka Mountains to the Gallatin Range); and at Cooke Pass (linking the Absaroka/Beartooth Range to areas south). *This goal and TPA specific objectives help protect and allow for movement of wildlife between mountain ranges.* (Under Alternative 7-M, Goal E becomes **GOAL F. Wildlife Corridors**, and it is worded differently. Provide for wildlife movement and genetic interaction (particularly for wide-ranging species) between and within mountain ranges throughout the Gallatin National Forest and connecting wildlands. **OBJ. F-1.** Provide habitat connectivity consistent with wildlife movement patterns between mountain ranges such as that at Bozeman Pass (Linking the Gallatin Range to the Bridger/Bangtails); the North Bridgers (linking the Bridger Range to the Big Belt Mountains); the Lionhead Area (linking the Henry's Lake Mountains to the Gravelly Mountains); the Shields (Crazy Mountains to the Castle and Little Belt Mountains) and any additional linkage or wildlife movement corridors recognized by the Forest Service.) *The language change between Alts. 2-6 and 7-M is an effort to move all of the direction into Forest-wide direction, and allows recognition of the potential addition of new corridors in the future. It also names the corridors that seem to be important connections among mountain ranges and deletes a few of the corridors that are currently less well documented. Corridors are recognized as essential parts of maintaining biodiversity by allowing wildlife movement and allowing wildlife populations to be as connected as they have been in the past. Corridors are important for wide ranging species such as the grizzly bear.*

**GOAL F. Threatened, Endangered and Sensitive Wildlife Species.** Manage human use of the Forest road and trail system that allows for the recovery of threatened and endangered species and maintains sensitive species and their habitats. (This becomes **Goal G. Threatened, Endangered and Species of Special Management Designation.** This wording change from Sensitive Species to Species of Special Management Designation allows for the potential change of designations of species that the Forest manages under the New Planning Rule such as Special of Concern.) *This goal helps protect and recover T&E species, such as the grizzly bear, and other rare species and their habitats.*

**OBJ. F-1. Grizzly Bear Recovery.** Within the grizzly bear recovery zone reduce total summer motorized access route density and increase core (secure) habitat, consistent with the Grizzly Bear Conservation Strategy, within subunits Gallatin #3, Henry's Lake #2 and Madison #2. Provide effective closures on access routes not designated for motorized use. (In Alts. 2-6.) (Under Alternative 7-M **Objective G-1** is: Provide effective closures on access routes not designated for motorized use. Grizzly Bear subunits Gallatin #3, Henry's Lake #2, and Madison #2 and non-designated routes that are attractive to motorized use within secure grizzly bear habitat should receive high priority.) *This helps assure that priority is given to closing routes in important grizzly bear habitat.*

**OBJ. F-2. Grizzly Bear Recovery.** Provide for no human-grizzly bear interaction that results in personal injury or bear mortality. Provide all visitors to the trail system of the Gallatin National Forest with information on proper food storage and safe recreation use. (In Alts. 2-6.)

**STANDARD F-1. Grizzly Bear Recovery.** Within the grizzly bear recovery zone (as described in Gallatin Forest Plan, 9/87), any new motorized route constructed and used for administrative or other purposes will be offset by closure of another open motorized route of equal or greater length within the same bear management subunit. (This standard is applicable to Alternatives 2 through 6 and is based on Amendment 19 of the 1987 Gallatin National Forest Land and Resource Management Plan (1995) that established certain requirements for the protection of the threatened grizzly bear.)

**STANDARD F-2. Lynx.** In accordance with the Lynx Conservation Strategy there shall be no net increase in any groomed or marked snowmobile or ski routes or designated play areas on the Gallatin National Forest. (This standard applies to Alternatives 2 through 6. The standard would mean that there could not be a net increase in groomed or marked routes or play areas once the travel planning decision has been made. This standard does not exist in Alternative 7-M).

**Under Alternative 7-M, Guidelines G-2 Species of Special Management Designation, and Guideline G-3, Threatened and Endangered Species** are brought into the EIS. Under **G-2**, new proposed routes are located to avoid important habitats of Species of special management designation, and mitigation measures are suggested. **Guideline G-3** for T&E species allows for temporary localized restrictions to prevent conflicts with T&E species.

**In addition to the proposed programmatic direction, travel management under Alternative 7-M would follow current direction applicable to the management of grizzly bear and lynx.** At the time of this EIS publication, the applicable direction is based on Memorandums of Understanding (MOU's) and Conservation Agreements (CA) with the United States Fish and Wildlife Service (USFWS). See MOU, Conservation Strategy (ICST 2003:12-13), the USFWS Biological Opinion on Access (1995), and Canada Lynx Conservation Agreement (2005). *Alternative 7-M, by following current direction for grizzly bear and lynx and by that wording allowing the Grizzly Bear Conservation Strategy for Grizzly Bears in the GYA and the Northern Rockies Lynx Amendment to become our current direction as these decisions are made, benefits these T&E species by using the best science and current information in their management.*

**GOAL G. Wildlife.** Provide for healthy vegetative conditions in key habitats such as willow, riparian, wetlands, whitebark pine, and potential old growth. (This becomes **Goal H. Wildlife** in Alternative 7-M, and several other key habitats are enumerated.) *Maintaining key habitats, which host more species than other habitats. Some of these rare habitats such as riparian habitat and old growth are very important for grizzly bear.*

**OBJ. G-1.** Strive for no unclassified, undesignated roads and trails within key habitats that have been damaged or is devoid of native vegetation due to motorcycle, ATV, horse or foot use. (This Objective is dropped from Alternative 7-M, and **Guidelines H-1 and H-2** are added. **H-1.** Relocate, reconstruct or take other appropriate action on system roads and trails that are found to have adverse impacts on key habitats. **H-2,** Roads and trails should be located to avoid key habitats or mitigate the impacts.) *Maintaining key habitats that are important for many wildlife species.*

**GOAL H. Wildlife.** Provide high quality security habitat in areas important to wildlife reproduction (e.g. calving, fawning, denning and nesting habitat). (This becomes **Goal I** in Alternative 7-M.) *Protection of reproductive habitats is important for protecting and maintaining one of the important food sources for grizzly bears.*

**OBJ. H-1.** Minimize stress factors from human recreation use to species of concern during calving, fawning, denning and nesting seasons in habitats used for reproduction. See specific travel management area direction. (This becomes **Guideline I-1** in Alternative 7-M.)

**GOAL I. Wildlife.** Provide high quality security habitat on important ungulate winter range. (In Alternative 7-M this was consolidated into Goal H.)

**OBJ. I-1. Ungulates.** Eliminate stress factors from human winter recreation use to ungulates in important winter range areas. (This Objective is part of Objective I-1 in Alternative 7-M.) *Although ungulates tend to be common species, providing security on big game winter range also benefits other species that occur there. Grizzly bears often move onto ungulate winter range soon after den emergence, and protection of security of these areas benefits grizzlies.*



**Guideline I-2.** This is new under Alternative 7-M and states that in management of winter travel should consider MFWP goals for optimal survival on big game winter ranges.

Alternatives 3 and 7-M both have language regarding the consideration of backcountry airstrips. Basically, proposals for airstrips (airplane and helicopter) will be considered and must go through NEPA analysis and would be under special use permits. Under Alternative 3, a number of airstrips are proposed, including several in the Recovery Zone. Under Alternative 7-M, backcountry airstrips for public recreational use will not be considered in designated Wilderness, the Hyalite/Porcupine-Buffalo Horn Wilderness Study Area, the Cabin Creek Recreation Wildlife Management Area, the Lionhead and Republic Mountain Recommended Wilderness Areas, or within the Grizzly Bear Recovery Zone. For grizzly bear, it is preferable not to allow airstrips at all on the Forest south of I-90, but if they are allowed, Alternative 7-M, which restricts some areas for this activity, is preferable over Alternative 3.

In Alternatives 2-6, there were additional categories of Administrative Uses and Road and Trail Construction, Reconstruction and Maintenance for Forest Plan direction. These do not exist under Alternative 7-M, but are meshed with other Goals, Objectives, Standards and Guidelines.

Overall, the modifications of Goals, objectives, standards and guidelines that occur from Alternatives 2-6 to 7-M are more clear and concise and more of them become Forest-wide. The wording in Alternative 7-M is preferable over that in the other alternatives for the Grizzly Bear issue.

All of the following programmatic Forest-wide direction benefits the grizzly bear and/or its habitat. As stated in Chapter 2, the Forest is following the most current direction for motorized access in grizzly bear habitat under Alternative 7-M as directed to by the Regional Forester's MOU and by the 1995 Biological Opinion of the USFWS directing implementation of Yellowstone access standards when they become available. That direction follows here.

## **Grizzly Bear**

Under the Grizzly Bear Conservation Strategy MOU (2003), future proposals for roads, trails and other actions relative to travel within the Grizzly Bear Recovery Zone would be governed by the following (further details are available in the Grizzly Bear Issue):

- \* Within the Grizzly Bear Recovery Zone, proposals to construct or open new motorized routes must be offset by closing other motorized routes such that there will be; no increase in Open Motorized Access Route Density (OMARD) and Total Motorized Access Route Density (TMARD); and no decrease in secure habitat within Grizzly Bear subunits with the following exceptions.
  - A project may decrease secure habitat by 1% of the largest subunit in the Bear Management Unit (BMU). Only one project that affects secure habitat can occur in a subunit at one time, and secure habitat must be restored within one year of the completion of the project.

- A project may permanently change secure habitat quality provided a replacement of secure habitat of equivalent habitat quality is made in the same subunit. This replacement habitat must be maintained for a minimum of 10 years and must be in place before project initiation or provided concurrently.

\* Maintain the percent of secure habitat in grizzly bear subunits at or above 1998 levels. (Secure habitat is defined as more than 500 meters from an open or gated motorized access route or re-occurring helicopter flight line (March 1- November 30). It must be greater than or equal to 10 acres in size. Replacement secure habitat created to mitigate for loss of existing secure habitat must be of equal or greater habitat value and remain in place for a minimum of 10 years. Large lakes are not included in the calculations.)

- Secure habitat in the subunits “in need of improvement” will be improved above the 1998 baseline (on the Gallatin National Forest these subunits are Gallatin #3, Madison #2, and Henry’s Lake #2).

Through an analysis separate from this Travel Plan EIS, the Forest Service has proposed to amend Greater Yellowstone Area Forest Plans (including the Gallatin Forest Plan) to adopt the Grizzly Bear Conservation Strategy (ICST 2003). If and when such decision is made it will supercede the travel management direction above.

## **Consistency with Laws, Regulations, Policy, and Federal, Regional, State and Local Land Use Plans (including the Forest Plan)**

The grizzly bear is a species listed as threatened under the Endangered Species Act (ESA). This Act and the Recovery Plans for grizzly bear in the Yellowstone area provide important direction for this species and its recovery. Much of this direction was incorporated into the 1987 Gallatin Forest Plan (USDA 1987:Appendix G). In 2003, the Grizzly Bear Conservation Strategy (ICST 2003) was produced and the Forest has been using this as current direction. A Memorandum of Understanding signed by the Regional Foresters for the Greater Yellowstone Area has directed the Forest Service to follow the Conservation Strategy (ICST 2003). In addition, a 1995 Biological Opinion from the US Fish and Wildlife Service directed the Gallatin National Forest to adopt motorized access standards when they became available. This led to an amendment to the Forest Plan (Amendment 19 1996) for motorized access in the grizzly bear Recovery Zone. The Conservation Strategy makes new motorized access standards available. By following the Conservation Strategy (2003), and direction from Biological Assessments and Amendment 19, the Forest is in compliance with the Endangered Species Act. Alternatives 2-6 strive to meet current direction for grizzly bear and place this direction in the goals, objectives, standards and guidelines of the Travel Plan. Alternative 7-M states that the Forest will follow current direction for grizzly bear management.

The Cabin Creek area on the Hebgen Lake Ranger District features a diverse mix of habitats with grass/forb meadows containing abundant forage for grazing animals, large stands of whitebark pine trees providing critical grizzly bear forage, many springs and seeps with green vegetation and water late into the driest parts of summer, along with areas of heavy forest cover. This area provides some of the highest quality wildlife habitat on the Gallatin National Forest, particularly for elk and grizzly bears. This was recognized by the Lee Metcalf Wilderness and Management Act of 1983 (Public Law 98-140), which stated that “the Congress finds that certain lands within the Gallatin

National Forest near Monument Mountain have important recreational and wildlife values, including critical grizzly bear and elk habitat.” The Act established the Cabin Creek Recreation and Wildlife Management Area (CCRWMA) and provided special protection for wildlife habitat in this area. It states that, “the Secretary shall permit continued use of the area by motorized equipment only for activities associated with existing levels of livestock grazing, administrative purposes (including snowmobile trail maintenance) and for snowmobiling during periods of adequate snow cover but only where such uses are compatible with the protection and propagation of wildlife within the area.” No definable threshold for evaluating compatibility of motorized uses with the protection and propagation of wildlife were included in the Act.

Because the CCRWMA has particularly high quality habitat for elk and grizzly bears relative to other wildlife species, the analysis for the Grizzly Bear and Big Game Issues were used to evaluate the consistency of the alternatives with the Act’s requirement to ensure that motorized uses allowed in the CCRWMA are compatible with the protection and propagation of wildlife. All alternatives would be consistent with the Act due to the lack of a definable threshold for evaluating the propagation and protection of wildlife requirement of the Act. However, summer motorized use under Alternatives 5 through 7-M would better provide for the protection and propagation of wildlife in the CCRWMA compared to Alternatives 1-4. The grizzly bear analysis for the Madison #1 BMS noted an increase in secure habitat from Alternatives 1 and 2 to Alternatives 3 through 7-M. It also noted that although secure habitat values in this BMS differed little among Alternatives 3 through 7-M, Alternatives 5 through 7-M would reduce disturbance, displacement, and mortality risk for grizzly bears relative to Alternatives 3 and 4 by restricting ATV use within the CCRWMA to a portion of Trails #68 and 203.

Grizzly Bear Issue disclosed that the effects of snowmobile use on grizzly bears are generally not significant, and that the effects of winter travel would be limited to some potential disturbance of individual bears. All alternatives for winter travel would therefore be consistent with the Act’s requirement for protection and propagation of wildlife.

The current condition for travel management, Alternative 1, which allows for a proliferation of motorized use, does not limit motorized use or cross-country use, and does not designate motorized routes, does not meet the above direction if allowed to continue. Motorized creep would occur with many more user built routes and double track routes appearing throughout the Forest. Alternative 1 could threaten the persistence of some species in the future. This would decrease secure habitat for grizzly bears and increase motorized route densities in the Recovery Zone and elsewhere on the Forest. This alternative does not meet the direction in the Conservation Strategy (ICST 2003), and therefore does not comply with ESA.

Alternatives 2 through 7-M take positive action by removing project roads from public use and designating routes. The alternatives that take the strongest measures to limit motorized use and protect connectivity are the alternatives that best meet direction relevant to grizzly bear. These are Alternatives 5, 6, and 7-M. Alternatives 5 and 6, with the least motorized routes and most secure habitat of all the alternatives, would benefit grizzly bear the most. However, the Forest is consistent with current direction for Alternatives 2 through 7-M as analyzed above because all of these alternatives either maintain or improve secure habitat and improve all three subunits “in need of improvement” (Gallatin #3, Madison #2, and Henry’s Lake #2). However, Alternative 3 proposes

backcountry airstrips which would only be compatible with the current grizzly bear direction if they can be compensated for within the same bear subunit. Unless compensation would occur, these airstrips would not meet current direction. Alternative 7-M also considers airstrips, but does not consider them within the Recovery Zone, thus it is compatible with current direction.